**Republic of Rwanda**

**Ministry of Health**
P. O. Box 84 Kigali
www.moh.gov.rw

# Pain Management Guidelines

**September 2012**

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# Acronyms

**AEDs** : Anti Epileptic Drugs
**ASA** : Acetyl Salicylic Acid
**BB** : Beta Blockers
**BNZ** : Benzodiazapins
**BID** : Twice a Day
**BPN** : Branchial Plexus Neuropathy
**CBI** : Cannabinoids Receptor Type 1
**CCB** : Calcium Channel Blockers
**CIPN** : Chemotherapy Induced Peripheral Neuropathy
**CNCP** : Chronic Non Cancer Pain
**CNS** : Central Nervous System
**COPD** : Chronic Obstructive Pulmonary Disease
**CPG** : Clinical Practice Guidelines
**CR** : Controlled Release
**IR** : Immediate Release
**IV** : Intravenous
**N/A** : Not Applicable
**NMDA** : N Methyl D Aspartate
**NRS** : Numerical Rating Scale
**NSAIDs** : Non Steroidal Anti-Inflammatory Drugs
**OT** : Occupational Therapy
**PCA** : Patient Controlled Analgesia
**PE** : Physical Exercise
**PED** : Poly Ethylen Glycol
**PHN** : Post Herpetic Neuralgia
**PO** : Per Oral
**PR** : Per Rectal
**PRN** : *Pro Re Nata* (As needArises)
**PT** : Physical Therapy
**q** : Every
**RoM** : Range of Motion
**SCS** : Spinal Cord Stimulation
**SR** : Sustained Release
**TCAs** : Tricyclic Antidepressants
**TENS** : Transcuteneus Electrical Nerve Stimulation
**TID** : Three Times a Day
**VAS** : Visual Analogue Scale
**WHO** : World Health Organization

# Foreword

The guidelines and protocols presented in this document are designed to provide a useful resource for healthcare professionals involved in clinical case management in Rwanda. They were developed by taking into consideration services provided at different levels within the health system and the resources available, and are intended to standardize care at both the secondary and tertiary levels of service delivery across different socio-economic levels of our society.

The clinical conditions included in this manual were selected based on facility reports of high volume and high risk conditions treated in each specialty area. The guidelines were developed through extensive consultative work sessions, which included health experts and clinicians from different specialties. The working group brought together current evidence-based knowledge in an effort to provide the highest quality of healthcare to the public. It is my strong hope that the use of these guidelines will greatly contribute to improved the diagnosis, management, and treatment of patients across Rwanda. And it is my sincere expectation that service providers will adhere to these guidelines and protocols.

The Ministry of Health is grateful for the efforts of all those who contributed in various ways to the development, review, and validation of the Clinical Treatment Guidelines. We would like to thank our colleagues from District, Referral, and University Teaching Hospitals, and specialized departments within the Ministry of Health, our development partners, and private health practitioners. We also thank the Rwanda Professional Societies in their relevant areas of specialty for their contributions and for their technical review, which enriched the content of this document, as well as the World Health Organization (WHO) and the Belgium Technical Cooperation (BTC) for their support.

We would like to especially thank the United States Agency for International Development (USAID) for both their financial and technical support through the Management Sciences for Health (MSH) Integrated Health System Strengthening Project (IHSSP) and Systems for Improved Access to Pharmaceuticals and Services (SIAPS).

To end with, we wish to express our sincere gratitude to all those who continue to contribute to improving the quality of health care of the Rwanda population.

**Dr Agnes Binagwaho**
**Minister of Health**

# 1. Introduction

Pain management guidelines are systematically developed recommendations that assist the health care practitioner and patient in making decisions about health care.

The purpose of these guidelines are:

- To optimize pain control, while recognizing that a completely pain- free state may not be attainable
- Enhance functional abilities, physical and psychological well being
- To enhance quality of life of patients
- Minimize adverse outcome

These guidelines will focus on knowledge base, skills and range of interventions that are the essential elements of effective management of acute, chronic and pain- related problems.

## Definitions

**Pain:** Is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.

Pain is an individual and Subjective experience modulated by physiological, psychological and environmental factors such as previous events, culture, prognosis, coping strategies, fear and anxiety.

- **Nociceptive pain:** Nociception is the activity in peripheral pain pathways that transmits or processes the information about noxious events associated with tissue damage.

  Nociceptive pain can be:

  - ***Somatic pain****:* Pain originating from bone, muscle, connective tissue etc. This type of pain can be described as aching, sharp, stabbing, throbbing and is well localized.
  - ***Visceral pain***: Pain originating from organs such as pancreas, liver, GI tract etc. This type of pain is described as cramping, dull, colicky, squeezing, often poorly localized, and may be referred to other areas.

- **Neuropathic pain:** It is caused by an injury or dysfunction of the peripheral or central nervous system. It is often described as: burning, shooting, stabbing, numbness or tingling. It has the following types:
    - ***Central neuropathic pain :***Example: Post stroke pain, Spinal cord injury, multiple sclerosis and syringomyelia
    - ***Peripheral***
        - Focal: Examples: Trigeminal neuralgia, Carpal tunnel syndrome, failed back surgery syndrome with nerve root fibrosis, post -herpetic neuralgia
        - Multifocal: Examples: Vasculitis, diabetes mellitus and brachial or lumbar plexus
        - Symmetrical : Examples: Diabetes mellitus, ethanol abuse, toxins (e.g: vincristine) and amyloidosis

    - **Other** sensations of neuropathic pain
        - Dysesthesia (bugs crawling on the skin, pins and needles)
        - Allodynia (pain to a non painful stimulus)
        - Hyperalgesia (increased pain sensation to a normally painful stimulus)

- **Mixed**: This involves both Nociceptive and Neuropathic types of pain.

# 2. Pain Assessment and Measurement

Pain assessment is critical to optimal pain management interventions. While pain is a highly subjective experience, its management necessitates objective standards of care.



## 2.1. Goals of pain assessment

- To capture the individual's pain experience in a standardized way
- To help determine type of pain and possible etiology
- To determine the effect and impact the pain experience has on the individual and his/her ability to function
- Basis on which to develop treatment plan to manage pain
- To aid communication between interdisciplinary care team members

**Note:** *Pain assessment should be documented so that all members of care team will have a clear understanding of the pain.*

Ongoing comprehensive assessment is the foundation of effective pain management, including interviews, physical assessment, medication review, medical and surgical review, psychosocial review, physical environment and appropriate diagnostics. Assessment must determine the cause, effectiveness of treatment and impact on quality of life for the patient and their family.

## 2.2. Assessment by PQRST Checklist

This assessment checklist may be used for general assessment or specifically for pain:

- **P** = Provocation and Palliation
  - What causes it?
  - What makes it better?
  - What makes it worse?

- **Q** = Quality and Quantity
  - How does it feel, look or sound?
  - How much of it is there?

- **R** = Region and Radiation
  - Where is it?
  - Does it spread?

- **S** = Severity and Scale
  - Does it interfere with activities?
  - How does it rate on a severity scale of 1 to 10?

- **T** = Timing and Type of Onset
  - When did it begin?
  - How often does it occur?
  - Is it sudden or gradual?

## 2.3. Measurement

Most measures of pain are based on self-report. These measures lead to sensitive and consistent results if done properly. Self-report measures may be influenced by mood, sleep disturbance and medication.

In some instances it may not be possible to obtain reliable self-reports of pain (e.g. patients with impaired consciousness or cognitive impairment, young children, elderly patients, or where there are failures of communication due to language difficulties, inability to understand the measures, unwillingness to cooperate or severe anxiety). In these circumstances other methods of pain assessment will be needed.

There are no objective measures of 'pain' but associated factors such as hyperalgesia (e.g. mechanical withdrawal threshold), the stress response (e.g. plasma cortisol concentrations), behavioral responses (e.g. facial expression), functional impairment (e.g. coughing, ambulation) or physiological responses (e.g. changes in heart rate) may provide additional information. Analgesic requirements (e.g. patient-controlled opioid doses delivered) are commonly used as post hoc measures of pain experienced.

