Drug Formulary 2009
كلمة وزير الصحة

شهدت مملكة البحرين قفزة نوعية متميزة خلال السنوات الماضية في مختلف المجالات، وفي مقدمتها الخدمات الصحية. وتأتي هذه الإنجازات بدعم وتوجيهات سديدة من صاحب الجلالة الملك حمد بن عيسى آل خليفة ملك مملكة البحرين، وصاحب السمو الشيخ خليفة بن سلمان آل خليفة رئيس الوزراء الموقر، وصاحب السمو الشيخ سلمان بن حمد آل خليفة ولي العهد الأمين.

وتسعى وزارة الصحة جاهدة لتحقيق الأهداف السامية التي حددتها خدمة للمواطنين والمحقرين على أرض المملكة. ومن أجل ذلك، تقوم وزارة الصحة بتقديم خدمات صحية نوعية ومتقاطعة من خلال مراكزها المتعددة، ومن ضمنها الأدوية الأممية ذات الفعالية المؤكدة والجودة العالية.

وقد دأت وزارة الصحة على تحديث قائمة الأدوية المعتمدة للاستخدام في المستشفيات والمرکز الصحية التابعة لها باستمرار، أخذة في الاعتبار الحاجة الفعلية لهذه الأدوية، والتطورات المتسارعة، والأكتشافات الجديدة والمبتكرة في مجال الأدوية، وكذلك التصاعد المضطرد في تكلفة الأدوية.

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الدكتور فيصل بن يعقوب الحمر
وزير الصحة
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   - Pharmacy & Drug Control
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# CARDIOVASCULAR SYSTEM

## CARDIAC GLYCOSIDES

### DIGOXIN

**Indications:** Heart failure, supraventricular arrhythmias (particularly atrial fibrillation).

**Cautions:** Recent myocardial infarction, hypothyroidism; reduce dose in elderly and in renal failure; avoid hypokalaemia or hypomagnesaemia.

**Note:** Several drug–drug interactions; need to monitor therapeutic drug levels.

**Contra-indications:** Heart block, supraventricular arrhythmias caused by Wolff-Parkinson-White syndrome, ventricular tachycardia or fibrillation.

**Side Effects:** Usually associated with excessive dosage, include: anorexia, nausea, vomiting, diarrhea and abdominal pain; visual disturbances, headache, fatigue, drowsiness, confusion, dizziness, delirium, hallucinations,

**Dose:** oedema, initially 25-100 mg, in a single or 2 divided doses, orally given in the morning. Maintenance, 25-50 mg on alternate days. Maximum recommended daily dose, 100 mg. Hypertension, 25 mg daily in single or divided doses. dose should not exceed 50 mg a day.

- *Esidrex Tablets 25 mg*
- *DyazideCapsules (With Triameterene 50 mg)*
<table>
<thead>
<tr>
<th>Agent</th>
<th>Dosage Forms</th>
<th>Relative Potency</th>
<th>Peak Blood Levels (oral) (h)</th>
<th>Protein Binding (%)</th>
<th>Volume of Distribution (L/kg)</th>
<th>Major Active Metabolite</th>
<th>Half-Life (parent) (hr)</th>
<th>Half-life (metabolite) (h)</th>
<th>Usual Initial Dose</th>
<th>Adult Oral Dosage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiolytic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alprazolam</td>
<td>Tab</td>
<td>0.5</td>
<td>1-2</td>
<td>80</td>
<td>0.9-1.2</td>
<td>No</td>
<td>12-15</td>
<td>-</td>
<td>0.25-0.5tid</td>
<td>0.75-4 mg/d</td>
</tr>
<tr>
<td>Diazepam</td>
<td>Gel, Inj. Sol, Tab</td>
<td>5</td>
<td>0.5-2</td>
<td>98</td>
<td>1.1</td>
<td>Yes</td>
<td>20-80</td>
<td>50-100</td>
<td>2-10 mg bid-qid</td>
<td>4-40 mg/d</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>Tab</td>
<td>1</td>
<td>1-6</td>
<td>88-92</td>
<td>1.3</td>
<td>No</td>
<td>10-20</td>
<td>-</td>
<td>05-2 mg tid-qid</td>
<td>2-4 mg/d</td>
</tr>
<tr>
<td>Sedative / Hypnotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flurazepam</td>
<td>Cap</td>
<td>5</td>
<td>05-2</td>
<td>97</td>
<td>-</td>
<td>Yes</td>
<td>Not significant</td>
<td>40-114</td>
<td>15mg qhs</td>
<td>15-60mg</td>
</tr>
<tr>
<td>Temazepam</td>
<td>Cap</td>
<td>5</td>
<td>2-3</td>
<td>96</td>
<td>1.4</td>
<td>No</td>
<td>10-40</td>
<td>-</td>
<td>15-30 mg qhs</td>
<td>15-30 mg</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clonazepam</td>
<td>Tab, drops</td>
<td>0.25-0.5</td>
<td>1-2</td>
<td>86</td>
<td>1.8-4</td>
<td>No</td>
<td>18-50 h</td>
<td>-</td>
<td>0.5 mg tid</td>
<td>1.5-20 mg/d</td>
</tr>
<tr>
<td>Clobazam</td>
<td>Tab</td>
<td>1-3</td>
<td>85-91</td>
<td>0.87-1.37</td>
<td>Yes</td>
<td>18</td>
<td>42</td>
<td>5-15 mg/d</td>
<td>5-80 mg/d</td>
<td></td>
</tr>
<tr>
<td>Midazolam</td>
<td>Inj</td>
<td>0.4-0.7 (IV only)</td>
<td>95</td>
<td>0.8-6.6</td>
<td>No</td>
<td>2-5 h</td>
<td>-</td>
<td>NA</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
# NARCOTIC AGONISTS (Comparative Pharmacokinetics)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Onset (min)</th>
<th>Peak (h)</th>
<th>Duration (h)</th>
<th>Half-Life (h)</th>
<th>Average Dosing Interval (h)</th>
<th>Equianalgesic Doses&lt;sup&gt;1&lt;/sup&gt; (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IM</td>
<td>Oral</td>
</tr>
<tr>
<td>Alfentanil</td>
<td>Immediate</td>
<td>ND</td>
<td>ND</td>
<td>1-2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Codeine</td>
<td>PO: 30-60, IM:10-30</td>
<td>0.5-1</td>
<td>4-6</td>
<td>3-4</td>
<td>3</td>
<td>(3-6)</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>IM: 7-15, IV:Immediate</td>
<td>ND</td>
<td>1-2</td>
<td>1.5-6</td>
<td>1</td>
<td>(0.5-2)</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>PO: 30, Parenteral: 15</td>
<td>PO IR: 1-1.5</td>
<td>Parenteral: 4-5</td>
<td>2-5</td>
<td>4</td>
<td>(3-6)</td>
</tr>
<tr>
<td>Meperidine</td>
<td>PO/ IM/ Sub Q: 10-15 IV:≤5</td>
<td>0.5-1</td>
<td>2-4</td>
<td>3-4</td>
<td>3</td>
<td>(2-4)</td>
</tr>
<tr>
<td>Methadone</td>
<td>PO: 30-60, IV:10-20</td>
<td>0.5-1</td>
<td>Acute:4-6 Chronic:&gt;8</td>
<td>15-30</td>
<td>8</td>
<td>(6-12)</td>
</tr>
<tr>
<td>Morphine</td>
<td>PO:15-60; IV:≤5</td>
<td>PO/ IM/ Sub Q: 0.5-1 IV: 0.3</td>
<td>3-6</td>
<td>2-4</td>
<td>4</td>
<td>(3-6)</td>
</tr>
<tr>
<td>Oxycodeone</td>
<td>PO:10-15</td>
<td>0.5-1</td>
<td>4-6</td>
<td>3-4</td>
<td>4</td>
<td>(3-6)</td>
</tr>
<tr>
<td>Naloxone&lt;sup&gt;2&lt;/sup&gt;</td>
<td>2.5</td>
<td>0.5-2</td>
<td>0.5-1</td>
<td>0.5-1.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Propoxyphene</td>
<td>PO: 30-60</td>
<td>2-2.5</td>
<td>4-6</td>
<td>3.5-15</td>
<td>6</td>
<td>(4-8)</td>
</tr>
<tr>
<td>Remifentanil</td>
<td>1-3</td>
<td>&lt;0.3</td>
<td>0.1-0.2</td>
<td>0.15-0.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sufentanil</td>
<td>1.3-3</td>
<td>ND</td>
<td>ND</td>
<td>2.5-3</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

ND= No data available, NA= Not Applicable, (A)= Acute, (C)= Chronic, IR= Immediate Release, SR=Sustained Release.

<sup>1</sup>Based on acute short-term use. Chronic administration may alter pharmacokinetics and decrease the oral parenteral dose ratio, the morphine oral parenteral ratio decreases to ~1.5-2.5:1 upon chronic dosing.

<sup>2</sup>Extensive survey data suggest that the relative potency of IM: PO morphine of 1:6 changes to 1:2-3 with chronic dosing.

<sup>3</sup>Narcotic antagonist.

<sup>4</sup>HCl Salt

<sup>5</sup>Napsylate salt.
# CORTICOSTEROIDS, SYSTEMIC EQUIVALENCIES

<table>
<thead>
<tr>
<th>Glucocorticoids</th>
<th>Approximate Equivalent Dose (mg)</th>
<th>Routes of Administration</th>
<th>Relative Anti-inflammatory Potency</th>
<th>Relative mineralocorticoid Potency</th>
<th>Half-life</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-Acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cortisone</td>
<td>25</td>
<td>PO, IM</td>
<td>0.8</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>Hydrocortisone</td>
<td>20</td>
<td>IM, IV</td>
<td>1</td>
<td>2</td>
<td>80-118</td>
</tr>
<tr>
<td><strong>Intermediate-Acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prednisone</td>
<td>5</td>
<td>PO</td>
<td>4</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>5</td>
<td>PO</td>
<td>4</td>
<td>1</td>
<td>115-212</td>
</tr>
<tr>
<td>Triamcinolone</td>
<td>4</td>
<td>PO, IM intra-articular, Intradermal, soft tissue injection</td>
<td>5</td>
<td>0</td>
<td>200+</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>4</td>
<td>PO, IM&lt; IV</td>
<td>5</td>
<td>0</td>
<td>78-188</td>
</tr>
<tr>
<td>Deflazacort</td>
<td>6</td>
<td>PO</td>
<td>-</td>
<td>-</td>
<td>84-144</td>
</tr>
<tr>
<td><strong>Long-Acting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>0.75</td>
<td>PO, IM intra-articular, Intradermal, soft tissue injection</td>
<td>25-30</td>
<td>0</td>
<td>110-210</td>
</tr>
<tr>
<td>Betamethasone</td>
<td>0.6-0.75</td>
<td>PO, IM intra-articular, Intradermal, soft tissue injection</td>
<td>25</td>
<td>0</td>
<td>300+</td>
</tr>
<tr>
<td><strong>Mineralocorticoids</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fludrocortisone</td>
<td>-</td>
<td>PO</td>
<td>10</td>
<td>125</td>
<td>210+</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plasma (min)</th>
<th>Biologic (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>8-12</td>
</tr>
<tr>
<td>60</td>
<td>18-36</td>
</tr>
<tr>
<td>115-212</td>
<td></td>
</tr>
<tr>
<td>200+</td>
<td>18-36</td>
</tr>
<tr>
<td>78-188</td>
<td></td>
</tr>
<tr>
<td>84-144</td>
<td></td>
</tr>
<tr>
<td>110-210</td>
<td>36-54</td>
</tr>
<tr>
<td>300+</td>
<td></td>
</tr>
<tr>
<td>210+</td>
<td>18-36</td>
</tr>
</tbody>
</table>
## CORTICOSTEROIDS, TOPICAL

<table>
<thead>
<tr>
<th>Steroid Potency</th>
<th>Steroids</th>
<th>Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lowest Potency</strong></td>
<td>(may be ineffective for some indications)</td>
<td></td>
</tr>
<tr>
<td>0.05% Alclometasone dipropionate</td>
<td>Cream, Ointment</td>
<td></td>
</tr>
<tr>
<td>0.5% Hydrocortisone</td>
<td></td>
<td>Ointment</td>
</tr>
<tr>
<td>1% Hydrocortisone</td>
<td></td>
<td>Ointment</td>
</tr>
<tr>
<td><strong>Low Potency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01% Fluocinolone acetonide¹</td>
<td>Solution</td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate Potency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.1% Betamethasone valerate</td>
<td>Cream, Ointment</td>
<td></td>
</tr>
<tr>
<td>0.1% Mometasone Furoate</td>
<td>Cream, Ointment, Lotion</td>
<td></td>
</tr>
<tr>
<td>0.025% Fluocinolone acetonide¹</td>
<td>Cream, Ointment</td>
<td></td>
</tr>
<tr>
<td>4mcg/com Flurandrenolide</td>
<td>Tape</td>
<td></td>
</tr>
<tr>
<td>0.1% Triamcinolone acetonide</td>
<td>Dental paste</td>
<td></td>
</tr>
<tr>
<td><strong>High Potency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.05% Betamethasone dipropionate</td>
<td>Cream</td>
<td></td>
</tr>
<tr>
<td>0.1% Betamethasone valerate</td>
<td>Ointment</td>
<td></td>
</tr>
<tr>
<td>0.05% Fluocinonide¹</td>
<td>Cream, Ointment</td>
<td></td>
</tr>
<tr>
<td><strong>Very High Potency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.05% Clobetasol propionate</td>
<td>Cream, Ointment, Scalp lotion</td>
<td></td>
</tr>
</tbody>
</table>

¹Fluorinated.

### Amount of Topical Steroid to Prescribe

<table>
<thead>
<tr>
<th>Area Treated</th>
<th>Single Dose</th>
<th>7-Day supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two hands, head, face, genital, anus</td>
<td>2 g</td>
<td>15-45 g</td>
</tr>
<tr>
<td>One arm, front or back of trunk</td>
<td>3 g</td>
<td>20-60 g</td>
</tr>
<tr>
<td>One leg</td>
<td>4 g</td>
<td>30-90 g</td>
</tr>
<tr>
<td>Whole body</td>
<td>30-60 g</td>
<td>0.2-1.3 kg</td>
</tr>
</tbody>
</table>
### Table of Conversion and Measuring

- 1 fluid ounce (fl. oz) = 30ml.
- 2 fluid ounce (fl. oz) = 60ml.
- 4 fluid ounce (fl. oz) = 120ml.
- 8 fluid ounce (fl. oz) = 240ml.
- 1 Kg = 2.25lb.
- 1 lb = 16oz.
- 1 grain = 60mg.
- 1 Kg = 1000g.
- 1 g = 1000mg.
- 1 mg = 1000microgram.
- 1 microgram = 1000nanogram.
- 1 nanogram = 1000picogram.
- 1 liter = 1000ml.
- 1 pint = 568ml.
- 1 ml = 15-20drops.
- 1 teaspoon = 5ml.
- 1 tablespoon = 15ml.
- 1 Kilo Calories (Kcal) = 4186.8Joules.

Rough guide for the approximate equivalent doses of the main corticosteroids in term of their glucocorticoid (or anti-inflammatory) properties alone is as follows:

<table>
<thead>
<tr>
<th>Prednisolone</th>
<th>5mg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>= Cortisone acetate</td>
<td>25mg.</td>
</tr>
<tr>
<td>= Betamethasone</td>
<td>0.75mg.</td>
</tr>
<tr>
<td>= Dexamethasone</td>
<td>0.75mg.</td>
</tr>
<tr>
<td>= Hydrocortisone</td>
<td>20mg.</td>
</tr>
<tr>
<td>= Methylpredisolone</td>
<td>4mg.</td>
</tr>
<tr>
<td>= Prednisone</td>
<td>5mg.</td>
</tr>
<tr>
<td>= Triamcinolone</td>
<td>4mg.</td>
</tr>
</tbody>
</table>
# Table of contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of contents</td>
<td>1</td>
</tr>
<tr>
<td>CARDIOVASCULAR SYSTEM</td>
<td>5</td>
</tr>
<tr>
<td>CARDIAC GLYCOSIDES</td>
<td>5</td>
</tr>
<tr>
<td>PHOSPHODIESTERASE INHIBITORS</td>
<td>6</td>
</tr>
<tr>
<td>DIURETICS</td>
<td>6</td>
</tr>
<tr>
<td>ANTI-DYSRHYTHMIC DRUGS</td>
<td>10</td>
</tr>
<tr>
<td>BETA-ADRENOCEPTOR BLOCKING DRUGS</td>
<td>13</td>
</tr>
<tr>
<td>ANTI-HYPERTENSIVE DRUGS</td>
<td>18</td>
</tr>
<tr>
<td>ANGIOTENSIN RECEPTOR BLOCKERS (ARBS)</td>
<td>22</td>
</tr>
<tr>
<td>CENTRAL ANTIHYPERTENSIVE DRUGS</td>
<td>24</td>
</tr>
<tr>
<td>ALPHA BLOCKERS</td>
<td>25</td>
</tr>
<tr>
<td>CALCIUM CHANNEL BLOCKERS</td>
<td>27</td>
</tr>
<tr>
<td>VASODILATORS</td>
<td>30</td>
</tr>
<tr>
<td>NITRATES (NITROVASODILATORS)</td>
<td>30</td>
</tr>
<tr>
<td>SYMPATHOMIMETICS</td>
<td>32</td>
</tr>
<tr>
<td>ANTI-COAGULANTS AND RELATED DRUGS</td>
<td>34</td>
</tr>
<tr>
<td>ANTIPLATELET DRUGS</td>
<td>37</td>
</tr>
<tr>
<td>FIBRINOLYTIC DRUGS</td>
<td>38</td>
</tr>
<tr>
<td>ANTI-FIBRINOLYTIC DRUGS AND HAEMOSTATICS</td>
<td>39</td>
</tr>
<tr>
<td>MISCELLANEOUS</td>
<td>40</td>
</tr>
<tr>
<td>LIPID-REGULATING DRUGS</td>
<td>41</td>
</tr>
<tr>
<td>FIBRATES</td>
<td>41</td>
</tr>
<tr>
<td>STATINS</td>
<td>41</td>
</tr>
<tr>
<td>BILE ACID BINDING RESIN</td>
<td>43</td>
</tr>
<tr>
<td>VASOCONSTRICTOR</td>
<td>44</td>
</tr>
<tr>
<td>SYMPATHOMIMETICS</td>
<td>44</td>
</tr>
<tr>
<td>LOCAL SCLEROSING AGENT</td>
<td>45</td>
</tr>
<tr>
<td>CENTRAL NERVOUS SYSTEM</td>
<td>46</td>
</tr>
<tr>
<td>HYPNOTICS, SEDATIVES AND ANXIOLYRICS</td>
<td>46</td>
</tr>
<tr>
<td>ANTIDEPRESSANT DRUGS</td>
<td>64</td>
</tr>
<tr>
<td>DRUGS USED IN NAUSEA AND VERTIGO</td>
<td>73</td>
</tr>
<tr>
<td>ANALGESICS</td>
<td>78</td>
</tr>
<tr>
<td>NON-NARCOTIC ANALGESICS</td>
<td>78</td>
</tr>
<tr>
<td>PARACETAMOL OVERDOSE</td>
<td>81</td>
</tr>
<tr>
<td>NARCOTIC ANALGESICS</td>
<td>81</td>
</tr>
<tr>
<td>OPIOID DEPENDENCE</td>
<td>84</td>
</tr>
<tr>
<td>TRIGEMINAL NEURALGIA</td>
<td>85</td>
</tr>
<tr>
<td>ANTI-MIGRAINE DRUGS</td>
<td>85</td>
</tr>
<tr>
<td>ANTI-EPILEPTICS</td>
<td>86</td>
</tr>
</tbody>
</table>
Table Of Content

DRUGS USED IN PARKINSONISM AND RELATED RELATED DISORDERS ................................................................. 95
DRUGS USED IN CHOREAS, TICS AND RELATED DISORDERS ........................................................................... 101
GASTROINTESTINAL SYSTEM .................................................. 104
ANTACIDS ................................................................................ 104
ANTISPASMODICS ................................................................ 105
ULCER-HEALING DRUGS ...................................................... 106
HELCOBACTER PYLORI INFECTION ........................................... 110
RECOMMENDED REGIMENS FOR HELICOBACTER PYLORI ERADICATION IN ADULTS ........................................... 111
PROTON PUMP INHIBITORS .................................................... 112
ANTI-DIARRHOEALS ............................................................. 116
TREATMENT OF CHRONIC BOWEL DISORDERS ......................... 117
LAXATIVES ........................................................................ 121
ANTI-HEMORRHOIDAL ........................................................ 124
DRUGS AFFECTING INTESTINAL SECRETIONS ......................... 124
ENDOCRINE SYSTEM ............................................................. 126
ANTIDIABETIC DRUGS .......................................................... 126
SULPHONYL UREA .............................................................. 126
INSULIN & HUMAN INSULIN ANALOGUES .................................. 129
TREATMENT OF HYPOGLYCAEMIA ........................................ 132
ANTI-THYROID DRUG .......................................................... 133
STEROIDS ........................................................................ 135
HORMONES ......................................................................... 140
IMMUNOLOGICAL PRODUCTS AND VACCINES ....................... 153
VACCINES .......................................................................... 155
IMMUNOGLOBULINS ........................................................... 163
INFECTIONS ....................................................................... 167
ANTIBACTERIAL DRUGS ......................................................... 167
ANTIMYCOBACTERIAL DRUGS .................................................. 195
ANTIFUNGAL DRUGS ............................................................ 199
ANTIVIRAL DRUGS ............................................................... 205
ANTIPROTOZOAL AND ANTIHELMINTIC DRUGS ..................... 211
MALIGNANT DISEASE & IMMUNOSUPPRESSION .................. 216
ALKYLATING AGENTS .......................................................... 216
ANTIMETABOLITES .............................................................. 219
CYTOTOXIC ANTIBIOTICS ...................................................... 223
VINCA ALKALOIDS .............................................................. 226
OTHER ANTINEOPLASTIC DRUGS ........................................... 228
HYDROXYCARBAMIDE: ......................................................... 229
MONOCLONAL ANTIBODY: ..................................................... 229
PLATINUM COMPOUNDS ...................................................... 230
<table>
<thead>
<tr>
<th>Table Of Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAXANES .................</td>
</tr>
<tr>
<td>TOPOISOMERASE I INHIBITORS</td>
</tr>
<tr>
<td>ANTIPROLIFERATIVE IMMUNOSUPPRESSANTS</td>
</tr>
<tr>
<td>CORTICOSTEROIDS AND OTHER IMMUNOSUPPRESSANTS</td>
</tr>
<tr>
<td>OTHER IMMUNOMODULATING DRUGS</td>
</tr>
<tr>
<td>SEX HORMONES AND HORMONE ANTAGONISTS IN MALIGNANT DISEASE</td>
</tr>
<tr>
<td>PROGESTOGENS:</td>
</tr>
<tr>
<td>HORMONAL ANTAGONISTS:</td>
</tr>
<tr>
<td>BREAST CANCER</td>
</tr>
<tr>
<td>PROSTATE CANCER &amp; GONADORELLIN ANALOGUES</td>
</tr>
<tr>
<td>SOMATOSTATIN ANALOGUES</td>
</tr>
<tr>
<td>BONE MODULATING DRUGS</td>
</tr>
<tr>
<td>ANTIMITOGENETIC DRUGS AND RELATED THERAPY</td>
</tr>
<tr>
<td>DRUGS USED IN NETUROPENIA</td>
</tr>
<tr>
<td>DRUGS USED IN UROTHELIAL TOXICITY</td>
</tr>
<tr>
<td>RESPIRATORY SYSTEM</td>
</tr>
<tr>
<td>BRONCHODILATORS AND ASTHMA DRUGS</td>
</tr>
<tr>
<td>DRUGS USED IN THE TREATMENT OF ALLERGIC DISORDERS</td>
</tr>
<tr>
<td>DRUGS USED IN TREATMENT OF COUGH</td>
</tr>
<tr>
<td>RESPIRATORY STIMULANTS AND PULMONARY SURFACTANTS</td>
</tr>
<tr>
<td>MUSCULOSKELETAL AND JOINT DISEASES</td>
</tr>
<tr>
<td>ANTI-INFLAMMATORY DRUGS (NSAIDS)</td>
</tr>
<tr>
<td>STEROIDAL DRUGS</td>
</tr>
<tr>
<td>DRUGS SUPPRESSING THE RHEUMATIC DISEASE PROCESS</td>
</tr>
<tr>
<td>DRUGS USED IN THE TREATMENT OF GOUT</td>
</tr>
<tr>
<td>DRUGS USED IN NEUROMUSCULAR DISORDERS</td>
</tr>
<tr>
<td>ENZYMES</td>
</tr>
<tr>
<td>NUTRITION AND BLOOD</td>
</tr>
<tr>
<td>NUTRITIONAL AGENT AND VITAMINS</td>
</tr>
<tr>
<td>ELECTROLYTES</td>
</tr>
<tr>
<td>BLOOD PRODUCTS AND PLASMA EXPANDERS</td>
</tr>
<tr>
<td>CHELATORS AND ANTAGONISTS</td>
</tr>
<tr>
<td>OBSTETRICS, GYNAECOLOGY &amp; URINARY TRACT DISORDERS</td>
</tr>
<tr>
<td>DRUG USED IN OBSTETRICS</td>
</tr>
<tr>
<td>PROSTAGLANDINS AND OXYTOCIC’S</td>
</tr>
<tr>
<td>DUCTUS ARTERIOSUS</td>
</tr>
<tr>
<td>MYOMETRIAL RELAXANTS</td>
</tr>
<tr>
<td>CONTRACEPTIVES</td>
</tr>
<tr>
<td>ANTI-INFECTIVE DRUGS</td>
</tr>
<tr>
<td>Table Of Content</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DIAGNOSTICS</td>
</tr>
<tr>
<td>DRUGS USED IN URINARY TRACT DISORDERS</td>
</tr>
<tr>
<td>EYE</td>
</tr>
<tr>
<td>ANTI-INFECTIVE DRUGS</td>
</tr>
<tr>
<td>CORTICOSTEROIDS AND ANTI-INFLAMMATORY PREPARATIONS</td>
</tr>
<tr>
<td>MYDRIATICS AND CYCLOPLEGICS</td>
</tr>
<tr>
<td>TREATMENT OF GLAUCOMA</td>
</tr>
<tr>
<td>LOCAL AESTHETICS</td>
</tr>
<tr>
<td>TEAR SUBSTITUTE AND LUBRICANTS</td>
</tr>
<tr>
<td>DIAGNOSTICS AND PRE-OPERATIVE PREPARATIONS</td>
</tr>
<tr>
<td>EAR, NOSE, AND OROPHARYNX</td>
</tr>
<tr>
<td>DRUGS ACTING ON THE EAR</td>
</tr>
<tr>
<td>DRUGS ACTING ON THE NOSE</td>
</tr>
<tr>
<td>DRUGS ACTING ON THE OROPHARYNX</td>
</tr>
<tr>
<td>SKIN</td>
</tr>
<tr>
<td>EMOLLIANT AND BARRIER PREPARATIONS</td>
</tr>
<tr>
<td>ANTI-PRURITIC PREPARATIONS</td>
</tr>
<tr>
<td>TOPICAL CORTICOSTEROIDS</td>
</tr>
<tr>
<td>PREPARATION FOR PSORIASIS AND ECZEMA</td>
</tr>
<tr>
<td>PREPARATIONS FOR ACNE</td>
</tr>
<tr>
<td>PREPARATIONS FOR WARTS AND CALLUSES</td>
</tr>
<tr>
<td>ANTI-INFECTIVE SKIN PREPARATIONS</td>
</tr>
<tr>
<td>ANTI-BACTERIAL PREPARITIONS</td>
</tr>
<tr>
<td>ANTI-FUNGAL PREPARATIONS</td>
</tr>
<tr>
<td>PARASITICIDAL PREPARATIONS</td>
</tr>
<tr>
<td>DISINFECTANTS AND CLEANSERS</td>
</tr>
<tr>
<td>ANESTHESIA</td>
</tr>
<tr>
<td>GENERAL ANESTHETICS</td>
</tr>
<tr>
<td>INTRAVENOUS ANESTHETICS</td>
</tr>
<tr>
<td>INHALATIONAL ANESTHETICS</td>
</tr>
<tr>
<td>PREMEDICATION AGENTS</td>
</tr>
<tr>
<td>MUSCLE RELAXANTS</td>
</tr>
<tr>
<td>ANTI-CHOLINESTERASES USED IN SURGERY</td>
</tr>
<tr>
<td>ANTAGONISTS FOR CENTRAL AND RESPIRATORY DEPRESSION</td>
</tr>
<tr>
<td>LOCAL ANESTHETICS</td>
</tr>
<tr>
<td>INDEX</td>
</tr>
</tbody>
</table>
CARDIOVASCULAR SYSTEM

CARDIAC GLYCOSIDES

DIGOXIN

**Indications:** Heart failure, supraventricular arrhythmias (particularly atrial fibrillation).

**Cautions:** Recent myocardial infarction, hypothyroidism; reduce dose in elderly and in renal failure; avoid hypokalaemia or hypomagnesaemia.

**Note:** Several drug–drug interactions; need to monitor therapeutic drug levels.

**Contra-indications:** Heart block, supraventricular arrhythmias caused by Wolff-Parkinson-White syndrome, ventricular tachycardia or fibrillation.

**Side Effects:** Usually associated with excessive dosage, include: anorexia, nausea, vomiting, diarrhea and abdominal pain; visual disturbances, headache, fatigue, drowsiness, confusion, dizziness, delirium, hallucinations, depression; arrhythmias, heart block; gynecomastia with long-term use.

**Dose:** It has to be adjusted individually for each patient and the indicated doses are intended only as an initial guide.

By mouth, rapid digitalization, 1 – 1.5 mg in divided doses over 24 hours.

Less urgent digitalization, 125-250 mcg twice daily for up to 1 week.

Maintenance, 0.125 - 0.25 mg once daily according to renal function status.

By I.V. infusion, for very rapid control, digitalizing dose of 0.75 – 1.25 mg in 50 ml over 2 or more hours, followed by normal maintenance therapy. I.M. route not recommended, except when other methods of administration are not available.

Infants and children under 10 years, digitalization (all routes), 0.01 – 0.02 mg/kg body weight repeated six hourly until therapeutic result is obtained, usually after 2 – 4 doses.

Maintenance, 0.01 – 0.02 mg/kg body weight daily in single or divided doses.
Cardiovascular System

- **Digoxin Tablets 0.25 mg, 0.0625 mg**
- **Digoxin Injection 0.5 mg/2ml**
- **Lanoxin Elixir 0.05 mg/ml**

**PHOSPHODIESTERASE INHIBITORS**

**MILRINONE**

**Indications:** short-term treatment of severe congestive heart failure unresponsive to conventional maintenance therapy (not immediately after myocardial infarction); acute heart failure, including low output states following heart surgery.

**Cautions:** heart failure associated with hypertrophic cardiomyopathy; stenotic or obstructive valvular disease; monitor blood pressure, heart rate, ECG, central venous pressure; fluid & electrolyte status; renal function; platelet count; hepatic enzymes; correct hypokalaemia, monitor renal function; renal impairment.

**Side effects:** ectopic beats; less frequently ventricular tachycardia or supraventricular arrhythmias; hypotension; headache; insomnia; nausea; vomiting; diarrhoea; chest pain, tremor, bronchospasm, anaphylaxis and rash.

**Dose:** by intravenous injection over 10 minutes, diluted before use, 50 mcg/kg followed by intravenous infusion at a rate of 375-750 nanograms/kg/minute, usually for up to 12 hours following surgery or for 48-72 hours in congestive heart failure; max. daily dose 1.13mg/kg.

- **Milrinone (As Lactate) 1mg/ml. For Dilution Before Use**

**DIURETICS**

**CHLORTALIDONE (CHLORTHALIDONE)**

This is a moderately potent thiazide diuretic.

**Indications:** ascites due to cirrhosis in stable patients; oedema due to nephrotic syndrome; hypertension; mild to moderate chronic heart failure; diabetes insipidus.

**Cautions:** glucose intolerance may occur; periodic serum electrolyte monitoring is required; renal or hepatic impairment.
Contra-indications: severe renal and hepatic insufficiency; untreated Addison's disease; concomitant lithium therapy.
Side effects: electrolyte imbalance, especially hypokalemia; loss of appetite; gastrointestinal effects; hypotension; hyperuricemia and dyslipidemia, impotence, and rarely hypersensitivity reactions, jaundice, cardiac arrhythmias, headache, eosinophilia.
Dose: adults, hypertension, 25 mg daily increased to 50 mg daily if necessary.
Oedema, 100-200 mg on alternate days or 50 mg daily. In severe cases, 100-200 mg daily.
Diabetes insipidus, initially, 100 mg twice daily. Maintenance, 50 mg daily. Child, up to 2 mg/kg daily.

FRUSEMIDE (FUROSEMIDE)
This is a potent loop diuretic.
Indications: pulmonary edema due to left ventricular failure; oliguria due to renal failure.
Cautions: hypotension; prosthetic enlargement; pregnancy; electrolyte imbalance, diabetes and gout.
Contra-indications: hypokalaemia, liver failure, prostatism.
Side effects: Hypokalemia, hyponatraemia, hypomagnesaemia, hyperuricemia, hyperglycaemia, hypotension.
Dose: by mouth, oedema, initially 40 mg in the morning.
Maintenance, 20 mg daily or 40 mg on alternate days, increased in resistant oedema to 80 mg daily.
Oliguria, initially 250 mg over 1 hour (rate not exceeding 4mg/minute); if necessary larger doses, increasing in steps of 250 mg, may be given every 4-6 hours to a maximum dose of 2 g in 24 hrs; effective dose (up to 1g) can be repeated. Every 24 hours. Child, 1-3 mg/kg daily.
By intramuscular or slow intravenous injection, initially 20-50 mg. Child, 0.5-1.5 mg/kg.
By intravenous infusion, in oliguria, 0.25-1 g at a rate not exceeding 4 mg/minute.

Lasix Tablets 40 mg
Lasix Injection 20 mg/2ml, 250 mg/25 ml.
Lasix Paediatric Syrup 1 mg/ml.

**HYDROCHLORTHIAZIDE**

This is a moderately potent thiazide diuretic.

**Indications:** oedema, hypertension.

**Cautions:** monitor electrolyte serum level; impaired hepatic and renal function; pregnancy and breast-feeding.

**Contra-indications and Side effects:** (same as Chlorthalidone)

**Dose:** oedema, initially 25-100 mg, in a single or 2 divided doses, orally given in the morning. Maintenance, 25-50 mg on alternate days. Maximum recommended daily dose, 100 mg.

Hypertension, 25 mg daily in single or divided doses. dose should not exceed 50 mg a day.

- Esidrex Tablets 25 mg
- Dyazide Capsules (With Triameterene 50 mg)

**INDAPAMIDE**

This is a mild diuretic which is a vasodilator.

**Indications:** essential hypertension.

**Cautions:** avoid diuretics, liable to cause hypokalaemia; monitor plasma potassium and urate levels in the elderly, gout and in patients on digoxin, hyperparathyroidism, porphyria.

**Contra-indications:** severe hepatic or renal impairment

**Side effects:** nausea, headache, dizziness, muscle cramps, rashes, slight weight loss; postural hypotension, hypokalemia.

**Dose:** 1.5 mg in the morning

- Natrilix Sr Tablets 1.5 mg

**MANNITOL**

This is an osmotic diuretic

**Indications:** cerebral oedema, forced diuresis in cases of drug overdose.

**Cautions:** extravasation causes inflammation and thrombophlebitis. Rarely used in heart failure as they may acutely expand the blood volume.
**Cardiovascular System**

*Dose:* by intravenous infusion, diuresis, 50-200 g over 24 hours, preceded by a test dose of 200 mg/kg by slow intravenous injection. Cerebral edema, 1 g/kg as a 20% solution by rapid I.V. infusion.

- **Mannitol I.V. Infusion 10% & 20% Solution**

**METOLAZONE**

This is a thiazide-like diuretic.

**Indications:** oedema, hypertension.

**Cautions:** serum electrolytes should be monitored to avoid fluid and/or electrolyte imbalance; may cause hypokalemia; elderly; pregnancy; concomitant use of frusemide; porphyria

**Contra-indications:** breast-feeding; paediatric use.

**Side effects:** dizziness; headache; muscle cramps; fatigue; joint pain and swelling; chest pain; rash; pruritis; anxiety; dry mouth; impotence.

**Dose:** edema, 5-10mg in the morning; increased if necessary to 20 mg daily. Max. dose, 80mg daily. Hypertension, initially, 5mg in the morning. Maintenance dose, 5mg on alternate day.

- **Metenix 5 mg Tablets**

**SPIRONOLACTONE**

This is an aldosterone antagonist, a potassium-sparing diuretic of mild to moderate potency.

**Indications:** oedema and ascitis in cirrhosis of the liver, nephrotic syndrome, congestive heart failure; primary hyper aldosteronism; malignant ascitis.

**Cautions:** breast feeding; pregnancy; hepatic and renal impairment.

**Contra-indication:** Hyperkalemia; hypernatremia; Addison’s disease.

**Side effects:** gastrointestinal disturbances, gynecomastia, menstrual irregularity, impotence; lethargy; headache; confusion; rashes; hepatotoxicity; osteomalacia

**Dose:** 100-200 mg daily increased to 400 mg if required. Child, 3 mg/kg daily in divided doses.

- **Aldactone Tablets 25 mg, 100 mg**
Cardiovascular System

ANTI-DYSRHYTHMIC DRUGS

ADENOSINE

**Indications:** rapid reversion to sinus rhythm of paroxysmal supraventricular tachycardia, including those associated with accessory pathways (e.g. Wolff-Parkinson-White syndrome); aid to diagnosis of broad or narrow complex supraventricular tachycardias.

**Cautions:** atrial fibrillation or flutter with accessory pathway (conduction down anomalous pathway may increase); heart transplant.

**Interactions:** Myocardial depression is enhanced by local anaesthetics, beta blockers, antiarrhythmic drugs, dipyridamole.

**Contra-indications:** second- or third- degree AV block and sick sinus syndrome (unless pacemaker fitted); asthma.

**Side effects:** transient facial flush, chest pain, dyspnoea, bronchospasm, choking sensation, nausea, light-headedness; severe bradycardia; ECG may show transient rhythm disturbances.

**Dose:** by rapid intravenous injection into central or large peripheral vein, 3 mg over 2 seconds with cardiac monitoring; if necessary followed by 6 mg after 1-2 minutes, and then by 12 mg after a further 1-2 minutes; increments should not be given if high level AV block develops.

Note: 3 mg dose ineffective in a number of patients, therefore higher initial dose sometimes used but patients with heart transplant are very sensitive to effects of adenosine, and should not receive higher initial dose.

- *Adenocor Injection, Adenosine 3mg/ml.*

AMIODARONE HYDROCHLORIDE

It is a class 3 antiarrhythmic drug.

**Indications:** treatment of arrhythmias when other antiarrhythmic drugs are contraindicated or ineffective; supraventricular and ventricular tachycardias, atrial fibrillation and flutter and ventricular fibrillation. Also for tachyarrhythmias associated with Wolff-Parkinson-White syndrome.
**Cardiovascular System**

**Cautions:** sinus bradycardia, heart block unless pacemaker is fitted; avoid in severe conduction defects or sinus node disease, cardiomyopathy and heart failure. Liver and thyroid functions should be checked before and during long term therapy. Regular eye examination during long term therapy (Treatment should be initiated in a hospital or under specialist supervision).

**Contra-indications:** sinus bradycardia, sino-atrial block, thyroid dysfunction, iodine sensitivity.

**Side effects:** nausea, vomiting, raised serum transaminases, jaundice, bradycardia, thyroid dysfunction, corneal opacity, photosensitivity and skin discolouration; circulatory collapse can occur with rapid I.V. injection.

**Dose:** by mouth, 200 mg 3 times daily for 1 week reduced to 200 mg twice daily for a further week. Maintenance, usually 200 mg daily or the minimum required to control the arrhythmias.

- By I.V. infusion via central catheter, up to 5 mg/kg over 20-120 minutes with ECG and blood pressure monitoring; maximum 1.2 g in 24 hours.
  - **Cordarone Tablets 200 mg.**
  - **Cordarone Injection 50 mg/ml - 3 ml Ampoules.**

### ATROPINE SULPHATE

It is an antimuscarinic (anticholinergic) drug.

**Indications:** bradycardia after myocardial infarction particularly if complicated by hypotension; bradycardia caused by beta-adrenoceptor blocking drugs. (Also used as a preanaesthetic medication, and an antidote for organophosphate poisoning).

**Cautions:** glaucoma, paralytic ileus, enlarged prostate.

**Dose:** by intravenous injection, 0.3-1 mg repeated if the initial dose is ineffective. Maximum 3mg in 24 hours.

- **Atropine Injection 600 mcg/ml - 3 ml Ampoules.**

### DISOPYRAMIDE

It is a class 1 antiarrhythmic drug (subgroup 1 A)

**Indications:** ventricular arrhythmias especially after myocardial infarction; supraventricular arrhythmias.

**Cautions:** glaucoma, heart failure or diminished cardiac output; reduce dose in renal impairment; discontinue if...
hypotension, hypoglycemia, ventricular tachycardia or torsades de pointes develop.

**Contra-indications**: contraindicated in second and third-degree heart block and sinus node dysfunction (unless pacemaker is fitted); cardiogenic shock

**Side effects**: ventricular tachycardia; fibrillation or torsades de pointes; myocardial depression; hypotension; AV Block; dry mouth; blurred vision; urinary retention; GI irritation; psychosis; cholestatic jaundice; hypoglycaemia.

**Dose**: by mouth, 300-800 mg daily in divided doses.

- Rhythmoman Capsules 100 mg

### LIDOCAINE HYDROCHLORIDE (LIGNOCAINE)

It is a class 1 antiarrhythmic drug (subgroup 1A)

**Indications**: ventricular arrhythmias, especially after myocardial infarction. (Also used as a local anaesthetic).

**Cautions**: lower dose in congestive cardiac failure, and following cardiac surgery; in elderly and in hepatic and renal impairment.

**Contra-indications**: sino-atrial disorders, all grades of AV block; severe myocardial depression; porphyria

**Side effects**: dizziness; paraesthesia or drowsiness; CNS effects like confusion, respiratory depression & convulsions; hypotension and bradycardia; rarely anaphylaxis.

**Dose**: by I.V. injection, in patients without gross circulatory impairment, 100 mg as a bolus over a few minutes as a loading dose, followed by infusion of 4 mg/minute for 30 minutes, 2 mg/minute for 2 hours, then 1 mg/minute; reduce infusion rate if infusion is continued beyond 24 hours. ECG monitoring is required.

- Lidocaine Hydrochloride Injection 2%, 20 mg/ml

### PHENYTOIN SODIUM

It is a class 1 antiarrhythmic drug (subgroup 1A)

**Indications**: ventricular arrhythmias, particularly those caused by cardiac glycosides, but this use is now unknown. (Also used for seizure disorders)

**Cautions**: do not give with lignocaine hydrochloride.
**Dose:** by slow intravenous injection via central catheter: 3.5-5 mg/kg at a rate not exceeding 50 mg/minute. Monitor the blood pressure and ECG. Repeat after 10 minutes if necessary.

- *Epanutin Injection 50 mg/ml Ampoules*

**PROPAFENONE HYDROCHLORIDE**

It is a class 1 antiarrhythmic drug (subgroup 1 C)

**Indications:** paroxysmal supraventricular tachyarrhythmias including atrial flutter or fibrillation and re-entrant tachycardias; ventricular arrhythmias.

**Caution:** pacemaker patients; pregnancy and lactation; obstructive airway disease; heart failure; myasthenia gravis and in elderly.

**Contra-indications:** uncontrolled congestive heart failure, cardiogenic shock, and in severe electrolyte disturbances.

**Side-effects:** bradycardia and conduction disturbances; arrhythmias, nausea and vomiting, constipation; paraesthesias, disturbances of vision and vertigo; rarely hypersensitivity reactions.

**Dose:** In patients with a body weight in excess of 70kg, initial dose 150 mg 3 times daily after food. The dose should be adjusted for patients weighing less than 70kg.

- *Rytomonorm Tablets 150 mg*

**BETA-ADRENOCEPTOR BLOCKING DRUGS**

**ACEBUTOLOL**

**Indications:** hypertension, angina, arrhythmias.

**Cautions, contra-indications and side effects:** same as propranolol hydrochloride.

**Dose:** hypertension, initially 400 mg once daily or 200 mg twice daily, increased after 2 weeks to 400 mg twice daily, if needed.

Angina, initially 400 mg once daily or 200 mg twice daily; 300 mg 3 times daily in severe angina.

Maintenance up to 1.2 g daily has been used.

Arrhythmias, 0.4 -1.2 g daily in 2-3 divided doses.

- *Sectral Capsule 200 mg*
ATENOLOL

**Indications:** hypertension, angina, arrhythmias, early intervention in acute myocardial infarction.

**Cautions, contra-indications and side effects:** same as propranolol; reduce dose in renal failure.

**Dose:** by mouth, hypertension, 50-100 mg daily.
Angina, 100 mg daily in 1 or 2 doses.
Arrhythmias, 50-100 mg daily.
  - Tenormin Tablets 25 mg, 50 mg, 100 mg.

BISOPROLOL FUMARATE

**Indications:** hypertension, angina and as an adjunct in heart failure.

**Cautions, contra-indications and side effects:** (see under Propranolol Hydrochloride); in heart failure monitor clinical status for 4 hours after initiation (with low dose) and ensure heart failure not worsening before increasing each dose; psoriasis; hepatic impairment.

**Contra-indications:** (see under Propranolol Hydrochloride); acute or decompensated heart failure requiring intravenous inotropes; sino-atrial block.

**Side effects:** (see under Propranolol Hydrochloride)

**Dose:** hypertension and angina, usually 10 mg once daily (5mg may be adequate in some patients); max. 20 mg daily.

Adjunct in stable moderate to severe heart failure, initially 1.25 mg once daily in the morning for 1 week, then, if well tolerated, increased to 2.5 mg once daily for 1 week, then 3.75 mg once daily for 1 week, then 5 mg once daily for 4 weeks, then 7.5 mg once daily for 4 weeks, then 10 mg once daily; max. 10 mg daily.
  - Concor Tablets 5mg

CARVEDILOL

**Indications:** hypertension; angina; adjunct to diuretics, digoxin or ACE-inhibitors in symptomatic chronic heart failure.

**Cautions:** unstable angina; reduced performance of the heart; recent heart attack; impaired renal function. (see Propranolol).
Contra-indications: severe chronic heart failure, constrictive respiratory tract diseases; allergic rhinitis (see propranolol).

Side effects: postural hypotension, dizziness, headache, GI disturbances, bradycardia; occasionally diminished peripheral circulation; peripheral oedema, and painful extremities; dry mouth, dry eyes, eye irritation, or disturbed vision; impotence, disturbances of micturition, influenza like symptoms, rarely angina, AV block, exacerbation of intermittent claudication or Raynaud’s phenomenon; allergic skin reactions, exacerbation of psoriasis; nasal stuffiness, wheezing, depressed mood, sleep disturbances, paraesthesia, heart failure, changes in liver enzymes; thrombocytopenia, leucopenia.

Dose: hypertension, initially 12.5 mg once daily increased after 2 days to 25 mg once daily. Maximum daily dose is 50 mg. Elderly may require much lower dosage, usually 12.5mg once daily.

Angina, initially 12.5 mg twice daily increased after 2 days up to 25 mg twice daily.

Heart failure, initially 3.125 mg twice daily increased at intervals of 2 weeks to 6.25 mg twice daily then 25 mg twice daily.

Maximum 50 mg twice daily in patients over 85 kg body weight.

Dilatrend Tablets 6.25 mg & 25 mg

ESMOLOL HYDROCHLORIDE

Indications: supraventricular tachycardia including atrial fibrillation, atrial flutter and sinus tachycardia; intraoperative and post-operative tachycardia and/or hypertension.

Cautions, contra-indications & side effects: symptomatic hypotension at any dose; cardiac failure; patients with hypertension due to vasoconstriction associated with hypothermia; diabetes and hypoglycaemia (Also see propranolol).

Dose: supraventricular tachycardia, initiate treatment with a loading dose of 500 mcg/kg/min over 1-minute followed by a 4-minute maintenance infusion of 50 mcg/kg/min. Usual dosage within range 50-200 mcg/kg/minute.
LABETALOL HYDROCHLORIDE

**Indications:** hypertension (including hypertension in pregnancy, hypertension with angina, and hypertension following acute myocardial infarction); hypertensive crisis; controlled hypotension in anaesthesia.

**Cautions and Contra-indications:** (see Propranolol Hydrochloride); interferes with laboratory tests for catecholamines; severe hepatocellular damage. Appropriate laboratory testing needed at first symptom of liver dysfunction and if laboratory evidence of damage (or if jaundice) occurs, labetalol should be stopped and not restarted.

**Side effects:** postural hypotension (avoid upright position during and for 3 hours after intravenous administration), tiredness, weakness, headache, rashes, scalp tingling, difficulty in micturition, epigastric pain, nausea, vomiting; liver damage; rarely lichenoid rash.

**Dose:**
- **by mouth,** initially 100 mg (50mg in elderly) twice daily with food, increased at intervals of 14 days to usual dose of 200 mg twice daily; up to 800 mg daily in 2 divided doses (3-4 divided doses if higher); max. 2-4 g daily.
- **By intravenous injection,** 50 mg over at least 1 minute, repeated after 5 minutes if necessary; max. total dose 200mg.

Note: Excessive bradycardia can be countered with intravenous injection of atropine sulphate 0.6 – 2.4 mg in divided dose of 600 mcg.

- **By intravenous infusion,** 2 mg/minute until satisfactory response then discontinue; usual total dose 50-200 mg (not recommended for phaeochromocytoma)

Hypertension of pregnancy, 20 mg/hour, doubled every 30 minutes; usual maximum dose 160 mg/hour.

Hypertension following myocardial infarction, 15 mg/hour, gradually increased to maximum 120 mg/hour.

- **Labetalol Hydrochloride Injection 5mg/ml.**
METOPROLOL TARTRATE

**Indications:** hypertension, angina, arrhythmias (including arrhythmias during anaesthesia), thyrotoxicosis, early intervention in acute myocardial infarction.

**Cautions:** same as Propranolol hydrochloride; reduce initial dose in renal impairment.

Contra-indications & Side effects: (See Propranolol Hydrochloride)

**Dose:** by mouth, hypertension, initially 100 mg daily. Maintenance, 100–400 mg daily in 1-2 doses.

Angina, 50-100 mg 2-3 times daily.

Arrhythmias, usually 50 mg 2-3 times daily, up to 300 mg daily in divided doses if necessary.

Thyrotoxicosis (as adjunct), 50 mg 4 times daily.

Migraine, prophylaxis- 100 – 200 mg daily in divided doses.

- Lopressor Tablets 100 mg.

PROPRANOLOL HYDROCHLORIDE

**Indications:** Hypertension, angina, arrhythmias, thyrotoxicosis, secondary prevention after acute myocardial infarction, migraine, and in phaeochromocytoma along with an alpha blocker.

**Cautions:** first degree AV block; portal hypertension and chronic obstructive pulmonary disease; late pregnancy; breast feeding; avoid abrupt withdrawal in angina; reduce oral dose of propranolol in liver disease; reduce initial dose in renal impairment; a small dose should be used initially in elderly patients; can mask signs and symptoms of hypoglycemia in patients receiving insulin therapy.

**Contra-indications:** Asthma; uncontrolled heart failure; Prinzmetal’s angina; marked bradycardia; hypotension; sick sinus syndrome; second or third degree AV block; cardiogenic shock; metabolic acidosis; severe peripheral arterial disease; phaeochromocytoma (apart from specific use with alpha blockers).

**Side effects:** Gastro intestinal disturbances; bradycardia, heart failure, hypotension, conduction disorders, bronchospasm, peripheral vasoconstriction (exacerbation of intermittent claudication or Raynaud’s phenomenon); dyspnea; headache, fatigue, sleep disturbances, paraesthesia, dizziness, vertigo, psychoses; sexual
Cardiovascular System
dysfunctions; purpura; thrombocytopenia, disturbed vision, exacerbation of psoriasis. alopecia, rarely rashes, dry eyes (reversible on withdrawal).

**Dose:** by mouth, hypertension, initially 80 mg twice daily.
Maintenance, 160-320 mg daily.
Angina, initially 40 mg 2-3 times daily.
Maintenance, 120-240 mg daily.
Arrhythmias and thyrotoxicosis, 10-40 mg 3-4 times daily.
Prophylaxis after infarction, 40 mg 4 times daily for 2-3 days, then 80 mg twice daily, beginning 5-21 days after infarction.
Migraine prophylaxis and essential tremor, initially 40 mg 2-3 times daily.
Maintenance, 80-160 mg daily.
By I.V. injection, arrhythmias and thyrotoxic crisis, 1 mg over 1 minute, preceded by atropine sulphate 1-2 mg in divided doses. If necessary, repeat at 2 minute intervals; maximum dose 10 mg (5 mg in anaesthesia).
- Inderal Tablets 10 mg, 40 mg
- Inderal Injection 1 mg/ml

**ANTI-HYPERTENSIVE DRUGS**

**ACE INHIBITORS**

**Indications:** hypertension; congestive heart failure as an adjuvant therapy.

**Cautions:** anaphylactoid and related reactions; impaired renal function; history of idiopathic or hereditary angioedema; breast feeding

**Contra-indications:** hypersensitivity to ACE - inhibitors and in renovascular disease; pregnancy.

**Side effects:** profound hypotension and renal impairment, especially when treatment is begun. ACE-inhibitors can produce persistent dry cough, hypersensitivity, pancreatitis, rhinitis, and sore throat. Gastrointestinal adverse effects and abnormal liver function tests, cholestatic jaundice and hepatitis have also been reported. Other rare adverse effects reported are paresthesias, alterations in taste, dizziness, fatigue, vasculitis, myalgia,
positive antinuclear antibodies, raised erythrocyte sedimentation rate, leukocytosis and photosensitivity.

**BENAZEPRIL HYDROCHLORIDE**

This is an angiotensin-converting enzyme inhibitor (ACE-inhibitor)

**Indications:** hypertension; congestive heart failure.

**Cautions, contra-indications and side effects:** (See ACE-inhibitors).

**Dose:** hypertension, initially, in patients not receiving diuretics, 10 mg once daily. The dose may be increased to 20 mg daily at intervals of 1 – 2 weeks. Maximum daily dose, 40 mg once or in two divided doses.

A thiazide-type diuretic or a calcium-antagonist could be added to achieve better control of blood pressure. Combination with beta blocker is not recommended. Congestive heart failure, as an adjunct treatment, initially 2-5 mg once daily; dose may be increased to 5 mg once daily after 2-4 weeks. Depending on the response, the dose may be increased to 10-20 mg once daily at appropriate intervals.

- Cibacen Tablets 5mg, 20 mg.

**CAPTOPRIL**

Captopril is an angiotensin-converting enzyme (ACE) inhibitor.

**Indications:** mild to moderate hypertension as an adjunct to thiazide therapy; severe hypertension resistant to other treatment; adjunct treatment in severe congestive heart failure.

**Cautions, contra-indications and side effects:** (See ACE-inhibitors) Also tachycardia, serum sickness, weight loss, stomatitis, maculopapular rash photosensitivity, flushing, acidosis.

**Dose:** Alone mild to moderate hypertension, initially 12.5 mg twice daily. Maintenance dose, 25 mg twice daily; can be increased at 2-4 week intervals until a satisfactory response is obtained to a maximum of 50 mg twice daily.
Cardiovascular System

A thiazide diuretic may be added; its dose is increased at 1-2 week intervals until optimum response is obtained or until maximum dose is reached.

Severe hypertension, starting dose is 12.5 mg twice daily increased to a maximum of 50 mg three times daily. A dose of 150 mg daily should not normally be exceeded. Other antihypertensives can be used but their doses are individual.

Heart failure, a starting dose of 6.25 or 12.5 mg.
Usual maintenance dose is 25 mg two or three times daily.
Usual maximum dose is 150 mg daily.
Diabetic nephropathy, 75-100 mg daily in divided doses.
Child, initially 0.3 mg/kg (0.15 mg/kg if a diuretic is given) 3 times daily; may be increased to a maximum dose of 6 mg/kg body weight in divided doses. This dose should not be exceeded.
The drug is not recommended in mild to moderate hypertension in children.

Capoten Tablets 12.5, 25, 50 mg.

CILAZAPRIL

This is an angiotensin-converting enzyme (ACE) inhibitor.

Indications: essential hypertension; renal hypertension; severe heart failure.

Cautions: (See ACE-inhibitors); severe hepatic impairment.

Contra-indications: (See ACE-inhibitors); ascites

Side Effects: (See ACE-inhibitors); dyspnoea, bronchitis.

Dose: hypertension, 2.5 mg once daily; initially 1 mg once daily (reduced to 0.5 mg, in those received a diuretic); severe heart failure, initially 0.5 mg once daily increased to a maintenance dose of 1 mg once daily.

Maximum daily dose is 5 mg once daily.

Inhibace Tablets 2.5 mg, 5 mg

ENALAPRIL MALEATE

This is an angiotensin-converting enzyme inhibitor.

Indications: all grades of essential hypertension and renovascular hypertension where standard therapy ineffective or inappropriate; congestive heart failure (adjunct).


**Cautions:** (See ACE-inhibitors); severe hepatic impairment.

**Contra-indications:** (See ACE-inhibitors)

**Side Effects:** (See ACE-inhibitors); dyspnoea, asthenia, blurred vision,. Less commonly dry mouth, peptic ulcer, anorexia, ileus, arrhythmias, palpitation, flushing, confusion nervousness, drowsiness, insomnia, vertigo etc.

**Dose:** hypertension, used alone initially 5 mg daily; used in addition to a diuretic, in elderly patients, or in renal impairment, initially 2.5 mg daily; usual maintenance dose 10-20 mg daily; maximum 40 mg daily. Heart failure, with a diuretic, dose initially, 2.5 mg daily under close hospital supervision. Usual maintenance dose, 10-20 mg daily in 1-2 divided doses.

- Renitec Tablets 5, 10, & 20 mg.
- Renitec 1.25mg Inj I.M.

**Lisinopril**

This is an angiotensin-converting enzyme inhibitor

**Indications:** essential hypertension; renovascular hypertension; congestive heart failure

**Cautions:** (See under ACE-inhibitors)

**Contra-indications:** (See under ACE-inhibitors)

**Side effect:** (See under ACE-inhibitors) Also tachycardia, cerebrovascular accident, myocardial infarction, dry mouth, blurred vision, confusion, mood changes, asthenia, sweating, impotence, alopecia.

**Dose:** essential hypertension, 10-20 mg in a single daily dose. In diuretic-treated patients, the diuretic should be stopped 2-3 days before beginning the therapy with lisinopril; if the diuretic cannot be stopped, start with 5 mg dose. In renal impairment, dose depends on creatinine clearance. Maximum daily dose is 40 mg.

Renovascular hypertension, 2.5-5 mg daily and can be adjusted thereafter. Congestive heart failure, 5-20 mg a day in a single dose

Diabetic nephropathy: initially 2.5 mg daily adjusted to achieve a sitting diastolic BP below 75 mm Hg in normotensive and 90 mmHg in hypertensive non-insulin dependent diabetes, Usual dose 10 – 20 mg.

- Zestril Tablets 5,10, & 20 mg.
PERINDOPIL
This is an angiotensin-converting enzyme inhibitor.

**Indications:** hypertension; congestive heart failure in association, or not, with diuretic, with or without digitalis.

**Cautions:** (See ACE-inhibitors); severe hepatic impairment.

**Contra-indications:** (See ACE-inhibitors)

**Side Effects:** (See ACE-inhibitors); asthenia, mood and sleep disturbances.

**Dose:** hypertension, 4mg once daily in the morning before food. The dose may be increased to 8 mg once daily after one month of treatment. In the elderly, in patients with renal impairment, and if used with diuretic treatment should be initiated with a single dose of 2mg in the morning and may be increased to 4mg after one month if necessary.

Congestive heart failure, initially 2 mg in the morning and may be increased to 4mg under close medical supervision.

- **Coversyl Tablets 4 mg & 8 mg**
- **Preterax (Perindopril 2 mg + Indapamide 0.625 mg)**
- **Bipreterax (Perindopril 4 mg + Indapamide 0.625 mg)**

ANGIOTENSIN RECEPTOR BLOCKERS (ARBs)
These have properties similar to ACE inhibitors however unlike ACE inhibitors, they do not inhibit breakdown of bradykinin and other kinins, and thus are unlikely to cause the persistent dry cough which complicates ACE inhibitor therapy.

These can be used as alternative to ACE inhibitors in management of heart failure or diabetic nephropathy.

**Cautions:** renal artery stenosis; aortic or mitral valve stenosis and obstructive hypertrophic cardiomyopathy.

Contra **Indications:** Pregnancy

**Side effect:** Usually mild. symptomatic hypotension including dizziness, Occasional hyperkalemia; angioedema, cough even it is less than ACE inhibitors.

IRBESARTAN

**Indications:** hypertension including left ventricular hypertrophy; renal disease in hypertensive type 2 diabetes mellitus.
**Cardiovascular System**

**Cautions:** renal artery stenosis; aortic or mitral valve stenosis and obstructive hypertrophic cardiomyopathy.

**Contra-indications:** breastfeeding, intravascular volume depletion.

**Side effects:** nausea, vomiting; fatigue; musculoskeletal pain; diarrhoea, dyspepsia, flushing, tachycardia, chest pain, cough and sexual dysfunction; dizziness; orthostatic effects; rash; angioedema.

**Dose:** hypertension and in renal disease in hypertensive type 2 diabetes mellitus: initially 150 mg once daily, increased if necessary to 300 mg once daily.

In haemodialysis or in elderly over 75 years, initial dose of 75 mg once daily may be used.

- *Aprovel Tablets* 150 mg, 300 mg.
- *Co-Aprovel Tablets* 150 mg, 300 mg.
- *Irbesartan* 150mg or 300mg + *Hydrochlorothiazide* 12.5 or 25mg

**LOSARTAN POTASSIUM**

This is an angiotensin-II receptor antagonist

**Indications:** hypertension, including patients with left ventricular hypertrophy; diabetic nephropathy in type-2 diabetes mellitus

**Cautions:** patients with intravascular volume depletion; renal artery stenosis; hepatic impairment; anesthesia and surgery; haemo-dialysis

**Contra-indications:** Angiotensin II receptor blockers such as losartan; pregnancy; breast feeding.

**Side effects:** (See Irbesartan) alos diarrhea, taste disturbances, cough, arthralgia, myalgia, asthenia, fatigue, migraine, vertigo, urticaria, pruritis, rash, rarely hepatitis, anaemia, thrombocytopenia, vasculitis.

**Dose:** initial and maintenance dose, 50 mg once daily; if necessary dosage may be increased to 100mg once daily.

Patients with intravascular volume depletion as those treated with high dose diuretics, and in the elderly, a starting dose of 25 mg once daily should be considered. Monitoring plasma potassium level is advised, particularly in patients with renal impairment, and in the elderly.

- *Cozaar Tablets* 50 mg
VALSARTAN

**Indications:** hypertension; myocardial infarction with left ventricular failure or left ventricular systolic dysfunction.

**Cautions:** (See Irbesartan) also mild to moderate hepatic impairment; renal impairment.

**Contra-indications:** severe hepatic impairment, cirrhosis, biliary obstruction, breastfeeding.

**Side effects:** fatigue, rarely diarrhea, headache, epistaxis; thrombocytopenia, arthralgia, myalgia, taste disturbance, neutropenia & rash.

**Dose:** hypertension, usually 80 mg once daily; in elderly over 75 years, mild to moderate hepatic impairment, moderate to severe renal impairment, intravascular volume depletion, initially 40 mg once daily; if necessary increased after at least 4 weeks to 160 mg daily.

Myocardial infarction, initially 20 mg twice daily increased over several weeks to 160 mg twice daily if tolerated; consider lower dose in mild to moderate hepatic impairment.

- Diovan 80 mg & 160 mg Tablets
- Co-Diovan Tablets With Diuretic (Note: For Hypertension Not Adequately Controlled By Valsartan Alone).
- Valsartan 80 mg, Hydrochlorothiazide 12.5 mg
- Valsartan 160 mg, Hydrochlorothiazide 12.5 mg

CENTRAL ANTIHYPERTENSIVE DRUGS

METHYLDOPA

This is a centrally acting anti-hypertensive drug.

**Indications:** moderate to severe hypertension in conjunction with a diuretic; pregnancy-induced hypertension.

**Cautions:** positive direct Coomb's test in 20% of patients; interference with laboratory tests; reduce initial dose in renal impairment; blood counts and liver function tests advised.

**Contra-Indications:** history of depression; liver disease, phaeochromocytoma, porphyria.

**Side Effects:** gastrointestinal disturbances; dry mouth; stomatitis, sialadenitis, bradycardia, exacerbation of angina, postural hypotension, edema, sedation,
depression, dizziness, myalgia, nightmares, abnormal liver function tests, hepatitis, jaundice, pancreatitis, haemolytic anemia, leucopenia, thrombocytopenia, eosinophilia, nasal congestion, sexual dysfunction, amenorrhea, hyperprolactinemia.

**Dosage:** by mouth, 250 mg 3 times daily gradually increased; maximum dose 3 g daily; In elderly, 125 mg 2 times daily increased to maximum of 2 gm daily.

- *Aldomet Tablets 250 mg*

**ALPHA BLOCKERS**

**PRAZOSIN**

This is a drug with post-synaptic alpha-blocking and vasodilator properties.

**Indications:** hypertension, congestive heart failure, Raynaud's syndrome; benign prostatic hyperplasia.

**Cautions:** first dose may cause collapse due to hypotension; reduce initial dose in renal failure. Avoid abrupt withdrawal in heart failure.

**Contra-indications:** congestive heart failure due to mechanical block (e.g. aortic stenosis)

**Side effects:** postural hypotension, drowsiness, weakness, dizziness, headache, lack of energy; nausea, palpitation, urinary frequency; incontinence & priapism reported.

**Dosage:** hypertension, 500 mcg 2-3 times daily, the initial dose being taken on retiring to bed at night; increased to 1 mg 2-3 times daily for a further 3–7 days; further increased to a maximum of 20 mg daily in divided doses. Congestive heart failure, 500 mcg 2-4 times daily, initially then 1 mg 3-4 times daily; maintenance 4-20 mg daily in divided doses (rarely used). Raynaud's syndrome, initially 500 mcg twice daily Maintenance 1-2 mg twice daily

Benign prostatic hypertrophy, initially 500 mcg twice daily for 3-7 days (initial dose at bedtime, as for above), dose subsequently adjusted according to response; usual maintenance (and max.) 2 mg twice daily.

- *Minipres Tablets 1 mg, 5 mg*
TOLAZOLINE HYDROCHLORIDE

This is a vasodilator with some alpha adrenergic blocking properties.

**Indications:** reduction of pulmonary artery pressure in persistent pulmonary hypertension in new-born infants with persistent foetal circulation.

**Cautions:** coronary artery disease, hypotension, after cerebrovascular accident; peptic ulceration; mitral stenosis.

**Side-effects:** pilo-erection, headache, flushing, tachycardia, cardiac arrhythmias, tingling, shivering, sweating, nausea, vomiting, diarrhoea, and epigastric pain; orthostatic hypotension or marked hypertension; blood dyscrasias; may cause disulfiram-like reaction if given with alcohol; hypochloraeemic metabolic alkalosis, acute renal failure and duodenal perforations have been reported in infants given tolazoline.

**Dose:** adults, subcutaneously, intra-muscularly, intravenously or by slow intra-arterial injection, up to 50 mg.

Infants, 1 to 2 mg/kg body weight over 10 minutes by intravenous infusion followed by 1 to 2 mg per kg per hour thereafter.

- *Priscol Injection 25 mg/ml & 4 ml Ampoules.*

RESERPINE

This is a centrally acting antihypertensive.

**Indications:** hypertension.

**Cautions:** severe impairment of renal or hepatic function, history of depression, recent myocardial infarction, severe coronary depression or cerebral sclerosis; debilitated or elderly patients; depression; peptic ulcer.

**Side effects:** nasal congestion, headache, CNS effects, flushing and bradycardia, depression, peptic ulcer.

**Dose:** initially, 500 mcg daily for 2 weeks reduced to the lowest effective dose.

Maintenance, 100-250 mcg daily

- *Brinerdin Tablets (Reserpine 100mcg With Dihydroergocristine & Clopamide/Tablet)*
CALCIUM CHANNEL BLOCKERS

AMLODIPINE
This is a calcium-channel blocker.
**Indications:** hypertension; prophylaxis of angina.
**Cautions:** severe liver impairment, pregnancy and breast-feeding.
**Contra-indications:** cardiogenic shock, unstable angina, aortic stenosis, breast feeding.
**Side effects:** headache, oedema, dizziness, fatigue, flushing, nausea, palpitations, sleep disturbances.
**Dose:** 5 mg once daily, may be increased to 10 mg once daily.
- Norvasc Tablets 5mg
- Istin Tablets 10 mg

DILTIAZEM HYDROCHLORIDE
This is a calcium-channel blocker.
**Indications:** prophylaxis and treatment of angina, hypertension.
**Cautions:** reduce dose in hepatic and renal impairment; heart failure or significantly impaired left ventricular function; bradycardia; first degree AV block or prolonged PR interval.
**Contra-indications:** severe bradycardia, second or third degree A-V block (unless pacemaker is fitted), sick sinus syndrome, pregnancy; porphyria.
**Side effects:** bradycardia and first-degree heart block, hypotension, palpitations, ankle oedema, headache, nausea, rarely rashes (toxic erythema reported), gum hyperplasia and extrapyramidal symptoms have been reported.
**Dose:** initially 60 mg 3 times daily (elderly patients twice daily), max 360 mg daily.
- Delzim Tablet 60mg
- Delzim-SR Tablet 120mg
- Delzim-200mg Cap

FELODIPINE
This is a calcium-channel blocker
**Indications:** hypertension; prophylaxis of angina pectoris.
Cautions: may precipitate hypotension which in susceptible individuals may result in myocardial ischaemia. Withdraw if ischemic pain occur or existing pain worsens after initiating treatment; avoid grape fruit juice.

Contra-indications: unstable angina, uncontrolled heart failure, recent myocardial infarction within past month; pregnancy; hypersensitivity.

Side effects: flushing, headache, palpitations, dizziness and fatigue; ankle edema; rarely gum hyperplasia, urinary frequency, and impotence.

Dose: hypertension, initially, 5 mg once daily (elderly 2.5 mg).

Angina pectoris, initially 5 mg once daily increased to 10 mg once daily if needed.

- Plendil Tablets 5 mg (Plendil)

NIFEDIPINE

This is a calcium-channel blocker.

Indications: treatment and prophylaxis of angina pectoris (exercise-induced angina, angina at rest and angina following myocardial infarction), and in the treatment of hypertension; Raynaud's phenomenon.

Cautions: withdraw the drug if ischaemic pain occurs or existing pain worsens shortly after initiating treatment; may inhibit labour. Systolic blood pressure of less than 90 mm Hg; dialysis patients with malignant hypertension and irreversible renal failure with hypovolaemia; avoid grape-fruit juice.

Contra-indications: cardiogenic shock; pregnancy and lactation; within one month of myocardial infarction; unstable or acute attacks of angina; advanced aortic stenosis; porphyria.

Side effects: headache, flushing, nausea, dizziness, lethargy, skin reactions, paraesthesia, hypotension, palpitation, tachycardia and dependent oedema; rarely hepatitis and reversible gingival hyperplasia.

Dose: angina, initially 10 mg 3 times daily with food, increased to 20 mg 3 times daily if necessary. In elderly patients, initially 5 mg 3 times daily.
Cardiovascular System

For immediate effect bite into capsule and retain liquid in mouth. Raynaud's syndrome, 10 mg 3 times daily; maximum 60 mg daily.

For sustained release capsules: angina pectoris, and hypertension, normally one capsule (20 mg) every 12 hours if necessary the dosage may be increased to 2 capsules every 12 hours. The capsule should be swallowed whole with a little fluid after meals.

- Adalat 10 mg Tablets
- Adalat Retard Tablets 20 mg
- Adalat La Tablet 30 mg

VERAPAMIL HYDROCHLORIDE

This is a calcium-channel blocker

Indications: mild to moderate hypertension; treatment and prophylaxis of chronic stable angina, vasospastic angina and unstable angina; paroxysmal supraventricular tachycardia; reduction of ventricular rate in atrial flutter/fibrillation.

Caution: first-degree AV block; acute myocardial infarction complicated by bradycardia; concomitant use of beta-blockers; pregnancy and breast-feeding; grapefruit juice ingestion.

Contra-indications: second-and third-degree AV block; sino-atrial block; uncompensated heart failure; bradycardia; porphyria; atrial flutter or fibrillation complicating Wolff-Parkinson-White syndrome.

Side-effects: constipation; flushing; headache; nausea and vomiting; allergic reactions.

Dose: by mouth, supraventricular, tachycardias, 40-120 mg 3 times daily. Angina, 80-120 mg 3 times daily. Hypertension, 240-480 mg daily in 2-3 divided doses. By slow I.V. injection over 2 minutes, 5-10 mg with ECG monitoring. In paroxysmal tachyarrhythmias a further 5 mg after 5-10 minutes if required.

- Isoptin Tablets 40, 80 mg
- Isoptin S.R. Tablets 240 mg
- Isoptin Injection 5 mg/2ml
VASODILATORS

HYDRAZINE HYDROCHLORIDE
This is a vasodilator antihypertensive.

Indications: moderate to severe hypertension, in addition to a beta-adrenoceptor blocker or diuretics; hypertensive crisis.

Cautions: reduce initial dose in renal impairment; excessive reduction in blood pressure can occur with even low I.V. doses; may provoke angina in patients with coronary artery disease.

Contra-indications: porphyria, severe tachycardia, high output heart failure and cor pulmonale, systemic lupus erythematosus.

Side Effects: tachycardia, palpitation, flushing, hypotension, fluid retention, GI disturbances; headache, dizziness, systemic lupus erythematosus like syndrome with long term therapy with over 100 mg daily dose.

Dose: by mouth, 25 mg twice daily increased to maximum of 50 mg twice daily.

By slow I.V. injection, 5-20 mg over 20 minutes; may be repeated after 20-30 minutes. By I.V. infusion, 20 mg repeated if necessary.

- Apresoline Tablets 25 mg
- Apresoline Injection 20 mg/Ampoule

NITRATES (NITROVASODILATORS)

GLYCERYL TRINITRATE

Indications: prophylaxis and treatment of angina; left ventricular failure.

Cautions: hypotensive conditions, severe hepatic or renal impairment, hypothyroidism, head trauma, cerebral haemorrhage.

Contra-indications: Nitrate hypersensitivity, hypotension and hypovolemia, hypertrophic obstructive cardiomyopathy, aortic stenosis, mitral stenosis, constrictive pericarditis, marked anemia, closed-angle glaucoma.

Side effects: throbbing headache, flushing, dizziness, postural hypotension, tachycardia.

Dose: sublingually, 0.3-1 mg repeated, as required.
By I.V. infusion, 10-200 mcg/minute.
Plaster, once daily on lateral chest wall, upper arm, thigh, abdomen or shoulder; siting replacement patch on different area.
- Angised Tablets 0.5 mg
- Nitroglycerin Sublingual Tablet 0.5 mg
- Nitroderm T.T.S. Self-Adhesive Patch, 5mg
- Nitroglycerin Injection 25 mg/5ml, To Be Diluted Before Use.

ISOSORBIDE DINITRATE

**Indications:** prophylaxis and treatment of angina; left ventricular failure.

**Cautions, contra-indications and side effects:** (see Glyceryl trinitrate)

**Dose:** by mouth, angina, 30-120 mg daily in divided doses.
Left ventricular failure, 40-160 mg, up to 240 mg daily if required, in divided doses.
- Vascardin Tablets 10 mg
- Isordil Tablets 10 mg

ISOSORBIDE MONONITRATE

**Indications:** coronary heart disease; prophylaxis of angina pectoris; post-myocardial infarction therapy; pulmonary hypertension; adjunctive treatment in heart failure.

**Cautions:** pregnancy; not suitable for treating attacks of angina pectoris

Contra-indications and side effects: (see Glyceryl trinitrate)

**Dose:** initial dose, 5-10 mg twice daily for 2 days.
Maintenane, 20 mg twice daily may be increased to 3 times daily. Maximum 120 mg daily in divided doses.
- Ismo Tablets 20 mg
- Ismo Tablets 60 mg

PENTOXYFYLLINE (OXPENTIFYLLINE)

It is a methylxanthine derivative.

**Indications:** peripheral vascular disease; venous leg ulcers.
Cardiovascular System

**Cautions:** hypotension, coronary artery disease, severe hepatic and renal impairment; porphyria.

**Contra-indications:** cerebral haemorrhage, extensive retinal haemorrhage, acute myocardial infarction, pregnancy, breast feeding.

**Side effects:** hypotension, angina, gastrointestinal disturbances, dizziness, agitation, sleep disturbances, headache.

**Dose:** 400 mg, 2-3 times daily.

- Trental Tablets 400 mg.

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**RAUBASINE**

Raubasine (ajmalicine) is a vasodilator related chemically to reserpine.

**Indications:** mental function impairment in the elderly; cerebrovascular disorders.

**Dose:** one tablets 2 times daily.

- Duxil Tablets (Almitrine Bismesylate 30 mg, Raubasine 10 mg/Tablet)

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**TRIMETAZIDINE**

Trimetazidine is an antiischemic agent.

**Indications:** preventive treatment of episodes of angina pectoris; adjuvant symptomatic treatment for vertigo and tinnitus in Menier’s disease.

**Dose:** 35 mg orally twice daily.

- Vastarel Tablets 35 mg.

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**SYMPATHOMIMETICS**

**EPHEDRINE HYDROCHLORIDE**

**Indications:** Reversal of hypotension from spinal or epidural anaesthesia

**Cautions:** hyperthyroidism, diabetes mellitus, ischaemic heart disease, hypertension, susceptibility to angle-closure glaucoma, elderly, pregnancy, may cause acute urine retention in rostatic hypertrophy.

**Contra-indications:** breast feeding.

**Side effect:** nausea, vomiting anorexia, tachycardia (sometimes bradycardia), arrhythmias, anginal pain, vasoconstriction with hypertension, vasodilation
with hypotension, dizziness and flushing, dyspnoea, headache, anxiety, restlessness, confusion, psychoses, insomnia, tremor, difficulty in micturition, urine retention, sweating, hypersalivation, changes in blood-glucose concentration, very rarely angle-closure glaucoma.

**Dose:** by slow intravenous injection of a solution containing ephedrine hydrochloride 3mg/ml, 3-mg (max 9mg) repeated every 3-4 minutes according to response to max 30mg.

- *Ephedrine Hydrochloride 3mg/ml injection.*

### EPINEPHRINE (ADRENALINE)

**Indications:** emergency treatment of acute anaphylaxis; angio-edema; cardiopulmonary resuscitation.

**Cautions:** ischaemic heart disease, diabetes mellitus, hyperthyroidism, hypertension, increased risk of arrhythmias with antidepressants, digoxin, or quinidine.

**Side-effects:** anxiety, tremor, tachycardia, headache, cold extremities; in overdose, arrhythmias, cerebral haemorrhage, pulmonary oedema.

**Dose:** in anaphylactic shock, by I.M. injection, 0.5-1.0 mg (0.5-1 ml of 1:1000 solution), repeated if required after 10 minutes.

In advanced cardiac life support, initial dose by I.V. injection, 1 mg (10 ml of 1 in 10,000 solution), preferably into a central vein, and repeated as often as every 2-3 minutes in some circumstances for up to an hour.

Dose can be increased after 3 doses to 5 mg or 100 mcg/kg.

Child, by I.V. doses, 10 mcg/kg initially then 100 mcg/kg.

Endotracheal doses are 2-3 times the I.V. doses.

- *Adrenaline (Epinephrine) Injection 1mg/1ml (1:1000); 1:10,000 (1mg/10 ml) Injection.*

### DOBUTAMINE HYDROCHLORIDE

**Indications:** inotropic support in infarction, cardiac surgery, cardiomyopathies, septic shock, and cardiogenic shock.

**Cautions:** severe hypotension complicating cardiogenic shock.
**Cardiovascular System**

*Side effects:* tachycardia and marked increase in systolic blood pressure indicate overdosage; phlebitis.

*Dose:* By I.V. infusion, 2.5-10 mcg/kg/minute, adjusted according to response.
- *Dobutrex Injection 250 mg/Vial*

**DOPAMINE HYDROCHLORIDE**

*Indications:* cardiogenic shock in infarction or cardiac surgery.

*Cautions:* correct hypovolemia; low dose in shock due to acute myocardial infarction.

*Contra-indication:* Tachyarrhythmias; pheochromocytoma.

*Side effects:* nausea, vomiting, peripheral vasoconstriction, hypotension, hypertension, tachycardia.

*Dose:* by I.V. infusion: 2-5 mcg/kg/minute initially.
- *Intropin Injection 40 mg/ml, 200 mg/5 ml.*

**ISOPRENALINE HYDROCHLORIDE**

It is a nonselective beta agonist.

*Indications:* heart block, severe bradycardia.

*Cautions:* ischaemic heart disease, diabetes, hyperthyroidism.

*Dose:* by I.V. infusion, 0.5-10 mcg/minute.
- *Isoprenaline Injection 2mg/2ml.*

**ANTI-COAGULANTS AND RELATED DRUGS**

**HEPARIN**

It is a an injectable anticoagulant

*Indications:* deep vein thrombosis, pulmonary embolism, unstable angina, disseminated intravascular coagulation, prevention of post-operative thrombosis.

*Cautions:* pregnancy, elderly, hepatic or renal impairment, heparin induced thrombocytopenia, hyperkalaemia.

*Contra-indications:* haemophilia and other haemorrhagic disorders, peptic ulcers, cerebral aneurysm, severe hypertension, severe liver disease, recent surgery of eye or nervous system, hypersensitivity to heparin.
Cardiovascular System

Side effects: hemorrhage, skin necrosis, thrombocytopenia, hyperkalaemia, hypersensitivity (urticaria, angioedema, anaphylaxis), osteoporosis after prolonged use; rarely alopecia.

Dose: For prophylaxis of deep vein thrombosis in general surgery by subcutaneous injection, 5000 units 2 hours before surgery, then every 8-12 hours until patient is ambulant; in pregnancy, 5000--10,000 units every 12 hours.

Treatment of deep vein thrombosis and pulmonary embolism, loading dose of 5000 units (10,000 in pulmonary embolism) followed by continuous infusion of 15--25 units/Kg/Hr or treatment of deep vein thrombosis by subcutaneous injection of 15000 units every 12 hours. Monitoring of dosage on daily basis. In unstable angina, acute peripheral arterial occlusion, same as intravenous regimen for deep vein thrombosis and pulmonary embolism.

- Heparin Injection 5,000 Units/ml;
- 15,000 Units/5ml;
- 25,000 Units/5ml Vial.

Enoxaparin Sodium

This is a low-molecular weight (LMW) heparin

Indications: prophylaxis of venous thromboembolic disease after certain procedures; prevention of thrombus formation in the extra-corporeal circulation during hemodialysis; treatment of established deep vein thrombosis; treatment of unstable angina and non Q-wave myocardial infarction during the acute stage, in combination with aspirin.

Cautions: do not inject intramuscularly.

Contra-indications: allergic reactions; major clotting disorders; history of thrombocytopenia; active gastrointestinal bleeding; acute infectious endocarditis; severe renal impairment; hemorrhagic vascular cerebral stroke; uncontrolled arterial hypertension; breastfeeding.

Side effects: (See Heparin)

Dose: every 1 mg (0.01 ml) corresponds to 100 anti-Xa i.u.

In prophylaxis and curative treatment, it should be given by subcutaneous route.
Cardiovascular System

During haemodialysis it should be given by extra vascular route.
Prophylaxis of venous thrombosis, 20 mg once daily.
Highly thrombogenic risk surgery (e.g. orthopedic surgery), 40 mg once daily.
Treatment should continue for 7-10 days.
Prevention of extra-corporeal thrombus during hemodialysis, 1mg/kg.
Treatment of established deep vein thrombosis, 1 mg/kg subcutaneous every 12 hours. Treatment period should not exceed 10 days.
Treatment of unstable angina and non-Q-wave myocardial infarction, 1 mg/kg S.C. every 12 hours for a period of 2-8 days. It should be administered concurrently with oral aspirin (100-325 mg daily).

- **Clexane Injection 20 mg, 40 mg**

**PROTAMINE SULPHATE**

*Indications:* as an antidote for heparin
*Cautions:* increased risk of allergic reaction to protamine (includes previous treatment with protamine or protamine insulin, allergy to fish, men who are infertile or who have had a vasectomy)
*Side effects:* nausea, vomiting, lassitude, flushing, hypotension, bradycardia, dyspnoea; hypersensitivity reactions (including angioedema, anaphylaxis) reported.
*Dose:* by intravenous injection over approx. 10 minutes, 1 mg neutralizes 80 – 100 units of heparin when given within 15 minutes of heparin; if longer time, less protamine required as heparin is rapidly excreted; max. 50 mg.

- **Protamine Sulphate Injection 10 mg/5ml.**

**WARFARIN SODIUM**

It is an oral anticoagulant.
*Indications:* deep vein thrombosis, transient brain ischaemic attacks, prophylaxis with prosthetic heart valves.
*Cautions:* hepatic or renal disease, recent surgery; avoid cranberry juice, breast feeding.
*Contra-Indications:* pregnancy, peptic ulcer, severe hypertension, bacterial endocarditis.
SIDE EFFECTS: haemorrhage, hypersensitivity, alopecia, diarrhea, unexplained drop in hematocrit, ‘purple toes’, skin necrosis and hepatic dysfunction; also nausea and vomiting.

DOSE: loading dose 10 mg daily for 2 days (5-6 mg if patient likely to be sensitive). Maintenance, usually 3-9 mg from day 3, according to prothrombin time based on International Normalized Ratio (INR). Doses are taken at the same time each day. The therapeutic range in prophylactic therapy of deep-vein thrombosis including high-risk surgery, 2-2.5 mg. Prophylactic therapy in hip surgery and fractured femur-operations, for treatment of deep vein thrombosis, pulmonary embolism, and transient ischaemic attacks, 2-3 mg per day. Recurrent deep-vein thrombosis and pulmonary embolism, arterial disease including myocardial infarction, arterial grafts, and prosthetic heart valves and grafts 3-4.5 mg per day.

Warfarin Tablets 1 mg, 2 mg, 5 mg.

ANTIPLATELET DRUGS

ASPIRIN

It is a nonsteroidal anti-inflammatory drug (NSAID), used as an antithrombotic in low doses.

Indications: prophylaxis of stroke or myocardial infarction.

Cautions: asthma; uncontrolled hypertension; pregnancy; peptic ulcer; hepatic and renal impairment.

Contra-indications: children and adolescent under 16 years (Reye's syndrome); breastfeeding; active peptic ulceration; haemophilia and other bleeding disorders.

Side effects: bronchospasm; gastro-intestinal haemorrhage.

Dose: secondary prevention of stroke or myocardial infarction, 300 mg daily (75, 81 or 100 mg daily for long term use with established cardiovascular disease, after coronary bypass surgery; or 150-300 mg on as soon as possible after an ischemic event).

Aspirin Tablets 300 mg, 81 mg
DIPYRIDAMOLE
This is an antithrombotic drug which decreases the platelet adhesiveness, thus inhibiting thrombus formation on the arterial side of the circulation; it has little effect on venous thromboembolism.

**Indications:** modifications of platelet function; all forms of coronary insufficiency; prophylaxis and after treatment of myocardial infarction; acute myocardial infarction without circulatory collapse; basic therapy in cardiac failure; cerebrovascular thrombosis; thrombosis of peripheral arteries; prevention of deep venous thrombosis of the leg.

**Cautions:** may exacerbate migraine, hypotension; myasthenia gravis; breast feeding; recent myocardial infarction, heart failure or aortic stenosis.

**Side effect:** gastrointestinal disturbances, dizziness, myalgia, throbbing headache, hot flushes and tachycardias, hypersensitivity.

**Dose:** by mouth, 300-600 mg daily in 3-4 divided doses before food.
- **Persantin Tablets 75 mg.**
- **Persantin Injection 10 mg/2ml.**

FIBRINOLYTIC DRUGS

ALTEPLASE (RT-PA, RECOMBINANT TISSUE TYPE PLASMINOGEN ACTIVATOR)

**Indications:** fibrinolytic therapy of acute thrombotic coronary artery occlusion.

**Cautions:** diabetes mellitus, diabetic retinopathy, severe renal impairment, pregnancy (possibility of placental separation); standard measures for arrhythmias.

**Contra-indications:** history of cerebrovascular disease, uncontrolled hypertension, bleeding, major surgery or puncture of major non-compressible blood vessels; acute pancreatitis; bacterial endocarditis; severe liver disease including hepatic failure, cirrhosis, oesophageal varices, active hepatitis.

**Side effects:** bleeding (generally limited to site of injection, occasionally intracerebral haemorrhage); nausea and vomiting.
**Cardiovascular System**

**Dose:** by intravenous injection, 10 mg over 1-2 minutes, followed by intravenous infusion of 50 mg over 1 hour, then 40 mg over the subsequent 2 hours (total dose 100 mg over 3 hours); treatment should be initiated within 6 hours; patients weighing less than 65 kg should receive a total dose of 1.5 mg/kg according to the above schedule.

- *Actilyse 10mg and 50 mg/Vial*

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**STREPTOKINASE**

**Indications:** venous thrombosis, pulmonary embolism, thrombosed arteriovenous shunts; thrombolysis in the eye, pulmonary embolism.

**Cautions:** atrial fibrillation, recent recovery from streptococcal infection.

**Contra-indications:** recent haemorrhage, coagulation defects, severe hypertension, streptococcal infection, surgery in previous hours, menstruation, pregnancy.

**Dose:** by I.V. infusion, 250,000 units over 30 minutes, then 100,000 units every hour for up to 12-72 hours according to condition.

