

DRUG USE

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Outline

At the end of this chapter, students will be able to:

- Define what is rational drug use?
- Describe what is irrational drug use?
- Describe drug use process
- Explain Strategies to improve drug use
- Understand monitoring and evaluation of rational drug use.

What is rational drug use?

- Rational drug use is a process of safe, effective and economic use of prescription and nonprescription drugs for diagnosis, prevention and treatment of diseases for the benefit of the patient
- The rational use of drugs requires that patients receive medicines 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 the community.

(WHO 1988)

What is Rational Use of Drugs?

- Appropriate drug
- Appropriate indication
- Appropriate administration, dosage, and duration
- Appropriate patient
- Appropriate patient information
- Appropriate evaluation
- Rational drug use requires active involvement of prescribers, dispensers and patients.
 - It also requires involvement of pharmaceutical regulatory body, industries, consumers protecting body and others

DRUG USE

Rational drug use

- ☞ Promotes quality of care and cost-effective therapy.
- ☞ Improves patient compliance,
- ☞ Prevents unnecessary exposure to side effects,
- ☞ Maximize therapeutic benefits.

Drug use process

- Appropriate drug use in the hospital setting is a multidisciplinary responsibility that includes:
 - Prescribing by the physician
 - Preparation and dispensing by the pharmacy department
 - Medication administration by nurses or other health care professionals
 - Monitoring the effect of drug on the patient by all members of the health care team
- Drug use is a continuous cyclic processes in which three parties are involved

Drug use process...

1. The medical doctor/prescriber

- **Diagnose**, **define treatment goal** and **selection of the most suitable drug**
- Drug selection should be based on the safety, efficacy, and suitability of a drug and its cost.
- Also the dose, route of administration, treatment duration, as well as the mental and physical condition of the patient should be considered by prescribing a drug.

Drug use process...

2. The pharmacist

- **Handle drugs** in a safe and hygienic manner and packed in appropriate containers
- **Counsel patients** about his/her knowledge of the health problem and the prescribed drugs
- **Check possible adverse drug reactions** in relation to other drugs prescribed and the patient's health condition
- **Inform the patient** about the dosage, duration of the drug therapy and possible side effects where applicable

Drug use process...

3. The patient:

- The patient should **adhere** to the drug therapy prescribed
- In case of a problem he/she should **contact** the pharmacist
- The pharmacist or physician should **follow up** on the patients' medication

IRRATIONAL DRUGS USE

- Irrational or non-rational use is the use of medicines in a way that is not compliant with rational use as defined before.

Worldwide:

- More than 50% of all medicines are prescribed, dispensed, or sold inappropriately.
- 50% of patients fail to take medicines correctly.
- About **one-third** of the world's population lacks access to essential medicines and this may go up to 50% in the near future.

Irrational drug use

- The use of drugs when no drug therapy is indicated
- The use of wrong drugs for a specific condition requiring drug therapy
- The use of drugs with doubtful or unproven efficacy
- The use of drugs of uncertain safety status
- Failure to prescribe available, safe, & effective drugs
- Incorrect administration, dosages, or duration
- Self-medication with prescription drugs
- Over use of relatively safe drugs (a pill for every ill)

Examples of Common Inappropriate Prescribing Practices

- The overuse of antibiotics and antidiarrheals for nonspecific childhood diarrhea
- Indiscriminate use of injections for malaria
- Multiple or over-prescription
- Use of antibiotics for mild, non-bacterial infection
- Unnecessary use of expensive antihypertensives

Factors Underlying Irrational Use of Drugs

Patients

- Drug misinformation
- Misleading beliefs
- Inability to communicate problems
- Adherence to treatment

Prescribers

- Lack of education and training
- Lack of drug information
- Heavy patient load
- Pressure to prescribe
- Generalization of limited beliefs
- Misleading beliefs about efficacy

