ACKNOWLEDGEMENT

The Directorate General of Pharmacy gratefully acknowledges the financial support of the Global Fund to fight against HIV/AIDS, Tuberculosis and Malaria. This work would not have been possible without technical support of World Health Organization.
Contents

Editorial 2

Where Are We? 2

Current Topic 3
  • Misuse of Injectable Antibiotics

Practice Issues 4
  • It is a human right to be free from pain

Articles 6
  • Clinical Skills for Pharmacists
  • How to Respond to Patients with Sore Throat in a Pharmacy Setting?
  • What Patients Need to Know About Juice Interactions?

News and Updates 12

Guidelines to Good Practices 14
  • Guide to Advice Giving and Monitoring

Useful Tips 16
  • How to Use Insulin Syringe

Questions and Answers 17

Educational Materials 18
  • Injection safety WHO best practices for injections for injections
  • Post Exposure Prophylaxis (PEP) for Human Immunodeficiency Virus (HIV) Infection
  • Infection Control

Message from WHO 24
  • Why do the physicians prescribe irrationally?
Dear fellows and readers

Welcome to the fourth issue of SJRUM.

As editors, we are excited to continue with you in these issues in order to further promote the field of rational use of medicine. In this issue, the SJRUM team is addressing one of the most important issues facing the rational use of medicine; which is the misuse of injections. The irrational use of injections may carry many hazards and thus require targeted training, special precautions and administrative controls such as policies, and standard operating procedures (SOPs), which aim to limit exposure to the potential hazards. Examples of potential hazards from using injection include the transmission of blood born diseases such as Human Immunodeficiency Virus and Hepatitis B Virus. Irrational use of injections in Sudan results from a range of inappropriate practices such as over-prescribing, under-prescribing, over the counter dispensing, wrong dose calculation and improper administration in different health care settings. The WHO in 2011 has identified many gaps in rational use of injection in Sudan which will be highlighted to you in this issue.

Editor-in-chief

Dr. Habab K. Elkheir

Where are we from rational use of injectable antibiotics?
Injectable dosages forms are unique pharmaceuticals that are valuable in emergency and difficult clinical situations. Injectables act rapidly and achieve high concentrations; so effects are seen faster than with other dosage forms. However, this should not tempt practitioners to use injectable medicines when it is not necessary or just to speed up effects or to give the impression of ample management of health conditions.

Injectable antibiotics are one of the most misused medicines. In general antibiotics are overused, misused and irrationally prescribed or dispensed when they are not needed. This is true almost worldwide. The case gets dire in low-income and developing countries where poor hygiene and dissemination of infectious diseases are prevalent. The WHO considers the frequent use of injectable medicines, and specifically injectable antibiotics, as an indicator of irrational use and improper medicines management.

Studies investigating the prevalence of antibiotic use and injectable forms in Sudan revealed a high tendency of overuse, even in comparison with other developing countries. Most of these studies were based in large public hospitals; where some form of rational use practices are seen and bodies to assist rational use exist even if inadequately functioning. It is disquieting to imagine the situation in private health care centers where rational use of medicines can be expected to be poor, because there is little or no driving force to implement it.

It is common practice in primary health care settings to start treatment with injectable antibiotics even when not needed. In general, lay people believe injections to be strong medicines, and hence apply pressure and demand to obtain injectable dosage forms. The further you move from city centers; the more prevalent is the response to direct patients demands or even perceived demands for injectable antibiotics. The indiscriminate use of injectable medicines may pose the following potential problems:

- Extra economic burden on people from low socio-economic class status.
- Faulty administration by lay people who are poorly trained or not at all trained.
- Septic hazards from an indwelling venous cannula, in non-hospitalized patients.
- Premature discontinuation of therapy.
- Resistance to unique antibiotics

Great responsibility is placed on health providers from all levels to promote and implement RUM specially the aspect of rational use of injectable antibiotics. Prescribers need to learn and practice how to resist responding to patients demands whether frank or hidden. Development and implementation of formularies, standard treatment and rational prescribing guidelines are crucial steps to limit the misuse of injectable dosage forms generally.
Introduction

One gets accustomed to the situation they are surrounded with and unfortunately one can also get accustomed to seeing cancer patients in pain. A doctor may think the grimaces on a patients' face is a normal reaction to their disease; the family expect their cancer patient to be in pain and indeed even the patients themselves believe pain to be a natural response to their disease.

One of the main factors preventing appropriate management of advanced cancer pain is the simple fear of morphine.

Most of cancer patients in Sudan present to health services with advanced stage of the disease. Pain is present in almost 70% of cancer patients; even in early disease, and it might be a major accompanying symptom. Failure to assess pain properly leads to under management, worsening of patient’s prognosis and a poor quality of life.

Freedom from Pain is a Human Right.

Problem

Initially patients suffering from pain, at RICK, were given morphine tablets that were supplied as 15 mg and 30 mg immediate-release formulation. The patient was given a twice a day regimen instead of a 4 hourly dose which led to poor pain control and side effects because the dose was too high.

When the pain worsened and became uncontrolled, the patients were switched to morphine injections. Morphine injections result in a high blood level very quickly, but this usually gives very short term control of pain, more side effects and perhaps even “a high!” The regulations of morphine supply meant that injections are supplied as a single dose from the pharmacy; hence the patient had to endure the pain while the nurse or co-patient walked down to pharmacy to obtain the drug. This could invariably take a lot of time.

Solution

We had a turning point after a visit from Hospice Africa Uganda who introduced palliative care services at RICK. They had a 13 years’ experience of using morphine powder in Uganda, mainly for cancer and HIV patients. Hospice Africa Uganda has experience with using oral morphine in 15,000 patients with no evidence of addiction. Palliative care services started with training doctors, nurses and pharmacists in various disciplines, principally pain management- assessment of pain control, the drugs used to manage pain and monitoring of pain control. Figure (1) is an excerpt from the WHO pain control ladder.