Recording pain intensity as 'the fifth vital sign' aims to increase awareness and utilization of pain assessment and may lead to improved acute pain management. Regular and repeated measurements of pain should be made to assess ongoing adequacy of analgesic therapy. An appropriate frequency of reassessment will be determined by the duration and severity of the pain, patient needs and response, and the type of drug or intervention.

## Measures of Pain

***Uni-dimensional measures of pain***

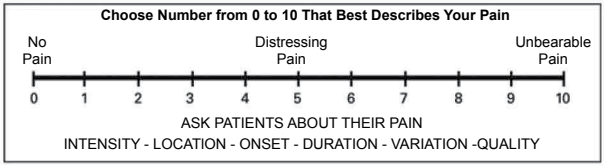
- Numerical rating scales
  - ➔ Numerical rating scales (NRS) have both written and verbal forms
    - The Verbal Numeric Rating Scale (VNRS)
      - o Patients rate their pain intensity on the scale of 0 to 10 (Refer Figure: 1 below) where 0 represents 'no pain' and 10 represent 'worst pain imaginable. It is important that scales are consistent, and it is recommended that the 'no pain' point be represented as zero (0) rather than 1.
    - Verbal Rating Scale use phrases such as "what is your pain like?" "is it mild, moderate, or severe?"

- Visual analogue scales (VAS) VAS (Refer Figure: 1 below)
  - ➔ VAS are the most commonly used scales for rating pain intensity, with the words 'no pain' at the left end and 'worst pain imaginable' at the right. VAS ratings of greater than 70 mm are indicative of 'severe pain' and 0 to 5 mm 'no pain', 5 to 44 mm 'mild pain' and 45 to 74 'moderate pain'

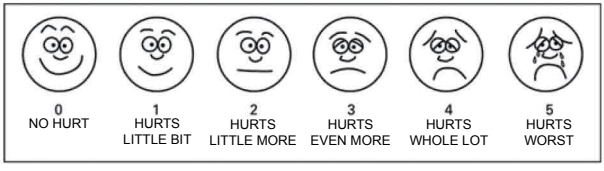
**Note:** *These scales are unsuitable for children under 5 years and may also be unsuitable in up to 26% of adult patients.*

**Figures: Tools Commonly Used to Rate Pain**

**Visual Analogue Scale**




**"Faces" Pain Rating Scale**




**Behavioral Observation Pain Rating Scale**

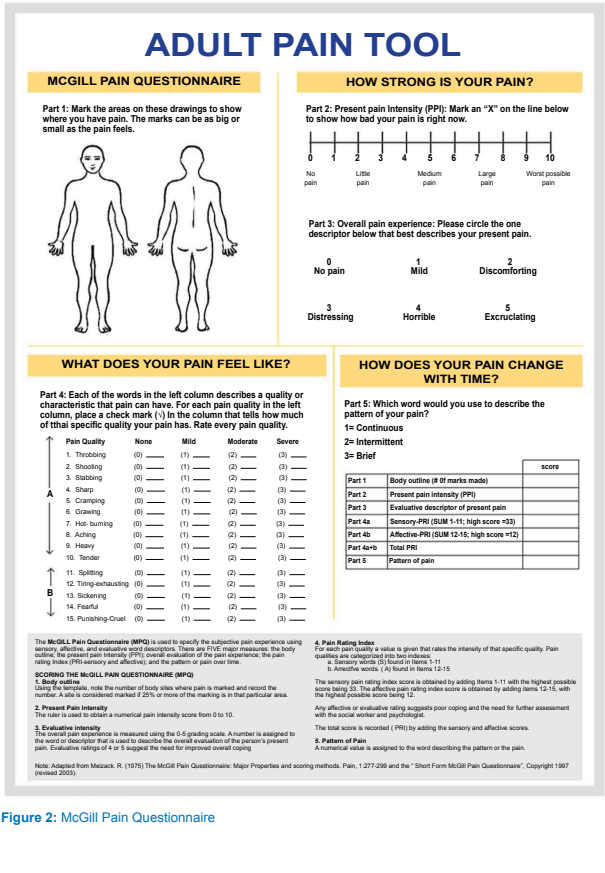
| Categories | Scoring | | |
|---|---|---|---|
| | **0** | **1** | **2** |
| **Face** | No particular expression or smile; disinterested | Occasional grimace or frown, withdrawn | Frequent to constant frown clenched jaw, quivering chin |
| **Legs** | No position or relaxed | Uneasy, restless, tense | Kicking, or legs drawn up |
| **Activity** | Lying quietly normal position, moves easily | Squirming, shifting back and forth, tense | Arched, rigid, or jerking |
| **Cry** | No crying (awake or asleep) | Moans or whimpers, occasional complaint | Crying steadily, screams or sobs, frequent complaints |
| **Consolability** | Content, relaxed | Reassured by occasional touching, hugging or talking to Distractable | Difficult to console or comfort |
| **Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Consolability is scored from 0-2, which results in a total score between 0 and 10** | | | |

**Figure 1:** Rating Scale

### *Multidimensional measures of pain*

Rather than assessing only pain intensity, multidimensional tools provide further information about the characteristics of the pain and its impact on the individual. Examples include

- The Brief Pain Inventory, which assesses pain intensity and associated disability
- The McGill Pain Questionnaire (Refer figure 2 below), which assesses the sensory, affective and evaluative dimensions of pain



# ADULT PAIN TOOL

## MCGILL PAIN QUESTIONNAIRE

**Part 1: Mark the areas on these drawings to show where you have pain. The marks can be as big or small as the pain feels.**

## HOW STRONG IS YOUR PAIN?

**Part 2: Present pain Intensity (PPI): Mark an "X" on the line below to show how bad your pain is right now.**

0 1 2 3 4 5 6 7 8 9 10

No pain | Little pain | Medium pain | Large pain | Worst possible pain

**Part 3: Overall pain experience: Please circle the one descriptor below that best describes your present pain.**

**0** No pain | **1** Mild | **2** Discomforting | **3** Distressing | **4** Horrible | **5** Excruciating

## WHAT DOES YOUR PAIN FEEL LIKE?

**Part 4: Each of the words in the left column describes a quality or characteristic that pain can have. For each pain quality in the left column, place a check mark (√) in the column that tells how much of tthai specific quality your pain has. Rate every pain quality.**

| | Pain Quality | None | Mild | Moderate | Severe |
|---|---|---|---|---|---|
| A | 1. Throbbing | (0) | (1) | (2) | (3) |
| | 2. Shooting | (0) | (1) | (2) | (3) |
| | 3. Stabbing | (0) | (1) | (2) | (3) |
| | 4. Sharp | (0) | (1) | (2) | (3) |
| | 5. Cramping | (0) | (1) | (2) | (3) |
| | 6. Grawing | (0) | (1) | (2) | (3) |
| | 7. Hot- burning | (0) | (1) | (2) | (3) |
| | 8. Aching | (0) | (1) | (2) | (3) |
| | 9. Heavy | (0) | (1) | (2) | (3) |
| | 10. Tender | (0) | (1) | (2) | (3) |
| B | 11. Splitting | (0) | (1) | (2) | (3) |
| | 12. Tiring-exhausting | (0) | (1) | (2) | (3) |
| | 13. Sickening | (0) | (1) | (2) | (3) |
| | 14. Fearful | (0) | (1) | (2) | (3) |
| | 15. Punishing-Cruel | (0) | (1) | (2) | (3) |

## HOW DOES YOUR PAIN CHANGE WITH TIME?

**Part 5: Which word would you use to describe the pattern of your pain?**

**1= Continuous**

**2= Intermittent**

**3= Brief**

| | | score |
|---|---|---|
| Part 1 | Body outline (# 0f marks made) | |
| Part 2 | Present pain intensity (PPI) | |
| Part 3 | Evaluative descriptor of present pain | |
| Part 4a | Sensory-PRI (SUM 1-11; high score =33) | |
| Part 4b | Affective-PRI (SUM 12-15; high score =12) | |
| Part 4a+b | Total PRI | |
| Part 5 | Pattern of pain | |

The **McGILL Pain Questionnaire (MPQ)** is used to specify the subjective pain experience using sensory, affective, and evaluative word descriptors. There are FIVE major measures: the body outline; the present pain Intensity (PPI); overall evaluation of the pain experience; the pain rating Index (PRI-sensory and affective); and the pattern or pain over time.