Myocardial infarction, 1,500,000 units over 60 minutes followed by aspirin 150 mg daily by mouth for at least 4 weeks.

- *Kabikinase Injection 250,000 Units/Vial*

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**ANTI-FIBRINOLYTIC DRUGS AND HAEMOSTATICS**

**ABSORBABLE GELATIN SPONGE**

**Indications:** effective in the control of capillary oozing and venous bleeding; variety of surgical procedures. It should be packed loosely in any cavities to prevent expansion damaging surrounding tissues.

**Contra-indications:** aural surgery where it might come into contact with fluid from the inner ear; ophthalmic surgery where the vitreous or aqueous humour is exposed.

- *Sterispon.*
- *Gelfoam.*

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**DROTRECOGIN ALFA (ACTIVATED)**

Recombinant activated protein C.
**Cardiovascular System**

**Indications:** adjunctive treatment of severe sepsis with multiple organ failure.

**Cautions:** increased risk of bleeding, concomitant use of drugs that increase risk of bleeding; pregnancy.

**Contra-indications:** internal bleeding; intracranial neoplasm or cerebral herniation; chronic severe hepatic disease; thrombocytopenia; not recommended for use in children.

**Side effects:** bleeding; headache; ecchymosis; pain.

**TRANEXAMIC ACID**

**Indications:** it inhibits plasminogen activation and fibrinolysis. It may be useful when haemorrhage cannot be stopped as in prostatectomy, dental extraction in haemophiliacs, or menorrhagia; also can be used in hereditary angioedema and in thrombolytic overdose.

**Cautions:** reduce dose in renal impairment; massive haematuria (ureteric obstruction); regular eye examinations and liver function test in long-term treatment of hereditary angioedema.

**Contra-indications:** thromboembolic disease; severe renal impairment.

**Side effects:** nausea, vomiting, diarrhoea (reduce dose); giddiness on rapid injection; disturbances in colour vision (discontinue)

**Dose:** by mouth, 1 -1.5 g 2-4 times daily.

By slow I.V. injection, 0.5 0 1 g 3 times daily for local fibrinolysis.

- Cyclokapron Tablets 500 mg.
- Cyclokapron Injection 100 mg/ml.

**MISCELLANEOUS**

**DIOSMIN (FLAVONOID EXTRACTS OF RUTACEAE)**

**Indications:** circulatory disorders in women, treatment of haemorrhoids, vascular protection and prevention and treatment of drug-induced bleeding and gastric bleeding due to capillary fragility.
**Side effects:** minor incidents such as gastralgia and headache; any gastric discomfort is avoided by taking the drug during meals.

**Dose:** phlebology, usual dose, 2 tablets daily in two divided doses midday and evening at meal times.

In acute haemorrhoidal episode, the dose is 6 tablets per day for the first 4 days, then 4 tablets per day for the following 3 days.

- Daflon Tablets 500 mg
- Diosmin 450 mg + Hesperidin 50 mg Tablet

**LIPID-REGULATING DRUGS**

**FIBRATES**

**BEZAFIBRATE**

**Indications:** hypertriglyceridaemia, hypercholesterolemia.

**Cautions:** reduce dose in moderate renal impairment; correct hypothyroidism before initiation of treatment

**Contra-indications:** severe renal or hepatic impairment, hypoalbuminaemia, primary biliary cirrhosis, gall bladder disease, nephrotic syndrome, pregnancy and breast feeding.

**Side effects:** gastrointestinal disturbance, rash, pruritis, rarely peripheral neuropathy.

**Dose:** 400 mg daily after food (this sustained release dose form is not appropriate in renal impairment).

- Bezalip Tablets S.R. 400 mg.

**STATINS**

**ATORVASTATIN**

It is antilipemic agent, HMG-CoA reductase inhibitor

**Indications:** Used with dietary therapy for the following, primary hypercholesterolaemia, heterozygous familial hypercholesterolaemia, homozygous familial hypercholesterolaemia or combined Hyperlipidaemia in patients who have not responded to diet and other appropriate measures, prevention of cardiovascular events in patients with type 2 diabetes.
**Cardiovascular System**

**Cautions:** Should be used with caution in those with history of liver disease or with a high alcohol intake. Hypothyroidism should be managed before treatment starting. Liver function tests should be performed before and within 1-3 months of starting treatment and thereafter at intervals of 6 months for 1 year. Should be used with caution in those with risk factor for myopathy or rhabdomyolysis.

**Contra-indications:** Hypersensitivity to atorvastatin or any component of the formulation, active liver disease, pregnancy, breast-feeding, unexplained persistent elevations of serum transaminases.

**Side effects:** Headache, abdominal pain, flatulence, constipation, diarrhea, nausea, vomiting, rash, chest pain, angina, insomnia, dizziness, hypoesthesia, arthralgia, back pain, anorexia, malasia, weight gain, alopecieca, urinary tract infection, sinusitis, pharyngitis, bronchitis, rinitis, flu-like syndrome.

**Dose:**
- Primary hypercholesterolaemia and combined hyperlipidaemia, 10 mg once daily, if necessary, may be increased at intervals of at least 4 weeks to max. 80 mg once daily.
- Child 10-17 years (females >1 year postmenarche) 10 mg once daily (max. 20 mg/day), prevention of cardiovascular events in type 2 diabetes, 10 mg once daily. No dosing adjustment required in renal impairment.

- **Lipitor 10 mg & 20 mg Tablets**

**FLUVASTATIN SODIUM**

This is an HMG-CoA reductase inhibitor

**Indications:** primary hypercholesterolaemia in patients with cholesterol level of 6.5 mmol/L or greater who have not responded adequately to dietary measures.

**Cautions:** liver function tests should be performed before and periodically during the treatment; correct hypothyroidism before initiation of treatment; symptoms of diffuse muscle pain of unknown origin; tenderness or weakness should be reported immediately particularly if accompanied by fever or malaise; severe renal failure.

**Contra-indications:** active liver disease; pregnancy; and breast feeding.
**Cardiovascular System**

**Side effects**: Reversible myositis is rare but significant side effect, altered liver function test; paresthesia; dyspepsia, insomnia, nausea, abdominal pain, flatulence, constipation, diarrhea, rash and hypersensitivity reactions and headache.

**Dose**: usual range, 40-80mg once daily with the evening meal or at bedtime.
- Lescol Capsules, 40 & 80 mg

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**PRAVASTATIN SODIUM**

This is an HMG-CoA reductase inhibitor.

**Indications**: as under Fluvastatin.

**Cautions**: as under Fluvastatin; renal impairment.

**Contra-indications**: as under Fluvastatin.

**Side effects**: headache, rash, myalgia, non-cardiac-chest pain, nausea/vomiting, diarrhoea, fatigue.

**Dose**: usual range, 20-40mg once a day at bedtime.
- Lipostat Tablets 20mg, 40 mg

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**SIMVASTATIN**

This is an HMG CoA reductase inhibitor.

**Indications**: elevated total and LDL cholesterol levels in primary hypercholesterolaemia.

**Cautions**: same as fluvastatin

**Contra-indications**: same as fluvastatin; women of child-bearing potential.

**Side effects**: same as fluvastatin. also alopecia, dizziness, anaemia, peripheral neuropathy, asthenia, jaundice, pancreatitis. Risk of myopathy increases if combined with fibrates or niacin.

**Dose**: 20-40 mg once daily at night.
- Zocor Tablets 20 mg, 40 mg

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**BILE ACID BINDING RESIN**

**COLESTYRAMINE (CHOLESTYRAMINE)**

This is a bile acid-binding resin.

**Indications**: hypercholesterolemia (type II a) in patients who have not responded to diet and other measures; primary prevention of coronary heart disease in men 35 to
59 years of age; pruritis associated with primary biliary obstruction & cirrhosis; diarrhoeal disorders.

**Cautions:** supplements of fat-soluble vitamins and of folic acid may be required with high doses, particularly in children, may reactivate peptic ulceration; hepatic impairment, pregnancy, breast feeding.

**Contra-indications:** complete biliary obstruction.

**Side effects:** Since it is not absorbed from GI tract, hence side effect are GI like nausea, vomiting, GI discomfort, constipation.

**Dose:** usually 12-24 g daily in liquid in single or divided doses; up to 36 g daily in resistant case.

- Questran Sachets 4 G/Sachet.

### VASOCONSTRICTOR

#### SYMPATHOMIMETICS

**NORADRENALINE ACID TARTRATE / NOREPINEPHRINE BITARTRATE**

**Indications:** Used as an emergency method of elevating blood pressure where other measures have failed.

**Cautions:** coronary, mesenteric, or peripheral vascular thrombosis; flowing myocardial infarction, Prinzmetal’s variant angina, hyperthyroidism, diabetes mellitus; hypoxia or hypercapnia; uncorrected hypovolemia; elderly; extravasation at injection site may cause necrosis; interactions: sympathomimetic.

**Contra-indications:** hypertension (monitor blood pressure and rate of flow frequently); pregnancy.

**Side effects:** hypertension, headache, bradycardia, arrhythmias, peripheral ischaemia.

**Dose:** acute hypotension, by intravenous infusion, via central venous catheter, of a solution containing noradrenaline acid tartrate 80 mcg/ml (equivalent to noradrenaline base 40 mcg/ml) at an initial rate of 0.16 – 0.33 ml/minute, adjusted according to response.

Cardiac arrest, by rapid intravenous or intracardiac injection, 0.5 – 0.75ml of a solution containing noradrenaline acid tartrate 200 mcg/ml (equivalent to noradrenaline base 100 mcg/ml)
Noradrenaline / Norepinephrine: Injection, Noradrenaline Acid Tartrate 2 mg/ml (Equivalent To Noradrenaline Base 1 mg/ml)

LOCAL SCLEROSING AGENT

ETHANOLAMINE OLEATE (MONOETHANOLAMINE OLEATE)

**Indications:** sclerotherapy of varicose veins.
**Cautions:** extravasation may cause necrosis of tissues.
**Side effects:** allergic reactions, including anaphylaxis.
**Dose:** by I.V. injection: 2-5 ml divided between 3-4 sites; repeated at weekly intervals.

- Ethanolamine Oleate Injection 5%
CENTRAL NERVOUS SYSTEM

HYPNOTICS, SEDATIVES AND ANXIOLYTICS

ALPRAZOLAM

Indications: anxiety, for short-term use
Cautions: see under diazepam
Contra-Indications: see under diazepam
Side-effects: see under diazepam
Dose: 250-500 mcg 3 times daily (elderly or debilitated patients 250 mcg 2-3 times daily), increased if necessary to a total of 3 mg daily
- Xanax Tablets 250 mcg; 500 mcgs; 1 mg

BROMAZEPAM

Cautions: rebound or withdrawal symptoms following abrupt withdrawal; elderly patients; hepatic disease, renal impairment, obesity.
Contra-Indications: myasthenia gravis, narrow angle glaucoma, severe hepatic or respiratory disease, sleep apnoea, pregnancy and lactation.
Side-effects: hypotension, palpitation, tachycardia; drowsiness, ataxia, dizziness, confusion, depression etc.; rash, pruritus; nausea, vomiting, xerostomia; incontinence; decrease in libido; weakness, muscle spasm; blurred vision, depth perception decreased.
Dose: 3-18 mg daily in divided doses.
Elderly patients half adult dose.
Maximum (in hospitalized patients) 60 mg daily in divided doses.
- Lexotanil Tablets 1.5 mg, 3 mg

BUSPIRONE HYDROCHLORIDE

Indications: anxiety disorders for short-term relief.
Cautions: concurrent use of MAOI's; gradual withdrawal of prior treatment with benzodiazepines and other common sedative/hypnotic drugs before starting buspirone therapy; renal and hepatic impairment.
Central Nervous System

Contra-Indications: pregnancy and lactation; epilepsy.
Side-effects: dream disturbances, suicidal ideation and seizures, nausea, headache, dizziness, euphoria and hallucination, tinnitus, sore throat, redness and itching of the eye, photophobia, chest congestion, pruritus, weight gain.

Dose: initially, 5mg 2-3 times daily, with divided doses of 20-30mg per day commonly employed after titration in 5mg increments; usual range 15–30 mg daily in divided doses; max. 45 mg daily.
   - Buspar Tablets 5mg, 10 mg

CHLORAL HYDRATE

Indications: insomnia, sedation in the elderly.
Cautions: doses are taken well-diluted with water to minimize gastro-intestinal disturbances. Contact with skin and mucous membranes should be avoided; pregnancy and breast feeding; respiratory disease, history of drug or alcohol abuse, marked personality disorder; reduce dose in elderly and debilitated; avoid prolonged use (and abrupt withdrawal thereafter); hepatic impairment

Contra-Indications: severe cardiac disease, gastritis, hepatic and renal disease; pregnancy; breast-feeding; porphyria
Side-effects: gastric irritation (nausea and vomiting reported), abdominal distention and flatulence; also ataxia, confusion, rashes, headache, lightheadedness, ketonuria, excitement, nightmares, delirium (especially on abrupt withdrawal); dependence (may be associated with gastritis and renal damage) on prolonged use

Dose: insomnia, 0.5-1 g (maximum 2 g), 15-30 minutes before bed time.
Child, 30-50 mg/kg up to a maximum single dose of 1 g.
Sedation, 250 mg 3 times daily.
   - Chloral Hydrate Elixir 250 mg/ 5ml

CHLORDIAZEPoxide

Indications: anxiety, acute alcohol withdrawal.
Cautions: see under Diazepam
Contra-indications: see under Diazepam
Side-effects: see under Diazepam
**Dose:** by mouth, anxiety, 10mg 3 times daily increased in severe cases to 60-100mg daily in divided doses. Reduce in elderly and debilitated patients to half adult dose. Child - not recommended.

![Librium Tablets 10, 25 mg]

**DIAZEPAM**

**Indications:** anxiety, insomnia, adjunctive treatment of acute alcohol withdrawal; epilepsy; febrile convulsions; muscle spasm; peri-operative use.

**Cautions:** may alter reaction time and patient's ability to drive or operate machinery, respiratory disease, muscle weakness and myasthenia gravis, history of drug or alcohol abuse, marked personality disorder, pregnancy, breast-feeding, reduce dose in elderly and debilitated, and in hepatic impairment (avoid if severe), renal impairment; avoid prolonged use (and abrupt withdrawal thereafter); porphyria; when given parenterally, close observation required until full recovery from sedation.

**Contra-Indications:** respiratory depression; marked neuromuscular respiratory weakness including unstable myasthenia gravis; acute pulmonary insufficiency; sleep apnoea syndrome; severe hepatic impairment; not for chronic psychosis; should not be used alone in depression or in anxiety with depression; avoid injections containing benzyl alcohol in neonates

**Side-effects:** drowsiness and lightheadedness the next day; confusion and ataxia (especially in the elderly); amnesia; dependence; paradoxical increase in aggression; muscle weakness; occasionally: headache, vertigo, hypotension, salivation changes, gastro-intestinal disturbances, visual disturbances, dysarthria, tremor, changes in libido, incontinence, urinary retention; blood disorders and jaundice; skin reactions; on intravenous injection, pain, thrombophlebitis, and rarely apnoea.

**Dose:** by mouth, anxiety, 2 mg 3 times daily increased in severe anxiety to 15-30 mg daily in divided doses. Elderly patients, half adult dose.

Child in night terrors and somnambulism 1-5 mg daily at bedtime.

Insomnia associated with anxiety - 5-15 mg at bedtime.
By I.M. or slow I.V. injection, (at a rate of not more than 5mg/minute), for severe anxiety, control of acute panic attacks, and acute alcohol withdrawal, 10 mg repeated if necessary after 4 hours. By I.V. infusion, maximum of 3 mg/kg over 24 hours.

- **Valium Tablets** 2, 5, 10 mg.
- **Valium Injection** 10 mg/2 ml.
- **Diazepam Retal Tube** 5mg/Tube.

Approximate equivalent doses, diazepam 5 mg

≡ chlordiazepoxide 15 mg
≡ loprazolam 0.5–1 mg
≡ lorazepam 500 mcg
≡ lormetazepam 0.5–1 mg
≡ nitrazepam 5 mg
≡ oxazepam 15 mg
≡ temazepam 10 mg

**GABAPENTIN**

**Indications**: adjunctive treatment of partial seizures with or without secondary generalization not satisfactorily controlled with other antiepiletics, neuropathic pain, trigeminal neuralgia.

**Cautions**: avoid sudden withdrawal, diabetes mellitus, renal impairment, elderly may need to reduce dose.

**Precautions**: hypersensitivity to gabapentin or any component of the formulation, pregnancy, breast-feeding.

**Side effects**: diarrhea, dyspepsia, nausea, vomiting, dry mouth, peripheral oedema, dizziness, drowsiness, anxiety, weakness, headache, blurred vision, flu-like symptoms, constipation, weight gain, abnormal gait, amnesia, ataxia, tremor, asthenia, emotional lability, hyperkinesia, dysarthria, arthralgia, diplopia, amblyopia, rash, purpura, confusion, urinary incontinence, hepatitis, jaundice, chest pain, palpitation, movement disorders, thrombocytopenia, tinnitus, acute renal failure, and alopecia.

**Dose**: Epilepsy, 300 mg on day 1, then 300 mg twice daily on day 2, then 300 mg 3 times daily on day 3, then increased according to response in steps of 300mg daily to max. 2.4 g daily, usual range 0.9 – 1.2 g daily, children 6–12 years, 10 mg/kg on day 1, then 20 mg/kg on day 2,
then 25-35 mg/kg daily in 3 divided doses, main tenance 900 mg daily (body weight 26-36 kg) or 1.2 g daily (body weight 37-50 kg). In renal dysfunction the dose need to adjust.

Neuropathic pain, adult over 18 years, 300mg on day 1, then 300 mg twice daily on day 2, then 300mg 3 times daily on day 3, then increased according to response in steps of 300 mg daily to max. 1.8 g daily.

- **Neurontin 300 mg & 400 mg**

### LORAZEPAM

**Indications**: insomnia (short term use)

**Cautions**: see under Nitrazepam

**Contra-indications**: see under Nitrazepam

**Side-effects**: see under Nitrazepam, short acting

**Dose**: 1 mg at bedtime, increased to 1.5 or 2 mg if required; ELDERLY (or debilitated) 0.5 or 1 mg; CHILD not recommended

- **Ativan Tablets 1, 2 mg**

### MAGNESIUM SULFATE

**Indications**: reduction of elevated intracranial pressure; central nervous system depressant; convulsive states; hypomagnesaemia.

**Dose**: by I.M. injection, 1-5 g as a 25 or 50% solution, repeated up to 6 times daily, if necessary.

By I.V. injection or infusion, 1-4 g as a 10 or 20% solution at a rate not exceeding 150 mg per minute.

- **Magnesium Sulfate Injection 50%**

### NITRAZEPAM

**Indications**: insomnia where daytime sedation is acceptable.

**Cautions**: respiratory disease, muscle weakness and myasthenia gravis, history of drug or alcohol abuse, marked personality disorder, pregnancy, breast-feeding; reduce dose in elderly and debilitated, and in hepatic impairment (avoid if severe) and renal impairment; avoid prolonged use (and abrupt withdrawal thereafter); porphyria;

**Contra-Indications**: respiratory depression; marked neuromuscular respiratory weakness including unstable
myasthenia gravis; acute pulmonary insufficiency; severe hepatic impairment; sleep apnoea syndrome; not for use alone to treat depression (or anxiety associated with depression) or chronic psychosis

**Side-effects:** drowsiness and light-headedness the next day; confusion and ataxia (especially in the elderly); amnesia may occur; dependence.

**Dose:** 5-10 mg (elderly 2.5-5 mg) 30 minutes before bedtime.
Child, 2.5-5 mg.

- Mogadon Tablets 5 mg

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**PROMETHAZINE HYDROCHLORIDE**

**Indications:** pre-medication; mild insomnia, sedation.

**Cautions & Contra-Indications:** prostatic hypertrophy, urinary retention, susceptibility to angle closure glaucoma, pyloroduodenal obstruction, hepatic & renal disease, pregnancy, breast feeding.
epilepsy, porphyria

**Side effects:** drowsiness, headache, psychomotor impairment, antimuscarinic effects like urinary retention, dry mouth, blurred vision, GI disturbances.

**Dose:** by mouth, 25-50 mg at bedtime.
Child- below 2 years not recommended; 2-5 years, 15-20 mg; 5-10 years, 20-25mg, all at bed time
For daytime sedation, once or twice daily using the lower dose.

- Phenergan Tablet 25 mg
- Phenergan Injection 50 mg/2 ml
- Phenergan Elixir 5mg/5 ml

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**CARBAMAZEPINE**

**Indications:** partial and secondary generalised tonic-clonic seizures, some primary generalised seizures; trigeminal neuralgia; prophylaxis of bipolar disorder unresponsive to lithium

**Cautions:** hepatic impairment or renal impairment; cardiac disease, skin reactions, history of haematological reactions to other drugs; may exacerbate absence and myoclonic seizures; susceptibility to angle-closure glaucoma; pregnancy, breast-feeding; avoid abrupt withdrawal.
Contra-indications: AV conduction abnormalities (unless paced); history of bone marrow depression, porphyria

Side-effects: nausea and vomiting, dizziness, drowsiness, headache, ataxia, confusion and agitation (elderly), visual disturbances (especially diplopia); constipation or diarrhoea, anorexia; mild transient generalised erythematous rash may occur in a large number of patients (withdraw if worsens or is accompanied by other symptoms); leucopenia and other blood disorders (including thrombocytopenia, agranulocytosis and aplastic anaemia); other side-effects include cholestatic jaundice, hepatitis and acute renal failure, Stevens-Johnson syndrome, toxic epidermal necrolysis, alopecia, thrombembolism, arthralgia, fever, proteinuria, lymph node enlargement, cardiac conduction disturbances (sometimes arrhythmias), dyskinesias, paraesthesia, depression, impotence (and impaired fertility), gynacacomastia, galactorrhoea, aggression, activation of psychosis; very rarely angle-closure glaucoma; photosensitivity, pulmonary hypersensitivity (with dyspnoea and pneumonitis), hyponatraemia, oedema, and disturbances of bone metabolism (with osteomalacia)

Note: Different preparations may vary in bioavailability; to avoid reduced effect or excessive side-effects, it may be prudent to avoid changing the formulation

Dose: By mouth, epilepsy, initially, 100–200 mg 1–2 times daily, increased slowly to usual dose of 0.4–1.2 g daily in divided doses; in some cases 1.6–2 g daily may be needed;

ELDERLY reduce initial dose;

CHILD daily in divided doses, up to 1 year 100–200 mg, 1–5 years 200–400 mg, 5–10 years 400–600 mg, 10–15 years 0.4–1 g

Trigeminal neuralgia, initially 100 mg 1–2 times daily (but some patients may require higher initial dose), increased gradually according to response; usual dose 200 mg 3–4 times daily, up to 1.6 g daily in some patients.

Prophylaxis of bipolar disorder unresponsive to lithium, initially 400 mg daily in divided doses increased until symptoms controlled; usual range 400–600 mg daily; max. 1.6 g daily

Note: Plasma concentration for optimum response 4–12 mg/litre (20–50 micromol/litre)
CHLORPROMAZINE HYDROCHLORIDE

Warning: Owing to the risk of contact sensitisation, pharmacists, nurses, and other health workers should avoid direct contact with chlorpromazine; tablets should not be crushed and solutions should be handled with care.

Indications: schizophrenia and related psychoses, adjunct in severe anxiety, as anti-emetic in terminal diseases, hiccup, tranquilization and emergency control in behavioral disturbances.

Cautions: cardiovascular disease, phaeochromocytoma, parkinsonism, acute infections, epilepsy.

Special precautions: patient should remain in the supine position for 30 minutes after I.M. injection; bone marrow depression, respiratory, renal and hepatic diseases; pregnancy and breast feeding; elderly susceptible to postural hypotension.

Contra-Indications: comatose patients, CNS depression; bone-marrow depression; closed-angle glaucoma.

Side-effects: extrapyramidal symptoms; dystonia and dyskinesia; tardive dyskinesia; hypothermia, drowsiness, apathy, pallor, nightmares; insomnia, depression and rarely agitation; cardiovascular symptoms; antimuscarinic effects; endocrine effects; sensitivity reactions; corneal and lens opacities after prolonged use.

Dose: by mouth, psychoses and severe anxiety, initially 25 mg 3 times daily or 75 mg at bedtime (may be doubled in bed-patients), adjusted according to response to 1 g or more in psychoses. Usual maintenance dose, 75-300 mg daily.

Child up to 5 years, 5-10 mg up to 3 times daily; 6-12 years, 1/3-1/2 adult dose.

Intractable hiccup, 25-50 mg 3-4 times daily. Tablets should be swallowed whole.

Deep I.M. injection (for relief of acute symptoms), 25-50 mg every 6-8 hours.

Child's dose, as oral dose.

- Largactil Tablets 100 mg
CLOZAPINE

This is atypical antipsychotic

**Indications:** schizophrenia (including psychosis in Parkinson's disease) in patients unresponsive to, or intolerant of, conventional antipsychotic drugs.

**Cautions:** cardiovascular disease; history of epilepsy; accompanied by strict procedures for the monitoring of white blood-cell counts for the first 18 weeks then at least fortnightly; bone-marrow; elderly; monitor leucocyte and differential blood counts; prostatic hypertrophy, susceptibility to angle-closure glaucoma; taper off other antipsychotics before starting; close medical supervision during initiation (risk of collapse because of hypotension); hepatic impairment; pregnancy. Clozapine should be used cautiously with drugs which cause constipation (e.g. antimuscarinic drugs) or in history of colonic disease or bowel surgery.

**Contra-Indications:** severe cardiac disorders (e.g. myocarditis); severe renal impairment; history of neutropenia or agranulocytosis; bone-marrow disorders; paralytic ileus; alcoholic and toxic psychoses; history of circulatory collapse; drug intoxication; coma or severe CNS depression; uncontrolled epilepsy; breast-feeding; *history of* concurrent use of co-trimoxazole, chloramphenicol, sulphonamides, penicillamine, carbamazepine or antineoplastics with high bone marrow suppression risk.

**Side-effects:** sedation; antimuscarinic symptoms; extra pyramidal symptoms; neutropenia and potentially fatal agranulocytosis; headache; dizziness, hyper salivation, urinary incontinence, priapism, pericarditis, myocarditis, and delirium; nausea and vomiting; hyperglycemia, hypertension; rarely circulatory collapse.

**Dose:** under close medical supervision on first day, 12.5 mg once or twice.

On second day, 25-50 mg; then slowly increased if well tolerated by 25-50 mg over 2-3 weeks to 300 mg daily in divided doses.

The larger dose (up to 200 mg as single dose daily) is taken at bed time.
If necessary, the dose may be increased by 50-100 mg once or twice weekly to a max. of 900 mg daily. Usual antipsychotic dose, 200-450 mg daily. Subsequent adjustment to the usual maintenance dose of 150-300 mg.

Child, not recommended. Elderly and special risk group, first day, 12.5 mg once. Subsequent adjustment restricted to 25 mg daily in slow and small steps in case of epileptic seizures, suspend for 24 hours and resume at lower dose. Restarting the treatment after interval of more than 2 days, 12.5 mg once or twice on first day and could be increased more quickly than initial therapy.

- *Lepnex Tablets 25 mg, 100 mg*

**FLUPENTIXOL (Flupentixol)**

*Indications:* maintenance in schizophrenia and related psychoses particularly with apathy but not mania or psychomotor hyperactivity; anxiety.

*Cautions:* with the high doses, periodic blood counts are needed. Another antipsychotic drug should be used if agitation or aggression appears; porphyria, hepatic & renal impairment, cardiovascular disease, Parkinson’s disease, epilepsy.

*Contraindications:* excitable or overactive patients.

*Side-effects:* extra pyramidal symptoms consisting of parkinsonian symptoms, dystonia, dyskinesia, restlessness, tardive dyskinesia.

*Dose:* Deep I.M. injection into the gluteal muscle, test dose 20 mg then after 5-10 days 20-40 mg repeated at intervals of 2-4 weeks, adjusted according to the response; maximum 400 mg weekly. Usual maintenance dose 50 mg every 4 weeks to 300 mg every 2 weeks; elderly initially quarter to half adult dose.

- *Depixol Injection 40 mg/2 ml; 100 mg/2 ml*

**FLUPHENAZINE DECANOATE**

*Indications:* maintenance in schizophrenia and related psychoses.

*Cautions:* with the high doses, periodic blood counts are needed. Another antipsychotic drug should be used if agitation or aggression appears; porphyria, hepatic & renal impairment, cardiovascular disease, Parkinson’s disease, epilepsy.
impairment, cardiovascular disease, Parkinson’s disease, epilepsy.

**Contra-Indications:** severely depressed states; marked cerebral atherosclerosis.

**Side-effects:** extra pyramidal symptoms consisting of parkinsonian symptoms, dystonia, dyskinesia, restlessness, tardive dyskinesia; systemic lupus erythematosus, inappropriate antidiuretic hormone secretion, oedema.

**Dose:** deep I.M. injection into the gluteal muscle, test dose 12.5 mg (6.25 mg in elderly), then after 4-7 days 12.5-100 mg repeated at intervals of 14-35 days, adjusted according to the response.

- **Modecate Injection 25 mg/ml In 1 ml Vial, 100 mg / 1 ml**

### HALOPERIDOL

**Indications:** schizophrenia and related psychoses, particularly mania; tranquillization and emergency control in behavioral disturbances; short-term adjunctive treatment of severe anxiety; motor tics, hiccups.

**Cautions:** thyrotoxic patients, basal ganglia disease; subarachnoid haemorrhage and metabolic disturbances such as hypokalaemia, hypocalcaemia, or hypomagnesaemia.

hepatic impairment, renal impairment, cardiovascular disease, Parkinson’s disease (may be exacerbated by antipsychotics), epilepsy (and conditions predisposing to epilepsy), depression, myasthenia gravis, prostatic hypertrophy, or a susceptibility to angle-closure glaucoma; severe respiratory disease and in patients with a history of jaundice; elderly, who are particularly susceptible to postural hypotension and to hyper- or hypothermia in very hot or cold weather; thyrotoxic patients, basal ganglia disease; subarachnoid haemorrhage and metabolic disturbances such as hypokalaemia, hypocalcaemia, or hypomagnesaemia.

**Contra-indication:** comatose states, CNS depression, and phaeochromocytoma.; pregnancy (unless essential); breast-feeding during treatment.

**Side-effects:** extra pyramidal symptoms consisting dystonia & akathesia particularly in thyrotoxic patients.
Rarely weight loss, hypoglycaemia, inappropriate antidiuretic hormone secretion.

**Dose:** schizophrenia, psychoses mania, short term management of psychomotor agitation, excitement, and violent or dangerously impulsive behavior, initially 1.5-3 mg 2-3 times daily.

Severely affected or resistant patients, 3-5 mg 2-3 times daily.

Resistant schizophrenia, up to 30 mg daily; then adjusted according to response to lowest maintenance dose as low as 5-10 mg daily.

Elderly or debilitated patients, initially half adult dose.

Child, initially 25-50 mcg/kg daily in 2 divided doses to maximum of 10 mg.

Severe anxiety, adults, 500 mcg twice daily.

Child not recommended.

By I.M. or I.V. injection, 2-10 mg, subsequent doses being given every 4-8 hours, according to response (up to every hour if necessary) to maximum 60 mg.

Severely disturbed patients may require initial dose up to 18 mg.

Child not recommended.

Intractable hiccup – 1.5 mg 3 times daily.

Nausea and vomiting, 0.5-2 mg by I.M or I.V injection; 1 mg 3 times daily orally.

- Serenace Tablets 1.5, 5, 10 mg
- Haldol Injection 5 mg/ml
- Haldol Drops 2 mg/1 ml- 15 ml Bottles

**HALOPERIDOL DECANOATE**

This is used for maintenance therapy especially when compliance with oral treatment is unreliable.

**Indications:** maintenance in schizophrenia and other psychoses.

**Cautions, Contraindications, Side effects:** As for haloperidol

**Dose:** by deep I.M. injection into the gluteal muscle, initially 50 mg every 4 weeks, if necessary increasing after 2 weeks by 50 mg increments to 300 mg every 4 weeks.

Higher doses may be needed in some patients.

Elderly, initially 12.5-25 mg every 4 weeks.

Child, not recommended.
**LITHIUM CARBONATE**

**Indications:** prophylaxis in manic-depressive illness & recurrent depression, treatment of mania; aggressive or self-mutilating behavior. Lithium is unsuitable for children.

**Special precautions:** Lithium salts have a narrow therapeutic/toxic ratio and should therefore not be prescribed unless facilities for monitoring serum-lithium concentrations are available. Doses are adjusted to achieve serum-lithium concentration of 0.4–1 mmol/litre (lower end of the range for maintenance therapy and in elderly patients) on samples taken 12 hours after the preceding dose. It is important to determine the optimum range for each individual patient.

**Overdosage:** usually with serum-lithium concentration of over 1.5 mmol/litre, may be fatal and toxic effects include tremor, ataxia, dysarthria, nystagmus, renal impairment, and convulsions. If these potentially hazardous signs occur, treatment should be stopped, serum-lithium concentrations redetermined, and steps taken to reverse lithium toxicity. In mild cases withdrawal of lithium and administration of generous amounts of sodium salts and fluid will reverse the toxicity. Serum-lithium concentration in excess of 2 mmol/litre require urgent treatment as Emergency Treatment of Poisoning. hyperreflexia and hyperextension of limbs, convulsions, toxic psychoses, syncope, renal failure, circulatory failure, coma, and occasionally, death;

**Cautions:** measure serum-lithium concentration regularly (every 3 months on stabilised regimens), measure renal function and thyroid function every 6–12 months on stabilised regimens and advise patient to seek attention if symptoms of hypothyroidism develop (women at greater risk) e.g. lethargy, feeling cold; maintain adequate sodium and fluid intake; test renal function before initiating and if evidence of toxicity, avoid in renal impairment, cardiac disease, and conditions with sodium imbalance such as Addison's disease; reduce dose or discontinue in diarrhoea, vomiting and intercurrent
infection (especially if sweating profusely); psoriasis (risk of exacerbation); pregnancy, breast-feeding, elderly (reduce dose), diuretic treatment, myasthenia gravis; surgery; avoid abrupt withdrawal.

**Note:** Patients should maintain adequate fluid intake and avoid dietary changes which reduce or increase sodium intake.

**Withdrawal of treatment:** While there is no clear evidence of withdrawal or rebound psychosis, abrupt discontinuation of lithium increases the risk of relapse. If lithium is to be discontinued, the dose should be reduced gradually over a period of a few weeks and patients should be warned of possible relapse if it is discontinued abruptly.

**Interactions:** Irreversible toxic encephalopathy may occur when lithium is given concurrently with high doses of haloperidol, fluphenazine, or flupentixol.

**Side-effects:** gastro-intestinal disturbances, fine tremor, renal impairment (particularly impaired urinary concentration and polyuria), polydipsia, leucocytosis; weight gain and oedema (may respond to dose reduction); hyperparathyroidism and hypercalcaemia; signs of intoxication are blurred vision, increasing gastro-intestinal disturbances (anorexia, vomiting, diarrhoea), muscle weakness, increased CNS disturbances (mild drowsiness and sluggishness increasing to giddiness with ataxia, coarse tremor, lack of co-ordination, dysarthria), and require withdrawal of treatment; goitre, raised antidiuretic hormone concentration, hypothyroidism, hypokalaemia, ECG changes, and kidney changes may also occur.

**Dose:** treatment, Initially 1.5-2 g daily, adjusted to reach plasma concentration of 0.4-1.0 m mole of Li/liter by tests on samples taken hours after the preceding dose on the fourth to seventh day of treatment, then weekly until dosage has remained constant for 4 weeks and every 3 months thereafter.

Prophylaxis, initially, 0.5-1.2 g daily.

Daily doses are usually divided and sustained release preparations normally given twice daily.

- **Priadel Tablets 400 mg**
PROCHLORPERAZINE

**Indications:** schizophrenia and related psychoses, adjunct in severe anxiety; antiemetic

**Cautions:** hepatic & renal impairment, Parkinson’s disease, epilepsy; hypotension after intramuscular injection.

Contraindications: children

**Side-effects:** extra pyramidal symptoms consisting dystonias, more frequent; respiratory depression may occur in susceptible individuals.

**Dose:** by mouth, psychoses 12.5 mg twice daily for 7 days; adjusted at intervals of 4-7 days to maximum dose 75-100 mg daily according to the response. Severe anxiety, 15-20 mg daily in divided doses; maximum dose 40 mg daily. By deep I.M. injection, psychoses, 12.5-25 mg 2-3 times daily.

- **Stemetil Injection 12.5 mg/ml.**
- **Stemetil Tablets 5 mg**

RISPERIDONE

This is an atypical antipsychotic.

**Indications:** acute and chronic psychoses, in which both positive and negative symptoms are prominent.

**Cautions:** pregnancy; hepatic impairment; renal impairment; concomitant administration of drugs that prolong QT intervals; cardiovascular disease; history of epilepsy and Parkinson’s disease; epilepsy; Increased risk of stroke in elderly patients with dementia.

Contra-Indications: breast-feeding.

**Side-effects:** weight gain; dizziness; insomnia, headache, decreased concentration; postural hypotension; fatigue; blurred vision; rash; gastro-intestinal disturbances; thrombocytopenia; seizures; abnormal temperature regulation; priapism, urinary incontinence.

**Dose:** 2 mg in 1-2 divided doses on first day then 4 mg in 1-2 divided doses on second day then 6 mg in 1-2 divided doses on third day. Usual range, 4-8 mg daily. Maximum dose is 16 mg daily (doses above 10 mg only if benefit outweighs risk)
Elderly, initially 500 mcg twice daily. Maintenance, 1 - 2 mg twice daily.

- Risperdal Tablets 2, 3, 4 mg, Liquid 1 mg/ml

**Risperidal Consta**

*Indication*: Schizophrenia and other psychoses in patients tolerant to risperidone by mouth

*Side-effects*: see under Risperidone; also depression, less commonly apathy, weight loss, and pruritus.

*Dose*: By deep intramuscular injection: into the gluteal muscle, patient taking oral risperidone up to 4 mg daily, initially 25 mg every 2 weeks or 37.5 mg every 2 weeks, dose adjusted at intervals of at least 4 weeks in steps 12.5 mg to maximum 50 mg.

- Elderly: 25 mg every 2 weeks
- Adolescents: Under 18 years not recommended.

- Risperdal Consta – Powder For Injection 25 mg, 37.5 mg Vial

**Olanzapine**

This is an atypical antipsychotic.

*Indication*: Schizophrenia, mono or combination therapy for mania;

*Caution*: Increased risk of stroke in elderly patients with dementia; concomitant administration of drugs that prolong QT intervals; pregnancy; hepatic impairment; renal impairment; cardiovascular disease; history of epilepsy and Parkinson's disease; also prostatic hypertrophy, susceptibility to angle-closure glaucoma, paralytic ileus; diabetes mellitus (risk of exacerbation or ketoacidosis), low leucocyte or neutrophil count, bone-marrow depression, hypereosinophilic disorders, myeloproliferative disease,

*Contra-indication*: Breast feeding, For injection acute myocardial infarction, unstable angina, severe hypotension or bradycardia, sick sinus syndrome, recent heart surgery.

*Side Effect*: mild & transient antimuscarenic effects, drowseness, speech difficulties, exacerbation of Parkinson's disease, abnormal gait, hallucinations, akathisia, asthenia, increased appetite, increased body temperature, increased triglycerides conc., edema,
hyperprolactinemia, urinary incontinence; eosinophilia; less commonly hypotension, bradycardia, QT interval prolongation, photosensitivity; rarely seizures, leucopenia, rash; very rarely thromboembolism, hypercholesterolaemia, hypothermia, urinary retention, priapism, thrombocytopenia, neutropenia, rhabdomyolysis, hepatitis, pancreatitis; with injection, injection-site reactions, sinus pause, hypoventilation

Dose: Schizophrenia, Combination therapy for mania
Adult over 18 years 10 mg daily to Max. 20 mg daily
Monotherapy of mania: 15 mg daily to Max. dose 20 mg daily

- Zyprexa 5 mg

SULPIRIDE

Indications: schizophrenia.
Cautions: cardiovascular and respiratory diseases; pregnancy; infections; renal and hepatic impairment. also excited, agitated, or aggressive patients (even low doses may aggravate symptoms)
Avoid abrupt withdrawal.
Contra-Indications: phaeochromocytoma, parkinsonism.
also porphyria
Side effects: Palpitation, hypertension; Dizziness, headache, neuroleptic malignant syndrome, sedation, tardive dyskinesia, galactorrhoea, sexual dysfunction, nausea, vomiting, constipation, impotence, cholestatic jaundice, blurred vision,
Dose: 200–400 mg twice daily; max. 800 mg daily in patients with predominantly negative symptoms, and 2.4 g daily in patients with mainly positive symptoms; elderly, initially 100–200 mg daily.
- Dogmatil Tablets 50 mg & 200 mg

TRIFLUOPERAZINE

Indications: schizophrenia and related psychoses, tranquillization in behavioral disturbances, adjunct in severe anxiety.
Cautions: hepatic & renal impairment, Parkinson’s disease, epilepsy; cardiovascular disease; depression; myasthenia gravis, prostatic hypertrophy, or a susceptibility to angle-closure glaucoma; in severe
respiratory disease and in patients with a history of jaundice or who have blood dyscrasias (perform blood counts if unexplained infection or fever develops).; elderly, who are particularly susceptible to postural hypotension and to hyper- or hypothermia in very hot or cold weather.; As photosensitisation may occur with higher dosages, patients should avoid direct sunlight.

**Contraindications:** in comatose states, CNS depression, and phaeochromocytoma; pregnancy, unless essential; breast-feeding during

**Side-effects:** extra pyramidal symptoms consisting dystonias, more frequent; respiratory depression may occur in susceptible individuals; pancytopenia; thrombocytopenia; hyperpyrexia; anorexia.

**Dose:** by mouth, psychoses, initially 5 mg twice daily or 10 mg daily in modified-release form, increased by 5 mg after 1 week, then at intervals of 3 days, according to response.

Child up to 12 years, initially 5 mg daily in divided doses.

Severe anxiety, 2-4 mg daily in divided doses or 2-4 mg daily in slow release form, increased if necessary to 6 mg daily.

Child 3-5 years, up to 1 mg daily.

6-12 years, up to 4 mg daily in divided doses.

- *Stelazine Tablets 1, 2, 5 mg*

**ZUCLOPENTHIXOL ACETATE**

**Indications:** short term management of acute psychosis, mania, or exacerbation of chronic psychosis.

**Cautions:** porphyria; severe cardiac, respiratory, hepatic or renal disease; in patients with decreased gastrointestinal motility, urinary retention, BPH.

**Contra-Indications:** Acute intoxication with ethanol, barbiturate or opioid, severe CNS depression; coma; sub cortical brain damage, circulatory collapse, blood dyscrasias, pheochromocytoma.

**Side-effects:** drowsiness; anxiety, insomnia, akathisia, extrapyrmidal effects, dizziness, xerostomaia, decreased libido, hypertonia, tremor, weakness.

**Dose:** by deep I.M. injection into the gluteal muscle or lateral thigh, 50-150 mg repeated after 2-3 days if necessary. Elderly, 50-100 mg repeated after 2-3 days if
necessary. One additional dose may be needed 1-2 days after the first injection. Max. cumulative dose, 400 mg per course and max. 4 injections. For necessary maintenance therapy, give oral antipsychotic 2-3 days after last injection or give long antipsychotic depot injection concomitantly with last injection of Zuclopenthixol acetate. Child, not recommended

- Clopixol Acuphase Injection 50 mg/Lml

**ZUCLOPENTHIXOL DIHYDROCHLORIDE**

*Indications:* schizophrenia and other psychoses, particularly when associated with agitated, aggressive or hostile behavior.

*Cautions:* Same as for injection.

*Contra-Indications:* same as for injection.

*Side-effects:* same as for injection.

*Dose:* initially, 20-30 mg daily in divided doses increased to a max. of 100 mg daily if necessary. Usual maintenance dose, 20-40 mg/day.

Child, not recommended.

- Clopixol Tablets 10 mg

**ANTIDEPRESSANT DRUGS**

Antidepressant drugs are effective in the treatment of major depression of moderate and severe degree including major depression associated with physical illness and that following childbirth; they are also effective for dysthymia (lower grade chronic depression). Antidepressant drugs are not generally effective in milder forms of acute depression but a trial may be considered in cases refractory to psychological treatments.

The major classes of antidepressants include the tricyclics and related antidepressants, the selective serotonin re-uptake inhibitors (SSRIs), and the monoamine oxidase inhibitors (MAOIs). Choice of antidepressant should be based on the individual patient's requirements, including the presence of concomitant disease, existing therapy, suicide risk, and previous response to antidepressant therapy.
AMITRIPTYLINE HYDROCHLORIDE

This is a tricyclic antidepressant.

**Indications:** depressive illness, particularly where sedation is required; nocturnal enuresis in children; neuropathic pain; migraine prophylaxis

**Cautions:** sedation may affect patient's responses. Avoid abrupt cessation of therapy, epilepsy; pregnancy and breast-feeding, hepatic impairment, thyroid disease, anesthesia, diabetes; alcohol intake, psychosis; susceptibility to angle-closure glaucoma; history of urinary retention; concurrent electroconvulsive therapy; porphyria.

**Contra-Indications:** recent myocardial infarction, heart block, mania; severe liver disease.

**Side-effects:** antimuscarinic effects- dry mouth, sedation, blurred vision (disturbance of accommodation, increased intra-ocular pressure), constipation, nausea, difficulty with micturition; cardiovascular side-effects (such as ECG changes, arrhythmias, postural hypotension, tachycardia, syncope, particularly with high doses); sweating, tremor, rashes and hypersensitivity reactions (including urticaria, photosensitivity), behavioural disturbances (particularly children), hypomania or mania, confusion or delirium (particularly elderly), headache, interference with sexual function, blood sugar changes; increased appetite and weight gain (occasionally weight loss); endocrine side-effects such as testicular enlargement, gynaecomastia, galactorrhoea; also convulsions, movement disorders and dyskinesias, dysarthria, paraesthesia, tinnitus, fever, agranulocytosis, leucopenia, eosinophilia, purpura, thrombocytopenia, hyponatraemia, abnormal liver function tests (jaundice);

**Dose:** by mouth, initially 50-75 mg (elderly and adolescents 30-75 mg) daily in divided doses, or as a single dose at bedtime, increased gradually as necessary to a maximum of 150-200 mg.

Maintenance dose, 50-100 mg daily;
Nocturnal enuresis, child 7-10 years, 10-20 mg; 11-16 years, 25-50 mg half an hour before bedtime for up to 3 months (including gradual withdrawal).

† Tryptizol Tablets 10, 25,50,75 mg.
### CLOMIPRAMINE HYDROCHLORIDE

This is a tricyclic antidepressant.  
**Indications:** depressive illness; phobia and obsession; adjunct drug in cataplexy associated with narcolepsy.  
Cautions & Contra-indications: see under Amitriptyline Hydrochloride  
**Side-effects:** see under Amitriptyline Hydrochloride; also diarrhoea; hair loss reported  
**Dose:** by mouth, initially 10 mg daily, increased gradually as necessary to 30-150 mg or more in severe depression and in phobic and obsessional states, in divided doses or as single dose at bed-time.  
Elderly patients, 10 mg daily increased to 30-75 mg.  
- *Anafranil Tablets 10, 25, 75 mg*

### DOXEPIN

This is a tricyclic antidepressant.  
**Indications:** depressive illness, particularly where sedation is required.  
**Cautions:** severe cardiovascular disease; hepatic and renal impairment; history of epilepsy; patients taking other medications.  
**Contra-Indications:** hypersensitivity; mania; severe liver disease; lactation; glaucoma; tendency to urinary retention.  
**Side-effects:** drowsiness; dry mouth, blurred vision, constipation and urinary retention; change in libido.  
**Dose:** initially 75 mg (elderly patients 10-50 mg) daily in 3 divided doses, increased gradually to a max. of 300 mg daily in divided doses; range 30-300 mg daily; up to 100 mg may be given as a single dose at bedtime.  
- *Sinequan Capsules 10 & 50 mg*

### ESCITALOPRAM HYDROBROMIDE

This is a selective serotonin reuptake inhibitor (SSRI).  
**Indications:** depressive illness (endogenous and non-endogenous depression) and generalizes anxiety disorder, panic disorder.  
**Cautions:** cardiac disease, diabetes mellitus, susceptibility to angle-closure glaucoma, a history of mania or bleeding disorders (especially gastro-intestinal bleeding), and if used with other drugs that increase the
Central Nervous System

risk of bleeding, hepatic impairment, renal impairment, pregnancy, and breast-feeding should not be given to patients on MAOI's for at least 14 days after discontinuation; Conversely, an MAOI should not be started until at least a week after antidepressant has been stopped.

**Contra-Indications:** if the patient enters a manic phase, the drug should be discontinued and treatment with a neuroleptic should be started.

**Side-effects:** nausea and reduced salivation, headache and reduced duration of sleep, postural hypotension, sinusitis, fatigue; hypersensitivity reactions including rash (consider discontinuation—may be sign of impending serious systemic reaction, possibly associated with vasculitis), urticaria, angioedema, anaphylaxis, arthralgia, myalgia and photosensitivity; galactorrhoea, sexual dysfunction, urinary retention, sweating, hypomania or mania, movement disorders and dyskinesias, visual disturbances, hyponatraemia, and bleeding disorders including ecchymoses and purpura. Suicidal behaviour has been linked with antidepressants.

**Dose:** initially 10 mg once daily could be increased to max. 20 mg
Max. dose is 20 mg once daily.
Elderly, half the recommended dose i.e. 10- mg/day.
Manic depressive illness, treatment should continue for at least 4-6 months.

Cipralex Tablets 10 mg

**FLUOXETINE HYDROCHLORIDE**

This is a selective serotonin reuptake inhibitor (SSRI).

**Indications:** depressive illness; compulsive obsession diseases; premenstrual dysphoric disorder; bulimia nervosa.

**Cautions:** hepatic impairment, renal impairment, epilepsy, pregnancy and breast-feeding; may impair performance of skilled tasks.
Should not be given to patients on MAOI's for at least 14 days after discontinuation; Conversely, MAOI's should not be used until at least 5 weeks after discontinuation of fluoxetine;
**Central nervous System**

**Contra-Indications**: severe renal impairment; poorly-controlled epilepsy.

**Side-effects**: rash and this entitles discontinuation of treatment; nausea, vomiting, diarrhea, anorexia with weight loss, headache, nervousness, insomnia, anxiety, tremor, dry mouth, dizziness, hypomania, drowsiness, convulsions, fever, sexual dysfunction, sweating; raised serum transaminases, depressed leucocyte counts.

vasodilatation, postural hypotension, pharyngitis, dyspnoea, chills, taste disturbances, sleep disturbances, euphoria, confusion, yawning, impaired concentration, changes in blood sugar, alopecia, urinary frequency;

**Dose**: initially, 20 mg in the morning is sufficient. If no clinical improvement is observed after several weeks, doses above 20 mg/day should be administered on twice-daily schedule

Max. daily dose is 60 mg.

> Prozac Capsules 20 mg

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**FLUVOXAMINE MALEATE**

This is a selective serotonin reuptake inhibitor (SSRI).

**Indications**: depression states; obsessive-compulsive disorder.

**Cautions**: epilepsy; concurrent electroconvulsive therapy; history of mania; cardiac disease, bleeding disorders; hepatic and renal impairment. That concomitant use of fluvoxamine and theophylline or aminophylline should usually be avoided;

**Contra-indication**: patients in manic phase.

**Side-effects**: palpitations, tachycardia, postural hypotension; confusion, hallucinations, ataxia, paraesthesia, malaise, taste disturbance, neuroleptic malignant syndrome-like event, abnormal liver function tests, usually symptomatic (discontinue treatment); hypersensitivity reactions.

**Dose**: depression, initially 50-100 mg daily increased if necessary to maximum 300 mg daily

Obsessive-compulsive disorder, initially 50 mg in the evening increased gradually if necessary after some weeks to max. 300 mg daily (over 150 mg in divided doses); usual maintenance dose 100–300 mg daily; . If no
improvement in obsessive-compulsive disorder within 10 weeks, treatment should be reconsidered.

**CHILD** over 8 years initially 25 mg daily increased if necessary in steps of 25 mg every 4–7 days to max. 200 mg daily (over 50 mg in divided doses)

- Faverin Tablets 50 mg

### IMIPRAMINE HYDROCHLORIDE

This is a tricyclic antidepressant.

**Indications:** depressive illness, nocturnal enuresis in children.

**Cautions, Contraindications, Side effects:** see under Amitriptyline HCl

**Dose:**
- Initially 75 mg daily in divided doses or as a single dose at bedtime increased gradually to 200 mg (up to 225 mg in hospitalized patients); up to 150 mg may be given as a single dose at bedtime;
- Maintenance dose, 75-100 mg daily
- Elderly patients, 10-25 mg 1-3 times daily.
- Nocturnal enuresis, child 6-7 years, 25 mg;
- 8-11 years, 25-50 mg;
- Over 11 years, 50-75 mg at bedtime;
- Maximum period of treatment (including gradual withdrawal) should not exceed 3 months.

- Tofranil Tablets 10, 25 mg

### MAPROTILOSE HYDROCHLORIDE

This is a tetracyclic antidepressant related to the tricyclic group.

**Indications:** depressive illness, particularly where sedation is required.

**Cautions:** May cause sedation, hypotension.

**Contra-Indications:** Use of MOI’s within 14 days during acute recovery from acute MI.

**Side-effects:** rashes and increased risk of convulsions at higher dosage.

**Dose:**
- Initially 25-75 mg daily in 3 divided doses or as a single dose at bedtime, increased gradually as necessary to a maximum of 150 mg daily;
- Elderly dose, 25-30 mg daily in 3 divided doses

- Ludiomil Tablets 25, 50, 75 mg
TIANEPTINE SODIUM
This acts by increasing (rather than inhibiting) the presynaptic reuptake of serotonin.

**Indications**: depressive states.

**Cautions**: reduce dose in renal impairment.

**Dose**: adults, 12.5 mg three times daily

Elderly, total 25 mg daily.

- *Stablon Tablets 12.5 mg*

TRANYLCYPROMINE
This is a monoamine oxidase inhibitor (MAOI)

**Indications**: depressive illness.

**Cautions**: diabetes mellitus, cardiovascular disease, epilepsy, blood disorders, concurrent electroconvulsive therapy; elderly (great caution); monitor blood pressure (risk of postural hypotension and hypertensive responses—discontinue if palpitations or frequent headaches); if possible avoid abrupt withdrawal; severe hypertensive reactions to certain drugs and foods; avoid in agitated patients; porphyria; pregnancy; breast-feeding and surgery.

**Contra-Indications**: hyperthyroidism; hepatic impairment or abnormal liver function tests, cerebrovascular disease, phaeochromocytoma; not indicated in manic phase.

**Side-effects**: insomnia, dizziness, muscular weakness, dry mouth, hypotension, hypertensive crises with throbbing headache requiring discontinuation of treatment occur more frequently than with other drugs of the same class.

**Dose**: initially 10 mg twice daily not later than 3 p.m., increasing if necessary the second daily dose to 20 mg after 1 week; Usual maintenance dose, 10 mg daily.

- *Parnate Tablets 10 mg*

TRIMPRAamine
This is a tricyclic antidepressant.

**Indications**: depressive illness, particularly where sedation is required.

**Cautions, Contraindications, Side effects**: see under Amitriptyline HCl

**Dose**: initially 50-75 mg daily in divided doses or as a single dose 2 hours before bedtime; or as 25 mg midday
and 50 mg evening (elderly patients 10-25 mg 3 times daily), increased as necessary to a maximum of 300 mg daily. Maintenance dose, 75-150 mg daily.

- Surmontil Capsules 50 mg

VENLAFAXINE HYDROCHLORIDE

This is a serotonin, and noradrenaline reuptake inhibitor (SNRI); it lacks the sedative and antimuscarinic effects of the tricyclic antidepressants.

**Indications:** depressive illness.

**Cautions:** may cause blood pressure increase; hepatic or renal impairment; close supervision of patients with high risk of suicidal tendencies during initial treatment; cardiac disease; history of mania. Should not be withdrawn immediately.

**Contra-indications:** conditions associated with high risk of cardiac arrhythmia, uncontrolled hypertension; pregnancy and lactation; severe renal and hepatic impairment.

**Side-effects:** nausea, anorexia; sexual dysfunction; insomnia, nervousness, abnormal dreams; hypertension, palpitation; visual disturbances.

**Dose:** initially 75 mg daily in 2 divided doses increased if necessary after several weeks to 150 mg daily in 2 divided doses. Severely depressed or hospitalized patients, initially 150 mg daily in 2 divided doses increased if necessary in steps of up to 75 mg every 2-3 days to maximum 375 mg daily then gradually reduced.

- Efexor Tablets 37.5 mg, 75 mg XR, 150mg XR

PAROXETINE

This is a selective serotonin reuptake inhibitor (SSRI).

**Indication:** Major depression, Obsessive compulsive disorder. Panic disorder, Anxiety disorder, post traumatic stress disorder, generalized anxiety disorder.

**Cautions:** See as Escitalopram Hydrobromide: also achlorhydria or high gastric pH (reduced absorption of oral suspension). Extrapyramidal reactions (including orofacial dystonias) and withdrawal syndrome are reported more commonly with paroxetine than with other SSRIs
Contra-indication: See as Escitalopram Hydrobromide.
Side-effect: See as Escitalopram Hydrobromide. also yawning; raised cholesterol; less commonly arrhythmias, transient changes in blood pressure, confusion, urinary incontinence; rarely panic attacks and paradoxical increased anxiety during initial treatment of panic disorder (reduce dose), depersonalisation, and neuroleptic malignant syndrome-like event; very rarely peripheral oedema, acute glaucoma, hepatic disorders (e.g. hepatitis), and priapism
Dose: Anxiety disorder, post traumatic stress disorder, generalized anxiety disorder 20 mg each morning, Max. dose 50 mg daily, Elderly 40 mg.
Obsessive compulsive disorder: 20 mg each morning, Max. dose 40 mg.
Panic disorder: initially 10 mg each morning max. dose 60mg.

Seroxat 20 mg.

MIRTAZAPINE
This is a presynaptic alpha2-adrenoreceptor antagonist, increases central noradrenergic and serotonergic neurotransmission. It has few antimuscarinic effects, but causes sedation during initial treatment.
Indications: Major depression
Cautions & Contra-indication: cardiac disorders, hypotension, history of urinary retention, susceptibility to angle-closure glaucoma, diabetes mellitus, psychoses (may aggravate psychotic symptoms), history of seizures or bipolar depression; hepatic impairment; renal impairment; pregnancy; breast-feeding; Patients should be advised to report any fever, sore throat, stomatitis or other signs of infection during treatment. Blood count should be performed and the drug stopped immediately if blood dyscrasia suspected.
Side Effect: Increased appetite and weight gain, oedema, dizziness, headache, abnormal dreams, mania, suicidal behavior, seizures, tremor, myoclonus, paraesthesia, arthralgia, myalgia, akathisia, rash, and blood disorders including reversible agranulocytosis.
Dose: Initially 15 mg daily at bed time increased within 2 – 4 weeks according to response. Max. 45 mg daily as single dose at bed time or in 2 divided doses.

- Remerone 30 mg

DRUGS USED IN NAUSEA AND VERTIGO

BETAHISTINE HYDROCHLORIDE

Indications: Vertigo and hearing disturbances in labyrinthine disorders.
Cautions: Asthma, peptic ulcer; pregnancy and breastfeeding. Effect of betahistine theoretically antagonised by antihistamines.
Contra-indication: Phaeochromocytoma
Side Effect: Gastro-intestinal disturbances; headache, rashes and pruritus.

Dose: 8-16 mg 3 times daily, preferably with meals, increased as necessary to a maximum of 48 mg daily.

- Betaserc Tablets 8 mg

CHLORPROMAZINE HYDROCHLORIDE

Indications: Severe nausea and vomiting of terminal illness (where other drugs have failed or are not available).
Dose: By mouth, 10-25 mg every 4-6 hours; Deep I.M. injection, 25 mg initially then 25-50 mg every 3-4 hours until vomiting stops.
Note: For details refer under drugs used in psychoses.

- Largactil Tablets 100 mg
- Largactil Injection 50 mg/2 ml

DOMPERIDONE

Domperidone acts at the chemoreceptor trigger zone. It has the advantage over metoclopramide and the phenothiazines of being less likely to cause central effects such as sedation and dystonic reactions because it does not readily cross the blood-brain barrier. In Parkinson’s disease, it is used to prevent nausea and vomiting during treatment with Domperidone is also used to treat.

Indications: Acute nausea and vomiting especially when associated with cytotoxic therapy, apomorphine and other
dopaminergic drugs, emergency hormonal contraception; dyspepsia, gastro-oesophageal reflux.

**Cautions**: children; renal impairment; breast-feeding; chronic use.

**Contra-Indications**: routine prophylaxis in post-operative vomiting; prolactinoma, hepatic impairment; where increased gastro-intestinal motility harmful; pregnancy.

**Side-effects**: increased prolactin concentrations; reduced libido; rash; acute dystonic reactions.

**Dose**: by mouth, acute nausea and vomiting, 10-20mg every 4-8 hours.

Maximum period of treatment, 12 weeks.

Child, nausea and vomiting induced by chemo-or radiotherapy only, 200-400 mcg/kg every 4-8 hours.

Functional dyspepsia, 10-20 mg 3 times daily before food and 10-20 mg at night.

Maximum period of treatment, 12 weeks.

Child, body-weight under 15 kg, not recommended

Motilium Suspension 5 mg/ 5 ml

**METOCLOPRAMIDE HYDROCHLORIDE**

**Indications**: nausea and vomiting particularly in gastrointestinal disorders, during treatment with cytotoxic drugs or radiotherapy, and post-operative conditions; migraine.

Use in patients below 20 years of age is restricted to severe intractable vomiting of unknown cause; aid to gastrointestinal intubation; pre-medication.

**Cautions**: renal impairment, elderly, young adults and children (measure dose accurately); may mask underlying cause such as cerebral irritation; porphyria.

**Contra-indications**: gastro-intestinal obstruction, perforation or haemorrhage; 3–4 days after gastrointestinal surgery; phaeochromocytoma; breast-feeding.

**Side-effects**: extrapyramidal effects (especially in children and young adults), hyperprolactinaemia, occasionally tardive dyskinesia on prolonged administration; drowsiness, restlessness, diarrhoea, depression, neuroleptic malignant syndrome, rashes, pruritus, oedema; cardiac conduction abnormalities reported following intravenous administration; rarely methaemoglobinemia (more severe in G6PD deficiency)
Central Nervous System

**Dose:** by mouth, I.M. and I.V. injection, up to 10 mg (5 mg up to the age of 20 years) 3 times daily. Child, up to 1 year, 1 mg twice daily; 1-3 years, 1 mg 2-3 times daily; 3-5 years, 2 mg 2-3 times daily; 5-9 years, 2.5 mg 3 times daily; 9-14 years, 5 mg 3 times daily.

A daily dose of 500 mcg/kg should not be exceeded particularly for patients under 20 years.

I.V. Infusion, nausea and vomiting associated with cytotoxic drugs, up to 2 mg/kg every 2 hours up to a maximum of 10 mg/kg/24 hours.

The initial dose should be given before starting cytotoxic treatment.

For radiological examinations, as a single dose by I.M. or I.V. injection 5-10 minutes before examination, 10-20 mg (10 mg for ages 15-19 years) Child under 3 years, 1 mg 3-5 years, 2 mg 5-9 years, 2.5 mg 9-14 years, 5 mg

By continuous I.V. infusion (preferred route), initially before starting the chemotherapy, 2-4 mg/kg over 15-30 minutes, then 3-5 mg/kg over 8-12 hours; max. in 24 hours, 10 mg/kg.

By intermittent I.V. infusion, initially before starting the chemotherapy, up to 2 mg/kg over at least 15 minutes then up to 2 mg/kg over at least 15 minutes every 2 hours; max. in 24 hours, 10 mg/kg.

- Premosan Tablets 10 mg
- Primperan Injection 5 mg/ml

**ONDANSETRON**

This is a highly selective 5-HT3 receptor antagonist.

**Indications:** management of nausea and vomiting induced by cytotoxic chemotherapy and radiotherapy; Prophylaxis and treatment of post operative nausea & vomiting.

**Cautions:** pregnancy; breast-feeding; moderate or severe hepatic impairment.

**Contra-Indications:** hypersensitivity reactions.

**Side-effects:** constipation; headache; flushing and warmth in the head and epigastrum.

**Dose:** dose is flexible in the range of 8-32 mg a day.

Adult, moderately emetogenic chemotherapy or radiotherapy, 8 mg by slow injection immediately before
Central nervous System

treatment or orally 1-2 hours before treatment followed by 8 mg orally twelve-hourly. To protect against delayed emesis after the first 24 hours, treatment should be continued orally, 8 mg twice daily for up to 5 days after a course of treatment.

Highly emetogenic chemotherapy, a single dose of 8 mg by slow injection immediately before chemotherapy, followed by 2 further I.V. doses of 8 mg 2-4 hours apart or by a constant I.V. infusion of 1 mg/hour for up to 24 hours.

In highly emetogenic chemotherapy, the efficacy may be enhanced by the addition of a single I.V. dose of dexamethasone 20 mg given before chemotherapy.

Child, single I.V. dose of 5 mg/m immediately before chemotherapy, then 4 mg orally twice daily for 5 days.

Prevention of postoperative nausea & vomiting: 16 mg 1 hr. before or 8 mg 1 hr. before anesthesia followed by 8 mg at intervals of 8 hrs. for further 2 doses. Alternatively, I.M. or slow IV injection, 4 mg at induction of anesthesia.

Treatment of postoperative nausea & vomiting: I.M. or slow IV injection, 4 mg

- Zofran Injection 4 mg & 8 mg
- Zofran Tablets 8 mg

PROCHLORPERAZINE

**Indications:** severe nausea and vomiting, vertigo, labyrinthine disorders; cytotoxic therapy.

**Contra-Indications:** avoid in children weighing less than 10 kg; elderly.

**Dose:** by mouth, nausea and vomiting, acute attack, 20 mg initially then 10 mg after 2 hours;

Prevention, 5-10 mg 2-3 times daily;

Child (over 10 kg), 250 mcg/kg 2-3 times daily;

Labyrinthine disorders, 5 mg 3 times daily, gradually increased if necessary to 30 mg daily in divided doses, then reduced after several weeks to 5-10 daily;

Deep I.M. injection, 12.5 mg when required followed if necessary after 6 hours by an oral dose.

- Stemetil Tablets 5 mg.
- Stemetil Injection 12.5 mg/ml
### PROMETHAZINE HYDROCHLORIDE

**Indications:** nausea, vomiting, vertigo, labyrinthine disorders, motion sickness.

Contra-Indications: porphyria.

**Dose:** by mouth, 25-50 mg daily as a single dose or in divided doses; max. 75 mg.

Child, motion sickness prevention, 2-5 years, 5 mg at night before traveling and following morning. 5-10 years, 10 mg at night and following morning.

- *Phenergan Tablet 25 mg*
- *Phenergan Elixir 5 mg/ml*

### PROMETHAZINE THEOCOLATE

**Indications:** nausea, vertigo, labyrinthine disorders, motion sickness (longer action than hydrochloride salt).

**Dose:** 25-75 mg, maximum 100 mg daily.

Child 5-10 years, 12.5-37.5 mg daily.

For severe nausea and vomiting in pregnancy, 25 mg at bedtime increased if necessary to a maximum of 100 mg daily.

Motion sickness prevention, 25 mg at bedtime on night before travelling or 25 mg 1-2 hours before traveling.

Child 5-10 years, half adult dose.

- *Avomine Tablets 25 mg*

### TRIFLUOPERAZINE

**Indications:** severe nausea and vomiting.

**Side-effects:** occur infrequently with anti-emetic doses.

**Dose:** by mouth, 2-4 mg daily in divided doses or a single dose of a sustained release preparation; max. 6 mg daily.

Child 3-5 years, up to 1 mg daily, 6-12 years, up to 4 mg daily.

- *Stelazine Tablets 1,2,5 mg*

### TROPISETRON

This is selective and competitive antagonist of 5-HT\textsubscript{3} receptors.

**Indications:** prevention of nausea and vomiting induced by cytotoxic agents; Postoperative nausea and vomiting.

**Cautions:** children; uncontrolled hypertension the dose should not exceed 10mg; cardiac conduction disorders;
arrhythmias, concomitant administration of drugs that prolong QT interval; pregnancy and lactation.

**Contra-Indications:** pregnancy; hypersensitivity.

**Side-effects:** headache; constipation; dizziness; fatigue and gastrointestinal disturbances.

**Dose:** Prevention of nausea and vomiting induced by cytotoxic chemotherapy, by slow intravenous injection or by intravenous infusion, 5 mg shortly before chemotherapy, then 5 mg by mouth every morning at least 1 hour before food for 5 days;

*child* over 2 years, by intravenous injection over at least 1 minute or by intravenous infusion, 200 mcg/kg (max. 5 mg) shortly before chemotherapy, then 200 mcg/kg daily for 4 days; *CHILD* 25 kg and over, by intravenous injection over at least 1 minute or by intravenous infusion, 5 mg shortly before chemotherapy, then by mouth (preferably) or by intravenous injection over at least 1 minute or by intravenous infusion, 5 mg daily for 5 days.

Postoperative nausea and vomiting, by slow intravenous injection or by intravenous infusion, prevention, 2 mg shortly before induction of anaesthesia; treatment, 2 mg within 2 hours of the end of anaesthesia

- *Navoban Capsules 5 mg*
- *Navoban Injection 5 mg*

**ANALGESICS**

**NON-NARCOTIC ANALGESICS**

**ACETYLSALICYLIC ACID**

**Indications:** mild to moderate, pain, pyrexia; antiplatelet.

**Cautions:** gastro-intestinal ulcers, haemophilia, anticoagulant therapy, asthma, impaired renal or hepatic function, dehydration, pregnancy; elderly; G6PD-deficiency.

**Contra-Indications:** children and adolescents under 16 years and in breast-feeding (Reye's syndrome); previous or active peptic ulceration, haemophilia; not for treatment of gout; history of hypersensitivity to aspirin or any other NSAID.
Interactions: Aspirin interacts significantly with a number of other drugs and its interaction with warfarin is a special hazard.

Side-effects: mild and occasional, high rate of gastrointestinal irritation with slight asymptomatic blood loss, increased bleeding time, bronchospasm and skin reactions in hypersensitive patients.

Dose: 300-900 mg every 4-6 hours when necessary, maximum 4 g daily.

Child and ADOLESCENT not recommended.

- *Aspirin 81mg, 100 mg & 300 mg Tablets*

**IBUPROFEN**

Indications: pain and inflammation in rheumatic disease (including juvenile idiopathic arthritis) and other musculoskeletal disorders; mild to moderate pain including dysmenorrhea; postoperative analgesia; migraine; dental pain; fever and pain in children; post-immunisation pyrexia.

Cautions: Same as for other NSAIDs; breast-feeding.

Dose: 1.2-1.8 g daily in 3-4 divided doses, preferably after food; maximum 2.4 g daily.

Maintenance dose, 0.6-1.2 g daily.

Child, 20 mg/kg daily

In Juvenile arthritis, up to 40 mg/kg daily.

- *Brufen Tablets 200 mg & 400 mg*
- *Brufen Suspension 100 mg / 5 ml*

**MEFENEMIC ACID**

Indications: mild to moderate pain, pyrexia in children, menorrhagia.

Cautions: exclude pathological conditions before treating menorrhagia; breast-feeding; porphyria

Contra-Indications: inflammatory bowel disease

Side-effects: drowsiness; diarrhoea or rashes (withdraw treatment); thrombocytopenia, haemolytic anaemia (positive Coombs' test), and aplastic anaemia reported; convulsions in overdosage.

Dose: 500 mg 3 times daily after food.
Central nervous System

Child over 6 months, 25 mg/kg daily in divided doses for not more than 7 days, except in juvenile chronic arthritis (Still's disease).

- Ponstan Capsule 250 mg, 500 mg

NAPOXEN SODIUM

**Indications:** mild to moderate pain and inflammation in rheumatic disease (including juvenile idiopathic arthritis) and other musculoskeletal disorders; dysmenorrhoea; acute gout.

**Cautions:** Same as for other NSAIDs; breast-feeding.

**Dose:** 550 mg initially, then 275 mg 6-8 hourly when necessary, preferably after food.

(275 mg sodium salt = 250 mg naproxen but the salt has a more rapid action).

- Nopain Tablets 250 mg

PARACETAMOL

**Indications:** mild to moderate pain; pyrexia.

**Cautions:** liver damage in prolonged use or overdosage; renal impairment; alcoholism.

**Side-effects:** side-effects rare, but rashes, blood disorders (including thrombocytopenia, leucopenia, neutropenia) reported; hypotension also reported on infusion;

**Dose:** 0.5-1 g every 4-6 hours, maximum 4 daily.

Child, 3 months to 1 year, 60-120 mg.

1-5 years, 120-250 mg.

6-12 years, 250-500 mg.

Doses repeated every 4-6 hours if necessary.

Infants, under 3 months, 5-10 mg/kg (on doctor's advice only).

- Adol 500 mg Tablets
- Adol Syrup 120 mg/5 ml
- Adol Suppositories 100, 200 mg.
- Fevadol 500mg Tablet
- Muscadol Tablets (Paracetamol 450 mg & Orphenadrine Citrate 35 mg/Tab))
- Perfalgan (Paracetamol IV Solution 10ml/ml)
PARACETAMOL OVERDOSE

ACETYLCYSTEINE

**Indications:** paracetamol overdosage.

**Cautions:** asthma.

**Side-effects:** hypersensitivity-like reactions, bronchoconstriction, rashes.

**Dose:** by intravenous infusion, in glucose intravenous infusion, initially 150 mg/kg in 200 ml over 15 minutes, followed by 50 mg/kg in 500 ml over 4 hours, then 100 mg/kg in 1000 ml over 16 hours.

- Parvoles Injection 200 mg/ml-10 ml Ampoules

NARCOTIC ANALGESICS.

DEXTROPROPOXYPHENE

**Indications** /mild to Moderate pain.

**Cautions:** renal impairment; drug abuse with dextropropoxyphene is increasing; daily doses above 720 mg cause toxic psychoses and convulsions; concomitant administration of sedatives, tranquilizers, muscle relaxants, antidepressants or other CNS-depressant drugs; alcohol consumption; hepatic and renal impairment.

**Side-effects:** dizziness, sedation, nausea and vomiting; abnormal liver function tests; subacute painful myopathy following chronic overdosage.

**Dose:** by mouth, 65 mg 3-4 times daily.

- Distalgesic Tablets.
  - (Dextropropoxyphene Hydrochloride 32.5 mg With Paracetamol 325 mg)

DIHYDROCODEINE TARTRATE

**Indications:** moderate to severe pain.

**Cautions:** As for morphine salts; hyperthyroidism; respiratory and renal impairment.

**Side-effects:** see under Morphine Salts

**Dose:** 30 mg every 4-6 hours, after food.
Child over 4 years, 0.5-1 mg/kg every 4-6 hours.

- Df 118 Tablets 30 mg
MORPHINE SALTS

**Indications:** severe pain, left ventricular failure, pulmonary oedema.

**Cautions:** hypotension, hypothyroidism, asthma and decreased respiratory reserve; prostatic hypertrophy; hepatic impairment; renal impairment; convulsive disorders; dependence; pregnancy; breast-feeding

**Contra-Indications:** acute respiratory depression; acute alcoholism; raised intracranial pressure and head injury; avoid injection in phaeochromocytoma (risk of pressor response to histamine release).

**Side-effects:** nausea and vomiting, constipation, drowsiness, respiratory depression and hypotension and muscle rigidity; other side-effects include difficulty with micturition, ureteric or biliary spasm, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension, hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes, urticaia and pruritus

**Dose:**

**Note:** The patient should be closely monitored for pain relief as well as for side-effects especially respiratory depression

acute pain, by S.C. or I.M. injection 10 mg every 4 hours if necessary (15 mg for heavier patients).

Child up to 1 month, 150 mcg/kg;

1-12 months, 200 mcg/kg;

1-5 years, 2.5-5 mg

6-12 years, 5-10 mg.

doses can be repeated every 4 hours, or more in terminal pain.

By slow I.V. injection, 1/4-1/2 corresponding I.M. dose.

Acute pulmonary oedema, by slow I.V. injection (2mg/minute), 10 mg. Followed by a further 5-10 mg if necessary.

Chronic pain, by mouth or by S.C. or I.M. injection, 5-20 mg regularly every 4 hours.

dose may be increased as necessary;

Oral dose = double I.M. dose.

Myocardial infarction, by slow I.V. injection (2 mg/minutes), 10 mg followed by a further 5-10 mg if necessary; elderly or frail patients, reduce dose by half.
Central Nervous System

By mouth, initially 10-20 mg twice daily, adjusted according to response
- Morphine Injection 10 mg
- MSTt Continus Tablets 30 mg

PENTAZOCINE

**Indications:** moderate to severe pain.
**Cautions:** occasionally hallucinations occur. porphyria
**Contra-Indications:** patients dependent on opioids; arterial or pulmonary hypertension, heart failure
**Side-effects:** As for morphine salts; occasional hallucinations.
**Dose:** by S.C, I.M. or I.V. injection, moderate pain, 30 mg; severe pain, 45-60 mg every 3-4 hours when necessary.
Child over 1 year, S.C. or I.M. injection, up to 1 mg/kg and by I.V. injection up to 500 mcg/kg.
- Sosegon Injection 30 mg/ml

PETHIDINE HYDROCHLORIDE

**Indications:** moderate to severe pain; obstetric analgesia; perioperative analgesia.
**Cautions:** As for morphine salts; not suitable for severe continuing pain.
**Contra-Indications:** As for morphine salts; severe renal impairment.
**Side-effects:** As for morphine salts; occasional convulsions.
**Dose:** Acute pain, by S.C. or I.M. injection, 25-100 mg, repeated after 4 hours,
Child, by I.M. injection, 0.5-2.0 mg/kg. By slow I.V. injection, 25-50 mg, repeated after 4 hours. Obstetric analgesia, by S.C. or I.M. injection, 50-100 mg; repeated 1-3 hours later if necessary; maximum 400 mg in 24 hours.
- Pethidine Injection 50 mg, 100 mg

**Note:** In the postoperative period, the patient should be closely monitored for pain relief as well as for side-effects especially respiratory depression
OPIOID DEPENDENCE

METHADONE HYDROCHLORIDE

**Indications:** severe pain, but less sedating than morphine and acts for longer periods; cough in terminal disease; adjunct in the treatment of opioid dependence. It is an opioid agonist and can be substituted for them to prevent the withdrawal symptoms.

**Cautions:** in prolonged use, avoid administration more often than twice daily to avoid the risk of accumulation and opioid over dosage, hypertension; hypothyroidism; asthma especially during attack and decreased respiratory reserve; pregnancy and breastfeeding; prostate hypertrophy; hepatic and renal impairment; convulsive disorder.

**Note:** patients with the following risk factors for QT interval prolongation are carefully monitored while taking methadone: heart or liver disease, electrolyte abnormalities, or concomitant treatment with drugs that can prolong QT interval; patients requiring more than 100 mg daily should also be monitored.

**Contra-Indications:** acute respiratory depression; acute alcoholism; paralytic ileus, acute abdomen; increased intracranial pressure or head injury; phaeochromocytoma

**Side-effects:** nausea, vomiting, constipation; drowsiness; respiratory depression and hypotension with high doses; difficulty in urination; dry mouth; hallucinations; mood changes; miosis; facial flushing; dependence; decreased libido.

**Dose:** analgesia, 2.5-10 mg at intervals of 3-8 hours depending on the pain.
Cough suppression, 1-2 mg every 4-6 hours but reduced to twice daily in prolonged use.
Opioid dependence, 10-20 mg initially increased as necessary by 10 mg daily until symptoms of withdrawal disappear.
Usual maintenance dose, 40-60 mg.
Child, not recommended.

- Methadone Tablets 5 mg
TRIGEMINAL NEURALGIA

CARBAMAZEPINE

Indications: trigeminal neuralgia, epilepsy. Has no effect on other types of headaches.
Caution, Contraindications & side effects: see carbamezipine under drugs used in psychoses & related disorders.
Dose: 100 mg once or twice daily at start and then gradually increased until the best effect is obtained. Usual maintenance dose is 200 mg 3-4 times daily; maximum 1.6 g daily in some patients.
- Tegretol Tablets 200 mg

PHENYTOIN

Indications: trigeminal neuralgia in some patients, pain in diabetes, neuropathy, epilepsy. It can be combined with carbamazepine in very refractory cases or in those unable to tolerate high doses of carbamazepine.
Caution, Contraindications & side effects: see under drugs used in epilepsy.
- Epanutin Capsules 50 mg & 100 mg

ANTI-MIGRAINE DRUGS

ERGOTAMINE TARTRATE

Indications: acute attacks of classical migraine and related type of vascular headache not responsive to analgesics.
Caution: risk of peripheral vasospasm; elderly; dependence, should not be used for migraine prophylaxis;
Note: Warn patient to stop treatment immediately if numbness or tingling of extremities develops and to contact doctor.
Contra-Indications: peripheral vascular disease, coronary heart disease, obliterative vascular disease, and Raynaud's syndrome, hepatic or renal impairment, sepsis, severe or inadequately controlled hypertension, pregnancy, breastfeeding, porphyria.
Side-effects: nausea, vomiting, abdominal cramps and occasionally headache provoked (usually because of
prolonged excessive dosage or abrupt withdrawal; precordial pain, myocardial and intestinal ischaemia, rarely myocardial infarction; repeated high dosage may cause ergotism with gangrene and confusion; pleural, peritoneal and heart-valve fibrosis may occur with excessive use

**Dose:** 1-2 tablets at onset; maximum 4 tablets in 24 hours; not to be repeated at intervals of less than 4 days; maximum 8 tablets in one week.

- *Cafergot Tablets* (Ergotamine Tartarate 1 mg & Caffeine 100 mg/Tablet)

**PIZOTIFEN**

*Indications:* prevention of vascular headache including classical migraine, common migraine, and cluster headache.

*Caution:* may affect the ability to drive or operate machinery and increase effects of alcohol; renal impairment; pregnancy; breast-feeding.

*Contra-Indications:* urinary retention, closed-angle glaucoma.

*Side-effects:* anti-muscarinic effects, drowsiness, weight gain, nausea, dizziness, muscle pain.

**Dose:** initially 500 mcg at night increased gradually to usual dose of 1.5 mg at night or 500 mcg 3 times daily, adjusted according to response within the range 0.5-3 mg daily; maximum single dose 3 mg; max. daily dose 4.5 mg

Child over 2 years, up to 1.5 mg daily in divided doses; maximum single dose at night 1 mg.

- *Sandomigran Tablets* 500 mcgs

**ANTI-EPILEPTICS**

**CARBAMAZEPINE**

*Indications:* all forms of epilepsy except absence seizures, trigeminal neuralgia, prophylaxis in manic-depressive illness.

*Caution:* MAOIS treatment; hepatic impairment; pregnancy and breast-feeding; glaucoma.
Central Nervous System

**Contra-Indications:** previous sensitivity to carbamazepine, atrioventricular conduction abnormalities; porphyria; MAOI's therapy.

**Side-effects:** gastrointestinal disturbances; dizziness; visual disturbances; rash; leucopenia and other blood disorders.

**Dose:** epilepsy, initially 100-200 mg 1-2 times daily increased slowly to a usual dose of 0.8 -1.2 g daily according to patient's needs; in some cases 1.6 g or even 2 g daily may be needed.

Child up to 1 year, 100-200 mg in divided doses;
1-5 years, 200-400 mg
6-10 years, 400-600 mg
11-15 years, 0.6- 1 g.

- Tegretol Tablets 200 mg
- Tegretol Cr Tablets 400 mg
- Tegretol Suspension 100 mg/5 ml

**CLONAZEPAM**

**Indications:** all forms of epilepsy; status epilepticus; myoclonus

**Cautions:** may affect the ability to drive or operate machinery and increase the effects of alcohol; breast-feeding; porphyria; avoid sudden withdrawal; myasthenia gravis, porphyria; hepatic or renal impairment; pregnancy; breast feeding.

Facilities for reversing respiratory depression with mechanical ventilation must be at hand.

**Contra-Indications:** respiratory depression; acute pulmonary insufficiency; sleep apnoea syndrome; marked neuromuscular respiratory weakness including unstable myasthenia gravis.

**Side-effects:** drowsiness, fatigue, dizziness, muscle hypotonia, hyper salivation in infants, paradoxical aggression, irritability and mental changes, visual disturbances on long-term treatment; blood disorders.

**Dose:** 1 mg, initially, at night for 4 nights, increased over 2-4 weeks to a daily maintenance dose of 4-8 mg at night.

Child up to 1 year, 250 mcg increased as above to 0.5-1 mg. 1-5 years, 250 mcg increased to 1-3 mg. 5-12 years, 500 mcg increased to 3-6 mg.

- Rivotril Tablets 0.5 mg & 2 mg.
Central nervous System

- **Rivotril Oral Drops 2.5 mg/1 ml- 10 ml Bottles.**

**DIAZEPAM**

*Indications:* status epilepticus, convulsions due to poisoning.

*Caution, Contraindications & side effects:* see under drugs used as hypnotics & sedatives.

*Dose:* Slow I.V. injection, adults and children, 10-20 mg at a rate of 0.5 ml (2.5 mg) per 30 seconds, repeated if necessary after 30-60 minutes; may be followed by slow infusion to a maximum of 3 mg/kg over 24 hours. Child, 200-300 mcg/kg or 1 mg/year of age.

- **Valium Injection 5 mg/ml In 2 ml Ampoules**

**ETHOSUXIMIDE**

*Indications:* absence seizures.

*Cautions:* avoid abrupt withdrawal; hepatic impairment; renal impairment; pregnancy; breast-feeding; avoid in porphyria.

*Blood disorders:* Patients or their carers should be told how to recognise signs of blood disorders, and advised to seek immediate medical attention if symptoms such as fever, sore throat, mouth ulcers, bruising, or bleeding develop.

*Side-effects:* gastro-intestinal disturbances (including nausea, vomiting, diarrhoea, abdominal pain, anorexia, weight loss); **less frequently** headache, fatigue, drowsiness, dizziness, hiccup, ataxia, mild euphoria, irritability, aggression, impaired concentration; **rarely** tongue swelling, sleep disturbances, night terrors, depression, psychosis, photophobia, dyskinesia, increased libido, vaginal bleeding, myopia, gingival hypertrophy, and rash; also reported, hyperactivity, increase in seizure frequency, blood disorders such as leucopenia, agranulocytosis, pancytopenia, and aplastic anaemia (blood counts required if features of infection), systemic lupus erythematosus, and Stevens-Johnson syndrome.

*Dose:* initially 500 mg daily increased according to patient's needs by 250 mg at intervals of 4-7 days to usual dose of 1–1.5 g daily up to a maximum of 2 g daily. Child up to 6 years, 250 mg daily.
Over 6 years, 500 mg increased gradually to a maximum of 1 g daily.

- Zarontin Capsules 250 mg

### LAMOTRIGINE

**Indications:** epilepsy; monotherapy and adjunctive treatment of partial seizures and tonic clonic seizures not satisfactorily controlled with other antiepileptic drugs.

**Cautions:** closely monitor and consider withdrawal if rash, fever, or other signs of hypersensitivity syndrome develop; abrupt withdrawal may provoke rebound seizures; impaired renal and hepatic functions; pregnancy and lactation.

**Contra-Indications:** hypersensitivity reactions, symptoms and signs suggestive of bone-marrow failure such as anaemia, bruising, or infection.

**Side-effects:** skin rashes that may lead to withdrawal of the drug; Stevens-Johnson syndrome; diplopia, blurred vision, nystagmus, dizziness, drowsiness, headache, unsteadiness, tiredness, hallucinations, occasional increase in seizure frequency; gastrointestinal disturbances, and irritability/aggression; blood disorders (including leucopenia, thrombocytopenia, pancytopenia); arthralgia; lupus erythematosus-like effect; photosensitivity.

**Dose:** the dispersible tablets may be chewed, dispersed in a small volume of water or swallowed whole with a little water.

Monotherapy, **ADULT** and **CHILD** over 12 years, initially 25 mg daily for 14 days, increased to 50 mg daily for further 14 days, then increased by max. 50–100 mg daily every 7–14 days; usual maintenance 100–200 mg daily in 1–2 divided doses (up to 500 mg daily has been required)

Adjunctive therapy with valproate, initially 25 mg every other day for 14 days then 25 mg daily for further 14 days, thereafter increased by max. 25–50 mg daily every 7–14 days; usual maintenance, 100–200 mg daily in 1–2 divided doses; **CHILD** 2–12 years initially 150 mcg/kg daily for 14 days (those weighing under 13 kg may receive 2 mg on alternate days for first 14 days) then 300 mcg/kg daily for further 14 days, thereafter increased by
max. 300 mcg/kg daily every 7–14 days; usual maintenance 1–5 mg/kg daily in 1–2 divided doses

- Lamictal Tablets 5mg, 25mg, 50 mg & 100 mg

LEVETIRACETAM

**Indications:** adjunctive treatment of partial seizures with or without secondary generalization, adjunctive treatment of myoclonic seizures.

**Cautions:** Avoid sudden withdrawal, pregnancy, renal and hepatic impairments.

**Contra-indications:** hypersensitivity to levetiracetam or any component of the formulation, breast-feeding.

**Side effects:** nausea, vomiting, dyspepsia, diarrhea, cough, drowsiness, asthenia, amnesia, ataxia, dizziness, headache, tremor, hyperkinesias, depression, insomnia, anxiety, anorexia, diplopia, rach, confusion, irritability, psychosis, suicidal ideation, leucopenia, pancytopenia, thrombocytopenia and alopecia.

**Dose:**
- Adult and child over 12 years, body weight over 50 kg, initially 500 mg twice daily, adjusted every 2 to 4 weeks, max. 1.5 g twice daily.
- Child and adolescent 4-18 years (12-18 years for myoclonic seizures), body weight under 50 kg, initially 10 mg/kg twice daily, adjusted every 2 weeks, max. 30 mg/kg twice daily.

