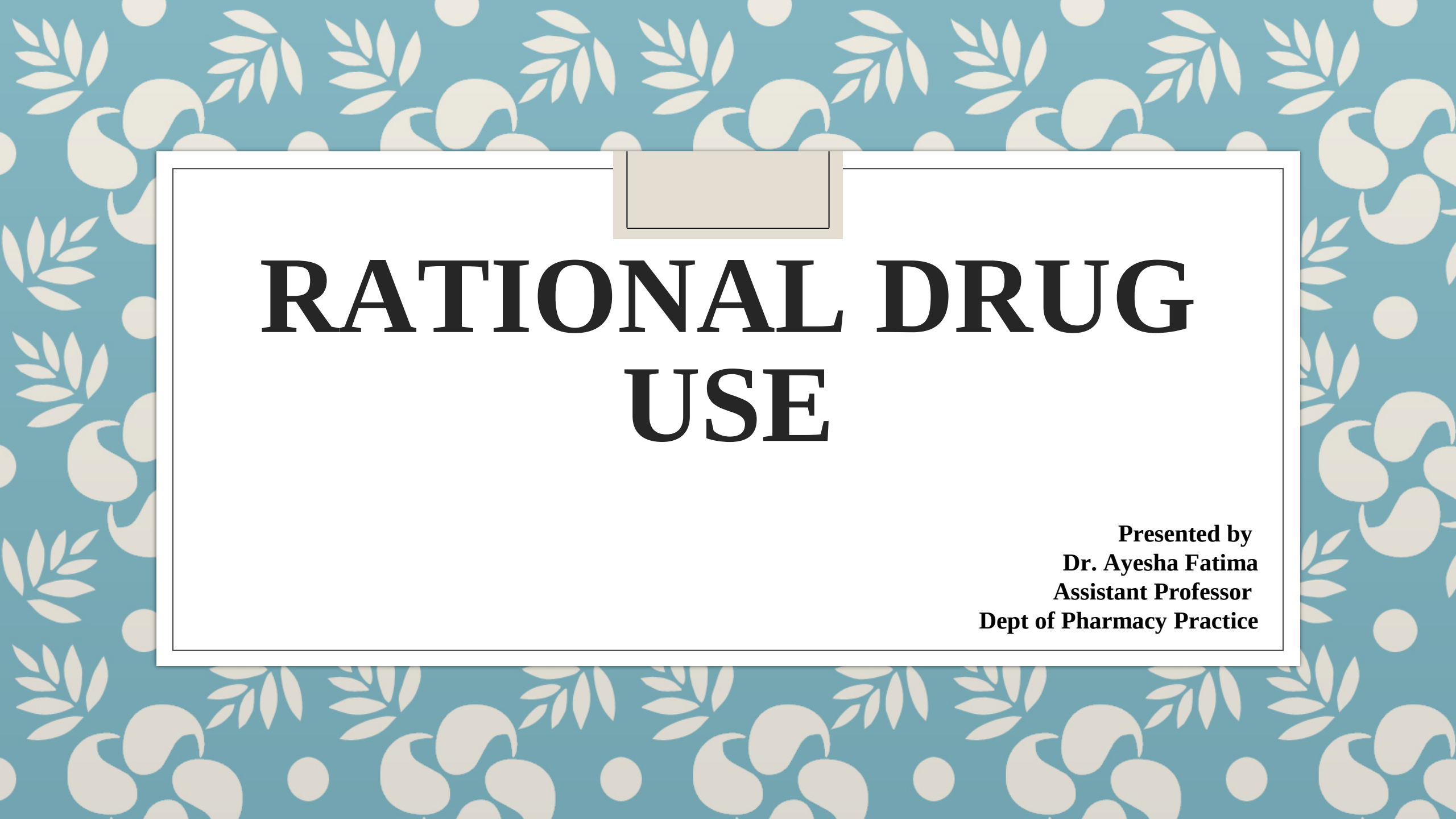




RATIONAL DRUG USE

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Rational Drug Use is defined as the use of an appropriate, efficacious, safe and cost effective drug given for

- The right indication
- The right dose and formulations
- At regular intervals
- The right duration of time

In 1985, the WHO conference of experts in Nairobi defined the rational use of drugs as one that

‘requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, and at the lowest cost to them and to their community’.