**SCORING THE McGILL PAIN QUESTIONNAIRE (MPQ)**

**1. Body outline**
Using the template, note the number of body sites where pain is marked and record the number. A site is considered marked if 25% or more of the marking is in that particular area.

**2. Present Pain Intensity**
The ruler is used to obtain a numerical pain intensity score from 0 to 10.

**3. Evaluative intensity**
The overall pain experience is measured using the 0-5 grading scale. A number is assigned to the word or descriptor that is used to describe the overall evaluation of the person's present pain. Evaluative ratings of 4 or 5 suggest the need for improved overall coping

**4. Pain Rating Index**
For each pain quality a value is given that rates the intensity of that specific quality. Pain qualities are categorized into two indexes:
a. Sensory words (S) found in Items 1-11
b. Amective words. ( A) found in Items 12-15

The sensory pain rating index score is obtained by adding Items 1-11 with the highest possible score being 33. The affective pain rating index score is obtained by adding items 12-15, with the highest possible score being 12.

Any affective or evaluative rating suggests poor coping and the need for further assessment with the social worker and psychologist.

The total score is recorded ( PRI) by adding the sensory and affective scores.

**5. Pattern of Pain**
A numerical value is assigned to the word describing the pattern or the pain.

Note: Adapted from Melzack, R. (1975) The McGill Pain Questionnaire: Major Properties and scoring methods. Pain, 1:277-299 and the " Short Form McGill Pain Questionnaire", Copyright 1997 (revised 2003).

**Figure 2:** McGill Pain Questionnaire

- ***Patients with special needs***
  - Communication aids and behavioral scales such as the modified Faces, Legs, Activity, Cry and Consolability (FLACC) (Refer to Figure: 1) scale
    - ➔ In neonates, infants and children, but must be both age and developmentally appropriate. These include behavioral assessments, pictorial scales (e.g. faces refer to Figure:1)
    - ➔ In Adult patients who have difficulty communicating their pain, (e.g. patients with cognitive impairment or who are critically unwell in the emergency department or intensive care,) require special attention as do patients, whose language or cultural background differs significantly from that of their health care team)

# 3. Treatment Approaches of Pain

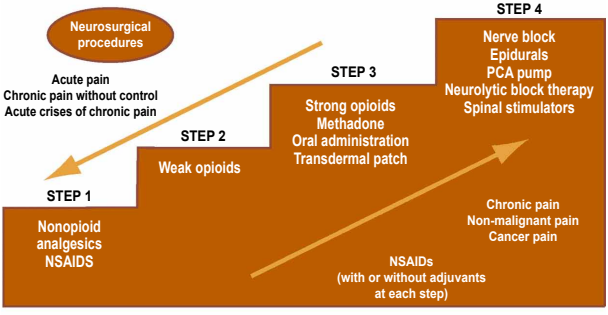
In acute pain problems, the goal is primarily pain relief. In chronic pain problems, achieving the best outcome for the patient often involves a variable blend of pharmacological and non-pharmacological approaches that addresses the multidimensional components of pain and suffering.

## Treatment Continuum Approach

In order to make the most efficient use of locally available medical resources and not expose the patient to unnecessarily risk, it makes sense to approach the management of pain using treatments along a continuum. Beginning with modalities that are more readily available, less expensive, more evidence-based, less invasive and with less potential side effects. If these modalities fail, one can then progress to treatment that is more specialized, more expensive and more invasive.



**Figure 3:** New adaptation of the analgesic ladder




NSAID-nonsteroidal anti-inflammatory drug, PCA-patient-controlled analgesia.

## 3.1. Pharmacological approach

### WHO Analgesic Ladder

- Step 1
  - Non opioid ±adjuvant : ASA, *Paracetamol*, NSAIDs/COX-2s±adjuvant

- Step 2
  - Opioid for mild to moderate pain± nonopioid ± adjuvant: Codeine, Tramadol, oxycodone, ± NSAIDs/COX – 2s, ± adjuvants

- Step 3
  - Opioid for moderate to severe pain, ± non opioid, ±Adjuvant: Oxycodone, Morphine, Hydromorphine, Fentanyl, methadone, ± NSAIDs/COX – 2s, ± adjuvants

- Step 4:
  - Nerve block, epidurals, PCA pump, neurolytic nerve blocks,

**Note:** *With some exceptions, most medication used in the treatment of pain work best when titrated dose to effect. This means starting at a low dose and increasing the dose at scheduled intervals until there is analgesic benefit or the patient experiences unacceptable and persistent adverse effects that do not improve with time and vigorous side-effect management.*

The exceptions to this principle are the non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol, both of which have recommended dose ceilings and some of the antidepressants and anticonvulsants which have measurable therapeutic serum levels.

## 3.2. Non-pharmacological Approach Physical Treatment Options

- Exercises
  - Stretching/ range of motion/ flexibility
  - Strengthening
  - General aerobic conditioning
  - Quota-based reactivation
  - Coordination balance/proprioceptive training
  - Relaxation
  - Postural stabilization
  - Yoga

- Passive physical modalities
  - Therapeutic cold
    - → Cold packs
    - → Ice massage
    - → Cold water immersion
  - Therapeutic heat
    - → Hot packs/heating pads

- Occupational therapy techniques
  - Ergonomic assessment / adaptations
  - Activities of daily living/ work modifications
  - Pacing strategies
  - Body mechanics and dynamic posturing

- Manual therapy
  - Mobilization with stretching
  - Manipulation (chiropractic treatment)
  - Massage

- Traction

### Psychological Approach

Chronic pain and physical limitations can have great psychological and emotional effects on a person with pain related problems. Living with pain can lead to problems such as depression, anxiety and helplessness, all of which can exacerbate pain and disability.

- Psychological Interventions
  - Cognitive-behavior therapy (CBT): Consists of 3 phases namely

- Education about biopsychosocial model of pain.
- Skills training: Relaxation techniques, activity pacing, pleasant activity scheduling, imagery techniques, distraction strategies, cognitive restructuring (changing negative thought patterns), problems solving and goal setting.
- Application phase : Practice and application of the skills in real-life situations

- Active coping characterized by
  - Solving problems
  - Seeking information
  - Seeking social support
  - Seeking professional help
  - Changing environments
  - Planning activities in response to some stress, physical or emotional. This is to avoid coping strategies, which lead people into activities (such as alcohol use) or mental states (such as withdrawal) that keep them from directly addressing stressful events.

# 4. Pain Classification and Management

## 4.1. Acute Pain

**Definition:** Recent pain that is usually transient in nature lasting for several minutes to several days. Is usually caused by tissue damage and is often associated with some degree of inflammation. The general approach to the treatment of acute pain includes treatment goals, therapeutic strategies, and elements of pain management.

### Common Types of Acute Pain

| Type or source | Definition | Source or examples |
|---|---|---|
| Acute illness | Pain associated with an acute illness | • Appendicitis, renal colic, myocardial infarction |
| Perioperative (includes postperative) | Pain in a surgical patient because of pre-existing disease, the surgical procedure (e.g. associated drains, chest or nasogastric tubes, complications) or both | • Head and neck surgery<br>• Chest and chest wall surgery<br>• Abdominal surgery<br>• Orthopedic and vascular surgery (back and extremities) |
| Post traumatic (major trauma) | Includes generalized or regionalized pain due to major acute injury | • Motor vehicle accident |
| Burns | Pain due to thermal or chemical burns | • Fire, chemical exposure |
| Procedural | Pain associated with a diagnostic or therapeutic medical procedure | • Bone marrow biopsy, endoscopy, catheter placement, circumcision, chest tube placement, suturing |
| Obstetrics | Pain related to labor and delivery | • Childbirth by vaginal delivery or cesarean section |

## Management

*Management Goals*

- Early intervention, with prompt adjustments in the regimen for inadequately controlled pain
- Reduction of pain to acceptable levels
- Facilitation of recovery from underlying disease or injury

*Management Strategies*

- Multimodal analgesia
  - ➔ Use of more than one method or modality of controlling pain
    - Drugs from two or more classes
    - Drug plus non drug treatment to obtain additive beneficial effects; reduce side effects, or both. These modalities may operate through different mechanisms or at different sites (i.e. peripheral versus central actions).
    - Example of multimodal analgesia is the use of various combinations of opioids and local anesthetics to manage postoperative pain.