Industry

- Promotion
- Misleading claims

Drug Supply

- Inefficient management
- Non-availability of required drugs

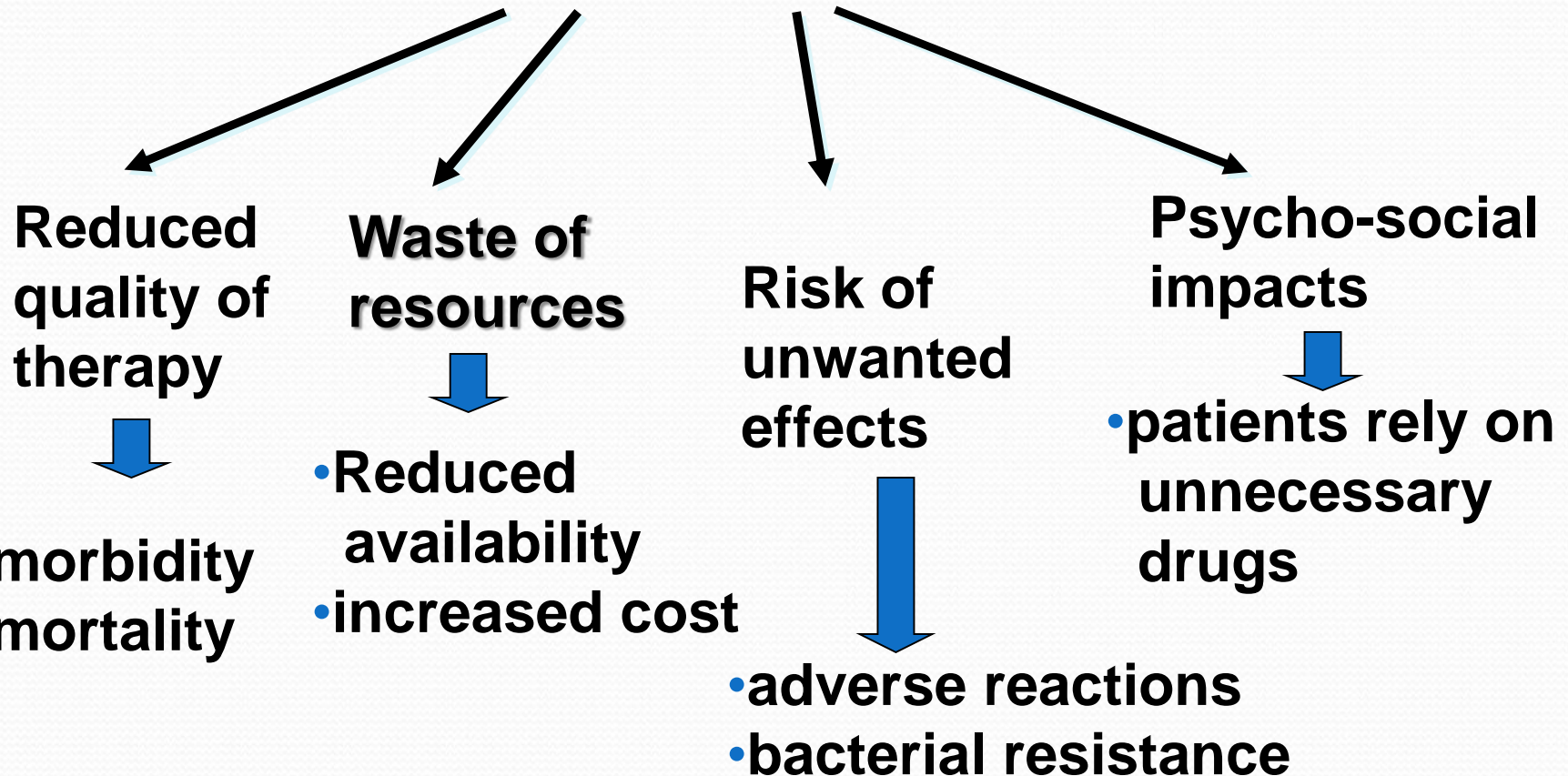
Drug Regulation

- Availability of unsafe drugs
- Informal prescribers
- etc.

Dispenser

- Quality of dispensing
- short dispensing time

Impact of Inappropriate Use of Drugs



Irrational drugs use....

Irrational Prescribing

- In irrational prescribing either **the diagnosis** or the **treatment prescribed** or **both** of them are **wrong/ inappropriate** as compared to appropriate standards of treatment.

Table: Common Types of Irrational Prescribing

Ser. No	Type of irrational Prescribing	Example
1	Extravagant prescribing	<ul style="list-style-type: none"> ✓ The use of unnecessarily expensive drugs when a less expensive drug would provide comparable efficacy and safety. ✓ Symptomatic treatment of mild conditions diverts funds from treatment of serious illness ✓ A brand name is used where less expensive equivalent are available
2	Over-prescribing	<ul style="list-style-type: none"> ✓ Drugs are used for conditions for which they are ineffective (The use of drugs when no drug therapy is indicated, e.g., antibiotics for viral upper respiratory infections.) ✓ The treatment period is too long
3	In-correct prescribing	<ul style="list-style-type: none"> ✓ The drug is given for incorrect diagnosis ✓ The use of the wrong drug for a specific condition requiring drug therapy, e.g., tetracycline in childhood (acute) diarrhea requiring ORS ✓ The prescription is prepared improperly ✓ Adjustments are not made for coexisting medical, genetic, environmental and other factors
4	Multiple-prescribing	<ul style="list-style-type: none"> ✓ Two or more medications are used when one or two would achieve virtually the same effect ✓ Several related conditions are treated when treatment of primary condition will improve or cure the other conditions
5	Under-prescribing	<ul style="list-style-type: none"> ✓ Needed medications are not prescribed ✓ Dosage is inadequate ✓ Length of treatment is too brief

Factors influencing Prescribing behavior

The prescriber can be affected by internal and external factors.

- ☞ He or she may have received *inadequate training*, or prescribing practices may have become outdated due to a lack of continuing education.
- ☞ (Limited Diagnostic involved in drug prescribing)
- ☞ The role models who are imitated may not prescribe rationally(i.e poor role models).
- ☞ There may be a lack of objective drug information, and the information provided by drug representatives may be unreliable.

Factors influencing Prescribing behavior....

- ☞ Unethical pharmaceutical promotional activities of drug company.
- ☞ The temptation to generalize inappropriately about the effectiveness or side effects of drugs on the basis of limited personal experience is strong.
- ☞ Absence of standard treatment guidelines for the common health problems also affects prescribing.
- ☞ a heavy patient load and pressure to prescribe from peers, patients, and drug company representatives all complicate prescribing decisions (Externally).
- ☞ profit may affect a prescriber's choice if the prescriber's income is dependent on drug sales.