- Keppra 500mg & 1000mg Tablets

PHENOBARBITAL

**Indications:** all forms of epilepsy except absence seizures; less satisfactory in status epilepticus.

**Cautions:** avoid sudden withdrawal; children, elderly; impaired renal or hepatic function; severe respiratory depression; pregnancy, breast-feeding; porphyria; CNS depressants, alcohol.

**Side-effects:** hepatitis, cholestasis; hypotension; respiratory depression; behavioural disturbances, nystagmus, irritability, drowsiness, lethargy, depression, ataxia, paradoxical excitement, hallucinations, impaired memory and cognition, hyperactivity particularly in the elderly and in children; osteomalacia; megaloblastic anaemia (may be treated with folic acid), agranulocytosis, thrombocytopenia; allergic skin reactions; very rarely
Stevens-Johnson syndrome and toxic epidermal necrolysis.

**Special precautions:** CNS sedatives, particularly alcohol.

**Dose:** by mouth, 60-180 mg at night; Child, 5-8 mg/kg daily.

By I.M. injection, 200 mg repeated after 6 hours if necessary. Child, 15 mg/kg.

Status epilepticus, by I.V. injection (dilute injection 1 in 10 with water for injection), 10 mg/kg at a rate of not more than 100 mg/minute; maximum 1 g.

**Note:** For therapeutic purposes phenobarbital and phenobarbital sodium may be considered equivalent in effect. Plasma-phenobarbital concentration for optimum response 15–40 mg/litre (60–180 micromol/litre)

- Luminal Tablets 15 mg, 30 mg & 60 mg.
- Gardenal Elixir 20 mg & 30 mg/5 ml.
- Phenobarbital Injection 200 mg/ml.

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**PHENYTOIN SODIUM**

**Indications:** all forms of epilepsy except absence seizures; status epilepticus; prophylaxis of seizures in neurosurgery.

**Cautions:** avoid abrupt withdrawal; avoid in porphyria; hepatic impairment; pregnancy; breast-feeding hepatic failure; sudden withdrawal and change to other drugs should be made cautiously.

**Side-effects:** nausea, vomiting, constipation, insomnia, transient nervousness, tremor, paraesthesia, dizziness, headache, anorexia; gingival hypertrophy and tenderness; rash (discontinue; if mild re-introduce cautiously but discontinue immediately if recurrence), acne, hirsutism, coarse facies; rarely hepatotoxicity, peripheral neuropathy, dyskinesia, lymphadenopathy, osteomalacia, blood disorders (including megaloblastic anaemia (may be treated with folic acid), leucopenia, thrombocytopenia, and aplastic anaemia), polyarteritis nodosa, lupus erythematosus, Stevens-Johnson syndrome, and toxic epidermal necrolysis; with excessive dosage nystagmus, diplopia, slurred speech, ataxia, confusion, and hyperglycaemia.

**Dose:** by mouth, daily as a single dose or 2 divided doses, with water, 150-300 mg increased gradually to 600 mg
Central nervous System

according to the patient's needs (with plasma-phenytoin concentration monitoring).
Usual dose, 200-500 mg daily
Child, 5-8 mg/kg daily in 1 or 2 doses; maximum 300 mg daily.
By slow I.V. injection or infusion, status epilepticus, 13-15 mg/kg at a rate not exceeding 50 mg per minute, as a loading dose; Maintenance doses of about 100 mg should be given thereafter at intervals of every 6 hours.
Note: Plasma concentration for optimum response 10–20 mg/litre (40–80 micromol/litre)
Take preferably with or after food
- **Epanutin Capsules 100 mg**
- **Epanutin Suspension 30 mg/5 ml**
- **Epanutin Injection 250 mg/Ampoule**

PRIMIDONE

**Indications:** all forms of epilepsy except absence seizures; essential tremor.

**Cautions:** Same as phenobarbital.

**Side effects:** Same as phenobarbital. also nausea and visual disturbances; less commonly vomiting, headache, and dizziness; rarely arthralgia

**Dose:** epilepsy. **ADULT and CHILD over 9 years,** initially 125 mg daily at bedtime, increased by 125 mg every 3 days to 500 mg daily in 2 divided doses then increased according to response by 250 mg every 3 days to max. 1.5 g daily in 2 divided doses;
**CHILD under 9 years,** initially 125 mg daily at bedtime, increased by 125 mg every 3 days according to response; usual maintenance. **CHILD under 2 years,** 250–500 mg daily in 2 divided doses; 2–5 years, 500–750 mg daily in 2 divided doses; 6–9 years 0.75–1 g daily in 2 divided doses.

**Essential tremor,** initially 62.5 mg daily increased gradually over 2–3 weeks according to response; max. 750 mg daily.
- **Mysoline Tablets 250 mg**

**Note:** Monitor plasma concentrations of derived phenobarbital. Optimum range as for phenobarbital.
SODIUM VALPROATE

**Indications:** all forms of epilepsy.

**Cautions:** hepatic impairment; liver function must be monitored before and at 2-months intervals during first 6 months of therapy; monitor platelet function before major surgery; systemic lupus erythematosus; false-positive urine tests for ketones; avoid abrupt withdrawal; renal impairment; pregnancy; breast-feeding

**Contra-Indications:** active liver disease, family history of severe hepatic dysfunction; porphyria.

**Side-effects:** gastric irritation, nausea, hyperammonaemia; increased appetite and weight gain; transient hair loss with curly regrowth, less frequently increased alertness, aggression, hyperactivity, behavioural disturbances, ataxia, tremor, and vasculitis; rarely hepatic dysfunction (withdraw treatment immediately if persistent vomiting and abdominal pain, anorexia, jaundice, oedema, malaise, drowsiness, or loss of seizure control), lethargy, drowsiness, confusion, stupor, hallucinations, menstrual disturbances, anaemia, leucopenia, pancytopenia, hearing loss, and rash; very rarely pancreatitis, peripheral oedema, increase in bleeding time, extrapyramidal symptoms, dementia, encephalopathy, coma, gynaecomastia, Fanconi's syndrome, hirsutism, acne, enuresis, hyponatraemia, toxic epidermal necrolysis, and Stevens-Johnson syndrome.

**Dose:** By mouth, initially 600 mg daily in 2 divided doses, preferably after food, increased by 200 mg daily every 3 days to max. 2.5 g daily, usual maintenance dose 1–2 g daily (20–30 mg/kg daily); **CHILD** body-weight up to 20 kg, initially 20 mg/kg daily in divided doses, may be increased provided plasma concentration monitored (dose above 40 mg/kg daily also monitor clinical chemistry and haematological parameters); **CHILD** under 12 years body-weight over 20 kg, initially 400 mg daily in divided doses increased according to response (usual range 20–30 mg/kg daily); max. 35 mg/kg daily

- Depakine Tablets 200 mg; 500 mg & 500mg Chromo
- Depakine Syrup 200 mg/5 ml- 150 ml Bottles
- Depakine Drops 200 mg/1 ml - 40 ml Bottles
VIGABATRIN

This is a selective inhibitor of GABA transaminase.

**Indications:** treatment of refractory epilepsy, particularly partial epilepsy in adults and children, excluding petit mal, in addition to existing treatment; monotherapy for infantile spasms (West's Syndrome)

**Cautions:** renal impairment; elderly; closely monitor neurological function; avoid sudden withdrawal (taper off over 2–4 weeks); history of psychosis, depression or behavioural problems; pregnancy and breast-feeding; absence seizures (may be exacerbated).

**Contra-Indications:** visual field defects

**Note:** Onset of symptoms varies from 1 month to several years after starting. In most cases, visual field defects have persisted despite discontinuation. Product literature advises visual field testing before treatment and at 6-month intervals; a procedure for testing visual fields in those with a developmental age of less than 9 years is available from the manufacturers. Patients should be warned to report any new visual symptoms that develop and those with symptoms should be referred for an urgent ophthalmological opinion. Gradual withdrawal of vigabatrin should be considered.

**Side-effects:** drowsiness and fatigue; dizziness, nervousness, irritability, behavioural effects such as excitement and agitation especially in children; depression, abnormal thinking, headache, nystagmus, ataxia, tremor, paraesthesia, impaired concentration; less commonly confusion, aggression, psychosis, mania, memory disturbance, visual disturbance (e.g. diplopia); also weight gain, oedema, gastro-intestinal disturbances, alopecia, rash; less commonly, urticaria, occasional increase in seizure frequency (especially if myoclonic), decrease in liver enzymes, slight decrease in haemoglobin; photophobia and retinal disorders (e.g. peripheral retinal atrophy); optic neuritis, optic atrophy, hallucinations.

**Dose:** with current antiepileptic therapy, initially 1 g daily in single or 2 divided doses then increased according to response in steps of 500 mg at weekly intervals; usual range 2–3 g daily (max. 3 g daily); CHILD initially 40 mg/kg daily in single or 2 divided doses then adjusted according to body-weight 10–15 kg; 0.5–1 g daily; body-
weight 15–30 kg, 1–1.5 g daily; body-weight 30–50 kg, 1.5–3 g daily; body-weight over 50 kg, 2–3 g daily
Infantile spasms (West's syndrome), *monotherapy*, 50 mg/kg daily, adjusted according to response over 7 days; up to 150 mg/kg daily used with good tolerability
- **Sabril Tablets 500 mg**

## DRUGS USED IN PARKINSONISM AND RELATED DISORDERS

### AMANTIDINE HYDROCHLORIDE

**Indications:** Parkinsonism (but not drug-induced extrapyramidal symptoms); antiviral

**Cautions:** cardiovascular, hepatic, or renal disease; recurrent eczema; psychosis; elderly patients; breast-feeding. Avoid abrupt discontinuation of treatment.

**Contra-Indications:** epilepsy, gastric ulcer; severe renal impairment; pregnancy, breast-feeding.

**Side-effects:** anorexia, nausea, nervousness, inability to concentrate, insomnia, dizziness, convulsions, hallucinations or feelings of detachment, blurred vision, gastro-intestinal disturbances, livedo reticularis and peripheral oedema; rarely leucopenia, rashes.

**Dose:** Parkinson's disease, 100 mg daily increased after one week to 100 mg twice daily, usually in conjunction with other treatment; some patients may require higher doses, max. 400 mg daily;

**ELDERLY** 65 years and over, 100 mg daily adjusted according to response.

Post-herpetic neuralgia, 100 mg twice daily for 14 days, continued for a further 14 days if necessary 100 mg daily increased if necessary to 100 mg twice daily (not later than 4 p.m.) usually in conjunction with other treatment. Maximum, 400 mg daily.
- **Symmetrel Capsules 100 mg**

### BENZTROPINE MESYLATE

This is an antimuscarinic drug.

**Indications:** Parkinsonism, drug-induced extra-pyramidal symptoms.

**Cautions:** same as for Benzhexol Hydrochloride; causes sedation rather than stimulation; persons

- **Symmetrel Capsules 100 mg**
affected should not drive or operate machinery; avoid alcohol (CNS depression).

**Contra-Indications:** gastrointestinal obstruction; tardive dyskinesia; avoid in children under 3 years.

**Side effects:** same as for Benzhexol Hydrochloride, but causes sedation rather than stimulation; also depression and hyperthermia.

**Dose:** by mouth, 0.5-1 mg daily usually at bedtime, gradually increased; maximum 6 mg daily; Usual maintenance dose, 1-4 mg daily in single or divided doses;

- By I.M. or I.V. injection, 1-2 mg repeated if symptoms reappear.

- **Cogentin Tablets 2 mg**
- **Cogentin Injection 1 mg/ml**

### BROMOCRIPTINE

**Indications:** Parkinsonism (but not drug-induced extrapyramidal symptoms); endocrine diseases.

**Cautions:** Monitor pituitary enlargement, pregnancy, breast feeding, history of psychic or cardiovascular disorders; Raynaud’s syndrome, fibrotic reactions, porphyria, hepatic impairment. Initial hypotensive reactions in some patients.

**Contra-Indications:** hypersensitivity to bromocriptine or other ergot alkaloids, toxaemia of pregnancy or hypertension in postpartum women or in puerperium.

**Side-effects:** abnormal involuntary movements; confusional states; nausea, constipation, headache, drowsiness.

**Dose:** by mouth, First week, 1-1.25 mg at night, Second week, 2-2.25 mg at night, Third week, 2.5 mg twice daily, Fourth week, 2.5 mg 3 times daily, increasing by 2.5 mg every 3-14 days according to response to a usual range of 10-40 mg daily in 3 divided doses, taken with food.

- **Parlodel Tablets 2.5 mg**

### LEVODOPA WITH BENSERAZIDE (Co-beneldopa)

A mixture of benserazide hydrochloride and levodopa in mass proportions corresponding to 1 part of benserazide and 4 parts of levodopa.
**Indications:** treatment of all stages of Parkinson's disease (but not drug-induced extrapyramidal symptoms).

**Cautions:** pulmonary disease, peptic ulceration, cardiovascular disease, diabetes mellitus, osteomalacia, open-angle glaucoma, susceptibility to angle-closure glaucoma, history of skin melanoma (risk of activation), psychiatric illness (avoid if severe); excessive drowsiness; in prolonged therapy, psychiatric, hepatic, haematological, renal, and cardiovascular surveillance is advisable; warn patients to resume normal activities gradually; avoid abrupt withdrawal of levodopa preparations.

**Contra-Indications:** narrow-angle glaucoma; severe psychoneuroses or psychoses; concomitant MAO I therapy; pregnancy; breast-feeding.

**Side-effects:** anorexia, nausea and vomiting, insomnia, agitation, postural hypotension (rarely labile hypertension), dizziness, tachycardia, arrhythmias, reddish discoloration of urine and other body fluids, rarely hypersensitivity; abnormal involuntary movements and psychiatric symptoms which include hypomania and psychosis may be dose-limiting; depression, drowsiness, headache, flushing, sweating, gastro-intestinal bleeding, peripheral neuropathy, taste disturbance, pathological gambling, increased libido, hypersexuality, pruritus, rash, and liver enzyme changes also reported; syndrome resembling neuroleptic malignant syndrome reported on withdrawal; very rarely angle-closure glaucoma.

**Dose:** expressed as levodopa, initially, 50 mg 3-4 times daily increased by 100 mg once or twice weekly according to response. Usual maintenance dose 400-800 mg daily in divided doses after meals.

- Madopar Capsules 250 mg (200 mg L-Dopa & 50 mg Benserazide)

**LEVODOPA WITH CARBIDOPA (Co-careldopa)**

**Indications:** parkinsonism but not drug-induced extrapyramidal effects.

**Cautions:** pulmonary disease, peptic ulcer, cardiovascular disease, diabetes mellitus, skin melanoma, open-angle glaucoma, asthma, renal and hepatic impairment.
**Central nervous System**

**Contra-Indications:** concomitant MAOI therapy; narrow angle glaucoma.

**Side-effects:** dyskinesia, muscle twitching and blepharospasm; mental changes.

**Dose:** expressed as levodopa, initially, 100 mg 3 times increased by 50-100 mg daily or on alternate days according to response up to 800 mg daily in divided doses

- Sinemet Tablets (L-Dopa 250 mg & Carbidopa 25 mg)
- Sinemet-Plus Tablets (L-Dopa 100 mg & Carbidopa 25 mg)

**ORPHENADRINE HYDROCHLORIDE**

This is an antimuscarinic drug.

**Indications:** Parkinsonism, particularly with apathy and depression; drug-induced extrapyramidal symptoms (but not tardive dyskinesia)

**Cautions:** same as for Benzhexol Hydrochloride.

**Contra-Indications:** gastrointestinal obstruction; tardive dyskinesia; also porphyria

**Side effects:** same as for Benzhexol Hydrochloride, less commonly insomnia and impaired coordination.

**Dose:** initially 150 mg daily in divided doses, increased gradually in steps of 50 mg every 2–3 days according to response; usual dose range 150–300 mg daily in divided doses; max. 400 mg daily;

**ELDERLY** preferably lower end of range

- Disipal Tablets 50 mg

**PRAMIPEXOLE**

It is dopamine agonists.

**Indications:** used alone or with other medications to treat the symptoms of Parkinson's, it is also used to treat restless legs syndrome (RLS; a condition that causes discomfort in the legs and a strong urge to move the legs, especially at night and when sitting or lying down).

**Cautions:** avoid abrupt withdrawal (risk of neuroleptic malignant syndrome), renal impairment, pregnancy, severe cardiovascular disease, psychotic disorders, ophthalmological testing recommended (risk of visual disorders).
**Contraindications**: hypersensitivity to pramipexole or any component of the formulation, breastfeeding.

**Side Effects**: nausea, abnormal body movements and motions, weakness, dizziness, drowsiness, difficulty falling asleep or staying asleep, difficulty remembering, confusion, abnormal thoughts, heartburn, constipation, diarrhoea, loss of appetite, weight loss, dry mouth, joint pain, frequent urination or urgent need to urinate, difficulty urinating or pain when urinating, decreased sexual interest or ability, oedema, hallucinations, changes in vision, chest pain, shortness of breath, dark, red, colored urine, muscle tenderness, muscle weakness, postural hypotension.

**Dose**: Parkinson's disease, initially 0.88 mg 3 times daily, dose doubled every 5-7 days if tolerated to 0.350 mg 3 times daily, further increased if necessary by 0.18 mg 3 times daily at weekly intervals. Max. 3.3 mg daily in 3 divided doses.

When it is used to treat restless legs syndrome, initially 0.88 mg once daily 2-3 hours before bedtime, dose doubled every 4-7 days if necessary to 0.350 mg daily, max. 0.540 mg daily, children and adolescent under 18 years not recommended.

The doses in renal impairment need to be adjusted.

- **Sifrol 0.88 mg**

**PROCYCLIDINE HYDROCHLORIDE**

This is an antimuscarinic drug.

**Indications**: Parkinsonism, drug-induced extrapyramidal symptoms (but not tardive dyskinesia)

**Cautions**: same as for Benzhexol Hydrochloride.

**Contra-Indications**: gastrointestinal obstruction; tardive dyskinesia.

**Side effects**: same as for Benzhexol Hydrochloride, but causes sedation rather than stimulation; also gingivitis.

**Dose**: By mouth, 2.5 mg 3 times daily, increased gradually in steps of 2.5–5 mg daily every 2–3 days if necessary; usual max. 30 mg daily in 2–4 divided doses (60 mg daily in exceptional circumstances); ELD ERLY preferably lower end of range

- **Kemadrin Tablets 5 mg**
Central nervous System

SELEGILINE HYDROCHLORIDE

**Indications:** Parkinson's disease, used alone or as adjunct to levodopa with dopa-decarboxylase inhibitor (but not drug-induced extrapyramidal effects).

**Cautions:** avoid abrupt withdrawal; gastric and duodenal ulceration (avoid in active ulceration), uncontrolled hypertension, arrhythmias, angina, psychosis, side-effects of levodopa may be increased, concurrent levodopa dosage can be reduced by 10–20%.

**Contra-Indications:** pregnancy; breast-feeding.

**Side effects:** nausea, constipation, diarrhoea, dry mouth; postural hypotension; dyskinesia, vertigo, sleeping disorders, confusion, hallucinations; arthralgia, myalgia; mouth ulcers with oral lyophilisate; rarely arrhythmias, agitation, headache, micturition difficulties, skin reactions; also chest pain.

**Dose:** 10 mg in the morning or 5 mg at breakfast and midday.

To avoid initial confusion and agitation, it may be appropriate to start treatment with a dose of 2.5 mg daily, particularly in the elderly.

- Eldepryl Tablets 5 mg

TRIHEXYPHENIDYL HYDROCHLORIDE

(Benzhexol Hydrochloride)

This is an antimuscarinic drug.

**Indications:** Parkinsonism, particularly with apathy and depression; drug-induced extrapyramidal effects (but not tardive dyskinesia).

**Cautions:** cardiovascular, renal and hepatic impairment; psychotic disorders; prostatic hypertrophy; elderly; may cause abuse; avoid abrupt withdrawal.

**Contra-Indications:** gastrointestinal obstruction; tardive dyskinesia.

**Side effects:** Constipation, dry mouth, nausea, vomiting, tachycardia, dizziness, confusion, euphoria, hallucinations, impaired memory, anxiety, restlessness, urinary retention, blurred vision and rash.

**Dose:** 1 mg daily gradually increased; Usual maintenance dose, 5-15 mg daily in 3-4 divided doses.

- Artane Tablets 2 mg & 5 mg
DRUGS USED IN CHOREAS, TICS AND RELATED DISORDERS

HALOPERIDOL

**Indications:** motor tics, stuttering, and symptoms of Gilles de la Tourette syndrome and related Choreres; as an antipsychotic.

**Cautions, Contra-Indications & Side effects:** See under antipsychotic drugs.

**Dose:** by mouth, 0.5-1.5 mg 3 times daily adjusted according to response; 10 mg daily or more may occasionally be necessary in Gilles de la Tourette syndrome.

Child, stuttering, 50 mcg/kg daily; Gilles de la Tourette syndrome, up to 10 mg daily.

- Serenace Tablets 1.5 mg, 5 mg & 10 mg
- Haldol Drops 2 mg/ml

PIRACETAM

**Indications:** adjunctive treatment of cortical myoclonus; It is said to protect the cerebral cortex against hypoxia; trauma of surgery; alcoholism; vertigo, senile dementia, cerebrovascular accidents and behavioral disorders in children.

**Cautions:** avoid abrupt withdrawal; elderly; haemostasis, major surgery, or severe haemorrhage; renal impairment.

**Contra-Indications:** cerebral haemorrhage; hepatic and severe renal impairment; pregnancy and lactation.

**Side-effects:** weight gain, nervousness, hyperkinesia; less commonly drowsiness, depression, asthenia; also reported abdominal pain, nausea, vomiting, diarrhoea, headache, anxiety, confusion, hallucination, vertigo, ataxia, insomnia, and rash.

**Dose:** initially 7.2 g daily in 2–3 divided doses, increased according to response by 4.8 g daily every 3–4 days to max. 20 g daily (subsequently, attempts should be made to reduce dose of concurrent therapy); CHILD under 16 years not recommended

- Nootropil 800mg Tablet
- Nootropil Infusion 400 mg
- Nootropil Oral Solution 20 % (1 ml = 330 mg)
PROPRANOLOL

**Indications:** treatment of essential tremors or tremors associated with anxiety or thyrotoxicosis.

**Dose:** by mouth, 40 mg 2-3 times daily increased if necessary; 80-160 mg daily is usually required for maintenance.

- *Inderal Tablets 10 mg & 40 mg*

PRIMIDONE

**Indications:** benign essential tremor.

**Dose:** by mouth, 125 mg 3 times daily.

- *Mysoline Tablets 250 mg*

OTHERS

MAGNESIUM SULFATE

**Indications:** reduction of elevated intracranial pressure; central nervous system depressant; convulsive states; hypomagnesaemia.

**Dose:** by I.M. injection, 1-5 g as a 25 or 50% solution, repeated up to 6 times daily, if necessary.

By I.V. injection or infusion, 1-4 g as a 10 or 20% solution at a rate not exceeding 150 mg per minute.

- *Magnesium Sulfate Injection 50%*

METHYLPHENIDATE HYDROCHLORIDE

This is a CNS stimulant

**Indications:** narcolepsy, excessive drug sedation, hyperkinetic behavior in children (attention deficit hyperactivity disorder); cerebral arteriosclerosis.

**Cautions:** epilepsy, hypertension, tolerance or dependence can occur, avoid long-term use, pregnancy.

**Contra-Indications:** cardiovascular disease, hyperthyroidism, glaucoma, severe depression, psychosis; anxiety, hyper excitability or restlessness; tics or a family history of Tourette syndrome; drug or alcohol dependence; hyperthyroidism; breast-feeding.

**Side-effects** abdominal pain, nausea, vomiting, dyspepsia, dry mouth, anorexia, reduced weight gain; tachycardia, palpitation, arrhythmias, changes in blood pressure; tics (very rarely Tourette Syndrome), insomnia, nervousness, asthenia, depression, irritability, aggression, headache,
drowsiness, dizziness, movement disorders; fever; arthralgia; rash, pruritus, alopecia; less commonly diarrhoea, abnormal dreams, confusion, suicidal ideation, urinary frequency, haematuria, muscle cramps, epistaxis; rarely angina, growth restriction, visual disturbances; very rarely hepatic dysfunction, myocardial infarction, cerebral arteritis, psychosis, neuroleptic malignant syndrome, tolerance and dependence, blood disorders including leucopenia and thrombocytopenia, angle-closure glaucoma, exfoliative dermatitis, erythema multiforme.

**Dose:** 10 mg 2-3 times daily before food (last dose not later than 4 p.m.)
Child above 6 years, 5 mg twice daily increasing if necessary by weekly increments of 5-10 mg max. 60 mg daily in divided doses.
Not recommended for children under 6 years.

- *Ritalin Tablets 10 mg*
**GASTROINTESTINAL SYSTEM**

**ANTACIDS**

**ALUMINIUM HYDROXIDE & MAGNESIUM HYDROXIDE**

*Indications:* Dyspepsia, used for the symptomatic relief of hyperacidity associated with gastritis, peptic ulceration, oesophageal reflux with heartburn and gastric hyperacidity.

*Caution:* Patient with gastrointestinal haemorrhage, patient with CHF, oedema, patient on low sodium diets, hypertension, cirrhosis and renal failure.

*Contraindication:* Known hypersensitivity to aluminium hydroxide or magnesium hydroxide.

*Pregnancy:* It is likely to cause complications for the mother or the baby, there is insufficient safety data.

*Drug Interactions:* Antacids `reduce the absorption of other drugs if they are taken at the same time. Drug affected include: azithromycin, benzodiazepines, captopril, ciprofloxacin cimetidine, iron, isoniazid, ketoconazole, naproxen, norfluraxin, ofloxacin, phenytoin, ranitidine, tetracyclines.

*Side effect:* Constipation, chalky taste, stomach cramps, decrease bowel motility, fecal impaction.

*Dose:* 10 ml - 20 ml suspension or 1-2 tablets chewed 4 times daily after meal and at bed time, children under 12 years not recommended.

- Moxal Suspension & Moxal Chewable Tablets (Aluminium Hydroxide 405 mg & Magnesium Hydroxide 100mg Per 5 ml Or Tablet)

**SODIUM BICARBONATE**

*Indications:* Simple hyperchlorhydria, dyspepsia, acidosis, alkalisation of urine.

*Caution:* Cardiac failure, hypertension, impaired renal function, peripheral and pulmonary oedema and in toxaemia of pregnancy.

*Dose:* 1-5 g when required or 10 ml of Carminative mixture to be repeated up to 4 times in a day if needed.

- Sodium Bicarbonate Tablets 600 mg
Gastrointestinal system

- Carminative Mixture (With Zingiberis Tincture, Cardamom Tincture & Aromatic Spirit Of Ammonia)

ANTISPASMODICS

<table>
<thead>
<tr>
<th>CLIDINUM BROMIDE AND CHLORDIAZEPoxide</th>
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<tbody>
<tr>
<td><strong>Indications:</strong> Antispasmodic agent, gastritis, effective as adjunctive therapy in the treatment of peptic ulcer, treatment of irritable bowel syndrome.</td>
</tr>
<tr>
<td><strong>Cautions:</strong> Use with caution with ethanol or other CNS depressants, because of possible combined effects.</td>
</tr>
<tr>
<td><strong>Contraindications:</strong> glaucoma, prostatic hyperplasia, benign bladder neck obstruction, pregnancy, breast feeding.</td>
</tr>
<tr>
<td><strong>Side effect</strong> Blurred vision, confusion, constipation, drowsiness, dry mouth, fainting, lack of coordination, liver problems, minor menstrual irregularities, nausea, skin eruptions, swelling due to fluid retention, urinary difficulties.</td>
</tr>
<tr>
<td><strong>Dose:</strong> 1-2 tablets 3-4 times daily before meal and at bedtime.</td>
</tr>
</tbody>
</table>

- Librax Tablets (Chlordiazepoxide 5 mg & Clidinium Bromide 2.5 mg/Tablets)

<table>
<thead>
<tr>
<th>HYOSCINE BUTYLBROMIDE</th>
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</thead>
<tbody>
<tr>
<td><strong>Indications:</strong> symptomatic relief of gastro-intestinal or genito-urinary tract disorders characterized by smooth muscle spasm, bowel colic and excessive respiratory secretions.</td>
</tr>
<tr>
<td><strong>Contraindications:</strong> hypersensitivity to scopolamine or any component of the formulation of narrow angle glaucoma, GI or GU obstruction, acute hemorrhage, paralytic ileus, thyrotoxicosis, tachycardia secondary to cardiac insufficiency, myasthenia gravis.</td>
</tr>
<tr>
<td><strong>Precautions:</strong> use with caution with hepatic or renal impairment pregnancy, use with caution in patient with GI obstruction, use with caution in Down syndrome, in children and elderly.</td>
</tr>
</tbody>
</table>
| **Side effect** anticholinergic side effects including dry mouth, dryness of skin, tachycardia, and urinary
Gastrointestinal system

retention, constipation, dilatation of the pupil with loss of accommodation, photophobia.

**Drug interactions:** decreased effect of paracetamol, levodopa, ketoconazole, digoxin, riboflavin, increased toxicity when given with other anticholinergic agents.

**Dose:** By mouth, adult dose is 20 mg 4 times daily; child 6-12 years, 10 mg 3 times daily.

Irritable bowel syndrome, 10 mg 3 times daily; increased if necessary up to 20 mg 4 times daily. By I.M. or I.V. injection, acute spasm and spasm in diagnostic procedures, 20 mg repeated after 30 minutes if necessary.

- Buscopan Tablets 10 mg
- Buscopan Injection 20 mg/ml (1ml Ampoule)

**PIPENZOLATE BROMIDE**

**Indications:** gastrointestinal colic in children.

**Side effect** Blurred vision, confusion, constipation, drowsiness, dry mouth.

**Dose:** 3-6 months, 2 mg 1-2 times daily. 6-12 months, 2 mg 2-3 times daily. 1-3 years, 2-4mg 2-3 times daily. Over 3 years, 4mg up to 3 times daily. All doses 15 minutes before feeding.

- Alinal Oral Drops (Pipenzolate Bromide 4 mg With Phenobarbital 6 mg/ml)

**ULCER-HEALING DRUGS**

**CIMETIDINE**

H2 receptor antagonist.

**Indications:** benign gastric and duodenal ulceration, stomach ulcer, reflux oesophagitis, Zollinger - Ellison syndrome, other conditions where gastric and acid reduction is beneficial.

**Caution:** Should be used with caution in impaired renal function, hepatic impairment; in pregnancy and breast feeding, they may mask symptoms of gastric cancer.

**Side effect:** Diarrhea and other gastro-intestinal disturbances, dizziness, rash, tiredness; occasionally, gynaecomastia (in high doses), reversible confusional states, reversible liver damage, headache; rarely, decreased blood counts, alopecia, muscle or joint pain, bradycardia; interstitial nephritis and acute pancreatitis.
Drug interactions: Increases plasma concentration of cyclosporine, diltiazem, labetalol, metronidazole, nifedipine, propranolol, procainamide and quinidine. It also potentiates the effects of warfarin, theophylline, carbamazepine, phenytoin, chlorothiazide, amitriptyline, desipramine, imipramine, clonazepam, chlordiazepoxide, diazepam, flurazepam and nitrazepam. Cimetidine increases the cardiac risks associated with lidocaine and decreases absorption of ketoconazole. Rifampicin reduces plasma concentration of cimetidine and absorption of cimetidine may be decreased in the presence of antacids and sucralfate.

Dose: by mouth, 400 mg twice daily (with breakfast and at night) or 800 mg at night (benign gastric and duodenal ulcer). For at least 4 weeks (6 weeks in gastric ulceration and 8 weeks in NSAID-associated ulceration); when necessary the dose may be increased to 400 mg 4 times daily or rarely (as in stress ulceration) to max. of 2.4 g daily in divided doses. Infant under 1 year 20 mg/kg daily in divided doses has been used, Child over 1 year, 25-30 mg/kg daily in divided doses.

Maintenance, 400 mg at night or 400 mg morning and night. Reflux oesophagitis, 400 mg 4 times daily for 4-8 weeks. Zollinger-Ellison syndrome, 400 mg 4 times daily or more.

Gastric acid reduction (prophylaxis of acid aspiration) obstetrics 400 mg at start of labour, then up to 400 mg every 4 hours if required (max. 2.4 g daily). Surgical procedures, 400 mg 90-120 minutes before induction of general anesthesia. Short-bowel syndrome, 400 mg twice daily (with breakfast and at bedtime) adjusted according to response.

To reduce degradation of pancreatic enzyme supplements, 0.8 - 1.6 g daily in 4 divided doses according to response 1-1.5 hours before meals.

By intramuscular injection, 200 mg every 4-6 hours; max 2.4 g daily.

By slow intravenous injection, 200 mg given over at least 2 minutes, may be repeated every 4-6 hours; if a larger dose is needed or there is cardiovascular impairment, the dose should be diluted and given over at least 10 minutes (infusion is preferable); max 2.4 g daily.
Gastrointestinal system

By intravenous infusion, 200-400 mg (may be repeated every 4-6 hours) or by continuous infusion at an average rate of 50-100 mg/hour over 24 hours, max 2.4 daily. Child over 1 year, by intramuscular injection or slow intravenous injection or infusion, 25-30 mg/kg daily in divided doses. Infant under 1 year, by I.M. or slow I.V. injection or infusion 20 mg/kg daily in divided doses.

- Tagamet Tablets 400 mg
- Tagamet Injection 100 mg/ml (2 ml Ampoule)
- Dyspamet Syrup 200mg/5ml

RANITIDINE

H2 receptor antagonist.

Indications: benign gastric and duodenal ulceration, stomal ulcer, reflux oesophagitis, Zollinger-Ellison syndrome, other conditions where reduction of gastric acidity is beneficial.

Caution: Should be used with caution in impaired renal function, hepatic impairment; dosage modification required, avoid use in patients with history of acute porphyria, in pregnancy and breast feeding, they may mask symptoms of gastric cancer, long term therapy may cause vitamin B12 deficiency.

Contraindications: Hypersensitivity to ranitidine.

Side effect: Diarrhea and other gastro-intestinal disturbances, dizziness, rash, tiredness; occasionally, gynaecomastia and impotence (in high doses), reversible confusional states, reversible liver damage, headache; rarely, decreased blood counts, alopecia, muscle or joint pain, bradycardia, acute pancreatitis, rarely visual disturbances, tachycardia, agitation, erythema multiforme, alopecia, vasculitis, and very rarely interstitial nephritis.

Dose: by mouth, adult and child over 12 years, 150 mg twice daily or 300 mg at night for 4 to 8 weeks in benign gastric and duodenal ulceration, up to 6 weeks in chronic episodic dyspepsia, and up to 8 weeks in NSAID – associated ulceration (in duodenal ulcer 300 mg can be given twice daily for 4 weeks to achieve higher healing rate). Child over 3 years, (benign gastric and duodenal
ulceration) 2-4 mg / kg (max 150 mg) twice daily for 4 to 8 weeks.
Duodenal ulcer associated with H. pylori, 300 mg twice daily, require combination therapy. See under guidelines for treatment of H. pylori.
Prophylaxis of NSAID-associated gastric or duodenal ulcer, adult and child over 12 years 300 mg twice daily.
Gastro-oesophageal reflux disease, adult and child over 12 years, 150 mg twice daily or 300 mg at night for up to 8 weeks or if necessary 12 weeks (moderate to severe, 600 mg daily in 2-4 divided doses for up to 12 weeks),
long term treatment of healed gastro-oesophageal reflux disease, 150 mg twice daily; child over 3 years, 2.5 – 5 mg / kg (max. 300 mg) twice daily.
Zollinger-Ellison syndrome (proton pump inhibitor is preferred), adult and child over 12 years, 150 mg 3 times daily, doses up to 6 g daily in divided doses have been used.
Gastric acid reduction (prophylaxis of acid aspiration) in obstetrics. By mouth 150 mg at onset of labour, then every 6 hours, surgical procedures, by intramuscular or slow intravenous injection, 50 mg 45-60 minutes before induction of anaesthesia (intravenous injection diluted to 20 ml and given over at least 2 minutes), or by mouth, 150 mg 2 hours before induction of anaesthesia and also when possible on the preceding evening.
By intramuscular injection, 50 mg every 6-8 hours.
By slow intravenous injection, 50 mg diluted to 20 ml and given over at least 2 minutes, may be repeated every 6-8 hours.
By intravenous infusion, 25mg / hour for 2 hours, may be repeated every 6-8 hours.
Prophylaxis of stress ulceration, initial slow intravenous injection of 50 mg (as above) then continuous infusion, 125-250 mcg / kg / hour (may be followed by 150 mg twice daily by mouth when oral feeding commences)
- Zantac 150mg Tablets
- Zantac 25mg/2ml Ampoules
TRIPOTASSIUM DICITRATE + BISMUTH (Bismuth Chelate)

**Indications:** benign gastric, duodenal ulceration, and in Helicobacter pylori eradication (combination therapy).

**Cautions:** Hepatic dysfunction, encephalopathy was reported with prolong use.

**Contraindications:** renal impairment; pregnancy.

**Side effect** nausea and vomiting and may darken tongue and blacken faeces.

**Drug interactions:** It reduces absorption of tetracyclines.

**Dose:** 2 tablets twice daily or 1 tablet 4 times daily, 30 minutes before meal, taken for 28 days followed by further 28 days if necessary. The course may be repeated after intervals of one month. Not recommended for children.

- De-Nol Tablets 120 mg

**HELICOBACTER PYLORI INFECTION**

Eradication of *Helicobacter pylori* reduces recurrence of gastric and duodenal ulcers. The presence of *H. pylori* should be confirmed before starting eradication treatment. Acid inhibition combined with antibacterial treatment is highly effective in the eradication of *H. pylori* reinfection is rare. Antibiotic-induced colitis is an uncommon risk.

For initial treatment, a one-week triple-therapy regimen that comprises a proton pump inhibitor, clarithromycin, and either amoxicillin or metronidazole can be used. However, if a patient has been treated with metronidazole for other infections, a regimen containing a proton pump inhibitor, amoxicillin, and clarithromycin is preferred for initial therapy. If a patient has been treated with clarithromycin for other infections, a regimen containing a proton pump inhibitor, amoxicillin, and metronidazole is preferred for initial therapy. These regimens eradicate *H. pylori* in about 85% of cases. There is usually no need to continue antisecretory treatment (with a proton pump inhibitor or H2-receptor antagonist) unless the ulcer is large, or complicated by haemorrhage or perforation. Treatment failure usually indicates antibacterial resistance or poor compliance. Resistance to amoxicillin is rare. However, resistance to clarithromycin and metronidazole is common and can develop during treatment.
Two-week triple-therapy regimens offer the possibility of higher eradication rates compared to one-week regimens, but adverse effects are common and poor compliance is likely to offset any possible gain.

Two-week dual-therapy regimens using a proton pump inhibitor and a single antibacterial are licensed, but produce low rates of H. pylori eradication and are not recommended.

Tinidazole is also used occasionally for H. pylori eradication; it should be combined with antisecretory drugs and other antibacterials.

A two-week regimen comprising a proton pump inhibitor plus tripotassium dicitratobismuthate, plus tetracycline 500 mg four times daily, plus metronidazole 400 mg three times daily can be used for eradication failure. Alternatively, the patient can be referred for endoscopy and treatment based on the results of culture and sensitivity testing.

**RECOMMENDED REGIMENS FOR HELICOBACTER PYLORI ERADICATION IN ADULTS**

<table>
<thead>
<tr>
<th>Acid suppressant</th>
<th>Amoxicillin</th>
<th>Clarithromycin</th>
<th>Metronidazole</th>
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</thead>
<tbody>
<tr>
<td>Esomeprazole</td>
<td>1 g twice daily</td>
<td>500 mg twice daily</td>
<td>—</td>
</tr>
<tr>
<td>20 mg twice daily</td>
<td>—</td>
<td>250 mg twice daily</td>
<td>400 mg twice daily</td>
</tr>
<tr>
<td>Omeprazole</td>
<td>1 g twice daily</td>
<td>500 mg twice daily</td>
<td>—</td>
</tr>
<tr>
<td>20 mg twice daily</td>
<td>500 mg 3 times daily</td>
<td>400 mg 3 times daily</td>
<td></td>
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</tbody>
</table>
Gastrointestinal system

Antibacterial

<table>
<thead>
<tr>
<th>Acid suppressant</th>
<th>Amoxicillin</th>
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<th>Metronidazole</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>250 mg twice daily</td>
<td>400 mg twice daily</td>
</tr>
<tr>
<td>Rabeprazole</td>
<td>1 g twice daily</td>
<td>500 mg twice daily</td>
<td>—</td>
</tr>
<tr>
<td>20 mg twice daily</td>
<td></td>
<td>250 mg twice daily</td>
<td>400 mg twice daily</td>
</tr>
</tbody>
</table>

PROTON PUMP INHIBITORS

ESOMEPRAZOLE

Suppresses gastric acid secretion by blocking proton pump within gastric parietal cells

Indications: gastroesophageal reflux disease (GERD), duodenal ulcer associated with Helicobacter pylori in combination with amoxicillin and clarithromycin or metronidazole, gastric ulcers associated with continuous NSAID therapy.

Caution: Used with caution in patients with liver disease, in pregnancy, breast-feeding and it may mask the symptoms of gastric cancer.

Side effect: Flatulence; abdominal pain, dyspepsia, nausea; vomiting, diarrhoea, dry mouth; constipation; Headache; dizziness. Less frequent side effects include dry mouth, insomnia, drowsiness, malaise, blurred vision, rash, and pruritus and dermatitis.

Dose: By mouth duodenal ulcer associated with Helicobacter pylori 20 mg twice daily for 2 weeks in combination with amoxicillin, 1000 mg twice daily and clarithromycin 500mg twice daily or metronidazole 400 mg twice daily, see page

NSAID- associated gastric ulcer, 20 mg once daily for 4-8 weeks; Prophylaxis in patients with an increased risk of
Gastrointestinal system

gastroduodenal complications who required continued
NSAID treatment, 20 mg daily.
Gastro-oesophageal reflux disease, 40 mg once daily for 4
weeks, continued for further 4 weeks if not fully healed or
symptoms persist, maintenance 20 mg daily, symptomatic
treatment in the absence of oesophagitis, 20 mg daily for
up to 4 weeks, then 20 mg daily when required.
Not recommended in children.
By intravenous injection over at least 3 minutes or by
intravenous infusion, gastro-oesophageal reflux disease,
40 mg once daily, symptomatic reflux disease without
oesophagitis, treatment of NSAID-associated gastric
ulcer, prevention of NSAID-associated gastric or
duodenal ulcer, 20 mg daily, continue until oral
administration possible.

Nexium Tablets 20 mg

OMEPRAZOLE

Suppresses gastric acid secretion by blocking acid
(proton) pump within gastric parietal cell.

Indications: Benign gastric, duodenal and NSAID
induced ulcer, oesophageal reflux disease, ulcer associated
with H. pylori infection, Zollinger-Ellison syndrome, gastric acid reduction during anaesthesia, acid-related dyspepsia and severe ulcerating reflux
oesophagitis.

Caution: To be used with caution in presence of liver
diseases (does not more than 20 mg daily should be
needed, reduced dose, not more than 8 mg daily in severe
cases), gastric malignancy should be excluded before
initiation of treatment.

Precautions: Avoid in pregnancy and breast feeding.

Side effects: Flatulence; abdominal pain, dyspepsia,
nausea; vomiting, diarrhoea, dry mouth; constipation;
headache; dizziness, insomnia, drowsiness, malaise,
rash, pruritus, paraesthesia, vertigo, alopecia, gynaecomastia, impotence, stomatitis, encephalopathy in severe liver
disease, hyponatraemia, reversible confusion, Agitation
and hallucinations in the severely ill, visual impairment
reported with high-dose injection.
**Dose:** By mouth, benign gastric and duodenal ulcers, 20 mg once daily for 4 weeks in duodenal ulceration or 8 weeks in gastric ulceration, in severe or recurrent cases increase to 40 mg daily, maintenance for recurrent duodenal ulcer, 20 mg once daily, prevention of relapse in duodenal ulcer, 10 mg daily increasing to 20 mg once daily if symptoms return.

NSAID-associated duodenal or gastric ulcer and gastroduodenal erosions, 20 mg once daily for 4 weeks, continued for further 4 weeks if not fully healed, prophylaxis in patients with a history of NSAID-associated duodenal or gastric ulcers, gastroduodenal lesions, or dyspeptic symptoms who require continued NSAID treatment, 200 mg once daily.

Duodenal or benign gastric ulcer associated with H. pylori, omeprazole 20 mg twice daily in combination with amoxicillin, 1000 mg twice daily or 500 mg 3 times daily and clarithromycin 500 mg twice daily or metronidazole 400 mg twice daily or 400 mg 3 times daily, see page

Zollinger- Ellison syndrome, initially 60 mg once daily, usual range 20-120 mg daily (above 80 mg in divided doses).

Gastric acid reduction during general anaesthesia 40 mg on the preceding evening then 40 mg 2-6 hours before surgery.

Gastro-oesophageal reflux disease, 20 mg once daily for 4 weeks, continued for further 4-8 weeks if not fully healed, 40 mg once daily has been given for 8 weeks in gastro-oesophageal reflux disease refractory to other treatment, maintenance, 20 mg once daily.

Acid reflux disease (long term management), 10 mg daily increasing to 20 mg once daily if symptoms return.

Acid related dyspepsia, 10-20 mg once daily for 4-8 weeks according to response.

Severe ulcerating reflux oesophagitis, child over 1 year, body weight 10-20 kg, 10 mg once daily increased if necessary to 20 mg once daily for 4-12 weeks, body weight over 20 kg, 20 mg once daily increased if necessary to 40 mg once daily for 4-12 weeks, to be initiated by hospital paediatrician.

By intravenous injection over 5 minutes or by intravenous infusion, prophylaxis of acid aspiration, 40 mg completed 1 hour before surgery.
Benign gastric ulcer, duodenal ulcer and gastro-oesophageal reflux, 40 mg once daily until oral administration possible.

- Losec Tablets 20mg
- Omizac Tablets 20mg
- Risek Injections 40 mg

RABEPRAZOLE

Suppresses gastric acid secretion by blocking acid (proton) pump within gastric parietal cells.

**Indications:** short-term treatment in healing and symptomatic relief of duodenal ulcers and erosive or ulcerative gastroesophageal reflux disease (GERD); maintaining healing and reducing relapse rates of heartburn symptoms in patients with GERD; treatment of daytime and nighttime heartburn and other symptoms associated with GERD; long-term treatment of pathological hypersecretory conditions, including Zollinger-Ellison syndrome and in combination with amoxicillin and clarithromycin to eradicate Helicobacter pylori.

**Caution:** Adjust the doses in chronic hepatic function impairment patients.

**Precautions:** Avoid in pregnancy and breast feeding.

**Side effect** Headache; insomnia; anxiety; dizziness; depression; nervousness; dry eyes; abnormal vision; Diarrhea; nausea; abdominal pain; vomiting; dyspepsia; flatulence; constipation; dry mouth.

**Dose:**
- Healing of Duodenal Ulcers, Adults: orally 20 mg/day after the morning meal for 4 wk, additional therapy may be required for some patients.
- Treatment of Erosive or Ulcerative GERD, Adults: orally 20 mg/day for 4 to 8 wk, an additional 8 wk may be considered for patients who do not heal. Maintenance of Erosive or Ulcerative GERD, Adults: orally 20 mg/day.
- Treatment of Symptomatic GERD, Adults: orally 20 mg once daily for 4 wk. An additional course of treatment may be considered if symptoms do not resolve after 4 weeks.
- Treatment of Pathological Hypersecretory Conditions, Adults: orally 60 mg/day. Doses up to 100mg daily or 60 mg twice daily have been administered.
H. Pylori Eradication to Reduce Risk of Duodenal Ulcer Recurrence, Adults: orally 20 mg rabeprazole plus amoxicillin 1,000 mg plus clarithromycin 500 mg bid for 7 days with morning and evening meals.

Tablets 20 mg

ANTI-DIARRHOEALS

LOPERAMIDE HYDROCHLORIDE

Loperamide is acts directly on intestinal muscles to inhibit peristalsis and prolongs transit time enhancing fluid and electrolyte movement through intestinal mucosa, reduces fecal volume, increases viscosity, and diminishes fluid electrolyte loss, demonstrates antisecretory activity exhibits peripheral action.

Indications: Symptomatic treatment of acute diarrhea, adjunct to rehydration in acute and chronic diarrhoea in adults and in adults and in acute diarrhoea in children over 4 years of age.

Caution: liver disease; pregnancy.

Contraindications: Children below 4 years. Diarrhoea of ulcerative colitis or antibiotic-associated colitis. Treatment should be avoided in the patients with acute dysentery, which is characterised with blood in stools and high fever. Treatment is not recommended for patients who could suffer detrimental effects from rebound constipation. If there is a suspicion of diarrhea associated with organisms that can penetrate the intestinal walls, such as E. coli or salmonella, loperamide is contraindicated.

Side effect drowsiness, dizziness, fatigue, sedation, constipation, abdominal pain or discomfort, dry mouth, and nausea, rash, toxic epidermal necrolysis.

Dose: Acute diarrhoea, 4 mg initially followed by 2 mg after each loose stool for up to 5 days, usual dose 6-8 mg daily, max. 16 mg daily, children under 4 years not recommended, Child, 4-8 years, 1 mg 3-4 times daily for up to 3 days only, 9-12 years, 2 mg 4 times daily for up to 5 days.

Chronic diarrhoea in adults, 4-8 mg daily in divided doses initially and then if necessary adjusted according to
response and given twice daily for maintenance. Maximum, 16 mg daily.

- **IModium Capsules 2 mg**

**TREATMENT OF CHRONIC BOWEL DISORDERS**

**AZATHIOPRINE**

*Indications:* induction and maintenance of remission in ulcerative colitis and Crohn's disease.

*Cautions:* Use with caution in patients with liver disease, renal impairment, monitor hematological functions regularly, reduce dose in elderly.

*Contraindications:* pregnancy, breast feeding.

*Side effect:* Rash, nausea; vomiting, diarrhoea, anorexia, aphthous stomatitis, pancreatitis, leukopenia; thrombocytopenia; macrocytic anemia; bleeding, selective erythrocyte aplasia, fever, chills, alopecia, retinopathy, hepatotoxicity, jaundice, hepatic veno-occlusive disease.

*Drug Interactions:* Allopurinol decreases metabolism of azathioprine.

*Dose:* 1 - 3 mg/kg daily given as single dose or twice daily.

- **Imuran Tablets 50 mg**

**COLESTYRAMINE (Cholestyramine)**

*Indications:* diarrhoea associated with ileal disease, ileal resection and post vagotomy diarrhoea, pruritis in liver disease. Adjunctive therapy to diet for reduction of elevated serum cholesterol in patients with primary hypercholesterolemia.

*Caution:* Bleeding tendencies related to vitamin K deficiency, folic acid deficiency. Fat-soluble vitamin deficiencies, hyperchloremic acidosis, osteoporosis, pregnancy, breast feeding. Monitor serum lipids frequently during first few months of therapy and periodically thereafter.

*Contraindications:* Hypersensitivity to bile acid sequestering resins; complete biliary obstruction.

*Side effects:* Abdominal pain, discomfort, and distention; aggravation of hemorrhoids; anorexia; bleeding; constipation (can be severe and at times accompanied by
Gastrointestinal system

fetal impaction); diarrhea; eructation; flatulence; nausea; steatorrhea; vomiting.

**Drug interactions:** This medicine can interfere with the absorption of other medicines from the gut if they are taken at the same time. To avoid this, any other medicines should be taken at least 1 hour before or 4 to 6 hours after taking colestyramine.

If you are taking any of the following medicines your treatment should be monitored, as colestyramine may alter the effects of these medicines, even if the above advice regarding timing of doses is followed.

**Dose:** Diarrhoea, initially 12-24 g daily mixed with water in 1-4 divided doses, subsequently adjusted as required, max. 36 g daily, Children 6-12 consult product literature.

Pruritis, 4-8 g daily. Mixed with water, Children 6-12 consult product literature

[*Questran Powder 4 G / Sachet*]

**INFLIXIMAB**

It is a monoclonal antibody that binds to human tumor necrosis factor alpha (TNFα) receptor sites.

**Indications:** In management of active Crohn's disease in patients who have an inadequate response to conventional therapy; reduce the number of draining enterocutaneous fistulas in fistulizing disease; active rheumatoid arthritis and severe chronic plaque psoriasis.

**Cautions:** Hepatic impairment, renal impairment, monitor for infections before, during and for 6 months after treatment (Tuberculosis patients should be evaluated before treatment). Active tuberculosis should be treated with standard treatment for at least 2 months before starting infliximab), heart failure (discontinue if symptoms develop, or worsen, avoid in moderate or severe heart failure).

**Contraindications:** in patients with history of active tuberculosis; serious infections such as sepsis, hepatitis, pneumonia, or pyelonephritis, pregnancy, breast feeding.

**Side effect:** hypersensitivity reactions including urticaria, dyspnea, and hypotension. Autoimmune antibodies and a lupus-like syndrome have been reported; hepatitis, diarrhea, constipation, cholecystitis, gastro-intestinal
haemorrhage, flushing, bradycardia, arrhythmias, fatigue, anxiety, drowsiness, dizziness.

Dose: Crohn's disease, moderately to severely active: 5mg/kg as a single infusion over a minimum of 2 hours. In fistulizing: 5mg/kg as an infusion over a minimum of 2 hours; dose repeated after 2 and 6 weeks from initial infusion.

- Remicade Injections (IV Infusion) 100mg.

MESALAZINE (Mesalamine) (5-Aminosalicylic Acid)

Indications: ulcerative colitis, management of active Crohn's disease. Rectally used to treat distal ulcerative colitis, proctosigmoiditis, or proctitis.

Caution: renal disorders; raised blood urea or proteinuria; pericarditis; Pancreatitis, pregnancy, breast feeding.

Contraindications: sensitivity to salicylates; moderate and severe renal impairment; hepatic impairment, children under 2 years of age.

Side effect: cramping, acute abdominal pain, bloody diarrhea; vomiting, nausea, headache; depression of bone marrow, chest pain, shortness of breath, pancreatitis and pericarditis should be considered, sore throat, hemorrhoids, blood disorders; renal dysfunction, skin reactions (including lupus erythematosus-like syndrome, Stevens-Johnson syndrome), alopecia.

Dose: Adult (usual course of therapy is 3-8 weeks):
Orally: treatment of ulcerative colitis, initial: 2 tablets 3 times / days for 6 weeks, maintenance of remission of ulcerative colitis, 1.6 g / day in divided doses.
Rectally: one supp. (500mg) twice daily. Some patients may require rectal and oral therapy concurrently.

- Asacol Tablets 400mg
- Pentasa Tablets 500mg
- Pentasa Rectal Suppositories 500mg

PREDNISOLONE

Indications: induction and maintenance of remission in ulcerative colitis; and Crohn's disease.

Caution: Use with caution in hyperthyroidism, cirrhosis, hypertension, osteoporosis, congestive heart failure, diabetes, peptic ulcer, and myasthenia gravis, renal impairment, corneal perforation, epilepsy,
hypothyroidism, hypertension, pregnancy, breast feeding, frequent monitoring required if history of tuberculosis.

**Contraindications:** glaucoma, hypersensitivity, systemic fungal infections, certain viral infections such as varicella and herpes genitalis infections.

**Side effect** Gastric and duodenal ulceration, with possible perforation and hemorrhage may occasionally occur, Cushing-like syndrome, menstrual irregularities, hirsutism, Acute adrenal insufficiency may occur with abrupt withdrawal after long term therapy.

**Drug interactions:** barbiturates, phenytoin, salicylates, vaccines, rifampicin, cholestyramine and colestipol decreased corticosteroids effect. Corticosteroids may decrease the effect of oral hypoglycemic agents, anticoagulants, aspirin, oral contraceptives.

**Dose:** by mouth, initial dose 10-20 mg daily, in single or divided doses, until remission occurs, followed by reducing doses. Rectally, initially, 20 mg enema daily at bedtime for 2-4 weeks then reduced to one enema on alternate days. The enema should be retained for at least 1 hour.

- Prednisolone Tablets 1mg, 5mg & 20mg
- Prednisolone Retention Enema 0.2%

**SULFASALAZINE**

**Indications:** induction and maintenance of remission in ulcerative colitis and colonic Crohn's disease; rheumatoid arthritis.

**Caution:** adequate fluid intake to prevent crystalluria, pregnancy, hepatic and renal disease, G6PD deficiency. Blood counts and urine analysis necessary during prolonged treatment; withdraw treatment if blood dyscrasias or hypersensitivity reactions develop.

**Contraindications:** sensitivity to salicylates and sulfonamides. children under 2 years of age

**Side effect** gastro-intestinal effects, loss of appetite, fever, blood disorders, hypersensitivity reactions, ocular complications, stomatitis, parotitis, ataxia, aseptic meningitis, vertigo, tinnitus, insomnia, depression, hallucinations, kidney reactions; oligospermia; urine may be coloured orange.
**Drug interactions:** Sulfasalazine interact with digoxin, folic acid, azathioprine, mercaptopurine, hydantoin, hypoglycemics, methenamine, methotrexate, NSAID, sulfipyrazone, thiazide, thiopurine, uricosuric agents, para-aminobenzoic acid, warfarin.

**Dose:** by mouth, acute attacks, 1-2 g 4 times daily until remission occurs (if necessary corticosteroids may also be given), reducing to a maintenance dose of 500 mg 3-4 times daily. Child, acute 40-60 mg/kg daily; Maintenance dose, 20-30 mg/kg daily.

- *Salazopyrin Tablets E. C. 500mg*

**LAXATIVES**

**BISACODYL**

**Indications:** constipation, bowel evacuation before radiological procedures, endoscopy and surgery. Tablets act within 10-12 hours while suppositories within 1 hour.

**Contraindications:** Nausea, vomiting, or other symptoms of appendicitis; acute surgical abdominal conditions; fecal impaction; intestinal obstruction; undiagnosed abdominal pain; ulcerative lesions of colon; ulcerative hemorrhoids.

**Side effect** Excessive bowel activity (griping, diarrhoea, nausea, vomiting); perianal irritation; bloating; flatulence; abdominal cramping; proctitis and inflammation. Dizziness, fainting. Palpitations.

**Dose:** by mouth for constipation, 5-10 mg after meals usually at night; avoid taking with milk and antacids, child 4-10 years (on medical advice only) 5 mg at night, over 10 years, adult dose. Rectally, 10 mg in the morning. Child under 10 years, 5 mg suppository inserted, over 10 years, adult dose 20-60 minutes before evacuation is required.

Before radiological procedures and surgery, by mouth, 10-20 mg at bedtime before examination and by rectum in suppository 10 mg the following morning. Child 4-10 years by mouth, 5mg the night before procedure and by rectum in suppositories, 5 mg the following morning, over 10 years, adult dose.

- *Dulcolax Tablets 5 mg*
- *Bisacodyl Suppositories 5 mg & 10 mg*
### Gastrointestinal system

**CASTOR OIL**
- **Indications:** constipation, bowel evacuation before radiological procedures, endoscopy, surgery. Acts within 2-8 hours.
- **Contraindications:** intestinal obstruction.
- **Precautions:** pregnancy, menstruation, undiagnosed abdominal pain.
- **Side-effects:** nausea, vomiting, abdominal colic, severe purgative.
- **Dose:** 5-20 ml when required. Child up to 1 year, 1-5 ml; 1-12 years, 5-15 ml in milk or fruit juice before breakfast or on an empty stomach.
  - *Castor Oil*

**GLYCERIN**
- **Indications:** Relieving occasional constipation, promotes peristalsis and evacuation of the lower bowel.
- **Contraindications:** Known hypersensitivity to glycerin anuria, severe dehydration.
- **Precautions:** use cautiously in hypovolemia, confused mental state, congestive heart failure, elderly, senile, diabetic, and severely dehydrated patients, pregnancy.
- **Side effect** Anal irritation; burning sensation; diarrhea; gas; nausea; stomach cramps.
- **Dose:** Children: 1 child suppository as needed. Adult: 1 adult suppository as needed.
  - *Glycerin Suppositories Child & Adult*

**LACTULOSE**
- It contains lactulose 3.35 gm per 5 ml
- **Indications:** Treatment of constipation; prevention and treatment of portal-systemic encephalopathy, including stages of hepatic precoma and coma. It produces increased osmotic pressure within colon and acidifies its contents, resulting in increased stool water content and stool softening. The onset appears after 24 to 48 hr.
- **Contraindications:** galactosaemia, intestinal obstruction.
- **Precautions:** lactose intolerance, patients on galactose-free diet, diabetes mellitus.
- **Side effect** Gaseous distention with flatulence or belching, abdominal discomfort and cramping; diarrhea; nausea; vomiting.
**Dose:** Constipation, initially 15 ml twice daily, gradually reduced according to patient's needs. Child, less than 1 year, 2.5 ml. Child 1-5 years, 5 ml. 6-12 years, 10 ml twice daily, gradually reduced. Hepatic encephalopathy, 30-50 ml 3 times daily, subsequently adjusted to produce 2-3 soft stools daily.
- Duphalac Syrup
- Ezilax Syrup

**MAGNESIUM HYDROXIDE**

*Indications:* Treating acid indigestion, heartburn, and constipation.

*Contraindications:* acute gastro-intestinal conditions.

*Precautions:* Use with caution in patients with severe renal impairment, hepatic impairment, elderly and hypermagnesemia.

*Side effect:* diarrhea, hypermagnesemia, colic, hypotension and muscle weakness.

Drug interactions: This medicine can interfere with the absorption of other medicines from the gut if they are taken at the same time. To avoid this, any other medicines should be taken at least 2-3 hours before taking magnesium hydroxide.

Dose: Adult: 30-60 ml/day or in divided doses. 6-12 years: 15-30 ml/day or in divided doses. 2-5 years: 5-15 ml/day or in divided doses.
- Milk Of Magnesia
- Laxomag Liquid

**MAGNESIUM SULFATE**

*Indications:* Constipation; evacuation of bowel.

*Contraindications:* As for magnesium hydroxide.

*Precautions:* As for magnesium hydroxide

*Side effect:* As for magnesium hydroxide

*Drug interactions:* As for magnesium hydroxide.

*Dose:* rectally, 60-180 ml of 50% solution in water. Orally for rapid bowel evacuation in 2-4 hours, 5-10 g in a glass of water before breakfast.
- Magnesium Sulfate Enema 50% In Water
Gastrointestinal system

ANTI-HEMORROIDAL

HEMORROIDAL PREPARATION
Bismuth, menthol, zinc and lidocaine
**Indications:** External and internal hemorrhoids, anal eczema, anal fissures, anal pruritus, proctitis, anal itching, pre and post operative treatment.
**Dose:** Ointment: 2-3 times daily. Suppository: one suppository morning and one evening.
- Hemoproct Ointment
- Hemoproct Suppositories

HEMORROIDAL PREPARATION with STEROID
Bismuth, menthol, zinc, lidocaine and steroid
**Indications:** External and internal hemorrhoids, anal eczema, anal fissures, anal pruritus, proctitis, anal itching, pre and post operative treatment.
**Contraindications:** As for hydrocortisone.
**Precautions:** As for hydrocortisone.
**Side effect:** As for hydrocortisone.
**Drug interactions:** As for hydrocortisone.
**Dose:** Ointment: 2-3 times daily. Suppository: one suppository morning and one evening.
- Proctoheal Ointment
- Proctoheal Suppositories

LIDOCAINE (Lignocaine)
**Indications:** analgesic ointment for painful and various anal conditions.
**Precautions:** do not leave on large body areas for > 2 hours.
**Side effect:** itching, rash, edema of skin, contact dermatitis.
**Dose:** apply locally once or twice daily
- Lidocaïne 5% Ointment

DRUGS AFFECTING INTESTINAL SECRETIONS

PANCREATIN
**Indications:** replacement therapy in pancreatic enzyme deficiency states such as cystic fibrosis, chronic
pancreatitis, pancreatectomy, total gastrectomy, gastric partial resections and ductal obstruction from neoplasm.  

**Precautions:** severe liver disease, bile duct obstruction, pregnancy.

**Side effect** Colonic strictures; diarrhea; abdominal pain; vomiting; constipation; flatulence; nausea; bloating; cramping, can irritate the perioral skin and buccal mucosa if retained in mouth long enough.  

**Dose:** initially one or two capsules with each meal and snack, then adjust according to response. Maintenance, 5-15 capsules daily. Capsules can be swallowed whole or opened before use and sprinkled on food or fluid and should not be chewed.

- Creon 10,000 (Lipase 10,000 Units, Amylase 8000 Units & Protease 600 Units / Capsule)

**URSODIOL (Ursodeoxycholic acid, UDCA)**

**Indications:** dissolution of cholesterol gallstones, hyperlipidaemia, primary biliary cirrhosis.  

**Caution:** Patients with variceal bleeding, hepatic encephalopathy, ascites or in need of an urgent liver transplant should receive appropriate specific treatment.  

**Contraindications:** radio-opaque stones, pregnancy, non-functioning gall bladder, inflammatory diseases and other conditions of small intestinal, colon and liver which interfere with enterohepatic circulation of bile salts.  

**Drug interactions:** absorption of bile acids possibly reduced by antacids and by lipid – regulating drugs, ursodeoxycholic acid increases absorption of ciclosporin.  

**Side effect** Constipation; diarrhea; dry skin; gas; headache; indigestion; metallic taste; muscle or joint pain; nausea; skin rash; stomach pain; swelling; tiredness.

**Dose:** In dissolution of gallstones, 8-12 mg/kg daily as a single dose at bedtime or in two divided doses, for up to 2 years, treatment is continued for 3-4 months after stones dissolve.  

In treatment of primary biliary cirrhosis, 13-15 mg/kg/day administered in two to four divided doses with food. Dosing regimen should be adjusted according to each patient’s need at the discretion of the physician.

- Urso 125 mg & 250 mg Capsules
ENDOCRINE SYSTEM

ANTIDIABETIC DRUGS

SULPHONYL UREA

The sulphonylureas act mainly by augmenting insulin secretion and consequently are effective only when some residual pancreatic beta-cell activity is present; during long-term administration they also have an extrapancreatic action. All may cause hypoglycaemia but this is uncommon and usually indicates excessive dosage. Sulphonylurea-induced hypoglycaemia may persist for many hours and must always be treated in hospital. Sulphonylureas are considered for patients who are not overweight, or in whom metformin is contra-indicated or not tolerated. Several sulphonylureas are available and choice is determined by side-effects and the duration of action as well as the patient’s age and renal function. The long-acting sulphonylureas chlorpropamide and glibenclamide are associated with a greater risk of hypoglycaemia; for this reason they should be avoided in the elderly and shorter-acting alternatives, such as gliclazide or tolbutamide, should be used instead. Chlorpropamide also has more side-effects than the other sulphonylureas (see below) and therefore it is no longer recommended. When the combination of strict diet and sulphonylurea treatment fails other options include combining with metformin reports of increased hazard with this combination remain unconfirmed); combining with acarbose, which may have a small beneficial effect, but flatulence can be a problem; combining with pioglitazone or rosiglitazone combining with bedtime isophane insulin but weight gain and hypoglycaemia can occur. Insulin therapy should be instituted temporarily during intercurrent illness (such as myocardial infarction, coma, infection, and trauma). Sulphonylureas should be omitted on the morning of surgery; insulin is required because of the ensuing hyperglycaemia in these circumstances.

Cautions: Sulphonylureas can encourage weight gain and should be prescribed only if poor control and symptoms
Endocrine system

Persist despite adequate attempts at dieting; metformin is considered the drug of choice in obese patients. Caution is needed in the elderly and in those with mild to moderate hepatic and renal impairment because of the hazard of hypoglycaemia. The short-acting tolbutamide may be used in renal impairment, as may gliclazide and gliclazide which are principally metabolised in the liver, but careful monitoring of blood-glucose concentration is essential; care is required to choose the smallest possible dose that produces adequate control of blood glucose.

**Contra-indications:** Sulphonylureas to be avoided if possible in severe hepatic and renal impairment and in porphyria They should not be used in women who breast-feed their babies and insulin therapy to be substituted during pregnancy Sulphonylureas are contra-indicated in the presence of ketoacidosis.

**Side-effects:** of sulphonylureas are generally mild and infrequent and include gastro-intestinal disturbances such as nausea, vomiting, diarrhoea and constipation. Chlorpropamide has appreciably more side-effects, mainly because of its very prolonged duration of action and the consequent hazard of hypoglycaemia and it should no longer be used. It may also cause facial flushing after drinking alcohol; this effect does not normally occur with other sulphonylureas. Chlorpropamide may also enhance antidiuretic hormone secretion and very rarely cause hyponatraemia (hyponatraemia is also reported with glimepiride and glipizide).

Sulphonylureas can occasionally cause a disturbance in liver function, which may rarely lead to cholestatic jaundice, hepatitis and hepatic failure. Hypersensitivity reactions can occur, usually in the first 6–8 weeks of therapy, they consist mainly of allergic skin reactions which progress rarely to erythema multiforme and exfoliative dermatitis, fever and jaundice; photosensitivity has rarely been reported with chlorpropamide and glipizide. Blood disorders are also rare but may include leucopenia, thrombocytopenia, agranulocytosis, pancytopenia, haemolytic anaemia, and aplastic anaemia.
**GLIBENCLAMIDE**

This is an oral sulphonylurea hypoglycemic agent

*Indications:* diabetes mellitus type 2

*Caution:* insulin dependent diabetes mellitus; ketoacidosis; severe infections; stress and trauma

*Contraindications:* As in sulfonylurea.

*Side Effects:* gastrointestinal discomfort; allergic reaction; water retention; CNS signs

*Dose:* initially 5 mg daily (elderly patients 2.5 mg), adjusted according to response; maximum 15 mg daily; taken with breakfast.

▶ Daonil Tablets 5 mg

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**GLICLAZIDE MR**

This is an oral sulphonylurea hypoglycaemic agent.

*Indications:* all types of maturity-onset diabetes, diabetes with or without obesity in adults, diabetes in the elderly, diabetes with vascular complications.

*Caution:* as for glibenclamide.

Dose: initially, 30-60 mg, adjusted according to response after two weeks; maximum 120 mg daily as a single dose to be given with breakfast.

▶ Diamicron MR 30 mg May Be Considered To Be Approximately Equivalent In Therapeutic Effect To Standard Formulation Diamicron 80 mg

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**GLIPIZIDE**

This is an oral sulphonylurea hypoglycaemic agent

*Indications:* Type 2 diabetes mellitus.

*Caution:* same as for glibenclamide.

*Contraindications:* pregnancy, impaired liver or renal function

*Side Effects:* Hypoglycemia, weight gain, Abdominal upset, headache, dizziness; drowsiness and hypersensitivity reactions.

*Dose:* initially, 2.5-5 mg daily as a single dose before breakfast or lunch.

Doses can be adjusted within few days by 2.5 - 5 mg. daily to a maximum of 20 mg daily.

Doses higher than 15 mg daily should be divided into 2 doses before meals.

▶ Minidiab Tablets 5 mg
INSULIN & HUMAN INSULIN ANALOGUES
Insulin plays a key role in the regulation of carbohydrate, fat and protein metabolism. There are 3 main types of insulin preparations:
Those of short duration which have a relatively rapid onset of action, namely, soluble insulin, insulin lispro and insulin aspart.
Those with an intermediate action, e.g. isophane insulin and insulin zinc suspension.
Those whose action is slower in onset and; lasts for long periods e.g. insulin zinc suspension.
The human insulin analogues, insulin aspart, insulin glulisine, and insulin lispro have a faster onset and shorter duration of action than soluble insulin; as a result, compared to soluble insulin, fasting and preprandial blood-glucose concentration is a little higher, postprandial blood-glucose concentration is a little lower, and hypoglycaemia occurs slightly less frequently.
Subcutaneous injection of insulin analogues may be convenient for those who wish to inject shortly before or, when necessary, shortly after a meal. They may also help those prone to pre-lunch hypoglycaemia and those who eat late in the evening and are prone to nocturnal hypoglycaemia. They may also be administered by subcutaneous infusion.
Soluble insulin is the most appropriate form of insulin for use in diabetic emergencies e.g. diabetic ketoacidosis and at the time of surgery. It can be given intravenously and intramuscularly, as well as subcutaneously.

ISOPHANE INSULIN, HUMAN (NPH)
This is an intermediate-acting insulin.

ISOPHANE INSULIN
(Isophane Insulin Injection; Isophane Protamine Insulin Injection; Isophane Insulin (NPH)—intermediate acting)
Additional information interactions (Insulin); renal impairment; pregnancy.
A sterile suspension of bovine or porcine insulin or of human insulin in the form of a complex obtained by the addition of protamine sulphate or another suitable protamine

Indications: diabetes mellitus
**Caution:** reduce dose in renal impairment.

**Side-effects:** see under Insulin; protamine may cause allergic reactions

**Dose:** by S.C. injection according to requirements. It has an onset of action of approximately 1-2 hours, a maximal effect at 4-12 hours, and a duration of 16-35 hours.

- **Humulin-N**
- **Insulatard**

### INSULIN NEUTRAL HUMAN

This is a short-acting insulin.

**Indications:** diabetes mellitus; diabetic ketoacidosis; diabetic emergencies and at time of surgery. Short-acting insulins

**Caution:** reduce dose in renal impairment.

**Side Effects:** local reactions and fat hypertrophy at site of injection; overdose causes hypoglycemia.

**Dose:** by S.C., I.M. or I.V. injection or I.V. infusion, according to requirements.

When injected S.C., it has rapid onset of action (after 30-60 minutes) and a peak action between 2-4 hours and duration of action of up to 8 hours. When injected I.V., it has very short half-life of about 5 minutes and its effect disappears within 30 minutes. Soluble insulin is a short-acting form of insulin. For maintenance regimens it is usual to inject it 15 to 30 minutes before meals.

- **Human Actrapid**
- **Humulin-R**
- **Novolet Insultard pen Humulin-R**
- **Mixtard pen**

### INSULIN GLARGINE (LANTUS)

This is a long acting human insulin analogue prepared by recombinant technology.

**Indications:** diabetes mellitus

**Caution:** reduce dose in renal impairment.

**Side-effects:** see under Insulin; protamine may cause allergic reactions

**Dose:** Adult & child over 6 years: by sc injection as per the requirement. It has 24 hrs. duration of action.

- **Insulin Glargine. Human 100 Units/ml. 10ml/Vial.**
**ROSIGLITAZONE**

*Indications:* Type 2 diabetes mellitus

*Caution:* impairment of liver function, liver function test to be done before initiating medications and to be repeated periodically later.

*Contraindications:* Liver Diseases, heart failure, pregnancy, breast feeding.

*Side Effects:* Fluid retention leading to edema, weight gain, and potentially aggravating heart failure. Headache, runny nose and other cold symptoms, sore throat, back pain, painful or irregular menstrual periods and flu like symptoms. Increased incidence of fractures in female patients who received long term treatment with rosiglitazone for type 2 DM. May cause ovulation in premenopausal women

*Drug Interactions:* Rifampicin decreases the blood concentration of rosiglitazone by increasing its breakdown in the liver leading to decrease the effect of rosiglitazone. Gemfibrozil increases the concentration of rosiglitazone in the blood resulting in increase of rosiglitazone side effects.

*Dose:* 4mg tablet once daily as initial dose may be increased within 8-12 week, to 8mg once daily with or without food based on response

*Safety in Pregnancy:* no adequate study on use during pregnancy

*Safety in Breast Feeding:* should not be given to breast feeding women as it is not known if it is passes in breast milk.

- *Avandia 4mg Tablet*

**METFORMIN HCL**

This is a biguanide

*Indications:* maturity-onset diabetes especially when this accompanies obesity(BMI > 25) and insulin resistance.

Women with Polycystic ovary syndrome and a body mass index above 25 may be given metformin when other therapy has failed to produce results.

*Caution:* congestive heart failure, hepatic and renal disease, acidosis, severe infections, gangrene, pregnancy; before or after surgery.
**Endocrine system**

**Contraindications:** renal impairment; ketoacidosis; withdraw if tissue hypoxia likely (e.g. sepsis, respiratory failure; recent myocardial infarction, hepatic impairment); use of iodine containing Xray contrast media; pregnancy and breast feeding.

**Side Effects:** lactic acidosis in those with impaired liver or kidney function. Gastrointestinal: diarrhea, cramps, nausea and vomiting.

**Dose:** Initially 500 mg with breakfast for 1 week followed by 500 mg with breakfast and evening meal for 1 week then 500 mg with breakfast, lunch and evening meal. Max 2 gm daily in divided doses.

Poly cystic ovary syndrome: Initially 500 mg with breakfast for 1 week followed by 500 mg with breakfast and evening meal for 1 week then 1.5 to 1.7 gm daily in 2-3 divided doses.

▶ **Glucophage Tablets 500 mg & 1000mg**.

**TREATMENT OF HYPOGLYCAEMIA**

Initially glucose 10–20 g is given by mouth either in liquid form or as granulated sugar or sugar lumps. Approximately 2 teaspoons sugar or 3 sugar lumps provide 10 g of glucose.

Unconsciousness due to hypoglycaemia is an emergency, if sugar cannot be given by mouth, glucagon can be given by injection. Carbohydrates to restore liver glycogen should be given as soon as possible; in chronic hypoglycaemia glucagon is not appropriate treatment. Glucagon may be issued to close relatives of insulin-treated patients for emergency use in hypoglycaemic attacks. In hospitalised patients who are treated with insulin, it is often advisable to prescribe glucagon on PRN basis, so that the nurses may give it rapidly during an hypoglycaemic emergency. If not effective in 10 minutes intravenous glucose should be given.

50 mL of glucose intravenous infusion 20% may be given intravenously into a large vein through a large-gauge needle as an alternative therapy, care is required since this concentration is irritant especially if extravasation occurs. Alternatively, 25 mL of glucose intravenous infusion 50% may be given, but this higher concentration is more irritant and viscous making administration difficult.
Glucose intravenous infusion 10% may also be used but larger volumes are needed. Close monitoring is necessary in the case of an overdose with a long-acting insulin because further administration of glucose may be required. Patients with hypoglycaemia due to oral antidiabetic drugs should be transferred to hospital, as the hypoglycaemic effects of these drugs may persist for many hours.

GLUCAGON HCl

**Indications:** acute hypoglycemia.

**Cautions:** ineffective in chronic hypoglycemia, starvation and adrenal insufficiency; insulinoma; glucagonoma, breast feeding.

**Contraindications:** phaeochromocytoma.

**Side Effects:** nausea, vomiting, rarely hypersensitivity reactions, abdominal pain, hypokalaemia, hypotension.

**Dose:** by S. C., I.M, or I.V. injection, adults and children over 8 years or body-weight over 25 kg, 1 mg; CHILDREN less than 8 years or body-weight below 25 kg, 500 mcg. If no response within 10 minutes intravenous glucose must be given.

**Note:** 1 unit of glucagon = 1 mg of glucagon or glucagon hydrochloride.

ANTI-TYROID DRUG

CARBIMAZOLE

**Indications:** hyperthyroidism, thyrotoxicosis.

**Caution:** pregnancy, lactation; tracheal obstruction; large goiter; liver disorders. Doctors should instruct patients about important symptoms and signs of bone marrow suppression induced by carbimazole and the need to stop treatment promptly and do the following:

- Patient to report symptoms and signs suggestive of infection, especially sore throat immediately.
- To perform white blood cell count if there is any clinical evidence of infection. Stop Carbimazole immediately if there is clinical or laboratory evidence of neutropenia.

**Dose:** 15 to 40 mg daily; a larger dose may be required occasionally. This dose is continued until the patient
becomes euthyroid, usually after 4 to 8 weeks and the
dose is then gradually reduced to a maintenance dose of 5
to 15 mg. Duration of therapy is given for 12 to 18
months. Children to be treated by specialist with initial
dose of carbimazole of 250 mcg/kg three times daily, and
to be adjusted according to response;

**Side Effects:** Nausea, mild gastro-intestinal disturbances,
headache, rashes and pruritus, arthralgia; rarely
myopathy, alopecia, bone marrow suppression(including
pancytopenia and agranulocytosis), jaundice

**Safety in Breast Feeding:** The lowest effective dose of
the drug should be used as the amount in milk may be
sufficient to affect neonatal thyroid function. Carbimazole
appears in breast milk but this does not preclude breast-
feeding as long as neonatal development is closely
monitored and the lowest effective dose is used.

- Neomercazole Tablets 5 mg

## PROPYLTHIOURACIL

**Indications:** Hyperthyroidism; thyrotoxicosis.

**Caution:** same as for carbimazole. Also hepatic and renal
impairment.

**Side effects:** same as for carbimazole: also leucopenia,
rarely cutaneous vasculitis, thrombocytopenia, aplastic
anaemia, hypoprothrombinemia, hepatitis,
encephalopathy, hepatic necrosis, nephritis, lupus
erythematosus like syndrome.

**Dose:** 100-200mg 3 times daily. Maintenance dose, 50-150
mg daily. Propylthiouracil is given in a dose of 200 to 400
mg daily in adults and this dose is maintained until the
patient becomes euthyroid; the dose may then be
gradually reduced to a maintenance dose of 50 to 150 mg
daily.

Antithyroid drugs only need to be given once daily
because of their prolonged effect on the thyroid. Over-
treatment can result in the rapid development of
hypothyroidism and should be avoided particularly during
pregnancy because it can cause fetal goitre

- Propylthiouracil Tablets 50 mg
STEROIDS

DEXAMETHASONE

**Indications:** suppression of inflammatory and allergic disorders; shock; diagnosis of Cushing's syndrome; congenital adrenal hyperplasia; cerebral oedema; inflammation associated with malignancy; croup; nausea and vomiting with chemotherapy; rheumatic disease; eye

**Caution:** pregnancy and breast-feeding, adrenal suppression and infection, children and adolescents (growth retardation possibly irreversible), elderly (use with supervision particularly on long-term treatment); if history of tuberculosis (or X-ray changes) use with frequent monitoring, hypertension, recent myocardial infarction (rupture reported), congestive heart failure, liver failure, renal impairment, diabetes mellitus including family history, osteoporosis (post-menopausal women at special risk), glaucoma (including family history), corneal perforation, severe affective disorders (particularly if history of steroid-induced psychosis), epilepsy, peptic ulcer, hypothyroidism, history of steroid myopathy; pregnancy; breast feeding.

**Contra-indications:** systemic infection; avoid live virus vaccines in those receiving immunosuppressive doses (serum antibody response diminished)

**Side-effects:** use lowest effective dose for minimum period possible to minimise side effects; gastro-intestinal effects include dyspepsia, peptic ulceration (with perforation), abdominal distension, acute pancreatitis, oesophageal ulceration and candidiasis; musculoskeletal effects include proximal myopathy, osteoporosis, vertebral and long bone fractures, avascular osteonecrosis, tendon rupture; endocrine effects include adrenal suppression, menstrual irregularities and amenorrhoea, Cushing's syndrome if used in high doses, usually reversible on withdrawal, hirsutism, weight gain, negative nitrogen and calcium balance, increased appetite; increased susceptibility to and severity of infection; neuropsychiatric effects include euphoria, psychological dependence, depression, insomnia, increased intracranial pressure with papilloedema in
children (usually after withdrawal), psychosis and
aggravation of schizophrenia, aggravation of epilepsy;
ophthalmic effects include glaucoma, papilloedema,
posterior subcapsular cataracts, corneal or scleral thinning
and exacerbation of ophthalmic viral or fungal disease;
other side-effects include impaired healing, skin atrophy,
bruising, striae, telangiectasia, acne, myocardial rupture
following recent myocardial infarction, fluid and
electrolyte disturbance, leucocytosis, hypersensitivity
reactions (including anaphylaxis), thromboembolism,
nausea, malaise, hiccups; perineal irritation may follow
intravenous administration of the phosphate ester

**Drug Interactions:** with Aspirin, NSAID drugs,
anticoagulant, diuretics estrogen phenytoin, rifampicin,
sulphonylurea resulting in side effects or altered
effectiveness of the medication.

**Dose:** By mouth, usual range 0.5–10 mg daily; CHILD 10–
100 mcg/kg daily; By intramuscular injection or slow
intravenous injection or infusion (as dexamethasone
phosphate), initially 0.5–24 mg; CHILD 200–400 mcg/kg
daily
Cerebral oedema associated with malignancy (as
dexamethasone phosphate), by intravenous injection, 10
mg initially, then 4 mg by intramuscular injection every 6
hours as required for 2–4 days then gradually reduced and
stopped over 5–7 days
Adjunctive treatment of bacterial meningitis, (starting
before or with first dose of antibacterial treatment, as
dexamethasone phosphate), by intravenous injection, 10
mg every 6 hours for 4 days; CHILD 150 mcg/kg every 6
hours for 4 days
Dexamethasone 1 mg = dexamethasone phosphate 1.2 mg
≡ dexamethasone sodium phosphate 1.3 mg
  - Decadron Tablets 0.5 mg, 4 mg
  - Decadron Injection 4 mg/ml -2 ml Ampoules
  - Decadron Elixir 0.5 mg/ 5 ml

**FLUDROCORTISONE ACETATE TAB 0.1 MG.**

**Indications:** mineralocorticoid replacement in
adrenocortical insufficiency; adrenal hyperplasia (given
with hydrocortisone)
**Endocrine system**

**Caution:** diabetes mellitus, tuberculosis, and liver disease.

**Contra-indications:** pregnancy and breast feeding.

**Side Effects:** hypertension; sodium and water retention, potassium loss; Irritation, stomach upset, vomiting, headache, dizziness, insomnia, restlessness, depression, anxiety, acne, increased hair growth, easy bruising, irregular or absent menstrual periods, skin rash, swollen face and ankles, vision problems, cold or infection that last a long time, muscle weakness, melena, DM.

**Dose:** adrenocortical insufficiency, 50-300 mcg daily
Child, 5 mcg/kg daily
Adrenal hyperplasia, 50-100 (rarely 150) mcg daily.

- *Florinef Tablets 100 mcg*

**HYDROCORTISONE**

**Indications:** adrenocortical insufficiency; suppression of inflammatory and allergic disorders; anaphylactic shock; and angioedema; inflammatory bowel disease and hemorrhoids; rheumatic disease; eye; skin.

**Caution:** kidney disease; liver disease; hypertension; sodium and water retention, potassium loss; heart disease; ulcerative colitis, diverticulitis, or stomach ulcers; hypothyroidism; a psychiatric condition; myasthenia gravis; diabetes mellitus; osteoporosis; pregnancy and breast feeding

**Contraindications:** In serious bacterial, viral, or fungal infection. Hydrocortisone weakens the body's immune response.

**Side Effects:** upset stomach, vomiting, headache, dizziness, insomnia, restlessness, irregular or absent menstrual periods, skin rash, swollen face, lower legs, or ankles, vision problems, cold or infection that lasts a long time, muscle weakness, Melena

**Drug Interactions:** Warfarin, Aspirin, OCP, NSAID Drugs

**Dose:** by I.M. or slow I.V. injection or infusion, 100-500 mg 3-4 times daily in 24 hours or as required.
By mouth, replacement therapy, 20-30 mg daily in divided doses.
Child, 10-30 mg.
Child, by slow I.V. injection, up to 1 year, 25 mg; 1-5 years, 50 mg;
Endocrine system

6-12 years, 100 mg.
High doses should be given in severe shock because the risk of complications is negligible with short-term therapy.

- **He Solu-Cortef Injection 100 mg/Vial.**
- **Hydrocortone Tablets 10 mg, 20 mg**

### METHYLPREDNISOLONE ACETATE 40MG/M

**Indications:** suppression of inflammatory and allergic disorders; cerebral oedema associated with malignancy; rheumatic disease

**Caution:** same as for dexamethasone. In addition, rapid intravenous administration may cause cardiovascular collapse.

**Contraindications:** as for dexamethasone

**Side Effects:** same as for dexamethasone

**Dose:** By Mouth 2 – 40 mg daily.
By IM or slow IV injection: initially 10 – 500 mg.
Graft rejection, up to 1 g daily by intravenous infusion for up to 3 days

- **Depo-Medrol Injection 40 mg/ml, For I.M. Use.**
- **Solu-Medrol 1000 mg Vial, For I.V. Use.**

### PREDNISOLONE

**Indications:** suppression of inflammatory and allergic disorders; inflammatory bowel disease; asthma; immunosuppression; rheumatic disease

**Caution:** adrenal suppression and infection, children and adolescents (growth retardation possibly irreversible), elderly (close supervision required particularly on long-term treatment); frequent monitoring required if history of tuberculosis (or X-ray changes), hypertension, recent myocardial infarction (rupture reported), congestive heart failure, liver failure, renal impairment, diabetes mellitus including family history, osteoporosis (post-menopausal women at special risk), glaucoma (including family history), corneal perforation, severe affective disorders (particularly if history of steroid-induced psychosis), epilepsy, peptic ulcer, hypothyroidism, history of steroid myopathy; pregnancy

**Contraindications:** systemic infection (unless specific antimicrobial therapy given); avoid live virus vaccines in
those receiving immunosuppressive doses (serum antibody response diminished)

**Side Effects:** minimised by using lowest effective dose for minimum period possible;
gastro-intestinal effects include dyspepsia, peptic ulceration (with perforation), abdominal distension, acute pancreatitis, oesophageal ulceration and candidiasis;
musculoskeletal effects include proximal myopathy, osteoporosis, vertebral and long bone fractures, avascular osteonecrosis, tendon rupture; endocrine effects include adrenal suppression, menstrual irregularities and amenorrhoea, Cushing's syndrome (with high doses, usually reversible on withdrawal), hirsutism, weight gain, negative nitrogen and calcium balance, increased appetite; increased susceptibility to and severity of infection; neuropsychiatric effects include euphoria, psychological dependence, depression, insomnia, increased intracranial pressure with papilloedema in children (usually after withdrawal), psychosis and aggravation of schizophrenia, aggravation of epilepsy; ophthalmic effects include glaucoma, papilloedema, posterior subcapsular cataracts, corneal or scleral thinning and exacerbation of ophthalmic viral or fungal disease; other side-effects include impaired healing, skin atrophy, bruising, striae, telangiectasia, acne, myocardial rupture following recent myocardial infarction, fluid and electrolyte disturbance, leucocytosis, hypersensitivity reactions (including anaphylaxis), thromboembolism, nausea, malaise, hiccups

**Dose:** by mouth, initially up to 10-20 mg daily in divided doses may increase up to 60 mg daily in severe disease. Maintenance, 2.5-15 mg daily but higher doses may be needed; to be taking after food. cushingoid side-effects is more likely with doses above 7.5 mg daily
By intramuscular injection, prednisolone acetate, 25–100 mg once or twice weekly
- *Prednisolone Tablets, 1 mg, 5 mg, 20 mg*
HORMONES

CHORIONIC GONADOTROPHIN (PREGNYL) H.C.G.