- Preemptive analgesia
  - ➔ Administration of one or more analgesic(s) prior to a noxious event (e.g. surgery) in an attempt to prevent peripheral and central sensitization, minimizing post-injury pain.

*Non-pharmacological*

Non-Pharmacological Interventions for Acute Pain

| Pain type or source | Physical methods | Psychological methods | Other |
|---|---|---|---|
| Acute illness | • Vibrations or cold for immobilization | Patient education, relaxation, imagery, distraction | |
| Perioparative pain | • Exercise or immoblisation<br>• Message<br>• Application of heat or cold<br>• Electro analgesia | Patient education, relaxation, distraction, acupuncture, imagery, bio feedback, hypnosis | Acupuncture |
| Trauma | • Rest, ice, compression, elevation<br>• Physical therapy (e.g. stretching, strengthening, thermal therapy, TENS, vibration | Relaxation, hypnosis, distraction, supportive psychotherapy, copying skills training | |
| Burns | • Limb elevation<br>• Minimise number of dress changes | Patient education, deep relaxation, distraction, imagery, music relaxation | |
| Procedural | • Application of cold (pre and post procedure)<br>• Counter irritation (simple massage, scratching, pressure)<br>• Rest or immobilization (post procedure) | | |
| Obstetrics | | Patient education, relaxation breathing, distraction | |

*Pharmacological*

- Acute pain.
  - → Most acute pain is nociceptive and responds to
    - Nonopioids and opioids
    - Adjuvant analgesics (e.g. local anesthetics)

- Mild somatic pain responds well to
  - → Oral non-opioids
    - *Paracetamol*
    - Nonsteroidal Anti-inflammatory drugs [NSAIDs])
  - → Topical agents (e.g. local anesthetics)
  - → Physical treatments (e.g. rest, ice, compression, elevation)

- Moderate to moderately severe acute pain is more likely to respond to
  - → Opioids
    Non-opioids often combined with opioids to improve pain relief and diminish the risk of side effects.
- Systemic Medication for Acute Pain Management

| Pain Type or source | Non Opioid | Opioids | Adjuvant analgesics | Comments |
|---|---|---|---|---|
| Acute illness | Paracetamol, NSAIDs | Systemic opioids | | |
| Perioperative (includes postoperative) | Paracetamol, NSAIDs | Systemic opioids including PCA | Local anesthetics (Lidocaine, bupivacaine) | Use multimodal whenever possible recorganise needs for special populations, scheduled ATC dosing is usuary preferred to PRN |
| Major trauma (generalized pain) | Paracetamol, NSAIDs, during post trauma healing phase | Bolus or continous IV opioids during emergency phase; IV or PO opioids during healing phase | IV ketamine (Very rare) | Use of ketamine is restricted to pain refractory to other treatments due to severe CNS side effects |
| Major trauma (regionalized pain) | NSAIDS (parental, oral during post trauma healing phase) | Bolus or IV opioids during emergency phase plus regional anesthesia | IV ketamine (Very rare) | Use of ketamine is restricted to pain refractory to other treatments due to severe CNS side effects, |
| Burns | Paracetamol, NSAIDs during rehabilitative phase | High doses of IV opioids (e.g. morphine, Fentanyl± PCA for NPO patients: oral opioids (e.g. morphine, Hydromorphone) when taking PO | Parental ketamine Very rare<br>IV lidocaine Very rare | Use of ketamine is restricted to pain refractory to other treatments due to severe CNS side effects,<br>Infusion of low dose lidocaine is restricted to burn pain that is refractory to opioids |
| Minor trauma | Paracetamol, NSAIDS | Opioids for mild to moderate pain | | |
| Procedural pain | NSAIDS for preemptive analgesia and post procedural pain | IV opioids (morphine, hydromorphone and fentanyl) | Local anasthetics (lidocaine, Bupivacaine, IV ketamine | Local anesthetics may be applied topically or injected into the tissue or used for nerve blocks. Use of ketamine limited by severe CNS side effects |
| Obstetrics Pain | | Bolus IV opioids (morphine, fentanyl and hydromorphone | | |

- Regional Anesthesia for Acute Pain Management

| | |
|---|---|
| **Perioparative pain** | • Epidural anesthesia with opioids or opioids plus local anesthesia mixture injected intermittently or infused continuously<br>• Intrathecal opioids or opioids plus local anesthetics<br>• Local neural blockade<br>• Other regional anesthesia techniques |
| **Trauma** | • Limited to local neural blockade during emergency phase<br>• Also included epidural analgesia with opioids and / or local anesthetics during post-trauma healing phase, especially for regionalized pain |
| **Burns** | • Pidural analgesia with opioids and/ or local anesthetics (only after closure of burn wound) |
| **Procedural** | • Includes local infiltration with local anesthetics |
| **Obstetrics** | • Epidural analgesia or spinal analgesia with local anesthetics (e.g. bupivacaine, ropicaine and /or opioid<br>• Combined spinal-epidural techniques with opioids<br>• Epidural analgesia, spinal, or combined spinal-epidural technique for cesarean section<br>• Tissue infiltration with local anesthetics |

## Recommendations

- Analgesics, especially opioids should be under prescribed and under dosed for both acute and chronic pain
- Moderate to severe acute pain should be treated with sufficient doses of opioids to safely relieve the pain
- If drug side effects preclude achieving adequate pain relief, the side effects should be treated and/or another opioid should be tried
- The concomitant use of other analgesics (e.g. non-opioids, local anesthetics) and non pharmacologic methods (e.g. applied heat or cold, electroanalgesia, relaxation) maximizes pain relief and minimizes the risk of treatment-limiting side effects.

## 4.2. Chronic Non Cancer Pain

The general approaches to the treatment of chronic non-cancer pain (CNCP) include treatment goals, therapeutic approaches, and elements of treatment. It also provides general information about the treatment of some common types of CNCP (i.e. summary tables) and identifies relevant clinical practice guidelines (CPGs)

### Management

*General management goals*

- Diminish suffering, including pain and associated emotional distress
- Increase/restore physical, social, vocational, and recreational function
- Optimize health, including psychological well-being
- Improve coping ability (e.g. develop self-help strategies, reduce dependence on health care system) and relationships with others (e.g. family, friends, health care professionals)

*Management Strategies*

- Multimodal therapy
  - → Medication from different classes (i.e. combination drug therapy)
  - → Rehabilitative therapies (e.g. physical therapy, occupational therapy) and medication
  - → Regional anesthesia (e.g. neural blockade) and medication
  - → Interdisciplinary Management of CNCP: An Examples of Interventions is below

- Patient education: Counseling about the pain, aggravating and alleviating factors, management strategies, lifestyle factors that may influence the pain (e.g ., use of nicotine, alcohol.
- Physical rehabilitative approaches: Physical therapy modalities for reconditioning, (e.g. walking, stretching, exercises to improve strength and endurance, oscillatory movements)
- Other physical approaches: Application of heat or cold, TENS, massage, acupuncture
- Occupational therapy: Attention to proper body mechanics, resumption of normal levels of activities of daily living
- Pharmaceuticals: Nonopioids, opioids, anti depressants, antiepileptic drugs, stimulants, antihistamines
- Regional anesthesia: Nerve blocks (e.g., diagnostic, somatic, sympathetic, visceral, trigger point) and/or intraspinal analgesia (e.g., opioids, clonidine, baclofen, local anesthetics)
- Psychological approaches: Relaxation training, hypnosis, biofeedback, copings skills, behavior modification, psychotherapy
- Surgery: Noeuroablation, neurolysis, microvascular decompression