Commonly Observed Irrational Dispensing Practices

- ☞ Poor prescription review / interpretation
- ☞ Mistakes in delivery of drugs to patients such as **wrong drug, wrong amount of drug**, etc
- ☞ Substitution of prescribed drug (of different chemical entity/dosage form) without the consent of the prescriber.
- ☞ Dispensing in unhygienic condition/materials

Irrational Dispensing Practices.....

- ☞ Dispensing without clear verbal, written information and inadequate counseling time
- ☞ Poor stock storage, Poor inventory control and Poor stock management
- ☞ Bulk dispensing practice or dispensing inadequate dose for patients
- ☞ Dispensing of prescription drugs without prescription

Common Causes of Irrational Dispensing Practice

The quality of dispensing may be affected by:

- the training and supervision the dispenser has received
- The drug information available to the dispenser.
- A shortage of dispensing materials and
- Short dispensing time due to heavy patient load, etc.

PATIENT NON-COMPLIANCE

(Irrational use of Drugs by Patient)

- **Compliance** is the degree to which the patient **carries out** the physician's instructions on **how to take the prescribed drug and treatment**.
- *Many studies about outpatient compliance carried out in developing countries indicate that only about 50% of patients follow the instructions given by the physician.*

Adherence Vs Compliance

- **Adherence:** The act or quality of sticking to something; steady devotion; the act of adhering
 - The acceptance of an active role in ones health care
- **Compliance:** the act of yielding conforming, or acquiescing
 - Lack of sharing in the decision made between provider and client



The individual's adherence to treatment is influenced by many factors, including:

- Cultural beliefs,
- The communication skills and attitudes of the prescriber and dispenser,
- The limited time available for consulting,
- The shortage of printed information,

Common Types of Poor Compliance/ adherence

The most common types of Poor compliance by patients are:

- ❖ Failure to take medication as prescribed:
 - Not taking prescribed drugs at all
 - Reducing the dose
 - Taking extra dose
 - Premature discontinuation

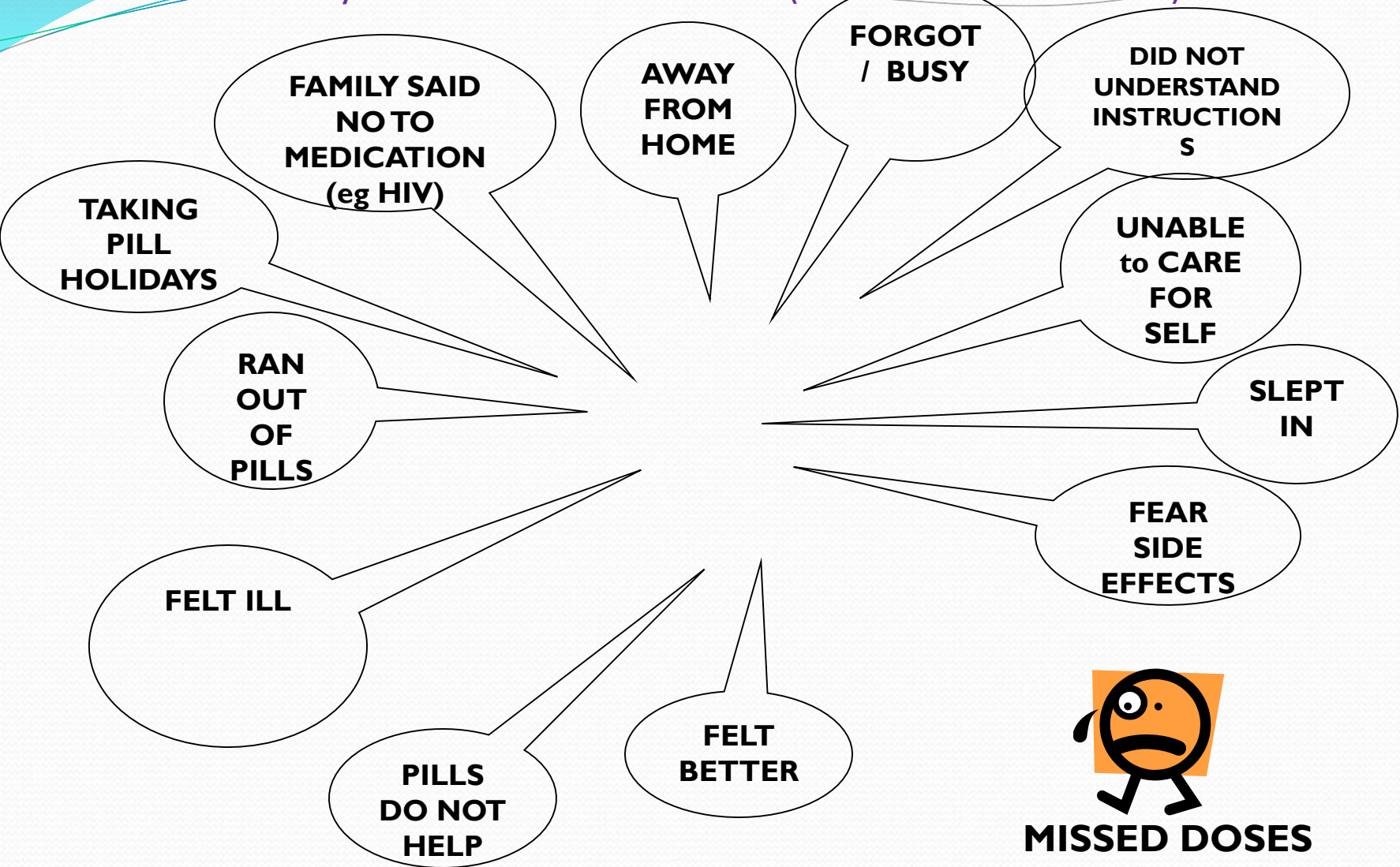
Common Types of Poor Compliance/adherence.....