Step three- Severe pain
Strong opioids e.g. morphine, fentanyl +/- adjuvants

Step Two- Moderate pain
Weak opioids – codeine or tramadol +/- adjuvants

Step One- Mild pain
Non-Steroidal Anti-inflammatory drugs, Paracetamol +/- adjuvants

Figure (1): WHO pain control ladder
The rule for prescribing pain control medication is:
- By the hour
- By the mouth
- By the patient

Our first palliative care patient was a 44 year old lady with metastatic breast cancer with lung deposits. She received 2 cycles of 2nd line chemotherapy but her general condition was too poor to continue therapy. She was admitted to the palliative care unit with the following problems: Painful severe oral and oesophageal candidiasis, anxiety, poor oral intake. The palliative care team initiated antifungal therapy and gave advice on oral hygiene. During this time, oral morphine solution was introduced at the hospital pharmacy. Liquid oral morphine was prescribed at a small dose of 2.5 mg, four hourly to relieve her pain. After a few days, her mouth was clear from the fungal infection and her pain was controlled. The patient was well enough for discharge. After discharge, she was referred to her oncologist who re-instated chemotherapy. Subsequent chest X-rays and clinical monitoring showed reduction in tumour size and lung deposits.
The paradigm shift in the pharmacy profession is vital for all pharmacists in order to provide an all-rounded health service. The new change in pharmaceutical care services is well defined by Hepler and Strand in 1990 which says: “Pharmaceutical care is the direct, responsible provision of medication-related care for the purpose of achieving definite outcomes that improve a patient’s quality of life”. In other words care has to be patient-oriented and not product-oriented only. In order to achieve this service. We need to change our way of thinking and the way we educate our pharmacists. Hence the need for being professionals is the way to be there.

So before we give an account of these changes let us think about this quotation:

“If you think a professional is expensive, wait till you try an amateur” Paul Red Adair

In order to provide our society with the professional pharmacist who can provide the right service we need to change our educational methods and curriculum content to achieve our goals. Professionalism is a philosophy that needs to be injected in our curriculum at all levels in order to produce the pharmacist we need. It encompasses injection of a large number of social, behavioral and mental subjects into the curriculum to satisfy the criteria for a clinically-competent pharmacist.

Professionalism covers aspects of communication skills, ethics and professional behaviors. Regarding communication skills, it is the means by which we can talk to patients, customers, other health providers, suppliers and a host of other people. We have to be skillful in how to communicate using verbal and non-verbal skills, have the right demeanor, show empathy and exhibit the right body language.

In dealing with patients and other professionals alike, we need to be good listeners and have good question techniques.

The attitudinal behavioral attributes of professionalism include the following:

- Respect for patients and other health professionals
- Compassion and empathy
- Integrity and honesty
- Being conscientious and reliable
- Work with high standards
- Responsiveness to the needs of patients and society that supersedes self-interest (Altruism)
- Accountability to patients, society and the profession
- Commitment to excellence and on-going professional development
- Being accountable, having to base advice and information on evidence
- Ethical/independent decision-making
- Taking responsibility for learning and professional development.
- Professional dress

Clinical Pharmacy Skills

The intended curriculum to prepare our graduates must be subjected to scrutiny and discussions among all educators and students. Practice-related teaching modules must cover the following broad areas:

Social Pharmacy, where concepts such as health, illness, patient behavior, the pharmacist’s role and place within society and the workplace are identified and taught.

1. University of Medical Science and Technology Sudan

Clinical Skills for Pharmacists

Prof. Abdalla Elkhawad

Sudan Journal of Rational Use of Medicine
Professional Pharmacy, where the individual pharmacist’s role and responsibilities, the policy and legal frameworks around pharmacy profession and the provision of medicine are defined, described and applied.

Clinical Pharmacy is where pathophysiology, therapeutics, disease management, pharmaceutical care and individualized drug regimens are covered. Such curricula if implemented correctly it will produce pharmacists with the following clinical skills:

- Proper patient etiquette
- Proper ward etiquette
- Able to deal with medical staff
- Understanding medical notes
- Understand guidelines for dispensing and prescribing medicines
- Able to implement guidelines for prescription endorsement of hospital or institutional drug policies, charts by pharmacists
- Taking drug history
- Writing in medical records
- Medication review (medicine reconciliation for admission of patients)
- Intervention monitoring
- Drug use evaluation
- Dealing with mistakes
- Dealing with distressed and dying patients
- Ethical dilemmas
- Managing meetings and Writing reports
- Assertiveness
- Communication and oral presentation skills
- Project planning and prioritizing
- Using Medicines Information services and
- Time Management

Social Pharmacy

Professional Pharmacy

Clinical Pharmacy
How to respond to patients with Sore throat in a Pharmacy Setting?

Prof. Abdalla Elkhawad

The new role of the pharmacist has changed dramatically to include management of medicines, chronic diseases, simple ailments and health promotion (Nuffield Report 1986). The reason for giving a new role in the management of simple ailments to the pharmacist is the high demand on the general practitioners in the primary health care, hence part of his services were shifted to the nurse and pharmacist. Ailments which can be diagnosed without physical examination are now dealt with by the community pharmacist. The following table (1) gives a summary of simple ailments pharmacists can deal with in a community setting using the skills needed to make the right differential diagnosis and give evidenced-based OTC products.