*Non-pharmacological*

**Non-pharmacological Interventions for Chronic Noncancer Pain**

| Type of pain | Surgical | Other physical methods | Psychological methods | Other |
|---|---|---|---|---|
| Arthritis pain | Includes arthroscopy, synovectomy, osteotomy and spinal fusion | TENS, applied heat or cold, low impact aerobic and ROM exercise, joint protection (splintor brace, massage | PE, (rest, exercise, nutrition), and social support | Acupuncture nutritional supplements |
| Low back pain | Laminectomy, diskectomy, lumber fusion, lumber stabilisation | SCS, cryoanalgesia, radiofrequency, coagulation, exercise, PT,OT,TENS, brace, vibration | PE 'back school' Biofeedback, psychotherapy | Acupuncture manipulation therapy |
| Fibromyalgia | | Applied heat massage, gentle aerobic, gentle aerobic and stretching, attention to proper posture, PT, TENS, vibration | PE, psychotherapy, relaxation, hypnosis | Acupuncture |
| Sickle cell disease | | Careful hydration, applied heat, massage, ultra sound, PT, TENS, possibly SCS, applied heat or cold, massage | PE, psychotherapy, deep breathing and relaxation techniques , distraction, imagery, meditation, biofeedback | Acupuncture |
| Peripheral neuropathy | Decompressive surgery for nerve entrapment, vascular surgery for vascular insufficiency | Good skin and foot care, PT, TENS | PE, psychotherapy, relaxation, biofeedback | |
| Migraine and other types of headache | | Applied heat or cold, exercise (prophylaxis), vibration | PE, relaxation, biofeedback | |

*Pharmacological*

**Pharmacological Management for Chronic Noncancer Pain: (Selected Examples)**

| Type of pain | Non opioids | Opioids | Adjuvant Analgesics and disease-specific drugs | Comments |
|---|---|---|---|---|
| Arthritis pain | • Paracetamol<br>• NSAIDs<br>• Selective COX-2 inhibitors | Short term opioid for flare-ups | Corticosteroids | Select NSAIDS based on dosing, efficiency, tolerance, costs and patient preference<br>Monitor closely for NSAIDs side effects<br>Opioids are appropriate for long term treatment in selected patients |
| Low back pain | • Paracetamol<br>• NSAIDs<br>• Selective COX-2 inhibitors | Short term opioid for mild to moderate flare -ups | TCA e.g. Amitriptyline<br>AEDs e.g. gabapentine, carbamazapine<br>Short acting Muscle relaxants e.g. cyclobenzaprine | Opioids are appropriate for long term treatment in selected patients |
| Fibromyalgia | • Paracetamol<br>• NSAIDs<br>• Selective COX-2 inhibitors | Opioida (occasional use for “flares”)<br>Tramadol | TCA e.g. Amitriptyline<br>Short acting Muscle relaxants eg cyclobenzaprine | Tramadol may have less potential for abuse |
| Sickle cell disease pain | • Paracetamol<br>• NSAIDs | Short or long term opioids | Sedatives<br>Anxiolytics | Use short acting opioids for short term treatment and long acting for long treatment |
| Peripheral neuropathy | • Paracetamol<br>• NSAIDs | Short term opioids only | TCA e.g. Amitriptyline<br>AEDs e.g. gabapentine, carbamazapine<br>Short acting muscle relaxants e.g. cyclobenzaprine | AEDs, TCAs and local anesthetics are first line treatment NSAIDs are really effective try opioids as last resort |

## Pharmacological Management of Migraine and Other Types of Headache

| Headache types | Prophylaxis | Arbotive | Comments |
|---|---|---|---|
| Migraine | • AEDs e.g. Gabapentine<br>• BBs e.g. propranolol<br>• CCBs e.g. verapamil, nifedipine<br>• TCAs<br>• NSAIDs | • NSAIDs<br>• Opioid Combination treatment e.g. Paracetamol plus codeine<br>• Dehydroegotamine Rizapritan Naratriptan | • Paracetamol plus ASA plus codein considered first line treatment. First choice NSAIDs are ASA, ibuprofene and naproxen, others are also effective Triptans are effective and initial choice for patient with mild to severe HA and no contra indication |
| Tension | • TCAs | • Paracetamol<br>• NSAIDs | |
| Cluster | • CCBs<br>• Corticosteroids<br>• AEDs | • Ergotamine<br>• Dihydroergotamine<br>• Inhalation of oxygen | |

## Regional Anesthesia for Chronic Noncancer Pain

| Pain type | Method |
|---|---|
| Arthritis pain | • Intra-articular injection of corticosteroids (e.g. methyl prednisolone<br>• Intra- articular injection of sodium hyaluronate |
| Low back pain | • Facet joint injections with local anesthetics<br>• Sciatic nerve block with local anesthetic due to sciatica<br>• Epidural steroid injections (e.g. methylprednisolone) often with local anesthetic (e.g. lidocaine) |
| Headache and migraine | • Occipital nerve block with local anesthetic for occipital headache |

# 5. Cancer Pain Management

## Introduction

Cancer pain shares the same neuro-patho-physiological pathways as non-cancer pain. It is a mixed mechanism pain that can be present as a pure neuropathic, visceral or somatic pain syndrome (however this is rare). But it may involve inflammatory, neuropathic, ischaemic and compressive mechanisms at multiple sites. Development over time is complex and varied, depending on cancer type, treatment regimes and underlying concurrent morbidities. Opioids are the mainstay of treatment and are associated with tolerance.

## Causes of Severity

- Direct tumour invasion of local tissues
- Metastatic bone pain
- Osteoporotic bone and degenerative joint pain in older people
- Visceral obstruction
- Nerve compression and plexus invasion
- Ischaemia
- Inflammation

*General Principles*

- Be committed to the relief of suffering and promotion of healing
- Do a thorough assessment of the pain and the patient
- Use a stepped approach to medication (WHO ladder) is the best
- Work as a team to manage cancer pain, using multiple professions and multiple therapies
- Treat moderate to severe pain while awaiting the result of investigations
- Constant or frequent pain requires regular medication
- A breakthrough dose of analgesic (10% of the total daily opioid dose) should be available as needed
- Treat opioid side effects from the start
- The oral route is preferable
- Consider adjuvant therapy for cancer pain
- Titrate opioids to achieve the best analgesia with the few side effects

- Be open to non- pharmacological therapies and credible complementary and alternative therapies that are helpful to the patient
- On-going re-evaluation is the key to a better outcome
- Educate patient and their caregivers in a way that incorporates them into the team and fosters a sense of trust and confidence
- Learn from patients and be self reflective

*Assessment*

- Core elements of Initial Assessment include
  - A detailed history to determine the presence of persistent pain, breakthrough pain and their effect on function
    - Definition: Breakthrough pain is defined as a transitory increase in pain that occurs on a background of otherwise controlled persistent pain.
    - Assessment: The presence of breakthrough pain, the frequency and number of episodes per day, the duration with the time in minutes, the intensity and the time to peak in severity, the description of breakthrough pain, current previous analgesic history and any precipitating factors
      - Use the Brief Pain Inventory tool to assess the location of pain, characteristics/ description of the pain. The severity/ intensity of the pain, the duration of the pain, any aggravating factors and any relieving factors. The effect of pain on function and activities of daily living, the impact on quality of life and the impact on psychological well-being. Any social impact , any spiritual impact, pain expectations, Medication (current and previous analgesics), Opioid toxicity and Complementary interventions

- A psychosocial assessment
  - The patient understands their condition
  - What the pain means to the individual and their family

- How the pain may impact upon relationships within the patient's family
- Whether the pain influences the patient's mood
- Changes in mood
- Coping strategies adopted by the patient
- The patient's sleep pattern
- Any economic impact

- A physical examination
- A diagnostic evaluation for signs and symptoms associated with common cancer pain syndromes

***Special higher risk Groups***

- Older people
- The cognitively impaired
- People with language barriers
- Known or suspected substance abusers
- Patients at the end of their lives

**Note:** *Practitioners should use appropriate strategies to identify patients who may be at a higher risk of under-treatment for cancer pain. Pain assessment tools to assess cancer pain in special groups should be made available.*

## Management

***Pharmacological***

- Opioids (mainstay of cancer pain management)
  - → High doses if used as the sole analgesic
    - Side Effects: Sedation, constipation, respiratory, depression, Cognitive disturbances, tolerance and opioid-induced hyperalgesia
    - To manage side effects use Anti-emetics and Laxative
      - o Side Effects of the Anti-emetics: Tolerance, Dependency, Hyperalgesia, constipation and the suppression of the hypothalamic/ pituitary axis