❖ Misuse of drugs

- Self-medication with prescription drugs
- Misuse of antibiotics
- Overuse of injection
- Taking medication whenever they feel ill
- Reserving medication for self medication
- Sharing of drug prescribed for others
- Using expired drugs

❖ Inappropriate storage and disposal, etc.

Adherence: Why do Patients Miss Doses? (Barriers to adherence)

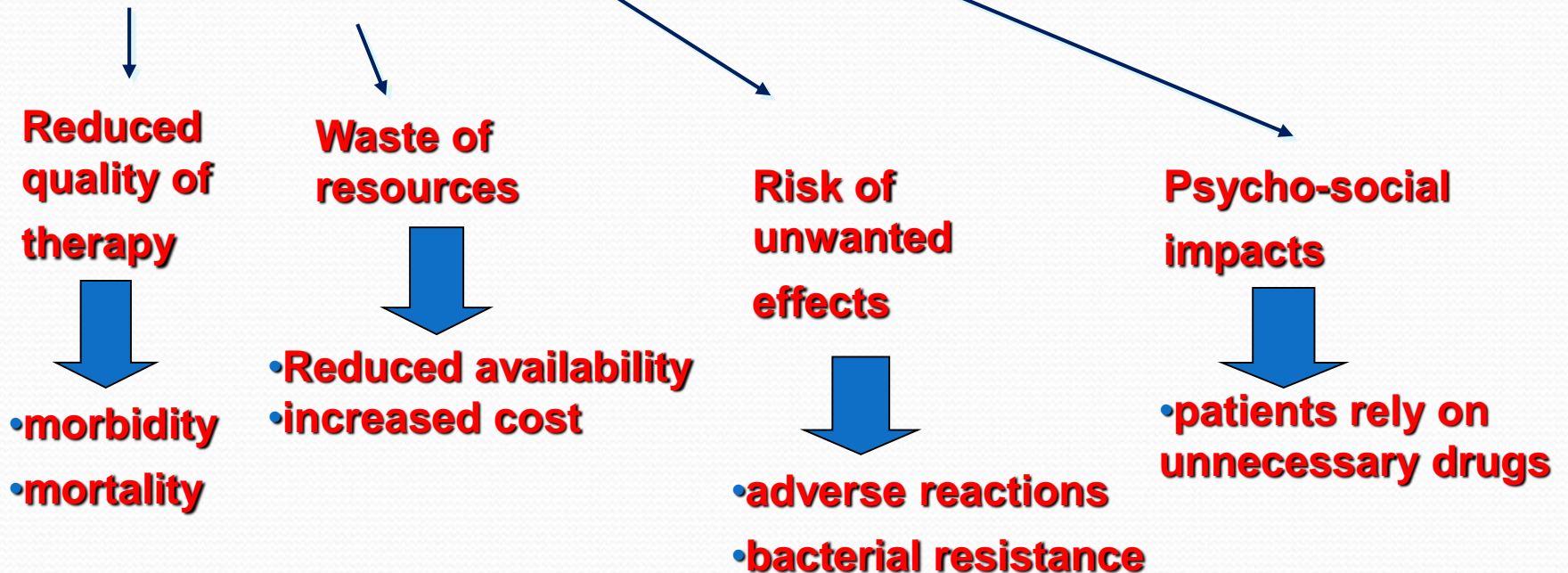


Other Barriers to adherence

- Communication difficulties
- Literacy levels
- Inadequate understanding of effectiveness of medications
- Lack of social support
- Alcohol and drug use
- Depression and other psychiatric problems
- System barriers, etc.

Impact of Inappropriate Use of Drugs

Impact of Inappropriate Use of Drugs



Impact of Inappropriate Use of Drugs.....

☞ In short an irrational of use drug results in the following:

- Treatment failure
- development of drug resistance
- Increase of toxicity risk
- Wastage of money

Ways to promote rational use of drugs

1. Standard process of prescribing:

- Rational prescribing is a process of safe, effective and economic ordering of drug / non-drug for prevention and treatment for diseases for the benefit of patient(s)

2. Ensuring Good Dispensing Practices

- Rational dispensing practice includes:
 - Good stock keeping practice
 - Good dispensing practice
 - Documentation and reporting

Dispensing process

- Dispensing refers to the process of preparing and giving out medicine to a named person a course of therapy on the basis of a prescription or on patient request for over counter drugs (self-medication) in a package which maintains the potency of drug and advising the patient on the safe and effective use of the drug product dispensed
- It involves the correct interpretation of the wishes of the prescriber and the accurate preparation and labeling of the medicine for use by the patient as advised.