- This means that the correct drug is chosen based on the efficacy, safety, suitability and cost for the appropriate indication, and that the drug is correctly dispensed in the most suitable dosage formulation with appropriate information that the patient can understand and that the patient adheres to the treatment.
- Medicine use is termed irrational when one or more of these conditions are not met.

RDU Criteria

1. Appropriate Indication
2. Appropriate Drug
3. Appropriate Patient
4. Appropriate Information
5. Appropriate Monitoring

Hazards of irrational drug use

1. Ineffective & unsafe treatment
2. over-treatment of mild illness
3. inadequate treatment of serious illness
4. Exacerbation or prolongation of illness, Distress & harm to patient
5. Increase the cost of treatment
6. Increased drug resistance - misuse of anti-infective drugs
7. Increased Adverse Drug Events
8. Loss of patients confidence to doctor

Reasons for Irrational use of drugs/ Factors affecting Rational drug use

1. Lack of information
2. Faulty & inadequate training & education of medical graduates
3. Role models Teachers or seniors
4. Lack of diagnostic facilities/Uncertainty of diagnosis
5. medicine for all possible causes
6. Demand from the patient prompt and quick action

6. Patient Overload

7. Promotional activities of pharmaceutical industries

8. Drug promotion and exaggerated claim by companies

9. Defective drug supply system & ineffective drug regulation

10. Poor communication between health professional & patient

11. Non adherence of dosing regimen

12. Self medication

13. Improper drug regulations

15. Self medication because

- a. Easy accessibility to prescription drugs
- b. Easy access to OTC drugs

16. "Prescription only" drugs are easily available without doctors prescription

17. Advice by the friends, relatives, and person on medication

18. Not filling the whole prescription

19. Self decision regarding how and when to take the drugs

20. Promotion or advertisements in newspaper, TV, radio by drug manufacturers

Types Of Irrational Drug Use

- Polypharmacy, The use of too many medicines in a single patient
- Inappropriate use of antibiotics, often in inadequate dosage (either strength or duration of treatment) or the use of antibiotics for nonbacterial infections like viral infections
- Over-use of injections when the oral route would be more appropriate
- Inappropriate self-medication, mostly with prescription-only drugs
- Failure to prescribe in accordance with STGs

Most Frequently Misused Irrational Drugs

Drugs which are frequently misused, fall in the following categories

- a. Drugs which are used as self-medication without doctor's advice - OTC Medicines
- b. Drugs which are overused, either potent drugs for small ailments, or high dose of a potent
- c. Drugs to get quick relief
- d. Drugs which are used for something else, for which they are not meant
- e. Drugs which are used not according to the regimen (often stopped in the middle of the course as soon as symptoms disappear)

Irrational fixed dose combination

1. Norfloxacin + metronidazole
2. Ofloxacin + metronidazole
3. Ciprofloxacin + tinidazole
4. Nimesulide + diclofenac
5. Simvastatin + nicotinic acid
6. Domperidone + rabeprazole
7. Enalapril + losartan
8. Cetrizine + phenylpropanolamine + paracetamol

Some Broad Categories of Drugs which are Misused and Irrationally Used

1. Antibiotics:

- Sale of antibiotics in drug stores amount to 55% of the total sales.
- This category is the most frequently prescribed, and so also most frequently misused and irrationally used.
- There are enormous ways in which antibiotics are misused, such as:
 - Sell medication, often on the advice of friends, relatives.
 - Old prescriptions used again and again, without doctor's advice.
 - Overdose, for quick relief.
 - Incorrectly used for some other ailment.