- Routes of administration
  - Transdermal
    - Transdermal brings advantages in terms of increased bio-availability, reduced side effects and/or convenience for many patients
  - Epidural and Intrathecal
    - Epidural and intrathecal routes for the administration of opioids (morphine, hydromorphone and fentanyl) with or without local anaesthetics increases effectiveness, while reducing side effects, particularly drowsiness and constipation, and should be considered when pain cannot be controlled by simpler means

- Adjuvant analgesic
  - Lignocaine patches
  - Tricyclic antidepressants
  - Tramadol
  - Post-synaptic NMDA receptors such as ketamine and the dextro-isomers of many opioids, notably methadone
  - NSAIDs and COX inhibitors
  - Antiepileptic drugs
  - Sodium channel blockers

***Psychological approaches***

- Coping skills training
  - Attention-diversion strategies
    - Relaxation Training
    - Diaphragmatic breathing
    - Guided imagery
    - Engaging in meaningful and stimulating activities
  - Cognitives
    - Cognitive therapy (cognitive restructuring)

***Physical therapies***

- Physiotherapy
- Occupational therapy

*Invasive procedures*

- Coeliac plexus block
- Intrathecal drug delivery
  - ➔ Patient selection for an interventional procedure requires knowledge of the disease process, the prognosis, the expectations of patient and family, a careful assessment and discussion with the referring physicians. There is good evidence for the effectiveness of a coeliac plexus block and intra-thecal drug delivery. Safety, aftercare and the management of possible complications have to be considered in the decision-making process. Where applied appropriately and carefully at the right time, these procedures can contribute enhanced pain relief, reduction of medication use and a markedly improved quality of life.

# 6. Pain Related to Cancer Treatments

## Introduction

- Chemotherapy, surgery and radiotherapy are cancer treatments that can cause persistent pain in cancer survivor patients and adversely affect quality of life and function
- Up to 50% of cancer survivors may experience chronic pain secondary to treatment, yet this is under-recognised and under-reported (Burton, 2007). Pain in cancer survivors has an additional burden in that it is often perceived to be indicative of disease recurrence.
- Painful chemotherapy-induced peripheral neuropathy (CIPN)
    - Neurotoxicity is a dose-limiting side-effect of many chemotherapies and biological therapies (also known as biological response modifiers, which modulate the natural response to tumour cells) used in the treatment of cancer. Peripheral neuropathy is the most prevalent form of neurotoxicity

- Post-cancer surgical pain
    - Pain syndromes after cancer surgery have been found following breast, thoracic, head and neck surgery

- Radiation-induced brachial plexus neuropathy (BPN)
    - BPN usually occurs at least 6 months after therapy, although higher doses may have a reduced latency. The major differential diagnosis is tumour-related plexopathy. In addition to clinical factors, MRI may aid diagnosis.

*Management of Side–effects of Opoids*

- General approach to treating Opioid Adverse effects
    - → Distinguish Opioid side effects from co-morbid conditions or other concurrent medication
    - → Reduce the dose of the opioid if the pain is well controlled. If pain not controlled:
    - → Add a non-opioid co-analgesic (e.g. NSAIDs)
    - → Add a specific adjuvant pain medication (e.g. gabapentin for Post Herpetic Neuralgia)
    - → Target the source of pain (e.g. hip replacement for severe osteoarthritis)

- Regional anaesthesia or ablative surgical techniques (e.g. radio facet neurotomy)
- Switch opioids to see if another opioid has a better balance of analgesia vs. adverse effects.
- Symptomatic treatment of the adverse effect (s)

- Constipation
  - Add fibre to the patient's diet
  - Exercises
  - Drink at least 4-6 glasses of water per day
  - When starting opioid therapy it is better to keep bowels "loose"
    - Add stimulant laxatives e.g. *Bisacodyl* starting at one tab twice daily and increasing to a maximum of 8 tabs daily
    - Lactulose/sorbital/ polyethylen glycol
  - Surfactant e.g. Docusate

- Nausea & vomiting
  - Antiemetics routinely when starting opioids
  - Try Supine rest if nausea is intermittent
  - Try *Dimenhydramine* 25-50mg PO or 50mg-100mg per rectal(PR) q4-6hr PRN
  - Next try *Haloperidol* 0.5-5mg daily to BID (usual dose less than 2mg/day)
  - Next try *Prochlorperazine* 5-10mg PO or PR q4-6hrs PR
  - Next try or add *Metoclopramide* or *Domperidone* 10-40mg PO (especially if gastric motility decreased)
  - Try transdermal *Scoplomine* patch, one applied every 2-3 days
  - Small doses of oral *Cannabinoids (Dronabinol or Nabilone,)* 5-10mg daily) may help
  - *Ondansetron* 0.15mg/kg
  - If intolerable nausea, try switching to another opioid

- Sedation
  - Mild sedation usually occurs when first starting opioids or with dosage titration
  - It usually decreases with stable dosing within 7 -14 days if the dose is correct
  - *Methadone*- induced sedation may take longer to clear

- No driving while titrating dose
- Stop all other sedation medication in case of prolonged drowsiness
- Lower the opioid dose or switch opioids if drowsiness still persist

- Confusion/Pyschotomimetic Effects
  - Dysphoria, hallucination, nightmares in a small percentage of patients
  - May occur in first few days especially in elderly patients or those into rapid dose titration
  - Look for and correct other possible factors (especially anti-cholinergic medication)
  - May need initial small doses of haloperidol
  - If persists, taper off opioid, restart lower dose and titrate more slowly or switch opioids

- Respiratory Depression
  - Very rare with titrated oral dosing (pain is the "antagonist" of respiratory depression)
  - Only a problem if too high a starting dose, too rapid titration or too large increments especially in patients with Chronic Obstructive Pulmonary Diseases (COPD), severe sleep apnea, renal failure, gastroparesis
  - If acute, use *Naloxone* but in very small increments 0.1mg IV q10-15 min

- Urinary retention
  - Rare except in older males, especially if also constipated and / or on drug with anticholinergic side effects (e.g. TCAs) Tricyclic antidepressants
  - Try oral *Pilocarpine* 5mg TID

- Dry mouth
  - Common with potent opioids , tricyclics, anticonvulsants, clonidine
  - Dental problem reported in some patient on long-term opioid treatment
  - Meticulous oral hygiene required +frequent oral fluids+/- sugarless gum or candies
  - *Pilocarpine* 4% drops orally or oral *Pyridostigmine*

- Increase sweat
  - Very common (and persistent) with high doses of opioids, especially with exertion
  - Try *Clonidine* 0.1 mg BID and work up to 0.2mg TID if tolerated
  - Oral *Glycorpyrrolate*
  - Transdermal *Scopolamine* patches
  - Low dose *Phenothiazine*

- Depression
  - Opioids more commonly have euphoric rather than a depressant effect
  - Discontinue the opioid to see if mood improves and re-start the opioid to see if depression occurs, if so try switching to another opioid
  - If symptom of depression persist but good pain relief, try adding TCA, (Tricyclic antidepressants)
  - *Bupropion* or an anti-epileptic drugs

- Pruritus
  - Itchy skin in small patients
  - Try older (*Diphenhydramine)* or new (*Cetrizine* and *Loratadine*) antihistamine *Cimetidine* or *Paroxetine* or a course of oral steroid.