Dispensing process

- Receive and validate the prescription;
- Understand and interpret the prescription
- Prepare items for issue
- Record the action taken
- Issue the medicine to the patient with clear instructions and advice
 - When to take the medicine
 - How to take and store the medicine
 - Warnings about possible side effects.

Patients' education

- Educate patients on **appropriate drug use** and **patient compliance**
- Having the right drug is not sufficient to rationally treat the patient
 - If patients fail to use drugs appropriately all the efforts that have been made to ensure availability of drugs and rationalize prescribing will have little impact on the health service

Patients' education...

- Patient compliance is the degree to which patients adhere to medical or health advice and take medicine (s) as directed.
- Non-compliance is common
- The non-compliance associated factors with drug therapy include:
 - *failure to have the prescription filled;*
 - *omission of doses;*
 - *errors of dosage;*
 - *errors in time of administration of the drug;*
 - *premature discontinuation of drug; and*
 - *taking the drug for wrong purpose*

Factors that significantly affect compliance

A. The illness itself:

- **Chronic illness**- patients with chronic illness are most prone to non-compliance especially those illnesses that require the medications be taken for long time; e.g. hypertension, epilepsy.
- **Mild conditions**- compliance is low if drugs are being taken for mild conditions.
- **Acute illnesses**- in acute illnesses, such as pneumonia, patients are conscious about medications early in the disease, but when they begin to feel better, they discontinue medication.
- **Psychiatric disorders**

Factors that significantly affect compliance...

B. Patient: non-compliance is more frequent

- At the extreme age
- In those who live alone with no family
- In lower socioeconomic class
- In people with less education
- In those situations where a cultural or language barrier exist between prescriber /dispenser and patient

Factors that significantly affect compliance...

C. Prescriber / dispenser/ patient interactions:

- Inappropriate attitudes and poor communication skills of providers
- Patients fear of asking questions and poor understanding of instructions
- Inadequate consulting time
- Lack of access to printed information in simple language, such as patient leaflets or adequate labels and failure to comprehend importance of therapy
- Waiting to see the physician/ pharmacist

Factors that significantly affect compliance...

D. Medication/Treatment regimen:

- Complexity and duration of treatment, particularly in cases of chronic disease
- Poor packaging as patients come to equate the packaging with quality of product and because of poor packaging, many drugs will decompose or become contaminated with dirt, further reducing compliance
- Strong or unexpected side effects and unpleasant taste of medications

Factors that significantly affect compliance...

E. Structure of service: Compliance increases

- Where patient follow-up provided through outreach service/home visit and
- If patients are able to make return visits to provider, if problems develop or to ask questions

Detection of non-compliance

- Analysis (direct method) (e.g., biologic markers, tracer compounds, biologic assay of body fluids)
- Counts of medication
- Interviewing the patient
- Evaluation of out come of therapy
- Physician estimates

How to improve patient compliance to medical or health advice

- Identification of risk factors
- Development of treatment plan, e.g. sustained release dosage, once daily regimen
- Patient education, i.e. providing information that patient is able to understand and utilize (verbal, written or audiovisual)
- Compliance aids, such as labeling, medication calendars and drug reminder charts, special medication containers and packaging.
- Monitoring therapy: self monitoring and pharmacist follow-up

Standard drug information for consumers

Effects of the drug

- Why the drug is needed?
- Which symptoms will disappear, and which will not
- When the effect is expected to start
- What will happen if the drug is taken incorrectly or not at all

Standard drug information...

Side effects

- Which side effects may occur
- How to recognize them
- How long they will continue
- How serious they are
- What action to take

Standard drug information...

Instructions

- How the drug should be taken
- When should the drug be taken
- How long the treatment should continue
- How the drugs should be stored
- What to do if a dose is missed
- What to do with the left over drugs

Standard drug information...

Warnings

- When the drug should not be taken
- What is the maximum dose
- Why the full treatment course should be taken
- What precautions should be taken
 - by children
 - during pregnancy
 - when breast feeding
 - while driving or operating machinery
 - if taking other medicines.

IDENTIFYING PROBLEMS WITH MEDICINE USE

- two basic methods:
 - Quantitative methods (to measure what is being done)
 - ☐ Aggregate methods ABC and VEN
 - ☐ Indicator Study methods
 - ☐ Medicine use Evaluation
 - Qualitative methods (to provide information on why it is being done). Commonly used methods are:
 - ☐ In-depth interview
 - ☐ Focus group discussions
 - ☐ Structured Questionnaires
 - ☐ Structured Observations

WHO/INRUD Drug Use Indicators

- Developed by INRUD and WHO
- WHO/INRUD have designed drug use indicator that can be used to identify general prescribing and quality of care problems at health care facilities since 1993.
- The WHO/INRUD drug use indicators are intended to measure aspects of health provider behaviour in primary health-care facilities in a reliable way, irrespective of who collects the data.

WHO/INRUD Drug Use Indicators.....

- The indicators provide information to health-care managers concerning medicine use, prescribing habits and important aspects of patient care.
- All the indicators have been extensively field-tested in many countries and found to be relevant, easily generated and measured, valid, consistent, reliable, representative, sensitive to change, understandable, and action oriented.