- Some of the common antibiotics which are irrationally used are as follows
 - a. Penicillins: Pentid or pentid-sulfa is most commonly misused, for mild fevers. Since tablet form and price is also low, has gained popularity as self-medication.
 - b. Ampicillin: Very dangerously used for children without doctor's advice. Frequently, are used again and again. Often high doses are given to a child to get quick prescriptions
 - c. Amoxicillin: This drug prescribed by GPs, consultants, for any illness or during convalescence.

Conditions for Misuse of Antibiotics

- a. Common Cold
- b. Upper respiratory infection.
- c. Starting antibiotics without diagnosis
- d. Frequently changing antibiotics.
- e. Giving suboptimal dose.
- f. Not completing the course of treatment.

Other Miscellaneous Drugs

2. Naphazoline and Xylomethazoline: Used as nasal decongestants a medication. Brands like Otrivin and Nazalin have now become household remedies. Both the drugs belong to the class of adrenergic stimulant drugs and can raise blood pressure in hypertensive patients a fact which is little known, Prolonged use also initiates blood pressure. The affect of decongestion is only temporary, and nasal passage gets choked up very readily.

3. Oral Antidiabetic Drugs: Drugs like glibenclamide, gliclazide, glipizide, metformin misused, because of a misconception. Diabetic patients think that these drugs are a kind of protective shield' against sugar in the diet and the dose is in proportion to the content of sugar in the diet. Often people take double the prescribed dose, when they anticipate high sugar meals wedding parties or social occasions, thinking that this will protect them against high sugar intake and allow them to enjoy the sweets.

4. Anti Hyperlipidaemic Drugs: Cholesterol lowering drugs like lovastatin, simvastatin, atorvastatin have gained popularity with people having high cholesterol. Like oral antidiabetic drugs people misuse these drugs by taking twice the dose or overdose, whenever they anticipate mess rich in fats, especially the 'non-veg' meals, knowing very well that such fast contains high cholesterol.

Steps To Promote Rational Drug Use

WHO recommends key interventions in order to promote the rational use of drugs.

1. A mandated multi-disciplinary national body to co-ordinate medicine use policies
2. Clinical guidelines
3. EML based on treatment of choice
4. Drug and Therapeutics Committees in districts and hospitals
5. Problem-based pharmacotherapy training in undergraduate curricula
6. Continuing in-service medical education as a licensure requirement
7. Supervision, audit and feedback
8. Independent information on medicines
9. Public education about medicines
10. Avoidance of perverse financial incentives
11. Appropriate and enforced regulation
12. Sufficient government expenditure to ensure availability of medicines and staff

National Strategies To Promote The Rational Use Of Medicines

1. Promoting the rational use of medicines requires medicines, trained healthcare professionals and money
2. Establish a mandated national body to co-ordinate medicine policies and to monitor them
3. Prepare and use evidence-based clinical guidelines or STGs for training and clinical decision-making
4. Prepare an EML based on the treatment of choice and use it for procurement and insurance reimbursement purposes
5. Set up a Drug and Therapeutics Committee (DTC) at institutional and district levels
6. Introduce and promote problem based pharmacotherapy training in undergraduate medical courses
7. Make continuing medical education a mandatory requirement for licensing to practice medicine

8. Provide and promote the use of independent, unbiased drug information such as formularies and bulletins to healthcare providers
9. Encourage the supervision of prescribing, drug audit and feedback based on audit results in healthcare facilities
10. Educate the public about medicines
11. Eliminate perverse financial incentives that would lead to irrational prescribing
12. Enforce appropriate drug regulations and ensure that drug promotional activities are in keeping with the WHO ethical criteria
13. Ensure adequate government spending for equitable availability of medicines and health providers

How Can The Use Of Medicines Be Improved?