# 7. Appendix

## 7.1. Definition of Terms

| TERM | DEFINITION |
|---|---|
| Breakthrough pain (BTP) | A transitory increase in pain that occurs on a background of otherwise controlled persistent pain |
| Titration | Adjustment of the dose until the medication has achieved the desired effect |
| Breakthrough doses (BTD) | An as-needed dose of medication for sporadic worsening of pain; given to palliate breakthrough pain |
| Antagonist | Drug that competes with agonist for opioid receptor binding sites; can displace agonists, thereby inhibiting their action. Examples include naloxone, naltrexone. |
| Analgesia | Absence of pain in response to painful stimulus |
| Allodynia | Pain due to a stimulus that does not normally provoke pain such as touch. Typically experienced in the skin around areas affected by nerve injury, commonly seen by many neuropathic pain syndromes. |
| Dysethesia | Dyesthesia is abnormal sensation that comes from damage to nerves. |
| Hyperalgesia | Increased sensitivity to stimulation, excluding the special senses |
| Nociceptor | Is a sensory receptor that responds to potentially damaging stimuli by sending nerve signals to the spinal cord and brain |
| Neuralgia | Pain in the distribution of a nerve (e.g. sciatica, trigeminal neuralgia) often felt as an electrical shock like pain |
| Paresthesia | Abnormal sensation, whether spontaneous or evoked, manifested by sensations of numbness, prickling, tingling and heightened sensitivity that is typically not unpleasant |
| Adjuvant analgesia | A drug that has a primary indication other than pain (e.g. anticonvulsant, antidepressant ,sodium channel blocker, and muscle relaxant) |
| Metabolite | The product of biochemical reactions during drug metabolism |
| Neuropathic Pain | Pain sustained by injury or dysfunction of the peripheral or central nervous system |

| TERM | DEFINITION |
|---|---|
| Nociceptive pain | Pain that is sustained by ongoing activation of the sensory system that subserves the perception of noxious stimuli; implies the existence of damage to somatic or visceral tissues sufficient to activate nociceptive system |
| Nonopioid | Term used instead of non narcotics refers to paracetamol and nonsteroidal anti-inflammatory drugs(NSAIDs) |
| Opioids | This term is preferred to narcotics. Opioids refers to codeine, morphine, and other natural, semisynthetic,and synthetic drugs that relieve pain by binding to multiple types of opioid receptors |
| Opioid naïve | An opioid- naïve person has not recently taken enough opioid on a regular enough basis to become tolerant to the effects of an opioid. |
| Preemptive analgesia | Pre-injury pain treatments (e.g. pre-operative epidural analgesia and pre-incision local anesthesia infiltration) to prevent the establishment of peripheral and central sensitization of pain |
| Self report | The ability of an individual to give a report, in the case of pain, especially intensity. This is considered the "Gold standard" of pa assessment |
| Psychotomimetic | characterized by or producing symptoms similar to those of psychosis |
| Craving | Intense desire for drugs |
| Central neuropathic pain | Pain caused by a lesion or disease of the central somatosensory nervous system |
| Peripheral neuropathic pain | Pain caused by a lesion or disease of the peripheral somatosensory nervous system |
| Addiction | Addiction is a primary, chronic, neurobiologic disease, with genetic, psychological, and environmental factors influencing its development and manifestations. It is characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm and craving. |
| Physical Dependence | Physical dependence is a state of adaptation that is manifested by a drug-class-specific withdrawal syndrome that can be produced by abrupt cessation, rapid dose reduction, decreasing blood level of the drug, and/or administration of antagonist. |
| Tolerance | Tolerance is a state of adaptation in which exposure to a drug induces changes that result in a diminution of one or more of the drug's effects over time. |

## 7.2. Non-Opioid Analgesic Doses

| Medications | Dose range/mg | Max/day/ mg | Duration | Considerations |
|---|---|---|---|---|
| Paracetamol/ Tylenol | 500-1000 | 4000 | 4-6hrs | Light headedness, dizziness, can cause severe liver toxicity |
| Aspirin | 325-1000 | 6000 | 4-6hrs | - do not use in children < 12yrs<br>- tinnitus<br>- gastro disturbances<br>- allergic reactions<br>- Rhinitis, asthma, nasal polyps |
| Ibuprofen | 200-800 | 3200 | 4-6hrs | |
| Naproxen | 250-500 | 1500 | 6-8hrs | |
| Indomethacin | 25 | 200 | 8-12hrs | Higher incidence of GI &CNS side effects |
| Diclofenac | 50 | 150 | 8hrs | |
| Nabumetone | 500-750 | 2000 | 8-12hrs | |
| Ketorolac | 30-60 IM 30 IV | 120mg | | Ketorolac 30mg IV= 4mg IV morphine |
| Celecoxib (Celebrex) | 100-200 | 400 | 12hrs | 400mg per oral daily for menstrual cramps |

## 7.3. Opioids Comparative Table

**Warning:** Equianalgesic doses are approximate and mostly based on single dose studies. When switching opioids, start with 50% to 75% of the proposed equianalgesic dose of the new opioid to compensate for incomplete cross-tolerance and individual variations, particularly if the patient has controlled pain.

| DRUG | Equianalgesic Dose | | Onset of Action | Peak of Action | Duration of Action | Starting dose in –opioid naïve * patients with risk factor (s) (Adults) | Starting dose in opioid – naïve* patients with no risk factor (s) (Adults) |
|---|---|---|---|---|---|---|---|
| | PO | IV/SC | SC/IV(PO) | SC/IV(PO) | SC/IV(PO) | | |
| Morphine | 10 mg | 5mg | 2.5 min (15min) | IV: 15min SC: 30min PO:30-60 min | 4 hrs (4-6hrs) | 2.5mg SC/IV (5mg PO) | 5mg SC/IV (10 mg PO) |
| Hydromorphone | 2 mg | 1mg | 6min (15 min) | IV:15min SC:15min PO:30-60 min | 4 hrs (4-6 hrs) | 0.5mg SC/IV (1mg PO) | 1mg SC/IV (2mg PO) |
| Fentanyl | N/A | 50mcg | 30-60 min | IV:5-15min SC:5-15 PO:N/A | 30-60min N/A | 25mcg SC/IV | 50mcg SC/IV |
| Codeine (IM/IV not recommended) | 100mg | N/A | 30-60 min | PO: 2-4 hrs | 4-6hrs | 30mg PO | 60mg PO |
| Oxycodone | 7.5mg | N/A | IV/SC:N/A PO 15 min | IV/SC:N/A PO: 30-60min | N/A 3-6 hrs | 5 mg PO | 7.5mg PO |
| Tramadol | 50mg/ day | | | | | 50-150 mg in 4 divided doses/day | |

## 7.4. Opioid Conversion Tips

a) Calculate the rescue dose/break through dose
- Calculate 10% of the provided total daily dose as an immediate release formulation.

b) Opioid adjustments
- Calculate the total oral opioid taken in 24 hours by adding the amount of the sustained-release and immediate-release rescue doses
- Divide total daily dose into appropriate intermittent dose based upon the specific opioid dosing intervals found in the "dosing and conversion table for opioid analgesics" above

c) Changing to another oral opioid
- Calculate the total daily dose of current opioid (add the long acting and rescue doses)
- Use the "dosing and conversion table for opioid analgesics" above to calculate the equivalent total daily oral dose of the alternative opioid
- Divide the total daily dose of the alternative opioid into appropriate intermittent doses based upon the specific opioid dosing intervals found in the "dosing conversion table for opioid analgesics"
- Modify by reducing dose by 25-50% for incomplete cross tolerance

d) Changing an oral opioid to its IV/SQ route
- Calculate the total amount of oral opioid taken per 24 hours (add long-acting and rescue doses)
- Use the "dosing and conversion table for opioid analgesics" to calculate the equivalent total daily parenteral dose.

e) Changing an oral or IV opioid to transdermal fentanyl
- Calculate the total opioid dose
- Use the "dosing and conversion table for opioid analgesics" to calculate the equivalent total daily morphine dose.
- Use the "morphine to fentanyl equivalents table equivalents table" to determine the equianalgesic dose of transdermal fentanyl

f) Changing an opioid agent and route (Oral to IV)
- Calculate the total daily dose of the original of the original opioid (add long-acting and rescue doses).

- Use the "dosing and conversion table given above for opioid analgesics" to convert from oral to IV dose.
- Use the "dosing and conversion table for opioid analgesics to convert original opioid to an alternative, equivalent IV dose.
- Adjust the dose for incomplete cross tolerance by reducing dose by 25-50%.
- Divide adjusted dose by 24 to obtain hourly opioid infusion rate.