<table>
<thead>
<tr>
<th>Serial #</th>
<th>System</th>
<th>Simple ailments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Respiratory system</td>
<td>Cough, Common cold, Sore throat, Rhinitis</td>
</tr>
<tr>
<td>2</td>
<td>Ophthalmology</td>
<td>Red eye, Eyelid disorders, Dry eye</td>
</tr>
<tr>
<td>3</td>
<td>Otic conditions</td>
<td>Eye wax impaction, otitis externa</td>
</tr>
<tr>
<td>4</td>
<td>The Central Nervous System</td>
<td>Headache, insomnia, Nausea and vomiting</td>
</tr>
<tr>
<td>5</td>
<td>Women’s Health</td>
<td>Cystitis, vaginal discharge, dysmenorrhoea (period pain), Premenstrual syndrome</td>
</tr>
<tr>
<td>6</td>
<td>Gastroenterology</td>
<td>Oral cavity conditions, mouth ulcers, oral Candidiasis, gingivitis, dyspepsia, diarrhoea, constipation, irritable bowel syndrome, haemorrhoids, abdominal pain</td>
</tr>
<tr>
<td>7</td>
<td>Dermatology</td>
<td>Hyperproliferative disorders, psoriasis, dandruff, seborrheic dermatitis, fungal infections, hair loss, warts and verrucas, corns and calluses, scabies, acne. Cold sores, eczema and dermatitis</td>
</tr>
<tr>
<td>8</td>
<td>Musculoskeletal conditions</td>
<td>Acute low back pain, activity related/sports-related soft tissue injuries,</td>
</tr>
<tr>
<td>9</td>
<td>Paediatrics</td>
<td>Head lice, threadworms, colic, atopic dermatitis, fever, infectious childhood conditions</td>
</tr>
</tbody>
</table>
We are going to explain how we can deal with a patient complaining from sore throat. The importance of dealing with such an ailment is the fact that a sizable number of doctors and most pharmacists give antibiotics for this complaint, whereas in most cases it is due to viral infection and does not require giving of an antibiotic. This irrational use has led to serious development of resistance that will have serious impact on selection of antibiotics for more life-saving situations.

How to deal with sore throat

Key general and specific questions are needed in order to deal with such situation. First establish who the patient is, his symptoms and then take family, medical and drug history, and his or her life style activities.

Age: take note that, streptococcal infections are seen mostly in school-aged children. Viral infections are the most common cause in adults and glandular fever is most prevalent in adolescents.

Tender cervical glands; this is more so in patients suffering from glandular fever and streptococcal sore throat

Presence of tonsillar exudates is a sign of bacterial infections

Ulceration: is sign of herpetiform and herpes simplex ulcers, which can cause soreness in the mouth especially in the posterior part of the mouth.

Medicine induced sore throat: Drugs can cause agranulocytosis e.g. captopril, carbimazole, cytotoxics, clozapine, penicillamine, salfasalzine and sulfur-containing antibiotics

Triggers for referral: Adverse drug events

Associated skin rash

Duration of more than two weeks

Dysphagia

Marked tonsillar exudates

High temperature and marked swollen glands

Evidence-based OTC products:

Local anesthetics: Lidocaine (Xylocaine) is very effective in relieving throat congestion, but should be avoided in third trimester of pregnancy.

Antibactrials: chlorhexidine, benzalkonium chloride are used widely as antibacterial agents and should be used for bacterial infections and not for viral infections

Use mild analgesics to relief pain (paracetamol or Ibuprofen)

Use lozenges or pastilles since they have longer contact time with bacteria than mouthwash.
Many patients are unaware of the fact that fruit juices can cause significant drug interactions and most of the patients take their medications with juice. Therefore, health care providers must educate and counsel patients about this fact to decrease the likelihood of these events. Grapefruit, orange, apple, and cranberry are among the fruit juices most prone to interact with a number of medications. Grapefruit juice interacts with more than 85 of the highly prescribed medications and approximately one-half of these interactions have the potential to cause serious adverse events. This interaction is based on a well-described mechanism mediated by an irreversible inhibition of intestinal cytochrome P450 CYP3A4 which metabolizes some furanocoumarins (e.g. dihydroxybergamottin) found in grapefruit to reactive intermediates that bond covalently to the active site of the enzyme, CYP3A4, causing irreversible inactivation. This leads to increased bioavailability of administered medications that are substrates for intestinal CYP3A4 and creates the potential for toxic effects. Since grapefruit primarily targets intestinal CYP3A4 only and not the liver CYP3A4, medications administered intravenously are usually not affected.

As little as 200 mL of grapefruit juice, the amount in a whole grapefruit, may be sufficient to cause clinically relevant increased systemic drug concentrations and subsequent adverse events. Since administration of grapefruit causes irreversible inactivation, the effects of consuming grapefruit or any of its products can last as long as 72 hours. Therefore, separation of medications and grapefruit products by a few hours is also not advisable.

Patients older than 45 years represent the most vulnerable group to grapefruit drug interactions. This patient population is most likely to purchase grapefruits and to have comorbidities which require multiple medications. Older patients are also at high risk for clinically significant fruit juice interactions because pharmacokinetics are different in patients older than 70 years, and in general, the body’s compensatory mechanisms do not work as effectively as one ages.

Some of medications with a very high interaction with grapefruit in dose-related adverse events are summarised in Table 1, while Table 2 enumerate medications with a high grapefruit interactions risk.

**Table 1. Medications with a very high grapefruit interaction risk**

<table>
<thead>
<tr>
<th>Interacting drugs (generic name)</th>
<th>Dose-related adverse events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maraviroc</td>
<td>Postural hypotension, syncope</td>
</tr>
<tr>
<td>Lovastatin</td>
<td>Rhabdomyolysis</td>
</tr>
<tr>
<td>Simvastatin</td>
<td>Rhabdomyolysis</td>
</tr>
<tr>
<td>Dronedarone</td>
<td>Torsades de pointes</td>
</tr>
<tr>
<td>Ergotamine</td>
<td>Gangrene, stroke</td>
</tr>
<tr>
<td>Oral ketamine</td>
<td>Respiratory depression</td>
</tr>
<tr>
<td>Lurasidone</td>
<td>Torsades de pointes, orthostatic hypotension, syncope</td>
</tr>
</tbody>
</table>