- The following strategies can be used to improve the use of medicines:

Table 15.3 : Three Major Strategies to Improve RUD

Educational	Managerial	Regulatory
i) Training Prescribers - Formal Education - Continuing education - Supervisory visits - Group lectures, seminars, workshops. ii) Printed Material - Clinical literature and Newsletter - Treatment guidelines and formularies - Illustrated materials, flyers, leaflets iii) Approaches based on Face-to-Face Contact : - educational outreach - patient education - Influencing opinion leaders	i) Selection, Procurement and Distribution - Limited procurement list - Drug Utilization Review - Hospital and regional drug therapeutic committees (DTC) - Cost information ii) Prescribing and Dispensing Approaches : - Structured drug order forms - Standard diagnostic and treatment guidelines iii) Financing : - Price setting - Capitation based budgeting	- Drug registration - Limited drug lists - Prescribing restrictions - Dispensing restrictions

Rational Drug Monitoring

- 1. Aggregate medicine consumption data:** This can be used to compare actual consumption against expected consumption. It is also used to determine whether costlier medicines of lower efficacy are being used for treatment. When done in a hospital, and consumption between wards is compared and made public, it can bring about decreased consumption and promote rational use remarkably quickly and effectively.
- 2. WHO drug use indicators:** These are used to describe the prescribing pattern and the quality of care at primary healthcare facilities use indicators. World Health Organization, Geneva.)
- 3. The Anatomical Therapeutic Chemical (ATC) classification and defined daily dose (DDD) methodology:** This is used to compare drug consumption patterns across institutions, regions and countries. Drug utilization review or focused drug use evaluation: This is useful especially in hospitals where the use of specific medicines or the treatment of specific diseases need to be documented for identifying problems associated with them.
- 4. Qualitative methods:** Methods such as in- depth interviews, structured questionnaires or focus group discussions can be used to identify the causes of irrational drug use.

Table 8.1 Selected WHO/INRUD* drug use indicators for primary healthcare facilities (WHO, 1993)

Prescribing Indicators:

Average number of medicines prescribed per patient encounter

% of medicines prescribed by generic name

% of encounters with an antibiotic prescribed

% of encounters with an injection prescribed

% of medicines prescribed from essential medicines list or formulary

Patient Care Indicators:

Average consultation time

Average dispensing time

% of medicines actually dispensed

% of medicines adequately labelled

% of patients with knowledge of correct doses

Facility Indicators:

Availability of essential medicines list or formulary to practitioners

Availability of clinical guidelines

% of key medicines available

Complementary Drug Use Indicators:

Average medicine cost per encounter

% of prescriptions in accordance with clinical guidelines

Role Of Pharmacist Towards Promoting The Rational Use Of Drugs

- ❖ Pharmacists play a vital role in the promotion of the rational use of medicines.
- ❖ From the provision of pharmaceutical care and unbiased drug information to the selection, procurement and dispensing of essential medicines, the pharmacist is in a position to make a major difference to the manner in which medicines are prescribed.
- ❖ However, the full potential of pharmacists can only be realized within a well-regulated, rule based healthcare system.
- ❖ Until then, it will be the efforts and commitment of individual pharmacists that will contribute to rational drug use (RDU).

A brief description of the activities in which pharmacists play an important role is given below:

1. **Member of the Drug and Therapeutics Committee:** The input given by a pharmacist during the selection of essential medicines, preparation and implementation of the EML and in all other activities is vital.
2. **Drug procurement:** The pharmacist is involved in the procurement process and can ensure that only good-quality medicines are procured at reasonable cost. Since drug procurement is based on proper inventory control and forecasting, pharmacists should be well-versed in these modern methods. They should make sure that only those medicines listed in the EML are procured and that they are bought from reliable pharmaceutical suppliers, are of good quality and are delivered on time.

3. **Drug storage:** The pharmacist should be capable of indenting, receiving and storing medicines for the health facility.

Good storage practices should be followed and prevention of stock-outs of essential medicines or undue pileups of medicines leading to their expiry should be prevented.

Procurement or indenting should be made based on actual needs.

Standard operating guidelines to deal with expired medicines, narcotic drugs and costly medicines should be in place and strictly followed.

3. **Dispensing:** One of the most important activities undertaken by the pharmacist is the dispensing of medicines.

In large hospitals, pharmacists dispense to both inpatients and outpatients.

If a restricted list is in place, the chances of error in dispensing medicines are limited.