This is an anterior pituitary hormone. (Human Chorionic Gonadotrophin; HCG)
A preparation of a glycoprotein fraction secreted by the placenta and obtained from the urine of pregnant women having the action of the pituitary luteinising hormone

Indications: female primary or secondary amenorrhoea, post-partum amenorrhoea, sterility.
In the male it is used for cryptorchidism, delayed puberty, hypogonadism, infertility.

Caution: asthma, epilepsy, migraine cardiac or renal impairment; prepubertal boys (risk of premature epiphyseal closure or precocious puberty)

Contraindications: androgen-dependent tumours

Side Effects: oedema (particularly in males—reduce dose), headache, tiredness, mood changes, multiple pregnancy, gynaecomastia, local reactions; ovarian hyperstimulation may be aggravated.

Dose: by I.M. or S.C. injection; usual dose is 500-5000 units twice weekly.

- Pregnyl Injection 1500, 5000 Units.

CLOMIPHENE CITRATE

This is an anti-estrogens.
They induce gonadotrophin release by occupying oestrogen receptors in the hypothalamus, thereby interfering with feedback mechanisms; chorionic gonadotrophin is sometimes used as an adjunct. Patients should be informed that there is a risk of multiple pregnancy (rarely more than twins).

Indications: female infertility due to oligomenorrhoea or secondary amenorrhoea (e.g. associated with polycystic ovarian disease); anovulatory infertility; oligospermia.

Caution: In polycystic ovary syndrome to be used with caution as cysts may enlarge during treatment, ovarian hyperstimulation syndrome may occur, uterine fibroids, ectopic pregnancy, incidence of multiple births increased, visual symptoms (discontinue and consult ophthalmologist); breast-feeding, clomifene should not
normally be used for longer than 6 cycles (increased risk of ovarian cancer)

**Contraindications:** ovarian cysts, hepatic disease, hormone dependent tumours or undiagnosed abnormal uterine bleeding, pregnancy (to be exclude before initiating treatment)

**Side Effects:** visual blurring (withdraw), ovarian hyperstimulation (withdraw), hot flushes, abdominal discomfort, occasionally nausea, vomiting, depression, insomnia, breast tenderness, headache, intermenstrual spotting, menorrhagia, endometriosis, convulsions, weight gain, rashes, dizziness, hair loss

**Dose:** 50 mg daily for 5 days, starting within about 5 days of onset of menstruation (preferably on 2nd day) or at any time (normally preceded by a progestogen-induced withdrawal bleed) if cycles have ceased; second course of 100 mg daily for 5 days may be given in absence of ovulation; most patients who are going to respond will do so to first course; 3 courses should constitute adequate therapeutic trial; long-term cyclical therapy not recommended

- **Clomid 50 mg Tablet**

**CONJUGATED ESTROGENS**

**Indications:** menopausal symptoms, senile vaginitis and pruritis vulvae, dysfunctional uterine bleeding, prostatic carcinoma, functional amenorrhoea, hypogonitalism.

**Cautions:** increase the risk of developing endometrial hyperplasia that may lead to cancer of the lining of the uterus. Taking progestins, with Premarin lowers the risk of developing this condition. Treatment with Premarin may increase the risk of heart attack, stroke, breast cancer, and blood clots in the lungs or legs. Because of these risks, Premarin should be prescribed at the lowest effective dose, for the shortest amount of time necessary.

**Contraindications:** Pregnancy; estrogen dependent cancer; history of breast cancer; active thrombophlebitis; active or recent thromboembolic disease; liver disease; untreated endometrial hyperplasia; undiagnosed vaginal bleeding, breast feeding.

**Side effects:** nausea, vomiting; abdominal cramps and blotting; weight changes, breast enlargement and...
tenderness, premenstrual like syndrome; sodium & fluid retention; cholestatic jaundice, glucose intolerance, altered blood lipids- may lead to pancreatitis, rashes & chloasma, changes in libido, depression, mood changes, headache, migraine, dizziness, leg cramps, vaginal candidiasis, contact lenses may irritate.

**Drug Interactions:** Decrease the effects of warfarin, Rifampin, barbiturates, carbamazepine (Tegretol), griseofulvin phenytoin all increase the elimination of estrogen by enhancing the liver's ability to eliminate estrogens. Use of any of these medications with estrogens may result in a reduction of the beneficial effects of estrogens. Conversely, drugs such as erythromycin, ketoconazole (Nizoral), itraconazole (Sporanox), and ritonavir (Norvir) may reduce the elimination of estrogens by the liver as and lead to increased levels of estrogens in the blood.

**Dose:**
- Menopausal symptoms, postmenopausal osteoporosis, 0.625-1.25 mg daily for 21 days from 5th day of cycle, repeated after 7 days if necessary, reduced to maintenance dose, and if necessary continued on a cyclical basis with a progestogen for 12-14 days per cycle if uterus intact.
- Primary amenorrhoea, 1.25-3.75 mg daily in divided doses for 21 days, with a progestogen from 15th to 21st day.

- Premarin 1.25 mg Tablets.

**DANAZOL**
It inhibits pituitary gonadotrophin secretion

**Indications:** endometriosis; menorrhagia, mammary dysplasia, and gynaecomastia. It is the drug of choice in the long-term management of hereditary angioedema.

**Caution:** cardiac, hepatic, or renal impairment (avoid if severe), elderly, polycythaemia, epilepsy, diabetes mellitus, hypertension, migraine, lipoprotein disorder, history of thrombosis or thromboembolic disease; withdraw if virilisation (may be irreversible on continued use).

**Contraindications:** pregnancy, ensure that patients with amenorrhoea are not pregnant. Severe hepatic, renal or cardiac impairment; breast-feeding; thromboembolic
Endocrine system
disease; undiagnosed genital bleeding; androgen-dependent tumours; porphyria

**Side Effects:** dizziness, nausea, skin reactions including rashes, photosensitivity and exfoliative dermatitis, fever, backache, nervousness, mood changes, anxiety, changes in libido, vertigo, fatigue, epigastric and pleuritic pain, headache, weight gain; menstrual disturbances, vaginal dryness and irritation, flushing and reduction in breast size, androgenic effects including acne, oily skin, oedema, hirsutism, voice changes and rarely clitoral hypertrophy; musculo-skeletal spasm, joint pain and swelling, hair loss; temporary alteration in lipoproteins and other metabolic changes, insulin resistance; headache and visual disturbances may indicate benign intracranial hypertension, thrombotic events; leucopenia, thrombocytopenia, eosinophilia, reversible erythrocytosis or polycythaemia; rarely cholestatic jaundice, pancreatitis, peliosis hepatitis and benign hepatic adenomata

**Dose:** In women of child-bearing potential, treatment should start during menstruation, preferably on day 1. Endometriosis, the dose is 200–800 mg daily in up to 4 divided doses, adjusted to achieve amenorrhoea, usually for 3–6 months 300 mg daily in divided doses usually for 3–6 months is prescribed for benign fibrocystic breast disease with severe pain and tenderness if not responding to other treatment. 200 mg 2–3 times daily initially for hereditary angioedema, then reduced according to response. Child, precocious puberty, 100-400 mg daily according to age and response.

- **Danol Capsules 200 mg**

**DESMOPRESSIN**
This is a posterior pituitary hormone.

**Indications:** diabetes insipidus; nocturnal enuresis; nocturia diagnostic procedures.

**Caution:** heart failure, asthma, epilepsy, migraine; renal impairment, in cardiovascular disease and in hypertension, pregnancy; elderly (avoid for nocturnal enuresis and nocturia in those over 65 years); in cystic fibrosis; in nocturia and nocturnal enuresis limit fluid
intake to minimum from 1 hour before dose until 8 hours afterwards; in nocturia periodic blood pressure and weight checks needed to monitor for fluid overload; Hyponatraemic convulsions

Patients being treated for primary nocturnal enuresis should be warned to avoid fluid overload and to stop taking desmopressin during an episode of vomiting or diarrhoea (until fluid balance normal). The risk of hyponatraemic convulsions can also be minimised by keeping to the recommended starting doses and by avoiding concomitant use of drugs which increase secretion of vasopressin (e.g. tricyclic antidepressants)

**Contraindications:** cardiac insufficiency and conditions treated with diuretics; psychogenic polydipsia and polydipsia due to alcohol dependence

**Side Effects:** fluid retention, and hyponatraemia (in more serious cases with convulsions) on administration without restricting fluid intake; headache, nausea, vomiting, abdominal pain, fluid retention and swelling, allergic reactions, and emotional disturbance in children, epistaxis, nasal congestion, rhinitis may developed with nasal spray

**Dose:** intranasally, maintenance, 10-20 mcg 1-2 times daily

Child, 5-10 mcg 1-2 times daily.

By mouth (as desmopressin acetate)

**Diabetes insipidus,** treatment, adult and child initially 300 mcg daily (in 3 divided doses); maintenance, 300–600 mcg daily in 3 divided doses; range 0.2–1.2 mg daily

**Primary nocturnal enuresis** (if urine concentrating ability normal), adult (under 65 years) and child over 7 years 200 mcg at bedtime, only increased to 400 mcg if lower dose not effective (important: see also Cautions); withdraw for at least 1 week for reassessment after 3 months

Postoperative polyuria or polydipsia, adjust dose according to urine osmolality

Sublingually (as desmopressin base)

**Diabetes insipidus,** treatment, adult and child initially 180 mcg daily in 3 divided doses; range 120–720 mcg daily

**Primary nocturnal enuresis** (if urine concentrating ability normal), adult (under 65 years) and child over 7
years 120 mcg at bedtime, only increased to 240 mcg if lower dose not effective; Polyuria or polydipsia after hypophysectomy, adjust dose according to urine osmolality

Intranasally (as desmopressin acetate)

**Diabetes insipidus, diagnosis**, adult and child 20 mcg (limit fluid intake to 500 mL from 1 hour before to 8 hours after administration)

**Diabetes insipidus, treatment**, adult 10–40 mcg daily (in 1–2 divided doses); child 5–20 mcg daily; infants may require lower doses

**Primary nocturnal enuresis** (if urine concentrating ability normal), adult (under 65 years) and child over 7 years: initially 20 mcg at bedtime, only increased to 40 mcg if lower dose not effective

**Nocturia associated with multiple sclerosis** (when other treatments have failed), adult (under 65 years) 10–20 mcg at bedtime, dose not to be repeated within 24 hours

**USE FOR DIAGNOSTIC PROCEDURES:**

**Renal function testing** (empty bladder at time of administration and limit fluid intake to 500 mL from 1 hour before until 8 hours after administration), adult 40 mcg; infant under 1 year 10 mcg (restrict fluid intake to 50% at next 2 feeds to avoid fluid overload), child 1–15 years 20 mcg

**Mild to moderate haemophilia and von Willebrand’s disease**, adult 300 mcg (one 150 mcg spray into each nostril) 30 minutes before surgery or when bleeding; may be repeated at intervals of 12 hours (or at intervals of at least 3 days if self-administered)

**Fibrinolytic response testing**, adult 300 mcg (one 150 mcg spray into each nostril); blood sampled after 1 hour for fibrinolytic activity

By injection (as desmopressin acetate)

**Diabetes insipidus, diagnosis** (subcutaneous or intramuscular), adult and child 2 mcg (limit fluid intake to 500 mL from 1 hour before to 8 hours after administration)

_Note_ withdraw for at least 1 week for reassessment after 3 months

**Safety in Pregnancy**: can be taking in pregnancy only if clearly needed and should be used with caution.

**Safety in Breast Feeding**: Not known to be harmful
DYDROGESTERONE

This is a progestogen

**Indications:** endometriosis, habitual abortion, failure of nidation, menstrual disorders, amenorrhea, dysfunctional uterine bleeding

**Caution:** conditions that may worsen with fluid retention e.g. epilepsy, hypertension, migraine, asthma, cardiac or renal dysfunction, and in those susceptible to thromboembolism. Breakthrough bleeding may rarely occur (increase dose). Liver function disturbance and jaundice; hepatic impairment; pregnancy.

**Contraindications:** history of liver tumours; severe liver impairment; genital or breast cancer; severe arterial disease; undiagnosed vaginal bleeding & porphyria; history of idiopathic jaundice, severe pruritis, pemphigoid gestations.

**Side Effects:** menstrual disturbances; premenstrual like syndrome (including bloating, fluid retention, breast tenderness); weight gain, nausea, headache, dizziness, insomnia, drowsiness, depression, skin reactions (including urticaria, pruritis, rash, acne) hirsuitism, alopecia, jaundice and anaphylactoid reactions.

**Dose:** endometriosis, 10 mg 2-3 times daily from day 5 to day 25th of cycle or continuously.
Failure of nidation, irregular cycles, 10 mg twice daily from 11th to 25th day for at least 6 cycles.
Habitual abortion, 10 mg twice daily from day 11th to 25th day of cycle until conception, then continuously until 20th week of pregnancy and gradually reduced.
Dysfunctional uterine bleeding, 10 mg twice daily for 5-7 days to arrest bleeding; 10 mg twice daily from 11th to 25th day of cycle to prevent bleeding.
Dysmenorrhoea, 10 mg twice daily from 5th to 25th day of cycle.
Amenorrhoea, 10 mg twice daily from 11th to 25th day of cycle following estrogen therapy from 1st to 25th day of cycle.
Premenstrual syndrome, 10 mg twice daily from 12th to 26th day of cycle.
Hormone replacement therapy, with continuous estrogen therapy, 10 mg daily on days 15-28 of each 28-day estrogen HRT cycle increased to 10 mg twice daily if withdrawal bleed is early or endometrial biopsy shows inadequate progestational response.

* Duphaston Tablets 10 mg

**MEDROXY PROGESTERONE ACETATE**

This is a progestogen.

**Indications:** endometriosis, dysfunctional uterine bleeding, secondary amenorrhea; breast cancer; contraception.

**Caution:** disturbances of normal cycle and irregular bleeding may occur; breast feeding.

**Contraindications:** Current deep vein thrombosis or pulmonary embolism, Migrain Headache with aura, Before evaluation of unexplained vaginal bleeding, past H/O breast cancer and no evidence of current disease for 5 years, active liver disease, H/O stroke, IHD, Diabetes with complications; pregnancy.

**Side Effects:** Menstrual irregularities (bleeding or amenorrhea or both), and nervousness; indigestion.

**Dose:** by mouth, 2.5-10 mg daily for 5-10 days beginning on 16th-21st day of cycle, repeated for 2 cycles in dysfunctional bleeding and 3 cycles in secondary amenorrhea.

Mild to moderate endometriosis, beginning on first day of menstrual cycle, 10 mg three times a day for 90 consecutive days.

By deep I.M. injection, endometrial or renal carcinoma, 400-1000 mg per week.

Maintenance, if condition improved, 400 mg per month.

Breast carcinoma, 500 mg/day for 28 days.

Maintenance, 500 mg twice weekly

By deep intramuscular injection, 150 mg within first 5 days of cycle or within first 5 days after parturition (delay until 6 weeks after parturition if breast-feeding); for long-term contraception, repeated every 12 weeks (if interval greater than 12 weeks and 5 days, rule out pregnancy before next injection and advise patient to use additional
Endocrine system

contraceptive measures (e.g. barrier) for 14 days after the injection
   - *Depo-Provera Injection 50 mg/ml In 3 ml Vials*
   - *Provera Tablets 5mg*

**MESTEROLONE**

This is a testosterone derivative

*Indications:* hypogonadism, male infertility due to hypogonadism.

*Caution:* breast cancer, prostatic carcinoma, nephritis, pregnancy, epilepsy, migraine, renal or hepatic impairment, circulatory failure, not recommended in children.

*Contraindications:* breast cancer in men, prostate cancer, history of primary liver tumours, hypercalcaemia, pregnancy, breast feeding, nephrosis

*Side Effects:* Headache, Depression, nausea, gynaecomastia, erections may be more frequent and last longer, baldness, acne, melena, edema of the ankle.

*Safety in Breast Feeding:* androgen deficiency, 25 mg 3-4 times daily for several months, reduced to 50-75 mg daily in divided doses for maintenance.

Male infertility, 100 mg daily for several months.; use in CHILD not recommended
   - *Proviron Tablets 25 mg*

**NORETHISTERONE**

This is a progestogen

*Indications:* endometriosis, premenstrual syndrome, dysmenorrhoea, dysfunctional uterine bleeding, postponement of menstruation, contraception, HRT, malignant diseases.

*Caution:* same as for dydrogesterone; breast feeding.

*Contraindications:* same as for dydrogesterone; pregnancy.

*Side Effects:* same as for dydrogesterone; rare with dose below 15 mg daily. Headaches and depression occur occasionally.

*Dose:* endometriosis, 10 mg daily starting on 5th day of cycle (increased if spotting occurs to 25 mg daily in divided doses to prevent breakthrough bleeding) for at least 6 months.
Dysfunctional uterine bleeding, menorrhagia, 5 mg 3 times daily for 10 days to arrest bleeding; to prevent bleeding, 5 mg twice daily from 19th to 26th day of cycle.
Dysmenorrhea, 5 mg 3 times daily from 5th to 25th day for 3-4 cycles.
Premenstrual syndrome, 5 mg 2-3 times daily from 19th to 26th day for several cycles (not recommended since there is no physiologic basis for such treatment).
Postponement of menstruation, 5 mg 3 times daily starting 3 days before anticipated onset (menstruation occurs 2-3 days after stopping).

Primolut N 5mg Tablet

TAMOXIFEN

This is an estrogen antagonist.

Indications: to reduce the incidence of breast cancer in women at high risk for developing breast cancer disease; metastatic breast cancer; infertility in women with anovulatory disorders.

Cautions: pregnancy and lactation; occasional cystic ovarian swellings in premenopausal women, occasional hypercalcaemia if bony metastases; increased risk of thromboembolic events when used with cytotoxics; porphyria.

Contraindications: pregnancy.

Side Effects: amenorrhoea in premenopausal women; hot flushes; vaginal bleeding, gastro-intestinal disturbances, endometrial cancer, increase triglyceride, thromboembolism, visual disorders.

Dose: breast cancer, initially 20 mg daily.
Anovulatory infertility, 20 mg daily on second, third, fourth and fifth days of cycle.
Doses may be increased to 40 mg then 80 mg for subsequent courses.
If cycles irregular, start initial course on any day, with subsequent courses starting 45 days later or on second day of cycle if menstruation occurs.

Nolvadex Tablets 10 mg
TESTOSTERONE UNDECANOATE

**Indications:** testosterone replacement therapy in male hypogonadal disorders; hypopituitarism; endocrine impotence; some types of infertility.

**Caution:** cardiac failure; renal dysfunction; hypertension; epilepsy or migraine; diabetes mellitus, skeletal metastases (risk of hypercalcaemia); prepubertal boys to avoid premature fusion of epiphyses and increased frequency of erection; oligospermia and decreased ejaculatory volume; water and salt retention.

**Contraindications:** breast cancer in men, prostate cancer, history of primary liver tumours, hypercalcaemia, pregnancy, breast feeding, nephritic syndrome.

**Side Effects:** prostate abnormalities and prostate cancer, headache, depression, gastrointestinal bleeding, nausea, cholestatic jaundice, changes in libido, gynaecomastia, polycythaemia, anxiety, asthenia, paraesthesia, hypertension, electrolyte disturbances with sodium retention with oedema and hypercalcaemia, weight gain, increased bone growth; androgenic effects such as hirsuitism, male pattern baldness, seborrhea, acne, pruritus, excessive frequency and duration of penile erection, precocious sexual development and premature closure of epiphyses in prepubertal males, suppression of spermatogenesis in men and virility in women.

**Dose:** an initial dose of 120-160 mg daily for 2-3 weeks followed by a maintenance dose of 40-120 mg daily. For injection; deep intramuscular injection, androgen deficiency, 1 ml usually every 3 weeks.

- Andriol Capsules 40 mg
- Testosterone Propionate 250mg/ml Injection

TETRACOSACTRIN ZINC

(Tetracosactide) This is an analogue of corticotrophin (ACTH)

**Indications:** diagnosis of adrenocortical function.

**Caution:** hypersensitivity to tetracosactrin or corticotrophin preparation, asthma or atopy

**Contraindications:** Same as for dexamethasone; the depot preparation is not suitable for use in neonates due to presence of benzyl alcohol as additive.
**Side Effects:** Same as for dexamethasone; hypersensitivity reactions including marked redness and pain at injection sit flushing, severe malaise, urticaria, pruritus, dyspnea, edema, anaphylaxis.

**Dose:** for the depot preparation, diagnostic (5-hour test), by I.M. injection, 1 mg as a single dose.
For the aqueous preparation, diagnostic (30-minute test), by I.M. or I.V. injection, 250 mcg as a single dose.

- Synacthen Depot Injection 1 mg/ml.
- Synacthen Injection 0.25 mg.

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### THYROXINE SODIUM (Levothyroxine sodium)

**Indications:** hypothyroidism including myxoedema.

**Caution:** angina, cardiovascular disorders, hypertension, adrenal insufficiency, thyrotoxicosis; diabetes insipidus, diabetes mellitus, pregnancy, breast feeding.

**Contraindications:** thyrotoxicosis, uncorrected adrenal insufficiency.

**Side Effects:** hyperthyroidism due to therapeutic overdose, headache, anxiety, irritability, emotional liability, insomnia, tremors, muscle weakness, palpitation, angina, heart failure, dyspnea, diarrhea, vomiting, abdominal cramps, hair loss, flushing, menstrual irregularities.

**Dose:** initially 50-100 mcg increasing by 25-50 mcg at 3-4 weeks intervals;
Maintenance dose, 100-200 mcg or more daily;
Infants, 10 mcg/kg daily to a maximum of 50 mcg daily.
Up to 5 years, 100 mcg daily;
Up to 12 years, adult dose.

- Eltroxin Tablet 25mcg, 50mcg & 100 mcg

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### VASOPRESSIN (ADH)

This is a posterior pituitary hormone.

**Indications:** diabetes insipidus; bleeding from oesophageal varices.

**Caution:** heart failure, hypertension, asthma, epilepsy, migraine and other conditions aggravated by water retention, renal impairment, pregnancy.

**Contraindications:** Coronary artery disease, chronic nephritis.
Endocrine system

Side effects: fluid retention, pallor, tremor, sweating, vertigo, headache, nausea, vomiting, belching, abdominal cramps, desire to defecate, hypersensitivity reaction including anaphylaxis, constriction of coronary arteries leading to anginal attacks, myocardial and/or peripheral ischemia and rarely gangrene.

Dose: by Subcutaneous or I.M. injection, diabetes insipidus, 5-20 units at least twice daily.
By intravenous infusion, variceal bleeding, 5-20 units over 15 minutes.
  * Pitressin Injection 10 Units / ml
IMMUNOLOGICAL PRODUCTS AND VACCINES

VACCINES

ADSORBED DIPHTHERIA AND TETANUS TOXOIDS (Double Vaccine, DT)

Indications: Active immunization against diphtheria and tetanus in infants and children under the age of six years, when it is advisable or contra-indicated to give a triple antigen containing pertussis component.

Contra-indications: Active or acute infection, concomitant corticosteroid therapy, immunosuppressive therapy, history of hypersensitivity.

Dose: For primary immunization with diphtheria and tetanus vaccine, three doses of 0.5 ml are needed; the given 8 weeks apart and the first booster dose at 18 months of age.

A second booster dose of 0.5 ml I.M. is recommended at the time of school entry (about 5-6 years of age).

All doses are I.M.

ADSORBED DIPHTHERIA - TETANUS VACCINE WITH REDUCED DIPHTHERIA COMPONENT

A mixture of diphtheria formol toxoid and tetanus formol toxoid adsorbed on a mineral carrier.

Indications: for combined active immunization of adults against diphtheria and tetanus.

Contra-indications: acute feverish illnesses.

Dose: I.M. injections of 0.5 ml at intervals of 4 weeks. A third injection, after 3 to 12 months, is recommended.

Di Te Anatoxal Berna For Adults - Double Vaccine

ADSORBED DIPHTHERIA - TETANUS -PERTUSSIS VACCINE

A mixture of purified and adsorbed diphtheria and tetanus formol toxoids, as well as Bordetella pertussis vaccine.

Indications: diphtheria, tetanus and pertussis prophylaxis.

Contra-indications: acute infectious diseases, currently evolving disease whether acute or chronic, personal
history of neurological problems like convulsions, encephalitis and encephalopathy.

**Dose:** infants and children until six years of age, 3 (primary) doses of 0.5 ml each at 4-8 weeks intervals followed by a fourth (reinforcing) dose of 0.5 ml about one year after the third primary dose. The fourth dose is part of the basic course. A booster dose at age 4-6 years All doses are I.M. or deep S.C.

- *Di To Per Anatoxal Berna, Triple Vaccine*

**HAEMOPHILUS INFLUENZAE B (Hib) VACCINE**

**Indications:** active immunizations against H. influenzae type B infections in children; component of the primary course of childhood immunization.

**Side effects and Precautions:** Fever, restlessness, loss of appetite, vomiting diarrhea and hypersensitivity. Erythema multiforme and transient cyanosis of the lower limbs have been reported rarely in children receiving haemophilus influenzae-containing vaccines.

**Dose:** 0.5 ml. (25 mcg of polysaccharide linked to 18 mcg of diphtheria toxoid protein) given by I.M. injection. For primary immunization, 3 doses are required at intervals of 1 month.

**HEPATITIS B VACCINE**

Alum-adsorbed, inactivated hepatitis-B virus surface antigen (Hbs Ag) vaccine. It is prepared biosynthetically using recombinant DNA technology. The vaccine is used in individuals at high risk of contracting hepatitis B. It takes up to 6 months for immunisation to confer adequate protection; the duration of immunity is thought to last for 3-5 years.

**Side effects:** abdominal pain, gastrointestinal disturbance, musculoskeletal, joint pain and inflammation have been reported after hepatitis B vaccines. There may also be dizziness and sleep disturbance. Cardiovascular effects include occasional hypotension and, rarely, tachycardia. Other rare adverse effects include dysuria, visual disturbances, and earache.

**Dose:** adults and children over 12 years, by intramuscular injection, 3 doses of 1 ml, the second one month and the third 6 months after the first dose.
Child, birth to 12 years, 3 doses of 0.5 ml (10 mcg).
For rapid immunization, third dose 2 months after first dose with booster at 12 months.
Infants born to HBs Ag-positive mothers, 3 doses of 0.5 ml (10 mcg), first dose at birth with antihepatitis B immunoglobulin injection (separate site).

- Engerix B 20 mcg/ml
- Engerix B 10 mcg/ml

**hexa Combined Diphtheria-Tetanus-acellular Pertussis (DTPa), Hepatitis B, Inactivated Poliovirus and Haemophilus influenzae type b Vaccine**

**Indications:** Active primary immunization against six diseases: diphtheria, tetanus, pertussis (whooping cough), hepatitis B, poliomyelitis (polio) and Haemophilus influenzae type b (Hib).

**Contra-indications:** Active or acute infection, concomitant corticosteroid therapy, immunosuppressive therapy, history of hypersensitivity; brain disease or central nervous system (CNS) disease (i.e. Epilepsy etc.); a bleeding problem; a tendency to febrile convulsions; a family history of seizures/fits; a family history of Sudden Infant Death Syndrome (SIDS).

**Side effects:** Mild effects - pain, redness, swelling, a hard lump, bruising or itching around the injection site; fever between 38 °C and 39.5 °C; unusual crying (for more than 1 hour), vomiting, diarrhoea, runny nose or loss of appetite; sleepiness, nervousness, irritability, restlessness, fussiness or difficulty sleeping; skin rash, bruising, or purple or red-brown spots visible through the skin (purpura). MORE **Serious Effects:** fever greater than 39.5°C; crying for 3 hours or more; collapse or periods of unconsciousness or lack of awareness; seizures (convulsions) or fits.

**Dose:** For primary immunization: three doses of 0.5 ml are given at 2, 4 and 6 months of age.
All doses are I.M.

- Infanrix
INFLUENZA VACCINES
Every year WHO recommends which strains should be included in the vaccine as the viruses A and B are constantly altering their antigenic structures.

**Indications:** persons at risk; annual immunization is highly recommended for those of all ages with any of the following conditions:
- Chronic respiratory disease, including asthma.
- Chronic heart disease.
- Chronic renal failure.
- Diabetes mellitus.
- Immunocompromised patients.
- Persons above 75 years of age.

**Contraindications:** Vaccination should be postponed if the individual is suffering from an acute illness. Minor illnesses without fever or systemic upset are not contraindications. Anaphylaxis with a preceding dose of a vaccine (or vaccine component) is a contra-indication to further doses. Hypersensitivity to egg with evidence of previous anaphylactic reaction, contra-indicates influenza vaccine.

**Dose:** 0.5 ml by deep S.C. or I.M. injection. Child 6-35 months, 0.25 ml. 3-12 years, 0.5 ml. Both repeated after 4-6 weeks.

MEASLES, MUMPS AND RUBELLA VACCINE (MMR)

**Indications:** simultaneous immunization against measles, mumps and rubella in children from one year of age.

**Contra-indications:** pregnancy, acute infectious disease, active developing illnesses, congenital or acquired immunodeficiency and hypersensitivity to chick embryos and egg proteins; another injectable live vaccine within the previous 3 weeks; 3 months of an immunoglobulin injection; untreated malignant disease.

**Contra-indications:** to MMR include:
- children with severe immunosuppression
- children who have received another live vaccine by injection within 4 weeks; children who have had an anaphylactic reaction to excipients such as gelatin and
neomycin; if given to women, pregnancy should be avoided for 1 month.

**Dose:** single dose of 0.5 ml by S.C. or I.M. injection.

**Trimovax**

**MENINGOCOCCAL MENINGITIS VACCINE**

**Indications:** it is a component of the primary course of childhood immunization; highest risk groups; pilgrims to mecca during Hajj season and individuals traveling to countries of risk.

**Side effects** of meningococcal group C conjugate vaccine include redness, swelling, and pain at the site of the injection, mild fever, irritability, drowsiness, dizziness, nausea, vomiting, diarrhoea, anorexia in children, headache, myalgia, rash, urticaria, pruritus, malaise, lymphadenopathy, hypotonia, paraesthesia, hypoaesthesia, and syncope. Hypersensitivity reactions (including anaphylaxis, bronchospasm, and angioedema) and seizures have been reported rarely.

**Dose:** recommended schedule is 3 doses for children aged 2-4 months, 2 doses for children aged over 4 months and a single dose for all individuals aged over 1 year.

Adult and child aged 2 months and over, 0.5 ml by deep S.C. or I.M. injection.

**PENTAVACCINE**

A suspension containing diphtheria (D), tetanus (T) toxoids, inactivated pertussis bacteria (Pw) and the purified surface antigen of the hepatitis B virus (HBV), adsorbed on aluminium salts. This suspension is used to reconstitute the lyophilized Hib vaccine in a second vial.

**Dose:** The preparation should under no circumstances be administered intravenously.

By deep I.M. injection, at six weeks of age within the primary vaccination schedule which consists of three doses within the first six months of life, 0.5 ml.

**Tritanrix-Hb With Hiberix Vials**

**PNEUMOCOCCAL VACCINE POLYVALENT**

**Indications:** Immunization against pneumococcal disease caused by pneumococcal types included in the vaccine
Immunological products and Vaccines system

only. Use in selected individuals over 2 years of age as follows:
Patients who have anatomical dysfunction or who have splenic dysfunction due to sickle cell disease or other causes;
Persons with chronic illnesses in which there is increased risk of pneumococcal disease, such as functional impairment of cardiorespiratory, hepatic and renal systems;
Persons over 50 years of age or older;
Patients with other chronic diseases who may be at greater risk of developing pneumococcal infections;
Patients with Hodgkin's disease if immunization can be given at least 10 days prior to treatment.

Contra-indications: Hypersensitivity to any component of the vaccine; revaccination; previous immunization with any polyvalent pneumococcal vaccine.

Dose: Single dose of 0.5 ml S.C. or I.M.
Avoid I.V. Injection.
Child under 2 years, not recommended.

Pneumovax

POLIOMYELITIS VACCINE
(Live, oral "Sabin Strains", Poliovirus types 1, 2 and 3)

Indications: poliomyelitis prophylaxis; it is a component of the primary immunization of childhood, unimmunized adults.

Contra-indications: immunosuppressed individuals or their household contacts, acute febrile illnesses, debilitating ailment, abdominal pain or diarrhoea, steroid therapy, leukemias, lymphogenus diseases, and dysgammaglobulinemias.

Side effects: Vaccine-associated poliomyelitis has been reported rarely in recipients of oral poliomyelitis vaccines and in contacts of recipients.

Precautions: Poliomyelitis vaccine may contain trace amounts of antibacterials such as neomycin, polymyxin B, and streptomycin and should be used with caution in patients with severe hypersensitivity to these antibacterials.
Oral poliomyelitis vaccines should not be given to patients with diarrhoea or vomiting.
Because the vaccine virus of oral poliomyelitis vaccines is excreted in the faeces for up to 6 weeks, the contacts of recently vaccinated babies and infants should be advised of the need for strict personal hygiene, particularly hand washing after napkin changing, in order to reduce the possibility of infection in unimmunised contacts. Unimmunised adults can be immunised at the same time as their children. Oral poliomyelitis vaccines should not be given to immunocompromised patients or their household contacts and in these persons an inactivated vaccine should be used.

Pregnancy.

Live vaccines such as oral poliomyelitis vaccines are generally contra-indicated in pregnancy because of a theoretical risk to the fetus. 

**Dose:** three doses of the oral trivalent vaccine are recommended (the first should be given at 2 months of age; the second and the third should be given at intervals of 8 weeks). A fourth dose may be given at 18 months of age. The immunization can be associated simultaneously with the first dose of DPT.

**RABIES VACCINE**

*Indications:* High risk groups, prophylactic and post exposure to attack.

*Side effects:* Patients may experience pain, erythema, and induration at the injection site after the use of any type of rabies vaccine; nausea and vomiting, headache, fever, malaise, or myalgia may also occur. Hypersensitivity reactions including anaphylaxis occur more commonly with vaccines prepared from non-human sources. Neuroparalytic reactions (transverse myelitis, neuropathy, or encephalopathy) have been associated with the use of non-human cell vaccines. There are only isolated reports of neurological reactions after use of human diploid-cell vaccines.

**Dose:** Prophylaxis, 3-dose schedule on days 0, 7, and 28 with a reinforcing dose every 2-3 years to those at continued risk.
For post-exposure treatment of previously immunized patients, two reinforcing doses on day 0 and on day 3-7.
For post exposure treatment of previously unimmunized patients, a course of injections should be started as soon as possible after exposure on days 0,3,7,14,30 and 90. The course may be discontinued if the patient found not at risk. Rabies immunoglobulin should be considered on day 0.

**ROTA VIRUS VACCINE**

This is a live, oral, vaccine for use in preventing rotavirus gastroenteritis in infants.
It is a Human monovalent against strains G1 & P8 of viruses. It is a liquid vaccine that is given by mouth in two doses, between the ages of 6 and 32 weeks.

*Indications:* It can help protect against rotavirus, a viral infection that may cause diarrhea, vomiting, fever, and dehydration in infants.

*Contraindications:* Individuals with immunodeficiency and in those predisposed to, or with a history of intussusception. Its administration should be postponed in infants with diarrhoea or vomiting.

*Caution:* Since rotavirus vaccine is excreted in the stool and may be transmitted to close contacts; the vaccine should be used with caution in those with immunosuppressed close contacts. Carers of recently vaccinated baby should be advised to wash hands after changing the baby’s nappies.

*Side Effects:* Diarrhoea, vomiting, abdominal pain, fever and irritability; rarely cramps & rash.

*Doses:* 2 doses of 1 ml suspension separated by at least 4 weeks (with DTP1, DTP2). The course should be completed before 24 months of age.

[Rotarix Oral Suspension (Powder For Reconstitution)]

**TUBERCULIN PURIFIED PROTEIN DERIVATIVE (PPD)**

*Indications:* Diagnostic reagent.

*Side effects:* Pain and pruritus may occur at the injection site, occasionally with vesiculation, ulceration, or necrosis in highly sensitive persons. Granuloma has been
reported. Nausea, headache, dizziness, malaise, rash, urticaria, oedema, and pyrexia have been reported occasionally; immediate systemic hypersensitivity, including anaphylaxis, has been reported rarely. There have also been rare reports of lymphangitis.

**Contra-indications:** Avoid testing within 4 weeks of receiving a live viral vaccine since response to tuberculin may be inhibited.

**Dose:** Mantoux test, by intradermal injection, routine, 10 units i.e. 0.1 ml of 100 units/ml.
Special (hypersensitive or TB suspected), 1 unit i.e. 0.1 ml of 100 units/ml.
Special (low sensitivity), 100 units i.e. 0.1 ml of 1000 units/ml
A positive and a strongly positive result consist of induration of at least 5 mm and 15 mm respectively in diameter.
Results are read after 48-72 hours but if necessary may be read up to 96 hours after the test.

**TUBERCULOSIS VACCINE**

Bacillus Calmette-Guerin Vaccine (BCG vaccine). It is a freeze dried preparation of live bacteria derived from the bacillus of Calmette-Guerin.

**Indications:** It is given at birth to children born to non Bahraini parents. It should be given simultaneously with other live vaccines. If not, then an interval of at least 4 weeks should be allowed between them.

**Side effects:** Pain and pruritus may occur at the injection site, occasionally with vesiculation, ulceration, or necrosis in highly sensitive persons. Granuloma has been reported.
Nausea, headache, dizziness, malaise, rash, urticaria, oedema, and pyrexia have been reported occasionally; immediate systemic hypersensitivity, including anaphylaxis, has been reported rarely. There have also been rare reports of lymphangitis.

**Precautions:** Tuberculin should be given with caution to patients who have, or are suspected of having, active tuberculosis; although severe local reactions may occur in patients with active tuberculosis, sensitivity may be diminished if it is particularly severe. Sensitivity to
Immunological products and Vaccines system

Tuberculin may also be diminished in the following conditions: infection; neoplastic disease; corticosteroid or immunosuppressive therapy; recent use of live virus vaccines; ultraviolet light treatment; chronic renal failure; dehydration; and malnutrition. Tuberculins may be adsorbed onto the surface of syringes and should therefore be given immediately.

**Dose:** New-borns and infants under 3 months, 0.05 ml containing 0.05 mg of BCG by intradermal injection.

### TYPHOID VACCINE

It is polysaccharide typhoid vaccine.

**Indications:** Typhoid vaccines are used for active immunisation against typhoid fever, especially for travellers to areas with poor sanitation standards.

**Side effects:** Local reactions including pain, swelling or erythema.

**Dose:** 0.5 ml by deep S. C. or I. M. injection for children above 2 years and adults every 3 years.

- Typherix (Gsk)
- Typhim Vi (Sanofi)

### YELLOW FEVER VACCINE

It is live attenuated yellow fever virus.

**Indications:** For travellers or people living in areas where infection is endemic.

**Contra-indications:** Impaired immune response; hypersensitivity to eggs with evidence of anaphylactic reaction is a contraindication to the vaccine; pregnancy.

**Side effects and Precautions**

Local and general reactions are not common after vaccination for yellow fever. Very rarely encephalitis has occurred, generally in infants under 9 months of age. Therefore, yellow fever vaccine is not usually given to infants under 9 months..

Headache, fever, tiredness and stiffness may occur 4-7 days after vaccination. Myalgia, asthenia, lymphopathy, rash, urticaria and injection site reaction.

Pregnancy.

Although yellow fever vaccine has been given to women during pregnancy without producing adverse effects in the infants, fetal infection has been reported.
**Dose:** 0.5 ml by S.C. injection – IMMunity start after 10 days and lasts for 10 years.

**IMMUNOGLOBULINS**

**HUMAN NORMAL IMMUNOGLOBULIN (HNIG)**

*Intramuscular IMMunoglobulins*

**Indications:** for prophylaxis of various viral diseases such as hepatitis A, measles and German measles; for therapy in cases of complications of these diseases in high doses.

**Contra-indications:** avoid administration of live vaccine for 3 months; after administration of live vaccine avoid giving the immunoglobulin for 2-3 weeks.

**Side effects and Precautions**

Intravenous immunoglobulin preparations should be used with caution in patients with renal impairment. IMMunoglobulin products containing sucrose may be associated with an increased risk of inducing acute renal failure.

Antibody titres for some common pathogens can vary. Formulations of intravenous immunoglobulins should therefore not be regarded as equivalent.

To be used with caution in patients with risk factors for arterial or venous thrombotic events and in obese individuals.

**Dose:** It is usually administered I.M. and never I.V. usual prophylactic dose by I.M. injection for adults and children is 0.02-0.04 ml/kg. This usually gives immunological protection for 3 months.

For longer periods of exposure or in areas of high endemicity, the dose is 0.06-0.12 ml/kg, repeated every 4-6 months on continued exposure.

Dose for pregnant women exposed to Rubella for whom therapeutic abortion is unacceptable is 20 ml (2 doses of 5-10 mg separated by a few days).

**GLOBUMAN BERNAR**

*Intravenous immunoglobulins*

**Indications:** prophylaxis and treatment of bacterial and viral infections; hypo- and agammaglobulinaemia, transient hypogammaglobulinaemia like during
immunosuppressive therapy; virus infections such as herpes, measles, etc; supplementary to antibiotic therapy in severe bacterial infections; management of idiopathic thrombocytopenic purpura; Guillain-Barre syndrome.

**Contra-indications:** hypersensitivity to human immunoglobulins.

**Side effects:** rise in temperature; cutaneous manifestations or subjective complaints may occur rarely, anaphylactoid reactions are possible.

**Dose:** according to requirements, consult product literature.
- *Intraglobin 500 mg/Vial*
- *Pentaglobin 5%*

### CYTOMEGALOVIRUS (CMV) IMMUNOGLOBULIN

**Indications:** prophylaxis of clinical manifestations of cytomegalovirus infection in patients subjected to immunosuppressive therapy particularly in transplant recipients.

**Cautions:** pregnancy and lactation; severe adverse reactions may be related to the rate of infusion. Patients should be observed for at least 20 minutes after administration. Special caution in patient with an amnestic known history of migraine.

**Contra-indications:** patients intolerant to homologous immunoglobulins.

**Side effects:** chills, headache, fever, vomiting, allergic reactions, mild back pain.

**Dose:** administration should be initiated on the day of transplantation or the day prior to it in case of BMT. A total of at least 6 doses at 2-3 weeks intervals should be given.
- *Cytotect Injection 100 mg*

### ANTI-D (RH) IMMUNOGLOBULIN

**Indications:** Rh-negative women should receive the anti-Rh injection at the earliest possible time after delivery of Rh-positive infant after expulsion of the placenta. Anti-Rh should be injected in cases of abortion as well.
Antibodies for Rh Sensitization

Anti-Rh is also used for prophylaxis against immunization following transfusion of wrong Rh-type blood.

**Side effects:** In patients given anti-D immunoglobulin for idiopathic thrombocytopenic purpura there have been rare, but sometimes fatal, cases of intravascular haemolysis.

Anti-D immunoglobulin should not be used in rhesus-positive individuals for prophylaxis of rhesus sensitisation. For the treatment of immune thrombocytopenic purpura, anti-D immunoglobulin is contra-indicated in splenectomised or rhesus-negative patients, in whom the resultant haemolysis may exacerbate pre-existing anaemia.

**Dose:** by deep I. M. injection to Rh-negative women following birth of rhesus-positive infant, 500 units immediately or within 72 hours.

Following any potentially sensitizing episode such as stillbirth or abortion up to 20 weeks gestation, 250 units per episode (500 units if after 20 weeks) immediately or within 72 hours.

Following Rh-incompatible blood transfusion, 125 units per ml transfused Rh-positive red cells.

**HEPATITIS B IMMUNOGLOBULIN (HBIG)**

(HBIG) is available for use in association with the vaccine for the prevention of infection in people accidentally contaminated with hepatitis B virus, and in infants born to mothers who have become infected with this virus in pregnancy or who are high-risk carriers.

**RABIES IMMUNOGLOBULIN**

**Dose:** 20 units/kg by I. M. route and half by infiltration around wound.

**TETANUS IMMUNOGLOBULIN**

Used for the protection of unimmunised persons when there is a specific risk of tetanus.

**Dose:** by intramuscular injection, prophylactic 250 units, increased to 500 unit if more than 24 hours have elapsed or there is risk of heavy contamination.

Therapeutic, 30-300 units/kg (multiple sites)
VARICELLA ZOSTER IMMUNOGLOBULIN

Used for protection of immuno suppressed persons and neonates at risk.

**Contraindication:** in patients on immunosuppressive therapy, or those with immunodeficiency.

- Varitect
INFECTIONS

ANTIBACTERIAL DRUGS

AMIKACIN SULPHATE

**Indications:** serious gram-negative infections resistant to gentamicin.

**Caution:** pregnancy, renal impairment, neonates and infants.

**Contraindications:** myasthenia gravis

**Side Effects:** vestibular and auditory damage; nephrotoxicity; colitis; nausea, vomiting and rash.

**Pharmacokinetics:** This is an aminoglycoside antibiotic. One-hour (‘peak’) serum concentration should not exceed 30 mg/litre; pre-dose (‘trough’) concentration should be less than 10 mg/litre.

**Dose:** by I.M. injection or slow I.V. injection or infusion, 15mg/kg daily in 2 divided doses, increased to 22.5 mg/kg daily in 3 divided doses in severe infections; max. 1.5 g daily for up to 10 days (max. cumulative dose 15 g); child 15 mg/kg daily in 2 divided doses; neonate loading dose of 10 mg/kg then 15 mg/kg daily in 2 divided doses.

**Safety in Pregnancy:** In second and third trimester: Auditory or vestibular nerve damage.

- *Amikin Injection 500 mg*  
- *Injection, Amikacin (As Sulphate) 250 mg/ml*

AMOXICILLIN

**Indications:** urinary tract infections, otitis media, sinusitis, chronic bronchitis, invasive salmonellosis, gonorrhoea; endocarditis prophylaxis; Helicobacter pylori eradication.

**Caution:** history of allergy; reduce dose in renal impairment; erythematous rashes in glandular fever and chronic lymphatic leukaemia, and possibly HIV infection.

**Contraindications:** penicillin hypersensitivity

**Side Effects:** nausea, diarrhoea, rash, antibiotic-associated colitis.

**Dose:** by mouth, 250 mg every 8 hours, doubled in severe infections.
Injections

Child up to 10 years, 125 mg every 8 hours.
Severe or recurrent purulent respiratory infection, 3 g every 12 hours.
Dental abscess as a short course, 3 g repeated after 8 hours.
Urinary tract infections, 3 g repeated after 10-12 hours as a short course.
Gonorrhoea, single dose of 2-3 g with probenecid 1 g.
Otitis media, child 3-10 years, 750 mg twice daily for 2 days.

Safety in Pregnancy: Not known to be harmful

Safety in Breast Feeding: Trace amounts in milk
- Amoxil Capsules 250 mg, 500 mg
- Amoxil Suspension 250 mg/5 ml

AMOXYCILLIN & CLAVULINIC ACID

Indications: infections due to beta-lactamase-producing strains (where amoxicillin alone not appropriate) including respiratory-tract infections, genito-urinary and abdominal infections, cellulitis, animal bites, severe dental infection with spreading cellulitis

Caution: I.V. preparation should be used with caution in patients with severe hepatic dysfunction. Dosage should be adjusted in moderate or severe renal impairment maintain adequate hydration with high doses (particularly during parenteral therapy) Cholestatic jaundice

Contraindications: penicillin hypersensitivity, history of co-amoxiclav-associated or penicillin-associated jaundice or hepatic dysfunction

Side Effects: hepatitis, cholestatic jaundice; Stevens-Johnson syndrome, toxic epidermal necrolysis, exfoliative dermatitis, vasculitis reported; rarely prolongation of bleeding time, dizziness, headache, convulsions (particularly with high doses or in renal impairment); superficial staining of teeth with suspension, phlebitis at injection site

Dose: the preparation is not suitable for I.M. injection or intermittent infusion.

By mouth, expressed as amoxicillin, 250 mg every 8 hours, dose doubled in severe infections; INFANT & CHILD up to 6 years 0.8 ml/kg daily in 3 divided doses. Severe infections 1.6 ml/kg daily in 3 divided doses.
Severe dental infections (but not generally first-line), expressed as amoxicillin, 250 mg every 8 hours for 5 days. By intravenous injection over 3–4 minutes or by intravenous infusion, expressed as amoxicillin, 1 g every 8 hours increased to 1 g every 6 hours in more serious infections; INFANTS up to 3 months 25 mg/kg every 8 hours (every 12 hours in the perinatal period and in premature infants); CHILD 3 months–12 years, 25 mg/kg every 8 hours increased to 25 mg/kg every 6 hours in more serious infections.

Surgical prophylaxis, expressed as amoxicillin, 1 g at induction; for high risk procedures (e.g. colorectal surgery) up to 2–3 further doses of 1 g may be given every 8 hours.

- Amoxicillin & Clavulanic Acid 1.2 Gm. Inf Vials
- Augmentin Vials 1.2 G/Each Vial Contains 1 G Amoxicillin & 200mg Clavulanic Acid

**AMPICILLIN**

**Indications:** urinary-tract infections, otitis media, sinusitis, oral infections, bronchitis, uncomplicated community-acquired pneumonia, (Haemophilus influenzae infections, invasive salmonellosis; listerial meningitis

**Caution:** history of allergy; renal impairment; erythematous rashes common in glandular fever, cytomegalovirus infection, and acute or chronic lymphocytic leukaemia

**Contraindications:** penicillin hypersensitivity

**Side Effects:** nausea; diarrhoea; rashes; rarely, antibiotic-associated colitis.

**Dose:** By intramuscular injection or intravenous injection or infusion, 500 mg every 4–6 hours; CHILD under 10 years, half adult dose

- Endocarditis (in combination with another antibiotic if necessary), by intravenous infusion, 2 g every 6 hours, increased to 2 g every 4 hours e.g. in enterococcal endocarditis or if ampicillin used alone
- Listerial meningitis (in combination with another antibiotic), by intravenous infusion, 2 g every 4 hours for 10–14 days; NEONATE 50 mg/kg every 6 hours; INFANT 1–
Injections

3 months, 50–100 mg/kg every 6 hours; CHILD 3 months–12 years, 100 mg/kg every 6 hours (max. 12 g daily)
- Ampicillin 0.5gm./Vial Inj
- Ampicillin 1 Gm./Vial /10ml. Inj

AZTREONAM

Indications: Gram-negative infections including Pseudomonas aeruginosa, Haemophilus influenzae, and Neisseria meningitidis

Caution: hypersensitivity to beta-lactam antibiotics; hepatic impairment; renal impairment, breast feeding

Contraindications: hypersensitivity; pregnancy

Side Effects: nausea, vomiting, diarrhoea, abdominal cramps; mouth ulcers, altered taste; jaundice and hepatitis; flushing; hypersensitivity reactions; blood disorders (including thrombocytopenia and neutropenia); rashes, injection-site reactions; rarely hypotension, seizures, asthenia, confusion, dizziness, headache, halitosis, and breast tenderness; very rarely antibiotic-associated colitis, gastro-intestinal bleeding, and toxic epidermal necrolysis

Dose: By deep intramuscular injection or by intravenous injection over 3–5 minutes or by intravenous infusion, 1 g every 8 hours or 2 g every 12 hours; 2 g every 6–8 hours for severe infections (including systemic Pseudomonas aeruginosa and lung infections in cystic fibrosis); single doses over 1 g intravenous route only

Urinary-tract infections, 0.5–1 g every 8–12 hours
CHILD over 1 week, by intravenous injection or infusion, 30 mg/kg every 6–8 hours increased in severe infections for child of 2 years or older to 50 mg/kg every 6–8 hours; max. 8 g daily

Gonorrhoea, cystitis, by intramuscular injection, 1 g as a single dose
- Azactam 1 G Vial (Aztreonam 1 Gm. I.M. & I.V. Inj)

BENZATHINE PENICILLIN

Indications: syphilis; penicillin-sensitive infections, active against some gram positive organisms and against few gram negative organisms e.g. Neisseria gonorrhoea

170
**Caution:** avoid intravascular route since ischaemic reactions may occur

**Contraindications:** hypersensitivity to penicillin

**Side Effects:** hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; rarely CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)

**Dose:** deep I.M. injection in usual dose of 900 mg for treatment of streptococcal infections. Children may be given I.M. doses of 225-675 mg according to body weight. To prevent recurrences of acute rheumatic fever, 900 mg I.M. every 4 weeks.

**Note:** 900 mg of Benzathine penicillin = 720 mg of Benzylpenicillin (1.2 million units) approximately.

❖ Penadur Injection 1,200,000 IU.

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**BENZYL PENICILLIN**

**Indications:** throat infections, otitis media, endocarditis, meningococcal disease, pneumonia, cellulitis; anthrax; prophylaxis in limb amputation

**Caution** history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment

**Contraindications:** penicillin hypersensitivity

**Side Effects:** hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; rarely CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)

**Dose:** By intramuscular or by slow intravenous injection or by infusion, 2.4–4.8 g daily in 4 divided doses, increased if necessary in more serious infections (single doses over 1.2 g intravenous route only); PRETERM NEONATE and NEONATE under 1 week, 50 mg/kg daily in 2 divided doses; NEONATE 1–4 weeks, 75 mg/kg daily in 3 divided doses; CHILD 1 month–12 years, 100 mg/kg daily
Injections

in 4 divided doses; intravenous route recommended in neonates and infants.

**Endocarditis** (in combination with another antibacterial if necessary), by slow intravenous injection or by infusion, 7.2 g daily in 6 divided doses, increased if necessary (e.g. in enterococcal endocarditis or if benzylpenicillin used alone) to 14.4 g daily in 6 divided doses

**Anthrax** (in combination with other antibacterials, by slow intravenous injection or by infusion, 2.4 g every 4 hours; CHILD 150 mg/kg daily in 4 divided doses

**Intrapartum prophylaxis** against group B streptococcal infection, by slow intravenous injection or by infusion, initially 3 g then 1.5 g every 4 hours until delivery

**Meningococcal disease**, by slow intravenous injection or by infusion, 2.4 g every 4 hours; PRETERM NEONATE and NEONATE under 1 week, 100 mg/kg daily in 2 divided doses; NEONATE 1–4 weeks, 150 mg/kg daily in 3 divided doses; CHILD 1 month–12 years, 180–300 mg/kg daily in 4–6 divided doses

**Important.** If bacterial meningitis and especially if meningococcal disease is suspected: a single injection of benzylpenicillin by intravenous injection (or by intramuscular injection) followed by continuous monitoring at the hospital. Suitable doses are: ADULT 1.2 g; INFANT under 1 year 300 mg; CHILD 1–9 years 600 mg, 10 years and over as for adult.

By intrathecal injection, not recommended

- **Crystapen Injection 1000,000 I U./Vial (1 Mega Unit)**
- **Benzyl Penicillin 1 Mega Units I.V.**

**CEFADROXIL MONOHYDRATE**

**Indications:** infections due to sensitive Gram-positive and Gram-negative bacteria; useful in urinary tract infections; poor activity against *H. influenzae*; respiratory tract infections; otitis media; sinusitis; skin and soft tissue infections.

**Caution:** penicillin sensitivity; renal impairment, false positive urinary glucose (if tested for reducing substances) and false positive coomb's test; pregnancy & breast feeding.
Contraindications: cephalosporin hypersensitivity; porphyria

Side Effects: diarrhoea and rarely antibiotic-associated colitis (both more likely with higher doses), nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis reported; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice; other side-effects reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

Dose: Patients over 40 kg, 0.5–1 g twice daily; skin, soft tissue, and simple urinary-tract infections, 1 g daily; CHILD under 1 year, 25 mg/kg daily in divided doses; 1–6 years, 250 mg twice daily; over 6 years, 500 mg twice daily

- Duricef Capsules 500 mg
- Cefadroxil (As Monohydrate) 500 mg Cap

CEFEPIME DIHYDROCHLORIDE MONOHYDRATE

Indications: Reserved to treat severe nosocomial pneumonia, infections caused by multi-resistant microorganisms (e.g. Pseudomonas aeruginosa) and empirical treatment of febrile neutropenia.

Cefepime has good activity against important pathogens including Pseudomonas aeruginosa, Staphylococcus aureus, and multiple drug resistant Streptococcus pneumoniae. A particular strength is its activity against Enterobacteriaceae. Whereas other cephalosporins are degraded by many plasmid- and chromosome-mediated beta-lactamases, cefepime is stable and is a front line agent when infection with Enterobacteriaceae is known or suspected

Caution: severe renal impairment. Prolonged use may result in superinfection; history of penicillin allergy, especially IgE-mediated reactions (eg, anaphylaxis,
Injections

urticaria); May cause antibiotic-associated colitis or colitis secondary to C. difficile.

**Contraindications:** Cephalospotin hypersensitivity

**Side Effects:** diarrhea and rarely antibiotic-associated colitis, nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice; other side-effects reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

- Cefepime Dihydrochloride Monohydrate Inj 1gm

**CEFPROZIL**

**Indications:** respiratory tract infections; otitis media; skin and soft tissue infections; active against methicillin sensitive staphylococci; streptococci and various gram negative bacilli including E. coli; some klebsiella; P. mirabilis, H. influenza and moraxella.

**Caution:** severe renal impairment; Prolonged use may result in superinfection; a history of penicillin allergy, especially IgE-mediated reactions (eg, anaphylaxis, urticaria). May cause antibiotic-associated colitis or colitis secondary to C. difficile.

**Side Effects:** diarrhoea and rarely antibiotic-associated colitis (CSM has warned both more likely with higher doses), nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis reported; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice; other side-effects include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial
nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

**Dose:** ADULTS and children ≥13 years:
- Pharyngitis/tonsillitis: Oral: 500mg every 24 hours for 10 days
- Secondary bacterial infection of acute bronchitis or acute bacterial exacerbation of chronic bronchitis: Oral: 500 mg every 12 hours for 10 days
- Uncomplicated skin and skin structure infections: Oral: 250 mg every 12 hours, Otitis media: Oral: Children >6 months to 12 years: 15 mg/kg every 12 hours for 10 days
- Children: 2-12 years:
  - Pharyngitis/tonsillitis: Oral: 7.5-15 mg/kg/day divided every 12 hours for 10 days (administer for >10 days if due to S. pyogenes); maximum: 1 g/day
- Uncomplicated skin and skin structure infections: Oral: 2-12 years: 20 mg/kg every 24 hours for 10 days; maximum: 1 g/day
  - Cefprozil Susp 250mg/5ml Powder For Oral Suspension, As Anhydrous: 250 mg/5 ml (50 ml, 75 ml, 100 ml)
  - Cefzil 250 mg/5 ml (50 ml, 75 ml, 100 ml)
  - Cefprozil 250mg Tabs
  - Cefzil 250 mg Tab

**CEFTAZIDIME**

**Indications:** infections due to sensitive Gram-positive and Gram-negative bacteria; good activity against Pseudomonas.

**Caution** sensitivity to beta-lactam antibacterials (avoid if history of immediate hypersensitivity reaction); renal impairment; pregnancy and breast-feeding (but appropriate to use); false positive urinary glucose (if tested for reducing substances) and false positive Coombs' test

**Contraindications:** cephalosporin hypersensitivity

**Side Effects:** diarrhoea and rarely antibiotic-associated colitis (both more likely with higher doses), nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum
sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis reported; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice; other side-effects reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

**Dose:** By deep intramuscular injection or intravenous injection or infusion, 1 g every 8 hours or 2 g every 12 hours; 2 g every 8–12 hours or 3 g every 12 hours in severe infections; single doses over 1 g intravenous route only;

**ELDERLY** usual max. 3 g daily;

**CHILD** up to 2 months 25–60 mg/kg daily in 2 divided doses, over 2 months 30–100 mg/kg daily in 2–3 divided doses; up to 150 mg/kg daily (max. 6 g daily) in 3 divided doses if immunocompromised or meningitis; intravenous route recommended for children.

Urinary-tract and less serious infections, 0.5–1 g every 12 hours

Pseudomonal lung infection in cystic fibrosis, **ADULT** 100–150 mg/kg daily in 3 divided doses; **CHILD** up to 150 mg/kg daily (max. 6 g daily) in 3 divided doses; intravenous route recommended for children

Surgical prophylaxis, prostatic surgery, 1 g at induction of anaesthesia repeated if necessary when catheter removed

- *Ceftazidime I.M.I.V. Inj*
- *Fortum Injection, Powder For Reconstitution, Ceftazidime (As Pentahydrate), With Sodium Carbonate, 1g Vial, 2g Vial*

**CEFTRIAXONE SOD**

Indications: infections due to Gram-negative and Gram-positive microorganisms; septicaemia; meningitis; abdominal infections (peritonitis, infections of the biliary and gastrointestinal tracts); infections of the bones, joints, soft tissue, skin and of wounds; infections in patients with impaired defence mechanisms; renal and urinary tract
infections; respiratory tract infections, particularly pneumonia, and ear, nose and throat infections; genital tract infections including gonorrhea and perioperative prophylaxis of infections.

**Caution** anaphylactic shock cannot be ruled out; shadows suggesting sludge have been detected by sonograms of the gall bladder, but this is reversible upon discontinuation of therapy or completion; caution in hyperbilirubinemic neonates, especially prematures; blood picture should be checked regularly during prolonged treatment.

**Contraindications:** known hypersensitivity to the cephalosporins; neonates with jaundice

**Side Effects:** gastro-intestinal complaints; skin reactions; hematological changes and other rare side effects like headache, and mycosis of the genital tract; phlebitis may occur rarely after administration and it can be prevented by slow injection (two to four minutes).

**Dose:** by deep I.M. injection on I.V. injection over at least 2-4 minutes or by I.V. infusion, adults and children over 12 years, 1-2 g once daily.

In severe cases or infections caused by moderately sensitive organisms, up to 4 g once daily.

Uncomplicated gonorrhoea, by deep I.M. injection, 250 mg as a single dose.

Neonates (up to 2 weeks), by I.V. infusion over 60 minutes, 20-50 mg/kg daily (max. 50 mg/kg daily).

Child 3 weeks-12 years, 20-80 mg/kg daily

Child with body weight more than 50 kg, adult dose should be given.

I.V. doses of 50 mg more /kg should be given by infusion over at least 30 minutes.

I.M. doses over 1 g divided between more than one site

**Safety in Pregnancy** Not known to be harmful

**Safety in Breast Feeding:** Present in milk in low concentration

- Rocephin 1 G I.V, I.M. Injection.
CEFUROXIME.

**Indications:** infections due to sensitive Gram-positive and Gram-negative bacteria; surgical prophylaxis

**Caution** sensitivity to beta-lactam antibacterials (avoid if history of immediate hypersensitivity reaction; renal impairment; pregnancy and breast-feeding (but appropriate to use); false positive urinary glucose (if tested for reducing substances) and false positive Coombs' test

**Contraindications:** cephalosporin hypersensitivity

**Side Effects:** diarrhoea and rarely antibiotic-associated colitis (CSM has warned both more likely with higher doses), nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis reported; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice; other side-effects reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

**Dose:** By mouth (as cefuroxime axetil), 250 mg twice daily in most infections including mild to moderate lower respiratory-tract infections (e.g. bronchitis); doubled for more severe lower respiratory-tract infections or if pneumonia suspected

Urinary-tract infection, 125 mg twice daily, doubled in pyelonephritis

Gonorrhoea, 1 g as a single dose

CHILD over 3 months, 125 mg twice daily, if necessary doubled in child over 2 years with otitis media

Lyme disease, ADULT and CHILD over 12 years, 500 mg twice daily for 20 days

By intramuscular injection or intravenous injection or infusion, 750 mg every 6–8 hours; 1.5 g every 6–8 hours in severe infections; single doses over 750 mg intravenous route only CHILD usual dose 60 mg/kg daily (range 30–100 mg/kg daily) in 3–4 divided doses (2–3 divided doses in neonates)
Infections

Gonorrhoea, 1.5 g as a single dose by intramuscular injection (divided between 2 sites)
Surgical prophylaxis, 1.5 g by intravenous injection at induction; up to 3 further doses of 750 mg may be given by intramuscular or intravenous injection every 8 hours for high-risk procedures
Meningitis, 3 g intravenously every 8 hours; CHILD, 200–240 mg/kg daily (in 3–4 divided doses) reduced to 100 mg/kg daily after 3 days or on clinical improvement; NEONATE, 100 mg/kg daily reduced to 50 mg/kg daily
  - Zinnat 250mg Tab (Cefuroxime Axetil).
  - Zinacef 750mg Vial (Cefuroxime Sodium)

CEFOTAXIME SOD

Indications: septicaemia, endocarditis and meningitis, except those due to Listeria monocytogenes, gonorrhoea; surgical prophylaxis; Haemophilus epiglottitis and meningitis
Caution allergy to cephalosporins or penicillins
Side Effects: allergic reaction; digestive disorders; transient hematological changes; hepatic function changes; phlebitis after injection.
Pharmacokinetics: This is a third generation cephalosporin.
Dose: by I.M. or I.V. injection or I.V. infusion, 1 g every 12 hours increased in severe infections such as meningitis to 8 g daily in 4 divided doses. Up to 12 g in 3-4 divided doses may be given. Neonate, 50 mg/kg in 2-4 divided doses increased to 150-200 mg/kg daily in severe infections.
Child, 100-150 mg/kg daily in 2-4 divided doses increased to 200 mg/kg daily in very severe infections
Gonorrhoea, 500 mg as a single dose.
  - Claforan
  - Cefotaxime Sod. 1gm/Vial IV Inj

CEPHALEXIN

Indications: infections due to sensitive Gram-positive and Gram-negative bacteria.
Caution: penicillin sensitivity; renal impairment; pregnancy and breast-feeding.
Injections

**Contraindications:** cephalosporin hypersensitivity; porphyria

**Side Effects:** allergic reactions including urticaria and rashes, hypersensitivity reactions including anaphylaxis, nausea, vomiting, diarrhoea, false positive results for glucose in urine with reducing substances, reduce also in renal impairment

**Dose:** 250 mg every 6 hours or 500 mg every 8-12 hours. In severe infections, 1-1.5 g every 6-8 hours. child 25 mg/kg daily in divided doses, doubled for severe infections, max. 100 mg/kg daily; or under 1 year 125 mg every 12 hours, 1–5 years 125 mg every 8 hours, 6–12 years 250 mg every 8 hours

Prophylaxis of recurrent urinary-tract infection, adult 125 mg at night

- Cephalexin Cap 250 mg
- Cephalexin 250 mg/5 ml Susp 100ml/Bottle
- Cephalexin Cap 500mg

**CEPHALOTHIN**

**Indications:** infection due to susceptible bacteria, particularly staphylococci.

**Caution** hypersensitivity to penicillin; renal impairment; false-positive urine reactions for glucose using copper reduction reactions.

**Contraindications:** hypersensitivity to cephalosporins.

**Side Effects:** allergic reactions including urticaria and rashes, hypersensitivity reactions, including anaphylaxis, nausea, vomiting, diarrhoea; avoid in renal impairment, I.M. injections painful.

**Dose:** by I.V. injection or infusion, 1 g every 4-6 hours; maximum 12 g daily Child, 80-160 mg/kg daily in divided doses

- Keflin Injection 1 G
- Cephalothin Sodium 1 Gm. Inj

**CIPROFLOXACIN**

**Indications:** infections of respiratory tract (except for pneumococcal pneumonia), middle ear (otitis media) and paranasal sinuses (sinusitis), genital organs, abdominal cavity, skin and soft tissues, bones and joints and sepsicaemia.

180
**Infections**

**Caution** elderly patients; renal impairment; epileptics and patients with damage to the central nervous system; ensure adequate fluid intake.

**Contraindications:** hypersensitivity to ciprofloxacin or other quinolone chemotherapeutics; pediatrics; nursing or pregnant women.

**Side Effects:** gastro-intestinal effects like nausea, diarrhoea and vomiting, flatulence; headache, dizziness; sleep disorders; rash; pruritus; rarely dysphagia, pancreatitis, tachycardia, hypotension, oedema, hot flushes, sweating, hyperglycaemia, and erythema nodosum; very rarely movement disorders, tinnitus, vasculitis, and tenosynovitis

**Dose:** by mouth, respiratory tract infections, 250-750 mg twice daily, for 7-14 days.
Urinary tract infections, 250-500 mg twice daily.
Acute uncomplicated cystitis in women, 100 mg twice daily for 3 days.
A single oral dose of of 500 mg has been suggested for the treatment of gonorrhea

- Ciprofloxacin Hydrochloride 500 mg Tab.
- Ciproton Tablets 500 mg
- Ciprofloxacin 200mg/ 50ml Inj

**CLINDAMYCIN**

**Indications:** staphylococcal bone and joint infections, peritonitis; endocarditis prophylaxis.

**Caution** discontinue immediately if diarrhoea or colitis develops; hepatic impairment, renal impairment; monitor liver and renal function on prolonged therapy and in neonates and infants; pregnancy, breast-feeding, void rapid intravenous administration; avoid in porphyria

**Contraindications:** diarrhoea states.

**Side Effects:** diarrhoea (discontinue treatment), abdominal discomfort, oesophagitis, nausea, vomiting, antibiotic-associated colitis; jaundice; leucopenia, eosinophilia, and thrombocytopenia reported; rash, pruritus, urticaria, anaphylactoid reactions, Stevens-Johnson syndrome, exfoliative and vesiculobullous dermatitis; pain, induration, and abscess after intramuscular injection; thrombophlebitis after intravenous injection.
Dose: By mouth, 150–300 mg every 6 hours; up to 450 mg every 6 hours in severe infections; CHILD, 3–6 mg/kg every 6 hours
By deep intramuscular injection or by intravenous infusion, 0.6–2.7 g daily (in 2–4 divided doses); life-threatening infection, up to 4.8 g daily; single doses above 600 mg by intravenous infusion only; single doses by intravenous infusion not to exceed 1.2 g; CHILD over 1 month, 15–40 mg/kg daily in 3–4 divided doses; severe infections, at least 300 mg daily regardless of weight
- Clindamycin 300 mg/2 ml. Inj
- Dalacin C Injection 300 mg/2 ml

CLOxacillin

Indications: infections due to penicillinase-producing staphylococci causing respiratory tract, skin, bone & joint, urinary tract infections.
Caution history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment
Contraindications: penicillin hypersensitivity
Side Effects: hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; rarely CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)
Dose: By mouth, 250–500 mg every 6 hours, at least 30 minutes before food; child under 2 years quarter adult dose; 2–10 years half adult dose
By intramuscular injection, 250–500 mg every 6 hours; child under 2 years quarter adult dose; 2–10 years half adult dose
By slow intravenous injection or by intravenous infusion, 0.25–2 g every 6 hours; child under 2 years quarter adult dose; 2–10 years half adult dose
Endocarditis (in combination with another antibacterial, body-weight under 85 kg) 8 g daily in 4 divided doses; body-weight over 85 kg, 12 g daily in 6 divided doses
Osteomyelitis, up to 8 g daily in 3–4 divided doses
- Cloxacillin 125mg5ml Susp(100ml/Bottle)
Infections

- **Cloxacillin Sodium 250 mg, 500 mg - Capsules**
- **Cloxacillin Sodium 500 mg/Vial IM, I.V.**
- **Orbenin Injection 500 mg.**
- **Orbenin Syrup 125 mg/5 ml & 250 mg/5 ml.**
- **Prostaphlin-A Capsules 250 mg & 500 mg.**

**COTRIMIXAZOLE D.S.**

**Indications:** drug of choice in *Pneumocystis jiroveci* (Pneumocystis carinii) pneumonia; also for toxoplasmosis and nocardiosis. In acute exacerbations of chronic bronchitis and infections of the urinary tract when there is good bacteriological evidence of sensitivity to co-trimoxazole and good reason to prefer this combination to a single antibacterial; similarly it should only be used in acute otitis media in children when there is good reason to prefer it.

**Caution:** maintain adequate fluid intake; avoid in blood disorders; monitor blood counts on prolonged treatment; discontinue immediately if blood disorders or rash develop; predisposition to folate deficiency or hyperkalaemia; elderly; asthma; G6PD deficiency, avoid in infants under 6 weeks (except for treatment or prophylaxis of pneumocystis pneumonia); hepatic impairment; renal impairment; pregnancy, breast-feeding

**Contraindications:** porphyria

**Side Effects:** nausea, diarrhoea; headache; hyperkalaemia; rash (very rarely including Stevens-Johnson syndrome, toxic epidermal necrolysis, photosensitivity)—discontinue immediately; less commonly vomiting; very rarely glossitis, stomatitis, anorexia, liver damage, pancreatitis, antibiotic-associated colitis, myocarditis, cough and shortness of breath, pulmonary infiltrates, asceptic meningitis, depression, convulsions, peripheral neuropathy, ataxia, tinnitus, vertigo, hallucinations, hypoglycaemia, blood disorders (including leucopenia, thrombocytopenia, megaloblastic anaemia, eosinophilia), hyponatraemia, renal disorders including interstitial nephritis, arthralgia, myalgia, vasculitis, and systemic lupus erythematosus

**Dose:** by mouth, 960 mg every 12 hours.
If treatment is to continue for more than 14 days, the dose should be 480 mg every 12 hours.
Injections

Child, 6 weeks - 5 months: 120 mg every 12 hours.
6 months- 5 years: 240 mg every 12 hours.
6-12 years: 480 mg every 12 hours.

Gonorrhoea. 1.92 g every 12 hours for 2 days. or 2.4 g followed by a further dose of 2.4 g after 8 hours.

For the intravenous infusion, adult and child > 12 years of age, 10 ml of the infusion twice daily
For severe infections, 15 ml of the I.V. infusion twice daily.

Child up to 12 years, 6 mg trimethoprim and 30 mg sulphamethaxazole/kg body-weight/24 hours, divided into two equal doses.
Infants (6 weeks- 6 months), 1.25 ml infusion twice daily. Child (6-12 years), 5 ml twice daily.

Paediatric dose may be increased by 50% in severe infections but not for more than 3 successive days.

**Dose in Pneumocystis carinii pneumonia:** 20 mg trimethoprim, 100 mg sulphamethaxazole/kg/day in two or more divided doses for 2 weeks followed or substituted by oral therapy as soon as it is appropriate.

**Safety in Pregnancy:** First trimester: Teratogenic risk (trimethoprim is a folate antagonist)
Third trimester: Neonatal haemolysis and methaemoglobinaemia; fear of increased risk of kernicterus in neonates appears to be unfounded

**Safety in Breast Feeding:** Small risk of kernicterus in jaundiced infants and of haemolysis in G6PD-deficient infants (due to sulphamethoxazole

- Cotrimoxazole Tab (400 mg Sulphamethoxazole + 80 mg Trimethoprim)
- Co-Trimoxazole Syp 100ml (200 mg Sulphamethoxazole + 40 mg Trimethoprim/ 5 ml)
- Septrin Double-Strength Tablets (800 mg Sulphamethoxazole + 160 mg Trimethoprim)
- Bactrim / Septrin Infusion (80 mg Trimethoprim & 400 mg Sulphamethoxazole In Each 5 ml Ampoule)

**DOXYCYCLINE HYCLATE**

**Indications:** chronic prostatitis; sinusitis, syphilis, pelvic inflammatory disease, treatment and prophylaxis of anthrax; malaria treatment and prophylaxis, recurrent
aphthous ulceration, adjunct to gingival scaling and root planing for periodontitis; oral herpes simplex; rosacea

**Caution:** hepatic impairment; alcohol dependence; photosensitivity (avoid exposure to sunlight or sun lamps); porphyria

**Contraindications:** Deposition in growing bone & teeth causes staining & dental hyperplasia in children below 12 years: pregnancy, breast feeding.

**Side Effects:** nausea, vomiting, diarrhoea, dysphagia, oesophageal irritation, anorexia, flushing, and tinnitus, rarely hepatotoxicity, pancreatitis, blood disorders, hypersensitivity reactions.

**Dose:** 200 mg on first day, then 100 mg daily; severe infections (including refractory urinary-tract infections), 200 mg daily

Early syphilis, 100 mg twice daily for 14 days; late latent syphilis 200 mg twice daily for 28 days

Uncomplicated genital chlamydia, non-gonococcal urethritis, 100 mg twice daily for 7 days (14 days in pelvic inflammatory disease); Anthrax (treatment or post-exposure prophylaxis), 100 mg twice daily;

**CHILD** (only if alternative antibacterial cannot be given) 5 mg/kg daily in 2 divided doses (max. 200 mg daily)

**Safety in Pregnancy:** First trimester; Effects on skeletal development in animal studies

Second and Third trimester; Dental discoloration; maternal hepatotoxicity with large parenteral doses

Safety in Breast Feeding: Avoid (although absorption and therefore discoloration of teeth in infant probably usually prevented by chelation with calcium in milk)

- Doxycycline Hyclate 100 mg Cap (Vibramycin)
- Doxydar Capsules 100 mg

**ERYTHROMYCIN**

**Indications:** susceptible infections in patients with penicillin hypersensitivity; oral infections; campylobacter enteritis, syphilis, non-gonococcal urethritis, respiratory-tract infections (including Legionnaires’ disease), skin infections; chronic prostatitis; diphtheria and whooping cough prophylaxis; acne vulgaris and rosacea
**Injections**

**Caution** neonate under 2 weeks (risk of hypertrophic pyloric stenosis); predisposition to QT interval prolongation (including electrolyte disturbances, concomitant use of drugs that prolong QT interval); porphyria; hepatic impairment; renal impairment; pregnancy and breast-feeding.

**Side Effects:** nausea, vomiting, abdominal discomfort, diarrhoea (antibiotic-associated colitis); less frequently urticaria, rashes and other allergic reactions; reversible hearing loss after large doses; cholestatic jaundice, pancreatitis, cardiac effects (including chest pain and arrhythmias), myasthenia-like syndrome, Stevens-Johnson syndrome, and toxic epidermal necrolysis.

**Dose:** By mouth, ADULT and CHILD over 8 years, 250–500 mg every 6 hours or 0.5–1 g every 12 hours up to 4 g daily in severe infections;

- NEONATE 12.5 mg/kg every 6 hours;
- CHILD 1 month–2 years 125 mg every 6 hours, 2–8 years 250 mg every 6 hours, doses doubled for severe infections

- Early syphilis, 500 mg 4 times daily for 14 days
- Uncomplicated genital chlamydia, non-gonococcal urethritis, 500 mg twice daily for 14 days

By intravenous infusion, ADULT and CHILD severe infections, 50 mg/kg daily by continuous infusion or in divided doses every 6 hours; mild infections (oral treatment not possible), 25 mg/kg daily; NEONATE 30–45 mg/kg daily in 3 divided doses

- Erythromycin Base/ Ethylsuccinate/ Stearate Tab 250mg
- Erythromycin Ethylsuccinate 200mg/5ml Susp
- Erythromycin Injection 1 Gm I.V.
- Erythrocin Tablets 250 mg
- Erythrocin Syrup 200 mg/ 5 ml

**SODIUM FUSIDATE / FUSIDATE**

**Indications:** penicillin-resistant staphylococcal infection including osteomyelitis; staphylococcal endocarditis in combination with other antibacterials

**Caution** monitor liver function with high doses, on prolonged therapy or in hepatic impairment, elimination

186
Infections

may be reduced in hepatic impairment or biliary disease or biliary obstruction; pregnancy; breast-feeding

*Side Effects:* nausea, vomiting, reversible jaundice, especially after high dosage or rapid infusion (withdraw therapy if persistent); rarely hypersensitivity reactions, acute renal failure (usually with jaundice), blood disorders

**Dose:** As sodium fusidate, by intravenous infusion, adult over 50 kg, 500 mg 3 times daily; adult under 50 kg and child, 6–7 mg/kg 3 times daily

Tablets: sodium fusidate, 500 mg every 8 hours, doubled for severe infections Skin infection, as sodium fusidate, 250 mg every 12 hours for 5–10 days

As fusidic acid, adult 750 mg every 8 hours; child up to 1 year 50 mg/kg daily (in 3 divided doses), 1–5 years 250 mg every 8 hours, 5–12 years 500 mg every 8 hours

- Fusidate Sodium Tab 250mg
- Fusidate Sodium I.V. Inf 500mg /10ml
- Fusidic Acid Susp 50 mg. 90ml

GENTAMYCIN

**Indications:** septicaemia and neonatal sepsis; meningitis and other CNS infections; biliary-tract infection, acute pyelonephritis or prostatitis, endocarditis; pneumonia in hospital patients, adjunct in listerial meningitis

**Caution** pregnancy; renal impairment, neonates, infants and elderly (adjust dose and monitor renal, auditory and vestibular function together with serum gentamicin concentrations); avoid prolonged use; conditions characterised by muscular weakness; obesity (use ideal weight for height to calculate dose and monitor serum-gentamicin concentration closely)

**Contraindications:** myasthenia gravis

*Side Effects:* vestibular and auditory damage, nephrotoxicity; rarely, hypomagnesaeemia on prolonged therapy, antibiotic-associated colitis, stomatitis; nausea, vomiting, rash, blood disorders.

**Dose:** By intramuscular or by slow intravenous injection over at least 3 minutes or by intravenous infusion, 3–5 mg/kg daily (in divided doses every 8 hours); NEONATE up to 2 weeks, 3 mg/kg every 12 hours; CHILD 2 weeks–12 years, 2 mg/kg every 8 hours

187
**Injections**

**Endocarditis** (in combination with other antibacterials),
ADULT 1 mg/kg every 8 hours

**Endocarditis prophylaxis:** Once daily dose regimen, by intravenous infusion, initially 5–7 mg/kg, then adjusted according to serum-gentamicin concentration
By intrathecal injection, seek specialist advice, 1 mg daily (increased if necessary to 5 mg daily)

**Safety in Pregnancy:** Second and third trimester:
Auditory or vestibular nerve damage; risk greatest with streptomycin; probably very small with gentamicin and tobramycin, but avoid unless essential.
- Gentamycin Sulphate 80mg/2ml. I.M., I.V. Inj
- Garamycin Injection 80 mg/2 ml.

**IMIPENEM AND CILASTATIN**

**Indications:** aerobic and anaerobic Gram-positive and Gram-negative infections; surgical prophylaxis; hospital-acquired septicaemia

**Caution** sensitivity to beta-lactam antibacterials (avoid if history of immediate hypersensitivity reaction), renal impairment; CNS disorders (e.g. epilepsy); pregnancy, breast-feeding.

**Side Effects:** nausea, vomiting, diarrhoea (antibiotic-associated colitis), taste disturbances, tooth or tongue discoloration, hearing loss; blood disorders, positive Coombs' test; allergic reactions (with rash, pruritus, urticaria, Stevens-Johnson syndrome, fever, anaphylactic reactions, rarely toxic epidermal necrolysis, exfoliative dermatitis); myoclonic activity, convulsions, confusion and mental disturbances; slight increases in liver enzymes and bilirubin, rarely hepatitis; increases in serum creatinine and blood urea; red coloration of urine in children; local reactions: erythema, pain and induration, and thrombophlebitis

**Dose:** By deep intramuscular injection, mild to moderate infections, in terms of imipenem, 500–750 mg every 12 hours
By intravenous infusion, in terms of imipenem, 1–2 g daily (in 3–4 divided doses); less sensitive organisms, up to 50 mg/kg daily (max. 4 g daily) in 3–4 divided doses;
CHILD 3 months and older, 60 mg/kg (up to max. of 2 g) daily in 4 divided doses; over 40 kg, adult dose
Surgical prophylaxis, by intravenous infusion, 1 g at induction repeated after 3 hours, supplemented in high risk (e.g. colorectal) surgery by doses of 500 mg 8 and 16 hours after induction
  - Imipenem & Cilastatin Sodium I.V. 500mg Each Inf.
  - Tienam 500 mg Vials I.M. & I.V.

NETROMYCIN / NETLIMICIN

**Indications:** serious Gram-negative infections resistant to gentamicin.

**Caution** renal impairment; infants and elderly; avoid prolonged use.

**Contraindications:** pregnancy; myasthenia gravis.

**Side Effects:** vestibular and auditory damage; nephrotoxicity; antibiotic-associated colitis.

**Dose:** by I.M. injection or I.V., injection or infusion, 4-6 mg/kg daily as a single dose or in divided doses every 8 or 12 hours; In severe infections, up to 7.5 mg/kg daily in divided doses every 8 hours (usually for 48 hours).

Neonate: up to 1 week, 3 mg/kg every 12 hours, Infant over 1 week, 2.5-3 mg/kg every 8 hours.

Child over one year, 2-2.5 mg/kg every 8 hours.

Urinary tract infections, 150 mg as a single daily dose for 5 days.

Gonorrhoea, 300 mg as a single dose.
  - **Netromycin Sulphate 150mg/1.5ml Vial.IM,IV**
  - **Netromycin Injection 150 mg/1.5 ml**

NITROFURANTOIN

**Indications:** urinary-tract infections

**Caution** anaemia; diabetes mellitus; electrolyte imbalance; vitamin B and folate deficiency; pulmonary disease; hepatic impairment; monitor lung and liver function on long-term therapy, especially in the elderly (discontinue if deterioration in lung function); susceptibility to peripheral neuropathy; false positive urinary glucose (if tested for reducing substances); urine may be coloured yellow or brown

**Contraindications:** renal impairment; infants less than 3 months old, G6PD deficiency (including pregnancy at
Injections
term, and breast-feeding of affected infants, and porphyria

**Side Effects:** anorexia, nausea, vomiting, and diarrhoea; acute and chronic pulmonary reactions (pulmonary fibrosis; possible association with lupus erythematosus-like syndrome); peripheral neuropathy; hypersensitivity reactions (including angioedema, anaphylaxis, sialadenitis, urticaria, rash and pruritus); rarely, cholestatic jaundice, hepatitis, exfoliative dermatitis, erythema multiforme, pancreatitis, arthralgia, blood disorders (including agranulocytosis, thrombocytopenia, and aplastic anaemia), benign intracranial hypertension, and transient alopecia

**Dose:** Acute uncomplicated infection, 50 mg every 6 hours with food for 7 days; CHILD over 3 months, 3 mg/kg daily in 4 divided doses
Severe chronic recurrent infection, 100 mg every 6 hours with food for 7 days (dose reduced or discontinued if severe nausea)
Prophylaxis, 50–100 mg at night; CHILD over 3 months, 1 mg/kg at night

**Safety in Pregnancy:** Third trimester: May produce neonatal haemolysis if used at term
- Nitrofurantoin Tab 100 mg.
- Furadantin Tablets 100 mg

**NORFLOXACIN**

**Indications:** broad spectrum bactericidal agent for upper and lower, complicated and uncomplicated acute and chronic urinary tract infections; acute bacterial gastro-enteritis caused by sensitive bacteria; gonococcal urethritis and/or cervicitis caused by both penicillinase and non-penicillinase producing Neisseria gonorrhoea; for the prophylaxis of sepsis in patients with profound neutropenia.

**Caution** history of convulsions; pregnancy; nursing mothers.

**Contraindications:** hypersensitivity to the drug or any chemically related quinolone antibacterials.

**Side Effects:** gastro-intestinal, neuropsychiatry and skin reactions; rarely, anorexia, sleep disturbances, depression.
**Dose:** Urinary-tract infections, 400 mg twice daily for 7–10 days (for 3 days in uncomplicated lower urinary-tract infections)
Chronic relapsing urinary-tract infections, 400 mg twice daily for up to 12 weeks; may be reduced to 400 mg once daily if adequate suppression within first 4 weeks
Chronic prostatitis, 400 mg twice daily for 28 days
- Norfloxacin 400 mg, Tablets
- Noroxin Tablets 400 mg

**Norfloxacin 400 mg. Tablets**
**Noroxin Tablets 400 mg**

**Penicillin V**
**Indications:** oral infections; tonsillitis, otitis media, erysipelas, cellulitis; rheumatic fever and pneumococcal infection prophylaxis
**Caution:** history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment
**Contraindications:** penicillin hypersensitivity

**Side Effects:** hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; rarely CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)

**Dose:** 500 mg every 6 hours increased up to 1 g every 6 hours in severe infections;
CHILD up to 1 year 62.5 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections; 1–5 years, 125 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections; 6–12 years, 250 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections
- Penicillin V 250mg/5ml. Susp 100ml.
- Penicillin V. Tab 250 mg.

**Piperacillin/Tazobactam**
**Indications:** Lower respiratory-tract, urinary-tract, intra-abdominal and skin infections, and septicemia, Complicated appendicitis; Infections in neutropenic patients
**Injections**

**Caution** history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment; pregnancy; breast feeding.

**Contraindications:** penicillin hypersensitivity

**Side Effects:** hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; *rarely* CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; diarrhoea (including antibiotic-associated colitis) nausea, vomiting, diarrhoea; *less commonly* stomatitis, dyspepsia, constipation, jaundice, hypotension, headache, insomnia, and injection-site reactions; *rarely* abdominal pain, hepatitis, oedema, fatigue, and eosinophilia; *very rarely* hypoglycaemia, hypokalaemia, pancytopenia, Stevens-Johnson syndrome, and toxic epidermal necrolysis

**Dose:** Lower respiratory-tract, urinary-tract, intra-abdominal and skin infections, and septicaemia:
- **ADULT** and **CHILD** over 12 years, by intravenous injection over 3–5 minutes or by intravenous infusion, 2.25–4.5 g every 6–8 hours, usually 4.5 g every 8 hours
- **Complicated appendicitis**, by intravenous injection over 3–5 minutes or by intravenous infusion, **CHILD** 2–12 years, 112.5 mg/kg every 8 hours (max. 4.5 g every 8 hours) for 5–14 days;
- **CHILD** under 2 years, not recommended

Infections in neutropenic patients (in combination with an aminoglycoside), by intravenous injection over 3–5 minutes or by intravenous infusion, **ADULT** and **CHILD** over 50 kg, 4.5 g every 6 hours; **CHILD** less than 50 kg, 90 mg/kg every 6 hours
- Piperacillin/Tazobactam **Inj. 4.5gm Vail** Inj
- Tazocin **Vials 4.5 G (4 G/500 mg).**

**PROCRAINE PENICILLIN**

**Indications:** throat infections, otitis media, endocarditis, meningococcal disease, pneumonia, cellulitis, anthrax; prophylaxis in limb amputation; early or late latent syphilis.