1. Faculty of Pharmacy, University of Science and Technology, P.O. Box 447, Omdurman, Sudan.
<table>
<thead>
<tr>
<th>Interacting drugs (generic name)</th>
<th>Dose-related adverse events</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anticancer agents</strong></td>
<td></td>
</tr>
<tr>
<td>Dasatinib</td>
<td>Torsades de pointes, myelotoxicity</td>
</tr>
<tr>
<td>Erlotinib</td>
<td>Myelotoxicity</td>
</tr>
<tr>
<td>Everolimus</td>
<td>Myelotoxicity, nephrotoxicity</td>
</tr>
<tr>
<td>Lapatinib</td>
<td>Torsades de pointes, myelotoxicity</td>
</tr>
<tr>
<td>Pazopanib</td>
<td>Torsades de pointes, myelotoxicity</td>
</tr>
<tr>
<td>Vandetanib</td>
<td>Torsades de pointes, myelotoxicity</td>
</tr>
<tr>
<td><strong>Anti-infective agents</strong></td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>Torsades de pointes</td>
</tr>
<tr>
<td>Primaquine</td>
<td>Myelotoxicity</td>
</tr>
<tr>
<td>Quinine</td>
<td>Torsades de pointes</td>
</tr>
<tr>
<td><strong>Cardiovascular agents</strong></td>
<td></td>
</tr>
<tr>
<td>Amiodarone</td>
<td>Torsades de pointes</td>
</tr>
<tr>
<td>Apixaban</td>
<td>Gastrointestinal bleeding</td>
</tr>
<tr>
<td>Cilostazol</td>
<td>Gastrointestinal bleeding</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>Loss of efficacy</td>
</tr>
<tr>
<td>Verapamil</td>
<td>Complete heart block</td>
</tr>
<tr>
<td><strong>Central nervous system agents</strong></td>
<td></td>
</tr>
<tr>
<td>Buspirone</td>
<td>Dizziness, sedation</td>
</tr>
<tr>
<td>Dextromethorphan</td>
<td>Hallucinations, somnolence</td>
</tr>
<tr>
<td>Oral fentanyl</td>
<td>Respiratory depression</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>Respiratory depression</td>
</tr>
<tr>
<td>Pimozide</td>
<td>Torsades de pointes</td>
</tr>
<tr>
<td>Ziprasidone</td>
<td>Torsades de pointes</td>
</tr>
<tr>
<td><strong>Gastrointestinal agent</strong></td>
<td></td>
</tr>
<tr>
<td>Cisapride</td>
<td>Torsades de pointes</td>
</tr>
<tr>
<td><strong>Immunosuppressant agents</strong></td>
<td></td>
</tr>
<tr>
<td>Cyclosporine</td>
<td>Nephrotoxicity</td>
</tr>
<tr>
<td>Everolimus</td>
<td>Myelotoxicity, nephrotoxicity</td>
</tr>
<tr>
<td>Tacrolimus</td>
<td>Nephrotoxicity</td>
</tr>
</tbody>
</table>

These types of interactions may be avoided by separating medication and juice consumption by at least 4 hours. FDA has released educational tips for patients regarding potential fruit juice interactions (www.fda.gov/ForConsumers/ConsumerUpdates/ucm292276.htm). These informational points include important points about the education of patients, pharmacists and other health care provider about grapefruit and other juices interactions with prescribed medications. It also encourages patients to read the Medication Guide or patient information sheet that comes with prescription medications to identify any fruit juice interactions.
Roche Offers Discounted Cancer Medicines in India

Healthcare today Mar 2012
The pharmaceutical giant, Roche, has agreed to offer reduced priced mono-clonal antibodies for the management of cancer to Indian patients. The two drugs; rituximab (Mabthera) used for Non-Hodgkins Lymphoma and trastuzumab (Herceptin) used for Breast cancer are Roche’s most demanded cancer drugs. This offer is the result of a joint venture between Roche and the Indian pharmaceutical company Emucre, where Roche had agreed to manufacture the drugs, under its own regulations.
The cost of a trastuzumab (Herceptin) dose may amount to 4,500 USD. This reduced price drug will enable a larger number of people in India to have access to these drugs.

Rational Use of Antibiotics Shows Benefit in Managing Mild Chronic Obstructive Pulmonary Disease (COPD) Exacerbations

American journal of respiratory and critical care medicine, August 2012-09-12
There is no consensus on the use of antibiotics in mild to moderate exacerbations of COPD. This study was conducted across 13 centres in Catalonia involving patients with COPD who were diagnosed with an exacerbation. The patients were randomised to receive Co-Amoxiclav 500mg/125mg or placebo three times a day for 8 days. At the end of therapy, 74.1% in the treatment group and 59.9% in the placebo group were considered cured. Patients who had completed a course of antibiotics had a longer median time to a second exacerbation than patients who had received placebo (233 days vs. 160 days). Patients with all grades of COPD can seemingly benefit from a course of antibiotics during acute exacerbations.
These results conclude that all COPD patients should be provided with a course of antibiotic to keep at home and use it when they feel an exacerbation of their symptoms. This could be considered as a method of early management to prevent hospitalisation and other complications.

Beta Blockers may be Safe to Use in Patients with Chronic Obstructive Pulmonary Disease (COPD)

Thorax 2012-09-12
A recent study published in the journal Thorax, reported details on findings from a study investigating the outcomes of patients with COPD on beta-blocker therapy. Beta blockers were traditionally withheld from COPD patients who may frequently have concomitant cardiovascular disease. This is due to previous recommendations which meant that COPD patients were not given beta-blockers because of concerns regarding the risk of bronchospasm. However, a recent retrospective analysis of the records of 35,082 patients aged > 40 years showed that some beta-blockers don’t have an adverse effect on COPD outcomes. This study analysed the records of patients who were admitted into hospital for an acute exacerbation of COPD and were receiving beta-blocker therapy for cardiovascular disease. Among those patients, 29% were treated with beta-blockers in the first two hospital days, including 22% with beta-1-selective and 7% with non-selective beta-blockers. In-hospital mortality or mechanical ventilation in patients receiving selective beta-blockers was not increased. However, non-selective beta-blockers were associated with a small increase in the risk of 30-day readmission.
This study adds to the growing evidence that benefits from the use of selective beta blockers should not be withheld from COPD patients who may present with concomitant cardiac disease.
The WHO defines medicinal drug promotion as "All the informational and persuasive activities by pharmaceutical manufacturers and distributors, the effect of which is to induce the prescription, supply, purchases and/or use of medicinal drugs". Pharmaceutical promotion is after more sales and profit, every penny used is bait. Pharmaceutical companies invest 20 to 30% of its revenues on promotion, far ahead of its investment on research and development. It has a strong hold on information, research lines, researchers, peer-reviewed journals, key opinion leaders and even political lobbies. For prescribers to decide on the most rational medication choice, they need to have up-to-date information and knowledge about medication(s) intended to be used, and to weigh harms against benefits and cost. Pharmaceutical products should not be viewed as products only but as a combination of active ingredient, dosage form, and knowledge.