Investigating Drug Use in Health Facilities and Communities

1. To describe current patterns of drug use:

- Measure consumption of particular drugs or therapeutic groups of drugs
- Compare use by individual health facilities or prescribers
- Decide whether drug use is clinically justified or cost effective
- Learn about the influence of prescribing on pharmaceutical costs

Investigating Drug Use...

2.To correct specific drug use problem:

- Find out about the factors that cause specific problem practices
- Identify and correct problems in prescribing, dispensing, or patient use

3.To monitor drug use over time

- Monitor quality of care within a health facility or geographic area
- Monitor the efficiency and cost effectiveness of prescribing

WHO/INRUD Drug Use Indicators....

- **motivate health-care providers** and DTC members to improve and follow established health-care standards.
- **evaluate the impact of interventions** designed to change prescribing behaviour by measuring indicators in control and intervention facilities before and after the intervention

WHO Indicators for PHC

A). Core Drug use indicators

- i. Prescribing indicators
- ii. Patient care Indicators
- iii. Facility indicators

B). Complementary drug use indicators

Core Drug use Indicators

1. Prescribing Indicators:

- Average number of drugs per encounter
- Percentage of drugs prescribed by generic name
- Percentage of encounters with an antibiotic prescribed
- Percentage of encounters with an injection prescribed
- Percentage of drugs prescribed from essential drugs list or formulary.

Core Drug use Indicators...

2. Patient care indicators:

- Average consultation time
- Average dispensing time
- Percentage of drugs actually dispensed
- Percentage of drugs adequately labeled
- Patients' knowledge of correct dosage

3. Health Facility Indicators:

- Availability of a copy of essential drugs list or formulary
- Availability of key drugs

A). Core Drug use indicators

I) Prescribing Indicators

☐ WHO/INRUD health facility prescribing indicators

- Average number of medicines per encounter
- % of medicines prescribed by generic name
- % of encounters with an antibiotic prescribed
- % of encounters with an injection prescribed
- % of medicines prescribed which are from the **essential medicines list** or **formulary list**

Prescribing indicators ...

Average number of drugs per encounter

- > To measure the degree of polypharmacy
- > Total number of drugs prescribed/total number of encounters
- > *Performance standard:* <2

Percentage of drugs prescribed by generic name

- > To measure the tendency to prescribe by generic name
- > Number of drugs prescribed by generic name/total number of drugs prescribed $\times 100\%$
- > *Performance standard:* 100%

Prescribing indicators ...

Percentage of encounters with an antibiotic prescribed

- > To measure the overall level of use of important, but commonly misused and costly forms of drug therapy(antibiotics).
- > Total number of encounters with one or more antibiotics/total number of encounters x100%
- > *Performance standard (not gold std): 20 - 30%*

Percentage of encounters with an injection prescribed

- > To measure the overall level of use of important, but commonly misused and costly forms of drug therapy (injections).
- > Total number of encounters with one or more injection/total number of encounters x100%
- > *Performance standard (not gold std): 15–25%*

Prescribing indicators ...

Percentage of drugs prescribed from EDL or the facilities medicines list

- > To measure the degree to which prescribing practices conform to national drug policy and the facilities medicines list.
- >
$$\frac{\text{Total number of drugs prescribed from EDL or the facilities medicines list}}{\text{Total number of drugs prescribed}} \times 100\%$$
- > *Performance standard: 100%.*

Prescribing indicator form

Ser. No.	Date of Rx	Age (yrs)	No. of drugs	No. of Generics	Antibiotic (0/1)*	Injection (0/1)*	No. on EDL
1							
2							
3							
4							
5							
6							
7							
8							
9							
10 ...							
Total							
Average							
Percentage							

II) Patient Care Indicators

❖ WHO/INRUD health facility patient care indicators

- ☞ Average consultation time
- ☞ Average dispensing times
- ☞ % of medicines actually dispensed
- ☞ % of medicines that are adequately labeled
- ☞ % of patients who know how to take their medicines

Patient Care Indicators ...

Average consultation time

- > to measure the time that medical personnel spend with patients in the process of consultation and prescribing
- > total time for a series of consultations/number of consultation

Average dispensing time

- > to measure the average time that the personnel dispensing drugs spend with patients
- > total time for dispensing drugs to a series of patients/the number of encounters

Patient Care Indicators ...

Percentage of drugs actually dispensed

- > to measure the degree to which health facilities are able to provide the drugs which were prescribed
- > $\text{Total number of drugs actually dispensed} / \text{number of drugs prescribed} \times 100$
- > *Performance standard: 100%*

Percentage of drugs adequately labeled

- > to measure the degree to which dispensers record essential information on the drug packages they dispense.
- > the number of drug packages containing at least **patient name, drug name, dose, frequency and duration or total quantity** / total number of drug packages dispensed $\times 100\%$.
- the ***name, strength, quantity, dosage and duration of treatment*** of the drug dispensed(asst of phar sec in ethiopia,2003)
 - > *Performance standard: 100%*

Patient Care Indicators ...

Patients' knowledge of correct dosage

- > to measure the effectiveness of the information given to patients on the dosage schedule of the drugs they receive.
- > percentage of patients who can adequately report the dosage schedule (**dose, frequency, duration**) for all of their drugs / total number of patients interviewed x 100%
- *Performance standard: 100%*

Patient care indicator form

Patient identifier (code) _____ No of drugs prescribed ____ no of drugs dispensed ____

Age _____ sex _____ Educational status _____

Dispensing time _____ Dispensing counseling time _____

Dispensers in the pharmacy _____

Adequate labeling Indicate response as ✓(yes) or x (No)								Patient knowledge Indicate response as ✓(yes) x (No)			
S/N	Name of dispensed drug	Patient name	Strength	dose	freq	Amount of drug	Duration	Dose	Freq.	duration	Reason for prescription
1											
2											
3 ...											