It is also important that pharmacists are vigilant and ensure that drugs are not pilfered. Careful accounting and checks should be done to prevent this.

5.Patient education: Counselling of patients and giving them proper advice on the optimal use of medicines is one of the key activities of a pharmacist.

Patient adherence in chronic diseases can be improved by the pharmacist providing both verbal and written information.

5.Pharmacovigilance: The monitoring and reporting of adverse effects is a major responsibility of pharmacists. They should be familiar with the monitoring forms and methods of reporting and should be actively engaged in all pharmacovigilance activities.

6.Drug information service: Pharmacists can provide information to prescribers, patients, the general public and other healthcare workers. Unbiased up-to-date drug information is part of the rational use of medicines, and the knowledge and skills of pharmacists are ideally suited to providing this

8. **Pharmaceutical care:** One of the more recent definitions of pharmaceutical care is ‘a patient centered practice in which the pharmacist assumes responsibility for a patient’s drug related needs and is held accountable for this commitment’.

This concept was started in the early 1990s in the United States of America, and focuses on the responsibility of the pharmacist to meet all of the patient’s medicine-related needs.

The pharmacist is responsible for helping the patient achieve his/her health goals by collaborating with other healthcare providers.

It has been shown that pharmaceutical care activities improve the rational use of medicines.

The pharmacist must also inform the prescribers if any change in medication or a dosage modification is required.

In many hospitals in the developed countries, the selection of appropriate antibiotics is done in collaboration with a pharmacist.

However, there are many barriers to this concept, mainly from the medical profession who see it as a threat to their right to prescribe.

Some of these activities have a routine component which can be assisted by computer systems.

Increasing use of computers in the management of medicines will be both cost effective and increase the job satisfaction of pharmacists.

- 9.The Pharmacist shall keep all controlled drugs in a locked cabinet under his/her own direct supervision and control.
- 10.The Pharmacist must check validity of the prescription and identity of the patient before dispensing
- 11.The Pharmacist shall consult the prescribing doctor if there is any doubt about the prescription.
- 12.The Pharmacist shall only dispense controlled drugs if the prescription provided by the physician is complete and valid.
- 13.The Pharmacist shall properly label and mark containers to avoid undue intermixing that may cause harm to the patient.
- 14.The Pharmacist shall provide complete information to the patient about the prescribed drug he/she is dispensing including cautions, warnings and clear direction for use.
- 15.Under the current regulation, the pharmacist is not permitted either to refill or substitute a generically equivalent controlled drug unless instructed by the physician
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- 17.Pharmacist shall provide complete information to the patient about the prescribed drug he/she is dispensing including cautions, warnings and clear direction for use.

Guidelines for Rational Prescribing

- ★ Define patient problem and establish therapeutic goal.
- ★ Use drug only when indicated and when potential benefits outweigh the risk.
- ★ Choose a drug of proven efficacy and safety and must be suitable for individual patient.
- ★ Avoid using more than one drug of the same chemical class at the same time.
- ★ Inform the patient.
- ★ Monitor the effects of treatment.
- ★ Decide whether the drug should be continued at the present dose or stopped.
- ★ If treatment has not been effective, identify the reason.

Rational Use of Antibiotics

1. Use antibiotics only when indicated.
2. Before commencing antibiotic therapy, specimen for gram stain, culture, sensitivity testing should be obtained
3. Choice should be based on suspected causative organism, safety, previous clinical response, cost, ease of use, potential for resistant organism. A
4. Adequate dose and duration of treatment.
5. History of allergy or ADR.
6. Prophylactic use of antibiotics restricted.
7. Oral therapy preferred more than parenteral therapy.
8. Antimicrobial combination should only be used where indicated
9. More effective and least toxic.
10. Topical antibiotics restricted to few proven indication.

Rational use of Injections

- 1.Oral administration is not tolerated.
- 2.Absorption problem.
- 3.Drug of choice formulated as parenterals.
- 4.High tissue concentration are needed.
- 5.Urgent treatment required.
- 6.Not comply with oral therapy.

REFERENCES

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