Healthcare providers at large, in the developing countries lack easy access to independent sources of information. The medication information generated by pharmaceutical industry is mainly directed to policy makers, managers, and prescribers. The medication information provided by the industry in its promotional message through pharmaceutical representatives, and in its various printed promotional materials (brochures, journal advertisement and journal reprints) is not intended to be only educational but also to serve its promotional aims. The quality of this promotional information is the subject of mounting international criticism for being imbalanced. Pharmaceutical companies may deliberately highlight medication attributes which encourage more use; for example the citation of misleading statistics derived from poorly conducted clinical trials. While the attributes relating to safety that restrict medication use; for example side effects and contraindications, are downplayed. Anecdotal evidence shows that these skewed messages are the main source of information to many prescribers, managers, and policy makers. Such information in itself leads to distorted and irrational prescribing decisions. In developing countries, there is an absence of explicit regulatory laws and lax enforcement of the current regulations. Pharmaceutical companies are exploiting this gap using friendship, sponsorship for conferences and educational events, and gifts to win their targets. Beneficiaries of these incentives generally dismiss the effect of promotion on their choice of medicines. However, they are clearly vulnerable to it!

Dr. Marcia Angel, former chief editor of the New England Journal of Medicine was quoted saying “Finding a senior medical researchers or a clinician without ties to pharmaceutical companies has become exceedingly difficult”.


It is very important to advise patients about their health condition and medication. Informed patients comply better with treatment and take an active role in caring of their health, thus benefit better from therapy and healthcare. At all points of the interaction between patients and the healthcare team advice and counseling are recommended.

The doctor-patient interaction is usually brief; a lot of information is given regarding the disease and treatment. Generally patients remember little of what is said by the doctor. This might be explained by: the patient might be too anxious worrying about their condition, or afraid to ask, or being inhibited by the setting. Nevertheless, prescribers should take ample time to stress on important information. Nurses have daily contact with hospitalized patients and are ideally placed to offer advice and re-assurance regarding both the disease and treatment. Pharmacists are usually the last point in this interaction and must emphasize the information given, advice and counsel patients.

Healthcare professionals should acquire knowledge and skills on how to deliver a professional counseling session. They should maintain medical ethics, professionalism, due empathy, trustworthiness and confidentiality when dealing with patients.

If the patient consents, the relatives, care takers and family members might be included in the counseling session.

**Important information to transfer to patients**

- Information about the disease
- Relevant information about the symptoms, complications, prognosis and monitoring of the disease; as well as life style modifications required to improve disease control.
- Instructions on medicines
- When to take; how to take; how to store; how long to continue the treatment; what to do in case of problems;
- Effects of the drug
- Which symptoms will disappear; and when; how important is it to take the drug; what happens if it is not taken;
- Side effects

Which common side effects may occur; how
to recognize them; how long will they remain; how serious they are; what to do if they occur;
• Warnings
What not to do (e.g. driving, operating machinery); maximum dose (for toxic drugs); need to continue treatment (antibiotics), what drugs and foods to avoid;
• Next appointment
When to come back (or not); when to come earlier; what to do with left-over drugs; what information will be needed;

Steps of monitoring

![Figure 1: Monitoring algorithm](image)

Passive monitoring is that you explain to the patient what to do if the treatment is not effective, or inconvenient, or too many side effects occur. In this case monitoring is done by the patient.

Active monitoring means that you make an appointment to determine by yourself whether the treatment has been effective. You will need to determine a monitoring interval, which depends on the type of illness, the duration of treatment, and the maximum quantity of drugs to prescribe.

In order to convey information, the relationship between patients and health care providers must be a good one with mutual respect and positive interaction.

Three basic models of health care provider-patient relationship exist.

• Activity passivity: the doctor is active and the patient is passive for example in treatment of emergencies and anesthesia
• Guidance- cooperation: the patient seeks help and is willing to cooperate with the healthcare provider who is in a position of power. It might seem that this relationship is passive but both people are active and contribute to the relationship.
• Mutual participation: this relationship is favored when the patient wants to care for themselves. The greater the intellectual, educational and experience similarity between the health provider and patient the more appropriate this model.

Monitoring

Where relevant some patient may require regular blood tests. It is important for both doctors and pharmacist to monitor the effects, adverse effects of therapy and non-pharmacological measures whether actively or passively.
How to Use Insulin Syringe

It is always recommended to assist patients to take care of their health. Teaching and encouraging insulin dependent patients to self administer insulin is an important skill that helps patients to gain more control on their condition. All health care providers can teach insulin-dependent patients, however nurses are better suited to do that. Reminders on proper administration and hygiene from time to time are needed as people fall into bad habits with routine use.

Insulin syringes come in different needle length and diameters, you can help your patient to select what best suits them. Generally short needles with small diameters are less painful.