III). Health Facility Indicators—PHC

WHO/INRUD health facility indicators

- Availability of essential medicine list or formulary
- Availability of key set of indicator medicines
- Availability of standard treatment guideline (STG)

Health Facility Indicators ...

Availability of essential medicine list or formulary

Availability of standard treatment guideline (STG).

--> to measure the extent to which copies of the national essential drug list, formulary, STG and the facilities drug list are available in the facilities

--> *Calculation:* Yes or No.

Availability of key medicines (%)

--> to measure the availability at the health facility of key medicines recommended for the treatment of some **common health problems**

--> the number of key medicines available in stock / total number of key medicines on the checklist x 100

LIST OF KEY ESSENTIAL DRUGS used in 2003 survey

Health problem	Key essential drugs
Acute Respiratory Tract infection	Amoxicilin capsule or tablet Co-trimoxazole tablet Procain penicillin injection
Diarrhea	Oral Rehydration Salt (ORS) Co-trimoxazole
Malaria	Chloroquin tablet (<i>Sulphadoxine-Primethamine Tablet</i>) , Cortem
Worm infestations	Mebindazole tablet
Conjunctivitis	Tetracycline eye ointment
Skin disinfection	Denatured alcohol
Anemia	Ferrous salt + Folic Acid
Pain	Paracetamol tablet
Scabies	Benzyl benzoate lotion

B). Complementary Indicators—PHC

WHO/INRUD medicine use indicators with less standardization and less experience in actual use:

- % of patients treated without medicines
- Average medicine costs per encounter
- % of medicine cost spent on antibiotics
- % of medicine cost spent on injections
- % of prescriptions in accordance with STG
- % of patients satisfied with care provided
- % of facilities with access to impartial information

Complementary drug use Indicators.....

Percentage of patients treated without medicines

→ to measure the degree to which prescribers treat patients seeking curative care with non-pharmaceutical therapies

-->
$$\frac{\text{number of consultation with no drug prescribed}}{\text{total number of consultations surveyed}} \times 100\%$$

Average medicine costs per encounter

--> to measure the cost of drug treatment

-->
$$\frac{\text{total cost of drugs prescribed}}{\text{total number of encounters surveyed}}$$

Complementary drug use Indicators.....

Percentage of medicine cost spent on antibiotics

--> to measure the overall cost impact of therapy with antibiotics

--> cost of antibiotics prescribed/total cost of drugs

prescribed x 100%

Percentage of medicine cost spent on injections

--> to measure the overall cost impact of therapy with injections.

--> cost of injections prescribed/total cost of drugs

prescribed x 100%

Complementary drug use Indicators

Percentage of prescriptions in accordance with STG

- > to measure quality of care for some important health conditions where clear standards of drug therapy exist locally.
- > number of cases receiving the chosen treatment/total number of cases surveyed x 100 %

Percentage of patients satisfied with care they received

- > to measure the extent to which patients leave health facilities generally satisfied with the overall care they received.
- > number of patients who report being generally satisfied/total number of patients interviewed x 100%.

Percentage of health facilities with access to impartial drug information

- > to determine whether accurate and unbiased information about drugs is locally available to prescribers.
- > Yes or No

Performing an Indicator Study

- Determine objectives, priorities, and indicators
- Determine study design according to objectives
 - Monitoring over time, comparing facilities
 - Cross-sectional survey, time series
 - Evaluating interventions
 - Randomized controlled trial, pre/post with control, time series
 - Operational definitions (antibiotics, injections, brands/generics, combined medications, etc)
- Define indicators and data collection procedures
- Pilot-test procedures

Performing an Indicator Study.....

- Train data collectors
- Randomly select facilities (at least 20 if possible) in the region from which to collect data
- Obtain approximately 30 medicine use encounters for each facility (100 if only one facility is chosen)
- Analyze data
- Provide results to DTC for evaluation and follow-up

Results of Indicator Studies

- Results can be used as follows—
 - ☞ Describing current treatment practices
 - ☞ Comparing the performance of individual facilities or practitioners
 - ☞ Periodic monitoring and supervision of specific medicine use behaviors
 - ☞ Identifying potential medicine use problems that affect patient care
 - ☞ Assessing the impact of an intervention

Medicine use evaluation (MUE)

- ❖ Medicine use Evaluation is an ongoing, systematic, criteria-based program of medicine use evaluations that will help ensure appropriate medicine use.
- ❖ It is ongoing review of prescribing, dispensing and use of medication.

Cont'd

- Medicine use studies using aggregate data or health facility indicators may indicate that there is over- or under-consumption of medicines,
- qualitative studies may indicate why certain health staff and patients behave the way they do. However, such studies do not provide detail about the exact nature of the irrational use..
- A MUE will:
 - ☐ Define appropriate medicine use (by establishing approved criteria)
 - ☐ Audit criteria against what is being prescribed
 - ☐ Provide feedback to prescribers on all identified problems
 - ☐ Monitor to see if criteria are followed and prescribing is improved

Cont'd

- ❑ MUE involves a comprehensive review of patients' prescription and medication data before, during and after dispensing to ensure appropriate medication decision-making and positive patient outcomes.
- ❑ It encompasses a drug review against predetermined criteria that results in changes to drug therapy when these criteria are not met.

steps are used for conducting MUE.