192
**Caution:** history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment

**Contraindications:** penicillin hypersensitivity

**Side Effects:** hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; rarely CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)

**Dose:** by I.M. injection, child over 25 kg and adults, 400,000 units (300 mg procaine penicillin and 60 mg benzylpenicillin sodium) 24-hourly or 12-hourly.
Child under 25 kg, according to body weight, Acute uncomplicated gonorrhoea, 2.4-4.8 g as a single dose.
Syphilis 1.2 g daily for 10-14 days.

- Procaine Penicillin 400,000 Units/2ml. Inj.

**TETRACYCLINE HCL**

**Indications:** acne vulgaris, rosacea, exacerbations of chronic bronchitis; infections due to brucella, chlamydia, mycoplasma and rickettsia

**Caution:** breast-feeding; rarely causes photosensitivity. Avoid administration in hepatic impairment

**Contraindications:** renal failure, pregnancy, children under 12 years of age.

**Side Effects:** nausea, vomiting, diarrhoea; super-infection with resistant organisms; rarely allergic reactions.

**Dose:** 250 mg every 6 hours, increased in severe infections to 500 mg every 6-8 hours
For acne, 250 mg 3 times daily for 1-4 weeks and then reduced to twice daily until improvement occurs.
Non-gonococcal urethritis, 500 mg every 6 hours for 7-14 days (21 days if failure or relapse after first course)

**Safety in Pregnancy:** First trimester: Effects on skeletal development in animal studies
Second and third trimester: Dental discoloration; maternal hepatotoxicity with large parenteral doses

- Tetracycline Hcl. Cap 250 mg
- Achromycin Capsules 250 mg
**TOBRAMYCIN.**

*Indications:* septicaemia and neonatal sepsis; meningitis and other CNS infections; biliary-tract infection, acute pyelonephritis or prostatitis, endocarditis; pneumonia in hospital patients, adjunct in listerial meningitis; chronic pulmonary P. aeruginosa infection in cystic fibrosis.

*Caution:* pregnancy, renal impairment, neonates, infants and elderly (adjust dose and monitor renal, auditory and vestibular function together with serum tobramicin concentrations); avoid prolonged use; conditions characterised by muscular weakness; obesity (use ideal weight for height to calculate dose and monitor serum concentration closely)

*Contraindications:* myasthenia gravis

*Side Effects:* vestibular and auditory damage, nephrotoxicity; rarely, hypomagnesaemia on prolonged therapy, antibiotic-associated colitis, stomatitis; nausea, vomiting, rash, blood disorders

*Dose:* By intramuscular injection or by slow intravenous injection or by intravenous infusion, 3 mg/kg daily in divided doses every 8 hours; in severe infections up to 5 mg/kg daily in divided doses every 6–8 hours (reduced to 3 mg/kg as soon as clinically indicated);

- **NEONATE** 2 mg/kg every 12 hours;
- **CHILD over 1 week** 2–2.5 mg/kg every 8 hours

Urinary-tract infection, by intramuscular injection, 2–3 mg/kg daily as a single dose

*Note:* One-hour (‘peak’) serum concentration should not exceed 10 mg/litre; pre-dose (‘trough’) concentration should be less than 2 mg/litre

*Safety in Pregnancy:* Second and third trimester:

- Auditory or vestibular nerve damage.
- Tobramycin Sulfate Inj 80 mg.
- Nebcin Injections 80 mg

**VANCOMYCIN**

*Indications:* prophylaxis and treatment of endocarditis and other serious infections caused by Gram-positive cocci; treatment of peritonitis associated with peritoneal dialysis added to dialysis fluid

*Caution:* avoid rapid infusion (risk of anaphylactoid reactions); rotate infusion sites; renal impairment; elderly;
Infections

avoid if history of deafness; all patients require plasma-vancomycin measurement (after 3 or 4 doses if renal function normal, earlier if renal impairment), blood counts, urinalysis, and renal function tests; monitor auditory function in elderly or if renal impairment; pregnancy and breast-feeding.

Side Effects: nephrotoxicity including renal failure and interstitial nephritis; ototoxicity (discontinue if tinnitus occurs); blood disorders including neutropenia (usually after 1 week or cumulative dose of 25 g), rarely agranulocytosis and thrombocytopenia; nausea; chills, fever; eosinophilia, anaphylaxis, rashes (including exfoliative dermatitis, Stevens-Johnson syndrome, toxic epidermal necrolysis, and vasculitis); phlebitis (irritant to tissue); on rapid infusion, severe hypotension (including shock and cardiac arrest), wheezing, dyspnoea, urticaria, pruritus, flushing of the upper body (red man syndrome), pain and muscle spasm of back and chest

Dose: By intravenous infusion, 1 g every 12 hours; Elderly over 65 years, 500 mg every 12 hours or 1 g once daily; Child over 1 month, 15 mg/kg every 8 hours (max. 2 g daily)

Endocarditis prophylaxis

Safety in Pregnancy: Use only if potential benefit outweighs risk—plasma-vancomycin concentration monitoring essential to reduce risk of fetal toxicity

- Vancomycin Ing 500mg/Vial I.V
- Vancocin Injection 500 mg Vial

ANTIMYCOBACTRIAL DRUGS

CLOFAZIMIN

Indications: leprosy
Caution: Hepatic and renal impairment; pregnancy and breast feeding.

Side Effects: nausea, vomiting (hospitalise if persistent), abdominal pain; headache, tiredness; brownish-black discoloration of lesions and skin including areas exposed to light; reversible hair discoloration; dry skin; red discoloration of faeces, urine and other body fluids; also rash, pruritus, photosensitivity, acne-like eruptions, anorexia, eosinophilic enteropathy, bowel obstruction,
Injections

dry eyes, dimmed vision, macular and subepithelial corneal pigmentation; elevation of blood sugar, weight loss, splenic infarction, lymphadenopathy

**Dose:** in multibacillary leprosy in 3-drug regimen with rifampicin and dapsone, 300 mg once monthly, supervised and 50 mg daily (or 100 mg on alternate days), self-administered for at least 2 years. Lepromatous lepra reactions, dose increased to 300 mg daily for maximum of 3 months.

**Safety in Pregnancy:** Third trimester: Neonatal haemolysis and methaemoglobinaemia reported

**Safety in Breast Feeding:** Haemolytic anaemia; although significant amount in milk, risk to infant very small unless infant is G6PD deficient

- Clofazimin 100mg Cap.
- Lamprone Capsules 100 mg

**DAPSONE**

**Indications:** leprosy, dermatitis herpetiformis

**Caution:** cardiac or pulmonary disease; breast-feeding, anaemia, G6 PD Deficiency, porphyria.

**Contraindications:** pregnancy; porphyria

**Side Effects:** dose-related and uncommon at doses used for leprosy, haemolysis, methaemoglobinaemia, neuropathy, allergic dermatitis (rarely including toxic epidermal necrolysis and Stevens-Johnson syndrome), anorexia, nausea, vomiting, tachycardia, headache, insomnia, psychosis, hepatitis, agranulocytosis; dapsone syndrome (rash with fever and eosinophilia)—discontinue immediately (may progress to exfoliative dermatitis, hepatitis, hypoalbuminaemia, psychosis and death)

**Dose:** leprosy, 1-2 mg/kg daily.

Multibacillary leprosy, as part of a three - drug regimen with rifampicin and clofazimine, 100 mg daily, self administered for at least 2 years.

Paucibacillary leprosy, as part of a two - drug regimen with rifampicin, 100 mg daily, self administered for at least 6 months

**Safety in Pregnancy:** Third trimester: Neonatal haemolysis and methaemoglobinaemia reported
Safety in Breast Feeding: Haemolytic anaemia; although significant amount in milk, risk to infant very small unless infant is G6PD deficient
  - Dapson Tab 100 mg.
  - Avlosulphon Tablets 100 mg

**ETHAMBUTOL HCL**

*Indications:* tuberculosis, in combination with other drugs

*Caution:* renal impairment and if creatinine clearance less than 30 mL/minute, monitor plasma-ethambutol concentration in elderly; pregnancy; test visual acuity before treatment and warn patients to report visual changes.

*Contraindications:* optic neuritis, poor vision

*Side Effects:* optic neuritis, red/green colour blindness, peripheral neuritis, rarely rash, pruritus, urticaria, thrombocytopenia

*Dose:* adult and children over 6 years, 15 mg/kg daily.
  - Ethambutol Hcl Tab 400 mg
  - Myambutol Tablets 400 mg

**ISONIAZID**

*Indications:* tuberculosis, in combination with other drugs; prophylaxis

*Caution:* hepatic impairment; renal impairment; slow acetylator status (increased risk of side-effects); epilepsy; history of psychosis; alcohol dependence, malnutrition, diabetes mellitus, HIV infection (risk of peripheral neuritis); pregnancy and breast-feeding; porphyria

*Contraindications:* drug-induced liver disease

*Side Effects:* nausea, vomiting, constipation, dry mouth; peripheral neuritis with high doses (pyridoxine prophylaxis), optic neuritis, convulsions, psychotic episodes, vertigo; hypersensitivity reactions including fever, erythema multiforme, purpura; blood disorders including agranulocytosis, haemolytic anaemia, aplastic anaemia; hepatitis (especially over age of 35 years); systemic lupus erythematosus-like syndrome, pellagra, hyperreflexia, difficulty with micturition, hyperglycaemia, and gynaecomastia reported
Injections

Dose: For 2 months initial and 4 months continuous phases: by mouth, pulmonary tuberculosis, 300mg daily on an empty stomach
Child, 5 mg/kg daily

tuberculous meningitis, 10 mg/kg daily.
  - *Isoniazid 100mg Tab (Inh)*
  - *Soniazid 300mg Tab (Inh)*

PYRAZINAMIDE

Indications: tuberculosis in combination with other drugs.
Caution: impaired renal function, diabetes, gout, liver-function tests required, pregnancy
Contraindications: Porphyria
Side Effects: hepatomegaly, hepatotoxicity including fever, anorexia, jaundice, fulminating liver failure; nausea, vomiting, arthralgia, sideroblastic anaemia, urticaria.
Dose: by mouth as a single dose, 35 mg/kg daily; max. daily dose, 3g-Alternative dosing schedule, 50 mg/kg three times weekly or 75mg/kg twice weekly.
  - Pyrazinamide Tab 0.5gm.

rifampicin

Indications: tuberculosis, in combination with other drugs, usually isoniazid and ethambutol; leprosy.
Caution: reduce dose in hepatic impairment; alcoholism; pregnancy. Discolors soft contact lenses.
Contraindications: jaundice
Side Effects: gastro-intestinal symptoms, respiratory symptoms including shortness of breath; acute renal failure; thrombocytopenic purpura; collapse and shock; orange-red discoloration of body secretions.
Dose: all doses taken 30 minutes before a meal or 2 hours after a meal. Tuberculosis, 450-600 mg (about 10 mg/kg) daily preferably before breakfast.
Child, up to 20 mg/kg daily to a maximum of 600 mg.
Dose in hepatic impairment should not exceed 8 mg/kg daily. Serious staphylococcal infections, 600-1200 mg in 2-4 divided doses in combination with another antibiotic.
Prophylaxis of meningococcal meningitis, 600 mg twice daily for 2 days.
Child 3 months-1 year, 5 mg/kg twice daily for 2 days
- Rifampicin Cap 150 mg
- Rifampicin Cap 300 mg
- Rifadin Capsules 150 mg, 300 mg
- Rifadin Syrup 100 mg/5 ml
- Rimactazid Tablets 300 mg
- Rifampin 300 mg & Isoniazid 150 mg/Tablet

STREPTOMYCIN

**Indications:** tuberculosis in combination with other drugs; adjunct to doxycycline in brucellosis

**Caution:** breast-feeding, increase dose interval in renal impairment.

**Contraindications:** pregnancy, myasthenia gravis

**Side Effects:** vestibular damage, reversible nephrotoxicity, rarely, hypomagnesaemia on prolonged therapy, antibiotic-associated colitis, stomatitis; also reported, nausea, vomiting, rash, blood disorders

**Dose:** by I.M. injection, 1 g daily.
In patients over 40 years, under 50 kg or those with renal impairment, reduce dose.

**Note:** One-hour (‘peak’) concentration should be 15–40 mg/litre; pre-dose (‘trough’) concentration should be less than 5 mg/litre (less than 1 mg/litre in renal impairment or in those over 50 years)

**Safety in Pregnancy:** Second and third trimester:
Auditory or vestibular nerve damage
- Streptomycin Inj 1g.

ANTIFUNGAL DRUGS

AMPHOTERICIN

**Indications:** candidiasis, systemic fungal infections

**Caution:** when given parenterally, toxicity common (close supervision necessary and test dose required); renal impairment; hepatic and renal function tests, blood counts, and plasma electrolyte (including plasma-potassium and magnesium concentration) monitoring required; corticosteroids (avoid except to control
Injections

reactions); pregnancy, breast-feeding; avoid rapid infusion (risk of arrhythmias, Anaphylaxis)

**Side Effects:** anorexia, nausea and vomiting, diarrhoea, epigastric pain; febrile reactions, headache, muscle and joint pain; anaemia; disturbances in renal function (including hypokalaemia and hypomagnesaemia) and renal toxicity; also cardiovascular toxicity (including arrhythmias, blood pressure changes), blood disorders, neurological disorders (including hearing loss, diplopia, convulsions, peripheral neuropathy, encephalopathy), abnormal liver function (discontinue treatment), rash, anaphylactoid reactions; pain and thrombophlebitis at injection site

**Dose:** By intravenous infusion, systemic fungal infections, initial test dose of 1 mg over 20–30 minutes then 250 mcg/kg daily, gradually increased over 2–4 days, if tolerated, to 1 mg/kg daily; max. (severe infection) 1.5 mg/kg daily or on alternate days

- Amphotericin 50mg./Vial I.V Infusion.
- Fungizone Injection 50 mg/ Vial.

**FLUCONAZOLE**

**Indications:** fungal infections.

**Caution:** renal impairment, pregnancy and breast-feeding; concomitant use with hepatotoxic drugs, monitor liver function with high doses or extended courses—discontinue if signs or symptoms of hepatic disease (risk of hepatic necrosis); susceptibility to QT interval prolongation

**Side Effects:** nausea, abdominal discomfort, diarrhoea, flatulence, headache, rash (discontinue treatment or monitor closely if infection invasive or systemic); less frequently dyspepsia, vomiting, taste disturbance, hepatic disorders, hypersensitivity reactions, anaphylaxis, dizziness, seizures, alopecia, pruritus, toxic epidermal necrolysis, Stevens-Johnson syndrome (severe cutaneous reactions more likely in AIDS patients), hyperlipidaemia, leucopenia, thrombocytopenia, and hypokalaemia.

**Dose:** Vaginal candidiasis and candidal balanitis, by mouth, a single dose of 150 mg
Mucosal candidiasis (except genital), by mouth, 50 mg daily (100 mg daily in unusually difficult infections)
Infections

given for 7–14 days in oropharyngeal candidiasis (max. 14 days except in severely immunocompromised patients); for 14 days in atrophic oral candidiasis associated with dentures; for 14–30 days in other mucosal infections (e.g. oesophagitis, candiduria, non-invasive bronchopulmonary infections);
CHILD by mouth or by intravenous infusion, 3–6 mg/kg on first day then 3 mg/kg daily (every 72 hours) NEONATE up to 2 weeks old, every 48 hours in neonate 2–4 weeks old
Tinea pedis, corporis, cruris, pityriasis versicolor, and dermal candidiasis, by mouth, 50 mg daily for 2–4 weeks (for up to 6 weeks in tinea pedis); max. duration of treatment 6 weeks
Invasive candidal infections (including candidaemia and disseminated candidiasis) and cryptococcal infections (including meningitis), by mouth or intravenous infusion, 400 mg on first day then 200–400 mg daily; max. 800 mg daily in severe infections; treatment continued according to response (at least 8 weeks for cryptococcal meningitis);
CHILD 6–12 mg/kg daily (every 72 hours in NEONATE up to 2 weeks old, every 48 hours in NEONATE 2–4 weeks old); max. 400 mg daily
Prevention of relapse of cryptococcal meningitis in AIDS patients after completion of primary therapy, by mouth, 200 mg daily or by intravenous infusion, 100–200 mg daily
Prevention of fungal infections in immunocompromised patients, by mouth or by intravenous infusion, 50–400 mg daily adjusted according to risk; 400 mg daily if high risk of systemic infections e.g. following bone-marrow transplantation; commence treatment before anticipated onset of neutropenia and continue for 7 days after neutrophil count in desirable range; CHILD according to extent and duration of neutropenia, 3–12 mg/kg daily (every 72 hours in NEONATE up to 2 weeks old, every 48 hours in NEONATE 2–4 weeks old); max. 400 mg daily

- **Fluconazole, Caps. 50mg**
- **Fluconazole, Caps. 150mg**
- **Diflucan Capsules 50 mg, 150 mg**
- **Fluconazole 200mg IV Inj**
### GRISEOFULVIN

**Indications:** dermatophyte infections of the skin, scalp, hair and nails where topical therapy has failed or is inappropriate

**Contraindications:** severe liver disease; systemic lupus erythematosus (risk of exacerbation); porphyria; pregnancy (avoid pregnancy during and for 1 month after treatment; men should not father children within 6 months of treatment); breast-feeding

**Side Effects:** nausea, vomiting, diarrhoea; headache; less frequently hepatotoxicity, dizziness, confusion, fatigue, sleep disturbances, impaired co-ordination, peripheral neuropathy, leucopenia, systemic lupus erythematosus, rash (including rarely erythema multiforme, toxic epidermal necrolysis), and photosensitivity

**Dose:** Dermatophyte infections, 500 mg once daily or in divided doses; in severe infection dose may be doubled, reducing when response occurs; CHILD under 50 kg, 10 mg/kg once daily or in divided doses

Tinea capitis caused by *Trichophyton tonsurans*, 1 g once daily or in divided doses; CHILD under 50 kg, 15–20 mg/kg once daily or in divided doses

- Griseofulvin Tab 125 mg & 500mg
- Fulcin Tablets 125 mg & 500 mg

### ITRACONAZOLE

**Indications:** vulvovaginal candidosis; pityriasis versicolor, dermatomycosis, fungal keratitis and oral candidosis; onchomycosis; systemic mycosis

**Caution:** absorption reduced in AIDS and neutropenia (monitor plasma-itraconazole concentration and increase dose if necessary); susceptibility to congestive heart failure; renal impairment, pregnancy, and breast-feeding. Potentially life-threatening hepatotoxicity reported very rarely. Monitor liver function—discontinue if signs of hepatitis develop; avoid or use with caution if history of hepatotoxicity with other drugs or in active liver disease; use in patients receiving other hepatotoxic drugs.

**Side Effects:** very rarely nausea, vomiting, dyspepsia, abdominal pain, diarrhoea, constipation, jaundice, hepatitis, heart failure, pulmonary oedema, headache, dizziness, peripheral neuropathy (discontinue treatment),
Infections

menstrual disorder, hypokalaemia, rash, pruritus, Stevens-Johnson syndrome, and alopecia; with intravenous injection, very rarely hypertension and hyperglycaemia

**Dose:** By mouth, oropharyngeal candidiasis, 100 mg daily (200 mg daily in AIDS or neutropenia) for 15 days; Vulvovaginal candidiasis, 200 mg twice daily for 1 day; Pityriasis versicolor, 200 mg daily for 7 days;

Tinea corporis and tinea cruris, *either* 100 mg daily for 15 days or 200 mg daily for 7 days;

Tinea pedis and tinea manuum, *either* 100 mg daily for 30 days or 200 mg twice daily for 7 days;

Onychomycosis, *either* 200 mg daily for 3 months or course (pulse) of 200 mg twice daily for 7 days, subsequent courses repeated after 21-day interval; fingernails 2 courses, toenails 3 courses;

Histoplasmosis, 200 mg 1–2 times daily;

Systemic aspergillosis, candidiasis and cryptococcosis including cryptococcal meningitis where other antifungal drugs inappropriate or ineffective, 200 mg once daily (candidiasis 100–200 mg once daily) increased in invasive or disseminated disease and in cryptococcal meningitis to 200 mg twice daily;

Maintenance in AIDS patients to prevent relapse of underlying fungal infection and prophylaxis in neutropenia when standard therapy inappropriate, 200 mg once daily, increased to 200 mg twice daily if low plasma-itraconazole concentration.

Prophylaxis in patients with haematological malignancy or undergoing bone-marrow transplant, 5mg / kg daily in 2 divided doses; starting before transplantation or chemotherapy and continue until neutrophil counts recover.

By intravenous infusion, systemic aspergillosis, candidiasis and cryptococcosis including cryptococcal meningitis where other antifungal drugs inappropriate or ineffective, histoplasmosis, 200 mg every 12 hours for 2 days, then 200 mg once daily for max. 12 days

- Itraconazole 100mg Cap
- Sporanox Capsules 100 mg
**KETOCONAZOLE**

**Indications:** skin, hair, and mucosal mycoses that cannot be treated with other antifungals (including dermatophytoses, pityrosporum folliculitis, cutaneous candidiasis, chronic mucocutaneous candidiasis, oropharyngeal and oesophageal candidiasis, chronic recurrent vaginal candidiasis); systemic mycoses that cannot be treated with other antifungals (including histoplasmosis, blastomycosis, coccidiodomycosis, paracoccidiodomycosis

**Caution:** predisposition to adrenocortical insufficiency; avoid in porphyria

Potentially life-threatening hepatotoxicity very rarely; risk of hepatotoxicity greater if given for longer than 14 days. Monitor liver function before treatment, then on weeks 2 and 4 of treatment, then every month; in active liver disease; if history of hepatotoxicity with other drugs.

**Contraindications:** hepatic impairment; breast-feeding

**Side Effects:** nausea, vomiting, abdominal pain; pruritus; less commonly diarrhoea, headache, dizziness, drowsiness, and rash; very rarely fatal liver damage, dyspepsia, raised intracranial pressure, adrenocortical insufficiency, erectile dysfunction, menstrual disorders, oligospermia, gynaecomastia, thrombocytopenia, photophobia, and alopecia

**Dose:** 200 mg once daily, increased if response inadequate to 400 mg once daily; continued until symptoms have cleared and cultures negative (usually for 4 weeks in dermatophytoses, 2–3 weeks for oral and cutaneous candidiasis, 1–2 months for hair infections);

CHILD body-weight 15–30 kg, 100 mg once daily; body-weight over 30 kg, adult dose

Chronic, recurrent vaginal candidiasis, 400 mg once daily for 5 days

- Ketoconazol 200mg Tab
- Nizoral Tablets 200 mg

**NYSTATIN**

**Indications:** candidiasis; vaginal infection, skin and oral infection
**Infections**

**Side Effects:** nausea, vomiting, diarrhoea at high doses; oral irritation and sensitisation; rash (including urticaria) and rarely Stevens-Johnson syndrome.

**Dose:** By mouth, intestinal candidiasis 500 000 units every 6 hours, doubled in severe infection; child 100 000 units 4 times daily

For use as mouth wash in oral candidiasis, place 1 ml of the suspension in the mouth and retain near lesions 4 times daily; continued for 48 hours after lesions have resolved

- Nystatin 100,000 Units/ml, 15ml./Bottle Oral Drops
- Mycostatin Suspension 100,000 Units/ml

**ANTIVIRAL DRUGS**

**ACYCLOVIR**

**Indications:** herpes simplex and varicella–zoster

**Caution:** maintain adequate hydration (especially with infusion or high doses); monitor neutrophil count at least twice weekly in neonates; renal impairment, pregnancy & breast feeding.

**Side Effects:** nausea, vomiting, abdominal pain, diarrhoea, headache, fatigue, rash, urticaria, pruritus, photosensitivity; very rarely hepatitis, jaundice, dyspnoea, neurological reactions (including dizziness, confusion, hallucinations, convulsions and drowsiness), acute renal failure, anaemia, thrombocytopenia and leucopenia; on intravenous infusion, severe local inflammation (sometimes leading to ulceration), and very rarely agitation, tremors, psychosis and fever

**Dose:** By mouth, herpes simplex, treatment, 200 mg (400 mg in the immunocompromised or if absorption impaired) 5 times daily; usually for 5 days (longer if new lesions appear during treatment or if healing incomplete; increase dose to 800 mg 5 times daily for genital herpes in the immunocompromised); CHILD under 2 years, half adult dose, over 2 years, adult dose

Herpes simplex, prevention of recurrence, 200 mg 4 times daily or 400 mg twice daily possibly reduced to 200 mg 2 or 3 times daily and interrupted every 6–12 months
Herpes simplex, prophylaxis in the immunocompromised, 200–400 mg 4 times daily; CHILD under 2 years, half adult dose, over 2 years, adult dose

Varicella and herpes zoster, treatment, 800 mg 5 times daily for 7 days; CHILD, varicella, 20 mg/kg (max. 800 mg) 4 times daily for 5 days or under 2 years 200 mg 4 times daily, 2–5 years 400 mg 4 times daily, over 6 years 800 mg 4 times daily

Attenuation of chickenpox (if varicella–zoster immunoglobulin not indicated), ADULT and CHILD 40 mg/kg daily in 4 divided doses for 7 days starting 1 week after exposure

By intravenous infusion, treatment of herpes simplex in the immunocompromised, severe initial genital herpes, and varicella–zoster, 5 mg/kg every 8 hours usually for 5 days, doubled to 10 mg/kg every 8 hours in varicella–zoster in the immunocompromised and in simplex encephalitis (usually given for at least 10 days in encephalitis, possibly for 14–21 days); prophylaxis of herpes simplex in the immunocompromised, 5 mg/kg every 8 hours on the basis of ideal body weight.

NEONATE and INFANT up to 3 months, with disseminated herpes simplex, 20 mg/kg every 8 hours for 14 days (21 days if CNS involvement); varicella–zoster 10–20 mg/kg every 8 hours for at least 7 days; CHILD 3 months–12 years, herpes simplex or varicella–zoster, 250 mg/m² every 8 hours usually for 5 days, doubled to 500 mg/m² every 8 hours for varicella–zoster in the immunocompromised and in simplex encephalitis (usually given for at least 10 days in encephalitis, possibly for 14–21 days)

- Zovirax Intravenous Infusion, Powder For Reconstitution, Aciclovir (As Sodium Salt). 250 mg, 500 mg Vial
- Zovirax Suspension, Both Off-White, Sugar-Free, Aciclovir 200 mg/5 ml (Banana-Flavoured), 125ml,
- Zovirax Suspension 400 mg/5 ml (Double Strength Suspension, Orange-Flavoured), 100 ml
INDINAVIR SULFATE

**Indications:** It is a protease inhibitors for treatment of HIV infection in combination with antiretroviral agents.

**Caution:** ensure adequate hydration (risk of nephrolithiasis especially in children); patients at risk of nephrolithiasis (monitor for nephrolithiasis); avoid in porphyria

**Contraindications:** Pregnancy; breast-feeding

**Side Effects:** dry mouth, hypoaesthesia, dry skin, hyperpigmentation, alopecia, paronychia, interstitial nephritis (with medullary calcification and cortical atrophy in asymptomatic severe leucocyturia), nephrolithiasis (may require interruption or discontinuation; more frequent in children), dysuria, haematuria, crystalluria, proteinuria, pyuria (in children); haemolytic anaemia

**Dose:** 800 mg every 8 hours; CHILD and ADOLESCENT 4–17 years, 500 mg/m² every 8 hours (max. 800 mg every 8 hours); CHILD under 4 years, safety and efficacy not established

- **Ndinavir Sulfate 400mg Crixivan Tab**
- **Crixivan Capsules 400 mg**

LAMIVUDINE

**Indications** HIV infection in combination with other antiretroviral drugs

**Caution:** Chronic Hepatitis B or C; hepatic or renal impairment; pregnancy; Recurrent hepatitis in patients with chronic hepatitis B may occur on discontinuation of lamivudine. When treating chronic hepatitis B with lamivudine, monitor liver function tests at least every 3 months and serological markers of hepatitis B every 6 months, more frequently in patients with advanced liver disease or following transplantation (monitoring to continue after discontinuation)

**Contraindications:** Breast feeding

**Side Effects:** gastro-intestinal disturbances (such as nausea, vomiting, abdominal pain, flatulence and diarrhoea), anorexia, pancreatitis, liver damage, dyspnoea, cough, headache, insomnia, dizziness, fatigue, blood disorders (including anaemia, neutropenia, and
Injections

thrombocytopenia), myalgia, arthralgia, rash, urticaria, and fever.
peripheral neuropathy, muscle disorders including rhombomyolysis, nasal symptoms, alopecia

**Dose:** 150 mg every 12 hours or 300 mg once daily; child 3 months–12 years, 4 mg/kg every 12 hours; max. 300 mg daily

- **3TC 150mg Tab 150mg**
- **Epivir 150mg Tab**

**RIBAVIRIN (TRIBAVIRIN)**

**Indications:** severe respiratory syncytial virus bronchiolitis in infants and children; in combination with peginterferon alfa or interferon alfa for chronic hepatitis C not previously treated in patients without liver decompensation, or for relapse in adults following previous response to interferon alfa

**Caution:** Specific cautions for oral treatment

Exclude pregnancy before treatment; effective contraception essential during treatment and for 6 months after treatment in women and in men; routine monthly pregnancy tests recommended; condoms must be used if partner of male patient is pregnant (ribavirin excreted in semen); renal impairment, cardiac disease (assessment including ECG recommended before and during treatment—discontinue if deterioration); gout; determine full blood count, platelets, electrolytes, serum creatinine, liver function tests and uric acid before starting treatment and then on weeks 2 and 4 of treatment, then as indicated clinically—adjust dose if adverse reactions or laboratory abnormalities develop; test thyroid function before treatment and then every 3 months in children

**Contraindications:** pregnancy (important teratogenic risk); breast-feeding

**Specific contra-indications for oral treatment:** Severe cardiac disease, including unstable or uncontrolled cardiac disease in previous 6 months; haemoglobinopathies; severe debilitating medical conditions; severe hepatic dysfunction or decompensated cirrhosis; autoimmune disease (including autoimmune hepatitis); uncontrolled severe psychiatric condition; history of severe psychiatric condition in children
Specific side-effects for oral treatment: Haemolytic anaemia; nausea, vomiting, dyspepsia, abdominal pain, peptic ulcer, flatulence, diarrhoea, constipation, pancreatitis, appetite changes, weight loss, chest pain, tachycardia, palpitation, syncope, peripheral oedema, changes in blood pressure, flushing, dyspnoea, cough, rhinitis, pharyngitis, interstitial pneumonitis, sleep disturbances, abnormal dreams, asthenia, impaired concentration and memory, psychoses, anxiety, depression, suicidal ideation (more frequent in children), dizziness, tremor, hypertonia, ataxia, dysphonia, myalgia, arthralgia, peripheral neuropathy, influenza-like symptoms, headache, hyperglycaemia, thyroid disorders, menstrual disturbances, reduced libido, impotence, prostatitis, micturition disorders, rash (including very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis), pruritus, urticaria, photosensitivity, psoriasis, alopecia, dry skin, increased sweating, dry mouth, stomatitis, glossitis, taste disturbance, eye changes including blurred vision, tinnitus; neutropenia, thrombocytopenia, aplastic anaemia, lymphadenopathy, hypocalcaemia, hyperuricaemia; in children also growth retardation (including decrease in height and weight), Raynaud's disease, hypertriglyceridaemia, hyperkinesia, testicular pain, virilism, tooth disorders, and skin discoloration

**Dose:** Chronic hepatitis C, adult over 18 years (in combination with interferon alfa or peginterferon alfa), body-weight under 65 kg, 400 mg twice daily; body-weight 65–85 kg, 400 mg in the morning and 600 mg in the evening; body-weight over 85 kg, 600 mg twice daily; child and adolescent 3–17 years (in combination with interferon alfa), body-weight under 47 kg, 15 mg/kg daily in 2 divided doses; body-weight 47–49 kg, 200 mg in the morning and 400 mg in the evening; body-weight 50–65 kg, 400 mg twice daily; body-weight over 65 kg, as adult

* Ribavirin 200 mg Tab (Rebetol)

**VALACICLOVIR**

It is prodrug for Aciclovir.

*Indications:* treatment of herpes zoster; treatment of initial and suppression of recurrent herpes simplex
Injections

infections of skin and mucous membranes including initial and recurrent genital herpes; reduction of transmission of genital herpes; prevention of cytomegalovirus disease following renal transplantation

Caution: maintain adequate hydration (especially with infusion or high doses); monitor neutrophil count at least twice weekly in neonates; renal impairment; pregnancy, breast-feeding

Side Effects: nausea, vomiting, abdominal pain, diarrhoea, headache, fatigue, rash, urticaria, pruritus, photosensitivity; very rarely hepatitis, jaundice, dyspnoea, neurological reactions (including dizziness, confusion, hallucinations, convulsions and drowsiness), acute renal failure, anaemia, thrombocytopenia and leucopenia; on intravenous infusion, severe local inflammation (sometimes leading to ulceration), and very rarely agitation, tremors, psychosis and fever

Dose: Herpes zoster, 1 g 3 times daily for 7 days
Herpes simplex, first episode, 500 mg twice daily for 5 days (longer if new lesions appear during treatment or if healing incomplete); recurrent infection, 500 mg twice daily for 5 days
Herpes simplex, suppression, 500 mg daily in 1–2 divided doses (in immunocompromised, 500 mg twice daily)
Reduction of transmission of genital herpes, 500 mg once daily to be taken by the infected partner
Prevention of cytomegalovirus disease following renal transplantation (preferably starting within 72 hours of transplantation), 2 g 4 times daily usually for 90 days

CHILD not recommended

- Valaciclovir 500mg Tab
- Valtrex Tablets 500 mg

ZIDOVUDINE

Indications: HIV infection in combination with other antiretroviral drugs; prevention of maternal-fetal HIV transmission

Caution: haematological toxicity particularly with high dose and advanced disease—monitor full blood count on week 4 of treatment, then every 3 months; vitamin B₁₂ deficiency (increased risk of neutropenia); reduce dose or

210
Infections

interrupt treatment according to product literature if anaemia or myelosuppression; elderly

**Contraindications:** abnormally low neutrophil counts or haemoglobin values; neonates with hyperbilirubinaemia requiring treatment other than phototherapy, or with raised transaminase; breast-feeding

**Side Effects:** anaemia (may require transfusion), taste disturbance, chest pain, influenza-like symptoms, paraesthesia, neuropathy, convulsions, dizziness, drowsiness, insomnia, anxiety, depression, loss of mental acuity, myopathy, gynaecomastia, urinary frequency, sweating, pruritus, pigmentation of nails, skin and oral mucosa

**Dose:** By mouth, 500–600 mg daily in 2–3 divided doses; CHILD 3 months–12 years, 360–480 mg/m² daily in 3–4 divided doses; max. 200 mg every 6 hours

Prevention of maternal-fetal HIV transmission, (combination therapy preferred)

Patients temporarily unable to take zidovudine by mouth, by intravenous infusion over 1 hour, 1–2 mg/kg every 4 hours (approximating to 1.5–3 mg/kg every 4 hours by mouth) usually for not more than 2 weeks; CHILD 3 months–12 years, 80–160 mg/m² every 6 hours (120 mg/m² every 6 hours approximates to 180 mg/m² every 6 hours by mouth

- Zidovudine 100 mg. Cap.
- Retrovir Capsules 100 mg

**ANTIPROTOZOAL AND ANTIHELMENTHIC DRUGS**

**CHLOROQUINE**

**Indications:** chemoprophylaxis and treatment of malaria; rheumatoid arthritis and lupus erythematosus.

**Caution:** renal impairment, pregnancy (but for malaria benefit outweighs risk), may exacerbate psoriasis, neurological disorders (avoid for prophylaxis if history of epilepsy, may aggravate myasthenia gravis, severe gastrointestinal disorders, G6PD deficiency, ophthalmic examination and long-term therapy, avoid concurrent therapy with hepatotoxic drugs
Injections

**Side Effects:** gastro-intestinal disturbances, headache; also hypotension, convulsions, visual disturbances, depigmentation or loss of hair, skin reactions (rashes, pruritus); rarely, bone-marrow suppression, hypersensitivity reactions such as urticaria and angioedema; other side-effects (not usually associated with malaria prophylaxis or treatment)

**Dose:** treatment of benign malarias, adult dosage regimen, initial dose 600 mg (base) followed by a single dose of 300 mg after 6-8 hours, followed by a single dose of 300 mg on each of the next 2 days (approximate total cumulative dose is 25 mg/kg (base)). Chloroquine alone is adequate for Plasmodium malaria infections. Children are given an initial dose of chloroquine 10 mg/kg (base) followed by a single dose of 5 mg/kg after 6-8 hours, then a single dose of 5 mg/kg on each of the following 2 days. If the patient is seriously ill, chloroquine is given by I.V. infusion. By I.V. infusion; adult dose is 10 mg/kg (base) infused over 8 hours, followed by three 8-hour infusions of 5 mg/kg (base) each. Oral therapy should be started as soon as possible to complete the course. The total cumulative dose of the course should be 25 mg/kg of base.

**Note:** Chloroquine base 150 mg = chloroquine sulfate 200 mg, chloroquine phosphate 250 mg

- **Chloroquine Phosphate Tab 200 mg**
- Nivaquin Tablets 200 mg, Chloroquine Injection 40 mg/ml 5 ml Ampoules

Mebendazole

**Indications:** threadworm, roundworm, whipworm, and hookworm infections

**Caution:** pregnancy (toxicity in rats); breast-feeding

**Side Effects:** very rarely abdominal pain, diarrhoea, convulsions (in infants) and rash (including Stevens-Johnson syndrome and toxic epidermal necrolysis)

**Dose:** Threadworms, ADULT and CHILD over 2 years, 100 mg as a single dose; if reinfection occurs second dose may be needed after 2 weeks; CHILD under 2 years, not yet recommended

212
Whipworms, roundworm & hookworm: ADULT and CHILD over 2 years, 100 mg twice daily for 3 days; CHILD under 2 years, not yet recommended
- Mebendazole Tab 100 mg.
- Mebendazole Syrup 100 mg /5 ml 30 ml.
- Vermox Tablets 100 mg
- Vermox Suspension 100 mg/ 5 ml

**METRONIDAZOLE**

**Indications:** high activity against anaerobic bacteria and protozoa; surgical and gynaecological sepsis in which activity against colonic anaerobes especially Bacteroides fragilis is important, trichomonal vaginitis, non-specific vaginitis, and E.histolytica and Giardia lamblia infections

**Caution:** active CNS disease, disulfiram-like reaction with alcohol; hepatic impairment.

**Side Effects:** gastro-intestinal disturbances (including nausea and vomiting), taste disturbances, furred tongue, oral mucositis, anorexia; very rarely hepatitis, jaundice, pancreatitis, drowsiness, dizziness, headache, ataxia, psychotic disorders, darkening of urine, thrombocytopenia, pancytopenia, myalgia, arthralgia, visual disturbances, rash, pruritus, and erythema multiforme; on prolonged or intensive therapy peripheral neuropathy, transient epileptiform seizures, and leucopenia

**Dose:** Anaerobic infections (usually treated for 7 days and for 10 days in antibiotic-associated colitis), ADULTS by mouth, *either* 800 mg initially then 400 mg every 8 hours or 500 mg every 8 hours, CHILD 7.5 mg/kg every 8 hours; by rectum, 1 g every 8 hours for 3 days, then 1 g every 12 hours, CHILD every 8 hours for 3 days, then every 12 hours, age up to 1 year 125 mg, 1–5 years 250 mg, 5–10 years 500 mg, over 10 years, adult dose; by intravenous infusion over 20 minutes, 500 mg every 8 hours; CHILD 7.5 mg/kg every 8 hours
Leg ulcers and pressure sores, by mouth, 400 mg every 8 hours for 7 days
Bacterial vaginosis, by mouth, 400–500 mg twice daily for 5–7 days or 2 g as a single dose
Pelvic inflammatory disease, by mouth, 400 mg twice daily for 14 days
Injections

Acute ulcerative gingivitis, by mouth, 200–250 mg every 8 hours for 3 days; CHILD 1–3 years 50 mg every 8 hours for 3 days; 3–7 years 100 mg every 12 hours; 7–10 years 100 mg every 8 hours

Acute oral infections, by mouth, 200 mg every 8 hours for 3–7 days (see also notes above); CHILD 1–3 years 50 mg every 8 hours for 3–7 days; 3–7 years 100 mg every 12 hours; 7–10 years 100 mg every 8 hours

Surgical prophylaxis, by mouth, 400–500 mg 2 hours before surgery; up to 3 further doses of 400–500 mg may be given every 8 hours for high-risk procedures; CHILD 7.5 mg/kg 2 hours before surgery; up to 3 further doses of 7.5 mg/kg may be given every 8 hours for high-risk procedures

By rectum, 1 g 2 hours before surgery; up to 3 further doses of 1 g may be given every 8 hours for high-risk procedures; CHILD 5–10 years 500 mg 2 hours before surgery; up to 3 further doses of 500 mg may be given every 8 hours for high-risk procedures

By intravenous infusion (if rectal administration inappropriate), 500 mg at induction; up to 3 further doses of 500 mg may be given every 8 hours for high-risk procedures; CHILD 7.5 mg/kg at induction; up to 3 further doses of 7.5 mg/kg may be given every 8 hours for high-risk procedures

- Metronidazol 500 mg Vaginal Pessaries
- Metronidazole Tab 200 mg.
- Metronidazole Syrup 25 mg./ml. 60 ml.
- Metronidazole 0.5g. Inj. 100ml
- Flagyl Tablets 200 mg
- Metrogyl Suspension 125 mg/5 ml
- Metronidzole Infusion 500 mg
- Elyzol Vaginal Suppositories 500 mg/Suppository

PRIMAQUINE

Indications: adjunct in the treatment of Plasmodium vivax and P. ovale malaria (eradication of liver stages)

Caution: G6PD deficiency (test blood; systemic diseases associated with granulocytopenia (e.g. rheumatoid arthritis, lupus erythematosus); pregnancy and breast-feeding
Infections

**Side Effects:** nausea, vomiting, anorexia, abdominal pain; less commonly methaemoglobinemia, haemolytic anaemia especially in G6PD deficiency, leucopenia.

**Dose:** In *P. vivax* infection: adult dosage of 30 mg daily for 14 days and for *P. ovale* infection it is given in an adult dosage of 15 mg daily for 14 days.

**Safety in Pregnancy:** Third trimester: Neonatal haemolysis and methaemoglobinemia
- Primaquine Phosphate Tab 7.5 mg.
- Primaquine Tablets 15 mg (7.5 mg Base)

**SODIUM STIBOGLUCONATE**

**Indications:** leishmaniasis

**Caution:** hepatic impairment; intravenous injections must be given slowly over 5 minutes (to reduce risk of local thrombosis) and stopped if coughing or substernal pain; mucocutaneous disease; monitor ECG before and during treatment; heart disease (withdraw if conduction disturbances occur); treat intercurrent infection (e.g. pneumonia); pregnancy and breast-feeding

**Contraindications:** significant renal impairment

**Side Effects:** anorexia, nausea, vomiting, abdominal pain, diarrhoea; ECG changes; coughing; headache, lethargy; arthralgia, myalgia; rarely jaundice, flushing, bleeding from nose or gum, substernal pain, vertigo, fever, sweating, and rash; also reported pancreatitis and anaphylaxis; pain and thrombosis on intravenous administration, intramuscular injection also painful.

**Dose:** 20 mg/kg daily (max. 850 mg) for at least 20 days by intramuscular or intravenous injection; the dosage varies with different geographical regions.
- Sodium Stibogluconate Inj. BP 100ml/Vial
- Pentostam Injection 100 mg/ml
ALKYLATING AGENTS

CHLORAMBUCIL
This is a bifunctional alkylating agent of the nitrogen mustard type.

Indications: chronic lymphocytic leukemia, malignant lymphomas including Hodgkin's disease, lymphosarcoma, giant follicular lymphoma.

Cautions: Hepatic impairment; porphyria.

Contra-indications: When rashes develop, discontinue drug and cyclophosphamide is substituted.

Side effect: bone marrow suppression; rarely severe rashes which may progress to Stevens-Johnson syndrome or toxic epidermal necrolysis.

Dose: Alone 5 – 10 mg (200 mcg / kg) daily for 4 – 8 weeks; maintenance – 2 – 4 mg daily.

CYCLOPHOSPHAMIDE
This is a synthetic antineoplastic drug chemically related to the nitrogen mustards.

Indications: chronic lymphocytic leukaemia, lymphomas, and solid tumours; rheumatoid arthritis.

Cautions: reduce dose in renal impairment; increased fluid intake for 24 to 48 hours to avoid haemorrhagic cystitis.

Contraindications: Severe bone-marrow depression; pregnancy & breast feeding.

Side effect: myelosuppression, alopecia, nausea and vomiting, haemorrhagic cystitis (absolute withdrawal of treatment)

Dose: According to individual protocol.

Children
In SLE: IV 500 – 750 mg / m^2 every month. Max. 1 g / m^2
JRA / Vasculitis: IV 10 mg / kg every 2 weeks.

Children and adults:
Oral: 500 – 750 mg / m^2 / day as continuous therapy or 400 – 1000 mg / m^2 in divided doses over 4 – 5 days as intermittent therapy.
IV: Single doses: 400 – 1800 mg / m² (30 – 50 mg/kg) per treatment course (1- 5 days) which can be repeated at 2 – 4 week intervals.
Continuous daily doses: 60 – 120 mg / m² (1 – 2.5 mg/kg) per day.

- Endoxan 50 mg Tablets
- Endoxan 200 mg, 500mg & 1g Vial For Injection

**IFOSFAMIDE**

This is an alkylating agent with properties similar to those of cyclophosphamide.

**Indications:** solid tumours of lung, ovary, cervix, breast, thymus and testis; soft tissue sarcoma; osteosarcoma; malignant lymphomas; carcinoma of the pancreas; head and neck tumours.

**Cautions:** should be administered in association with mesna, and adequate hydration should be maintained to avoid urological toxicity; fluid intake should not be less than 2 litres daily.

**Contraindications:** hepatic impairment; hypersensitivity to ifosfamide, bone-marrow aplasia, myelosuppression; infections; pregnancy; breast-feeding.

**Side effect:** As for cyclophosphamide; amenorrhoea; azoospermia; potential risk to future progeny; mutagenic, teratogenic and carcinogenic properties.

**Dose:** According to individual protocol.

Children:
1200-1800 mg / m² / day for 3-5 days every 3-4 weeks or 5 g / m² once every 3-4 weeks or 3 g / m² for 2 days every 3-4 weeks.

Adults: 50 mg / kg /day or 700-2000 mg / m² / day for 5 days every 3-4 weeks or 2400 mg / m² / day for 3 days every 3-4 weeks or 5000 mg / m² as single dose every 3-4 weeks.

- Mitoxana 2 G- Vials For Injection

**IMITANIB**

Imatinib is known as a signal transductase inhibitor, because it blocks the 'grow' signal. The chemical it blocks is called tyrosine kinase, so imatinib is also known as a tyrosine kinase inhibitor.
Malignant Disease & Immunosupression

**Indications:** chronic myeloid leukaemia (CML), and a rare type of cancer known as gastro-intestinal stromal tumour (GIST)

**Cautions:** pregnancy

Contraindications: breast feeding

**Side effect:** Most common side effects include Nausea, Diarrhoea, Headaches, Leg aches/cramps, Fluid retention, Visual disturbances, Itchy rash, Lowered resistance to infection due to leucopenia, reduced platelets, Anaemia, Loss of appetite, abdominal pain, myalgia, gynaecomastia

**Dose:** 400 to 800 mg daily given as single dose with meals with lot of fluids.

- Glivec Tablet 100mg, 400mg

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**MELPHALAN**

This is an antineoplastic drug that act as a bifunctional alkylating agent.

**Indications:** multiple myeloma; advanced ovarian adenocarcinoma, advanced breast cancer, childhood neuroblastoma and polycythaemia vera.

**Cautions:** reduce dose in renal failure; not to be taken with food (bioavailability is reduced by food).

**Contraindications:** pregnancy; breast feeding.

**Side effect:** bone-marrow depression; hypersensitivity reactions (anaphylaxis); gastro intestinal disturbances; interstitial pneumonitis; pulmonary fibrosis; carcinogenic, mutagenic and teratogenic potential.

**Dose:** By mouth: Dose may vary according to regimen;
- Multiple myeloma: Typical dose 150 mcg /kg daily for 4 weeks, repeated every 6 weeks.
- Ovarian adrenocarcinoma: 200 mcg /kg daily for 5 days, repeated every 4-8 weeks.
- Advanced breast cancer: 150 mcg /kg daily for 5 days, repeated every 6 weeks.
- Polycythaemia vera: initially 6-10 mg daily reduced after 5-7 days to 2-4 mg daily until satisfactory response then further reduce to 2-6 mg per week.

- Alkeran 2 mg Tablet

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**RITUXIMAB**

This is a monoclonal antibody which causes lysis of B lymphocytes

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218
**Indications:** Chemotherapy resistant advanced follicular lymphoma of stage III or IV; diffuse large B-cell non-Hodgkins lymphoma in combination with other chemotherapy; advanced follicular lymphoma with other chemotherapeutic agents.

**Cautions:** In patients receiving cardiotoxic chemotherapy or history of cardiovascular disease because exacerbation of angina, arrhythmia, heart failure has been reported.

**Contraindications:** Breast feeding

**Side effect:** Infusion-related side effects (including cytokine release syndrome) like chills, fever, nausea, vomiting, hypersensitivity reactions such as anaphylaxis, urticaria, bronchospasm, dyspnoea and angioedema, flushing & tumour pain; Severe cytokine release syndrome (characterized by severe dyspnoea) and associated with features of tumour lysis syndrome have occurred 1-2 hours after infusion.

**Dose:** 375mg/meter squared once a week for 4 infusions if given as monotherapy and 8 if given with chemotherapy.

- Mabthera (Roche) 100 mg & 500 mg vial

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**ANTIMETABOLITES**

**CAPECITABINE**

This is a prodrug that is converted to fluorouracil in body tissues following oral administration.

**Indications:** It is given by mouth for the treatment of metastatic breast and colorectal cancer.

**Cautions:** Should be used with care in patients with renal impairment; doses should be reduced in moderate renal impairment.

**Contraindications:** In patients with severe hepatic and renal impairment (creatinine clearance below 30 ml/minute); pregnancy; breast feeding.

**Side effect:** Diarrhoea, nausea and vomiting, stomatitis, palmer-plantar syndrome (erythema and desquamation of hands and feet), dermatitis, and bone-marrow depression have all been reported. Hyperbilirubinaemia has occurred.

**Dose:** Adult over 18 years, 1.25 g/m² twice daily for 14 days; subsequent courses repeated after a 7-day interval.

- Xeloda 500 mg Tablet
CYTARABINE

Cytarabine, a pyrimidine nucleoside analogue, is an antimetabolite antineoplastic, which inhibits the synthesis of DNA.

**Indications:** induction of remission of acute myeloblastic leukaemia.

**Cautions:** severe myelosuppression; careful hematological monitoring is necessary.

**Contraindications:** pregnancy & breast feeding

**Side-effects:** myelosuppression (particularly granulocytopenia); gastrointestinal disturbances; hepatic dysfunction; renal dysfunction; neurotoxicity; bleeding complications; flu-like symptoms

**Dose:** Remission induction – IV: 100-200 mg /m²/ day for 5-10 days; second course beginning 2-4 weeks after initial therapy, may be required in some cases.

IT - 5-75 mg /m²/ every 2-7 days until CNS findings normalize or age related dosage: < 1 year-20 mg; 1-2 years-30 mg; 2-3 years-50 mg; >3 years-75 mg.

Remission maintenance: – IV: 70-200 mg /m²/ day for 2 - 5 days at monthly intervals.

IM . SC: 1-1.5 mg / kg single dose at 1 to 4 weeks intervals.

- **Cytarabe 100 mg & 500 mg Vial For Injection**

FLUDARABINE

This is a fluorinated nucleotide analogue of the antiviral vidarabine which acts as a purine antagonist antimetabolite.

**Indications:** Treatment of advanced B-cell chronic lymphocytic leukaemia for patients who either have failed or are intolerant of, first-line chemotherapy.

**Cautions:** dosage should be reduced in renal impairment and fludarabine should not be given if creatinine clearance is less than 30 ml/minute. It should also be avoided in patients with decompensated haemolytic anaemia.

**Contraindications:** Haemolytic anaemia; pregnancy & breast feeding.

**Side effect:** Myelosuppression which can be severe and cumulative; immuno-suppression is also common and co-trimoxazole is often used to prevent pneumocystis
infection. Immune-mediated haemolytic anaemia, thrombocytopenia, and neutropenia are less common side effects. 
**Dose:** By bolus injection or by IV infusion over 30 minutes in a usual dose of 25 mg/m² body-surface daily for 5 consecutive days. It may be given by mouth in a dose of 40 mg/m² daily for 5 consecutive days. Courses may be repeated every 28 days, usually for up to 6 cycles.

- *Fludarabine Phosphate 50 mg Vial, 10 mg Capsule.*

**FLUOROURACIL**

This, a pyrimidine analogue, is an antineoplastic that acts as an antimetabolite to uracil.

**Indications:** metastatic colon cancer, other solid tumours, particularly breast cancer. It may also be used topically for certain malignant and pre-malignant skin lesions.

**Cautions:** Patients with a history of heart disease, hepatic or renal insufficiency.

**Contraindications:** pregnancy & breast feeding.

**Side-effects:** myelosuppression, mucositis and rarely a cerebellar syndrome. On prolonged infusion, desquamative hand-foot syndrome may occur.

**Dose:** According to individual protocols.

Adults: IV bolus: 500-600 mg/m² every 3 – 4 weeks or 425 mg/m² on days 1-5 every 4 weeks. Continuous IV infusion: 1000 mg/m²/ day for 4-5 days every 3 – 4 weeks or 2300-2600 mg/m² on day 1 every week or 225 mg/m²/ day for 5-8 weeks (with radiation therapy).

- *Fluorouracil 250 mg/ml – 10-ml Vial For Injection.*

**GEMCITABINE HYDROCHLORIDE**

This is an analogue of cytarabine which inhibit DNA synthesis by inhibition of DNA polymerase and ribonucleotide reductase, specific for the S phase of the cycle.

**Indications:** advanced or metastatic non-small cell lung cancer; locally advanced pancreatic cancer; advanced bladder cancer (in combination with cisplatin).
**Cautions:** patients with impaired renal or hepatic function; to be discontinued at the first signs of microangiopathic haemolytic anaemia.

**Contraindications:** pregnancy & breast feeding

**Side effect:** As for cytarabine, myelosuppression; gastrointestinal disturbances; fever; dyspnoea; somnolence (patients should not drive or operate machinery).

**Dose:** Pancreatic cancer: 1000 mg /m² over 30 minutes weekly for 3 or 7 weeks followed by 1 week rest; repeat cycles 3 out of every 4 weeks.

non-small cell lung cancer in combination with cisplatin: 1000 mg /m² over 30 minutes on days 1,8,15; repeat every 28 days or 1250 mg /m² over 30 minutes on days 1,8; repeat every 21 days.

-  Gemzar 200 mg & 1 G Vials For Injection.

**MERCAPTOPURINE**

This, an analogue of the natural purines, hypoxanthine and adenine, is an antineoplastic that act as an antimetabolite. It has also immunosuppressant properties.

**Indications:** acute leukaemias and chronic myeloid leukaemia.

**Cautions:** patients with impaired hepatic and renal function; hepatic function should be monitored periodically.

**Contraindications:** Pregnancy; breast-feeding.

**Side-effects:** bone-marrow depression; gastrointestinal toxicities (less toxic than fluorouracil and methotrexate)

**Dose:** Initially 2.5 mg / kg daily.

- Puri-Nethol 50 mg Tablet

**METHOTREXATE**

This acts as an antimetabolite of folic acid. It has also immunosuppressant properties.

**Indications:** maintenance therapy for childhood acute lymphoblastic leukaemia, choriocarcinoma, non-Hodgkin's lymphomas, a number of solid tumours; intrathecal methotrexate is used in the CNS prophylaxis of childhood acute lymphoblastic leukemia, and as a therapy for established meningeal carcinoma or lymphoma.
**Cautions:** Should be avoided in the presence of significant pleural effusion or ascites because it can accumulate in these fluids, and its subsequent return to the circulation may cause myelosuppression.

**Contraindications:** Patients with significant renal and hepatic dysfunction.

**Side-effects:** bone-marrow suppression (dose-related), gastro-intestinal disturbances (anorexia, nausea, vomiting, and diarrhoea); oral ulceration, stomatitis, pharyngitis; glossitis; gingivitis; hepatotoxicity; interstitial pulmonary fibrosis.

**Dose:** According to individual protocols. Conventional 15 – 20 mg/m² orally twice weekly or 30-50 mg/m² orally / IV weekly or 15 mg / day for 5 days orally / IM every 2-3 weeks.

- Methotrexate 2.5 mg Tablet
- Methotrexate 50 mg & 500 mg Vials For Injection.

**TIOGUANINE (THIOGUANINE)**

This is an analogue of the naturally occurring purine, guanine, and is an anti-neoplastic with actions and uses similar to those of mercaptopurine.

**Indications:** induction of remission and maintenance in acute myeloid leukaemia; acute lymphoblastic leukaemia; chronic myeloid leukaemia.

**Cautions:** reduce dose in renal failure.

**Contraindications:** Pregnancy; breast-feeding.

**Side effect:** As for mercaptopurine (gastrointestinal side effects are less frequent than mercaptopurine)

**Dose:** induction 100 - 200 mg/m³ by mouth in 1 – 2 divided doses for 5 – 20 days; maintenance, usually 60 – 200 mg/m³ daily.

- Lanvis 40 mg Tablets.

**CYTOTOXIC ANTIBIOTICS**

**BLEOMYCIN (Systemic)**

Bleomycin is a mixture of cytotoxic glycopeptide antibiotics isolated from a strain of Streptomyces verticillus.
**Malignant Disease & Immunosupression**

**Indications:** squamous cell carcinoma, lymphomas (Hodgkin’s disease, non-Hodgkin’s lymphoma); testicular carcinoma.

**Cautions:** in patients with significant impairment of renal function or compromised pulmonary function. Because of the possibility of an anaphylactoid reaction (idiosyncratic reaction), lymphoma patients should be treated with 2 units or less for the first two doses. If no acute reaction occurs, then the regular dosage schedule may be followed.

**Contraindications:** pregnancy & breast feeding

**Side effect:** Pulmonary toxicities in 10% of the treated patients (pneumonitis progresses to pulmonary fibrosis). An idiosyncratic reaction in 1% of the lymphoma patients treated with bleomycin has been reported. It consists of hypotension, mental confusion, fever, chills and wheezing (anaphylactic reaction).

- **Bleomycin Injection: 15000 Units / Vial**

**DACTINOMYCIN (ACTINOMYCIN D)**

This is a highly toxic antibiotic with antineoplastic properties.

**Indications:** Treatment of paediatric cancers.

**Cautions:** Caution in handling – irritant to tissues

**Contraindications:** pregnancy & breast feeding

**Side effect:** nausea and vomiting, myelosuppression, supraventricular arrhythmias, alopecia and mucositis.

- **Cosmegen Lyovac 500- mcg Vial**

**DAUNORUBICIN (Daunomycin; Rubidomycin)**

This is an antineoplastic anthracycline antibiotic closely related to doxorubicin.

**Indications:** induce remission in acute leukaemia.

**Cautions:** caution in handling - irritant to tissues; renal impairment; hepatic impairment (dose adjustment is necessary).

**Contraindications:** pregnancy & breast feeding.

**Side effect:** subcutaneous extravasation may cause severe local reaction like phlebitis; bone marrow depression; cardiotoxicity; gastrointestinal side-effect; loss of scalp hair.

- **Daunorubicin 20mg Vial For Injection.**
DOXORUBICIN HYDROCHLORIDE
This is an anthracycline antineoplastic antibiotic.

**Indications:** acute leukaemias, lymphomas, and a variety of solid tumours.

**Cautions:** caution in handling - irritant to tissues. Limit total doses administered to 450-550 mg/m² body-surface area in one or more courses as symptomatic and potentially fatal heart failure occurs increasingly commonly above this level. Patients with pre-existing cardiac disease, the elderly, and those who have received myocardial irradiation should be treated cautiously. Cardiac functions should be monitored during treatment.

**Contraindications:** Patients with heart diseases; It should be given with great care in reduced doses in patients with hepatic impairment; pregnancy & breast feeding

**Side effect:** rarely supraventricular tachycardia; cardiomyopathy with cumulative high doses; bone-marrow depression which may be dose-limiting.

- Adriamycin Vials 10mg & 50 mg Vials For Injection.

EPIRUBICIN HYDROCHLORIDE
This is an anthracycline antibiotic with antineoplastic actions similar to those of doxorubicin (structurally – related to doxorubicin).

**Indications:** acute leukaemias, lymphomas, multiple myeloma, solid tumours including cancer of bladder, breast, cervix and gastrointestinal tract.

**Cautions:** reduce dose in hepatic impairment; irritant to tissues.

**Contraindications:** pregnancy & breast feeding

**Side effect:** cardiotoxicity and myelotoxicity is more likely when the cumulative dose exceeds 0.9 to 1 g per m² body-surface.

- Famorubicin 10- & 50- mg Vials For Injection.

IDARUBICIN HYDROCHLORIDE
This is an anthracycline antibiotic with antineoplastic actions similar to those of doxorubicin.

**Indications:** induction of remission in patients with acute myeloid leukaemias; acute lymphoblastic leukaemia (second-line treatment); advanced breast cancer.
Cautions: caution in handling – irritant to tissues; hepatic and renal impairment.

Contraindications: pregnancy & breast feeding; severe renal and liver impairment; pregnancy and lactation.

Side effects: as for doxorubicin hydrochloride. Raised liver enzyme and bilirubin.

Zavedos 5- & 10- mg Vials For Injection

MITOMYCIN

This is a highly cytotoxic antibiotic with antineoplastic properties.

Indications: I.V. for upper gastro-intestinal and breast cancers; and by bladder instillation for superficial bladder tumors.

Cautions: hepatic and renal impairment; caution in handling irritant to tissues; renal function should be tested before the beginning of treatment and after each course.

Contraindications: Patients with impaired renal function or coagulation disorders; pregnancy & breast feeding.

Side effect: prolonged use may result in permanent marrow damage; renal damage and lung fibrosis; fatal haemolytic – uraemic syndrome.

Mitomycin C Kyowa 5 mg- Vial For Injection.

VINCA ALKALOIDS

VINBLASTINE SULFATE

This is an antineoplastic agent which apparently acts by binding to the microtubular proteins of the spindle and arresting mitosis at the metaphase.

Indications: Acute leukaemias; lymphomas and certain solid tumours (breast and lung cancer)

Cautions: avoid contact with eyes; caution in handling - irritant to tissues; hepatic impairment.

Contraindications: pregnancy & breast feeding. Intrathecal injection may cause neurotoxicity.

Side effect: Myelosuppression is the dose-limiting side-effect of vinblastine and vinorelbine (vincristine causes negligible myelosuppression); neurotoxicity, usually as peripheral or autonomic neuropathy, is a limiting side effect of vincristine (less often with vinblastine and vinorelbine); reversible alopecia.
Velbe 10 mg Amp For Injection

**VINCRISTINE SULFATE**
This is an antineoplastic agent which may act similarly to vinblastine.

**Indications:** acute leukaemias, particularly lymphoblastic leukaemia, lymphomas and certain solid tumours.

**Cautions:** see vinblastine

**Contraindications:** see vinblastine

**Side effect:** See vinblastine.

**Dose:** Maximum recommended dose, 2 mg.

Oncovin 1 mg Vial For Injection.

**VINORELBINE TARTRATE**
This is a semisynthetic derivative of vinblastine with similar general properties.

**Indications:** advanced breast cancer; non-small cell lung cancers.

**Cautions:** reduce dose in hepatic insufficiency; caution in handling.

**Contraindications:** see vinblastine.

**Side effect:** see vinblastine.

Navelbine 50 mg/5 ml For Injection.

Epipodophyllotoxins

**ETOPOSIDE**
This is a semi-synthetic derivative of podophyllotoxin with antimitotic and antineoplastic properties.

**Indications:** small cell carcinoma of the bronchus; lymphomas, and testicular cancer.

**Cautions:** renal impairment.

**Contraindications:** Severe hepatic impairment; pregnancy & breast feeding.

**Side effect:** alopecia, myelosuppression (dose-related), nausea and vomiting.

**Dose:** Oral: 120 – 140 mg/m² daily for 5 days.

Vepesid 20 mg/ml For Injection.

Vepesid Capsules 50 mg Po.
OTHER ANTINEOPLASTIC DRUGS

CRISANTASPASE (Asparaginase)
Asparaginase contains the enzyme L-asparagine amidohydrolase which hydrolyses serum asparagine to nonfunctional aspartic acid and ammonia, depriving tumour cells of a required amino acid.

**Indications:** Acute lymphoblastic leukaemias (induction regimen in paediatric).

**Cautions:** Intradermal skin test should be performed prior to initial administration of this drug and repeated when at least 1 week separates doses (to avoid risk of anaphylaxis); monitor frequently serum amylase to detect early evidence of pancreatitis. If pancreatitis occurs, discontinue therapy.

**Contraindications:** Anaphylactic reactions to asparaginase; pancreatitis or a history of pancreatitis; pregnancy & breast feeding

**Side effects:** anaphylaxis, nausea, vomiting, pancreatitis, CNS depression, and liver and blood lipid changes. Careful monitoring is, therefore, necessary and the urine should be tested for glucose because of a risk of hyperglycaemia.

- *Crisantaspase 10,000 Unit For Injection.*

DACARBAZINE

**Indications:** metastatic melanoma and, in combination therapy, soft tissue sarcomas. It is also a component of a commonly used second line combination for Hodgkin's disease [ABVD-doxorubicin (Adriamycin), bleomycin, vinblastine and dacarbazine].

**Cautions:** caution in handling - irritant to skin and mucous membranes.

**Contraindications:** pregnancy

**Side effects:** myelosuppression; very severe nausea and vomiting; rarely liver necrosis due to hepatic vein thrombosis; irritant to skin and tissues.

- *Dacarbazine 100 mg Vial & 200 mg Vial For Injection*
HYDROXYCARBAMIDE:

HYDROXYUREA
This is an antineoplastic that may cause inhibition of DNA synthesis by acting as a ribonucleotide reductase inhibitor.

*Indications:* chronic myeloid leukaemia; myeloproliferative disorders; polyclythaeemia vera; haemoglobinopathies (sickle-cells disease).

*Cautions:* impaired renal function; pre-existing anaemia should be corrected before beginning therapy with hydroxyurea.

*Contraindications:* pregnancy & breast feeding.

*Side effect:* myelosuppression, nausea, and skin reactions.

*Dose:* 20-30 mg/kg daily or 80 mg/kg every third day.

*Hydrea 500 mg Capsule*

MONOCLONAL ANTIBODY:

TRASTUZUMAB
This is a monoclonal antibody directed against a cell surface protein produced by the human epidermal growth factor receptor 2 (HER2) gene which is overexpressed in about one-third of all breast cancers.

*Indications:* As monotherapy for metastatic breast cancer or in combination with docetaxel or paclitaxel.

*Cautions:* Concomitant use of trastuzumab with anthracyclines is associated with cardiotoxicity. It has been advised that the use of anthracyclines even after stopping trastuzumab may carry a higher risk of cardiotoxicity and if possible should be avoided for up to 22 weeks. If anthracyclines need to be used, cardiac functions should be monitored.

*Contraindications:* Severe dyspnoea at rest; breast feeding.

*Side effect:* Infusion-related side effects including chills, fever, hypersensitivity reactions such as anaphylaxis, urticaria and angioedema, pulmonary events (possibly delayed onset); cardiotoxicity, gastrointestinal symptoms, asthenia, headache, chest pain, arthralgia, myalgia, hypotension.
Dose: 4mg/Kg initially, by intravenous infusion in 0.9% sodium chloride over 90 minutes. This may be followed by 2 mg/Kg over 30 minutes at weekly intervals.

Herceptin 440 mg Vial For Intravenous Infusion.

PLATINUM COMPOUNDS

CARBOPLATIN
This is a platinum-containing complex which may act similarly to the alkylating agents.

Indications: Advanced ovarian cancer and lung cancer (particularly the small cell type)

Cautions: Transfusional support may be needed particularly after prolonged therapy, since anaemia is cumulative; concurrent use of nephrotoxic compounds; renal impairment.

Contraindications: Severe renal impairment; severe myelosuppression; bleeding tumoural localizations; pregnancy & breast feeding.

Side-effects: Myelosuppression (more than cisplatin); nausea, vomiting, nephrotoxicity, neurotoxicity and ototoxicity (less than cisplatin); anaphylactic-like reactions may occur within a minute of administration.

Dose: Needles or aluminium parts that may come in contact with the drug should not be used due to precipitate formation upon contact and loss of potency.

Adults with normal kidney function and previously untreated: 400 mg / m² as single iv dose as short infusion (15– 60 minutes)

Paraplatin 50 mg/5ml & 150 mg/15 ml For IV Infusion

CISPLATIN
This is a platinum-containing complex with action similar to alkylating agents.

Indications: Metastatic testicular or ovarian tumours; advanced bladder cancer.

Cautions: Reduce dose in renal impairment.

Contraindications: Pregnancy & breast feeding.

Side-effects: Severe nausea, vomiting, nephrotoxicity (pretreatment hydration recommended and the creatinine clearance should be closely monitored), myelo-toxicity,
ototoxicity (high tone hearing loss and tinnitus), peripheral neuropathy, and hypomagnesaemia.
- **Cisplatin 10 mg / 20 ml Vial For Injection.**
- **Cisplatin 50 mg / 50 ml Vial For Injection.**

**OXALIPLATIN**
This is a platinum-containing complex similar to cisplatin.

**Indications:** metastatic colorectal cancer in combination with fluorouracil and folic acid; colon cancer.

**Cautions:** Monitor WBC with differential, Hb, platelet count, and blood chemistries (ALT, AST, bilirubin and creatinine) before each cycle.

**Contraindications:** patients with pre-existing sensory neuropathies or to those with severe renal impairment; pregnancy & breast feeding.

**Side-effects:** similar to those of cisplatin but nausea and vomiting, and nephrotoxicity, seem to be less marked. Peripheral neuropathy occurs in 85 to 95% of patients; pain, functional impairment and loss of tendon reflexes may develop.
- **Eloxatin 50 mg Vial.**

**PROCARBAZINE**
This is an antineoplastic which appears to inhibit protein and nucleic acid synthesis and suppress mitosis.

**Indications:** Hodgkin's disease (MOPP regimen), non-Hodgkin lymphomas, small cell carcinoma of the bronchus.

**Cautions:** proper dietary advice is recommended because it is a mild MAOI. Alcohol ingestion may cause a disulfiram-like reaction. Reduce dose in renal failure. Care is also advisable in patients with phaeochromocytoma, epilepsy, cardiovascular or cerebrovascular disease.

**Contraindications:** severe renal and hepatic impairment; pregnancy & breast feeding.

**Side effect:** nausea, myelosuppression and hypersensitivity rash which may prevent further use of the drug.
**Dose:** Used alone, initially 50mg daily, by mouth, increased by 50mg daily to 250 – 300mg daily to cumulative total of at least 6g.
- **Natulan 50 mg Capsules**

**TAXANES:**

**DOCETAXEL**

This is a semisynthetic taxane similar to paclitaxel; manufactured from a taxane precursors obtained from the needles of European yew tree *Taxus baccata*.

**Indications:** advanced metastatic breast cancer and non-small cell lung cancer resistant to other cytotoxic drugs; hormone-resistant prostate cancer.

**Cautions:** Premedication with oral dexamethasone for five days starting on the day before each course of docetaxel is recommended for reducing fluid retention and hypersensitivity reactions; hepatic impairment.

**Contra-indications:** pregnancy and lactation; severe allergy; neutropenia; severe hepatic impairment; patients hypersensitive to polysorbate-80, which is contained in the formulation.

**Side effect:** persistent fluid retention commonly seen as leg oedema which worsens during treatment and can be resistant to treatment; hypersensitivity reactions also occurs; ascites, pleural and pericardial effusion and weight gain is common and may be cumulative.
- **Taxotere 20 mg Vial For Injection**

**PACLITAXEL**

This is a taxane originally derived from the bark of the Pacific yew tree; now obtained semisynthetically from a taxane precursor derived from the needles of the European yew.

**Indications:** Primary treatment of advanced ovarian cancer in combination with cisplatin or carboplatin, primary adjuvant or second-line therapy of breast cancer and in combination with cisplatin or carboplatin, primary treatment of advanced non-small cell lung cancer; second-line treatment of AIDS-related Kaposi's sarcoma.

**Cautions:** Premedication with corticosteroids and antihistamines and a histamine H2 receptor antagonist is
recommended to reduce hypersensitivity reactions; continuous cardiac monitoring should be performed in patients who have experienced previous significant conduction abnormality while receiving paclitaxel.

**Contraindications:** severe hepatic impairment; patients hypersensitive to polyethoxylated castor oil which is contained in formulation.

**Side effect:** myelosuppression; peripheral neuropathy; cardiac conduction defects, arrhythmias; hypersensitivity reactions.

- **Taxol 30 mg Vial For Injection.**

**TOPOISOMERASE I INHIBITORS**

**IRINOTECAN HYDROCHLORIDE**

This is a topoisomerase I inhibitor which inhibits nucleic acid synthesis by interfering with the coiling and uncoiling of DNA during replication.

**Indications:** metastatic colorectal cancer in combination with fluorouracil and folinic acid or where treatment containing fluorouracil has failed.

**Cautions:** raised plasma bilirubin concentration.

**Contraindications:** chronic inflammatory bowel disease, bowel obstruction; high plasma bilirubin level; female patient should avoid conception for at least 3 months after cessation of treatment.

**Side effect:** acute cholinergic syndrome (with early diarrhoea) and delayed diarrhoea.

- **Campto 100 mg/5 ml Vial For Injection**

**ANTIPROLIFERATIVE IMMUNOSUPPRESSANTS**

**AZATHIOPRINE**

This a cytotoxic immunosuppressant with similar actions to those of mercaptopurine, to which it is converted in the body.

**Indications:** transplant recipient and also in a number of autoimmune conditions, usually when corticosteroid therapy alone has provided inadequate control.

**Cautions:** reduce dose in renal failure and when allopurinol is given concurrently; blood picture
Malignant Disease & Immunosuppression

monitoring is necessary; hepatic and renal impairment; pregnancy.

**Contraindications:** hypersensitivity to azathioprine or mercaptopurine.

**Side effect:** bone marrow depression (dose-related); hepatic toxicity, hyper-sensitivity reactions; hair loss; increased susceptibility to infections and colitis.

**Dose:** by mouth, autoimmune conditions, 1-3 mg/kg daily. Suppression of transplant rejection, initially up to 5 mg/kg then 1-4 mg/kg daily according to response.

- *Imuran 50 mg Tablet*

**MYCOPHENOLATE MOFETIL**

This is an immunosuppressant derived from Penicillium stoloniferum. It is a reversible inhibitor of inosine monophosphate dehydrogenase and this inhibits purine synthesis, with potent cytostatic effects on both T- and B-lymphocytes.

**Indications:** prophylaxis of acute rejection of renal or cardiac or hepatic transplantation (in combination with ciclosporin and corticosteroids).

**Cautions:** Blood counts every week for 4 weeks, then twice a month for 2 months, then every month in the first year (interrupt treatment if neutropenia develops); elderly (increased risk of infection, gastrointestinal haemorrhage and pulmonary oedema); children (higher incidence of side-effects may call for temporary reduction of dose or interruption); active serious gastro-intestinal disease (risk of haemorrhage, ulceration and perforation); delayed graft function; increased susceptibility to skin cancer (avoid exposure to strong sunlight).

**Contraindications:** pregnancy (exclude before starting and avoid for 6 weeks after discontinuation) & breast feeding.

**Side effects:** diarrhoea, abdominal discomfort, gastritis nausea, vomiting, constipation; cough, influenza like syndrome; headache; infections; increased blood creatinine; leucopenia; anaemia; thrombocytopenia.

**Dose:** Orally 1g twice daily starting within 72 hrs. of transplantation or IV 1 g twice daily starting within 24 hrs of transplantation for up to max. 14 days.

- *Cellcept 250 mg-Tablet & 500 mg-Capsule.*
CICLOSPORIN (Cyclosporin)

This is a powerful immunosuppressant which appears to act specifically on lymphocyte, mainly helper T-cells. It has little effect on bone marrow but marked nephrotoxicity.

**Indications:** prevention of graft rejection following bone marrow, kidney, liver, pancreas, heart, and heart-lung transplantation, and for prophylaxis and treatment of graft-versus-host disease. Because of risk of anaphylaxis, I.V. infusion should only be used where oral ingestion is not feasible in immediate post-operative period or where gastro-intestinal absorption is impaired. Such patients should be switched to oral therapy as soon as possible.

**Cautions:** increased susceptibility to infections and lymphomas especially when administered with the immunosuppressive agents due to over suppression; avoid during pregnancy, breast-feeding or with systemic nephrotoxic antibiotics; avoid other immunosuppressant except cortico-steroids; monitor liver and kidney functions.

**Contraindications:** uncontrolled hypertension; uncontrolled infections, and malignancy; renal impairment.

**Side effects:** hepatic and renal impairment; tremor, gastrointestinal disturbances, hypertrichosis; gum hyperplasia; hyperkalaemia; occasionally facial oedema, hypertension, fluid retention, and convulsion; serum creatinine, bilirubin, and liver enzymes may be increased; burning sensation in hands and feet during first week of oral administration.

**Dose:**
- Orally should be given 4-12 hours prior to transplantation as a single dose of 15 mg/kg. By IV injection it should be given 4-12 hours prior to transplantation as a single I.V. dose of 5-6 mg/kg/day. This daily single dose is continued postoperatively until the patient can tolerate the soft gelatin capsules or oral solution.
  - Neoral 25 mg-, 50 mg-, 100 mg Capsules
  - Sandimmun 50 mg/ml For Intravenous Infusion

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Malignant Disease & Immunosuppression
PREDNISOLONE

**Indications:** Acute lymphoblastic leukemia, Hodgkin's disease and non-Hodgkin lymphomas, hormone-sensitive breast cancer, palliation of symptomatic end stage malignant disease when it may produce a sense of well-being, prevention of organ transplant rejection; in high doses it is used to treat rejection episodes, systemic lupus erythematosus, chronic active hepatitis, rheumatoid arthritis and acute immune hemolytic anemia.

**Dose:** the dose used depends on the disease, its severity and the clinical response expected. Divided dosage is usually employed. Short term treatment, 20-30 mg daily for few days then reduced by 2.5-5 mg every 2-5 days depending on response. Rheumatoid arthritis, 20-30 mg daily.

Maintenance, lowest effective dose. Most other conditions, 10-100 mg daily for 1-3 weeks then reduced to most effective dose.

- *Precortisyl 1,5,20 mg-Tablets.*

**SIROLIMUS**

This is a macrolide compound obtained from *Streptomyces hygroscopicus* with potent immunosuppressant properties.

**Indications:** prophylaxis of organ rejection in patients receiving renal transplants.

**Cautions:** monitor kidney function when given with ciclosporin; hepatic impairment, renal impairment.

**Contraindications:** pregnancy; breastfeeding.

**Side effect:** gastrointestinal disturbances, tremor, acne, impaired renal function, hyperlipidaemia, peripheral oedema, headache, pain, asthenia and hypertension.

**Dose:** initial 6 mg after surgery, then 2 mg once daily.

- *Sirolimus “Rapamune”1mg Tablet*

**TACROLIMUS**

This is a potent macrolide immunosuppressant derived from *Streptomyces tsukabaensis*, and has actions similar to those of ciclosporin.
**Indications:** prophylaxis organ rejection in patients receiving allogenic liver or kidney transplants. Used in conjunction with adrenal corticosteroids.

**Cautions:** Cardiomyopathy has been reported in children given tacrolimus after transplantation. Patients should be monitored carefully by echocardiography for hypertrophic changes; dose reduction or discontinuation should be considered if these occur. Monitor visual status, blood glucose, hematological and neurological parameters.

**Contraindications:** hypersensitivity to macrolides; hypersensitivity (risk of anaphylaxis) to polyoxyl 60 hydrogenated caster oil, which is present in the injection; avoid concurrent use with ciclosporin (additive nephrotoxicity).

**Side-effects:** include gastrointestinal disturbances like dyspepsia, and inflammatory & ulcerative disorders; hepatic dysfunction, jaundice, bile duct and gall bladder abnormalities; hypertension; cardiomyopathy.

**Dose:** 100 – 300 mcg / kg daily in 2 divided doses orally; or by IV infusion over 24 hrs., 10 – 50 mcg / kg.

- Tarcolimus 1mg & 5mg Tablets.
- Prograf 1mg & 5mg Tablets.

**OTHER IMMUNOMODULATING DRUGS**

**INTERFERON ALFA**

Alfa interferons have shown some anti-tumour effect in certain lymphomas and solid tumours; are also used in treatment of chronic hepatitis B, and chronic hepatitis C (in combination with ribavirin).

**Indications:** chronic hepatitis B, hairy-cell leukaemia and chronic myeloid leukaemia (alfa-2a, alfa-2b, and alfa-n1); chronic hepatitis C (alfa-2a, alfa-2b, alfa-n1, and alfacon-1); AIDS-related Kaposi’s sarcoma, follicular lymphoma and melanoma (alfa-2a, alfa-2b), cutaneous T-cell lymphoma and renal cell carcinoma (alfa-2a), carcinoid tumours and myeloma (alfa-2b); and in condylomata acuminata (alfa-2b and alfa-n3)

**Contraindication:** consult product/specialist literature; avoid injection containing benzyl alcohol in neonates

**Side-effects:** See under peginterferons.
Malignant Disease & Immunosupression

- Interferon Alfa-2a “Roferon-A” 3 Million Unit For S.C Or IM Injection
- Interferon Alfa-2b “Intron-A” 5 Million Unit For S.C Or I.V Injection

INTERFERON BETA
Interferon beta-1a & beta-1b have antiviral and immunomodulating activities; mainly used in the management of multiple sclerosis

**Indications:** interferon beta–1a is used in relapsing remitting multiple sclerosis whereas interferon beta-1b is used in both relapsing – remitting and in secondary progressive multiple sclerosis.

**Contraindications:** consult product/specialist literature

**Side effect:** The most frequently reported side effects include irritation at injection site (inflammation, hypersensitivity and necrosis), influenza-like symptoms, nausea, and vomiting. Other side effects include hypersensitivity reactions (anaphylaxis and urticaria), blood disorders, menstrual disorders, mood and convulsions, alopecia, hepatitis, and thyroid dysfunction.

- Interferon Beta-1a “Avonex” 30 mcg (60 Million-Unit) & 60 mcg (120 Million-Unit) Prefilled Syringe For IM Injection.
- Interferon Beta-1b “Betaferon” 300 mcg (9.6-Million Unit Vial With Diluent) For Subcutaneous Injection.

PEGINTERFERON ALFA
Peginterferon Alfa-2a and Alfa-2b are polyethylene glycol conjugated ‘pegylated’ derivatives of interferon alfa. Pegylation increases the persistence of the interferon in the blood.

**Indications:** combined with ribavirin for chronic hepatitis C, as monotherapy if ribavirin is not tolerated or contraindicated.

**Cautions:** interferon alfa for either monotherapy or combined therapy should be used only if neutropenia and thrombocytopenia are a particular risk.

**Contraindications:** consult product / specialist literature.

**Side-effects:** side effects are dose-related, but commonly include anorexia, nausea, influenza-like symptoms, and
lethargy. Ocular side effects, depression (including suicidal behaviour), myelosuppression, cardiovascular problems, nephrotoxicity and hepatotoxicity have been reported. Hypertriglyceridaemia, sometimes severe, has been observed. Other side effects include hypersensitivity reactions, thyroid abnormalities, hyperglycaemia, alopecia, psoriasiform rash, confusion, coma and seizures.

- Peginterferon Alfa – 2a “Pegasys” 180 mcg Prefilled Syringe, For Subcutaneous Injection.
- Peginterferon Alfa – 2b “Peginferon” 120 mcg Vial & 150 mcg Vial, For Subcutaneous Injection.

SEX HORMONES AND HORMONE ANTAGONISTS IN MALIGNANT DISEASE

PROGESTOGENS:

MEGESTROL ACETATE

This is a progestogen structurally related to progesterone that is used for the palliative treatment of various cancers. **Indications:** endometrial cancer; breast cancer; renal cancer (declined); prostate cancer. **Cautions:** epilepsy, hypertension, migraine, asthma, cardiac and renal dysfunction, liver impairment, history of depression. **Contraindications:** history of liver tumours, and in severe liver impairments; undiagnosed vaginal bleeding. **Side effect:** mild but may include nausea, fluid retention, and weight gain (increased appetite); glucocorticoid effects. **Dose:** breast cancer, 160 mg daily in single or divided doses. Endometrial cancer, 40-320 mg daily in divided doses. - Megace 40 mg- Tablets

HORMONAL ANTAGONISTS:

BREAST CANCER

LETRIOZOLE

This is a nonsteroidal inhibitor of the aromatase (oestrogen synthetase) system.
Indications: advanced breast cancer in postmenopausal women (including those in whom other anti-oestrogen therapy has failed); early invasive breast cancer in postmenopausal women after standard adjuvant tamoxifan therapy; pre-operative therapy to those with localized hormone receptor positive disease, to allow subsequent breast conserving surgery.

Cautions: severe renal impairment

Contraindications: severe hepatic impairment; not indicated for pre-menopausal women, pregnancy & breast feeding.

Side-effects: hot flushes, nausea, vomiting, fatigue, headache, dyspepsia, constipation, diarrhoea, depression, anorexia, appetite increase, hypercholesterolemia, alopecia, increased sweating, rash, peripheral oedema, musculoskeletal pain, osteoporosis, bone fracture etc.

Dose: Po 2.5 mg daily, (for 3 years after tamoxifen), discontinue if tumour progression occurs.

Femora 2.5 mg Tablet.

PROSTATE CANCER & GONADORELLIN ANALOGUES

GOSERELIN

This is an analogue of gonadorelin with similar properties.

Indications: prostate cancer; advanced breast cancer in pre- and peri-menopausal women and in the management of endometriosis and uterine fibroids.

Cautions: patients with metabolic bone disease (decrease in bone mineral density may occur); injection site should be rotated.

Side effect: hot flushes, decreased libido, breast swelling and tenderness; skin rashes.

Dose: advanced breast cancer and prostate cancer by S.C. injection into anterior abdominal wall, 3.6 mg every 28 days.

Zoladex 3.6 mg For Injection
TRIPTORELIN
This is a synthetic analogue of gonadotrophin-releasing hormone (GnRH) that acts as a potent inhibitor of gonadotrophin.

**Indications:** advanced prostate cancer; endometriosis; precocious puberty, reduction in size of uterine fibrosis

**Cautions:** Men at risk of tumour ‘flare’ should be monitored closely during first month of therapy. In patients with bone disease because reduction in bone mineral density can occur. The injection site should be rotated.

**Side effect:** Transient hypertension, dry mouth, paraesthesia, increased dysuria, gynaecomastia.

**Dose:** advanced prostate cancer: 3 mg every 4 weeks. Endometriosis and reduction in uterine fibroids: 3 mg every 4 weeks starting during first 5 days of menstrual cycle. Max. duration of treatment – 6 months.

*Somatostatin Analogue*

**OCTREOTIDE ACETATE**
This is an octapeptide analogue of somatostatin with similar properties but a longer duration of action.

**Indications:** symptomatic treatment of diarrhoea associated with carcinoid tumour, treatment of profuse diarrhoea associated with vasouctive intestinal peptide tumours (VIPoma); reduce blood levels of growth hormone in acromegaly.

**Cautions:** monitored for signs of tumour expansion (visual field defects), ultrasound of gall bladder is recommended before and at intervals of 6-12 months during treatment. Hepatic impairment; pregnancy; breast feeding. Monitor thyroid functions on long term therapy.

**Side effect:** gastrointestinal disturbances including anorexia, nausea, vomiting, abdominal pain, bloating, flatulence, diarrhoea, and steatorrhoea may occur. Postprandial glucose tolerance may be impaired and persistent hyperglycaemia occurs with chronic administration (rare). Gallstones have been reported after long-term treatment. Pain and irritation may occur at the injection site.
Malignant Disease & Immunosupression

- Sandostatin Lar 20 mg Vial (Depot Preparation) For Injection.

**BONE MODULATING DRUGS**

**ZOLEDRONIC ACID**

This is an aminobisphosphonate which is a potent inhibitor of bone resorption.

**Indications:** reduction of bone damage in advanced malignancies involving bone; hypercalcaemia of malignancy.

**Cautions:** monitor serum electrolytes, calcium, phosphate and magnesium; assess renal function before each dose; ensure adequate hydration; renal impairment; cardiac disease (avoid fluid overload).

**Side effects:** hypophosphotaemia, anaemia, influenza-like symptoms; gastrointestinal disturbances, headache, conjunctivitis; renal impairment. Osteonecrosis of the jaw reported in cancer patients being treated with bisphosphonate; consider dental examination and preventive treatment before initiating bisphosphonate; avoid invasive dental procedures during treatment.

**Dose:** IV infusion of 4 mg every 3-4 weeks (reduction of bone damage in advanced malignancies) and 4 mg as a single dose (hypercalcaemia of malignancy)

- Zometa 5-ml (4mg) Vial For IV Infusion.

**ANTIMETABOLITES AND RELATED THERAPY**

**LEUCOVORIN CALCIUM (CALCIUM FOLINATE)**

**Indications:** High dose methotrexate therapy (folate rescue); inadvertent overdose of methotrexate; with fluorouracil in the palliative treatment of advanced colorectal cancer.