You should explain the following steps to your patient:

1. Wash hands with soap and water thoroughly.
2. Pull the cap off the needle. Hold the syringe in the dominant hand between two fingers. With thumb and fourth finger, pull back to withdraw an amount of air that equals the insulin dose.
3. Pick the vial up and invert it, push in the air and withdraw the prescribed dose of insulin into the syringe. If bubbles appear, lightly tap the syringe until the bubbles rise, then inject them back into the vial and withdraw more insulin until the correct amount is completed.
4. Withdraw the needle from the vial and recap it.
5. Select an injection site, preferably on the abdomen or thigh. Clean around it.
6. Pinch up the area surrounding the injection site with the non-dominant hand.
7. Quickly insert the needle into the skin at a 45-to 90-degree angle.
8. Release the tissue and inject the insulin slowly.
9. Wait for 5 seconds and withdraw the needle quickly, apply pressure to the site with a piece of cotton.
10. Discard the needle and syringe in an appropriate way.
11. Wash hands with soap and water.
**Safe syringe disposal**

**Q:** What are the risks associated with injections?

**A:** Unsafe injections can result in the transmission of a wide variety of pathogens, including viruses, bacteria, fungi and parasites. They can also cause non-infectious adverse events such as toxic reactions.

**Q:** What is meant by safe injection practice?

**A:** A safe injection does not cause harm to the recipient, does not expose the health worker to any risk and does not result in economic waste.

**Q:** How to achieve safe injection practice?

**A:** To achieve this, the injection needs to be administered following aseptic technique using a sterile syringe and needle. After administration, sharp equipment should be discarded in a puncture-proof container for appropriate disposal. Any break or departure from this procedure represents a risk, rendering the injection unsafe.

**Q:** What are the reasons for injection overuse?

**A:** Some studies showed that injections are very widely used in hospitals in Sudan because injections act faster and they have higher bioavailability than oral medications, so they are perceived to be more effective than other routes of administration. Consequently, there is a wide belief among health care providers and the public that injections are the best treatment option.

**Q:** How does overuse of injections lead to the transmission of blood borne pathogens?

**A:** Risk of transmission of blood borne infections depends on the particular pathogen and on the volume and type of blood exposure. Pathogens such as HBV, HCV and HIV may be transmitted in the absence of visible blood contamination.

Reuse of injection equipment, non sterile syringes or needles, poor hand hygiene, cross contamination through poor hand hygiene and medication vials, all are considered common causes of transmission of blood borne pathogens as well as non sterile syringes.

**Q:** What are the reasons of syringes re-use in the countries like Sudan?

**A:** This practice is wide spread, due to several factors:

- Lack of awareness regarding the risks associated with syringe re-use
- Cultural resistance to dispose material in countries where resources are limited.
- Lack of regular supplies of syringes and needles (expensive) at both health care facility and individuals as they buy their medicines
- Absence of infrastructure for the safe collection and destruction of used injection

**Q:** How can safe syringe disposal be achieved?

**A:** Safe syringe disposal requires that syringes and needles be placed in puncture-proof containers e.g.: safety box immediately after use. These boxes must then be collected for incineration or other forms of destruction.
**Injection Safety: WHO Best Practices for Injections**

Health-care settings should ensure that an adequate supply of single-use injection devices are available, to allow providers to use a new device for each procedure.

When using a sterile single-use device:
- use a new device for each procedure, including for the reconstitution of a unit of medication or vaccine;
- inspect the packaging of the device to ensure that the protective barrier has not been breached;
- discard the device if the package has been punctured, torn or damaged by exposure to moisture, or if the expiry date has passed.

### Preparing Injections

Injections should be prepared in a designated clean area where contamination by blood and body fluids is unlikely.

### Practical Guidance on Preparing Injections

Four steps must be followed when preparing injections.

1. Keep the injection preparation area free of clutter so all surfaces can be easily cleaned.
2. Before starting the injection session, and whenever there is contamination with blood or body fluids, clean the preparation surfaces with 70% alcohol (isopropyl alcohol or ethanol) and allow to dry.
3. Assemble all equipment needed for the injection:
   - sterile single-use needles and syringes;
   - reconstitution solution such as sterile water or specific diluent;
   - alcohol swab or cotton wool;
   - sharps container.
4. Perform hand hygiene.

### Procedure for Septum Vials

Wipe the access diaphragm (septum) with 70% alcohol (isopropyl alcohol or ethanol) on a swab or cotton-wool ball before piercing the vial, and allow to air dry before inserting a device into the bottle.

- Use a sterile syringe and needle for each insertion into a multi-dose vial.
- Never leave a needle in a multi-dose vial.
• Once the loaded syringe and needle has been withdrawn from a multi-dose vial, administer the injection as soon as possible.

Labelling
• After reconstitution of a multi-dose vial, label the final medication container with:
  • date and time of preparation; type and volume of diluent (if applicable); final concentration; expiry date and time after reconstitution; name and signature of the person reconstituting the drug.
• For multi-dose medications that DO NOT require reconstitution, add a label with:
  • date and time of first piercing the vial; name and signature of the person first piercing the vial.
  • using a sterile syringe and needle, withdraw the medication from the ampoule or vial.

Reconstitution
• If reconstitution using a sterile syringe and needle is necessary, withdraw the reconstitution solution from the ampoule or vial, insert the needle into the rubber septum in the single or multi-dose vial and inject the necessary amount of reconstitution fluid.
• Mix the contents of the vial thoroughly until all visible particles have dissolved.
• After reconstituting the contents of a multi-dose vial, remove the needle and syringe and discard them immediately as a single unit into a sharps container.

Waste management
Use of sealed, puncture and leak-proof sharps containers helps to prevent access to used devices

Practical guidance on waste management
To ensure that waste is dealt with safely:
• transport and store sharps containers in a secure area before final disposal;
• close, seal and dispose of sharps containers when the containers are three quarters full; assign responsibility in written policy for monitoring the fill level of sharps containers and replacing them when three quarters full;
• discard waste that is not categorised as sharp or infectious in appropriate colour-coded bags;
• ensure that infectious waste bags and sharps containers are closed before they are transported for treatment or disposal.