## 7.5. Initial Oral Opioid Dose Based on Pain Severity

| Opioid | Pain Severity | Dose | Frequency |
|---|---|---|---|
| Codeine | Mild to moderate | 30-60 mg | every 4 hrs |
| CR Codeine (e.g. codeine contin) | Mild to moderate | 50-100mg | Every 12hrs |
| Oxycodone | Moderate to severe | 5-10mg | Every 6hrs |
| CR Oxycodone (e.g. oxyContin) | Moderate to severe | 10-20mg | Every 12hrs |
| Morphine | Severe | 10mg | Every 4 hrs |
| SR Morphine(e.g. MS contin) | Severe | 15-30mg | Every 12hrs |
| Hydromorphone | Severe | 2mg | Every 4hrs |
| CR Hydromorphone (e.g. hydromorph Contin) | Severe | 3mg | Every 12hrs |
| **Note:** *In the elderly start doses should be 25-50% of those listed*<br>**Note:** *Controlled or Sustained-release tablets (and capsule beads) should never be chewed or crushed as this can lead to the rapid release and absorption of the opioid medication, increasing the risk of overdose* | | | |

***Note for opioids:***

***Opioid- naïve:** Patient previously not on opioid or who have been receiving opioid for less than 7 days.

**Renal failure:** All the above opioids except fentanyl produce metabolites, which can accumulate. Dosing interval should be increased by approximately 50%.

**Liver failure:** Most opioid may have decreased clearance, however no specific dose adjustment can be recommended.

## 7.6. Titrating Opioids

In patient with uncontrolled pain who has been on an IR opioid, the pain control and the amount of medication used needs to be reviewed each day. Add up the dose of breakthrough opioid used during the previous 24 hours and combine that dose with the total daily dose of the regular administered opioid to give the total dose of opioid used in previous 24 hours. That dose divided into the number of intervals, will be the new regular dose.

For example if the regular is morphine 50mg every 4 hrs (300mg/day) the breakthrough dose will be 30mg IR morphine p.r.n.(calculated as 300g÷10). If the pain dairy from the previous 24 hours notes that 5 breakthrough doses were taken

5 X 30mg = 150mg of breakthrough medication
+ 300mg/day of regular scheduled opioid
450mg used over the last 24 hours

Divided into 6 doses, the new regular opioid dose is 75mg every 4 hours (450÷6). The new breakthrough dose will be 45 mg p.r.n. (450÷10). This method allows the systematic advance of the dose until the patient reports comfort without troublesome side effects.

The same method is used when titrating controlled-release medication.

## 7.7. Adjuvant Medications with Analgesic Activity

| Antidepressants | Starting dose | Titration | Max dose/day | Considerations |
|---|---|---|---|---|
| Amitriptyline | 10mg Hs | Increase by 10mg every 3-7 days according to tolerance up to 30mg Hs change to tabs of 25,50 or 75 mg up to 150 mg/day | 150 mg, but for nortriptyline and despiramine are given in 3 divided doses (Tid) to avoid insomnia. | **Side effects:** dry mouth, urinary retention, constipation, sedation, orthostatic hypotension |
| Nortriptyline | | | | |
| Desipramine | | | | Orthostatic hypotension |
| Clomipramine | | | | |
| Imipramine | | | | |
| Maprolitine | | | | |
| Duloxetine | 30mg bid | Increase to 60 mg every day, from 1 to 2 weeks | 120 mg | |
| Venlafaxine | 37.5mg | 75 mg every 1-4 weeks | 225 mg | |
| Paroxetine | 10 mg, | 10 mg every 1-4 weeks | 50mg | |
| Citalopram | 10 mg ,Single dose | 10 mg every 1-4 weeks | 60 mg | |
| Bupropion | 100 mg, 1-2 doses | 100 mg every 1-4 weeks | 300 mg | |

-

| Anticonvulsants | Starting dose | Titration | Max dose/day | Duration | Considerations |
|---|---|---|---|---|---|
| Gabapentin | 100-300 mg Hs or 100-300 mg Tid | Increase by 100-300mg Tid every 1 to 4 weeks | 3600 mg divided 3-4 doses /day | 6-8 hrs | -Dizziness<br>-Drowsiness<br>-Constipation<br>-Peripheral edema<br>-Weight gain |
| Pregabaline | 25-50mg Hs, bid or tid, Max 150mg/day | 75mg | 600mg | 12hrs | -Tremors<br>-Weight gain |
| Carbamazepine | 50mg | 100-200mg per week | 1200mg | 6-12hrs | |
| Lamotrigine | 25mg | Slowly to avoid cutaneous reactions | 50mg | Once /day | |
| Topiramate | 15mg | 15-25mg per week | 400mg | 12hrs | -Tremors<br>-Arrhythmias<br>-Dyspepsia<br>-Weight loss |
| Levetiracetam | 250mg | 500mg every 1to 4 weeks | 3000mg | once | |
| **NMDA receptor block and opioid** | **Start Dose** | **Titration** | **Max Dose** | | |
| Methadone | 2-3mg q 6-12hrs PRN | Adjust once every week until pain is relieved | | | |
| NMDA- R/ blocker Ketamine | 10mg Tid or Qid with juice . Iv, in emergency, start with the bolus of 10mg or 20mg,or 3mg/hr in infusion. | Double the dose every 2-7 days and max dose 450mg. | Per PO, 450 mg in 3-4 divided doses | | |
| Alpha-adrenergic and anti-arrythimic | | | | | |

| Anticonvulsants | Starting dose | Titration | Max dose/day | Duration | Considerations |
|---|---|---|---|---|---|
| Clonidine | 0.05mg once day, Bid | 0.1mg every 2-4 weeks | 0.6mg | | |
| Tizanidine | 2mg | 2-4mg every 1-2 weeks | | | |
| Mexiletine | | | | | |
| **Cannabinoids** | | | | | |
| Dronabinol | | | | | |
| Nabilone | 0.5-1mg Hs or Bid | | 6mg | | |
| THC/CBD | | | | | |
| Baclofene | 5mg ,Tid | 5mg , tid every 3-7 days | 80mg | | |
| **Corticosteroids** | | | | | |
| Dexamethasone | | | | | |
| Prednisolone | | | | | |
| **Bisphosphonate** | | | | | |
| Pamidronate | | | | | |
| Clodronate | | | | | |
| Zoledronic acid (Zometa) | | | | | |
| **Miscellaneous** | | | | | |
| Baclofene | 5mg ,Tid | 5mg , tid every 3-7 days | 80mg | | |
| Calcitonin | 100-200 IU (Subcutaneous or intranasal)/day | | | | |

## 7.8. Neuropathic Pain Treatment Algorithm

| 1st line | 2nd line | 3rd line | 4th line |
|---|---|---|---|
| **Gabapentinoids** | **Selective serotonin norepinephrine inhibitors (SSNIs)** | **selective serotonin reuptake inhibitors (SSRIs)** | ▪ Methadone<br>▪ Ketamine<br>▪ Mexiletine<br>▪ Baclofene<br>▪ Clonidine<br>▪ Clonazepam |
| ▪ Pregabalin<br>▪ Gabapentin | ▪ Duloxetine<br>▪ Venlafaxine | ▪ Citalopram<br>▪ Paroxetine | |
| **Tricyclic and Tetracyclic Antidepressants** | **Cannabinoids** | **Other Antidepressants** | |
| ▪ Amitriptyline<br>▪ Clomipramine<br>▪ Imipramine<br>▪ Nortriptyline<br>▪ Desipramine<br>▪ Maprolitine | ▪ Dronabinol<br>▪ Nabilone<br>▪ Tetrahydrocannabinol (THC) (by oral) | ▪ Bupropion | |
| **Local Anesthesics** | | **Other anticonvulsants** | |
| Topical Lidocaine 10% | | Topiramate<br>Carbamazépine<br>Lévétiracétam<br>Lamotrigine | |
| **Note:** *Opioids or Tramadol: Utilize Opioids or tramadol in second line as monotherapy or in association, however when you anticipate to use them for long-term use long acting/sustained release formulations.* | | | |

## 7.9. Breakthrough Doses

When prescribing an opioid on a regular scheduled basis (e.g. every 12 hours), it is also important to provide an Immediate Release (IR) opioid for p.r.n. dosing to manage episodes of "breakthrough" or " incident" pain.

A breakthrough dose is calculated by taking approximately 10% of the total daily dose of the scheduled opioid and administering it as needed for uncontrolled pain. For example patient receiving controlled release (CR) Oxycodone 40mg every 12 hours will have breakthrough dose calculated as follows:

40mg X 2doses = 80mg/day
80mg ÷ 10 mg =8mg approximately 10mg IR oxycodone as needed

The breakthrough dose is calculated in the same way no matter what route of administration is being used.

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## 9. List of participants

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