**Cautions:** not indicated for pernicious anaemia or other megaloblastic anaemias due to vitamin B₁₂ deficiency; pregnancy; breastfeeding.

**Contraindications:** intrathecal injection is contraindicated.

**Side effect:** allergic reactions; pyrexia after parenteral administration
Folinic Acid (As Calcium Salt) 300 mg/30 ml Amp, 15 mg Vial For IM, IV Or Infusion.

DRUGS USED IN NETUROPENIA

LENOGRASTIM

This is a glycosylated recombinant human granulocyte-colony stimulating factor (rhG-CSF).

**Indications:** to treat or prevent neutropenia in patients receiving myelosuppressive cancer chemotherapy and to reduce the period of neutropenia in patients undergoing bone marrow transplantation.

**Cautions:** pre-malignant myeloid conditions; reduced myeloid precursors; sickle cell disease; monitor spleen size (risk of splenic rapture).

- Granocyte 33.6 Million Unit (263 mcg) - Vial For Injection.
- Neupogen PFS 0.5ml, 30MIU/0.5ml

DRUGS USED IN UROTHELIAL TOXICITY

MESNA

**Indications:** urethelial toxicity associated with the use of cyclophosphamide or ifosfamide. (urethelial toxicity is manifested by hemorrhagic cystitis and is caused by the metabolite acrolein).

**Contraindications:** hypersensitivity to thiol-containing compounds.

**Side effect:** above max. therapeutic doses, gastrointestinal disturbances, fatigue, headache, limb pains, depression, irritability, hypotension and tachycardia, and skin rash.

**Dose:** given simultaneously with cyclophosphamide or ifosfamide, and further doses are given orally or intravenously 4 and 8 hours after treatment. For oral administration, the contents of ampoule are taken in fruit juice.

- Uromitexan 100 mg/ml In 4-ml & 10-ml Ampoules For Injection
**AMINOPHYLLINE**

This is a xanthine bronchodilator. Aminophylline is a stable mixture of theophylline and ethylenediamine. The latter confers greater solubility in water.

**Indication:** reversible airways obstruction, status asthmaticus, left ventricular failure, severe acute asthma.

**Cautions:** reduce dose in liver disease; epilepsy, breastfeeding, pregnancy, cardiac disease, elderly patients, fever, hypertension, hyperthyroidism; peptic ulcer and hypokalemia.

**Side effects:** tachycardia, palpitations, nausea, gastrointestinal disturbances, insomnia, arrhythmias, and convulsions especially if given rapidly by intravenous injection; use of suppositories for more than a few days may cause proctitis, intramuscular injection is painful (therefore this route is not used). Neonatal irritability and apnoea have been reported. Allergy to ethylene diamine may develop.

**Dose:** by mouth, 100-300 mg 3-4 times daily, preferably after food.

For doses of sustained-release preparation, 1 tablet twice daily initially, increased after 1 week to 2 tablets twice daily.

Deteriorating acute asthma not previously treated with theophylline, by slow I.V. Injection over 20 minutes, 250-500 mg (5 mg/kg), then as for acute severe asthma. Child, 5mg/kg then as for acute severe asthma.

Acute severe asthma, by I.V. infusion, 500 mcg/kg/hr, adjusted according to plasma-theophylline concentration.

Child 6 months - 9 years, 1 mg/kg/hour.

10-16 years, 800 mcg/kg/hour adjusted according to plasma-theophylline concentration.

- Nuelin Sa Tablets 250 mg
- Phyllcontin Continus 100 mg Tablets
- Aminophylline Injection 250 mg/10 ml
FLUTICASONE PROPIONATE

Fluticasone is a synthetic corticosteroid and is used to decrease inflammation in the lungs.

**Indications:** Prophylaxis of asthma.

**Cautions:** active or quiescent tuberculosis; Diabetes

**Contraindications:** Known sensitivity or allergy; children below 4 years

**Side effect:** Yeast infection of the mouth (oral thrush); Throat irritation; Hoarse voice; Unexpected narrowing of the airways (paradoxical bronchospasm)

Inhaled corticosteroids have considerably fewer side effects than steroids taken by mouth. However, when taken for long periods of time at high doses, inhaled steroids do have the potential to cause side effects such as glaucoma, cataracts, thinning of the bones (osteoporosis), slowed growth in children and adolescents, and to suppress the functioning of the adrenal glands.

**Dose:** 400 to 800 mg daily given as single dose with meals with lot of fluids.

- Flixotide accuhaler 125 mcg

FORMOTEROL

**Indication:** A long acting Beta2 agonist used for long term maintenance treatment of asthma and in prevention of reversible obstructive airways disease. It is used in patients with nocturnal asthma and in prevention of exercise-induced bronchospasm.

**Cautions:** Severe liver cirrhosis, pregnancy and breastfeeding, hypertension, arrhythmias and coronary insufficiency.

**Side effects:** Oropharyngeal irritation, taste disturbances. Insomnia, nausea, pruritus, skeletal muscle tremor, cramps and tachycardia also reported. Potential for paradoxical bronchospasm.

**Dose:** A usual dose for adults and children aged 5 years or older is 12 mcg every 12 hours or 15 minutes before exercise by inhalation, increased to 24 mcg twice daily if necessary in severe disease.

Children from age of 6 months: A dose of 4 mcg/kg daily, in 2 or 3 divided doses. (not exceeding 160mcg daily)

- Foradil 12 mcg/Capsule
Respiratory System

BECLOMETASONE DIPROPIONATE
(Beclomethasone Dipropionate)

**Indication:** A corticosteroid used in chronic airways obstructions, especially in asthma not controlled by bronchodilators.

**Cautions:** respiratory infection, active or quiescent tuberculosis; may need to reinstate systemic therapy during periods of stress or when airways obstruction or mucus prevent drug access to smaller airways.

**Side effects:** hoarseness; candidiasis of mouth or throat, usually only with large doses (rinsing the mouth with water after inhalation of a dose; it can be reduced by using spacer; antifungal lozenges may help).

**Dose:**
- Standard dose inhalers: by aerosol inhalation, 100 mcg 3-4 times daily or 200 mcg twice daily (in more severe cases, initially 600-800 mcg daily).
- Child, 50-100 mcg 2-4 times daily, reduced to the minimum effective dose.
- High Dose Inhalers: by aerosol inhalation, 500 mcg twice daily or 250 mcg 4 times daily; if necessary the dose may be increased to 500 mcg 4 times daily.
  - **Becotide 50 mcg/Metered Inhalation**

BUDESONIDE

**Indication:** A corticosteroid used in prophylaxis of asthma especially if not fully controlled by bronchodilators or cromoglycate.

**Cautions:** pulmonary tuberculosis and viral infections in the airways; Pregnancy.

**Side effects:** mild irritation in the throat, coughing and hoarseness; candidal infections of the oropharynx; bronchoconstriction in hyperreactive patients.

**Dose:**
- adults, initially or in severe asthma, or when reducing or discontinuing oral corticosteroids, 1-2 mg twice daily.
- Child 3 months - 12 years, 0.5 - 1 mg twice daily.
- Maintenance, usually half above doses.
- Croup, 2mg as a single dose (or as two 1 mg doses separated by 30 minutes).
Respiratory System

- *Pulmicort Respules (Single Dose Nebulizing Solution 500 Meg/Unit).*

**EPINEPHRINE**
(Adrenaline)

**Indication:** A non-selective adrenoceptor agonist, used in reversible airways obstruction; emergency treatment of acute anaphylaxis; angioedema; cardiopulmonary resuscitation.

**Cautions:** hyperthyroidism, diabetes, ischaemic heart disease, hypertension, elderly patients. Tolerance to bronchodilator effect may develop. Not to be given intravenously or with tricyclic antidepressants, digoxin, or quinidine because of increased risk of arrhythmias.

**Interactions:** adrenaline may cause severe hypertension in those receiving beta-blockers. Patients on tricyclic antidepressants are considerably more susceptible to arrhythmias, calling for the dose of adrenaline to be reduced by 50%.

**Side effects:** nausea, vomiting; tachycardia, arrhythmias, palpitation, cold extremities, hypertension (risk of cerebral haemorrhage); dyspnoea, pulmonary oedema (on excessive dosage or extreme sensitivity); anxiety, tremor, restlessness, headache, weakness, dizziness; hyperglycaemia; urinary retention; sweating; tissue necrosis at injection site and angle-closure glaucoma also reported.

**Dose:** acute anaphylaxis by I.M. (or S.C.) injection of 1:1000 (1 mg/ml) solution, adult, 0.5-1 ml. Child: 6-12 years, 0.5 ml; 5 years, 0.4 ml; 3-4 years, 0.3 ml; 2 years, 0.2 ml; 1 year, 0.1 ml; under 1 year, 0.05 ml.

These doses may be repeated every 10 minutes according to blood pressure and pulse until improvement occurs. In underweight children (2-12 years), use half the above doses. Intravenous route for the 1 in 10,000 (100 mcg/ml) preparation should be used with extreme care.

- Epinephrine Injection 1: 1000
- Epinephrine Injection 1: 10,000 In Prefilled Syringes

**FLUTICASONE PROPIONATE**

**Indication:** A corticosteroid used in prophylactic management of severe chronic asthma.
Respiratory System

**Cautions:** active or quiescent pulmonary tuberculosis; severe or unstable asthma; children under 16 years of age.

**Side effects:** prolonged use with high doses may lead to adrenal suppression, growth retardation in children and adolescents, decrease in bone mineral density, cataract and glaucoma; candidiasis of mouth and throat; oedema; dyspepsia.

**Dose:** 500 - 2000 mcg twice daily.

- *Flixotide Nebules 0.5 mg/2 ml*

**IPRATROPIUM BROMIDE**

**Indication:** An anti-muscarinic bronchodilator used in reversible airways obstruction, particularly in chronic bronchitis. Ipratropium bromide is used intranasally for the treatment of rhinorrhea in allergic and non-allergic rhinitis. It has also relieved rhinorrhea and sneezing associated with the common cold.

**Cautions:** glaucoma (standard doses are unlikely to be harmful); prostatic hypertrophy. First inhalation dose should be given under medical supervision.

**Side effects:** dry mouth occasionally reported; rarely urinary retention, constipation.

**Dose:** by inhalation of nebulized solution, 100-500 mcg up to 4 times daily.

Child 1 month-3 years, 62.5-250 mcg up to 3 times daily.

3-14 years, 100-500 mcg up to 3 times daily.

- *Atrovent Solution 0.25 mg/ml - 20 ml Bottle.*

**SALBUTAMOL**

**Indication:** A selective beta 2-adrenoceptor agonist used in reversible airway obstruction, status asthmaticus, severe acute asthma and premature labour.

**Cautions:** hyperthyroidism, ischaemic heart disease, hypertension, pregnancy, elderly patients (reduce dose); intravenous administration to diabetics (blood sugar estimates required).

**Side effects:** fine tremor (usually hands), nervous tension, headache, peripheral vasodilatation, tachycardia (seldom troublesome when by aerosol inhalation); hypokalaemia after high doses, slight pain on intramuscular injection.

**Dose:** by mouth, 4 mg (elderly and sensitive patients initially 2 mg) 3-4 times daily, max. 8 mg (but unlikely to be
Respiratory System

tolerated); Child under 2 years, 100 mcg/kg 4 times daily (not licensed).
Child 2-6 years, 1-2 mg 3 -4 times daily.
6-12 years, 2 mg 3-4 times daily.
By S.C. or I.M. injection, 500 mcg repeated every 4 hours if necessary.
By slow I.V. injection, 250 mcg repeated if necessary.
By continuous I.V. infusion, initially 5 mcg/minute, adjusted according to response and heart-rate usually in the range of 3-20 mcg/minute or more if necessary.
By aerosol inhalation, acute and intermittent episodes of wheezing and asthma, 100-200 mcg repeated after 4 hours if necessary; Child, 100 mcg.
Prophylaxis in exercise-induced bronchospasm, 200 mcg.
Child, 100 mcg.
Chronic maintenance therapy, 200 mcg 3-4 times daily, or in severe bronchospasm every 4 hours.
Child, 100 mcg 3-4 times daily increased to 200 mcg if necessary.
By inhalation of nebulized solution, chronic bronchospasm unresponsive to conventional therapy and severe acute asthma, 2.5mg(2.5 ml of a solution containing 1 mg/ml), repeated up to times daily; increased to 5 mg if necessary.
In refractory patients with severe acute asthma 10 mg can be used if side effects permit. Child 2.5 mg, increased to 5 mg if required.

- Ventolin Tablets 2 mg
- Ventolin Syrup 2 mg/5 ml
- Ventolin Inhaler 100 mcg/Metered Inhalation
- Ventolin Respiratory Solution 5 mg/1 ml
- Ventolin Injection 0.5 mg/ Lml

SODIUM CROMOGLICATE

(Sodium Cromoglycate)

Indication: A mast cell stabilizer used in prophylaxis of asthma; food allergy; allergic conjunctivitis; allergic rhinitis.

Cautions: it should be emphasized that regular administration is necessary whether symptoms are present or not.

Side effects: coughing, transient bronchospasm, and throat irritation due to inhalation of powder.
Respiratory System

**Dose:** by aerosol inhalation, adults and children, 10 mg 4 times daily initially, increased in severe cases or during periods of risk to 6-8 times daily; additional doses may also be taken before exercise; maintenance 5 mg 4 times daily. By inhalation of nebulized solution, adults and children, 20 mg 4 times daily increased in severe cases to 6 times daily.

- Intal Inhaler 5 mg/Inhalation

**DRUGS USED IN THE TREATMENT OF ALLERGIC DISORDERS**

**CETRIZINE**

**Indication:** Long-acting non-sedating antihistamine with some mast-cell stabilising activity used in symptomatic relief of allergy such as hay fever, urticaria.

**Caution:** prostatic hypertrophy, urinary retention, glaucoma and hepatic disease.

**Contra-indication:** pregnancy and breast feeding.

**Side effects:** palpitations and arrhythmias; hypotension; hypersensitivity reactions; depression.

**Dose:** adult and child over 6 years, 10 mg daily or 5 mg twice daily.

Child 2-6 years, hay fever, 5 mg daily or 2.5 mg twice daily.

- Zyrtec Tablets 10 mg

**CHLOPHENAMINE MALEATE**

(Chlorpheniramine maleate)

**Indication:** symptomatic relief of allergic conditions including urticaria and angioedema, rhinitis, and conjunctivitis, and in pruritic skin disorders. Intravenously as an adjunct in the emergency treatment of anaphylactic shock.

**Caution:** epilepsy, prostatic hypertrophy, glaucoma and hepatic disease.

**Side effects:** drowsiness; impaired ability to drive or operate machinery; effects of alcohol maybe increased; headache; psychomotor impairment, anti-muscarinic effects such as urinary retention, dry mouth, blurred vision, and gastro-intestinal disturbances; occasional
rashes; rarely photosensitivity reaction and paradoxical stimulation especially with high doses and in children. 
**Dose:** by mouth, 4 mg 3-4 times daily. 
Maximum dose, 24 mg daily. 
Child under 1 year, not recommended. 
1-2 years, 1 mg twice daily. 
2-5 years, 1 mg 4-6 times daily with a maximum dose of 6 mg daily. 6-12 years, 2 mg 4-6 times daily with a maximum dose of 12 mg daily. 
- Chlorhistol Tablets 4 mg 
- Chlorhistol Syrup 2 mg/5 M 

**LORATADINE**

**Indication:** allergic rhinitis; chronic urticaria and other allergic dermatologic disorders. symptomatic relief of allergy such as hay fever 
**Cautions:** children under 12 years of age; pregnancy; nursing mothers. 
**Contra-indications:** sensitivity or idiosyncrasy reactions. 
**Dose:** adult and child over 6 years, 10 mg once daily. 
Child 2-5 years, 5 mg daily. 
- Claritine Tablets 10 mg 

**PROMETHAZINE HYDROCHLORIDE**

**Indication:** symptomatic relief of allergy such as hay fever, urticaria, emergency treatment of anaphylactic reactions; premedication in anesthesia; sedation; motion sickness. 
**Cautions:** intramuscular injection may be painful. 
**Contra-indications:** porphyria. 
**Side Effects:** Headache, psychomotor impairment, and antimuscarinic effects such as urinary retention, dry mouth, blurred vision, and gastro-intestinal disturbances. Cardiovascular adverse effects more commonly seen after injection: bradycardia, tachycardia, transient minor increases in blood pressure and occasional hypertension. Jaundice and blood dyscrasias have been reported, and extrapyramidal effects may occur at high doses. Venous thrombosis has been reported at the site of intravenous injections, and arteriospasm and gangrene may follow inadvertent intra-arterial injection. intramuscular injection may be painful.
**Respiratory System**

**Dose:** by mouth, 25 mg at night, may be increased to 50-75 mg at night if necessary.
Child below 2 years, not recommended.
2-5 years, 5-15 mg daily.
5-10 years, 10-25 mg daily.
By I.M. injection, adult, 25-50 mg.
Child 5-10 years, half oral dose i.e 6.25-12.5 mg.
By slow I.V. injection after dilution with water for injection to 2.5 mg/ml, 25-50 mg.
Maximum parenteral dose, 100 mg.
- **Phenergan Tablet 25 mg**
- **Phenergan Elixir 5 mg/5 ml**
- **Phenergan Injection 50 mg/2ml**

**DRUGS USED IN TREATMENT OF COUGH**

**BROMHEXINE HCl**

**Indication:** Bromhexine is a mucolytic used in the treatment of respiratory disorders associated with productive cough.

**Cautions:** gastric ulceration.; asthmatic patients; reduced Clearance of bromhexine or its metabolites in patients with severe hepatic or renal impairment.

**Side effects:** Gastrointestinal adverse effects may occur occasionally with bromhexine and a transient rise in serum aminotransferase values has been reported. Other reported side effects include headache, dizziness, sweating, and skin rashes. Inhalation of bromhexine has occasionally produced cough or bronchospasm in susceptible subjects.

**Dose:** by mouth, 8-16 mg 3-4 times daily.
Child up to 1 year, 2 mg twice daily.
1-5 years, 4 mg twice daily.
6-10 years, 4 mg 4 times daily.
- **Bisolvon Elixir 4 mg/5 ml**
- **Mucolyte 4mg/ 5ml Syrup**

**CODEINE PHOSPHATE**

**Indication:** dry or painful cough; cough suppressant.

**Cautions:** asthma, hepatic and renal impairment, history of drug abuse.

**Contra-indications:** liver disease, ventilatory failure
Respiratory System

**Side effects:** constipation; respiratory depression in sensitive patients or in high dose.

**Dose:** 15-30 mg 3-4 times daily.
- Codeine Linctus 15 mg/5 ml

**DIPHENHYDRAMINE HYDROCHLORIDE**

**Indication:** cough suppression; common cold and allergy symptoms.

**Cautions:** may cause drowsiness; alcoholic drinks should be avoided. Pregnancy

**Side effects:** sedation and drowsiness.

**Dose:**
- Adult, 25-50 mg (10-20 ml of adult preparation) 3-4 times daily.
- Child 1-5 years, 6.5 mg (5 ml of paediatric preparation) 3 times daily.
- Child 6-12 years, 6.25-25 mg (5-15 ml of paediatric preparation) 3-4 times daily.
- Amydramine Expectorant 14 mg/5 ml
- Amydramine Paediatric 7 mg/5 ml

**RESPIRATORY STIMULANTS AND PULMONARY SURFACTANTS**

**BERACTANT**

**Indication:** A bovine lung extract used in treatment of respiratory distress syndrome (RDS) in newborn premature infants with a bodyweight of 700 g or greater who are intubated and are receiving mechanical ventilation.

**Cautions:** should be administered with adequate facilities for ventilation and monitoring of babies with RDS. Artificial warming methods of the product should not be used.

**Side effects:** pulmonary and intracranial haemorrhages have been reported. Also, increased risk of pulmonary haemorrhage, especially in more premature infants. A transient decrease in brain electrical activity has been reported in neonates. Transient bradycardia has also been reported. Giving surfactant has occasionally been associated with obstruction of the endotracheal tube by mucus.
**Dose:** by intratracheal instillation, 100mg phospholipids/kg birthweight in a volume not exceeding 4 ml/kg.
The dose should be administered early in the course of RDS i.e. preferably less than 8 hours of age.
The dose may be repeated within 48 hours at intervals of at least 6 hours for up to 4 doses.

- *Survanta Suspension For Instillation Equivalent To 200 mg Total Phospholipids 100mg/4ml, 200mg/8ml*
ANTI-INFLAMMATORY DRUGS (NSAIDS)

DICLOFENAC SODIUM

Indications: Pain and inflammation in rheumatic disease (including Still's disease) and other musculoskeletal disorders; acute gout; post-operative pain.

Cautions: Breast-feeding.

Contra-indications: Porphyria; Intravenous use.

Additional Contra-indications include concomitant NSAID or anticoagulant use (including low-dose heparin), history of haemorrhagic diathesis, history of confirmed or suspected cerebrovascular bleeding, operations with high risk of haemorrhage, history of asthma, moderate or severe renal impairment, hypovolaemia, dehydration.

Side effects: Diarrhoea, constipation, gas or bloating, headache, dizziness, ringing in the ears, unexplained weight gain, excessive tiredness, lack of energy, upset stomach, loss of appetite, itching, pain in the upper right part of the stomach, yellowing of the skin or eyes, flu-like symptoms, fever, blisters, rash, hives, swelling of the eyes, face, tongue, lips, throat, arms, hands, feet, ankles, or lower legs, difficulty breathing or swallowing, hoarseness, pale skin, fast heartbeat, cloudy, discolored, or bloody urine back pain, difficult or painful urination; suppositories may cause rectal irritation; injection site reactions.

Dose: By mouth, 75–150 mg daily in 2–3 divided doses.

By deep intramuscular injection into the gluteal muscle, acute exacerbations of pain and postoperative pain, 75 mg once daily (twice daily in severe cases) for max. of 2 days.

Ureteric colic, 75 mg then a further 75 mg after 30 minutes if necessary.

By intravenous infusion (in hospital setting), 75 mg repeated if necessary after 4–6 hours for max. 2 days.

Prevention of postoperative pain, initially after surgery 25–50 mg over 15–60 minutes then 5 mg/hour for max. 2 days.
Musculoskeletal and Joint Diseases

By rectum in suppositories, 75–150mg daily in divided doses
Max. total daily dose by any route 150mg.
child 1–12 years, juvenile arthritis, by mouth or by rectum, 1–3mg/kg daily in divided doses (25mg e/c tablets, 12.5mg and 25mg suppositories only)
child 6–12 years, postoperative pain, by rectum, 1–2mg/kg daily in divided doses (12.5mg and 25mg suppositories only) for max. 4 days
- Voltaren-R Tablets 100 mg
- Votrex Injection 75 mg/3 M
- Diclogesic Suppositories 50 mg & 100mg

BUPROFEN

It is a Non steroidal anti inflammatory drug.

Indications: pain and inflammation in rheumatic disease (including juvenile arthritis) and other musculoskeletal disorders; mild to moderate pain including dysmenorrhea; post operative analgesia; migraine; fever and pain in children; post immunization pyrexia.
Cautions: Elderly; allergic disorders; renal, hepatic or cardiac impairment.
Contraindications: Known hypersensitivity to aspirin and other Non steroidal anti inflammatory drugs, pregnancy & breast feeding.
Side effect: Same as for other Non steroidal anti inflammatory drugs.

Dose: Adults: 1.2 to 1.8 g daily divided in 3-4 doses preferably after food. Max. 2.4 g daily. Maintenance: 0.6 -1.2g daily.
Juvenile rheumatoid arthritis – Child over 5kg body weight 30 – 40 mg / kg daily in 3-4 divided doses.
Fever and pain: Child over 5kg body weight 20-30 mg / kg daily in 3-4 divided doses. OR
3 – 6 months (over 5 kg): 50 mg 3 times daily.6 months to 1 year: 50 mg 3-4 times daily; 1-3 years: 100 mg 3 times daily; 4-6 years: 150 mg 3 times daily; 7-9 years: 200 mg 3 times daily; 10-12 years: 300 mg 3 times daily.
- Ibuprofen tablets 200 mg; 400 mg; suspension – 100 mg / 5 ml
INDOMETACIN

**Indications:** pain and moderate to severe inflammation in rheumatic disease and other acute musculoskeletal disorders; acute gout; dysmenorrhoea; closure of ductus arteriosus.

**Cautions:** may impair the ability to drive or operate machinery; allergic disease, particularly asthma; hepatic and renal impairment, pregnancy, epilepsy, parkinsonism, psychiatric disturbances, elderly patients. During prolonged therapy ophthalmic and blood examinations are advisable. Avoid rectal administration in proctitis and haemorrhoids.

**Contra-indications:** peptic ulceration, salicylate hypersensitivity.

**Side Effects:** frequently gastro-intestinal disturbances (including diarrhoea), headache, dizziness, and light-headedness; gastro-intestinal ulceration and bleeding; rarely, drowsiness, confusion, insomnia, convulsions, psychiatric disturbances, depression, syncope, blood disorders (particularly thrombocytopenia), hypertension, hyperglycaemia, blurred vision, corneal deposits, peripheral neuropathy, and intestinal strictures; suppositories may cause rectal irritation and occasional bleeding.

**Drug Interactions:** Refer table in the end.

**Dose:** by mouth, 50-200 mg daily in divided doses with food. By rectum in suppositories, 100 mg at night, repeated in the morning if required. If rectal and oral treatment are to be combined, max. total daily dose 150-200 mg.

- **Indocid Capsules** 25 mg
- **Indomethacin IV** 1 mg / ml
- **Indomin Suppositories** 100 mg/Supp

NAPROXEN

**Indications:** pain and inflammation in rheumatic disease (including Still’s disease) and other musculoskeletal disorders; acute gout; dysmenorrhoea.

**Cautions:** In patients with renal, cardiac, or hepatic impairment caution is required since NSAIDs may impair renal function.
Contra-indications: patient with hypersensitivity to Aspirin or other NSAIDs, pregnancy, breast feeding and patients with coagulase defects; severe heart failure

Side Effects: Gastro-intestinal discomfort, nausea, diarrhoea, and occasionally bleeding and ulceration occur; hypersensitivity reactions (particularly rashes, angioedema, and bronchospasm; Renal failure may be provoked by NSAIDs especially in patients with renal impairment; Hepatic damage, alveolitis, pulmonary eosinophilia, pancreatitis, eye changes, Stevens-Johnson syndrome and toxic epidermal necrolysis are other rare side-effects.

Dose: by mouth, 0.5-1 g daily in 2 divided doses; Child (over 5 years), Still's disease, 10 mg/kg daily in 2 divided doses.

Acute musculoskeletal disorders and dysmenorrhoea, 500 mg initially, then 250 mg every 6-8 hours as required.

Acute gout, 750 mg initially, then 250 mg every 8 hours until attack has passed.

Nopain Tablets 250 mg

DRUG INTERACTIONS FOR ANALGESICS:

NSAIDs belongs to Analgesics and has the following interaction information:

<table>
<thead>
<tr>
<th>ACE Inhibitors</th>
<th>Increased risk of renal impairment when NSAIDs given with ACE inhibitors, also hypotensive effect antagonised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenergic Neurone Blockers</td>
<td>NSAIDs antagonise hypotensive effect of adrenergic neurone blockers</td>
</tr>
<tr>
<td>Alpha-blockers</td>
<td>NSAIDs antagonise hypotensive effect</td>
</tr>
</tbody>
</table>

258
Angiotensin-II Receptor Antagonists

- Effect of alpha-blockers
- Increased risk of renal impairment when NSAIDs given with angiotensin-II receptor antagonists, also hypotensive effect antagonised

Antidepressants, SSRI

- Increased risk of bleeding when NSAIDs given with SSRIs

Aspirin

- Avoid concomitant use of NSAIDs with aspirin (increased side-effects)

Baclofen

- NSAIDs possibly reduce excretion of baclofen (increased risk of toxicity)

Since systemic absorption may follow topical application of beta-blockers to the eye, the possibility of interactions, in particular, with drugs such as verapamil should be borne in mind.
Musculoskeletal and Joint Diseases

<table>
<thead>
<tr>
<th>Hypotensive effect of calcium-channel blockers</th>
<th>Hypotensive blockers include: amlodipine, felodipine, isradipine, lacidipine, lercanidipine, nicardipine, nifedipine, nimodipine, and nisoldipine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac Glycosides</td>
<td>NSAIDs possibly increase plasma concentration of cardiac glycosides, also possible exacerbation of heart failure and reduction of renal function increased risk of nephrotoxicity when NSAIDs given with ciclosporin NSAIDs antagonise hypotensive effect of clonidine increased risk of bleeding when NSAIDs given with clopidogrel increased risk of gastro-intestinal bleeding and ulceration when NSAIDs given with corticosteroids</td>
</tr>
<tr>
<td>Clonidine</td>
<td>Interactions do not generally apply to corticosteroids used for topical action (including inhalation) unless specified</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>Corticosteroids</td>
</tr>
<tr>
<td>Coumarins</td>
<td>NSAIDs possibly enhance anticoagulant effect of coumarins</td>
</tr>
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<td>----------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diazoxide</th>
<th>NSAIDs antagonise hypotensive effect of diazoxide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>risk of nephrotoxicity of NSAIDs</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Diuretics</th>
<th>Increased by diuretics, also antagonism of diuretic effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Possibly increased risk of hyperkalaemia when NSAIDs given with potassium-sparing diuretics and aldosterone antagonists</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diuretics Potassium-sparing and Aldosterone Antagonists</th>
<th>Increased by diuretics, also antagonism of diuretic effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drospirenone</td>
<td>Possibly increased risk of hyperkalaemia when NSAIDs given with</td>
</tr>
</tbody>
</table>

261
<table>
<thead>
<tr>
<th>Medication</th>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drospirenone</td>
<td>Monitor serum potassium during first cycle</td>
</tr>
<tr>
<td>Erlotinib</td>
<td>Increased risk of bleeding when NSAIDs given with erlotinib</td>
</tr>
<tr>
<td>Heparins</td>
<td>Increased risk of bleeding when NSAIDs given with heparins</td>
</tr>
<tr>
<td>Hydralazine</td>
<td>Increased risk of bleeding when NSAIDs given with hydralazine</td>
</tr>
<tr>
<td>Iloprost</td>
<td>Increased risk of bleeding when NSAIDs given with iloprost</td>
</tr>
<tr>
<td>Ketorolac</td>
<td>Avoid concomitant use of NSAIDs with ketorolac</td>
</tr>
<tr>
<td>Lithium</td>
<td>Probably reduce excretion of lithium</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>Probably reduce excretion of methotrexate</td>
</tr>
</tbody>
</table>

262
for concomitant use in rheumatic disease see Methotrexate section 10.1.3

Methyldopa
hypotensive effect of methyldopa
avoidance of

Mifepristone
NSAIDs advised by manufacturer of mifepristone
NSAIDs antagonise

Minoxidil
hypotensive effect of minoxidil

Moxonidine
hypotensive effect of moxonidine
NSAIDs antagonise

Nitrates
hypotensive effect of nitrates
NSAIDs antagonise

Nitroprusside
hypotensive effect of nitroprusside
avoid concomitant use of NSAIDs with other NSAIDs (increased side-effects)

NSAIDs
Interactions do not generally apply to topical NSAIDs

Penicillamine possible
<table>
<thead>
<tr>
<th>Drug</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentoxifylline (oxpentifylline)</td>
<td>Increased risk of nephrotoxicity when NSAIDs given with penicillamine</td>
</tr>
<tr>
<td></td>
<td>Possible increased risk of bleeding when NSAIDs given with pentoxifylline</td>
</tr>
<tr>
<td>Phenindione</td>
<td>NSAIDs possibly enhance anticoagulant effect of phenindione</td>
</tr>
<tr>
<td></td>
<td>Change in patient's clinical condition particularly associated with liver</td>
</tr>
<tr>
<td></td>
<td>disease, intercurrent illness, or drug administration, necessitates more</td>
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<tr>
<td></td>
<td>frequent testing. Major changes in diet (especially involving salads and</td>
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<tr>
<td></td>
<td>vegetables) and in alcohol consumption may also affect anticoagulant control</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>NSAIDs possibly enhance effects of phenytoin</td>
</tr>
<tr>
<td></td>
<td>Possible increased risk of convulsions when NSAIDs given with quinolones</td>
</tr>
<tr>
<td>Quinolones</td>
<td>Plasma</td>
</tr>
<tr>
<td>Ritonavir</td>
<td>Concentration of NSAIDs</td>
</tr>
</tbody>
</table>

264
Diclofenac belongs to Analgesics and has the following interaction information:

- **Ciclosporin**: Plasma concentration of diclofenac increased by ciclosporin (halve dose if necessary)
- **Tacrolimus**: Increased risk of nephrotoxicity when NSAIDs given with tacrolimus
- **Venlafaxine**: Increased risk of bleeding when NSAIDs given with venlafaxine

Increased risk of toxicity with haematological and nephrotoxic myelosuppressive drugs - for further details consult product literature.

Interactions do not generally apply to tacrolimus used topically; risk of facial flushing and skin irritation with alcohol consumption (see section 13.5.3) does not apply to tacrolimus taken systemically.

Sibutramine

- Possibly increased by ritonavir
- Increased risk of bleeding when NSAIDs given with sibutramine

**Sulphonylureas**

- Possibly enhance effects of sulphonylureas

**Venlafaxine**

- Increased risk of bleeding when NSAIDs given with venlafaxine

**Zidovudine**

- Increased risk of haematological and nephrotoxic and myelosuppressive toxicity when NSAIDs given with zidovudine - for further details consult product literature
Coumarins

diclofenac possibly enhances anticoagulant effect of coumarins, also increased risk of haemorrhage with intravenous diclofenac (avoid concomitant use)

Heparins

diclofenac increased risk of haemorrhage when intravenous diclofenac given with heparins (avoid concomitant use, including low-dose heparin)

Lithium

diclofenac reduces excretion of lithium (increased risk of toxicity)

Methotrexate

diclofenac reduces excretion of methotrexate (increased risk of toxicity)—but for concomitant use in rheumatic disease see Methotrexate section 10.1.3

Phenindione diclofenac Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control
enhances anticoagulant effect of phenindione, also increased risk of drug administration, haemorrhage with more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control.

Diflunisal belongs to Analgesics and has the following interaction information:

- **Antacids**: Absorption of diflunisal is reduced by antacids. Antacids should preferably not be taken at the same time as other drugs since they may impair absorption.

- **Coumarins**: Possibly enhances anticoagulant effect of coumarins. Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control.

Etodolac belongs to Analgesics and has the following interaction information:

- **Coumarins**: Possibly enhances anticoagulant effect of coumarins. Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control.
vegetables) and in alcohol consumption may also affect anticoagulant control

**STEROIDAL DRUGS**

**TRIAMCINOLONE ACETONIDE**

*Indications:* local inflammation of joints and tissues

*Caution:* active infection in or near joints; pregnancy; children under 6 years; patients with myasthenia gravis, infection, diabetes and other conditions where corticosteroid therapy should be avoided or contraindicated.

Contra-indications:

Dose by intra-articular injection, 2.5-40 mg according to joint size, to a maximum of 80 mg in multiple injections. By deep I.M. injection, 40 mg into the upper and outer quadrant of the gluteal muscle.

- *Adcortyl Intra-Articular/Intradermal Injection (Aqueous Suspension)* 10 mg/ml
- *Kenalog Intra-Articular/Intramuscular Injection (Aqueous Suspension)* 40 mg/ml

**DRUGS SUPPRESSING THE RHEUMATIC DISEASE PROCESS**

**CHLOROQUINE**

*Indications:* active rheumatoid arthritis, systemic lupus erythematosus; malaria.

*Caution:* renal and hepatic impairment, pregnancy, porphyria, psoriasis, glucose-6-phosphate dehydrogenase deficiency; elderly patients, children; regular ophthalmic examinations required.

Contra-indications: pre-existing maculoretinopathy; concurrent therapy with hepatotoxic drugs.

*Side Effects:* gastro-intestinal disturbances, headache, visual disturbances, irreversible retinal damage, corneal opacities, depigmentation or loss of hair, skin reactions that could be severe to mandate discontinuation of treatment;
can rarely lead to deafness; neuromyopathy, sensitization and blood disorders such as thrombocytopenia.
Dose administered on expert advice, chloroquine (base) 150 mg daily after food.
Maximum 2.5 mg/kg daily.
Child, 3 mg/kg daily
Note: 200 mg of chloroquine sulfate
= 250 mg chloroquine phosphate
= 150 mg chloroquine. Nivaquine tablets 200 mg

**CICLOSPORIN**

*Indications:* severe active rheumatoid arthritis when conventional second-line therapy inappropriate or ineffective; graft-versus-host disease; atopic dermatitis and psoriasis.

*Cautions:* serum creatinine level should be monitored especially if dose increased or concomitant NSAIDs introduced or increased

*Contra-indications:* in abnormal renal function, uncontrolled hypertension, uncontrolled infections, and malignancy. Measure serum creatinine at least twice before treatment and monitor every 2 weeks for first 3 months, then every 4 weeks (or more frequently if dose increased or concomitant NSAIDs introduced or increased; reduce dose if serum creatinine increases more than 30% above baseline in more than 1 measurement; if above 50%, reduce dose by 50% (even if within normal range) and discontinue if reduction not successful within 1 month; monitor blood pressure (discontinue if hypertension develops that cannot be controlled by antihypertensive therapy); monitor hepatic function if concomitant NSAIDs given.

*Side Effects:* tremors, Overgrowth of the gums, Unusual bleeding or bruising, Chills, Yellowing of the skin or eyes, Seizures, Decreased urination, Swelling (feet, ankles, lower legs, and hands), Weight gain, headache

*Drug Interactions:* Several potential drug interactions.

*Dose:* by mouth, initially 2.5 mg/kg daily in 2 divided doses, if necessary increased gradually after 6 weeks. Maximum, 4 mg/kg daily.
Discontinue if response is insufficient after 3 months. child and under 18 years, not recommended
HYDROXYCHLOROQUINE SULPHATE

**Indications:** active rheumatoid arthritis (including Still's disease), systemic and discoid lupus erythematosus.

**Cautions:** hepatic impairment, renal impairment, regular ophthalmological examinations are recommended; pregnancy, breast-feeding; neurological disorders; psoriasis; porphyria

**Contra-indications:** psoriatic arthritis; concurrent use of hepatotoxic drugs.

**Side effects:** gastro-intestinal disturbances, headache, and skin reactions; ECG changes, convulsions and visual changes; blood disorders, mental changes, myopathy; Stevens-Johnson Syndrome

**Dose:** administered on expert advice, initially 400 mg daily in divided doses. Maintenance, 200-400 mg daily; max. 6.5 mg/kg daily (but not exceeding 400 mg daily).

Child, up to 6.5 mg/kg daily (dosage form not suitable for children under 3 years of age).

Penicillamine

**Indications:** severe active or progressive rheumatoid arthritis, Still's disease; Wilson's disease; copper and lead poisoning.

**Cautions:** patients should be warned not to expect improvement for at least 6 to 12 weeks after initiation of treatment. Blood counts, including platelets, and urine examinations should be carried out every 1 or 2 weeks for the first 2 months then every 4 weeks to detect blood disorders and proteinuria. A reduction in platelet count indicates that treatment must be stopped and later re-introduced at a lower dosage level and then increased gradually, if possible; renal impairment; pregnancy and portal hypertension; avoid concurrent gold, chloroquine, hydroxychloroquine or immunosuppressive treatment.

**Contra-indications:** lupus erythematosus; moderate to severe renal impairment
**Musculoskeletal and Joint Diseases**

**Side Effects:** hypersensitivity reactions (may necessitate discontinuation of treatment), nausea, anorexia, taste loss, mouth ulcers, muscle weakness, skin reactions, oedema, proteinuria, agranulocytosis or severe thrombocytopenia which could be fatal; rarely myasthenia gravis, febrile reactions, lupus erythematosus.

**Dose:** rheumatoid arthritis, administered on expert advice, adults initial dose of 125-250 mg daily before food for 1 month increased by this amount every 4 to 12 weeks until remission occurs. Usual maintenance dose, 500-750 mg daily but up to 1.5 g may rarely be given.

If remission has been sustained for 6 months, reduction of dosage by 125-250 mg every 12 weeks may be attempted. Child, initial dose, 50 mg daily before food for 1 month, increased at 4 weeks intervals to a maintenance dose of 15-20 mg/kg daily.

Toxic metal poisoning (lead and copper), 1-2 g daily in divided doses before food until urinary lead is stabilized at less than 500mcg/day.

Child 20 mg/kg daily.

- **Distamine Tablets 125 mg**

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**SODIUM AUROTHIOMALATE**

**Indications:** severe active or progressive rheumatoid arthritis; palindromic rheumatism, juvenile chronic arthritis (Still's disease).

**Cautions:** patients should report any untoward symptoms (fever, buccal ulceration, purpura, epistaxis, bleeding gums, menorrhagia diarrhoea, metallic taste, sore throat, malaise, bruising). Cautions in renal and hepatic impairment, elderly patients, eczema, colitis breast-feeding; treatment with drugs which can cause blood disorders; annual chest x-ray recommended.

**Contra-indications:** severe renal and hepatic disease; history of blood disorders or bone marrow aplasia, exfoliative dermatitis, systemic lupus erythematosus, necrotizing enterocolitis, pulmonary fibrosis; pregnancy; porphyria.

**Side Effects:** Severe reactions, which could be fatal, mouth ulcers skin reactions, oedema, proteinuria, blood
disorders; rarely colitis peripheral neuritis, pulmonary fibrosis, hepatotoxicity with cholestatic jaundice.

**Dose:** administered on expert advice, adults, dose must be given by deep IM. injection and the area gently massaged. It is usual to begin treatment with test dose of 10 mg followed by doses of 50 mg at weekly intervals until remission occurs or a total of 1 g has been given. Benefit is not to be expected until about 8 doses (300-500 mg) have been given. The interval between injections is then gradually increased to 2 and then to 4 weeks but intervals of 6 weeks may be suitable in some patients and treatment is continued for 5 years after complete remission. If relapse occurs dosage may be immediately increased to 50 mg weekly and then reduced if control is obtained. It is important to avoid complete relapse since second courses of gold are not usually effective. Child, 1 mg/kg weekly to a maximum of 50 mg weekly, the interval being gradually increased to 4 weeks according to response; an initial test dose is given which is equivalent to 1/10-1/5 of the calculated dose.

- *Myocrisin Injection 10 & 50 mg*

**BOTULINUM A TOXIN**

**Indications:** focal spasticity, including arm symptoms in conjunction with physiotherapy, dynamic equinus foot deformity caused by spasticity in ambulant paediatric cerebral palsy patients over 2 years, and hand and wrist disability associated with stroke; blepharospasm; hemifacial spasm; spasmodic torticollis; severe hyperhidrosis of axillae

**Cautions:** history of dysphagia; pregnancy; breastfeeding; Special cautions for blepharospasm or hemifacial spasm.

**Cautions:** if risk of angle-closure glaucoma; reduced blinking can lead to corneal exposure, persistent epithelial defect and corneal ulceration (especially in those with VIIth nerve disorders) careful testing of corneal sensation in previously operated eyes, avoidance of injection in lower lid area to avoid ectropion, and vigorous treatment of epithelial defect needed

**Contra-indications:** generalised disorders of muscle activity (e.g. myasthenia gravis)
Side Effects: increased electrophysiologic jitter in some distant muscles; misplaced injections may paralyse nearby muscle groups and excessive doses may paralyse distant muscles; influenza-like symptoms; rarely arrhythmias, myocardial infarction, seizures, hypersensitivity reactions including rash, pruritus and anaphylaxis, antibody formation (substantial deterioration in response), and injection-site reactions
Specific side-effects for blepharospasm or hemifacial spasm: Ptosis; keratitis, lagophthalmos, dry eye, irritation, photophobia, lacrimation; facial oedema; less commonly facial weakness (including drooping), dizziness, tiredness, ectropion, entropion, diplopia, visual disturbances; rarely eyelid bruising and swelling (minimised by applying gentle pressure at injection site immediately after injection); very rarely angle-closure glaucoma, corneal ulceration
Special side-effects in paediatric cerebral palsy: Drowsiness, paraesthesia, urinary incontinence, myalgia
Special side-effects in torticollis: Dysphagia and pooling of saliva (occurs most frequently after injection into sternomastoid muscle), nausea, dry mouth, rhinitis, drowsiness, headache, dizziness, hypertonia, stiffness; less commonly dyspnoea, voice alteration, diplopia, and ptosis; rarely respiratory difficulties (associated with high doses); CSM has warned of persistent dysphagia and sequelae (including death)—important
Special side-effects in axillary hyperhidrosis: Non-axillary sweating, hot flushes; less commonly myalgia and joint pain
Specific side-effects in focal upper-limb spasticity associated with stroke Dysphagia; hypertonia; less commonly arthralgia and bursitis
Dose: specific to each individual preparation
- Botox IM Inj. 100 IU/ml

ETANERCEPT

Indications: severe, active and progressive rheumatoid arthritis in patients not previously treated with methotrexate; psoriasis
Cautions: predisposition to infection; significant exposure to herpes zoster virus—interrupt treatment and
Musculoskeletal and Joint Diseases

consider varicella–zoster immunoglobulin; heart failure (risk of exacerbation); demyelinating CNS disorders (risk of exacerbation); history of blood disorders; Tuberculosis

Contraindications: pregnancy; breast-feeding; active infection

Side Effects: vomiting, oesophagitis, cholecystitis, pancreatitis, gastro-intestinal haemorrhage, myocardial or cerebral ischaemia, venous thromboembolism, hypotension, hypertension, dyspnœa, demyelinating disorders, seizures, bone fracture, renal impairment, polymyositis, bursitis, lymphadenopathy

Dose: By subcutaneous injection, rheumatoid arthritis, adult over 18 years, 25 mg twice weekly or 50 mg once weekly
Psoriatic arthritis, ankylosing spondylitis, adult over 18 years, 25 mg twice weekly
Polyarticular-course juvenile idiopathic arthritis, child and adolescent 4–17 years, 400 mcg/kg twice weekly (max. 25 mg twice weekly)
Psoriasis, adult over 18 years, initially 25–50 mg twice weekly for up to 12 weeks then reduce to 25 mg twice weekly; max. treatment duration 24 weeks; discontinue if no response after 12 weeks

Enbrel 25 mg & 50 mg Inj.

INFLIXIMAB

Indications: severe, active and progressive rheumatoid arthritis in patients not previously treated with methotrexate; psoriasis; inflammatory bowel disease.

Cautions: hepatic impairment; renal impairment; monitor for infections before, during, and for 6 months after treatment; heart failure (discontinue if symptoms develop or worsen; avoid in moderate or severe heart failure); demyelinating CNS disorders (risk of exacerbation); Hypersensitivity reactions

Contraindications: pregnancy; breast-feeding; severe infections

Side Effects: dyspepsia, diarrhoea, constipation, hepatitis, cholecystitis, diverticulitis, gastro-intestinal haemorrhage, flushing, bradycardia, arrhythmias, palpitation, syncope, vasospasm, peripheral ischaemia, ecchymosis, haematoma, interstitial pneumonitis or fibrosis, fatigue,
anxiety, drowsiness, dizziness, insomnia, confusion, agitation, amnesia, seizures, demyelinating disorders, vaginitis, myalgia, arthralgia, endophthalmitis, rash, sweating, hyperkeratosis, skin pigmentation, alopecia

**Dose:** By intravenous infusion, rheumatoid arthritis (in combination with methotrexate), adult over 18 years, 3 mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 8 weeks; discontinue if no response by 12 weeks of initial infusion

Ankylosing spondylitis, adult over 18 years, 5 mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 6–8 weeks; discontinue if no response by 6 weeks of initial infusion

Psoriatic arthritis (in combination with methotrexate), adult over 18 years, 5 mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 8 weeks

Psoriasis, adult over 18 years, 5 mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 8 weeks; discontinue if no response by 14 weeks of initial infusion

- **Remicade 100 mg Injection**

**DRUGS USED IN THE TREATMENT OF GOUT**

**ALLOPURINOL**

**Indications:** gout prophylaxis, hyperuricaemia

**Caution:** administer prophylactic colchicine or NSAID (not aspirin or salicylate) until at least 1 month after hyperuricaemia corrected; ensure adequate fluid intake (2 liters/day); render urine alkaline if uric acid overload is high; caution in hepatic disease; reduce dose in renal impairment (in renal failure adjustment of dosage is necessary during dialysis). In neoplastic conditions, treatment with allopurinol (if required) should be commenced before cytotoxic drugs are given; pregnancy and breast-feeding

**Contra-indications:** not a treatment for acute gout; if patient is receiving allopurinol when attack occurs continue as normal and treat attack separately.

**Side effects:** rashes, fever (withdraw therapy). If the rash is mild the drug can be re-introduced with caution and discontinued immediately if rash recur; malaise, vertigo,
headache, symptomless xanthine deposits in muscle, alopecia, hepatotoxicity.

**Drug interactions:** Anticoagulants—Allopurinol may increase the chance of bleeding; Azathioprine or Mercaptopurine Allopurinol may cause higher blood levels of azathioprine or mercaptopurine.

**Dose:** initially, 100 mg daily as a single dose, after meals gradually increased over 1-3 weeks according to the plasma or urinary uric acid concentration, to about 300 mg daily.
Usual maintenance dose, 200-600 mg, rarely 900 mg daily, divided into doses of not more than 300 mg.
Child, (in neoplastic conditions, enzyme disorders), 10-20mg/kg daily.

**Safety in Breast Feeding:** Allopurinol passes into the breast milk

- **Zyloric Tablets 100 & 300 mg**

**DRUGS USED IN NEUROMUSCULAR DISORDERS**

**BACLOFEN**

This is a skeletal muscle relaxant.

**Indications:** spasticity of the skeletal muscles in multiple sclerosis; spastic conditions; muscle spasticity of cerebral origin like infantile cerebral palsy.

**Cautions:** psychotic disorders, schizophrenia, confusional states; epilepsy; peptic ulcers; cerebrovascular diseases; respiratory, hepatic, or renal failure; abrupt withdrawal of drug; motor responses are altered; pregnancy, lactation

**Contra-indications:** hypersensitivity reactions

**Side Effects:** day-time sedation, drowsiness, nausea, dryness of the mouth, respiratory depression, insomnia and other CNS effects. Mild gastro-intestinal tract symptoms and cardiovascular effects have been reported.

**Dose:** Initial doses are small and gradually increased.
Adult, 5 mg 3 times daily, can be increased at 3-day intervals by 5mg 3 times daily.
Usual optimal dose is 30-75 mg daily.
In hospitalized patients a dose of 100-120 mg daily may be reached.
Child, 0.75-2 mg/kg bodyweight
In children over 10 years of age, max. daily dose is 2.5 mg/kg bodyweight
Child 12 months-2 years, 10-20 mg.
Child 6-10 years, 30-60 mg daily.

- Lioresal Tablets 10 mg

**EDROPHONIUM CHLORIDE**

**Indications:** It is a short and rapid-acting cholinergic drug; brief reversal of non-depolarizing neuromuscular Blockade; diagnosis of dual block.

**Cautions:** Patients may develop “anticholinesterase insensitivity” for brief or prolonged periods; asthma (extreme caution), bradycardia, arrhythmias, recent myocardial infarction, epilepsy, hypotension, parkinsonism, vagotonia, peptic ulceration, hyperthyroidism, renal impairment

**Contra-indications:** intestinal and urinary obstructions of mechanical type.

**Side Effects:** nausea, vomiting, increased salivation, diarrhoea, abdominal cramps (more marked with higher doses); signs of overdosage include bronchoconstriction, increased bronchial secretions, lacrimation, excessive sweating, involuntary defaecation and micturition, miosis, nystagmus, bradycardia, heart block, arrhythmias, hypotension, agitation, excessive dreaming, and weakness eventually leading to fasciculation and paralysis

**Drug Interactions:** Care should be given when administering this drug to patients with symptoms of myasthenic weakness who are also on anticholinesterase drugs. Since symptoms of anticholinesterase overdose (cholinergic crisis) may mimic underdosage (myasthenic weakness), their condition may be worsened by the use of this drug.

**Dose:** reversal of blockade, by I.V. injection, 10 mg (after or with atropine sulfate 0.6-1.2 mg) repeated at intervals of 10 minutes according to patient's response.
Diagnosis of dual block, by I.V. injection, 10 mg (with atropine).

**Safety in Pregnancy:** Antimyasthenics have not been reported to cause birth defects; however, muscle weakness has occurred temporarily in some newborns
babies whose mothers took antimiasthenics during pregnancy.

- Tensilon Injection 10 mg/ml

**PYRIDOSTIGMINE BROMIDE**

This is an anticholinesterase drug.

**Indications** myasthenia gravis

**Cautions:** weaker muscarinic action, asthma, bradycardia, recent myocardial infarction, epilepsy, hypotension, parkinsonism, peptic ulcer, renal impairment; pregnancy and breast-feeding.

**Contra-indications:** intestinal or urinary obstruction.

**Side Effects:** nausea, vomiting, increased salivation, abdominal cramps, bronchial secretions, sweating, weakness, hypotension and agitation.

**Dose:** by mouth, 30-120 mg at suitable intervals throughout the day. Total daily dose, 0.3-1.2 g

Neonates, 5-10 mg every 4 hours, 1/2-1 hour before feed.

Child up to 6 years, 30 mg initially.

6-12 years, initially 60 mg.

Usual total daily dose 30-360 mg.

- Mestinon Tablets 60 mg

**QUININE**

**Indications:** nocturnal leg cramps; malaria

**Cautions:** atrial fibrillation, conduction defects, heart block, pregnancy (not in malaria); monitor blood glucose levels during parenteral administration; G6PD deficiency.

**Contra-indications:** haemoglobinuria; optic neuritis.

**Side Effects:** cinchonism, including tinnitus, headache, hot and flushed skin, nausea, abdominal pain, rashes, visual disturbances, temporary blindness, confusion; hypersensitivity reactions including angioedema and blood disorders

**Dose:** quinine (anhydrous base) 100 mg = quinine bisulfate 169 mg = quinine dihydrochloride 122 mg = quinine hydrochloride 122 mg = quinine sulfate 121 IMg.

Leg cramps: as salts, 200-300 mg at bed time.

- Quinine Sulfate Tablets 300 mg
**ENZYMES**

**HYALURONIDASE**

This is an enzyme used to render the tissues more easily permeable to injected fluids as in S.C. infusions.

*Indications:* enhance permeation of S.C. or I.M. injections, local anesthetics and S.C. infusions; promote resorption of excess fluids and blood.

*Cautions:* infants and elderly

*Contra-indications:* do not apply direct to cornea; sites of infection or malignancy; swelling sites of bites or stings; not for I.V. use.

*Side Effects:* occasional severe allergy.

*Dose:* With subcutaneous or intramuscular injection, 1500 units dissolved directly in solution to be injected (ensure compatibility)

With local anaesthetics, 1500 units mixed with local anaesthetic solution (ophthalmology, 15 units/mL)

Hypodermoclysis, 1500 units dissolved in 1 mL water for injections or 0.9% sodium chloride injection, administered before start of 500–1000 mL infusion fluid; Extravasation or haematoma, 1500 units dissolved in 1 mL water for injections or 0.9% sodium chloride injection, infiltrated into affected area (as soon as possible after extravasation)

- **Hyalase Injection 1500 Units**
NUTRITION AND VITAMINS

ALFACALCIDOL l-alpha-hydroxy-cholecalciferol

**Indications:** renal osteodystrophy, hyperparathyroidism with bone disease, hypoparathyroidism; neonatal hypocalcaemia; nutritional and malabsorption rickets and osteomalacia; pseudo-deficiency (D-dependent) rickets and osteomalacia; hypophosphataemic vit-D resistant rickets and osteomalacia.

**Caution:** high systemic doses may cause hypercalcaemia in infant.

**Contraindications:** hypercalcaemia; metastatic calcification; breast-feeding.

**Side Effects:** symptoms of overdosage include anorexia, lassitude, nausea and vomiting, diarrhoea, weight loss, polyuria, sweating, headache, thirst, vertigo, and raised concentrations of calcium and phosphate in plasma and urine.

**Dose:** adult and children over 20 kg, initially 1 mcg daily, adjusted according to response. Child under 20 kg, 0.05 mcg/kg/day. Maintenance, 0.25-1 mcg daily.

**Note:** 1 mg = 40,000 units

- One-Alpha Tablets 1 mcg, 0.25 mcg
- One-Alpha Drops 2 mcg/ml (0.1 mcg/ Drop)

AMINO ACIDS

**Indications:** prophylaxis and therapy of protein deficiency, i.e. in pre- and post-perative as well as post-traumatic situations like burns, tetanus, osteomyelitis, malabsorption, maldigestion, intoxications, nephrosis, under dialysis treatments

**Caution:** the compatibility of any additive to this solution should be checked before use.

**Contraindications:** advanced liver disease, disturbed protein metabolism, manifest cardiac insufficiency, renal insufficiency with increased rest nitrogen values, acidosis, hyperhydration.

280
**Nutrition and Blood**

*Dose*: I.V., up to 30 ml/kg body weight/day at a drop rate of 40-60 drops/minute or 120-180 ml/hour.
- *Aminoplasmal 5% E, -10% E*

**CYANOCOBALAMIN (Vitamin B12)**

*Indications*: addisonian pernicious anemia, subacute combined degeneration of the spinal cord, other causes of vitamin B12 deficiency.

*Contraindications*: Sensitivity to cobalt and/or vitamin B12.

*Side Effects*: Mild diarrhea, itching, temporary feeling of warmth and pain at the injection site may occur.

*Dose*: Avoid using the intravenous route
- *Cyanocobalamin Injection, USP 1000 mcg/ml*

**DEXTROSE (Glucose)**

*Indications*: energy and liquid supply, hypertonic dehydration, carbohydrate therapy/high-caloric alimentation, vehicle solution for supplementary medication, hypoglycaemia.

*Caution*: the compatibility of any additive to this solution should be checked before use. These products should not be administered through the same infusion equipment, simultaneously, before, or after an administration of blood, because of the possibility of pseudo-agglutination. Electrolytes have to be administered as required, and patient should be monitored for hyperglycemia and glucosuria.

*Contraindications*: hyperglycaemia, diabetes mellitus, hypotonic dehydration; if electrolytes lacking do not administer simultaneously; hyperhydration, hypokalemia, hyperosmolar coma.

*Side Effects*: exceeding the specified dosage may lead to enhanced values of serum bilirubin and serum lactate.

*Dose*: according to individual requirements, 1.5-3.0 g dextrose/kg body weight/day or up to 0.5 g dextrose/kg body weight/hour.
- *Dextrose Intravenous Fluid 5%, 10%, 20%, 25%, 50%*

**FERROUS GLUCONATE**

*Indications*: iron-deficiency anemia
**Nutrition and Blood**

**Caution:** interactions with iron salts

**Dose:** ferrous iron, therapeutic, 100-200 mg daily in divided
doses; Prophylactic, 60 mg daily;
Child up to 1 year, therapeutic, daily in divided doses, 36
mg 1-5 years, 72 mg.
6-12 years, 120 mg.
- *Ferrous Gluconate Tablets 300 mg It Contains
  35mg Elemental Iron/Tablet*

**FERROUS SULFATE**

**Indications:** nutritional iron-deficiency anemia

**Side Effects:** temporary discoloration of teeth or dentures
(can be minimized by thorough brushing).

**Dose** therapeutic, 375 mg (75 mg elemental iron) daily in
divided doses.
Preventive, 40-75 mg (8-15 mg elemental iron) daily in
water or in juice.
- *Kdiron Drops (15 mg Elemental Iron/0.6 ml)*
- *Kdiron Syrup (30 mg Elemental Iron/5 ml)*
- *Fefol Spansules (47 mg Elemental Iron With 500
  Megfolic Acid/Spansule)*

**FOLIC ACID**

**Indications:** megaloblastic anemia due to folic acid
deficiency; pregnancy vitamin supplement.

**Caution:** should never be given alone in the treatment of
Addisonian pernicious anemia and other vitamin B12
deficiency states because it may precipitate the onset of
subacute degeneration of the spinal cord. Do not use in
malignant disease unless megaloblastic anemia due to
folate deficiency is an important complication (some
malignant tumours are folate-dependent).

**Dose:** initially, 15 mg daily for 4 months or until a
haematopoietic response has been obtained.
Maintenance, 5 mg every 1-7 days, depending on
underlying
disease.
Child up to 1 year, 500 mcg/kg daily.
Child over 1 year, same as adult dose.
- *Folic Acid Tablets 5 mg*
**IRON-SORBITOL**

*Indications:* iron-deficiency anemia

*Caution:* 24 hours should elapse between iron administered orally and start of therapy with iron sorbitol injection. When another injectable iron preparation has been used, a week should elapse between the last injection and the start of therapy with iron sorbitol.

*Contraindications:* liver disease, kidney disease (particularly pyelonephritis), untreated urinary tract infections, cardiac abnormalities like angina or arrhythmia.

*Dose:* by deep I.M. injection, adults and children over 3 kg, 1.5 mg iron/kg to a maximum of 100 mg iron, repeated daily or, in patients with low tolerance to I.M. iron injection, on alternate days.

- *Jectofer Injection. It Contains 5% (50 mg/ml) Of Iron.*

**LIPIDS**

*Indications:* coverage of caloric and essential fatty acid requirements in parenteral nutrition as in postoperative catabolism malabsorption, maldigestion, consuming disease, renal insufficiency and during convalescence.

*Caution:* the emulsion should be perfectly homogenous

*Contraindications:* disturbances in fat metabolism, hyperlipidaemia and fasting lipaemia, pregnancy, shock conditions, advanced liver insufficiency, cerebral affections, disturbances in blood coagulation; cardiac infarction, pulmonary high pressure, acute and life threatening situations like sepsis, acute embolism, hepatic and diabetic coma.

*Dose:* by I.V. infusion, 1-2 g of fat/kg body weight/day. Drop rate, start with 15-20 drops/minute and eventually increase to maximum 45 drops/minute after 10-15 minutes

- *Intralipid 10%, 20% - 100 & 500 MI*

**MULTIVITAMINS**

*Indications:* deficiency states; neurological disorders influenced by B-complex vitamin deficiency.

- *Megavit Drops (Multivitamin)*
- *Mixavit Tablets (Multivitamin)*
Nutrition and Blood

* Multivitamin Tab (Minerals & Trace elemental Iron)
* Mixavit Syrup (Multivitamin)
* Neurobion Injection (Vitamin B₁, Vitamin B₆, Vitamin B₁₂)

**PHYTOMENADIONE (Vitamin K₁)**

**Indications:** Vitamin-K deficiency in neonates; haemorrhage associated with over-dosage of anti-coagulants; hypoprothrombinemia due to anti-coagulants without haemorrhage.

**Caution:** I.V. injection should be given very slowly.

**Dose:** neonate, by I.M. injection, 1 mg.
Alternatively, by mouth, 2 doses of the colloidal (mixed micelle MM) preparation 2 mg should be given in the first week. For breast-fed babies a third dose of 2 mg is given at 1 month of age. The third dose is omitted in formula-fed babies because formula feeds contain vitamin K.
Haemorrhage due to anti-coagulant overdosage, 2.5 mg to 20 mg by slow I.V. injection.
- Konakion MM Injection 1 mg/0.5 ml For I.V. Injection Only.
- Konakion Mm Paediatric Injection 2 mg In 0.2 ml For I.M., I.V.
- Konakion Tablets 10 mg

**Pyridoxine Hydrochloride (Vitamin B₆)**

**Indications:** Pyridoxine deficiency, including inadequate diet, drug-induced causes (e.g. isoniazid, hydralazine, oral contraceptives) or inborn errors of metabolism; Idiopathic sideroblastic anaemia; parenteral use is indicated when oral therapy is not feasible.

**Dose:** neuritis and deficiency states, 20-50 mg up to 3 times daily. Isoniazid neuropathy prophylaxis, 10 mg daily. Idiopathic sideroblastic anaemia, 100-400 mg daily in divided doses.
- Vitamin B₆ Tablets 50 mg

**THIAMINE HYDROCHLORIDE (Vitamin B₁)**

**Indications:** thiamine deficiency
**Caution:** Anaphylactic shock may occasionally follow injection; breast feeding.
**Dose:** by mouth or by I.M. injection, 10-100 mg daily, up to 600 mg daily in acute deficiency
- *Vitamin B₁ Tablets 100 mg*

**ELECTROLYTES**

**CALCIUM SALTS**

**Indications:** calcium deficiency; hyperphosphataemia; cardiac resuscitation

**Caution:** renal impairment; sarcoidosis; history of nephrolithiasis; avoid calcium chloride in respiratory acidosis or respiratory failure;

**Contraindications:** conditions associated with hypercalcaemia and hypercalciuria (e.g. some forms of malignant disease)

**Side Effects:** gastro-intestinal disturbances; bradycardia, arrhythmias; *with injection*, peripheral vasodilatation, fall in blood pressure, injection-site reactions

**Dose** according to the requirements of the patient.

- By slow intravenous injection, acute hypocalcaemia, calcium gluconate 1–2 g (Ca²⁺ 2.25–4.5 mmol);
- CHILD obtain paediatric advice

Injection, calcium chloride (as calcium chloride dihydrate 10%) 75 mg/mL (calcium 27.3 mg or Ca²⁺ 80 micromol/mL.)

Injection, calcium gluconate 10% (calcium 8.9 mg or Ca²⁺ 220 micromol/mL).

Chewable tablets, calcium carbonate 1.5 g (calcium 600 mg or Ca²⁺ 15 mmol)

**POTASSIUM SALTS**

**Indications:** potassium depletion as in diarrhoea; patients on digoxin and antiarrhythmic drugs; conditions in which secondary hyperaldosteronism occurs like nephrotic syndrome and liver cirrhosis; hypokalaemia.

**Caution:** intestinal stricture, hiatus hernia (for sustained release tablets). For I.V. infusion, the concentration should not exceed 3.2 g (43 mmole) /liter; the solution must not be injected undiluted.
**Contraindications:** renal failure, plasma potassium concentration above 5 mmole/ litre. Rapid injection may be toxic to heart.

**Side Effects:** nausea and vomiting (severe symptoms may indicate obstruction), oesophageal or small bowel ulcers.

**Dose:** by mouth, prophylactic administration, 25-50 mmole of K⁺ daily for established potassium depletion, 135-200 mmole daily may be needed. By parenteral route, the maximum dosage is 20 mmole potassium per hour. It is recommended not to exceed 2-3 mmole potassium per kg bodyweight in 24 hours.

The injectable solution should be diluted as additive to large volume intravenous infusion i.e. 10 ml diluted with not less than 500 ml of a suitable diluent such as NaCl 0.9% fluid.

- **Slow-K Tablets 600 mg (8 mmole Of K⁺ & Cl⁻ /Tab)**
- **Potassium Chloride Syrup (5 Mmole K⁺ & Cl⁻ /5 ml)**
- **Potassium Chloride Injection 10% (2 mmole Of K⁺ & Cl⁻ /1 ml)**

**SODIUM BICARBONATE**

**Indications:** chronic acidotic conditions; for severe metabolic acidosis use the I.V. route; emergency treatment of hyperkalemia.

**Contraindications:** respiratory and metabolic alkalosis, hypoventilation, hyper-naatraemia and in all situations where supply of sodium is contraindicated like cardiac insufficiency, oedema, hypertension and eclampsia.

**Dose:** by mouth, 4.8 g daily (57 mmole of Na⁺ and HCO₃⁻).

By I.V. route; the quantity of sodium bicarbonate injection to be infused is determined by the blood gas values and is calculated according to the following formula:

\[
\text{ml of 8.4% sodium bicarbonate injection} = \text{negative base excess x kg body weight} \times 0.3
\]

Correction of metabolic acidosis should be effected too rapidly. It is advisable to start administering only half of the calculated dose and make a continuation of the
therapy conditional on further blood gas analysis. Drop rate, approximately 40 drops/minute = 120 ml/hour.

- **Sodium Bicarbonate Injection 8.4% - 20 ml (1 mmole of NaHCO₃ /1 ml)**

### SODIUM CHLORIDE

**Indications:** electrolyte imbalance, plasma isotonic fluid replacement, sodium and chloride depletion, hypochloremic alkalosis, vehicle solution for supplementary medication, externally for wound irrigation and moisturizing of wound dressings.

The hypertonic sodium chloride solution is used for reversal of refractory hypovolemic shock.

**Caution:** restrict intake in impaired renal function, cardiac failure, hypertension, peripheral and pulmonary edema, toxemia of pregnancy.

**Contraindications:** hyperhydration, hypernatremia, hypokalaemia, acidic situations, hypertension.

**Dose:**
- By I.V. infusion, average dose, 1000 ml/day
- Drop rate, 120-180 drops/minute corresponding to 360-540 ml/hour.
- By mouth, prophylaxis of sodium chloride deficiency, 2.4-4.8 g (40-80 mmole) daily with water.
- Chronic renal salt wasting, up to 12 g daily with appropriate fluid intake.

**Oral rehydration therapy (ORS)**

(with glucose and potassium chloride)

- **Sodium Chloride Tablets 300 mg**
- **0.9% Sodium Chloride (Normal Saline)**
- **0.45% Sodium Chloride (Half Normal Saline)**
- **3% Sodium Chloride (Hypertonic Sodium Chloride Solution)**
- **0.18% Sodium Chloride & 4.3% Dextrose;**
- **0.45% Sodium Chloride & 5% Dextrose (Half Normal Saline With Dextrose)**

### SODIUM LACTATE

**Indications:** replacement of extra cellular fluid loss (isotonic dehydration), salt depletion, light metabolic acidosis, electrolyte substitution in burns.

**Contraindications:** hypertonic and hypotonic dehydration,
Nutrition and Blood

hyper hydration, oedema, alkalosis, hypokalemia, hypernatremia, hyperlactatemia, renal insufficiency, hypertension.

**Dose:** by I.V. infusion, average dose 2000 ml/day. Drop rate, 120-180 drops/minute corresponding to 360-540 ml/hour.

- Compound Sodium Lactate Injection;
- Hartmann's Solution
- Ringer Lactate Solution

It provides 131 mmole of Na⁺/liter, 5 mmole of K⁺/liter, 2 mmole of Ca/liter, 111 mmole of Cl⁻/liter and 29 mmole of bicarbonate (as lactate)/liter

**BLOOD PRODUCTS AND PLASMA EXPANDERS**

**ALBUMIN (Human Albumin solution)**

**Indications:** concentrated solutions are used for substitution therapy in hypo proteinemia, particularly hypo albuminaemia associated with low plasma volume and as an adjunct in the treatment of hyperbilirubinaemia by exchange transfusion in the newborn. Isotonic solutions may be used in acute or sub acute loss of plasma volume and in plasma exchange.

**Caution:** hypervolaemia, acute cardiac insufficiency, pulmonary edema, renal insufficiency, known intolerance to proteins; increased cardiovascular overload; conditions where capillary integrity is affected. Correct dehydration when using concentrated solutions.

- Human Albumin 20% Solution 50 ml & 100 ml
- Human Albumin 5% Solution 50 ml

**DEXTRAN 40%**

**Indications:** conditions associated with peripheral local slowing of the blood flow; To expand and maintain blood volume in conditions like shock, burns, fat embolism; peripheral and cerebral circulatory disturbances; prophylaxis of post surgical thromboembolic disease.

**Caution:** the compatibility of any additive to this solution should be checked before use. Special care is to be taken in case of a combined dextran therapy with conventional anti-coagulants because of the risk of bleeding.
Contraindications: Cardiac decompensation, pulmonary oedema, cerebral haemorrhage, renal failure, haemorrhagic diseases, extra cellular fluid deficit, hypersensitivity to dextran.

Side Effects: anaphylactoid reactions may develop after administration of colloid volume replacement fluids. Normally these reactions manifest themselves on the skin, but in exceptional cases, more serious situations may develop ranging from flush to a sudden fall in blood pressure and possibly even to an immediate circulatory standstill.

Dose: by I.V. infusion, according to indication, up to 500 ml/ infusion.

Maximum dose for adults, 2 g dextran /kg body weight/day.

Drop rate, 40-80 drops/minute or 120-240 ml/hour

Child, up to 15 ml/kg body weight/day.

DEXTRAN 70

Indications: volume replacement for immediate treatment of shock, thromboprophylaxis, preoperative haemodilution.

Caution: can interfere with some laboratory tests; monitor central venous pressure whenever possible.

Contraindications: Same as for dextran 40

Side Effects: cardiac and renal failure. hypersensitivity reactions; transient increase in bleeding time may occur.

Dose: by I.V. infusion, according to indication, up to 500 ml per dose.

Maximum dose, 2 g dextran/kg body weight/day.

Drop rate, 40-80 drops/minute or 120-240 ml/hour.

Darbeepoetin Alfa

Indications: Anaemia associated with chronic renal failure; Anaemia in adults with non-myeloid malignancies receiving chemotherapy.
**Caution:** poorly treated or inadequately controlled blood pressure; sickle cell disease; exclude other causes of anaemia; ischemic vascular disease; thrombocytosis; epilepsy; malignant disease; chronic liver failure; pregnancy; breast feeding.

**Contraindications:** pure red cell aplasia; uncontrolled hypertension; patients unable to receive thromboprophylaxis; avoid injection containing benzyl alcohol in neonates.

**Side Effects:** dose dependent increase in blood pressure or aggravation of hypertension; in isolated patients with normal or controlled blood pressure, hypertensive crisis with encephalopathy like symptoms and generalized tonic clonic convulsions requiring urgent medical attention; headache; dose dependent increase in platelet count; influenza like symptoms; thromboembolic events; peripheral oedema; injection site pain; isolated reports of pure red cell aplasia; antagonism of hypotensive effect and increased risk of hyperkalaemia when given with ACE inhibitors or angiotensin-II receptor antagonists.

**Dose**

Anaemia associated with chronic renal failure in patients on dialysis: ADULT and CHILD over 11 years, by subcutaneous or intravenous injection, initially 450 nanograms/kg once weekly, adjusted according to response by approx. 25% of initial dose at intervals of at least 4 weeks; maintenance dose (when haemoglobin concentration of 11 g/100 mL achieved), given once weekly or once every 2 weeks.

Anaemia associated with chronic renal failure in patients not on dialysis: ADULT and CHILD over 11 years, by subcutaneous or intravenous injection, initially 450 nanograms/kg once weekly or by subcutaneous injection, initially 750 nanograms/kg once every 2 weeks; adjusted according to response by approx. 25% of initial dose at intervals of at least 4 weeks; maintenance dose (when haemoglobin concentration of at least 11 g/100 mL achieved), given once weekly or once every 2 weeks or once every month.

Note: Reduce dose by 25–50% if haemoglobin rise exceeds 2.5 g/100 mL per month; suspend if haemoglobin exceeds 14 g/100 mL until it falls below 13 g/100 mL and then restart with dose at 25% below previous dose. When changing route give same dose then adjust according to
weekly or fortnightly haemoglobin measurements. Adjust doses at 2-week intervals during maintenance treatment. Anaemia in adults with non-myeloid malignancies receiving chemotherapy: by subcutaneous injection, initially 6.75 mcg/kg once every 3 weeks (if response inadequate after 9 weeks further treatment may not be effective) or 2.25 mcg/kg once weekly (if appropriate rise in haemoglobin not achieved after 4 weeks, double initial dose; if response remains inadequate after 4 weeks at higher dose further treatment may not be effective); haemoglobin should not exceed 13 g/100 mL; if adequate response obtained or if rise in haemoglobin greater than 2 g/100 mL in 4 weeks, reduce dose by 25–50%; continue for approx. 4 weeks after chemotherapy

- Aranesp Injection, Prefilled Syringe, Darbepoetin Alfa 10 mcg, 20 mcg

**ERYTHROPOIETIN (EPOETIN ALPHA & BETA)**

*Indications:* correction of anemia associated with end-stage renal disease in patients maintained on haemodialysis; anemia in adults receiving platinum-containing cancer chemotherapy.

*Caution:* same as Darbepoetin alpha

*Contraindications:* same as Darbepoetin alpha

*Side Effects:* same as Darbepoetin alpha

*Dose:* in hemodialysis patients, initially by I.V. injection, 50 units/kg three times per week increased by 25 u/kg at intervals of 4 weeks according to response. Maximum dose, 200 u/kg three times a week

If hemoglobin level increased at a rate exceeding 2 g/dL/month at 50 u/kg three times a week, a reduction of the dose is done by omitting one of the weekly doses.

- Eprex Injection 1000 U/ml, 2000 U/ml, 4000 U/ml
- Recormon Injection 1000, 2000, 4000 U/ml
- Recombinat 30000 IU

**FACTOR VIII, DRIED (Human antihaemophilic fraction)**

*Indications:* for the treatment of congenital and acquired coagulation factor VIII deficiency (usually for severe and moderately severe haemophilia A) or for prophylaxis in surgery where bleeding may occur.
Caution: intravascular haemolysis after frequent and repeated doses in patients with blood groups A, B, or AB.

Contraindications: known hypersensitivity to human proteins

Side Effects: allergic reactions, including chills and fever.

Dose: depends upon the severity of the clinical symptoms and/or the desired increase of factor VIII.

- Factor VIII Injection 250 I.U.

**FACTOR IX**

Dried factor IX fraction is prepared from human plasma by a suitable fractionation technique. It may also contain clotting factors II, VII and X.

Indications: congenital factor IX deficiency (haemophilia B).

Caution: risk of thrombosis – principally with prior low purity products; liver disease.

Contraindications: disseminated intravascular coagulation without prior treatment with heparin.

Side Effects: allergic reactions, including chills and fever.

- Factor IX Complex For I.V. Injection 500 I.U.

**CHELATORS AND ANTAGONISTS**

**DEFEROXAMINE MESILATE**

Indications: chronic iron overload; iron poisoning; aluminium overload in dialysis patients.

Caution: renal impairment; eye and ear examinations before treatment and at 3-month intervals during treatment; monitor body-weight and height in children at 3-month intervals—risk of growth retardation with excessive doses; aluminium-related encephalopathy

Side Effects: hypotension (especially when given too rapidly by intravenous injection), disturbances of hearing and vision (including lens opacity and retinopathy); injection-site reactions, gastrointestinal disturbances, asthma, fever, headache, arthralgia and myalgia; very rarely anaphylaxis, acute respiratory distress syndrome, neurological disturbances (including dizziness, neuropathy and paraesthesia), Yersinia and mucormycosis infections, rash, renal impairment, and blood dyscrasias

292
**Dose:** by slow S.C. infusion, by means of a portable pump, over a period of 8-12 hours, 20-60 mg/kg, 4-7 times a week depending on the degree of iron overload. I.M. injections are less effective. I.V. infusions of desferoxamine can be administered during blood transfusion. Continuous I.V. infusion could be used in patients incapable of tolerating S.C. infusions or who have cardiac problem secondary to iron overload.  

**Safety in Pregnancy** Teratogenic in animal studies; use only if potential benefit outweighs risk.  
**Safety in Breast Feeding** Manufacturer advises use only if potential benefit outweighs risk.  
- **Deferasirox Tab 125mg, 250mg & 500mg**  
- **Desferal Injection, Powder For Reconstitution, Desferrioxamine Mesilate, 500 mg Vial**

**DEFERASIROX**

It acts by binding to iron and removes it from the blood stream  
**Indications** iron overload caused by blood transfusions in adults and children at least 2 years old.  
**Cautions:** Serum ferritin should be measured monthly to assess response to therapy and to evaluate for the possibility of overchelation of iron. If the serum ferritin falls consistently below 500 mcg/L, consideration should be given to temporarily interrupting therapy  
**Contraindications:** Known sensitivity or allergy; kidney or liver disease; vision or hearing problems; or a weak immune system caused by disease (such as cancer, HIV)  
**Side effect:** signs of an allergic reaction: hives; difficulty breathing; swelling of your face, lips, tongue, or throat. severe skin rash; problems with vision or hearing; urinating less than usual or not at all; easy bruising or bleeding, unusual weakness; fever, chills, body aches, flu symptoms; drowsiness, confusion, mood changes; swelling or numbness in your hands or feet; or nausea, stomach pain, loss of appetite, itching, dark urine, clay-colored stools, jaundice (yellowing of the skin or eyes).
Nutrition and Blood

Less serious side effects may include: mild stomach pain, diarrhea, nausea or vomiting; fever; mild skin rash; or headache, cough, sinus pain, runny or stuffy nose.

**Dose:** 20 mg / kg body weight. It should be taken once daily on an empty stomach at least 30 minutes before food, preferably at the same time each day. Tablets should not be chewed or swallowed whole. It should not be taken with aluminum-containing antacid products. Doses (mg/kg per day) should be calculated to the nearest whole tablet. Tablets should be completely dispersed by stirring in water, orange juice, or apple juice until a fine suspension is obtained. Doses of < 1 g should be dispersed in 3.5 ounces of liquid and doses of ≥ 1 g in 7.0 ounces of liquid. After swallowing the suspension, any residue should be resuspended in a small volume of liquid and swallowed.

- *Exjade Tablet 125, 250, 500mg*
Obstetrics, Gynaecology & Urinary Tract Disorders

DRUG USED IN OBSTETRICS

PROSTAGLANDINS AND OXYTOCICS

DINOPROSTONE (Prostaglandin E2)

**Indications:** Induction of labor; the I.V. preparation is used for foetal death in utero and therapeutic termination of pregnancy.

**Cautions:** Asthma, excessive dosage may cause uterine rupture, glaucoma and raised intra-ocular pressure; cardiac, hepatic or renal impairment; hypertension; patient with epilepsy; uterine scarring; monitor uterine activity and fetal status; uterine rupture; monitor for post delivery disseminated intravascular coagulation; risk factors for disseminated intravascular coagulation; effect of oxytocin enhanced.

**Contra-indications:** Conditions where prolonged uterine contractions would be inappropriate; active cardiac, pulmonary, renal or hepatic disease. Intravenous route is contraindicated with pelvic infection, placenta praevia or unexplained vaginal bleeding during pregnancy, ruptured membranes, major cephalo pelvic disproportion or fetal malpresentation, history of caesarean section or major uterine surgery, untreated pelvic infection, fetal distress, grand multiparas and multiple pregnancy, history of difficult or traumatic delivery; avoid extra-amniotic route in cervicitis or vaginitis

**Side Effects:** Nausea, vomiting, diarrhoea; uterine hypertonus, severe uterine contractions, pulmonary or amniotic fluid embolism, abruptio placenta, fetal distress, maternal hypertension, bronchospasm, rapid cervical dilation, fever, backache; uterine hypercontractility with or without fetal bradycardia, low Apgar scores; cardiac arrest, uterine rupture, stillbirth or neonatal death also reported; vaginal symptoms; intravenous administration may result in flushing, shivering, headache, dizziness, temporary pyrexia and raised leucocytosis; disseminated intravascular coagulation; also local tissue reaction and erythema had been reported after intravenous
administration and possibility of infection after extra-amniotic administration
prostaglandins potentiate uterotonic effect of oxytocin

**Dose:** by I.V. route, diluted with normal saline or concentration 5% dextrose to produce a solution of 1.5 mcg/ml and infused at a 0.25 mcg/minute for 30 minutes and then maintained or increased.

Cases of fatal death in utero may require higher doses; initial doses of 0.5 mcg/minute may be used with step increments at intervals of not less than one hour.

Therapeutic abortion, missed abortion, and hydatidiform mole, as a solution containing 5 mcg/ml, 2.5 mcg/minute for at least 30 minutes then increased if necessary to 5mcg/minute; should be maintained for at least 4 hours before increasing further.

By vagina, induction of labour, in vaginal tablets, inserted high into the posterior fornix, 3 mg, followed after 6-8 hours by 3 mg if labor is not established; max 6 mg of vaginal tablets.

For gel, by cervix, pre-induction cervical softening and dilation, 500 mcg.

The patient should remain recumbent for 10-15 minutes.

**Safety in Breast Feeding:** undetermined

- Dinoprostone 3 mg. Pessaries
- Dinoprostone 1mg./ml (Prostin E2 Inj) I.V.

**METHYLERGOMETRINE MALEATE**

**Indications:** prevention and treatment of post-partum haemorrhage.

**Cautions:** toxemia, cardiac disease, hypertension, sepsis, multiple pregnancy.

**Contra-indications:** 1st and 2nd stage of labour, vascular disease, impaired pulmonary, hepatic and renal function, hypertension.

**Side Effects:** Nausea, vomiting, transient vasoconstriction.

**Dose:** after delivery of the anterior shoulder or on completion of the third stage of labour, by I.M. injection, 200 mcg, repeated for up to 5 doses if necessary at intervals of 2-4 hours.

In emergencies, by slow I.V. injection, 200 mcg over at least 60 second.
During the puerperium, by mouth, 200 mcg 3-4 daily for up to 7 days.

- Methergin Injection 0.2 mg/1 ml
- Methergin Tablets 0.125 mg

**OXYTOCIN**

**Indications:** induction and augmentation of labor; management of missed or incomplete abortion; postpartum haemorrhage.

**Cautions:** hypertension, pressor drugs, multiple pregnancy, high parity, previous caesarean section. Particular caution needed when given for induction or enhancement of labour in presence of borderline cephalopelvic disproportion, pregnancy-induced hypertension both mild or moderate, cardiac disease, women over 35 years or with history of lower-uterine segment caesarean section; water intoxication and hyponatraemia—avoid large infusion volumes and restrict fluid intake by mouth; effects enhanced by concomitant prostaglandins (very careful monitoring), caudal block anaesthesia (may enhance hypertensive effects of sympathomimetic vasopressors).

**Contra-indications:** hypertonic uterine contractions, fetal distress; any condition where spontaneous labour or vaginal delivery is inadvisable; avoid prolonged administration in oxytocin-resistant uterine inertia, severe pre-eclamptic toxaemia or severe cardiovascular disease

**Side Effects:** uterine spasm (may occur at low doses), uterine hyperstimulation (usually with excessive doses—may cause fetal distress, asphyxia and death, or may lead to hypertonicity, tetanic contractions, soft-tissue damage or uterine rupture); water intoxication and hyponatraemia associated with high doses with large infusion volumes of electrolyte-free fluid; also nausea, vomiting, arrhythmias; rashes and anaphylactoid reactions (with dyspnoea, hypotension or shock) also reported; placental abruption and amniotic fluid embolism also reported on overdose

**Dose:** by slow I.V. infusion, induction and augmentation of labor, as a solution containing 5 units in 500 ml of a physiologic electrolyte solution, 1-4 milliunits per minute, adjusted according to response.
Incomplete, inevitable or missed abortion, by slow I.V. injection, 5 units followed if necessary by I.V. infusion, 0.02–0.04 units/minute or faster.

Treatment of post-partum haemorrhage, by slow I.V. injection, 5 units, followed in severe cases by I.V. infusion of 5–20 units/500 ml given at a rate of 15 drops/minute, adjusted according to response.

Prevention of post-partum hemorrhage, after delivery of placenta, by slow I.V. injection, 5 units (if infusion used for induction or enhancement of labour, increase rate during third stage and for next few hours).

Induction of labour for medical reasons or stimulation of labour in hypotonic uterine inertia, by intravenous infusion.; max. 5 units in 1 day (may be repeated next day starting again at 0.001–0.002 units/minute)

Important: Careful monitoring of fetal heart rate and uterine motility essential for dose titration (avoid intravenous injection during labour); discontinue immediately in uterine hyperactivity or fetal distress

Caesarean section, by slow intravenous injection immediately after delivery, 5 units
Prevention of postpartum haemorrhage, after delivery of placenta, by slow intravenous injection, 5 units (if infusion used for induction or enhancement of labour, increase rate during third stage and for next few hours)

Note: May be given in a dose of 10 units by intramuscular injection instead of oxytocin with ergometrine (Syntometrine)

Treatment of postpartum haemorrhage, by slow intravenous injection, 5–10 units, followed in severe cases by intravenous infusion of 5–30 units in 500 mL infusion fluid at a rate sufficient to control uterine atony

Important: Avoid rapid intravenous injection (may transiently reduce blood pressure); prolonged administration, see warning below

Incomplete, inevitable or missed abortion, by slow intravenous injection, 5 units followed if necessary by intravenous infusion, 0.02–0.04 units/minute or faster

Prolonged intravenous administration at high doses with large volume of fluid (as possible in inevitable or missed abortion or postpartum haemorrhage) may cause water intoxication with hyponatraemia. To avoid: use electrolyte-containing diluent (i.e. not glucose), increase
Oxytocin concentration to reduce fluid intake by mouth; monitor fluid and electrolytes
- **Syntocinon Injection 5 Units/ml**
- **Oxytocin 5 Units Inj 1ml**

**SULPROSTONE**

**Indications:** termination of pregnancy.
- **Naiador 500 mcg Per Ampoule**

**DUCTUS ARTERIOUS**

**Indications:** maintenance of patency in congenital heart defects (ductus arteriosus) in neonates prior to corrective surgery; erectile dysfunction.
**Cautions:** history of haemorrhage, avoid in hyaline membrane disease, monitor arterial pressure; priapism—patients should be instructed to report any erection lasting 4 hours or longer—anatomical deformations of penis, follow up regularly to detect signs of penile fibrosis, discontinuation the drug if angulation, cavernosal fibrosis or Peyronie's disease develop.
**Contra-indications:** in sickle cell anaemia, multiple myeloma or leukaemia; not to be used with other agents for erectile dysfunction, in patients with penile implants or when sexual activity medically inadvisable; urethral application also contra-indicated in urethral stricture, severe hypospadia, severe curvature, balanitis, urethritis **Side Effects:** apnoea (particularly in infants under 2 kg), flushing, bradycardia, hypotension, tachycardia, cardiac arrest, oedema, diarrhoea, fever, convulsions, disseminated intravascular coagulation, hypokalemia; cortical proliferation of long bones, weakening of the walls of the ductus arteriosus and pulmonary artery may follow prolonged use, gastric-outlet obstruction reported penile pain, priapism, reactions at injection site include haematoma, haemosiderin deposits, penile rash, penile oedema, penile fibrosis, haemorrhage; inflammation; other local reactions include urethral burning and bleeding, penile warmth, numbness, penile or urinary-tract infection, irritation, sensitivity, phimosis, pruritus, erythema, venous leak, abnormal ejaculation; systemic
effects reported include testicular pain and swelling, scrotal disorders, changes in micturition (including haematuria), nausea, dry mouth, fainting, hypotension (very rarely circulatory collapse) or hypertension, rapid pulse, vasodilatation, chest pain, supraventricular extrasystole, peripheral vascular disorder, dizziness, weakness, localised pain (buttocks, legs, genital, perineal, abdominal), headache, pelvic pain, back pain, influenza-like syndrome, swelling of the leg veins

**Dose:** by intravenous infusion, initially 50-100 nanograms/kg/minute, then decreased to lowest effective dose. [but lower dose such as 10 nanograms/kg/minute may be effective and safer]

- Prostin VR Injection 500 mcg/ml

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**MISOPROSTOL**

**Indications** Misoprostol, a synthetic prostaglandin analogue has antisecretory and protective properties, promoting healing of gastric and duodenal ulcers. It can prevent NSAID-associated ulcers, its use being most appropriate for the frail or very elderly from whom NSAIDs cannot be withdrawn.