In the event of a definite or possible exposure of a healthcare worker to a needle stick injury or splash of bodily fluids into the eyes from an HIV infected person or the other conditions detailed in Table (1), the following procedure is recommended by the WHO:

- Refer the person exposed to the risk of transmission to a trained person for medical evaluation, risk assessment and prescription of PEP. The decision on whether or not to take PEP should be based on the WHO recommendations, as well as appropriate information, counseling on adherence and on the possible adverse reactions to the antiretroviral drugs.

**Reporting of HIV exposure**

HIV exposure should be reported to the concerned body within the healthcare facility immediately. All reports should be strictly confidential.

<table>
<thead>
<tr>
<th>Table (1): HIV post-exposure prophylaxis following occupational exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PEP recommended</strong></td>
</tr>
<tr>
<td>PEP is recommended if exposure meets ALL the following criteria:</td>
</tr>
<tr>
<td>• exposure within 72 hours</td>
</tr>
<tr>
<td>• exposed individual not known to be HIV-infected</td>
</tr>
<tr>
<td>• source of exposure is HIV-infected or of unknown status</td>
</tr>
<tr>
<td>• exposure was to one or more of the following: blood, body tissues, visibly blood-stained fluid, concentrated virus, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid</td>
</tr>
<tr>
<td>• exposure was through one or more of the following: skin penetration with spontaneous bleeding or deep puncture</td>
</tr>
<tr>
<td>• splash of significant amount of fluid to mucous membrane</td>
</tr>
<tr>
<td>• prolonged contact of an at-risk substance with non-intact skin</td>
</tr>
</tbody>
</table>
Administration of PEP

Do not administer PEP to a person who is HIV positive, because PEP generally includes only two drugs to be taken for only 28 days, and is thus not a treatment for HIV infection. HIV treatment is based on a combination of three antiretroviral drugs taken continuously. If desired, it is acceptable to administer antiretroviral drugs for PEP, and to stop the treatment if the exposed person is found to be HIV positive.

In situations where PEP is required:

• administer the antiretroviral drugs for PEP as soon as possible after the exposure (ideally within 4 hours);
• continue the PEP regimen continuously for 28 days;
• use the two-drug regimen (recommended by WHO) unless there is suspicion or evidence of drug resistance, or unless there are national guidelines on choice of PEP regimen (in which case, follow these in preference);
• evaluate the person taking PEP within 72 hours, to monitor for possible adverse drug reactions and adherence, and follow-up (as described below) for at least two weeks.
Eliminating unnecessary injections is the best way to prevent injection-associated infections. When effective treatment can be given by other routes (oral or rectal), this is preferred, because it reduces potential exposure to blood and infectious agents, and thus reduces infection risks.

Methods for reducing exposure and preventing infection transmission –include hand hygiene, barrier protection (gloves), minimal manipulation of sharp instruments (including injection equipment), and appropriate segregation and disposal of sharps waste (note: sharps are items such as needles that have corners, edges or projections capable of cutting or piercing the skin)

Injection safety is an important component of basic infection control. The concept of “standard precautions”, with mandatory safe practices, must be routinely applied in all healthcare settings, and every person in such settings should be considered a potential source of infection

General safety practices
The following practices are recommended to ensure the safety of injections and related practices:

• hand hygiene;
• gloves where appropriate;
• other single-use personal protective equipment; and
• skin preparation and disinfection.

Hand hygiene
Hand hygiene is a general term that applies to hands washing, antiseptic hand wash, antiseptic hand rub or surgical hand antisepsis. It is the best and easiest way to prevent the spread of microorganisms. Hand hygiene should be carried out as indicated below;

either with soap and running water (if hands are visibly soiled) or with alcohol rubs (if hands appear clean).

Practical guidance on hand hygiene
Hand hygiene before and after contact with every patient is the single most important means of preventing the spread of infection

Perform hand hygiene BEFORE:
• starting an injection session (i.e. preparing injection material and giving injections);
• coming into direct contact with patients for health-care related procedures;
• putting on gloves (first make sure hands are dry).

Perform hand hygiene AFTER:
• an injection session;
• any direct contact with patients;
• removing gloves.
• Hand hygiene may be needed between injections, depending on the setting and whether there was contact with soil, blood or body fluids.
• Avoid giving injections if the skin integrity is compromised by
local infection or other skin conditions (e.g. weeping dermatitis, skin lesions or cuts), and cover any small cuts.

- When hands are visibly dirty or contaminated with proteinaceous material, wash them with antibacterial or plain soap and running water, then dry them using single-use paper towels
- When hands appear clean (i.e. are not visibly soiled), clean them with an alcohol-based hand product for routine decontamination, then dry them using single-use paper towels

**Precautions**

- Ensure hands are dry before starting any activity
- DO NOT use alcohol-based hand products when hands are visibly soiled
- DO NOT use alcohol-based hand products after exposure of nonintact skin to blood or body fluids; in such cases, wash hands with antibacterial or plain soap and running water, then dry them using single-use paper towels

**Gloves**

- Health workers should wear non-sterile, well-fitting latex or latex-free gloves when coming into contact with blood or blood products.
- Indications for glove use in injection practice
- Glove use Wear non-sterile, well-fitting, single-use gloves:
  - when there is a likelihood of coming into direct contact with a patient’s blood or other potentially infectious materials (e.g. body fluids, moist body substances and saliva [in dental procedures]), mucous membranes and nonintact skin.
  - when performing venipuncture or venous access injections, because of the potential for blood exposure at the puncture site
  - if the health worker’s skin is NOT intact (e.g. through eczema, or cracked or dry skin)
  - if the patient’s skin is NOT intact (e.g. through eczema, burns or skin infections).

**Key elements Precautions**

- When undertaking injections, DO NOT use gloves:
  - for routine intradermal, subcutaneous and intramuscular injections
  - if the health worker’s skin is intact
  - if the patient’s skin is intact. Gloves DO NOT provide protection against needle-stick or other puncture wounds caused by sharp objects.

Needles, scalpels and other sharps should be handled with extreme caution.
Why do the physicians prescribe irrationally?

In an earlier volume it was proclaimed that for irrational prescription the physician alone cannot be singled out and blamed. It is a net result of a range of factors and in the following we discuss some of these root causes.