**Cautions:** conditions where hypotension might precipitate severe complications (e.g. cerebrovascular disease, cardiovascular disease)

**Contra-indications:** pregnancy or planning to be pregnant, important: women of childbearing age, and breast-feeding

Manufacturer advises that misoprostol should not be used in women of childbearing age unless the patient requires non-steroidal anti-inflammatory (NSAID) therapy and is at high risk of complications from NSAID-induced ulceration. In such patients it is advised that misoprostol should only be used if the patient takes effective contraceptive measures and has been advised of the risks of taking misoprostol if pregnant.

**Side Effects:** diarrhoea, dyspepsia, abdominal pain, flatulence, nausea and vomiting, abnormal vaginal bleeding, rashes, dizziness

**Dose** Benign gastric and duodenal ulceration and NSAID-associated ulceration, 800 mcg daily (in 2–4 divided
doses) with breakfast (or main meals) and at bedtime; treatment should be continued for at least 4 weeks and may be continued for up to 8 weeks if required. Prophylaxis of NSAID-induced gastric and duodenal ulcer, 200 mcg 2–4 times daily taken with the NSAID
child not recommended

**Safety in Breast Feeding:** Avoid as no information available as advised by manufacturer.

- Cytotec 200mg Tablets

### MYOMETRIAL RELAXANTS

#### RITODRINE

**Indications:** premature labour (after 16th week); acute foetal distress during labour if caused by hyper-motility of the uterus or compression of the umbilical cord uncomplicated premature labour

**Cautions:** diabetes; first 16 weeks of pregnancy; patients with cardiac risk. suspected cardiac disease (physician experienced in cardiology to assess), hypertension, hyperthyroidism, hypokalaemia (special risk with potassium-depleting diuretics), diabetes mellitus (closely monitor blood glucose during intravenous treatment), mild to moderate pre-eclampsia, monitor blood pressure and pulse rate (should not exceed 140 beats per minute) and avoid over-hydration; important: closely monitor state of hydration (discontinue immediately and institute diuretic therapy if pulmonary oedema occurs); concomitant beta-blocker treatment; drugs likely to enhance sympathomimetic side-effects or induce arrhythmias

**Contra-indications:** heavy blood loss from vagina; maternal cardiac disease; chorioamnionitis; cases when prolongation of pregnancy is hazardous; eclampsia; intra-uterine infection. cardiac disease, eclampsia and severe pre-eclampsia, intra-uterine infection, intra-uterine fetal death, antepartum haemorrhage (requires immediate delivery), placenta praevia, cord compression

**Side Effects:** nausea, vomiting, flushing, sweating, tremor; hypokalaemia, tachycardia, palpitation, and hypotension (left lateral position throughout infusion to minimise risk), uterine bleeding (may be reversed with a
non-selective beta-blocker); pulmonary oedema (see below and under Cautions); chest pain or tightness (with or without ECG changes) and arrhythmias reported; salivary gland enlargement also reported; on prolonged administration (several weeks) leucopenia and agranulocytosis reported; liver function abnormalities (including increased transaminases and hepatitis) reported.

**Dose:** premature labour, at the earliest onset of symptoms, 0.05 mg/minute increased by 0.05 mg/min every 10 minutes until the desired result is reached. Effective dose is 0.15-0.35 mg/min. The infusion should be continued for 12-48 hours after the contractions have ceased.

I.M. route is used if I.V. facilities are not available, initially 10 mg, if no response is attained another 10 mg is given within 1 hour followed by 10-20 mg every 2-6 hours continuing for 12-48 hours after contractions have ceased.

Oral dose is 10 mg given 30 minutes before termination of I.V. therapy.

For the first 24 hours, the dose is 120 mg given as 10 mg every 2 hours, then the dose is 80-120 mg divided over the day.

Maximum oral dose, 20 mg.

The oral treatment is continued as long as required.

By intravenous infusion (important: minimum fluid volume, see below), initially 50 mcg/minute, increased gradually according to response by 50 mcg/minute every 10 minutes until contractions stop or maternal heart rate reaches 140 beats per minute; continue for 12-48 hours after contractions cease (usual rate 150–350 mcg/minute); max. rate 350 mcg/minute; or by intramuscular injection, 10 mg every 3–8 hours continued for 12–48 hours after contractions have ceased; then by mouth (but see notes above), 10 mg 30 minutes before termination of intravenous infusion, repeated every 2 hours for 24 hours, followed by 10–20 mg every 4–6 hours, max. oral dose 120 mg daily.

**Important:** Manufacturer states that although fatal pulmonary oedema associated with ritodrine infusion is almost certainly multifactorial in origin, evidence suggests that fluid overload may be the most important single factor. The volume of infusion should therefore be...
kept to a minimum. For specific guidance on infusion rates, consult product literature.

- **Yutopar Tablets 10 mg**
- **Yutopar Injection 20 mg/2 ml**

### TIBOLON

**Indications** short-term treatment of symptoms of oestrogen deficiency (including women being treated with gonadotrophin releasing hormone analogues); osteoporosis prophylaxis in women at risk of fractures (second-line)

**Cautions** renal impairment, liver disease, epilepsy, migraine, diabetes mellitus, hypercholesterolaemia; withdraw the drug if signs of thromboembolic disease, abnormal liver function tests or cholestatic jaundice

**Contra-indications**: hormone-dependent tumours, history of cardiovascular or cerebrovascular disease (e.g. thrombophlebitis, thromboembolism), uninvestigated vaginal bleeding, severe liver disease, pregnancy, breast-feeding

**Side Effects** abdominal pain, weight changes, leucorrhoea, facial hair, and rarely amnesia; gastrointestinal disturbances, oedema, dizziness, headache, migraine, depression, breast cancer, arthralgia, myalgia, vaginal bleeding, visual disturbances, seborrhoeic dermatitis, cases with rash and pruritus had been reported

**Dose** 2.5 mg daily

Unsuitable for use in the premenopause (unless being treated with gonadotrophin-releasing hormone analogue) and as (or with) an oral contraceptive; also unsuitable for use within 12 months of last menstrual period (may cause irregular bleeding); induce withdrawal bleed with progestogen if transferring from another form of HRT

- **Livial**

### CONTRACEPTIVES

**ETHINYLESTRADIOL**

**Indications** Ethinylestradiol is used for short-term treatment of symptoms of oestrogen deficiency, for osteoporosis prophylaxis if other drugs cannot be used
and for the treatment of female hypogonadism and menstrual disorders. Ethinylestradiol is occasionally used under specialist supervision for the management of hereditary haemorrhagic telangiectasia. For use in prostate cancer. **Cautions:** cardiovascular disease as it causes sodium retention with oedema, thromboembolism, hepatic impairment (jaundice).

**Contra-indications:** see under Combined Hormonal Contraceptives and under Oestrogen for HRT.

**Side Effects:** Include nausea, fluid retention, and thrombosis. Impotence and gynaecomastia have been reported in men.

**Dose**
- Menopausal symptoms and osteoporosis prophylaxis, (with progestogen for 12–14 days per cycle in women with intact uteruses), 10–50 mcg daily for 21 days, repeated after 7-day tablet-free period
- Female hypogonadism, 10–50 mcg daily, usually on cyclical basis; initial oestrogen therapy should be followed by combined oestrogen and progestogen therapy
- Menstrual disorders, 20–50 mcg daily from day 5 to 25 of each cycle, with progestogen added either throughout the cycle or from day 15 to 25

**Safety in Pregnancy:** Epidemiological evidence suggests no harmful effects on fetus

**Safety in Breast Feeding:** Avoid till 6/12 to prevent adverse effects on lactation

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**ANTI-INFECTIVE DRUGS**

**MICONAZOLE NITRATE**

**Indications:** vaginal and vulval candidiasis. Local treatment of vulvovaginal candidiasis and superinfections due to gram-positive bacteria. The Cream may also be used for the treatment of mycotic balanitis.

**Cautions:** if local sensitisation or an allergic reaction occur, the treatment should be discontinued. General hygienic measures should be observed to control sources of infection and reinfection.

Appropriate therapy is indicated when the sexual partner is also infected. Cautions should be exercised when using the Cream during lactation.
**Contra-indications:** in individuals with a known hypersensitivity to miconazole or any other components of these medicines.

**Side Effects:** Cream is usually well tolerated, and adverse reactions are rare and mild in most cases. A few cases of local irritation, pruritus and burning sensation have been observed, especially at the start of treatment. Complaints of pelvic cramping, hives, skin rash have also been reported.

**Drug Interactions:** Contact should be avoided between certain latex products such as contraceptive diaphragms or condoms and the cream since the rubber may be damaged. Unintended pregnancy or transmission of infectious disease may result.

**Pharmacokinetics:** Systemic absorption after intravaginal administration is limited. Eight hours after application 90% of miconazole nitrate is still present in the vagina. Unchanged miconazole could not be traced in blood plasma or urine.

**Dose Administration:** Once daily (before bedtime), the contents of one applicator (approximately 5g of cream) should be squeezed deeply into the vagina, for seven days, even after pruritis and leukorrhoea has disappeared and regardless of intervening menstruation. Insert 1 pessary daily for 14 days or 1 pessary twice daily for 7 days.

**Safety in Pregnancy** Although intravaginal absorption is limited, Gyno-Daktarin should only be used in the first trimester of pregnancy if, in the judgment of the physician, the potential benefits outweigh the possible risks.

**Safety in Breast Feeding** It is not known whether miconazole nitrate is excreted in human milk.

- Mikozal Cream
- Mycoheal Vaginal Cream
- Gyno-Daktarin Cream.
- Mycoheal 100mg Vaginal Pessaries

**DIAGNOSTICS**

<table>
<thead>
<tr>
<th>INDIGO CARMINE</th>
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<td>INDIGOCARMINE INJ 0.4% 5 ML.</td>
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305
Indications: test of renal function. A marker dye, particularly in urological procedures and amniocentesis.

Dose: 40 mg by I.V. injection.
   - Indigo Carmine Injection 0.4%- 5 ml Ampoules

**METHYLENE BLUE**

Indications: methaemoglobinaemia; a dye in diagnostic procedures such as fistula detection and the diagnosis of rupture amniotic membranes.

Cautions: S.C. injection causes necrotic abscesses; intrathecal injection causes neural damage; severe renal impairment; pregnancy and lactation

Contra-indications: ! patients with G6PD-deficiency; methaemoglobinaemia induced by sodium nitrite during the treatment of cyanide poisoning; methaemoglobinaemia due to chlorate poisoning.

Dose: drug-induced methaemoglobinaemia, by I.V. injection as a 1% solution, 1-2 mg/kg over a period of several minutes.
   - Methylene Blue Injection Injection 1%

**DRUGS USED IN URINARY TRACT DISORDERS**

**GLYCINE**

GLYCINE IRRIGATION SET "Y"TYPE

Urological surgery

There is a high risk of fluid absorption from the irrigant used in endoscopic surgery within the urinary tract; if this occurs in excess, hypervolaemia, haemolysis, and renal failure may result. Glycine irrigation solution 1.5% is the irrigant of choice for transurethral resection of the prostate gland and bladder tumours; sterile sodium chloride solution 0.9% (physiological saline) is used for percutaneous renal surgery.

Indications: bladder irrigation during urological surgery such as transurethral resection of the prostate gland and bladder tumours.

Cautions: fluid absorption from the irrigant; causing hypervolemia, haemolysis, and may result in renal failure.

Dose:
   - Glycine Irrigation Set "Y"Type
LIDOCAINE HYDROCHLORIDE

(Lignocaine hydrochloride)

**Indications:** surface anesthesia of urethra during catheterization cystoscopy; may be used on oral mucosa to relieve pain in connection with dentistry.

Lidocaine (lignocaine) gel is a useful topical application in urethral pain or to relieve the discomfort of catheterisation

**Dose:** for anesthesia of the urethra, in men, 10 ml followed by further 10 ml (total up to 40 ml for cystoscopy); in women, 5-10ml.

Endoscopy, 10-20 ml.

Endotracheal intubation, 5 ml applied to surface of tube.

Xylocaine Gel 2%

OXYBUTYNIN HYDROCHLORIDE

**Indications:** urinary frequency, urgency and incontinence and nocturnal enuresis, in bladder dysfunction, especially in the elderly; uninhibited vesical hyperactivity after bladder surgery, prostatectomy and in association with acute and chronic cystitis. neurogenic bladder instability, and nocturnal enuresis associated with overactive bladder

**Cautions:** pregnancy, children less than 5 years of age; ulcerative colitis, toxic megacolon autonomic neuropathy, severe heart disease, porphyria, renal or hepatic disease.

**Contra-indications:** ileostomy, colostomy; glaucoma, myasthenia gravis.

**Side Effects:** anticholinergic side effects may occur as dry mouth, blurred vision, decreased sweating, drowsiness, tachycardia, palpitations, urinary retention and constipation. Allergic skin reactions may occur. dizziness; less commonly anorexia, facial flushing; rarely night terrors; application site reactions with patches

**Dose:** adults, by mouth Initially 2.5–5 mg 2–3 times daily increased if necessary to max. 5 mg 4 times daily; elderly initially 2.5–3 mg twice daily, increased to 5 mg twice daily according to response and tolerance,
Obstetrics, Gynaecology & Urinary Tract Disorders

Child over 5 year, neurogenic bladder instability, 2.5 mg - 3 mg twice daily increased to 5 mg twice daily; max. dose is 5 mg 3 times daily.
Nocturnal enuresis in child over 7 days, 2.5 - 3 mg twice daily increased to 5 mg 2-3 times daily (last dose before bedtime).

Safety in Pregnancy: avoid unless benefit outweighs risk.
Safety in Breast Feeding: Present in milk- advise to avoid

- Cystrin Tablets 5 mg

PAPAVERINE HYDROCHLORIDE

Indications: relieving ischaemia and symptoms of senile dementia but its value is doubtful; impotence.
Although not licensed the smooth muscle relaxant papaverine has also been given by intracavernosal injection for erectile dysfunction. Patients with neurological or psychogenic impotence are more sensitive to the effect of papaverine than those with vascular abnormalities. Phentolamine is added if the response is inadequate Persistence of the erection for longer than 4 hours is an emergency

Cautions: intravenous injection can cause cardiac arrhythmias; glaucoma; depressed myocardial function.

Contra-indications: complete atrioventricular block.

Side Effects: gastro-intestinal disturbance, flushing of the face, headache, malaise, drowsiness, skin rash, sweating and vertigo; hypersensitivity reactions.

Dose: impotence, by intra-cavernosal injection, 30 mg together with phentolamine 1 mg.

- Papaverine Hcl Injection 10 mg/ml

POTASSIUM CITRATE (Alkaline diuretic)

Indications: relief of discomfort in mild urinary tract infections; alkalinization of urine.

Cautions: renal impairment, cardiac disease, elderly,

Side Effects: hyperkalemia on prolonged high dosage, mild diuresis.

Dose: Cystitis, adults and children over 6 years, 3 g, well diluted with water, 3 times daily.
Child 1-6 years, 1.5 g.
Alkalization of urine, 3-6 g with water every 6 hours.

- **Potassium Citrate Mixture Contains 1.5 G/ 5 ml**

### SODIUM CITRATE

**Indications**: relief of discomfort in mild urinary tract infections.

**Caution**: renal impairment, cardiac disease, pregnancy, patients on sodium-restricted diet; elderly.

**Side-effects**: mild diuresis.

**Dose**: about 4 g 3 times daily for a max. of 3 days.

Sodium citrate 3%, dilute hydrochloric acid 0.2%, in purified water, freshly boiled and cooled, and sterilised

### ACID CITRIC

**Indications**: Catheter Maintenance Solution, ‘Solution R’

- Uro-Tainer Solution R,
- Uriflex R), Citric Acid 6%, Gluconolactone 0.6%, Magnesium Carbonate 2.8%, Disodium Edetate 0.01%
**EYE**

**ANTI-INFECTIVE DRUGS**

**ACYCLOVIR**

*Indications:* local treatment of herpes simplex infections  
*Side Effects:* local irritation and inflammation reported; very rarely hypersensitivity reactions including angioedema.  
*Dose:* Apply 5 times daily (continue for at least 3 days after complete healing)  
  - *Zovirax Eye Ointment 3%*

**CHLORAMPHENICOL**

*Indications:* It has broad spectrum of activity and is the drug of choice for superficial eye infections.  
*Contra-indications:* history of hypersensitivity to chloramphenicol, myelosuppression during previous exposure to chloramphenicol and in patients with a family history of blood dyscrasias including aplastic anaemia.  
*Side Effects:* transient stinging, a plastic anemia (very rare).  
*Dose:* apply eye drops or eye ointment every 3 hours.  
  - *Phenicol Eye Drops 0.5%*;  
  - *Phenicol Eye Ointment 1%*

**FUSIDIC ACID**

Contains 1% w/w fusidic acid anhydrous (as the hemihydrate).  
*Indications:* bacterial infections of the eye caused by susceptible organisms.  
*Caution:* Prolonged use of an anti-infective may result in the development of super infection due to organisms, including fungi, resistant to that anti-infective  
*Contra-indications:* hypersensitivity; Use when contact lenses are worn.  
*Side Effects:* None Known  
*Dose:* one drop of Fucithalmic is applied in the conjunctival sac every 12th hour. Treatment should be continued for two days after the eye appears normal. On the first day of the treatment Fucithalmic may be applied more frequently e.g. every 4th hour.
Surgical prophylaxis, one drop of Fucithalmic every 12th hour 24-48 hours before operation.

- **Fucithalmic 1 % Viscous Eye Drops**

**GENTAMICIN**

*Indications:* infection of the eye caused by susceptible bacteria and Pseudomonas aeruginosa.

*Dose:* Apply 1 drop at least every 2 hours then reduce frequency as infection is controlled and continue for 48 hours after healing.

Eye ointment

Apply either at night (if eye drops used during the day) or 3–4 times daily (if eye ointment used alone).

- **Garamycin Eye Drops 0.3%**
- **Gentacin Eye Ointment 0.3%**

**OXYTETRACYCLINE HCL**

*Indications:* conjunctivitis, blepharitis, keratitis.

*Dose:* apply 2-4 times daily.

- **Terramycin Eye Ointment 1 %**

**POLYMYXIN B SULFATE**

*Indications:* ocular bacterial infections; prophylactic use before and after surgery or removal of foreign bodies.

*Side Effects:* local irritation and dermatitis

*Dose:* 1 -2 drops two to four times daily.

- **Neosporin Eye Drops (With Gramicidin & Neomycin);**
- **Neomixin Eye Drops (With Neomycin)**

**SULFACETAMIDE SODIUM**

*Indications:* Conjunctivitis and other ocular infections susceptible to the drug. Prophylaxis of mild infections.

*Caution:* Allergy to sulfonamides

*Contra-indications:* Hypersensitivity to sulfonamides, infants below 2 months of age, epithelial herpetic simplex; keratitis, vaccinia, varicella, mycobacterium or fungal infections of the eye.

*Side Effects:* hypersensitivity reactions like itching, swelling, redness and other signs of irritation.

*Dose:* apply eye drops every 2-6 hours.
CORTICOSTEROIDS AND ANTI-INFLAMMATORY PREPARATIONS

ANTAZOLINE SULPHATE

**Indications:** allergic conjunctivitis

**Caution:** should not be used for prolonged periods, such usage may lead to rebound symptoms on withdrawal of treatment.

**Contra-indications:** glaucoma.

**Dose:** apply 2-3 times daily.

- Antistine - Privine Eye Drops (With Naphazoline)

DEXAMETHASONE

**Indications:** local treatment of inflammation.

**Caution:** aggravation of dendritic corneal ulceration; glaucoma may be produced. Not to be used for a long period except when its use is indicated.

**Contra-indications:** ocular herpes simplex and fungal infections; tuberculous lesions of the eye.

**Dose:** instill one or two drops into the conjunctival sac every hour during the day and when convenient every two hours during the night as initial therapy. After favorable response reduce to 3-4 times daily as it may be sufficient.

- Decadron Eye Drops
- Maxitrol Eye Drops (With Neomycin 0.35% & Polymyxin B 6000 Units/ml)
- Sofradex Eye Drops (With Framycetin 0.5% & Gramicidin 0.005%)

FLUOROMETHOLONE

**Indications:** acute and chronic conjunctivitis and keratitis of an allergic nature; inflammations of the anterior uvea (iritis, iridocyclitis), scleritis, episcleritis and myositis. Post-operative conditions after strabismus, cataract and glaucoma operations.

**Contra-indications:** herpes cornea, superficialis, mycosis of the cornea, and conjunctiva, tuberculous affections and ulcerous processes of the cornea.
**Ejemoline Eye Drops (With Tetrahydrozoline 0.25 mg/ml)**

**Dose:** 1 or 2 drops 2-3 times daily in the conjunctival sac. During the first 24-48 hours the dosage can be increased to 1-2 drops hourly.

**Prednisolone**

**Indications:** allergic conjunctivitis, corneal conjunctivitis, inflammation of the eye, uveitis and keratitis.

**Contra-indications:** injuries and ulcerations of the cornea including especially infections of viral and bacterial origin.

**Side Effects:** 'steroid glaucoma' may follow the use of corticosteroid eye preparations in susceptible individuals; -a 'steroid cataract' may follow prolonged use.

-Other side-effects include thinning of the cornea and sclera.

**Dose:** Apply every 1–2 hours until controlled then reduce frequency apply a little eye ointment or instill 1-2 drops in the conjunctival sac several times daily.

- **Ultracortenol Eye Drops 0.5%**
- **Ultracortenol Eye Ointment 0.5%**

**Sodium Cromoglicate**

**Indications:** allergic conjunctivitis; seasonal keratoconjunctivitis

**Side Effects:** burning and stinging

**Dose:** ADULT and CHILD 1-2 drops 4 times daily.

Safety in Pregnancy hypersensitivity to benzalkonium chloride; should be used with caution during the first trimester of pregnancy

- **Opticrom Eye Drops**
- **Cusicrom 2**
- **Dadcrom 2 %**
**MYDRIATICS AND CYCLOPLEGICS**

**ATROPINE SULFATE**

*Indications:* mydriatic and cycloplegic; it is used mainly for the treatment of iridocyclitis to prevent posterior synechiae preferably with phenylephrine 10% eye drops.

*Caution:* mydriasis may precipitate acute closed-angle (congestive) glaucoma in a few patients over 60 years of age.

*Contra-indications:* narrow-angle glaucoma.

*Dose:* 1 or more drops as required; The ointment is to be applied as necessary. It has 7 days of duration of action; Homatropine is preferred to atropine since it has a shorter duration of 24 hours.

- Atropine Eye Drops 1%
- Atropine Eye Ointment 1%

**CYCLOPENTolate HYDROCHLORIDE**

*Indications:* cycloplegia for refraction in young children.

*Caution:* raised intra-ocular pressure.

- Patients should be warned not to drive for 1–2 hours after mydriasis
- Toxic systemic reactions to and cyclopentolate may occur in the very young and the very old

*Side Effects:* transient stinging and raised intra-ocular pressure; on prolonged administration, local irritation, hyperaemia, oedema and conjunctivitis may occur.

*Dose:* Apply once and the action lasts for up to 24 hours.

- Minims Cyclopentolate Hcl 0.5%

**PHENYLEPHRINE HYDROCHLORIDE**

*Indications:* mydriatic to dilate pupil without causing cycloplegic effect.

*Caution:* as for atropine.

*Contra-indications:* patients with narrow angle between iris and cornea.

*Dose:* one drop as required.

- Phenylephrine Minims Of 2.5% & 10%
TROPICAMIDE

**Indications:** mydriatic and cycloplegic with rapid recovery; preoperative pupillary dilation (cataract operations)

**Caution:** not to drive for 1–2 hours after mydriasis

**Contra-indications:** narrow-angle glaucoma

**Side Effects:** Ocular side-effects of mydriatics and cycloplegics include transient stinging and raised intraocular pressure; on prolonged administration, local irritation, hyperaemia, oedema and conjunctivitis may occur. Contact dermatitis (conjunctivitis) is not uncommon with the antimuscarinic mydriatic drugs, especially atropine

**Dose:** for simple mydriasis, 1-2 drops; for pre-retinoscopic cycloplegia, 4-6 drops, at intervals of 5 minutes in the eye being examined. It has a duration of action of 3 hours.

- Mydriacyl Eye Drops 1%
- Tropicamide Minims 1%

TREATMENT OF GLAUCOMA

ACETAZOLAMIDE

**Indications:** adjunct in glaucoma.; reduction of intraocular pressure in open-angle glaucoma, secondary glaucoma, and peri-operatively in angle-closure glaucoma

**Caution:** not generally recommended for prolonged use but if given monitor blood count and plasma electrolyte concentration; pulmonary obstruction (risk of acidosis); elderly; pregnancy, avoid extravasation at injection site (risk of necrosis);

**Contra-indications:** hypokalaemia, hyponatraemia, hyperchloraemic acidosis; severe hepatic impairment; renal impairment, sulphonamide hypersensitivity

**Side Effects:** nausea, vomiting, diarrhoea, taste disturbance; loss of appetite, paraesthesia, flushing, headache, dizziness, fatigue, irritability, depression; thirst, polyuria; reduced libido; metabolic acidosis and electrolyte disturbances on long-term therapy; occasionally, drowsiness, confusion, hearing disturbances, urticaria, malaena, glycosuria, haematuria, abnormal liver function, renal calculi, blood disorders including agranulocytosis and thrombocytopenia, rashes
including Stevens-Johnson syndrome and toxic epidermal necrolysis; rarely, photosensitivity, liver damage, flaccid paralysis, convulsions; transient myopia reported

**Dose:** by mouth or by I.V. injection, initially 500 mg, subsequent doses 250 mg every 6 hours.

- Diamox Tablets 250 mg
- Diamox Injection 500 mg Per Vial

**DIPIVEFERINE HYDROCHLORIDE**

It is a pro-drug of adrenaline

**Indications:** control of intra-ocular pressure in chronic open-angle glaucoma and ocular hypertensive patients

**Caution:** aphakic patients; pregnancy; children patients with hypertension and heart disease.

**Contra-indications:** narrow-angle glaucoma; hypersensitivity to the drug.

**Side Effects:** Include severe smarting and redness of the eye

**Dose:** One drop every 12 hours.

In transferring patients from other anti-glaucoma therapy (other than epinephrine), continue the previous medicines with dipiveferine for the first day only and then discontinue them on the following day

- Propine Eye Drops 0.1%

**PILOCARPINE NITRATE**

**Indications:** chronic non-congestive glaucoma and to reverse mydriasis.

**Caution:** A darkly pigmented iris may require higher concentration of the miotic or more frequent administration and care should be taken to avoid overdosage. Retinal detachment has occurred in susceptible individuals and those with retinal disease; therefore fundus examination is advised before starting treatment with a miotic. Care is also required in conjunctival or corneal damage. Intra-ocular pressure and visual fields should be monitored in those with chronic simple glaucoma and those receiving long-term treatment with a miotic. Miotics should be used with caution in cardiac disease, hypertension, asthma, peptic ulceration, urinary-tract obstruction, and Parkinson's disease. Blurred
vision may affect performance of skilled tasks (e.g. driving) particularly at night or in reduced lighting.

**Contra-indications:** conditions where pupillary constriction is undesirable such as acute iritis, anterior uveitis and some forms of secondary glaucoma. They should be avoided in acute inflammatory disease of the anterior segment.

**Side Effects:** Ciliary spasm leads to headache and browache which may be more severe in the initial 2–4 weeks of treatment (a particular disadvantage in patients under 40 years of age). Ocular side-effects include burning, itching, smarting, blurred vision, conjunctival vascular congestion, myopia, lens changes with chronic use, vitreous haemorrhage, and pupillary block

**Dose:** glaucoma, 1 drop 3-6 times daily; miosis, 1 drop of 1% solution.

- Pilocarpine Eye Drops 2% & 4%
- Pilocarpine Eye Ointment 2%

**TIMOLOL MALEATE**

**Indications:** chronic simple glaucoma.

**Caution:** caution is necessary in patients with asthma, bradycardia or heart failure.

**Side Effects:** ocular stinging, burning, pain, itching, erythema, dry eyes and allergic reactions including anaphylaxis and blepharoconjunctivitis; occasionally corneal disorders have been reported.

**Drug Interactions:** Since systemic absorption may follow topical application the possibility of interactions, in particular, with drugs such as verapamil should be borne in mind

**Dose:** 1 drop twice daily.

- Timoptol Eye Drops 0.5%

**DORZOLAMIDE + TIMOLOL**

**Indications:** raised intra-ocular pressure in ocular hypertension, open-angle glaucoma, pseudo-exfoliative glaucoma adjunct to beta-blocker

**Cautions:** hepatic impairment; systemic absorption follows topical application; history of renal calcul; chronic corneal defects, history of intra-ocular surgery;
**Eye**

*Contra-indications:* severe renal impairment of hyperchloraemic acidosis, pregnancy and breast-feeding

*Side-Effects:* ocular burning, stinging and itchig, blurred vision, lacrimatin, conjunctivitis, super-ficial punctuate keratitis, eyelid inflammation and crusting anterior uveitis, transient myopia, corneal oedema, iridocyclitis, headache, dizziness, paraesthesia, asthena, sinusitis, rhinitis, nausea, hypersensitivity reactions (including urticaria, angio-edema, bronchospasm); bitter taste, epistaxis, urolithiasis.

*Dose:* for raised intra-ocular pressure in open-angle glaucoma, or pseudoexfoliative glaucoma when beta-blockers alone not adequate, apply twice daily.

- *Cosopt Ophthalmic Solution* contains *Dorzolamide (as hydrochloride)* 2%, *Timolol (as maleate)* 0.5%

**LOCAL AESTHETICS**

**OXYBUPROCAINE HYDROCHLORIDE**

*Indications:* surface anesthesia of the cornea; local anesthesia during eye surgery

*Contra-indications:* hypersensitivity reactions to the drug.

*Dose:* topical anesthesia of the cornea, in removal of superficial foreign bodies, one drop 3 times over 5 minutes; Removal of deep-seated foreign bodies, one drop 5-10 times at intervals of 30-60 seconds. Tonometry, gonioscopy, 1 -2 drops Local anesthesia prior to injection or surgery, one drop 3 times over 5 minutes.

- *Novesine Eye Drops 0.4%*

**TETRACAINE HYDROCHLORIDE**

*Indications:* anesthesia of cornea and conjunctiva for ophthalmic procedures.

*Caution:* hypersensitivity.

*Dose:* one drop as required.

- *Tetracaine Hydrochloride Eye Minims 1%*
**TEAR SUBSTITUTES AND LUBRICANTS**

**BALANCED SALT SOLUTION (BSS)**
A sterile iso-osmotic solution containing sodium chloride 0.49%, potassium chloride 0.075%, calcium chloride 0.048%, magnesium chloride 0.03%, sodium acetate 0.39%, and sodium citrate 0.17%.

*Indications:* for intra-ocular and topical irrigation during surgical procedures. Sodium chloride 0.9% drops are sometimes useful in tear deficiency, and can be used as ‘comfort drops’ by contact lens wearers, and to facilitate lens removal. Special presentations of sodium chloride 0.9% and other irrigation solutions are used routinely for intra-ocular surgery.

- **BSS Bottles 15 ml, 500 ml**

**HYPROMELLOSE (Hydroxypropylmethylcellulose)**

*Indications:* tear deficiency; it prolongs the action of medicated eye-drops; used as artificial tears to prevent damage to the cornea in patients with keratoconjunctivitis sicca or keratitis or during gonioscopy procedures.

- **Natural Tears Eye Drops**
- **Methocel Eye Drops 2%**

**WHITE PETROLATUM**

*Indications:* adjunctive therapy to lubricate and protect the eye in exposure keratitis, decreased corneal sensitivity, recurrent corneal erosions, keratitis sicca, ophthalmic and non-ophthalmic surgeries.

*Caution:* It may cause temporary visual disturbance and are best suited for application before sleep. Ointments should not be used during contact lens wear.

*Contra-indications:* hypersensitivity reactions

*Dose:* Administration: pull lower lid to form a pocket, apply small amount of ointment in pocket as needed.

- **Lacrí-Lube Ophthalmic Ointment**
ACETYLCOLINE CHLORIDE

**Indications:** cataract surgery, penetrating keratoplasty, iridectomy, and other anterior segment surgery requiring rapid miosis.

**Side Effects:** rarely bradycardia, hypotension, breathing difficulty, sweating, flushing

**Dose:** in most cases a satisfactory miosis is produced in seconds by 1/2-2 ml.
  - **Miochol Intra-Ocular 1% Solution**

DICLOFENAC SODIUM

**Indications:** inhibition of miosis during cataract surgery (but does not possess intrinsic mydriatic properties); postoperative inflammation after cataract surgery and other surgical procedures; preoperative and postoperative prevention of cystoid macular oedema associated with lens extraction and intraocular lens implantation; non-infectious inflammatory conditions affecting anterior region of the eye; post-traumatic inflammation in penetrating and non-penetrating wounds; seasonal allergic conjunctivitis.

**Caution:** patients with bleeding tendencies or on anticoagulants

**Side Effects:** transient burning or stinging; blurred vision, local oedema, keratitis, irritation, dry eye, lacrimation, corneal infiltrates (discontinue) and staining; photophobia; headache, and rhinitis occasionally reported

**Dose:** ADULT and CHILD over 3 years, apply twice daily. preoperative, 5x1 drop over the 3 hours preceding surgery. Postoperative, 3x1 drop immediately after surgery, thereafter 3-5x1 drop daily for as long as required.
  - **Voltarol Ophtha Eye Drops 0.1% - 5 ml**

FLUORESCEIN SODIUM

**Indications:** detection of lesions and foreign bodies; examination of the ophthalmic vasculature by retinal angiography
Fluorescein sodium and rose bengal are used in diagnostic procedures and for locating damaged areas of the cornea due to injury or disease. Rose bengal is more efficient for the diagnosis of conjunctival epithelial damage but it often stings excessively unless a local anaesthetic is instilled before hand.  

**Dose:** topically by application of the tip of the strip. By I.V. injection, 500 mg. Child, 7.5 mg/kg body-weight  
- **Fluorets Strips**  
- **Fluorescein Injection 10%**

**HYALURONATE SODIUM**

Each ml contains sodium hyaluronate 10 mg, sodium chloride 8.5 mg, disodium hydrogen phosphate dihydrate 0.28 mg, sodium dihydrogen phosphate hydrate 0.04 mg in sterile water for injection.  

**Indications:** eye surgery. It maintains a deep anterior chamber during surgery, allowing for efficient manipulation with fewer traumas to the corneal endothelium and other surrounding tissues; its visco-elasticity helps to push back the vitreous fluid and prevent formation of a postoperative flat chamber. It is slowly removed after 6 days if left in the anterior segment of the eye after operation.  

**Caution:** increased intra-ocular pressure due to overfilling of the anterior or posterior segments of the eye.  

**Side Effects:** post operative inflammatory reactions, corneal oedema, corneal decompensation, transient post operative rise in intra ocular pressure.  

**Dose:** it varies with the type of surgery. Usually a dose of 0.2 to 0.6 ml is introduced through a thin cannula into the anterior segment of the eye during surgery, whereas larger amounts are used in the posterior segment.  
- **Haelon Injection**

**BRIMONIDINE**

a selective alpha2-adrenoceptor stimulant.  

**Indications:** raised intra-ocular pressure in open-angle glaucoma or ocular hypertension in patients for whom beta-blockers are inappropriate; as adjunctive therapy
when intra-ocular pressure is inadequately controlled by other antiglaucoma therapy.

**Caution:** severe cardiovascular disease; cerebral or coronary insufficiency, Raynaud's syndrome, postural hypotension, depression, hepatic or renal impairment; pregnancy, breast-feeding; Drowsiness may affect performance of skilled tasks (e.g. driving).

**Side Effects:** conjunctival hyperaemia, burning, stinging, pruritus, allergy, and conjunctival folliculosis, visual disturbances, blepharitis, epiphora, corneal erosion, superficial punctate keratitis, eye pain, discharge, dryness, and irritation, eyelid inflammation, oedema, pruritus conjunctivitis, photophobia; also, hypertension, headache, depression, dry mouth, fatigue, drowsiness; *less commonly*, taste disturbances, palpititation, dizziness, syncope, rhinitis, nasal dryness.

**Dose:** Apply twice daily

- *Alphagan Eye Drop*

### OFLOXACIN

**Indications:** active against a wide variety of bacteria.

**Caution:** Pregnancy, breast feeding: not to be used for more than 10 days.

**Side Effects:** local irritation including photophobia; dizziness, numbness, nausea and headache.

**Dose:** Apply 1 drop at least every 2 hours then reduce frequency as infection is controlled and continue for 48 hours after healing

- *Exocin Eye Drop*

### NEPHAZOLINE NITRATE 0.05MG+ZINC SULPHATE 0.02MG

**Indications:** Acute and chronic non-infectious conjunctivitis. Unspecific conjunctival irritations, including allergies. After successful treatment of bacterial and viral infections. Irrigation of the tear duct.

**Caution:** hyperthyroidism, cardiovascular disease, hypertension, diabetes mellitus or hyperglycemia and eye disease, infection or injury; Contact lens to be removed before instillation and are not to be worn for at least 15 minutes after application.
**Contra-indications:** Hypersensitivity; narrow-angle glaucoma, dry eye and keratoconjunctivitis sicca; Not to be used in infants; Not to be administered during Monoamine oxidase inhibitors or within 14 days of termination of such treatment. In pregnancy and lactation as safety has not been established.

**Side Effects:** slight and transient burning; mydriasis; blurred vision and a slight increase in intra-ocular pressure. Long term use may result in reactive redness of the eye (rebound effect). Systemic absorption, especially in children and the elderly has been reported following ocular application of naphazoline containing solutions. Symptoms of naphazoline being absorbed into the body are dizziness, headache, increased sweating, nausea, nervousness and weakness.

**Caution:** concurrent use of tricyclic antidepressants, as this will potentiate the pressor effect of naphazoline, should systemic absorption of naphazoline take place following ocular administration.

**Dose:** Use only as directed. one drop into the lower eyelid four times per day.

-  *Oculosan Eye Drops*

**LATANOPROST**

**Indications:** raised intra-ocular pressure in open-angle glaucoma; ocular hypertension

**Caution:** before initiating treatment, advise patients of possible change in eye colour; monitor for eye colour change; aphakia, or pseudophakia with torn posterior lens capsule or anterior chamber lenses; risk factors for iritis, uveitis, and cystoid macular oedema; brittle or severe asthma; not to be used within 5 minutes of use of thiomersal-containing preparations; Pregnancy; Breast Feeding.

**Side Effects:** brown pigmentation particularly in those with mixed-colour irides; blepharitis, ocular irritation and pain; darkening, thickening and lengthening of eye lashes; conjunctival hyperaemia; transient punctate epithelial erosion; skin rash; less commonly eyelid oedema and rash; rarely dyspnoea, exacerbation of
asthma, iritis, uveitis, local oedema, darkening of palpebral skin; very rarely chest pain, exacerbation of angina

**Dose:** Apply once daily, preferably in the evening; **CHILD** not recommended

- Xalatan 50 mcg / ml
**EAR, NOSE, AND OROPHARYNX**

**DRUGS ACTING ON THE EAR**

**CHLORAMPHENICOL**
*Indications:* bacterial infection in otitis externa.
*Cautions:* perforation of the tympanic membrane; avoid prolonged use; hypersensitivity with prolonged use.
*Side effects:* hypersensitivity reaction due to its vehicle, propylene glycol including rashes, fever; angioedema may occur.
*Dose:* 2-3 drops into the ear, 2-3 times daily.
  - Chloramphenicol Ear Drops 5%

**DEXAMETHASONE**
*Indications:* eczematous inflammation in otitis externa.
*Cautions:* avoid prolonged use.
*Contraindications:* untreated infection.
*Side effects:* hypersensitivity reactions.
*Dose:* apply 2-3 drops 3-4 times daily.
  - Sofradex Ear & Eye Drops 0.05% Contains Dexamethasone Sodium Metasulphobenzoate 0.05% + Framycetin Sulphate 0.5% + Gramicidin 0.005%

**FLUMETASONE PIVALATE**
*Indications:* bacterial and fungal infection in the otitis externa, eczema of auditory meatus, otomycosis.
*Cautions:* perforation of the tympanic membrane; avoid prolonged use; hypersensitivity reactions may occur.
*Contraindications:* untreated infection.
*Side effects:* local sensitivity reactions.
*Dose:* 2-3 drops into the ear twice daily for up to 10 days.
  - NOT recommended for children under 2 years.
  - Locacorten Vioform Ear Drops Contains Flumetasone Pivalate 0.02% + Clioquinol (A Compound With The Antibacterial & Antifungal Activity Contraindicated In Children).
### GENTAMICIN

**Indications:** bacterial infection in otitis externa.

**Cautions:** prolonged use; tympanic perforation.

**Contraindications:** perforated tympanic membrane.

**Dose:** apply 3-4 times daily.
- [ ] Genticin Ear Drops 0.3%

### OLIVE OIL

**Indications:** to soften ear wax.
- [ ] Olive Oil Ear Drops

### OTOSPORIN

It is an eardrop contains hydrocortisone 1%, neomycin sulphate 3400 units, poly-mixin B sulphate 10,000 unit/ml.

**Indications:** eczematous inflammation in otitis externa.

**Cautions:** avoid prolonged use

**Contraindications:** untreated infection

**Side effects:** local sensitivity reactions

**Dose:** Adult and child over 3 years, apply 3 drops into ear 3-4 times daily
- [ ] Otosporin Ear Drops

### SODIUM BICARBONATE

**Indications:** soften and remove wax.
- [ ] Sodium Bicarbonate Ear Drops 5%

### DRUGS ACTING ON THE NOSE

Oral decongestants such as oral antihistamines and some sympathomimetics are discussed under respiratory system.

### BECLOMETASONE DIPROPIONATE (Beclometasone dipropionate)

**Indications:** allergic rhinitis.

**Cautions:** pregnancy, untreated nasal infection; nasal surgery (until healing has occurred); pulmonary tuberculosis; prolonged use, previous treatment with corticosteroids by mouth; children under 6 years.
Side effects: Local side effects include dryness, irritation of nose and throat, epistaxis and rarely ulcerations; nasal septal perforation (usually following nasal surgery) and glaucoma may also occur. Headache, smell disturbances and bronchospasm have been reported.

**Dose:** Adult and children over 6 years, apply (1 spray) 50 mcg in each nostril 4 times daily (maximum 400 mcg; 8 spray). When symptoms controlled, dose reduce to 50 mcg (1 spray) into each nostril twice daily.

- Beconase Aerosol 50 mcg/Metered Spray

**BENZOIN TINCTURE**

**Indications:** treatment of catarrh of the upper respiratory tract.

**Cautions:** not advised for infants under the age of 3 months

**Method of use:** add 5 ml of the benzoin tincture to 500 ml of hot water (not boiling) and inhale the vapor.

- Benzoin Tincture Inhalation 1%

**DIMETHINDENE MALEATE**

**Indications:** symptomatic treatment of cough and common cold, acute and chronic rhinitis, hay fever, acute and chronic sinusitis.

**Dose:** adult and child over 6 years, after blowing the nose carefully, apply as deeply as possible into each nostril, 3-4 times daily.

One application at bedtime keeps the nose clear for the night.

- Vibrocil Nasal Gel (Dimethindene + Phenylephrine)

**GLUCOSE IN GLYCERIN**

This should be sterilized by autoclaving for 1 hour and filled in sterile bottles.

**Indications:** softening the nasal crust.

- Glucose 25% In Glycerin Nose Drops

**XYLOMETAZOLINE HYDROCHLORIDE**

**Indications:** nasal congestion.
Side effects: (see ephedrine) It may cause a hypertensive crisis if used during treatment with MAO-inhibitors including moclobemide.

Dose: instill xylometazoline HCl 0.1% 2-3 drops into each nostril 2-3 times daily when required; maximum duration 7 days; not recommended for children over 12 years. Instill xylometazoline HCl 0.05% 1 – 2 drops into each nostril 1 – 2 times daily when required. Not recommended for infants under 3 months of age.

- Otrivine Drops 0.1% Adult
- Otrivine Drops 05% (Children Over 3 months)

DRUGS ACTING ON THE OROPHARYNX

BORIC ACID

Indications: paint for throat and tongue in children and to alleviate dryness of the mouth.

- Boroglycerin Paint 5%

CHOLINE SALICYLATE

Indications: relief of pain and discomfort of common mouth ulcers, cold sores, denture sore spots and infant teething.

Caution: Excessive use, specially in children, can lead to salicylate poisoning.

Dose: using a clear finger, massage approximately ½ inch of the gel onto the sore area, not more than once every three hours; child over 4 months ¼ inch of gel, not more than every 3 hrs; max. 6 applications daily.

- Bonjela Gel

CHLORHEXIDINE GLUCONATE

It is a mouthwash contain chlorhexidine gluconate 0.2%.

Indications: oral hygiene and plaque inhibition.

Caution: It may be incompatible with some ingredients in toothpaste; leave an interval of at least 30 minutes between using mouthwash and toothpaste.

Side-effects: mucosal irritation (if desquamation occurs, discontinue treatment of dilute mouthwash with an equal volume of water); taste disturbances; reversible brown
staining of teeth; tongue discoloration; parotid gland swelling.

**Dose:** rinse mouth with 10 ml for about 1 minute twice daily.

- **Chlorhexidine 0.2% Mouthwash**

**HEXETIDINE**

It is a mouthwash gargle, contains 0.1% hexetidine.

**Indications:** mouth and throat infection (oral hygiene).

**Dose:** Adult and child over 6 years, use 15 ml undiluted 2-3 times daily.

- **Oraldene 0.1% Mouth Wash**

**HYDROGEN PEROXIDE**

**Indications:** mouth wash, cleansing agent for discharging ulcers and abscesses.

**Cautions:** avoid prolonged use; not to be ingested.

**Dose:** use 15 ml of the 3% to rinse the mouth for 2-3 minutes. If using the 6% (20 volumes), use 15 ml in half tumbler-full of warm water 2-3 times daily.

- **Hydrogen Peroxide Diluted To 10 Volumes (3%)**

**NYSTATIN**

**Indications:** oral and perioral fungal infections.

**Dose:** place 1 ml in the mouth and retain near lesions 4 times daily; should be continued for 48 hours after clinical cure.

- **Mycostatin Suspension 100,000 Units/ml**

**SOLCOSERYL**

It consists of deproteinized calves blood extract 5% (haemodialysate and polidocanol 1% (local anaesthetic).

**Indications:** painful and inflammatory infections of the oral mucosa, gums and lips; denture pressure sores; teething pain.

**Dose:** apply a thin layer to the lesion 3-5 times daily. Paste should not be rubbed and should be applied to a dry area for better adhesion.

- **Solcoseryl Dental Adhesive Paste**
- **Bonjela**
SKIN

EMOLLIENT AND BARRIER PREPARATIONS

PANTHENOL
Indications: wounds, burns and fissures.
Administration: apply once or twice daily;
For fissured nipples; apply as a dressing immediately after each feed.
- Bepanthen Cream 5%
- Dexipan Cream 5%

VASELINE (White soft paraffin)
Indications: ointment base; emollient in skin disorders.
- Aqueous Cream
- Emulsifying Ointment

ZINC OXIDE
Indications: napkin rash, urinary-rash and eczematous conditions
- Zinc Oxide Cream 32 % W/W

ANTI-PRURITIC PREPARATIONS

CALAMINE
Indications: Pruritis
- Calamine Lotion (Calamine 15% With Zinc Oxide 5%)
- Calamine Cream (Calamine 4% With Zinc Oxide 3%)

CROTAMITON
Indications: pruritis and scabies.
Caution: avoid use near eyes and broken skin; children under 3 years.
Contraindications: acute exudative dermatoses.
Dose: scabies, apply over the whole body omitting the head and neck, after a hot bath, and remove by washing the following day. The application may be repeated 24
hours later but a bath should not be taken until the following day. Pruritis, apply 2-3 times daily.
Child below 3 years, apply once daily.

- *Eurax Cream 10%*

**TOPICAL CORTICOSTEROIDS**

**BETAMETHASONE VALERATE**

**Indications:** Severe inflammatory skin disorders such as eczema in patients unresponsive to less potent corticosteroids

**Caution:** Applications of more than 100 g per week of 0.1% preparation is likely to cause adrenal suppression. Should not be used indiscriminately in pruritis; avoid prolonged use in children and infants; (extreme caution in dermatoses of infancy including napkin rash where possible treatment should be limited to 5-7 days); avoid prolonged use on the face.

**Contraindications:** In infants and young children; rosacea, perioral dermatitis; acne vulgaris; untreated bacterial, fungal, or viral skin lesions.

**Side Effects:** Absorption is greatest from areas of thin skin, raw surfaces, and intertriginous areas and is increased by occlusion; spread and worsening of untreated infection; reversible thinning of the skin but irreversible striae atrophicae; increased hair growth, perioral dermatitis.

**Dose:** Apply sparingly 2-3 times daily, reducing strength and frequency as condition responds.

- *Betaxone Cream 0.1%*
- *Betaxone Ointment 0.1%*
- *Celestoderm- V Lotion 0.1%*

**FLUMETASONE PIVALATE**

**Indications:** Acute to hyper chronic, inflammatory and/or dysplastic skin disease; hyperkeratotic conditions; eczema; neurodermatitis, psoriasis vulgaris.

**Caution:** Long term treatment especially of the facial skin should always be avoided regardless of the patient's age; infants and children should be treated with caution; occlusive dressings should be of limited duration and
confined to small areas of diseased skin; patients with severe renal failure in view of the possibility of salicylate absorption; acute weeping stages or subacute stages if there is still risk of exudation, mucous membranes.

**Contraindications:** Tuberculosis of the skin, syphilitic skin affections, and fresh virus infections of the skin; hypersensitivity to any of the components; perioral dermatitis, acne vulgaris, rosacea.

**Side Effects:** local sensitivity reactions

**Dose:** apply sparingly once or twice daily.
- Locasalen Ointment 0.02% *(With 3% Salicylic Acid)*

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**FLUCINOLONE ACETONIDE**

**Indications:** inflammatory skin disorders such as eczema; soriasis.

**Caution:** breast-feeding during prolonged treatment

**Contraindications:** bacterial, fungal or viral infections of the skin.

**Side Effects:** irritation, folliculitis, hypertrichosis, acne, decrease in skin pigmentation. Side-effects increase with occlusion.

**Dose:** apply sparingly 2-3 times daily reducing strength and frequency as condition responds.
- Synalar Cream 0.025%
- Synalar Ointment 0.025%

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**HYDROCORTISONE**

**Indications:** mild inflammatory skin disorders.

**Caution:** avoid extensive and prolonged use; infants and children; avoid prolonged use on the face.

**Contraindications:** Untreated bacterial, fungal or viral skin lesions.

**Dose:** Apply sparing 2-3 times daily, reducing strength and frequency as condition responds
- Alfacort Cream 1%

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**MOMETASONE FUROATE**

**Indications:** severe inflammatory skin conditions; pruritic manifestations; psoriasis and atopic – dermatitis

**Caution,** contraindications & side effects: As for betamethsone valerate
**Skin**

**Dose:** a thin film is applied once daily

- *Elocom Cream 0.1%*
- *Elocom Ointment 0.1%*

**PREPARATION FOR PSORIASIS AND ECZEMA**

**ACITRETIN**

This is a metabolite of etretinate

**Indications** severe resistant or complicated psoriasis, congenital disorders of keratinization including Darier's disease (keratosis follicularis).

**Caution:** avoid in hepatic impairment, monitor liver function and plasma lipids (especially in patients with hypertriglyceridaemia) 1 month after initiating treatment and then at 3 monthly intervals. Exclude pregnancy before starting; patients should avoid pregnancy at least 1 month before, during and for at least 2 years after treatment; should avoid concomitant high doses of vitamin A and should not donate blood during or for 2 years after stopping therapy (teratogenic risk); radiographic assessment on long-term treatment; investigate atypical musculoskeletal symptoms; avoid long term use in children (skeletal hyperostosis and extra-osseous calcification).

**Contraindications:** hepatic and renal impairment; pregnancy and breast-feeding.

**Side Effects:** (Mainly dose-related) dryness and erosion of mucous membranes, scaling, thinning erythema and pruritis of skin and conjunctiva; palmar and plantar exfoliation, epistaxis and epidermal fragility; paronychia, reversible alopecia; myalgia and anthralgia; nausea, headache, malaise, drowsiness and sweating; benign intracranial hypertension; raised liver enzymes, jaundice and hepatitis, raised triglycerides.

**Dose:** initially 25-30 mg daily for 2-4 weeks.

Maintenance, 25-50 mg daily (may reach 75 mg in some cases) for further 6-8 weeks.

Child, (in very exceptional cases only) 500 mcg/kg daily with careful monitoring of musculoskeletal development.

- *Neotigason 10mg, 25mg Capsules*
CALCIPTRIOL
This is a vitamin D analogue that affects cell division and differentiation.

**Indications:** plaque psoriasis

**Caution:** pregnancy; not to be used on the face; careful hand washing after use is recommended; children; risk of hypercalcaemia if maximum recommended weekly dose exceeded.

**Contraindications:** hypersensitivity to the drug constituents; disorders of calcium metabolism.

**Side Effects:** transient local irritation; facial dermatitis may occur; photosensitivity; skin atrophy

**Dose** Cream or ointment apply once or twice daily; max. 100g weekly (less with scalp solution); child over 6 years, apply twice daily; 6–12 years max. 50g weekly; over 12 years max. 75g weekly

- Divonex 0.005% W/W Ointment & Cream
- Divobet (Plus Steroid)

ICHTHAMMOL

**Indications:** Chronic eczema

**Caution:** Avoid application to broken or inflamed skin.

**Side Effects:** skin irritation

Dose and administration: Apply 1–3 times daily

- Ichthyol Ointment 10%

SALICYLIC ACID

**Indications:** hyperkeratoses.

**Caution:** avoid broken or inflamed skin.

**Side-effects:** sensitivity, excessive drying, irritation, systemic effects after prolonged use.

**Administration:** apply to hydrated skin, cover with an occlusive dressing, preferably overnight and remove by washing; wash hands thoroughly after use.

- Salicylic Acid Ointment 2%

PREPARATIONS FOR ACNE

SALICYLIC ACID

**Indications:** acne vulgaris.

**Administration:** apply to clean skin once twice daily.
ISOTRETINOIN

It is an isomer of tretinoin.

**Indications:** severe forms of nodulo-cystic acne which are resistant to previous therapy, particularly cystic acne and conglobate acne especially when the lesions involve the trunk.

**Caution:** liver function should be checked before and one month after the start of treatment, and subsequently at three month intervals; serum lipids should also be checked.

**Contraindications:** blood donation by patients who are treated (one or two weeks) with the drug to women of child-bearing age is contra-indicated; pregnancy; hepatic and renal insufficiency; hypervitaminosis A; patients with excessively elevated blood lipid values; hypersensitivity to the drug; concurrent use of other keratolyses or exfoliative acne drugs; exposure to sun; U.V. exposure.

**Side Effects:** dryness of the skin, nasal mucosa and conjunctiva; visual disturbances; malaise and drowsiness; change in blood picture; mood changes and depression.

**Drug Interactions** possible increased risk of benign intracranial hypertension when retinoids given with tetracyclines; risk of hypervitaminosis A when given with vitamin A; it possibly reduces plasma concentration of carbamazepine.

**Dose:** Initially, 500 mcg/kg daily; after 4 weeks the dose is adjusted within the range of 0.1-1.0 mg/kg daily. The max. dose of 1 mg/kg daily should be given for only a limited period of time.

Treatment lasts for 16 weeks. There is often an improvement after the discontinuation of the treatment and thus a period of at least 8 weeks is needed before restarting the treatment.

PREPARATIONS FOR WARTS AND CALLUSES

**SALICYLIC ACID**

**Indications:** removal of warts and hard skin.
Skin

**Cautions:** avoid normal skin and application to large areas; application to the face and ano-genital region is contra-indicated for most salicylic acid preparations.

**Administration:** apply daily.
- Salicylic Acid Ointment 20% & 30%
- Wart Paint It Contains Liquid Phenol 10%, Glacial Acetic Acid 10%, Salicylic Acid 1%, Iodine Tincture In Methylated Spirit 20%

**ANTI-INFECTIVE SKIN PREPARATIONS**

**ANTI-BACTERIAL PREPARATIONS**

**FUSIDIC ACID**

**Indications:** staphylococcal skin infections and abscesses.

**Caution:** avoid contact with eyes.

**Side Effects:** rarely hypersensitivity reactions

**Dose:** Apply 2-3 times
- Fucidin Cream 2%
- Fucidin Ointment 2%

**MUPIROCIN**

This is a topical broad-spectrum antibiotic.

**Indications:** bacterial skin infections e.g. impetigo, folliculitis, and furunculosis.

**Caution:** as with other polyethylene based ointments, the preparation should be used with caution in moderate or severe renal impairment

**Side Effects:** local reactions including urticaria, pruritus, burning sensation, rash

**Dose** Apply up to 3 times daily for up to 10 days; infant under 1 year not recommended
- Bactroban Ointment 2%

**NEOMYCIN SULFATE**

**Indications:** bacterial skin infections.

**Caution:** If large areas of skin are being treated - ototoxicity may be a hazard, particularly in children, in the elderly, and in those with renal impairment.
Contraindications: In neonates

Side Effects: sensitization

Dose: apply up to 3 times daily; for short-term use only:
- Neomycin & Bacitracin Cream

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**NITROFURAZONE**

Indications: superficial skin infections.

Side Effects: local hypersensitivity reactions.

Dose: apply 3 or more times daily.
- Furacin Soluble Dressing 0.2%

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**SILVER SULFADIAZINE**

Indications: skin infections, particularly Gram-negative infections such as pseudomonas infections in second and third degree burns, infected leg ulcers, and pressure sores.

Caution: hepatic and renal impairment; G6PD deficiency; pregnancy and breast-feeding.

Contraindications: sensitivity to sulfonamide. not recommended for neonates

Side Effects: rarely allergic reactions including burning, itching and rashes; argyria reported following prolonged use; leucopenia reported (monitor blood levels)
- Flamazine Cream 1%

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**ANTI-FUNGAL PREPARATIONS**

**ISOCONAZOLE NITRATE**

Indications: Fungal skin infections

Caution: avoid contact with eyes.

Contraindications: tuberculous or syphilitic skin infections; viral infections; pregnancy.

Side Effects: occasional skin irritation or sensitivity.

Dose & Administration: apply twice daily continuing for 10 days after lesions have healed.

Nail infections, apply daily under occlusive dressing.
- Daktarin Cream 2%
- Travacort Cream 1% (With 0.1% Diflucortolone Valerate)

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**NYSTATIN**

Indications: skin infections due to Candida spp
**TERBINAFINE**

**Indications:** dermatophyte fungal infections of the skin; ringworm infections where oral therapy is considered appropriate; renal and hepatic impairment; oral treatment should be used only when topical treatment is not practicable.

**Side Effects:** abdominal discomfort, anorexia, nausea, diarrhoea; headache; rash and urticaria occasionally with arthralgia or myalgia; less commonly taste disturbance; rarely liver toxicity (including jaundice, cholestasis and hepatitis)—discontinue treatment; angioedema, dizziness, malaise, paraesthesia, hypoaesthesia, photosensitivity, serious skin reactions (including Stevens-Johnson syndrome and toxic epidermal necrolysis) —discontinue treatment if progressive skin rash; very rarely psychiatric disturbances, blood disorders (including leucopenia and thrombocytopenia), lupus erythematosus-like effect, and exacerbation of psoriasis.

**Dose:**
- Adults, 250 mg once daily for 2-6 weeks in tinea pedis, 2-4 weeks in tinea corporis, tinea criris and cutaneous candidiasis.
- Nail infections, 250 mg once daily for 6 weeks - 3 months.
- Toenail infections- longer treatment is required. Child: usually for 2 weeks, tinea capitis, over 1 year, body-weight 10–20 kg, 62.5 mg once daily; body-weight 20–40 kg, 125 mg once daily; body-weight over 40 kg, 250 mg once daily

**Lamisil Tablets 250 mg**

**THIOSULFATE SODIUM**

**Indications:** pityriasis versicolor, ring worm infections

**Dose:** Apply once or twice daily.

**Sodium Thiosulfate Lotion 20%**
PARASITICIDAL PREPARATIONS

BENZYL BENZOATE

**Indications:** scabies, pediculosis

**Caution:** children (not recommended), avoid contact with eyes and mucous membranes; do not use on broken or secondarily infected skin

**Side Effects:** slight skin irritation, transient burning sensation especially on genitalia and excoriations, occasionally rashes.

**Dose:** Apply over the whole body; repeat without bathing on the following day and wash off 24 hours later; a third application may be required in some cases

**Note:** Not recommended for children—dilution to reduce irritant effect also reduces efficacy. Some manufacturers recommend application to the body but to exclude the head and neck. However, application should be extended to the scalp, neck, face, and ears

**Safety in Breast Feeding:** suspend feeding until product has been washed off.

- Benzyl Benzoate Application 25%:

DISINFECTANTS AND CLEANSERS

ALCOHOL

**Indications:** skin preparation before injection

**Cautions:** flammable, avoid broken skin.

- Surgical Spirit 70%
- Industrial Methylated Spirit

CETRIMIDE

**Indications:** skin disinfection; soap or shampoo substitute in acne, skin infections and seborrhoea of the scalp.

**Caution:** avoid contact with eyes; avoid use in body cavities.

**Side Effects** skin irritation and occasionally sensitisation

- Cetavlon Solution 1% & 20%
- Hibicet Hospital Concentrate (With Chlorhexidine)
### Skin

#### CHLORHEXIDINE

**Indications**: instead of soap as pre-operative scrub or disinfectant wash for hands and skin.

**Caution**: avoid contact with eyes, brain, meninges and middle ear; not for use in body cavities.

**Side Effects**: hypersensitivity reactions.
- Chlorhexidine Alcoholic Solution 0.5%
- Chlorhexidine Aqueous Solution 0.02%
- Hibicit Hospital Concentrate (With Cetrimide).
- Hibicit Aqueous Solution 1%
- Hibicit Alcoholic Solution 1:30.
- Hibiscrub Cleansing Solution 4%
- Hibitane Obstetric Cream 1%

#### CRYSTAL VIOLET (Gentian Violet)

**Indications**: minor skin wounds.

**Caution**: stains clothes and skin.
- Gentian Violet Paint 0.5%

#### ETHER

**Note**: solvent ether is not intended for anaesthesia; only ether of a suitable quality should be used.

**Indications**: cleansing the skin before surgical operations and for removal of adhesive plaster from the skin.

Its use in the topical treatment of herpes simplex virus infections has inconsistent results.

#### GLUTARALDEHYDE

**Indications**: warts, particularly plantar warts.

**Caution**: protect surrounding skin; not for application to face, mucosa, or anogenital areas.

**Side Effects**: rashes, skin irritation (discontinue if severe); stains skin brown.

**Dose**: Apply twice daily
- Cidex
- Oph-Cidex “Ortho-Phthalaldehyde

#### HYDROGEN PEROXIDE

**Indications**: skin disinfection, particularly cleansing and deodorizing wounds ulcers.
Skin

**Caution**: bleaches fabric; solutions above 6% (20 volumes) should be diluted before application to the skin. Incompatible with products containing iodine and potassium permanganate.

- **Hydrogen Peroxide 3% (10 Volumes)**

**Kenacomb cream & ointment**

**Indications**: for use in corticosteroid responsive severe inflammatory skin disorders such as Atopic dermatitis, Seborrhoeic dermatitis, Lichen simplex chronicus, Psoriasis (particularly of the face and body folds) and Allergic contact dermatitis. Cream permits use in moist intertrigenous areas.

**Caution**: Prolonged use may result in overgrowth if non-susceptible organisms, including fungi other than candida; use with particular caution in facial dermatoses, and only for short periods. A rosacea-like faces may be produced. Use with caution near the eyes.

**Contraindications**: patients with tuberculous lesions, topical or systemic viral infections, ophthalmic use, nor should it be applied in the external auditory canal of patients with perforated eardrums. Pregnancy.

**Side Effects**: Burning, itching, irritation, dryness, folliculitis, hypertrichosis, acne form eruptions, hypopigmentation, perioral dermatitis, allergic contact dermatitis, maceration of the skin, secondary infection, skin atrophy, striae, and miliaria due to corticosteroid.

Nystatin is well tolerated even with prolonged therapy. Irritation and cases of contact dermatitis have been reported. Delayed type hypersensitivity reactions have been reported during use of neomycin; sensitization has been reported following prolonged use. Ototoxicity and nephrotoxicity have been reported when applied to large surfaces or damaged skin. Sensitivity reactions to gramicidin have been reported.

**Dose**: Apply a thin film of ointment or rub the cream to the affected areas 2 or 3 times daily.

**Safety in Pregnancy**: Teratogenic

- **Kenacomb Cream & Ointment**

Each gram contains 100,000 units nystatin, 2.5 mg neomycin base (as sulphate), 0.25 mg gramicidin, and 1.0 mg triamcinolone acetonide.
**ACYCLOVIR**

**Indications:** local treatment of herpes simplex and varicella-zoster infections.

**Caution:** avoid contact with eyes and mucous membrane

**Side Effects:** local irritation and inflammation reported; very rarely hypersensitivity reactions including angioedema

**Dose:** Apply 5 times daily (continue for at least 3 days after complete healing)

- Zovirax Eye Ointment 3%
ANESTHESIA

GENERAL ANESTHETICS

INTRAVENTOUS ANESTHETICS

KETAMINE

Indications: sole anesthetic for surgical procedure for two or more hours. For the induction of anesthesia prior to the administration of other general anesthetic agents. Used to supplement low potency agents such as nitrous oxide.

Caution: hypertension, eclampsia, convulsions, psychiatric diseases.

Contraindications: in patients with hypertension and is best avoided in those prone to hallucinations or nightmares; porphyria

Side Effects: cardiovascular stimulation, tachycardia, and raised arterial pressure high incidence of hallucinations, nightmares, and other transient psychotic effects

Drug Interactions: barbiturates, diazepam, hydroxyzine, tubocurarine.

Dose: By intramuscular injection, short procedures, initially 6.5–13 mg/kg (10 mg/kg usually produces 12–25 minutes of surgical anaesthesia)

Diagnostic manoeuvres and procedures not involving intense pain, initially 4 mg/kg

By intravenous injection over at least 60 seconds, short procedures, initially 1–4.5 mg/kg (2 mg/kg usually produces 5–10 minutes of surgical anaesthesia)

By intravenous infusion of a solution containing 1 mg/mL, longer procedures, induction, total dose of 0.5–2 mg/kg; maintenance, 10–45 mcg/kg/minute, rate adjusted according to response

Ketalar Injection 50 mg/ml-10 ml Vial

PROPOFOL

Indications: induction and maintenance of general anesthesia

Caution: monitor blood-lipid concentration if risk of fat overload or if sedation longer than 3 days; may cause anaphylaxis and delayed recovery
**THIOPENTAL SODIUM**

**Indications:** short duration surgical procedures

**Caution:** respiratory depression; reconstituted solution is highly alkaline—extravasation causes tissue necrosis and severe pain; avoid intra-arterial injection; cardiovascular disease; hepatic impairment

**Contraindications:** myotonic dystrophy; breast-feeding

**Side Effects:** arrhythmias, myocardial depression, laryngeal spasm, cough, sneezing, hypersensitivity reactions, rash, injection-site reactions; excessive doses associated with hypothermia and profound cerebral impairment

**Dose:** by I.V. injection in fit premedicated adults, initially 100-500 gm (4-6 ml of 2.5% solution) over 10-15 seconds, repeated if necessary according to the patient's response, after 20-30 seconds or up to 4 mg/kg.

Child, induction, 4-8 mg/kg.

By continuous intravenous infusion, as 0.2-0.4% solution, according to the patient's response.

- *Intraval Sodium Injection 2.5%*

**INHALATIONAL ANESTHETICS**

**ISOFLURANE**

**Indications:** induction and maintenance of anesthesia

**Side Effects:** heart rate may rise, particularly in younger patients; systemic arterial pressure may fall; respiration is depressed.
**Anesthesia**

**Dose:** using a specifically calibrated vaporizer, induction increased gradually from 0.5% to 3%, in oxygen or nitrous oxide-oxygen.

Maintenance, 1-2.5%
- Forane 100 ml

**NITROUS OXIDE**

**Indications:** general anesthesia

**Caution:** abdominal distention, pneumothorax, encephalography. Special care is needed to avoid hypoxia if an anaesthetic machine is being used; machines should incorporate an anti-hypoxia device. Exposure of patients to nitrous oxide for prolonged periods, either by continuous or by intermittent administration, may result in megaloblastic anaemia owing to interference with the action of vitamin B₁₂. For the same reason, exposure of theatre staff to nitrous oxide should be minimised. Depression of white cell formation may also occur.

**Dose:** using a suitable anesthetic apparatus, a mixture with 20-30% oxygen for induction and maintenance of light anesthesia.

Analgesia, as a mixture with 50% oxygen according to patient’s needs.

**SEVOFLURANE**

**Indications:** a rapid acting volatile liquid anaesthetic

**Caution:** renal impairment; pregnancy

**Contraindications:** susceptibility to malignant hyperthermia

**Side Effects:** agitation occurs frequently in children

**Dose:** Using a specifically calibrated vaporiser, induction, up to 5% in oxygen or nitrous oxide-oxygen; child up to 7%

Maintenance, 0.5–3%
- Seroflurane
- Sevorane 250 ml
PREMEDICATION AGENTS

ATROPINE SULFATE

**Indications:** drying secretions; reversal of excessive bradycardia; with neostigmine for reversal of non-depolarising neuromuscular block; antidote to organophosphorous poisoning, antispasmodic; bradycardia; cardiopulmonary resuscitation; eye

**Caution:** cardiovascular disease

**Dose:** Pre-medication, by I.V. injection, 300-600 mcg immediately before induction of anesthesia and in incremental doses of 100 mcg for the treatment of bradycardia.

By I.M. injection, 300 - 600 mcg 30 to 60 minutes before induction.

Child, 20 mcg/kg.

For control of muscarinic side-effects of neostigmine in reversal of Competitive neuromuscular block, by I.V. injection 0.6-1.2 mg.

- Atropine Sulfate Injection 0.3 mg/ml
- Atropine Sulfate Injection 0.6 mg/ml

DIAZEPAM

**Indications:** pre-medication; sedation with amnesia and in conjunction with local anesthetics.

**Caution:** neuromuscular disorders, respiratory disease, hepatic dysfunction, renal impairment.

**Drug Interactions:** Refer to table

**Dose:** By mouth, 5 mg on night before minor or dental surgery then 5 mg 2 hours before procedure; elderly (or debilitated), half adult dose

By intravenous injection, into a large vein 10–20 mg over 2–4 minutes as sedative cover for minor surgical and medical procedures; premedication 100–200 mcg/kg

**Safety in Pregnancy:** Avoid regular use (risk of neonatal withdrawal symptoms); use only if clear indication such as seizure control (high doses during late pregnancy or labour may cause neonatal hypothermia, hypotonia and respiratory depression)

**Safety in Breast Feeding:** Present in milk avoid if possible

- Valium Injection 10 mg / 2 ml Ampoules
Anesthesia

- Valium Tablets 2.5,10 mg

FENTANYL CITRATE

**Indications:** analgesia; adjunct to general anesthetics; anesthetic for induction and maintenance; neuroleptanalgesia if given with a neuroleptic.

**Caution:** elderly and debilitated patients; respiratory depression; concomitant administration with opioid premedications and other CNS - depressant drugs; pregnancy; lactating mothers

**Contraindications:** avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; also avoid in raised intracranial pressure or head injury (affects pupillary responses vital for neurological assessment); avoid injection in phaeochromocytoma (risk of pressor response to histamine release)

**Side Effects:** respiratory depression; muscular rigidity; hypotension; bradycardia; laryngospasm; nausea and vomiting.

**Dose:** as analgesic supplement to general anesthesia, low dose 2mcg/kg body weight. In painful minor surgery, 2-20 mcg/kg body weight. In complicated surgery, 20-50 mcg/kg body weight. Supplemental dose of 25-250 mcg may be added according to the needs of the patient and length of surgery. Child, 2-12 years, for induction and maintenance, 2-3 mcg/kg body weight.

- Fentanyl Injection 50 mcg/ml, 2 ml & 10 ml Vials

MIDAZOLAM

**Indications:** sedation with amnesia; sedation in intensive care; premedication, induction of anaesthesia; status epilepticus

**Caution:** cardiac disease; respiratory disease; myasthenia gravis; children (particularly if cardiovascular impairment); history of drug or alcohol abuse; reduce dose in elderly and debilitated; avoid prolonged use (and abrupt withdrawal thereafter); concentration of midazolam in children under 15 kg not to exceed 1 mg/mL; hepatic impairment; renal impairment

**Contraindications:** marked neuromuscular respiratory weakness including unstable myasthenia gravis; severe respiratory depression; acute pulmonary insufficiency
**Anesthesia**

**Side Effects:** gastro-intestinal disturbances, increased appetite, jaundice; hypotension, cardiac arrest, heart rate changes, anaphylaxis, thrombosis; laryngospasm, bronchospasm, respiratory depression and respiratory arrest (particularly with high doses or on rapid injection); drowsiness, confusion, ataxia, amnesia, headache, euphoria, hallucinations, fatigue, dizziness, vertigo, involuntary movements, paradoxical excitement and aggression (especially in children and elderly), dysarthria; urinary retention, incontinence, changes in libido; blood disorders; muscle weakness; visual disturbances; salivation changes; skin reactions; on intravenous injection, pain, thrombophlebitis.

Central nervous system (CNS) depressants or alcohol—The CNS depressant and other effects of alcohol, other medicines, or midazolam may be increased; also, the effects of midazolam may last longer.

Saquinavir—Saquinavir may interfere with the removal of midazolam from the body, which could lead to serious side effects.

**Dose:** Sedation, by slow intravenous injection, 70-100 mcg/kg 30-60 minutes before surgery. Usual dose 5 mg (2.5 mg in elderly patients) Induction, by slow intravenous injection, 200-300 mcg/kg (elderly patients 100-200 mcg/kg).

**Safety in Pregnancy:** Midazolam is not recommended for use during pregnancy because it may cause birth defects; use of midazolam during pregnancy, especially during the last few days, may cause drowsiness, slow heartbeat, shortness of breath, or troubled breathing in the newborn infant. In addition, receiving midazolam just before or during labor may cause weakness in the newborn infant.

**Safety in Breast Feeding:** Midazolam passes into human breast milk

- Dormicum Injection 15 mg/3 ml

**MORPHINE SULFATE**

**Indications:** analgesia during and after operation, enhancement of anesthesia; pre-operative sedation.

**Caution:** in head injuries with increased intracranial pressure; in patients with chronic respiratory insufficiency.
Contraindications: avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; avoid injection in pheochromocytoma

Side Effects: nausea and vomiting (particularly in initial stages), constipation, and drowsiness; larger doses produce respiratory depression, hypotension, and muscle rigidity; other side-effects include difficulty with micturition, ureteric or biliary spasm, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension, hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes, urticaria and pruritus

Dose: S.C. or I.M. injection, up to 10 mg 1-1.5 hours before operation.
Child, by I.M. injection, 150 mcg/kg.

Morphine Injection 10 mg

PETHIDINE HYDROCHLORIDE

Indications: pre-operative analgesia; pre-medication; analgesia in obstetrics; moderate to severe pain.
Caution: head injuries, severe hepatic or renal impairment, biliary tract disorders, hypothyroidism; patients exhibiting acute alcoholism, raised intracranial pressure, convulsive disorders. Not suitable for severe continuing pain;

Contraindications: avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; avoid injection in pheochromocytoma; severe renal impairment

Side Effects: nausea and vomiting (particularly in initial stages), constipation, and drowsiness; larger doses produce respiratory depression, hypotension, and muscle rigidity; other side-effects include difficulty with micturition, ureteric or biliary spasm, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension, hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes, urticaria and pruritus; convulsions reported in overdosage

Dose: pre-medication, by I.M. injection, 50-100 mg 1 hour before operation;
Child, 1-2 mg/kg. Adjunct to nitrous oxide-oxygen, by I.V. injection, 10-25 mg repeated when required.
- Pethidine Injection 50 mg & 100 mg

PROMETHAZINE HYDROCHLORIDE

**Indications:** Anti-emetic, pre-operative sedative and anti-cholinergic agent.

**Side Effects:** Drowsiness; include headache, psychomotor impairment, and antimuscarinic effects such as urinary retention, dry mouth, blurred vision, and gastro-intestinal disturbances.

**Dose:**
- Pre-medication, by mouth:
  - Child, 6-12 month, 10 mg; 1-5 years, 15-20 mg; 6-10 years, 20-25 mg.
  - By deep I.M. injection, 25-50 mg 1 hour before operation.
- Child, 5-10 years, 6.25-12.5 mg.
  - Phenergan Tablet 25 mg
  - Phenergan Injection 50 mg/2 ml
  - Phenergan Elixir 5 mg/5 ml

REMIFENTANIL

**Indications:** supplementation of general anaesthesia during induction and analgesia during maintenance of anaesthesia (consult product literature for use in patients undergoing cardiac surgery); analgesia and sedation in ventilated, intensive care patients

**Caution:** in head injuries with increased intracranial pressure; in patients with chronic respiratory insufficiency.

**Contraindications:** left ventricular dysfunction; avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; avoid injection in pheochromocytoma

**Side Effects:** nausea and vomiting (particularly in initial stages), constipation, and drowsiness; larger doses produce respiratory depression, hypotension, and muscle rigidity; other side-effects include difficulty with micturition, ureteric or biliary spasm, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension, hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes,
urticaria and pruritus; hypertension, hypoxia; very rarely asystole and anaphylaxis

**Dose:** Induction of anaesthesia, adult and child over 12 years, by intravenous infusion, 0.5–1 mcg/kg/minute, *with or without* an initial dose by intravenous injection of 0.25–1 mcg/kg over at least 30 seconds. Maintenance of anaesthesia in ventilated patients, adult and child over 12 years, by intravenous infusion, 0.05–2 mcg/kg/minute (*with or without* an initial dose by intravenous injection of 0.25–1 mcg/kg over at least 30 seconds) according to anaesthetic technique and adjusted according to response; in light anaesthesia supplemental doses by intravenous injection every 2–5 minutes

Maintenance of anaesthesia in spontaneous respiration anaesthesia, adult and child over 12 years, by intravenous infusion, initially 40 nanograms/kg/minute adjusted according to response, usual range 25–100 nanograms/kg/minute

Maintenance of anaesthesia, child 1–12 years, by intravenous infusion, 0.05–1.3 mcg/kg/minute (*with or without* an initial dose by intravenous injection of 0.1–1 mcg/kg over at least 30 seconds) according to anaesthetic technique and adjusted according to response.

Analgesia and sedation in ventilated, intensive care patients, by intravenous infusion, adult over 18 years initially 100–150 nanograms/kg/minute adjusted according to response in steps of 25 nanograms/kg/minute (allow at least 5 minutes between dose adjustments); usual range 6–740 nanograms/kg/minute; if an infusion rate of 200 nanograms/kg/minute does not produce adequate sedation add another sedative (consult product literature for details).

Additional analgesia during stimulating or painful procedures in ventilated, intensive care patients, by intravenous infusion, adult over 18 years maintain infusion rate of at least 100 nanograms/kg/minute for at least 5 minutes before procedure and adjust every 2–5 minutes according to requirements, usual range 250–750 nanograms/kg/minute

- Ultiva Injection 2 mg & 5 mg per Vial
**MUSCLE RELAXANTS**

**ATRACURIUM BESYLATE**

*Indications:* muscle relaxation (short to intermediate duration) for surgery or during intensive care

*Caution:* Allergic cross-reactivity between neuromuscular blocking agents. Activity is prolonged in patients with myasthenia gravis and in hypothermia, therefore lower doses are required.

*Side Effects:* are associated with histamine release which can cause skin flushing, hypotension, tachycardia, bronchospasm and rarely, anaphylactoid reactions.

*Drug Interactions:* inactivated by thiopental and other alkaline solutions

*Dose:* by I.V. injection, initially 300-600 mcg/kg, then 100-200 mcg/kg, repeated as required.

By I.V. infusion, 5-10 mcg/kg/minute
- *Tracrium Injection* 10 mg/ml, 2.5 ml & 25 ml

**CISATRACURIUM BESYLATE**

*Indications:* intermediate-duration, non-depolarising neuromuscular blocking agent for I.V. use. Used as an adjunct to general anesthesia, or sedation in the Intensive Care Unit (ICU) to relax skeletal muscles and to facilitate tracheal intubation and mechanical ventilation.

*Caution:* hypersensitivity to other neuro-muscular blocking agents due to cross-reactivity; myasthenia gravis and other forms of neuromuscular disease.

*Dose:* In adult intubation, by I.V. bolus injection, 150mcg/kg.

Maintenance, 30 mcg/kg provides 20 minutes of additional effective neuromuscular block.

Child, 2-12 years, 100 mcg/kg.

Maintenance, 20 mg/kg provides 9 minutes of additional effective neuromuscular block.

- *Nimbex Injection* 2 mg/ml -2.5 ml & 10 ml Ampoules

**MIVACURIUM CHLORIDE**

*Indications:* Non depolarising muscle relaxation (short duration) for surgery
**Caution:** low plasma cholinesterase activity; elderly; hepatic impairment; renal impairment cardiovascular disease; history of greater sensitivity to histamine release and related mediators; neuromuscular disease, obesity; burns; acid-base and serum electrolyte imbalance.

**Contraindications:** allergic reactions to the drug or any benzylisoquinolinium agents such as manifested by urticaria, hypotension or severe respiratory distress.

**Side Effects:** lushing of the face, neck, and/or chest; hypotension; tachycardia, bradycardia, arrhythmia, phlebitis; bronchospasm; wheezing, hypoxemia; rash, muscle spasm

**Dose:** by I.V. injection, initially 70-150 mcg/kg, then 100 mcg/kg every 15 minutes.

Child 2-12 years, initially 100-200 mcg/kg, then 100 mcg/kg every 6-7 minutes.

By I.V. infusion, maintenance of block, 8-10 mcg/kg/minute adjusted if necessary every 3 minutes by 1 mcg/kg/minute to usual dose of 6-7 mcg/kg/minute.

Child 2-12 years, usual dose 10-15 mcg/kg/minute

- *Mivacron Injection 2 mg/ml - 5 ml Ampoules*

**ROCURONIUM BROMIDE**

**Indications:** non-depolarising muscle relaxant of intermediate duration; adjunct in anesthesia to facilitate endotracheal intubation

**Caution:** ventilatory support is mandatory for patients until adequate spontaneous respiration is restored. Clinicians should be familiar with early signs of malignant hyperthermia before the start of any anesthesia.

**Side Effects:** anaphylactic reactions; itching and erythematous reactions at the site of injection; bronchospasm and cardiovascular changes.

**Dose:** endotracheal intubation, 0.6 mg/kg body weight. Maintenance, 0.15 mg/kg body weight.

This should be reduced in long-term inhalational anesthesia to 0.075 - 0.1 mg/kg body weight.
Anesthesia

Continuous infusion, a loading dose of 0.6 mg/kg body weight and when the block starts to recover, I.V. infusion should start.
Child, same sensitivity as adults.
Neonates, not recommended
   ❖ Esmeron Injection 10 mg/ml - 5ml Vials

SUXAMETHONIUM CHLORIDE

**Indications:** this is a depolarizing muscle-relaxant which is used for short surgical procedures especially in the abdominal region, reposition of fractures and dislocations, endoscopies; laryngo-broncho- and cystoscopies.

**Caution:** liver dysfunction; patients with cardiac, respiratory or neuromuscular disease; raised intra-ocular pressure (avoid in penetrating eye injury); severe sepsis (risk of hyperkalaemia);

**Contraindications:** family history of malignant hyperthermia, low plasma cholinesterase activity (including severe liver disease) , hyperkalaemia; major trauma, severe burns, neurological disease involving acute wasting of major muscle, prolonged immobilisation—risk of hyperkalaemia, personal or family history of congenital myotonic disease, Duchenne muscular dystrophy

**Side Effects:** postoperative muscle pain, myoglobinuria, myoglobinaemia; tachycardia, arrhythmias, cardiac arrest, hypertension, hypotension; bronchospasm, apnoea, prolonged respiratory depression, anaphylactic reactions; hyperkalaemia; hyperthermia; increased gastric pressure; rash, flushing

**Dose:** by I.V. injection, 20-100 mg according to the patient’s needs.
Child, initially 1-1.5 mg/kg, then 1/3rd of the initial dose.
By I.V. infusion as a 0.1% solution, 2.5 mg/minute (2-5 ml/minute)
   ❖ Scoline Injection 100 mg/2 ml
ANTI-CHOLINESTERASES USED IN SURGERY

EDROPHONIUM CHLORIDE

Indications: It is a short and rapid-acting cholinergic drug; brief reversal of non-depolarizing neuromuscular Blockade; diagnosis of dual block.

Caution: Patients may develop “anticholinesterase insensitivity” for brief or prolonged periods; asthma (extreme caution), bradycardia, arrhythmias, recent myocardial infarction, epilepsy, hypotension, parkinsonism, vagotonia, peptic ulceration, hyperthyroidism, renal impairment

Contraindications: intestinal and urinary obstructions of mechanical type.

Side Effects: nausea, vomiting, increased salivation, diarrhoea, abdominal cramps (more marked with higher doses); signs of overdosage include bronchoconstriction, increased bronchial secretions, lacrimation, excessive sweating, involuntary defaecation and micturition, miosis, nystagmus, bradycardia, heart block, arrhythmias, hypotension, agitation, excessive dreaming, and weakness eventually leading to fasciculation and paralysis

Drug Interactions: Care should be given when administering this drug to patients with symptoms of myasthenic weakness who are also on anticholinesterase drugs. Since symptoms of anticholinesterase overdose (cholinergic crisis) may mimic underdosage (myasthenic weakness), their condition may be worsened by the use of this drug.

Dose: reversal of blockade, by I.V. injection, 10 mg (after or with atropine sulfate 0.6-1.2 mg) repeated at intervals of 10 minutes according to patient’s response. Diagnosis of dual block, by I.V. injection, 10 mg (with atropine).

Safety in Pregnancy Antimyasthenics have not been reported to cause birth defects; however, muscle weakness has occurred temporarily in some newborn babies whose mothers took antimyasthenics during pregnancy.

❖ Tensilon injection 10 mg/ml
**NEOSTIGMINE METHYLSULFATE**

**Indications** Reversal of non-depolarising neuromuscular blockade

**Caution:** asthma (extreme caution), bradycardia, arrhythmias, recent myocardial infarction, epilepsy, hypotension, parkinsonism, vagotonia, peptic ulceration, hyperthyroidism, renal impairment

**Contraindications:** intestinal or urinary obstruction

**Side Effects:** nausea, vomiting, increased salivation, diarrhoea, abdominal cramps (more marked with higher doses); signs of overdosage include bronchoconstriction, increased bronchial secretions, lacrimation, excessive sweating, involuntary defaecation and micturition, miosis, nystagmus, bradycardia, heart block, arrhythmias, hypotension, agitation, excessive dreaming, and weakness eventually leading to fasciculation and paralysis

**Dose:** by I.V. injection, 1-5 mg or 1 mg/20 kg. after or with atropine sulfate 0.6-1.2 mg.

**Safety in Pregnancy:** Antimyasthenics have not been reported to cause birth defects; however, muscle weakness has occurred temporarily in some newborn babies whose mothers took antimyasthenics during pregnancy

**Safety in Breast Feeding:** Antimyasthenics have not been reported to cause problems in nursing babies.

- Prostigmin Injection 2.5 mg/ml

**ANTAGONISTS FOR CENTRAL AND RESPIRATORY DEPRESSION**

**FLUMAZENIL**

**Indications:** reversal of sedative effects of benzodiazepines in anaesthetic, intensive care, and diagnostic procedures

**Caution:** short-acting (repeat doses may be necessary—benzodiazepine effects may persist for at least 24 hours); benzodiazepine dependence (may precipitate withdrawal symptoms); prolonged benzodiazepine therapy for epilepsy (risk of convulsions); history of panic disorders (risk of recurrence); ensure neuromuscular blockade cleared before giving; avoid rapid injection in high-risk or anxious patients and following major surgery; hepatic
impairment; head injury (rapid reversal of benzodiazepine sedation may cause convulsions); elderly, children,

Contraindications: life-threatening condition (e.g. raised intracranial pressure, status epilepticus) controlled by benzodiazepines

Side Effects: nausea, vomiting, and flushing; if wakening too rapid, agitation, anxiety, and fear; transient increase in blood pressure and heart-rate in intensive care patients; very rarely convulsions (particularly in those with epilepsy), hypersensitivity reactions including anaphylaxis

Dose: By intravenous injection, 200 mcg over 15 seconds, then 100 mcg at 60-second intervals if required; usual dose range, 300–600 mcg; max. total dose 1 mg (2 mg in intensive care); question aetiology if no response to repeated doses

By intravenous infusion, if drowsiness recurs after injection, 100–400 mcg/hour, adjusted according to level of arousal

Anexate Injection 100 mcg/ml - 5 ml

Naloxone Hydrochloride

Indications reversal of opioid-induced respiratory depression; reversal of neonatal respiratory depression resulting from opioid administration to mother during labour; overdosage with opioids

Caution: cardiovascular disease or those receiving cardiotoxic drugs (serious adverse cardiovascular effects reported); physical dependence on opioids (precipitates withdrawal); pain (see also under Titration of Dose, below); has short duration of action (repeated doses or infusion may be necessary to reverse effects of opioids with longer duration of action); In postoperative use, the dose should be titrated for each patient in order to obtain sufficient respiratory response

Side Effects: hypotension, hypertension, ventricular tachycardia and fibrillation, cardiac arrest; hyperventilation, dyspnoea, pulmonary oedema; less commonly agitation, excitement, paraesthesia

Dose: by I.V. injection, 100-200 mcg(1.5-3mcg/kg).