1. **Medical Practice**

The health in western system of medicine is perceived as ‘the absence of disease’. In this perspective the diagnosis of the disease requires identification of the abnormality (pathology), which in turn is based on the understanding of the normal structure (anatomy and histology) and the functionality (physiology). Treatment is the correction of the abnormality. Given that the concept of disease in terms of etiology and pathogenesis has narrowed through ages from supernatural forces to the natural forces and through body tissues. The patient is usually seem as a disease and treated disregarding his social and cultural background. Tackling social and cultural aspects into account lead to better selection of medicines and dosage forms and hence compliance and acceptance by patients.

2. **Medical Education**

The medical undergraduates are given inadequate knowledge concerning clinical application of drugs and the principles of drug use, drug effects and assessment of efficacy and safety in clinical trials. Furthermore, the teachers in pharmacology and therapeutics often have a little interaction with patients. Added to this is the shortage of clinical pharmacologists involved in education, few medical schools include in their curriculum topics like ‘cost-effectiveness analysis in therapy’. More emphasis should be placed on pharmacotherapeutics for medical schools. With these shortcomings, medical students tend to acquire prescribing attitudes from their seniors regardless of scientific grounds.

3. **Professionals**

The extensive body of knowledge and prolonged training characterizes the medical profession and the successful accomplishment of which endows the physician a right to practice out his healing skills. At the same time, however the patient is put to the other end of the scale i.e. to be healed. In this interaction, the balance of power, to decide and prescribe, remains in favor of the physician, and not uncommonly misused in prescription. The medical organization built by the medical profession, through monopolizing the knowledge does not allow others, i.e. contemporary medical practices to intervene and even discourages the right to self care. Such a situation could well be quite damaging to the patient, particularly when the profession is not able to any help.

4. **Health Care Services**

Although the very nature of the health care service could itself influence the prescribing behavior of the physician, the culture of the organization also determines the mode and behavior of the physician. Health care facilities that generate and follow formularies, guidelines, protocols, and that have functioning DTCs tend to have better prescribing practices than the health facilities that lack them. Some health care facilities, might by their nature promote the use curative and alleviative pharmaceuticals, or like research and teaching centers promote the use of new and wonder drugs. Other factors pertaining to the health services, which can determine and affect the prescription pattern of the physician, include the workload, efficiency of the logistics management systems, and the economic status of the services and the availability of the pharmaceuticals.

5. **Personal attributes of physicians**

Factors like professional level, other professional activities, higher qualifications, continuing professional education, preventive medical activities, information sources i.e. journals, advertisement, detail men etc. influence prescribing. Also, the organization of work, i.e., solo practice, group practice, area, size of community, socio-demographic variables, i.e., his age, sex, social integration in the society, whole person orientation etc., all contribute to prescribing pattern. However the precise role of each is difficult to determine.
Instructions to authors
Scope of the Journal: Rational use of medicines related to health care providers and patients.

Suitability of publication:
All topics related to the different aspects of Rational use of medicines (RUM) will be evaluated by the editorial board. Prospective authors with a subject(s) or questions about the suitability of their papers or materials are invited to request an opinion from the Editorial Board (nmicrl@gmail.com).

Avoid plagiarism

How to submit materials:
Manuscripts can be handed over directly to the editor-in-chief as soft copy or by e-mail (nmicrl@gmail.com).

Types of manuscripts:
1. Research papers.
2. Case reports.

Preparation of manuscripts
All manuscripts must be typed in Arial font size 12, with 1.5 line spacing. Manuscripts must be in Word. Page margins on all sides must be at least 2.5 cm wide. You can use either English or American spelling but not both on the same manuscript.

1. Research papers
Original research will have the priority of publications. Author(s) name and affiliations should be clearly written. Contact person, telephone number and e-mail address should be included. Total words count should not exceed 800 words including references, tables, table captions, figure legends, and footnotes. Maximum of three tables and figures are accepted.

The manuscript should be divided into sections. Each section should have a separate heading. Subheadings take the form of paragraph lead-ins (should be bold case), indented and run in with the text, separated by a period.

Introduction: This section should provide the reader with sufficient background information to evaluate the results of the research. An extensive review of the literature is not needed in this section. It should also give the rationale for and objectives of the study that is being reported.

Methods: Sufficient information must be provided so that the reader will understand the methodology and be able to repeat the experiment.

Results: The results section should be written in such a manner to provide information by means of text, tables and figures. Results and discussion may be combined or there may be a separate discussion section. If a discussion section is included, place extensive interpretations of results in this section. Do not repeat the results. Give numbers to figures and tables in the order in which they are mentioned in the text. All figures and tables must be cited in the text.

Conclusions and recommendations: Acknowledge personal, financial and institutional assistance at the end of this section.

References: Use the Vancouver reference system. Cite 6 references maximum.

2. Case reports
Any case that is related to RUM will be considered. The manuscript should include the following:

Setting, complete description of the case, consequences and outcome and finally follow up if applicable. Words count should not exceed 400 words.

NOTE: Ethical clearance is a requirement for all researches from 2012 onward.
The National Medicine Information Centre and Reference Library (NMICRL)

The National Medicine Information Centre and Reference Library (NMICRL), established to provide technical support, offering its service through the General Directorate of Pharmacy which is operated under the auspices of Federal Ministry of Health.

The vision of the NMICRL is in accord with the current Quarter-Century Pharmaceutical Strategy (2005-2029) and the National Medicines Policy (2012-2016).

The mission of the NMICRL is to promote the use of evidence-based medicine, improve medication safety, and enhance patient-centred pharmaceutical care in Sudan. Its main objective is to disseminate accurate health information to the community and to provide expert assistance to healthcare professionals on all matters pertaining to medicines information country-wide.

The NMICRL is striving to provide current, unbiased and comprehensive quality medicines information capitalizing on it highly skilled personnel coupled with the latest editions of reference books, electronic media and internet facility.