Adjusted according to the response, then 100 mcg every 2 minutes.
Neonates, by S.C. or I.M. or I.V. injection, 10 mcg/kg repeated every 2 minutes or 200 mcg (60 mcg/kg) by I.M. injection as a single dose.

- Narcan Injection 1mg/ml; 0.4 mg/ml In 2ml Ampoules

DROPERIDOL

**Indications:** To reduce the incidence of nausea and vomiting associated with surgical and diagnostic procedures.

**Caution:** in the presence of risk factors for development of prolonged QT syndrome, such as bradycardia, cardiac disease, Class I and Class III antiarrhythmics, treatment with monoamine oxidase inhibitors (MAOI’s), electrolyte imbalance, in particular hypokalemia and hypomagnesemia

**Contraindications:** Droperidol is contraindicated in patients with known or suspected QT prolongation

**Side Effects:** QT interval prolongation, torsade de pointes, cardiac arrest, and ventricular tachycardia; mild to moderate hypotension and tachycardia; include dysphoria, postoperative drowsiness, restlessness, hyperactivity and anxiety

**Drug Interactions:** Potentially Arrhythmogenic Agents such as class I or III antiarrhythmics, antihistamines that prolong the QT interval, antimalarials, calcium channel blockers, neuroleptics that prolong the QT interval, and antidepressants.

**Caution:** should be used when patients are taking concomitant drugs known to induce hypokalemia or hypomagnesemia as they may precipitate QT prolongation and interact with Droperidol. These would include diuretics, laxatives and supraphysiological use of steroid hormones with mineralocorticoid potential.

**CNS Depressant Drugs:** Other CNS depressant drugs (e.g., barbiturates, tranquilizers, opioids and general anesthetics) have additive or potentiating effects with Droperidol. Following the administration of Droperidol, the dose of other CNS depressant drugs should be reduced.

**Dose:** Dosage should be individualized;

358
**Adult Dosage:** The maximum recommended initial dose of Droperidol is 2.5 mg I.M. or slow I.V. Additional 1.25 mg doses of Droperidol may be administered to achieve the desired effect. However, additional doses should be administered with caution, and only if the potential benefit outweighs the potential risk.

**Pediatric Dosage:** For children two to 12 years of age, the maximum recommended initial dose is 0.1 mg/kg, taking into account the patient’s age and other clinical factors. However, additional doses should be administered with caution, and only if the potential benefit outweighs the potential risk.

- *Droperidol Injection 2.5 mg/ml In 2 ml Ampoules*

**LOCAL ANESTHETICS**

**BUPIVACAINE HYDROCHLORIDE**

*Indications:* post-operative analgesia, therapeutic pain block, Obstetric anesthesia.

*Caution:* epilepsy, hepatic impairment, impaired cardiac conduction, bradycardia.

*Dose:* Shall be adjusted according to the site of operation and response of patient.

- Local infiltration block, up to maximum which is 225 mg with epinephrine and 175 mg (or 150 mg in the British System) without epinephrine.
- For epidural and caudal block, 25-150 mg. Peripheral nerve block, 12.5 mg maximum.
- Retro bulbar block, 15-30 mg.
- Sympathetic block, 50-125 mg.
- Spinal anesthesia, heavy preparation 5 mg/ml is used, 2-4 ml.

The 0.75% strength is contra-indicated for epidural anesthesia in obstetrics. It is recommended to give a test dose of 10-15 mg before epidural use. No more than 400 mg should be given daily.

- *Marcaine Plain 0.5%*
- *Marcaine 5 mg/ml With Adrenaline (Epinephrine) 5 mcg/ml Injection*
- *Marcaine 80 mg/ml - 4 ml Ampoules*
ETHYL CHLORIDE SPRAY

**Indications:** local anesthesia by local freezing.

LIDOCAINE HYDROCHLORIDE

**Indications:** local anesthesia by surface, infiltration, regional, epidural, and caudal routes; dental anesthesia

**Caution:** epilepsy, respiratory impairment, impaired cardiac conduction, bradycardia, severe shock; porphyria; myasthenia gravis; reduce dose in elderly or debilitated; resuscitative equipment should be available; hepatic impairment

**Contraindications:** hypovolaemia, complete heart block; do not use solutions containing adrenaline for anaesthesia in appendages

**Side Effects:** CNS effects include confusion, respiratory depression and convulsions; hypotension and bradycardia (may lead to cardiac arrest); hypersensitivity reported

**Dose:** adjusted according to the site of operation and response of the patient. By injection, maximum dose 200 mg, or 500 mg with solutions which also contain adrenaline (epinephrine).

Maximum dose of adrenaline (epinephrine) 500 mcg.

Infiltration anesthesia, 0.25-0.5% with adrenaline (epinephrine) 1 in 200,000, using 2-50 ml of a 0.5% solution in minor surgery and up to 60 ml in more extensive surgery.

Nerve blocks, with adrenaline (epinephrine) 1 in 200,000, 1% to a maximum of 50 ml, 2% to a maximum of 25 ml.

Epidural and caudal block, with adrenaline (epinephrine) 1 in 200,000, 1% to a maximum of 50 ml, 2% to a maximum of 25 ml. Surface anesthesia, usual strengths 2-4%. Mouth, throat, and upper gastro-intestinal tract, maximum 200 mg. Dental procedures, adults, 100-200 mg lidocaine HC1. Children under 10 years, 20-40 mg lidocaine HC1.

- **Xylocaine injection 1%**
- **Xylocaine injection 2%**
- **Xylocaine spray 10%**
- **Xylocaine gel 2%**
- **Xylocaine ointment 5%**
- **Xylocaine topical solution 4%**
- **Xylocaine 1% with adrenaline (epinephrine)**
- **Xylocaine 2% with adrenaline (epinephrine)**
- **Xylocaine 5% heavy for spinal anesthesia.**
- **Xylocaine 2% with adrenaline (epinephrine) (20 mg/ml + 12.5 mcg/ml) for dental use**

**PRILOCAINE HYDROCHLORIDE**

**Indications:** infiltration, regional nerve block and spinal anesthesia and regional intravenous analgesia; dental anesthesia

**Caution:** severe or untreated hypertension, severe heart disease; concomitant drugs which cause methaemoglobinemia; reduce dose in elderly or debilitated; hepatic impairment; renal impairment;

**Contraindications:** anaemia or congenital or acquired methaemoglobinemia

**Side Effects:** ocular toxicity (including blindness) reported with excessively high strengths used for ophthalmic procedures; in high doses, methemoglobinemia may occur which can be treated by intravenous methylene blue 1% injection using a dose of 75-100 mg.

**Dose:** adjusted according to the site of operation and response of patient, to a max of 400 mg used alone, or 600 mg if used with adrenaline (epinephrine) or felypressin.

- **Prilocaine 3% with felypressin dental cartridges.**
- **Emla cream, contains lidocaine 2.5% and prilocaine 2.5%**

**Indications:** anaesthesia before venepuncture

**Administration:** apply a thick layer for 1-2 hours under anocclusive dressing.
Index

0.18% sodium chloride & 4.3% dextrose · 287
0.45% sodium chloride & 5% dextrose (half normal saline with dextrose) · 287
0.45% sodium chloride (half normal saline) · 287
0.9% sodium chloride (normal saline) · 287
3tc 150mg tab 150mg · 208
5% sodium chloride (hypertonic sodium chloride solution) · 287

a

absorbable gelatin sponge · 39
ace inhibitors · 18
acebutolol · 13
acetazolamide · 315
acetylcysteine · 81
acetylsalicylic acid · 78
acromycin capsules 250 mg · 193
acid citric · 309
acitretin · 333
acne lotion (1% salicylic acid with 1% resorcinol) · 335
actilyse 10mg and 50 mg/vial · 39
acyclovir · 205, 310, 342
adalat 10 mg tablets · 29
adalat la tablet 30 mg · 29
adalat retard tablets 20 mg · 29
adocryl intra-articular/intradermal injection (aqueous suspension) 10 mg/ml · 268
adenocor injection · 10
adenocor injection, adenosine 3mg/ml · 10
adenosine · 10
adol 500 mg tablets · 80
adol suppositories 100, 200 mg · 80
adol syrup 120 mg/5 ml · 80
adrenaline (epinephrine) injection 1mg/1ml (1 1000) 10,000 (1mg/10 ml) injection. · 33
Index

adriamycin vials
10mg & 50 mg vials for injection. · 225
adsorbed diphtheria -
tetanus vaccine with reduced diphtheria component · 153
adsorbed diphtheria and tetanus toxoids (double vaccine, dt) · 153
adsorbed diphtheria -
tetanus-pertussis vaccine · 153
albucid drops 10%, 20% · 312
albumin (human albumin solution) · 288
alcohol · 339
aldactone tablets 25 mg, 100 mg · 9
aldomet tablets 250 mg · 25
alfacalcidol i-alpha-
hydroxy-cholecalciferol · 280
alfacort cream 1% · 332
alinal oral drops (pipenzolate bromide 4 mg with phenobarbital 6 mg/ml) · 106
alkeran 2 mg tablet · 218
alkylating agents · 216
allopurinol · 117
allopurinol · 275
alpha blockers · 25
alphagan eye drop · 322
alprazolam · 46
alprostadil · 299
alteplase (rt-pa, recombinant tissue type plasminogen activator) · 38
aluminium hydroxide & magnesium hydroxide · 104
amantidine
hydrochloride · 95
aminophylline · 244
aminophylline injection 250 mg/10 ml · 244
aminophylline · 280
amikacin sulphate · 167
amikin injection 500 mg · 167
aminoglycosides · 280
analog capsules 250 mg, 500 mg · 168
amoxicillin suspension 250 mg/5 ml · 168
amoxicillin · 169
amoxycillin · 167, 168
amoxycillin & clavulanic acid · 168
amphotericin · 199
amphotericin · 199
ampicillin · 170
ampicillin · 169
ampicillin 0.5gm./vial inj · 170
ampicillin 1 gm./vial /10ml. inj · 170
amydramine expectorant 14 mg/5 ml · 253
amydramine paediatric 7 mg/5ml · 253
anafranil tablets 10, 25, 75 mg · 66
analgesics · 258
analgesics · 78
andriol capsules 40 mg · 150
anesthesia · 343
angiotensin receptor blockers (arbs) · 22
angised tablets 0.5 mg. · 31
antacids · 104
antacids · 104
antagonists for central and respiratory depression · 356
antazoline sulphate · 312
antibacterial drugs · 167
anti-bacterial preparations · 336
anti-cholinesterases used in surgery · 355
anti-coagulants and related drugs · 34
anti-d (rh) immunoglobulin · 164
antidepressant drugs · 64
antidiabetic drugs · 126
anti-diarrhoeals · 116
anti-dysrhythmic drugs · 10
anti-epileptics · 86
anti-fibrinolytic drugs and haemostatics · 39
antifungal drugs · 199
anti-fungal preparations · 337
anti-hemorrhoidal · 124
anti-hypertensive drugs · 18
anti-infective drugs · 304, 310
anti-infective skin preparations · 336
anti-inflammatory drugs (nsaids) · 255
antimetabolites · 219, 242
antimetabolites and related therapy · 242
anti-migraine drugs · 85
antimycobacterial drugs · 195
antiplatelet drugs · 37
antiproliferative immunosuppressants · 233
antiprotozoal and antihelmenthic drugs · 211
anti-pruritic preparations · 330
antispasmodics · 105
antistine - privine eye drops (with naphazoline) · 312
anti-thyroid drug · 133
antiviral drugs · 205
apresoline injection 20 mg/ampoule · 30
apresoline tablets 25 mg · 30
aprovel tablets 150 mg, 300 mg · 23
aqueous cream · 330
artane tablets 2 mg & 5 mg · 100
asacol tablets 400mg · 119
aspirin · 37, 137
aspirin 81mg, 100 mg & 300 mg tablets · 79
aspirin tablets 300 mg, 81 mg · 37
atenolol · 14
ativan tablets 1, 2 mg · 50
atorvastatin · 41
atracurium besylate · 352
atropine eye drops 1% · 314
atropine eye ointment 1% · 314
atropine sulfate · 314, 346
atropine sulfate injection 0.3 mg/ml · 346
atropine sulfate injection 0.6 mg/ml · 346
atropine sulphate · 11
atrovent solution 0.25 mg/ml · 20 ml bottle · 248
augmentin vials 1.2 g each vial contains 1g amoxycillin & 200mg clavulanic acid · 169
avandia 4mg tablet · 131
avlosulphon tablets 100 mg · 197
avomine tablets 25 mg · 77
azactam 1 g vial (aztreonam 1 gm. i.m. & i.v. inj) · 170
azathioprine · 117, 233
aztreonam · 170
baclofen · 276
bactrim / septrin infusion (80 mg trimethoprim & 400 mg sulphamethoxazole in each 5 ml ampoule) · 184
bactroban ointment 2% · 336
balanced salt solution (bss) · 319
beclometasone dipropionate · 246, 326
beclometasone dipropionate (beclometasone dipropionate) · 326
becotide 50 mcg/metered inhalation · 246
beconase aerosol 50 mcg/metered spray · 327
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>benazepril hydrochloride    · 19</td>
<td></td>
</tr>
<tr>
<td>benzathine penicillin      · 170</td>
<td></td>
</tr>
<tr>
<td>benzoic tincture           · 327</td>
<td></td>
</tr>
<tr>
<td>benzoic tincture inhalation 1% · 327</td>
<td></td>
</tr>
<tr>
<td>benzotropine mesylate       · 95</td>
<td></td>
</tr>
<tr>
<td>benzyll benzoate           · 339</td>
<td></td>
</tr>
<tr>
<td>benzyll benzoate application 25%</td>
<td></td>
</tr>
<tr>
<td>benzyl penicillin          · 171</td>
<td></td>
</tr>
<tr>
<td>benzyl penicillin 1 mega units i.v. · 172</td>
<td></td>
</tr>
<tr>
<td>bepanthen cream 5% · 330</td>
<td></td>
</tr>
<tr>
<td>beractant · 253</td>
<td></td>
</tr>
<tr>
<td>beta-adrenoceptor blocking drugs · 13</td>
<td></td>
</tr>
<tr>
<td>beta-histin</td>
<td>73</td>
</tr>
<tr>
<td>betamethasone valerate    · 331</td>
<td></td>
</tr>
<tr>
<td>betaserc tablets 8 mg · 73</td>
<td></td>
</tr>
<tr>
<td>betasone cream 0.1 % · 331</td>
<td></td>
</tr>
<tr>
<td>betasone ointment 0.1% · 331</td>
<td></td>
</tr>
<tr>
<td>bezafibrate · 41</td>
<td></td>
</tr>
<tr>
<td>bezalip tablets s.r. 400 mg · 41</td>
<td></td>
</tr>
<tr>
<td>bile acid binding resin · 43</td>
<td></td>
</tr>
<tr>
<td>bipreterax · 22</td>
<td></td>
</tr>
<tr>
<td>bisacodyl · 121</td>
<td></td>
</tr>
<tr>
<td>bisacodyl · 121</td>
<td></td>
</tr>
<tr>
<td>bisacodyl suppositories 5 mg &amp; 10 mg · 121</td>
<td></td>
</tr>
<tr>
<td>bisolvon elixir 4 mg/5 ml · 252</td>
<td></td>
</tr>
<tr>
<td>bisoprolol fumarate       · 14</td>
<td></td>
</tr>
<tr>
<td>bleomycin (systemic)      · 223</td>
<td></td>
</tr>
<tr>
<td>bleomycin injection 15000 units / vial · 224</td>
<td></td>
</tr>
<tr>
<td>bone modulating drugs    · 242</td>
<td></td>
</tr>
<tr>
<td>bonjela · 329</td>
<td></td>
</tr>
<tr>
<td>bonjela gel · 328</td>
<td></td>
</tr>
<tr>
<td>boric acid · 328</td>
<td></td>
</tr>
<tr>
<td>boroglycerin paint 5% · 328</td>
<td></td>
</tr>
<tr>
<td>botox im inj. 100 iu / ml · 273</td>
<td></td>
</tr>
<tr>
<td>botulinum a toxin · 272</td>
<td></td>
</tr>
<tr>
<td>breast cancer · 239</td>
<td></td>
</tr>
<tr>
<td>brevibloc injection 2.5 g/10 ml, 10 mg/ml · 16</td>
<td></td>
</tr>
<tr>
<td>brimonidine · 321</td>
<td></td>
</tr>
<tr>
<td>brinerdin · 26</td>
<td></td>
</tr>
<tr>
<td>brinerdin tablets (reserpine 100mcg with dihydroergocristine &amp; clopamide/tablet) · 26</td>
<td></td>
</tr>
<tr>
<td>bromazeepam · 46</td>
<td></td>
</tr>
<tr>
<td>bromhexine hcl · 252</td>
<td></td>
</tr>
<tr>
<td>bromocriptine · 96</td>
<td></td>
</tr>
<tr>
<td>bronchodilators and asthma drugs · 244</td>
<td></td>
</tr>
<tr>
<td>brufen suspension 100 mg / 5 ml · 79</td>
<td></td>
</tr>
<tr>
<td>brufen tablets 200 mg &amp; 400 mg · 79</td>
<td></td>
</tr>
<tr>
<td>bss bottles 15 ml, 500 ml · 319</td>
<td></td>
</tr>
<tr>
<td>budesonide · 246</td>
<td></td>
</tr>
<tr>
<td>bupivacaine hydrochloride · 359</td>
<td></td>
</tr>
</tbody>
</table>
buscopan injection 20 mg/ml (1ml ampoule) 106
buscopan tablets 10 mg 106
buspar tablets 5mg, 10 mg 47
buspirone hydrochloride 46
carminative mixture (with zingiberis tincture, cardamom tincture & aromatic spirit of ammonia) 105
carvedilol 14
castor oil 122
castor oil 122
cefadroxil (as monohydrate) 500 mg, cap 173
cefadroxil monohydrate 172
cefepime dihydrochloride monohydrate 173
cefepime dihydrochloride monohydrate inj 1gm 174
cefepime 174
cefprozil 250mg tabs 175
cefprozil susp 250mg/5ml 175
ceftriaxone sod. 176
ceftazidime 1g. i.m.i.v. inj 176
ceftazidime 175
ceftazidime 250mg tabs 0.1% 331
calamine 330
calamine cream (calamine 4% with zinc oxide 3%) 330
calamine lotion (calamine 15% with zinc oxide 5%) 330
calcipotriol 334
calcium channel blockers 27
calcium salts 285
campto 100 mg/5 ml vial for injection 233
capoten tablets 12.5, 25, 50 mg 20
captopril 19
carbamazepine 51, 85, 86
carbimazole 133
carboplatin 230
cardiac glycosides 5
cardiovascular system 5
cellcept 250 mg-tablet & 500 mg-capsule · 234
central antihypertensive drugs · 24
central nervous system · 46
cephalexin · 179
cephalexin 250 mg/5 ml susp
100ml/bottle · 180
cephalexin cap 250 mg · 180
cephalexin cap 500mg · 180
cephalothin · 180
cephalothin · 180
cephalothin sodium 1 gm. inj · 180
cetavlon solution 1% & 20% · 339
cetrizine · 250
chlophenamine maleate · 250
chloral hydrate · 47
chloral hydrate · 47
chloral hydrate elixir 250 mg/5ml · 47
chlorambucil · 216
chloramphenicol · 325
chloramphenicol · 310, 325
chloramphenicol ear drops 5% · 325
chlordiazepoxide · 105
chlordiazepoxide · 47
chlorhexidine · 328, 340
chlorhexidine 0.2% mouthwash · 329
chlorhexidine alcoholic solution 0.5% · 340
chlorhexidine aqueous solution 0.02% · 340
chlorhexidine gluconate · 328
chlorhistol syrup 2 mg/5 ml · 251
chlorhistol tablets 4 mg · 251
chloroquine · 211, 268
chloroquine phosphate tab 200 mg · 212
chlorpromazine hydrochloride · 53, 73
chlordialdone (chlorthalidone) · 6
choline salicylate · 328
chorionic gonadotrophin (pregnityl) h.c.g. · 140
cibacen tablets 3mg, 20 mg · 19
ciclosporin · 235, 269
ciclosporin (cyclosporin) · 235
cidex · 340
cilazapril · 20
cimetidine · 107
cimetidine · 106
cipralex tablets 10 mg · 67
ciprofloxacin · 180
ciprofloxacin 200mg/50ml inj · 181
ciprofloxacin hydrochloride 500 mg tab. · 181
ciprolon tablets 500 mg · 181
cisatracurium besylate · 352
cisplatin · 230
cisplatin 10 mg / 20 ml vial for injection · 231
cisplatin 50 mg / 50 ml vial for injection · 231
cisplatin 10 mg / 20 ml vial for injection · 231
cisplatin 50 mg / 50 ml vial for injection · 231
clforan · 179
claritine tablets 10 mg · 251
clexane injection 20 mg, 40 mg · 36
clidinium bromide and chlordiazepoxide · 105
clofazimin · 195
clofazimin 100mg cap · 196
clopid 50 mg tablet · 141
clophosphine citrate · 140
clopinolamine hydrochloride · 66
clozapine · 54
clozapine · 54
clozapine · 54
co-aprove tablets 150 mg, 300 mg · 23
codedin lactus 15 mg / 5 ml · 253
codeine phosphate · 252
codiovan tablets · 24
cogentin injection 1 mg / ml · 96
cogentin tablets 2 mg · 96
colestyramine (cholestyramine) · 117
colestyramine (cholestyramine) · 43
compound sodium lactate injection · 288
concor tablets 5mg · 14
conjugated estrogens · 141
contraceptives · 303
cordarone injection 50 mg / ml · 3 ml
ampoules · 11
cordarone tablets 200 mg · 11
corticosteroids and anti-inflammatory preparations · 312
corticosteroids and other immunosuppressant s · 235
coxogen lyovac 500-mcg vial · 224
cosopt ophthalmic · 318
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>cotrimixazole d.s. · 183</td>
</tr>
<tr>
<td>cotrimixazole tab (400 mg sulphamethoxazole + 80 mg trimethoprim) ·</td>
</tr>
<tr>
<td>184</td>
</tr>
<tr>
<td>co-trimoxazole syp (100ml/200 mg sulphamethoxazole + 40 mg trimethoprim) · 184</td>
</tr>
<tr>
<td>coversyl tablets 4 mg &amp; 8 mg · 22</td>
</tr>
<tr>
<td>cozaar tablets 50 mg · 23</td>
</tr>
<tr>
<td>creon 10,000 (lipase 10,000 units, amylase 8000 units &amp; protease 600 units / capsule) · 125</td>
</tr>
<tr>
<td>crisantaspase (asparaginase) · 228</td>
</tr>
<tr>
<td>crisantaspase 10,000 unit for injection · 228</td>
</tr>
<tr>
<td>crixivan capsules 400 mg · 207</td>
</tr>
<tr>
<td>crotamiton · 330</td>
</tr>
<tr>
<td>cryx tap en injection (1000,000 i u./vial (1 mega unit) · 172</td>
</tr>
<tr>
<td>crystal violet (gentian violet) · 340</td>
</tr>
<tr>
<td>cuscicrom 2 · 313</td>
</tr>
<tr>
<td>cyanocobalamin (vitamin b12) · 281</td>
</tr>
<tr>
<td>cyanocobalamin injection, asp 1000 mcg/ml · 281</td>
</tr>
<tr>
<td>cyclokapron tablets 500 mg · 40</td>
</tr>
<tr>
<td>cyclopentolate hydrochloride · 314</td>
</tr>
<tr>
<td>cyclophosphamide · 216</td>
</tr>
<tr>
<td>cystrin tablets 5 mg · 308</td>
</tr>
<tr>
<td>cytarabine 100 mg &amp; 500 mg vial for injection · 220</td>
</tr>
<tr>
<td>cytarabine · 220</td>
</tr>
<tr>
<td>cytomegalovirus (cmv) immunoglobulin · 164</td>
</tr>
<tr>
<td>cytotec 200mg tablets · 301</td>
</tr>
<tr>
<td>cytotect injection 100 mg · 164</td>
</tr>
<tr>
<td>cytotoxic antibiotics · 223</td>
</tr>
<tr>
<td>dacarbazine · 228</td>
</tr>
<tr>
<td>dacarbazine 100 mg vial &amp; 200 mg vial for injection · 228</td>
</tr>
<tr>
<td>dactinomycin (actinomycin d) · 224</td>
</tr>
<tr>
<td>dadcrom 2 % · 313</td>
</tr>
<tr>
<td>dalaflox tablets 500 mg · 41</td>
</tr>
<tr>
<td>daktarin cream 2% · 337</td>
</tr>
<tr>
<td>dalacin c injection 300 mg/ 2 ml · 182</td>
</tr>
<tr>
<td>danazol · 142</td>
</tr>
<tr>
<td>danol capsules 200 mg · 143</td>
</tr>
</tbody>
</table>
daonil tablets 5 mg · 128
dapson tab 100 mg · 197
dapsone · 196
darbepeotin alfa · 289
daunorubicin 20 mg vial for injection · 224
ddavp intranasal spray 100 mcg/ml - 2.5 ml,
tablet 0.1 mg & 0.2 mg · 146
ddavp tablet 0.1 mg & 0.2 mg · 146
decadron elixir 0.5 mg/5 ml · 136
decadron eye drops · 312
decadron injection 4 mg/ml - 2 ml,
ampoules · 136
decadron tablets 0.5 mg, 4 mg · 136
decapeptyl sr 3.75 mg vial for im injection · 241
deferasirox · 293
deferasirox tab 125 mg, 250 mg & 500 mg · 293
deferoxamine mesilate · 292
delzim tablet 60 mg · 27
delzim-200 mg cap · 27
delzim-sr tablet 120 mg · 27
de-nol tablets 120 mg · 110
depakine drops 200 mg/1 ml - 40 ml,
bottles · 93
depakine syrup 200 mg/5 ml - 150 ml,
bottles · 93
depakine tablets 200 mg, 500 mg & 500 mg chromo · 93
depixol injection 40 mg/2 ml; 100 mg/2 ml · 55
depo-medrol injection 40 mg/ml, for i.m.
use · 138
depo-provera injection 50 mg/ml in 3 ml
vials · 148
desferal injection, powder for reconstitution,
desferroxamine mesilate, 500 mg vial · 293
desmopressin · 143
dexamethasone · 135, 312, 325
dexipan cream 5% · 330
dextran 40 intravenous infusion in glucose
intravenous infusion 5% or in sodium
chloride intravenous infusion 0.9% · 289
dextran 40% · 288
dextran 70 · 289
dextropropoxyphene · 81
dextropropoxyphene · 81
dextropropoxyphene hydrochloride 32.5 mg
with paracetamol 325 mg · 81
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>dextrose (glucose) · 281</td>
<td></td>
</tr>
<tr>
<td>dextrose intravenous fluid 5%, 10%, 20%, 25%, 50% · 281</td>
<td></td>
</tr>
<tr>
<td>df 118 tablets 30 mg · 81</td>
<td></td>
</tr>
<tr>
<td>di te anatoxal berna for adults · double vaccine · 153</td>
<td></td>
</tr>
<tr>
<td>di te per anatoxal berna, triple vaccine · 154</td>
<td></td>
</tr>
<tr>
<td>diagnostics · 305, 320</td>
<td></td>
</tr>
<tr>
<td>diagnostics and pre-operative preparations · 320</td>
<td></td>
</tr>
<tr>
<td>diamox injection 500 mg per vial · 316</td>
<td></td>
</tr>
<tr>
<td>diamox tablets 250 mg · 316</td>
<td></td>
</tr>
<tr>
<td>diazem · 48, 88, 346</td>
<td></td>
</tr>
<tr>
<td>diazem retal tube 5mg/tube · 49</td>
<td></td>
</tr>
<tr>
<td>diclofenac sodium · 255, 320</td>
<td></td>
</tr>
<tr>
<td>diclogesic suppositories 50 mg &amp; 100mg · 256</td>
<td></td>
</tr>
<tr>
<td>disiflucan capsules 50 mg, 150 mg · 201</td>
<td></td>
</tr>
<tr>
<td>digoxin · 5</td>
<td></td>
</tr>
<tr>
<td>digoxin injection · 6</td>
<td></td>
</tr>
<tr>
<td>digoxin injection 0.5 mg/2ml · 6</td>
<td></td>
</tr>
<tr>
<td>digoxin tablets · 6</td>
<td></td>
</tr>
<tr>
<td>digoxin tablets 0.25 mg, 0.0625 mg · 6</td>
<td></td>
</tr>
<tr>
<td>dilatrend tablets 6.25 mg &amp; 25 mg · 15</td>
<td></td>
</tr>
<tr>
<td>diliazem hydrochloride · 27</td>
<td></td>
</tr>
<tr>
<td>dimethindene maleate · 327</td>
<td></td>
</tr>
<tr>
<td>dinoprostone (prostaglandin e2) · 295</td>
<td></td>
</tr>
<tr>
<td>dinoprostone 1mg/ml (prost e2 inj) i.v. · 296</td>
<td></td>
</tr>
<tr>
<td>dinoprostone 3 mg, pessaries · 296</td>
<td></td>
</tr>
<tr>
<td>diosmin (flavonoid extracts of rutaceae) · 40</td>
<td></td>
</tr>
<tr>
<td>diosmin 450 mg + hesperidin 50 mg table · 41</td>
<td></td>
</tr>
<tr>
<td>diov an 80 mg, &amp; 160 mg tablets · 24</td>
<td></td>
</tr>
<tr>
<td>diphenhydramine hydrochloride · 253</td>
<td></td>
</tr>
<tr>
<td>dipiveferine hydrochloride · 316</td>
<td></td>
</tr>
<tr>
<td>dipivridamole · 38</td>
<td></td>
</tr>
<tr>
<td>disinfectants and cleansers · 339</td>
<td></td>
</tr>
<tr>
<td>disipal tablets 50 mg · 98</td>
<td></td>
</tr>
<tr>
<td>disopyramide · 11</td>
<td></td>
</tr>
<tr>
<td>distalgesic tablets · 81</td>
<td></td>
</tr>
<tr>
<td>distamine tablets 125 mg · 271</td>
<td></td>
</tr>
<tr>
<td>diuretics · 6</td>
<td></td>
</tr>
<tr>
<td>divobet (plus steroid) · 334</td>
<td></td>
</tr>
<tr>
<td>dobutamine hydrochloride · 33</td>
<td></td>
</tr>
<tr>
<td>dobutrex injection 250 mg/vial · 34</td>
<td></td>
</tr>
<tr>
<td>docetaxel · 232</td>
<td></td>
</tr>
</tbody>
</table>
Index

dogmatil tablets 50 mg & 200 mg · 62
domperidone · 73
dopamine hydrochloride · 34
dormicum injection 15 mg/3 ml · 348
dorzolamide + timolol · 317
dovonex 0.005% w/w ointment & cream · 334
doexipin · 66
doxorubicin hydrochloride · 225
doxycline hyclate · 184
doxycline hyclate 100 mg cap (vibramycin) · 185
doxydar capsules 100 mg · 185
droperidol · 358
droperidol injection 2.5 mg/ml in 2 ml amp · 359
drotrecogin alfa (activated) · 39
drug interactions for analgesics
drug used in obstetrics · 295
drugs acting on the ear · 325
drugs acting on the nose · 326
drugs acting on the oropharynx · 328
drugs affecting intestinal secretions · 124
drugs suppressing the rheumatic disease process · 268
drugs used in choreas, tics and related disorders · 101
drugs used in nausea and vertigo · 73
drugs used in neutropenia · 243
drugs used in neuromuscular disorders · 276
drugs used in parkinsonism and related disorders · 95
drugs used in the treatment of allergic disorders · 250
drugs used in the treatment of gout · 275
drugs used in treatment of cough · 252
drugs used in urinary tract disorders · 306
drugs used in urothelial toxicity · 243
ductus arteriosus · 299
dulcolax tablets 5 mg · 121
duphalac syrup · 123
duphaston tablets 10 mg · 147
duricef capsules 500 mg · 173
duxit tablets · 32
duxit tablets (almitrine bismesylate 30 mg, raubasine 10 mg/tablet) · 32

373
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>dyazide capsules (with triameterene 50 mg) · 8</td>
</tr>
<tr>
<td>dydrogesterone · 146</td>
</tr>
<tr>
<td>dyspepsia syrup 200mg/5ml · 108</td>
</tr>
<tr>
<td>ear, nose, and oropharynx · 325</td>
</tr>
<tr>
<td>edrophonium chloride · 277, 355</td>
</tr>
<tr>
<td>efemoline eye drops (with tetrahydrozoline 0.25mg/1ml · 313)</td>
</tr>
<tr>
<td>efexor tablets 37.5 mg, 75 mg xr, 150mg xr · 71</td>
</tr>
<tr>
<td>eldepryl tablets 5 mg · 100</td>
</tr>
<tr>
<td>electrolytes · 281</td>
</tr>
<tr>
<td>electrolytes · 285</td>
</tr>
<tr>
<td>elocom cream · 1% · 333</td>
</tr>
<tr>
<td>elocom ointment 0.1% · 333</td>
</tr>
<tr>
<td>eloxatin 50 mg vial. · 231</td>
</tr>
<tr>
<td>eltroxin tablet 25mcg, 50mcg &amp; 100 mcg · 151</td>
</tr>
<tr>
<td>elyzol vaginal suppositories 500 mg/suppository · 214</td>
</tr>
<tr>
<td>emla cream · 361</td>
</tr>
<tr>
<td>emollient and barrier preparations · 330</td>
</tr>
<tr>
<td>emulsifying ointment · 330</td>
</tr>
<tr>
<td>enalapril maleate · 20</td>
</tr>
<tr>
<td>enbrel 25 mg &amp; 50 mg inj. · 274</td>
</tr>
<tr>
<td>endocrine system · 126</td>
</tr>
<tr>
<td>endoxan 200 mg, 500mg &amp; 1g vial for injection · 217</td>
</tr>
<tr>
<td>endoxan 50 mg tablets · 217</td>
</tr>
<tr>
<td>enoxaparin sodium · 35</td>
</tr>
<tr>
<td>enzymes · 279</td>
</tr>
<tr>
<td>epanutin capsules 100 mg · 92</td>
</tr>
<tr>
<td>epanutin capsules 50 mg &amp; 100 mg · 85</td>
</tr>
<tr>
<td>epanutin injection 250 mg/ampoule · 92</td>
</tr>
<tr>
<td>epanutin injection 50 mg/ml ampoules · 13</td>
</tr>
<tr>
<td>epanutin suspension 30 mg/5 ml · 92</td>
</tr>
<tr>
<td>ephedrine hydrochloride · 32</td>
</tr>
<tr>
<td>ephedrine hydrochloride 3mg/ml injection · 33</td>
</tr>
<tr>
<td>epinephrine · 33, 247</td>
</tr>
<tr>
<td>epinephrine · 33, 247</td>
</tr>
<tr>
<td>epinephrine (adrenaline) · 33</td>
</tr>
<tr>
<td>epinephrine injection 10,000 in prefilled syringes · 247</td>
</tr>
<tr>
<td>1000 · 247</td>
</tr>
<tr>
<td>epipodophyllotoxins · 227</td>
</tr>
<tr>
<td>epirubicin hydrochloride · 225</td>
</tr>
<tr>
<td>epivir 150mg tab · 208</td>
</tr>
<tr>
<td>eprex injection 1000 u/ml, 2000 u/ml, 4000 u/ml · 291</td>
</tr>
<tr>
<td>374</td>
</tr>
<tr>
<td>Drug Name</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>ergotamine tartarate</td>
</tr>
<tr>
<td>ergotamine tartarate</td>
</tr>
<tr>
<td>erythrocin syrup 200 mg/5 ml</td>
</tr>
<tr>
<td>erythrocin tablets 250 mg</td>
</tr>
<tr>
<td>erythromycin 186</td>
</tr>
<tr>
<td>erythromycin 185</td>
</tr>
<tr>
<td>erythromycin base/ethylsuccinate/steearate tab 250mg</td>
</tr>
<tr>
<td>erythromycin ethylsuccinate 200mg/5ml susp</td>
</tr>
<tr>
<td>erythromycin injection 1 gm i.v.</td>
</tr>
<tr>
<td>erythropoietin (epoetin alpha &amp; beta)</td>
</tr>
<tr>
<td>escitalopram hydrobromide</td>
</tr>
<tr>
<td>esidrex tablets 25 mg</td>
</tr>
<tr>
<td>esmeron injection 10 mg/ml - 5ml vials</td>
</tr>
<tr>
<td>esmolol hydrochloride</td>
</tr>
<tr>
<td>esomeprazole</td>
</tr>
<tr>
<td>etanercept</td>
</tr>
<tr>
<td>ethambutol hcl 400 mg</td>
</tr>
<tr>
<td>ethanolamine oleate (monoethylamine oleate)</td>
</tr>
<tr>
<td>ethanolamine oleate injection 5%</td>
</tr>
<tr>
<td>ether</td>
</tr>
<tr>
<td>ethinylestradiol</td>
</tr>
<tr>
<td>ethosuximide</td>
</tr>
<tr>
<td>ethyl chloride spray</td>
</tr>
<tr>
<td>etoposide</td>
</tr>
<tr>
<td>eurax cream10 %</td>
</tr>
<tr>
<td>exjade tablet 125, 250, 500mg</td>
</tr>
<tr>
<td>exocin eye drops</td>
</tr>
<tr>
<td>eye</td>
</tr>
<tr>
<td>ezilax syrup</td>
</tr>
<tr>
<td>factor ix</td>
</tr>
<tr>
<td>factor ix complex for i.v. injection 500 i.u.</td>
</tr>
<tr>
<td>factor viii injection 250 i.u.</td>
</tr>
<tr>
<td>factor viii, dried (human antihaemophilic fraction)</td>
</tr>
<tr>
<td>farmorubicin 10- &amp; 50-mg vials for injection</td>
</tr>
<tr>
<td>faverin tablets 50 mg</td>
</tr>
<tr>
<td>fefol spansules (47 mg elemental iron with 500 megfolic acid/spansule)</td>
</tr>
<tr>
<td>felodipine</td>
</tr>
<tr>
<td>femora 2.5 mg tablet</td>
</tr>
<tr>
<td>fentanyl citrate</td>
</tr>
<tr>
<td>fentanyl injection 50 mcg/ml, 2 ml &amp; 10 ml vials</td>
</tr>
<tr>
<td>ferrous gluconate</td>
</tr>
<tr>
<td>ferrous gluconate tablets 300 mg it</td>
</tr>
</tbody>
</table>
Index

contains 35mg elemental iron/tablet · 282
errous sulfate · 282
evadol 500mg tablet · 80
fibrates · 41
fibrinolytic drugs · 38
flagyl tablets 200 mg · 214
flamazine cream 1% · 337
floxotide accuhaler 125 mcg · 245
floxotide nebulos 0.5 mg/2 ml · 248
fluconazole · 200
fluconazole 200mg iv inj · 201
fluconazole, caps. 50mg · 201
fluconazole, caps. 150mg · 201
fludarabine · 220
fludarabine phosphate · 220
fludrocortisone acetate · 136
flumazenil · 356
flumetasone pivalate · 325, 331
fluocinolone acetonide · 332
fluorescein injection · 321
fluorescein sodium · 320
fluorescent strips · 321
fluorometholone · 312
fluorouracil · 221
fluorouracil 250 mg/ml – 10-ml vial for injection. · 221
fluoxetine hydrochloride · 67
flupentixol (flupenthixol) · 55
fluphenazine decanoate · 55
fluticasone propionate · 245, 247
fluvastatin sodium · 42
fluvoxamine maleate · 68
folic acid · 282
folic acid tablets 5 mg · 282
folic acid (as calcium salt) 300 mg/30 ml amp. 15 mg vial for im, iv or infusion. · 243
foradil 12 mcg/capsule · 243
forane 100 ml · 345
formoterol · 245
fortum injection, powder for reconstitution, ceftazidime (as pentahydrate), with sodium carbonate, 1g vial, 2g vial · 176
frusemide (furosemide) · 7
fucidin cream 2% · 336
fucidin ointment 2% · 336
fucithalmic 1 % viscous eye drops · 311
fulcin tablets 125 mg & 500 mg · 202
<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Strength</th>
<th>Formulation</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fungizone Injection</td>
<td>50 mg/vial</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Furacin Soluble Dressing</td>
<td>0.2%</td>
<td>337</td>
<td></td>
</tr>
<tr>
<td>Furadantin Tablets</td>
<td>100 mg</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>Fusidate Sodium i.v. inj</td>
<td>500 mg/10 ml</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td>Fusidate Sodium Tab</td>
<td>250 mg</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td>Fusidic Acid Susp</td>
<td>50 mg, 90 ml</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td>Fusidic Acid</td>
<td>336</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gabapentin</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garamycin Eye Drops</td>
<td>0.3%</td>
<td>311</td>
<td></td>
</tr>
<tr>
<td>Garamycin Injection</td>
<td>80 mg/2 ml</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>Gardenal Elixir</td>
<td>20 mg &amp; 30 mg/5 ml</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Gastrointestinal System</td>
<td>104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gelfoam</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gemcitabine Hydrochloride</td>
<td>221</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gemzar 200 mg &amp; 1 g vials for injection</td>
<td>222</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Anesthetics</td>
<td>343</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentacin Eye Ointment</td>
<td>0.3%</td>
<td>311</td>
<td></td>
</tr>
<tr>
<td>Gentamicin</td>
<td>311, 326</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamycin</td>
<td>187</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamycin Sulphate</td>
<td>80 mg/2 ml i.m., i.v. inj</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>Gentian Violet Paint</td>
<td>0.5%</td>
<td>340</td>
<td></td>
</tr>
<tr>
<td>Genticin Ear Drops</td>
<td>0.3%</td>
<td>326</td>
<td></td>
</tr>
<tr>
<td>Glibenclamide</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gliclazide MR</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glipizide</td>
<td>128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glivec Tablet</td>
<td>100 mg, 400 mg</td>
<td>218</td>
<td></td>
</tr>
<tr>
<td>Glucagon Hcl</td>
<td>133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glucagon Injection</td>
<td>1 unit/vial</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>Glucophage Tablets</td>
<td>500 mg &amp; 1000 mg</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>Glucose 25% in Glycerin Nose Drops</td>
<td>327</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glucose in Glycerin</td>
<td>327</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glutaraldehyde</td>
<td>340</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerin</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerin</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerin Suppositories</td>
<td>Child &amp; Adult</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>Glycerin Trinitrate</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycine</td>
<td>306</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycine Irrigation Solution</td>
<td>306</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycine-Irrigation Solution 1.5% 3000 mL</td>
<td>307</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goserelin</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granocyte 33.6 million unit (263 mcg) - vial for injection</td>
<td>243</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Griseofulvin</td>
<td>202</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Griseofulvin Tab</td>
<td>125 mg &amp; 500 mg</td>
<td>202</td>
<td></td>
</tr>
<tr>
<td>Gyne-Daktarin Cream</td>
<td>305</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Index

h

haelon injection · 321
haemophilus influenzae b (hib) vaccine · 154
haldol decanoate injection 50 mg/1 ml in sesame oil · 58
haldol drops 2 mg/1 ml · 15 ml bottles · 57
haldol drops 2 mg/ml · 101
haldol injection 5 mg/ml · 57
haloperidol · 56, 57, 101
haloperidol decanoate · 57
hartmann's solution · 288
hc solu-cortef injection 100 mg/vial · 138
helicobacter pylori infection · 110
hemoproct ointment · 124
hemoproct suppositories · 124
hemorrhoidal preparation · 124
hemorrhoidal preparation with steroid · 124
heparin · 35
heparin · 34
heparin injection 5,000 units/ml · 35
hepatitis b immunoglobulin (hbig) · 165
hepatitis b vaccine · 154
herceptin 150 mg vial for intravenous infusion · 230
hexa combined diphtheria-tetanus-acellular pertussis (dtpa), hepatitis b, inactivated poliovirus and haemophilus influenzae type b vaccine · 155
hexetidine · 329
hibicet alcoholic solution 1 · 30 · 340
hibicet aqueous solution 1 % · 340
hibicet hospital concentrate (with chlorhexidine) · 339
hibiscrub cleansing solution 4% · 340
hibitane obstetric cream 1 % · 340
hibicet hospital concentrate (with cetrimide) · 340
hormonal antagonists hormones · 140
human actrapid · 130
human albumin 20% solution 50 ml & 100 ml · 288
human albumin 5% solution 50 ml · 288
human normal immunoglobulin (hnig) · 163
humulin-n · 130
humulin-r · 130
hyalase injection 1500 units · 279
Index

hyaluronate sodium · 321
hyaluronidase · 279
hydralazine · 30
hydrea 500 mg capsule · 229
hydrochlorothiazide · 8
hydrocortisone · 137, 332
hydrocortone tablets 10 mg, 20 mg · 138
hydrogen peroxide · 329, 340
hydrogen peroxide 3% (10 volumes) · 341
hydrogen peroxide diluted to 10 volumes (3%) · 329
hydroxyurea · 229
hygroton tablets 50 mg · 7
hyoscine butylbromide · 105
hypnotics, sedatives and anxiolytics · 46
hypermelllose (hydroxypropylmethylcellulose) · 319

imipenem & cilastatin sodium i.v. 500 mg each inj. · 189
imipenem and cilastatin · 188
imipramine hydrochloride · 69
imitanib · 217
immunoglobulins · 163
immunological products and vaccines · 153
imodium capsules 2 mg · 117
imuran 50 mg tablet · 234
indapamide · 22
indapamide · 22
indapamide · 8
inderal injection 1 mg/ml · 18
inderal tablets 10 mg & 40 mg · 102
inderal tablets 10 mg, 40 mg · 18
indigo carmine · 305
indigo carmine injection 0.4% 5 ml ampoules · 306
indinavir sulfate · 207
indocid capsules 25 mg · 257
indometacin · 257
indomethacin iv 1 mg/ml · 257
indomin suppositories 100 mg/supp · 257
industrial methylated spirit · 339
infanrix · 155
infections · 191
infections · 167

ibuprofen · 79, 256
ichthammol · 334
ichthyol ointment 10% · 334
idarubicin hydrochloride · 225
ifosfamide · 217
Index

infliximab · 118, 274
influenza vaccines · 156
inhalational anesthetics · 344
inhibace tablets 2.5 mg, 5 mg · 20
injection, amikacin (as sulphate) 250 mg/ml · 167
insulatard · 130
insulin & human insulin analogues · 129
insulin glargine(lantus) · 130
insulin glargine, human 100 units/ml, 10ml/vial · 130
insulin neutral human · 130
intal inhaler 5 mg/inhalation · 250
interferon alfa · 237
interferon alfa-2a · 238
interferon alfa-2b · 238
interferon beta · 238
interferon beta-1a · 238
interferon beta-1b · 238
intraglobin 500 mg/vial · 164
intralipid 10%, 20% · 100 & 500 ml · 283
intralipid sodium injection 2.5% · 344
intravenous anesthetics · 343
intropin injection 40 mg/ml, 200 mg/5 ml. · 34
ipratropium bromide · 248
irbesartan · 22
Index

j
jectofer injection. it contains 5% (50 mg/ml) of iron. · 283

k
kabikinase injection · 250,000 units/vial · 39
kiron drops (15 mg elemental iron/0.6 ml) · 282
kiron syrup (30 mg elemental iron/5 ml) · 282
keflin injection 1 g · 180
kemadrin tablets 5 mg · 99
kenacomb cream & ointment · 341
kenacomb cream & ointment · 341
konalog intra-articular/intramuscular injection (aqueous suspension) 40 mg/ml · 268
ketalar injection 50 mg/ml-10 ml vial · 343
ketamine · 343
ketoconazol 200mg tab · 204
ketoconazole · 204
konakion mm injection 1 mg/0.5 ml for i.v. injection only. · 284
konakion mm paediatric injection 2 mg in 0.2 ml for i.m., i.v. · 284
konakion tablets 10 mg · 284

l
labetalol hydrochloride · 16
labetalol hydrochloride · 16
labetalol hydrochloride injection 5mg/ml · 16
lacr-lube ophthalmic ointment · 319
lactulose · 122
lamictal tablets 5mg, 25mg, 50 mg & 100 mg · 90
lamisil tablets 250 mg · 338
lamivudine · 207
lamotrigine · 89
lamprene capsules 100 mg · 196
lanoxin elixir 0.05 mg/ml · 6
lanvis 40 mg tablets · 223
largactil injection 50 mg/2 ml · 54, 73
largactil tablets100 mg · 53
largactil tablets100 mg. · 73
lasix injection 20 mg/2ml, 250 mg/25 ml · 7
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>lasix paediatric syrup 1 mg/ml</td>
<td>8</td>
</tr>
<tr>
<td>lasix tablets 40 mg</td>
<td>7</td>
</tr>
<tr>
<td>latanoprost</td>
<td>323</td>
</tr>
<tr>
<td>laxatives</td>
<td>121</td>
</tr>
<tr>
<td>laxomag liquid</td>
<td>123</td>
</tr>
<tr>
<td>lenograztin</td>
<td>243</td>
</tr>
<tr>
<td>lempex tablets 25 mg, 100 mg</td>
<td>55</td>
</tr>
<tr>
<td>lescol capsules, 40 &amp; 80 mg</td>
<td>43</td>
</tr>
<tr>
<td>letrozole</td>
<td>239</td>
</tr>
<tr>
<td>leucovorin calcium (calcium folinate)</td>
<td>242</td>
</tr>
<tr>
<td>leukeran 2mg tablet</td>
<td>216</td>
</tr>
<tr>
<td>levodopa with benserazide (co-beneldopa)</td>
<td>96</td>
</tr>
<tr>
<td>levodopa with carbidopa (co-careldopa)</td>
<td>97</td>
</tr>
<tr>
<td>lextanil tablets 1.5 mg, 3 mg</td>
<td>46</td>
</tr>
<tr>
<td>librax tablets(chlordiazepoxide 5 mg &amp; clidinium bromide 2.5 mg/tablets)</td>
<td>105</td>
</tr>
<tr>
<td>librarium tablets 10, 25 mg</td>
<td>48</td>
</tr>
<tr>
<td>lidocaine (lignocaine)</td>
<td>124</td>
</tr>
<tr>
<td>lidocaine 5% ointment</td>
<td>124</td>
</tr>
<tr>
<td>lidocaine hydrochloride 307, 360</td>
<td></td>
</tr>
<tr>
<td>lidocaine hydrochloride (lignocaine) 12</td>
<td></td>
</tr>
<tr>
<td>lidocaine hydrochloride injection 2%, 20 mg/ml</td>
<td>12</td>
</tr>
<tr>
<td>lioresal tablets 10 mg</td>
<td>277</td>
</tr>
<tr>
<td>lipid-regulating drugs</td>
<td>41</td>
</tr>
<tr>
<td>lipids</td>
<td>283</td>
</tr>
<tr>
<td>lipitor 10 mg &amp; 20 mg tablets</td>
<td>42</td>
</tr>
<tr>
<td>lipostat tablets 20mg, 40 mg</td>
<td>43</td>
</tr>
<tr>
<td>lisinopril</td>
<td>21</td>
</tr>
<tr>
<td>lithium carbonate</td>
<td>58</td>
</tr>
<tr>
<td>livial</td>
<td>303</td>
</tr>
<tr>
<td>locacorten vioform ear drops</td>
<td>325</td>
</tr>
<tr>
<td>local aesthetics</td>
<td>318</td>
</tr>
<tr>
<td>local anesthetics</td>
<td>359</td>
</tr>
<tr>
<td>local sclerosing agent</td>
<td>45</td>
</tr>
<tr>
<td>locasalen ointment</td>
<td>0.02% (with 3% salicylic acid) 332 loperamide hydrochloride 116 lopressor tablets 100 mg, 17 loratadine 251 lorazepam 50 losartan potassium 23 lospec tablets 20mg, 115 ludimil tablets 25, 50, 75 mg, 69 luminal tablets 15 mg, 30 mg &amp; 60 mg, 91 mabthera (roche) 100 mg &amp; 500 mg vial 219 macrodex (dextran 70 in glucose 5% or</td>
</tr>
</tbody>
</table>
sodium chloride 0.9% i.v. solution · 289
madopar capsules 250 mg (200 mg l-dopa & 50 mg benserazide) · 97
magnesium hydroxide · 104
magnesium hydroxide · 123
magnesium sulfate · 102, 123
magnesium sulfate · 50, 102, 123
magnesium sulfate enema 50% in water · 123
magnesium sulfate injection 50% · 50, 102
malignant disease & immunosupression · 216
mannitol · 9
mannitol · 8
mannitol iv. infusion 10% & 20% solution · 9
maprotiline hydrochloride · 69
marcaine 5 mg/ml with adrenaline (epinephrine) · 359
marcaine 80 mg/ml - 4 ml ampoules · 359
marcaine plain 0.5% · 359
maxitrol eye drops (with neomycin 0.35% & polymyxin b 6000 units/ml) · 312
measles, mumps and rubella vaccine (mmr) · 156
mebendazole · 212
mebendazole sup 100 mg · 5 ml, 30 ml · 213
mebendazole tab 100 mg · 213
medroxy progesterone acetate · 147
mefenemic acid · 79
megace 40 mg tablets · 239
megavit drops (multivitamin) · 283
megestrol acetate · 239
melphalan · 218
meningococcal meningitis vaccine · 157
mercaptopurine · 222
mesalazine (mesalamine) (5-aminosalicylic acid) · 119
mesna · 243
mesterolone · 148
mestinon tablets 60 mg · 278
metenix 5 mg tablets · 9
metformin hcl · 131
methadone hydrochloride · 84
methadone tablets 5 mg · 84
methergin injection 0.2 mg/1 ml · 297
methergin tablets 0.125 mg · 297
methocel eye drops 2% · 319
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>methotexate 2.5 mg tablet · 223</td>
<td></td>
</tr>
<tr>
<td>methotexate 50 mg &amp; 500 mg vials for injection · 223</td>
<td></td>
</tr>
<tr>
<td>methotrexate · 222</td>
<td></td>
</tr>
<tr>
<td>methyldopa · 24</td>
<td></td>
</tr>
<tr>
<td>methylene blue · 306</td>
<td></td>
</tr>
<tr>
<td>methylene blue · 306</td>
<td></td>
</tr>
<tr>
<td>methylene blue injection injection 1% · 306</td>
<td></td>
</tr>
<tr>
<td>methylergometrine maleate · 296</td>
<td></td>
</tr>
<tr>
<td>methylphenidate hydrochloride · 102</td>
<td></td>
</tr>
<tr>
<td>methylprednisolone acetate 40mg/m · 138</td>
<td></td>
</tr>
<tr>
<td>metoclopramide hydrochloride · 74</td>
<td></td>
</tr>
<tr>
<td>metolazone · 9</td>
<td></td>
</tr>
<tr>
<td>metoprolol tartrate · 17</td>
<td></td>
</tr>
<tr>
<td>metrogyl suspension 125 mg/5 ml · 214</td>
<td></td>
</tr>
<tr>
<td>metronidazol 500 mg vaginal pessaries · 214</td>
<td></td>
</tr>
<tr>
<td>metronidazole · 213</td>
<td></td>
</tr>
<tr>
<td>metronidazole 0.5g inj. 100ml · 214</td>
<td></td>
</tr>
<tr>
<td>metronidazole syrup 25 mg / ml 60 ml · 214</td>
<td></td>
</tr>
<tr>
<td>metronidazole tab 200 mg · 214</td>
<td></td>
</tr>
<tr>
<td>metronidazole infusion 300 mg · 214</td>
<td></td>
</tr>
<tr>
<td>mexilet capsules 200 mg · 12</td>
<td></td>
</tr>
<tr>
<td>miconazole nitrate · 304</td>
<td></td>
</tr>
<tr>
<td>midazolam · 347</td>
<td></td>
</tr>
<tr>
<td>mikoal cream · 305</td>
<td></td>
</tr>
<tr>
<td>milk of magnesia · 123</td>
<td></td>
</tr>
<tr>
<td>milrinone · 6</td>
<td></td>
</tr>
<tr>
<td>milrinone · 6</td>
<td></td>
</tr>
<tr>
<td>milrinone (as lactate) 1mg/ml for dilution before use · 6</td>
<td></td>
</tr>
<tr>
<td>minipres tablets 5 mg · 128</td>
<td></td>
</tr>
<tr>
<td>minims cyclopentolate hcl 0.5% · 314</td>
<td></td>
</tr>
<tr>
<td>minipres tablets 1 mg, 5 mg · 25</td>
<td></td>
</tr>
<tr>
<td>miochol intra-ocular 1% solution · 320</td>
<td></td>
</tr>
<tr>
<td>mirtazapine · 72</td>
<td></td>
</tr>
<tr>
<td>miscellaneous · 40</td>
<td></td>
</tr>
<tr>
<td>misoprostol · 300</td>
<td></td>
</tr>
<tr>
<td>mitomycin · 226</td>
<td></td>
</tr>
<tr>
<td>mitomycin c kyowa 5 mg- vial for injection · 226</td>
<td></td>
</tr>
<tr>
<td>mitoxana 2 g- vials for injection · 217</td>
<td></td>
</tr>
<tr>
<td>mivacuron injection 2 mg/ml - 5 ml</td>
<td></td>
</tr>
<tr>
<td>mivacurium chloride · 352</td>
<td></td>
</tr>
<tr>
<td>mixavit syrup (multivitamin) · 284</td>
<td></td>
</tr>
<tr>
<td>mixavit tablets (multivitamin) · 283</td>
<td></td>
</tr>
<tr>
<td>mixtard pen · 130</td>
<td></td>
</tr>
<tr>
<td>modecate injection 25 mg / ml in 1 ml vial, 100 mg / 1 ml · 56</td>
<td></td>
</tr>
<tr>
<td>mogadon tablets 5 mg · 51</td>
<td></td>
</tr>
<tr>
<td>mometasone furoate · 332</td>
<td></td>
</tr>
<tr>
<td>monoclonal antibody</td>
<td></td>
</tr>
</tbody>
</table>

384
Index

morphine injection 10 mg · 83, 349
morphine salts · 81
morphine salts · 82
morphine sulfate · 348
motilium suspension 5 mg/5 ml · 74
moxal suspension & moxal chewable tablets (aluminium hydroxide 405 mg & magnesium hydroxide 100mg per5 ml or tablet) · 104
mst continus tablets 30 mg · 83
mucolyte 4mg/5ml syrup · 252
multivitamin tab (minerals & trace elemental iron) · 284
multivitamins · 283
mupirocin · 336
muscadol tablets (paracetamol 450 mg & orphenadrine citrate 35 mg/tab) · 80
muscle relaxants · 352
musculoskeletal and joint diseases · 255
myambutol tablets 400 mg · 197
mycoheal 100mg vaginal pessaries · 305
mycoheal vaginal cream · 305
mycophenolate mofetil · 234
mycostatin cream 100,000 units/g · 338
mycostatin suspension 100,000 units/ml · 205, 329
mydriacyl eye drops · % · 315
mydriatics and cycloplegics · 314
mycrisin injection 10 & 50 mg · 272
myometrial relaxants · 301
mysoline tablets 250 mg · 92

n
naloxone hydrochloride · 357
naproxen · 80, 257
naproxen sodium · 80
narcotic analgesics · 81
natrilix sr tablets 1.5 mg · 8
natulan 50 mg capsules · 232
natural tears eye drops · 319
navelbine 50 mg/5 ml for injection · 227
navoban capsules 5 mg · 78
navoban injection 5 mg · 78
ndinavir sulfate 400mg crixivan tab · 207
nebcin injections 80 mg · 194

385
Index

neomerczole tablets 5 mg · 134
neomisin eye drops (with neomycin) · 311
neomycin · 336
neomycin & bacitracin cream; · 337
neomycin sulfate · 336
neoral 100mg / ml susp 50ml · 236
neoral 25 mg-, 50 mg-, 100 mg- capsules · 235
neoral oral solution 100 mg/ml · 270
neosporin eye drops (with gramicidin & neomycin); · 311
neostigmine methylsulfate · 356
neotigason 10mg, 25mg capsules · 333
nepha-zone nitrate 0.05mg+zinc sulphate 0.02mg · 322
netromycin / netlimicin · 189
netromycin injection 150 mg/1.5 ml · 189
netromycin sulphate 150mg/1.5ml vial.im.iv · 189
neupogen pfs 0.5ml, 30miu/0.5ml · 243
neurobion injection (vitamin b1 vitamin b6 vitamin b12) · 284
neurontin 300 mg & 400 mg · 50

nexium tablets 20 mg · 113
nifedipine · 28
nimbinex injection 2 mg/ml -2.5 ml & 10 ml ampoules · 352
nitrates (nitrovasodilators) · 30
nitazepam · 50
nitroderm t.t.s. self-adhesive patch, 5mg. · 31
nitrofurantoin · 189
nitrofurantoin tab 100 mg · 190
nitrofurazone · 337
nitroglycerin injection 25 mg/5ml, to be diluted before use. · 31
nitroglycerin sublingual tablet 0.5 mg · 31
nitrous oxide · 345
nivaquin tablets 200 mg , chloroquine injection 40 mg/ml 5 ml ampoules · 212
nizoral tablets 200 mg · 204
nolvadex tablets 10 mg · 149
non-narcotic analgesics · 78
nootropil 800 mg tablet · 101
nootropil infusion 400 mg · 101
nootropil oral solution 20 % (1 ml = 330 mg) · 101

386
Index

nopain tablets 250 mg · 80, 258
noradrenaline / norepinephrine
injection, noradrenaline acid tartrate 2 mg/ml (equivalent to noradrenaline base 1 mg/ml) · 45
noradrenaline acid tartrate / norepinephrine bitartrate · 44
norethisterone · 148
norfloxacin · 190
norfloxacin 400 mg tablets · 191
noroxin tablets 400 mg · 191
norvasc tablets 5mg · 27
novesine eye drops 0.4% · 318
novolet insultard pen · 130
nuelin sa tablets 250 mg · 244
nutrition and blood · 280
nystatin · 204, 329, 337
nystatin 100,000 units/ml. 15ml./bottle oral drops · 205

obstetrics, gynaecology & urinary tract disorders · 295
octosim 15ug/ml inj · 146
octreotide acetate · 241
oculosan eye drops · 323
ofloxacin · 322
olanzapine · 61
olive oil · 326
olive oil ear drops · 326
omeprazole · 113
omizac tablets 20mg · 115
oncovin 1 mg vial for injection · 227
ondansetron · 75
one-alpha tablets 1 mcg, 0.25 mcg · 280
oph-cidex · 340
opioid dependence · 84
opticrom eye drops · 313
oraldene 0.1% mouth wash · 329
orbenin injection 500 mg · 183
orbenin syrup 125 mg/5 ml & 250 mg/5 ml · 183
orphenadrine citrate 35 mg/tab · 80
orphenadrine hydrochloride · 98
other antineoplastic drugs · 228
other immunomodulating drugs · 237
otosporin · 326
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>otosporin ear drops · 326</td>
</tr>
<tr>
<td>otrivine drops 0.1% adult · 328</td>
</tr>
<tr>
<td>otrivine drops 0.5% (children over 3 months) · 328</td>
</tr>
<tr>
<td>oxaliplatin · 231</td>
</tr>
<tr>
<td>oxybuprocaine hydrochloride · 318</td>
</tr>
<tr>
<td>oxybutynin hydrochloride · 307</td>
</tr>
<tr>
<td>oxytetracycline hcl · 311</td>
</tr>
<tr>
<td>oxytocin · 299</td>
</tr>
<tr>
<td>oxytocin · 297</td>
</tr>
<tr>
<td>oxytocin 5 units inj 1ml · 299</td>
</tr>
<tr>
<td>paclitaxel · 232</td>
</tr>
<tr>
<td>pancreatin · 124</td>
</tr>
<tr>
<td>panthenol · 330</td>
</tr>
<tr>
<td>papaverine hydrochloride · 308</td>
</tr>
<tr>
<td>papaverine injection 10 mg/ml · 308</td>
</tr>
<tr>
<td>paracetamol · 81</td>
</tr>
<tr>
<td>paracetamol · 80, 81</td>
</tr>
<tr>
<td>paracetamol overdose · 81</td>
</tr>
<tr>
<td>paraplatin 50 mg/5ml &amp; 150 mg/15 ml for iv infusion · 230</td>
</tr>
<tr>
<td>parasiticidal preparations · 339</td>
</tr>
<tr>
<td>pariet tablets 20 mg · 116</td>
</tr>
<tr>
<td>parfodel tablets 2.5 mg · 96</td>
</tr>
<tr>
<td>parnate tablets 10 mg · 70</td>
</tr>
<tr>
<td>paroxetine · 71</td>
</tr>
<tr>
<td>parvolex injection 200 mg/ml-10 ml ampoules · 81</td>
</tr>
<tr>
<td>peginterferon alfa · 238</td>
</tr>
<tr>
<td>peginterferon alfa – 2a · 239</td>
</tr>
<tr>
<td>peginterferon alfa – 2b · 239</td>
</tr>
<tr>
<td>penadur injection 1,200,000 iu · 171</td>
</tr>
<tr>
<td>penicillamine · 270</td>
</tr>
<tr>
<td>penicillin v · 191</td>
</tr>
<tr>
<td>penicillin v 250mg/5ml. susp 100ml · 191</td>
</tr>
<tr>
<td>penicillin v. tab 250 mg · 191</td>
</tr>
<tr>
<td>pentaglobin 5% · 164</td>
</tr>
<tr>
<td>pentasa rectal suppositories 500mg · 119</td>
</tr>
<tr>
<td>pentasa tablets 500mg · 119</td>
</tr>
<tr>
<td>pentavaccine · 157</td>
</tr>
<tr>
<td>pentazocine · 83</td>
</tr>
<tr>
<td>pentostam injection 100 mg/ ml · 215</td>
</tr>
<tr>
<td>pentoxyfylline (oxpentifylline) · 31</td>
</tr>
<tr>
<td>perfalgan (paracetamol iv solutionl · 80</td>
</tr>
<tr>
<td>perindopil · 22</td>
</tr>
<tr>
<td>perindopril · 22</td>
</tr>
<tr>
<td>perindopril 4 mg + indapamide 0.625 mg · 22</td>
</tr>
<tr>
<td>persantin injection 10 mg/2ml · 38</td>
</tr>
<tr>
<td>persantin tablets 75 mg · 38</td>
</tr>
</tbody>
</table>
Index

pethidine hydrochloride · 83, 349
pethidine injection 50 mg & 100 mg · 350
pethidine injection 50 mg, 100 mg · 83
phenergan elixir mg/5 ml · 51
phenergan elixir 5 mg/5 ml · 252, 350
phenergan elixir 5 mg/ml · 77
phenergan injection 50 mg/2 ml · 51, 350
phenergan injection 50 mg/2 ml · 252
phenergan tablet 25 mg · 51, 77, 252
phenergan tablet 25 mg · 350
phenicol eye drops 0.5%; · 310
phenicol eye ointment 1%; · 310
phenobarbital · 91, 106
phenobarbital · 90
phenobarbital injection 200 mg/ml · 91
phenylephrine hydrochloride · 314
phenylephrine minims of 2.5% & 10% · 314
phenytoin · 12, 85
phenytoin sodium · 12, 91
phosphodiesterase inhibitors · 6
phyllcontin continus 100 mg tablets · 244
phytomenadione (vitamin k1) · 284
pilocarpine eye drops 2% & 4% · 317
pilocarpine eye ointment 2% · 317
pilocarpine nitrate · 316
pipenzolate bromide · 106
pipenzolate bromide · 106
piperacillin/tazobactam · 191
piperacillin/tazobactam inj. 4.5 gm vial inj. · 192
piracetam · 101
pitressin injection 10 units/ml · 152
pizotifen · 86
plaquanil tablets 200 mg · 270
platinum compounds · 230
plendil tablets 5 mg (plendil) · 28
pneumococcal vaccine polysaccharide · 157
pneumovax · 158
poliomyelitis vaccine · 158
polymyxin b sulfate · 311
ponstan capsule 250 mg, 500 mg · 80
potassium chloride injection 10%/2 mmole of k+ & cl− /1 ml · 286
potassium chloride syrup (5 mmole k+ & cl− /5 ml) · 286

389
index

potassium citrate
(alkaline diuretic) · 308
potassium citrate mixture contains 1.5 g/5 ml · 309
potassium salts · 285
pramipexole · 98
pravastatin sodium · 43
prazosin · 25
precortisyl 1,5,20 mg tablets · 236
prednisolone · 119, 138, 236, 313
prednisolone retention enema 0.2% · 120
prednisolone tablets 1mg, 5mg & 20mg · 120
prednisolone tablets, 1 mg, 5 mg, 20 mg · 139
pregnyl injection 1500, 5000 units · 140
premarin 1.25 mg tablets · 142
premedication agents · 346
premosan tablets 10 mg · 75
preparation for psoriasis and eczema · 333
preparations for acne · 334
preparations for warts and calluses · 335
preterax · 22
priadel tablets 400 mg · 39
prilocaine 3% with felypressin dental cartridges · 361
prilocaine hydrochloride · 361
primaquine · 214
primaquine phosphate tab 7.5 mg · 215
primaquine tablets 15 mg (7.5 mg base · 215
primidone · 92, 102
primolut n 5mg tablet · 149
primperan injection 5 mg/ml · 75
priscol injection 25 mg/ml & 4 ml ampoules · 26
procaine penicillin · 192
procaine penicillin 400,000 units/2ml inj · 193
procarbazine · 231
prochlorperazine · 60, 76
proctoheal ointment · 124
proctoheal suppositories · 124
procyclidine hydrochloride · 99
progestogens prograf 1mg & 5mg tablets · 237
promethazine hydrochloride · 51, 77, 251, 350
promethazine theocolate · 77
propafenone hydrochloride · 13
propine eye drops 0.1% · 316
propofol · 343
propranolol · 17, 102
propranolol hydrochloride · 17
propylthiouracil · 134
propylthiouracil tablets 50 mg · 134
prostaglandins and oxytocics · 295
prostaphlin-a capsules 250 mg & 500 mg · 183
prostate cancer & gonadorellin analogues · 240
prostigmin injection 2.5 mg/ml · 356
prostin vr injection 500 mcg/ml · 300
protamine sulphate · 36
protamine sulphate injection 10 mg/5ml. · 36
proton pump inhibitors · 112
provera tablets 5mg · 148
proviron tablets 25 mg · 148
prozac capsules 20 mg · 68
pulmicort respules (single dose nebulizing solution 500 mcg/unit) · 247
puri-nethol 50 mg tablet · 222
pyrazinamide · 198
pyrazinamide · 198
pyrazinamide tablet 0.5gm. · 198
pyridostigmine bromide · 278
pyridoxine hydrochloride (vitamin b6) · 284
questran powder 4 g / sachet · 118
questran sachets 4 g /sachet. · 44
quinine · 278
quinine sulfate tablets 300 mg · 278
rabeprazole · 115
rabies immunoglobulin · 165
rabies vaccine · 159
ranitidine · 108
raubasine · 32
recombinat 30000 iu · 291
recommended regimens for helicobacter pylori eradication in adults · 111
recommon injection 1000, 2000, 4000 u/ml · 291
remeron 30 mg · 73
remicade 100 mg injection · 275
remicade injections (iv infusion) 100mg. · 119
remifentanil · 350
Index

renitec 1.25mg inj i.m · 21
renitec tablets 5, 10, & 20 mg · 21
reserpine · 26
respiratory stimulants and pulmonary surfactants · 253
respiratory system · 244
retrovir capsules 100 mg · 211
rhythmogan capsules 100 mg · 12
ribavirin (tribavirin) · 208
ribavirin 200mg tab (rebetal) · 209
rifadin capsules 150 mg, 300 mg · 199
rifadin syrup 100 mg/5 ml · 199
rifampicin · 107
rifampicin · 198
rifampicin 300 mg & isoniazid 150 mg/tablet · 199
rifampicin cap 150 mg · 199
rifampicin cap 300 mg · 199
rimactazid tablets 300 mg · 199
ringer lactate solution · 288
risek injections 40 mg · 115
risperdal consta – powder for injection 25 mg, 37.5mg vial · 61

risperdal tablets 2, 3, 4 mg, liquid 1 mg / ml · 61
risperdal consta · 61
risperidone · 61
risperidone · 60
ritalin tablets 10 mg · 103
ritodrine · 301
rituximab · 218
rivotril oral drops 2.5 mg/1 ml- 10 ml bottles · 88
rivotril tablets 0.5 mg & 2 mg · 87
roaccutane capsules 10 mg & 20 mg · 335
rocephin 1 g i.v, i.m. injection · 177
rocuronium bromide · 353
rosiglitazone · 131
rotarix oral suspension (powder for reconstitution) · 160
rotavirus vaccine · 160
daunorubicin (daunomycin · 224
rytomonorn tablets 150 mg · 13

s

sabril tablets 500 mg · 95
salazopyrin tablets e. c. 500mg · 121
salbutamol · 248
salicylic acid · 334, 335
salicylic acid ointment 2% · 334
salicylic acid ointment 20% & 30% · 336
sandimmun 50 mg/ml for intravenous infusion · 235
sandostatin lar 20 mg vial (depot preparation) for injection · 242
coline injection 100 mg/2 ml · 354
sectral capsule 200 mg · 13
selegiline hydrochloride · 100
seprin double-strength tablets (800 mg sulphamethoxazole + 160 mg trimethoprim) · 184
serenate tablets 1.5 mg, 5 mg & 10 mg · 101
serenate tablets 1.5, 5, 10 mg · 57
seraxai 20 mg · 72
sevorane 250 ml · 345
sex hormones and hormone antagonists · 239
sifrol 0.88 mg · 99
silver sulfadiazine · 337
simvastatin · 43
sinemet tablets (l-dopa 250 mg & carbidopa 25 mg) · 98
sinemet-plus tablets (l-dopa 100 mg & carbidopa 25 mg) · 98
carbidopa 25 mg · 98
sinequan capsules 10 & 50 mg · 66
sirolimus · 236
sirolimus · 236
skin · 187
skin · 330
slow-k tablets 600 mg (8 mmole of k+ & cl-/tab) · 286
sodium aurothiomalate · 271
sodium bicarbonate · 104
sodium bicarbonate · 104, 286, 326
sodium bicarbonate ear drops 5% · 326
sodium bicarbonate injection 8.4% - 20 ml (1 mmole of nahco3 /ml) · 287
sodium bicarbonate tablets 600 mg · 104
sodium chloride · 287
sodium chloride tablets 300 mg · 287
sodium citrate · 309
sodium cromoglicate · 249, 313
sodium fusidate / fusidate · 186
sodium lactate · 287
sodium stibogluconate · 215
sodium stibogluconate inj. bp 100 ml/vial · 215
sodium thiosulfate lotion 20% · 338
sodium valproate · 93
sofradex ear & eye drops · 325
sofradex eye drops (with framycetin 0.5% & gramicidin 0.005%) · 312
solcoseryl · 329
solcoseryl · 329
solcoseryl dental adhesive paste · 329
solu-medrol 1000 mg vial for i.v. use · 138
somatostatin analogues · 241
soniazid 300mg tab (inh) · 198
sosegon injection 30 mg/ml · 83
spironolactone · 9
sporanox capsules 100 mg · 203
stablon tablets 12.5 mg · 70
statins · 41
stelazine tablets 1, 2, 5 mg · 63
stelazine tablets 1,2,5 mg · 77
stemetil injection 12.5 mg/ml · 60, 76
stemetil injection 12.5 mg/ml · 60
stemetil tablets 5 mg · 60, 76
stemetil tablets 5 mg · 76
sterispon · 39
steroidal drugs · 268
steroids · 135
streptokinase · 39
streptomycin · 199
streptomycin injection 1g. · 199
sulacetamide sodium · 311
sulfasalazine · 121
sulfasalazine · 120
sulphonyl urea · 126
sulpiride · 62
sulprostone · 299
surgical spirit 70% · 339
surmontil capsules 50 mg · 71
survanta suspension for instillation equivalent to 200 mg total phospholipids 100mg/4ml, 200mg/8ml · 254
ibuprofen tablets 200 mg; 400 mg · 256
suxamethonium chloride · 354
symmetrel capsules 100 mg · 95
sympathomimetics · 32, 44
synacthen depot injection i mg/ml. · 151
synacthen injection 0.25 mg · 151
synalar cream 0.025% · 332
synalar ointment 0.025% · 332
syntocinon injection 5 units/ml · 299
tacrolimus · 236
tagamet injection 100 mg/ml (2 ml ampoule) · 108
tagamet tablets 400 mg · 108
tamoxifen · 149
tarcolimus 1mg & 5mg tablets · 237
taxanes
taxol 30 mg vial for injection · 233
taxotere 20 mg vial for injection · 232
tazocin vials 4.5 g (4 g/500 mg) · 192
tear substitutes and lubricants · 319
tegretol cr tablets 400 mg · 87
tegretol oral liquid 100 mg/5 ml · 53
tegretol suspension 100 mg/5 ml · 87
tegretol tablets 200 mg · 53, 85, 87
tegretol-cr tablets 400 mg · 53
tenormin tablets 25 mg, 50 mg, 100 mg · 14
tensilon injection 10 mg/ml · 355
tensilon injection 10 mg/ml · 278
terbinafine · 338
terramycin eye ointment 1% · 311
testosterone propionate 250mg/ml injection · 150
testosterone undecanoate · 150
tetanus immunoglobulin · 165
tetracaine hydrochloride · 318
tetracaine hydrochloride eye minims 1% · 318
tetracosactrin zinc · 150
tetracycline hcl · 193
tetracycline hcl. cap 250 mg · 193
thiamine hydrochloride (vitamin bl) · 284
thiopental sodium · 344
thiosulfate sodium · 338
thyroxine sodium (levothyroxine sodium) · 151
tianeptine sodium · 70
tibolon · 303
tienam 500 mg vials i.m. & i.v. · 189
timolol maleate · 317
timotol eye drops 0.5% · 317
tioguanine (thioguanine) · 223
tobramycin sulfate inj 80 mg · 194
tobramycin · 194
tofranil tablets 10, 25, mg · 69
tolazoline
hydrochloride · 26
topical corticosteroids · 331
topoisomerase i inhibitors · 233
<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Index Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracrium injection 10</td>
<td>396</td>
</tr>
<tr>
<td>mg/ml, 2.5 ml &amp; 25 ml</td>
<td></td>
</tr>
<tr>
<td>Tranexamic acid</td>
<td>352</td>
</tr>
<tr>
<td>Tranylcypromine</td>
<td>70</td>
</tr>
<tr>
<td>Trastuzumab</td>
<td>229</td>
</tr>
<tr>
<td>Trascort cream 1% (with 0.1% diflucortolone valerate)</td>
<td>337</td>
</tr>
<tr>
<td>Treatment of chronic bowel disorders</td>
<td>117</td>
</tr>
<tr>
<td>Treatment of glaucoma</td>
<td>315</td>
</tr>
<tr>
<td>Treatment of hypoglycaemia</td>
<td>132</td>
</tr>
<tr>
<td>Trental tablets 400 mg.</td>
<td>32</td>
</tr>
<tr>
<td>Triamcinolone acetonide</td>
<td>268</td>
</tr>
<tr>
<td>Trifluoperazine</td>
<td>62, 77</td>
</tr>
<tr>
<td>Trigeminal neuralgia</td>
<td>85</td>
</tr>
<tr>
<td>Trihexyphenidyl hydrochloride</td>
<td>100</td>
</tr>
<tr>
<td>Trimetazidine</td>
<td>32</td>
</tr>
<tr>
<td>Trimovax</td>
<td>157</td>
</tr>
<tr>
<td>Trimpramine</td>
<td>70</td>
</tr>
<tr>
<td>Tripotassium dicitrate + bismuth (bismuth chelate)</td>
<td>110</td>
</tr>
<tr>
<td>Triptorelin</td>
<td>241</td>
</tr>
<tr>
<td>Tritanrix-hb with hiberix vials</td>
<td>157</td>
</tr>
<tr>
<td>Tropicamide</td>
<td>315</td>
</tr>
<tr>
<td>Tropicamide minims 1%</td>
<td>315</td>
</tr>
<tr>
<td>Tropisetron</td>
<td>77</td>
</tr>
<tr>
<td>Tryptizol tablets 10, 25, 50, 75 mg.</td>
<td>65</td>
</tr>
<tr>
<td>Tuberculin purified protein derivative (ppd)</td>
<td>160</td>
</tr>
<tr>
<td>Tuberculosis vaccine</td>
<td>161</td>
</tr>
<tr>
<td>Typherix (gsk)</td>
<td>162</td>
</tr>
<tr>
<td>Typhim vi (sanofi)</td>
<td>162</td>
</tr>
<tr>
<td>Typhoid vaccine</td>
<td>162</td>
</tr>
<tr>
<td>Ulcer-healing drugs</td>
<td>106</td>
</tr>
<tr>
<td>Ultiva injection 2mg &amp; 5 mg per vial</td>
<td>351</td>
</tr>
<tr>
<td>Ultracortenol eye drops</td>
<td>0.5% · 313</td>
</tr>
<tr>
<td>Ultracortenol eye ointment 0.5%</td>
<td>313</td>
</tr>
<tr>
<td>Uriflex r), citric acid 6%, glucuronolactone 0.6%, magnesium carbonate 2.8%, disodium edetate 0.01%</td>
<td>309</td>
</tr>
<tr>
<td>Uromitexan 100 mg/ml in 4-ml &amp; 10-ml ampoules for injection</td>
<td>243</td>
</tr>
<tr>
<td>Uro-tainer solution r,</td>
<td>309</td>
</tr>
<tr>
<td>Urso 125 mg &amp; 250 mg capsules</td>
<td>125</td>
</tr>
<tr>
<td>Ursodiol (ursodeoxycholic acid, udca)</td>
<td>125</td>
</tr>
<tr>
<td>Vaccines</td>
<td>153</td>
</tr>
<tr>
<td>Valaciclovir</td>
<td>209</td>
</tr>
<tr>
<td>Drug Name</td>
<td>Page</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>valaciclovir 500mg tab</td>
<td>210</td>
</tr>
<tr>
<td>valium injection 10 mg / 2 ml ampoules</td>
<td>346</td>
</tr>
<tr>
<td>valium injection 10 mg / 2 ml</td>
<td>49</td>
</tr>
<tr>
<td>valium injection 5 mg/ml in 2 ml</td>
<td>88</td>
</tr>
<tr>
<td>valium tablets 2, 5, 10 mg</td>
<td>49</td>
</tr>
<tr>
<td>valium tablets 2.5,10 mg</td>
<td>347</td>
</tr>
<tr>
<td>valsartan</td>
<td>24</td>
</tr>
<tr>
<td>valsartan 160 mg, hydrochlorothiazide</td>
<td>12.5 mg - 24</td>
</tr>
<tr>
<td>valsartan 80 mg, hydrochlorothiazide</td>
<td>12.5 mg - 24</td>
</tr>
<tr>
<td>valtrex tablets 500 mg</td>
<td>210</td>
</tr>
<tr>
<td>vancocin injection 500 mg vial</td>
<td>195</td>
</tr>
<tr>
<td>vancomycin</td>
<td>194</td>
</tr>
<tr>
<td>vancomycin mg</td>
<td>195</td>
</tr>
<tr>
<td>varicella zoster immunoglobulin</td>
<td>166</td>
</tr>
<tr>
<td>varitect</td>
<td>166</td>
</tr>
<tr>
<td>vascardin tablets 10 mg</td>
<td>31</td>
</tr>
<tr>
<td>vasoconstrictor</td>
<td>44</td>
</tr>
<tr>
<td>vasodilators</td>
<td>30</td>
</tr>
<tr>
<td>vasopressin (adh)</td>
<td>151</td>
</tr>
<tr>
<td>vastarel tablets 35 mg</td>
<td>32</td>
</tr>
<tr>
<td>velbe 10 mg amp for injection</td>
<td>227</td>
</tr>
<tr>
<td>venlafaxine hydrochloride</td>
<td>71</td>
</tr>
<tr>
<td>ventolin inhaler 100 mcg/ metered inhalation</td>
<td>249</td>
</tr>
<tr>
<td>ventolin injection 0.5 mg/ml</td>
<td>249</td>
</tr>
<tr>
<td>ventolin respiratory solution 5 mg/1 ml</td>
<td>249</td>
</tr>
<tr>
<td>ventolin syrup 2 mg/5 ml</td>
<td>249</td>
</tr>
<tr>
<td>ventolin tablets 2 mg</td>
<td>249</td>
</tr>
<tr>
<td>vepesid 20 mg/ml for injection</td>
<td>227</td>
</tr>
<tr>
<td>vepesid capsules 50 mg po</td>
<td>227</td>
</tr>
<tr>
<td>verapamil</td>
<td>29</td>
</tr>
<tr>
<td>vermax suspension 100 mg/5 ml</td>
<td>213</td>
</tr>
<tr>
<td>vermax tablets 100 mg</td>
<td>213</td>
</tr>
<tr>
<td>vibrocil nasal gel (dimethindene + phenylephrine)</td>
<td>327</td>
</tr>
<tr>
<td>vigabatrin</td>
<td>94</td>
</tr>
<tr>
<td>vinblastine sulfate</td>
<td>226</td>
</tr>
<tr>
<td>vinca alkaloids</td>
<td>226</td>
</tr>
<tr>
<td>vincristine sulfate</td>
<td>227</td>
</tr>
<tr>
<td>vinorelbine tartrate</td>
<td>227</td>
</tr>
<tr>
<td>vitamin b1 tablets 100 mg</td>
<td>285</td>
</tr>
<tr>
<td>vitamin b6 tablets 50 mg</td>
<td>284</td>
</tr>
<tr>
<td>voltaren-r tablets 100 mg</td>
<td>256</td>
</tr>
<tr>
<td>voltarol ophtha eye drops 0.1% - 5 ml</td>
<td>320</td>
</tr>
<tr>
<td>Page Dimensions: 595.2x842.0</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Index</strong></td>
<td>398</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>votrex injection 75 mg/3 ml</th>
<th>256</th>
</tr>
</thead>
<tbody>
<tr>
<td>warfarin sodium</td>
<td>36</td>
</tr>
<tr>
<td>warfarin tablets 1 mg, 2 mg, 5 mg</td>
<td>37</td>
</tr>
<tr>
<td>wart paint</td>
<td>336</td>
</tr>
<tr>
<td>white petrolatum</td>
<td>319</td>
</tr>
<tr>
<td>xalatan 50 mcg/ml</td>
<td>324</td>
</tr>
<tr>
<td>xeloda 500 mg tablet</td>
<td>219</td>
</tr>
<tr>
<td>xigris</td>
<td>40</td>
</tr>
<tr>
<td>xylocaine 1% with adrenaline (epinephrine)</td>
<td>360</td>
</tr>
<tr>
<td>xylocaine 2% with adrenaline (epinephrine)</td>
<td>361</td>
</tr>
<tr>
<td>xylocaine 2% with adrenaline (epinephrine) (20 mg/ml + 12.5 mcg/ml) for dental use</td>
<td>361</td>
</tr>
<tr>
<td>xylocaine 5% heavy for spinal anesthesia</td>
<td>361</td>
</tr>
<tr>
<td>xylocaine gel 2%</td>
<td>360</td>
</tr>
<tr>
<td>xylocaine gel 2%</td>
<td>307</td>
</tr>
<tr>
<td>xylocaine injection 1%</td>
<td>360</td>
</tr>
<tr>
<td>xylocaine injection 2%</td>
<td>360</td>
</tr>
<tr>
<td>xylocaine ointment 5%</td>
<td>360</td>
</tr>
<tr>
<td>xylocaine spray 10%</td>
<td>360</td>
</tr>
<tr>
<td>xylocaine topical solution 4%</td>
<td>360</td>
</tr>
<tr>
<td>xylometazoline hydrochloride</td>
<td>327</td>
</tr>
<tr>
<td>yellow fever vaccine</td>
<td>162</td>
</tr>
<tr>
<td>yutopar injection 20 mg/2 ml</td>
<td>303</td>
</tr>
<tr>
<td>yutopar tablets 10 mg</td>
<td>303</td>
</tr>
<tr>
<td>zantac 150 mg tablets</td>
<td>109</td>
</tr>
<tr>
<td>zantac 25 mg/2 ml</td>
<td>109</td>
</tr>
<tr>
<td>zarontin capsules 250 mg</td>
<td>89</td>
</tr>
<tr>
<td>zavedos 5- &amp; 10-mg vials for injection</td>
<td>226</td>
</tr>
<tr>
<td>zestril tablets 5, 10, &amp; 20 mg</td>
<td>21</td>
</tr>
<tr>
<td>zidovudine</td>
<td>210</td>
</tr>
<tr>
<td>zidovudine 100 mg, cap.</td>
<td>211</td>
</tr>
<tr>
<td>zinacef 750 mg/vial (cefuroxime sodium)</td>
<td>179</td>
</tr>
<tr>
<td>zinc oxide</td>
<td>330</td>
</tr>
<tr>
<td>zinc oxide cream 32% w/w</td>
<td>330</td>
</tr>
<tr>
<td>zinnat 250 mg, tab (cefuroxime axetil)</td>
<td>179</td>
</tr>
</tbody>
</table>
zocor tablets 20 mg, 40 mg · 43
zofran injection 4 mg & 8 mg · 76
zofran tablets 8 mg · 76
zoladex 3.6 mg for injection · 240
zoledronic acid · 242
zometa 5-ml (4mg) vial for iv infusion · 242
zovirax eye ointment 3% · 310, 342
zovirax intravenous infusion, 250 mg, 500 mg vial · 206
zovirax suspension, 200 mg/5 ml · 206
zovirax suspension, 400 mg/5 ml (double strength suspension) · 206
zuclophentixol acetate · 63
zuclophentixol dihydrochloride · 64
zyloric tablets 100 & 300 mg · 276
zyprexa 5 mg · 62
zyrtec tablets 10 mg · 250