Step 1. Establish Responsibility

- The DTC or a responsible subcommittee of DTC should be established to conduct MUEs in the facility.
- The committee will develop procedures and plan to conduct the study

Cont'd

Step 2. Develop Scope of Activities

- involves identifying the specific areas where the evaluation should focus on.
- Results from ABC, VEN analysis, ADE reports, antibiotic sensitivity results, procurement studies, indicator studies, patient complaints or feedback, and staff feedback can be used as a starting point for MUE.
- Because of the large number of medicines available at a facility, concentrate on the most important medicines, those with the highest potential for problems, to get the most return from the study

Cont'd

Step 3: Establish Criteria

- Criteria are statements that define correct medicine use.
- Criteria for the use of any medicine should be established by using reliable up-to-date literature sources and recognized international and local experts.
- The criteria for any MUE should reflect what is in the country's STGs and any medicine-use protocols that exist.

Cont'd

Step 4: Define and Establish Thresholds

- establish a threshold or standard (benchmark) against which the criteria will be judged.
- A threshold refers to the percentage of charts or records that will meet or exceed the established criteria for the medicine.
- Ideally, this threshold should be 100 %, but realistically, a bit smaller percentage will be more appropriate to account for exceptions to routine medicine use practices.
- A threshold of 90 and above is commonly used for many criteria, but each instance must be carefully analyzed before reaching a conclusion.

Sample MUE Criteria for Ciprofloxacin

Indicator	Criteria	Threshold, %
Indication	Complicated, chronic, or relapsing urinary tract infection (UTI) Gonorrhea Resistant respiratory tract infections Bone and joint infections Prostatitis Gastrointestinal (GI) infections	90
Dose	Complicated or recurrent infections: 500–750 mg bid GI infections: 500 mg bid Gonorrhea: 250 mg in 1 dose Dose in renal disease decrease as follows: Creatinine clearance (CrCl) 30–50 ml/min – 250–500 q 12 h 5–29 ml/min – 250–500 q 18 h Hemodialysis—500 mg q 24 h	95
Duration	Complicated UTI: 10–21 days Respiratory: 7–14 days Osteomyelitis: 4–6 weeks GI infection: 5 days	95
Contraindications	Pregnancy and lactation, allergy	100
Medicine interactions	Medicines—theophylline, antacids, iron, sucralfate, probenecid Food: decreased absorption with milk	90
Outcome	Negative cultures Improved symptomatology No treatment failures	90

Cont'd

Step 5: Collect Data and Organize Results

- accomplished by reviewing a sample of patient charts or prescriptions
(50 to 75) with the medicine under evaluation.
- Random or systematic random sampling can be used to draw the samples for evaluation from the total patient charts or prescriptions with the medicine prescribed during a specific period of time.

Cont'd

Step 6: Analyze Data

- Calculate the percentage for each criteria on the format.
- Tabulate results for each indicator.
- Analyze results to see if the criteria and thresholds are met or not the attention of the DTC

Step 7: Develop Recommendations and Intervention Plan

Step 8: Conduct MUE Follow-up

When MUEs Go Wrong

- Some of the difficulties' which may cause MUE failures are:
 - Lack of DTC/subcommittee authorized to conduct the MUE
 - Poor problem prioritization,
 - Poor communication,
 - Poor documentation
 - Lack of committee members' involvement.
 - Inadequate follow-up
 - Overly intrusive data collection and evaluation
 - Failure to obtain “buy in” from medical staff

Strategies to Improve Drug Use

- To improve the knowledge, attitudes and practices of health care practitioners and consumers

Steps for developing strategies

- Identify the problem and recognize the need for action
- Identify underlying causes and motivating factors
- List possible interventions: educational, managerial and regulatory interventions
- Assess resources available for action: e.g. human
- Choose an intervention or interventions to test
- Monitor the impact and restructure the intervention

Strategies to Improve Use of Drugs

Educational:

- ✓ *Inform or persuade*
 - Health providers
 - Consumers

Managerial:

- ✓ *Guide clinical practice*
 - Information systems/STGs
 - Drug supply / lab capacity

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graph TD; Educational --> UoM((Use of Medicines)); Managerial --> UoM; Economic --> UoM; Regulatory --> UoM;
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Use of Medicines

Economic:

- ✓ *Offer incentives*
 - Institutions
 - Providers and patients

Regulatory:

- ✓ *Restrict choices*
 - Market or practice controls
 - Enforcement

³WHO, Dept. Essential Drugs and Medicines Policy

Educational Strategies

- are intended to inform and persuade practitioners and include the following:
 - ❖ Basic Training of Health Professionals
 - ❖ Consumer Information and Education
 - ❖ Printed materials
 - ❖ Pharmaceutical bulletins and newsletters
 - ❖ Formulary manuals and STGs
 - ❖ Drug information services
 - ❖ Face-to-face communications with healthcare providers, health care leaders and patients
 - ❖ In-service Training of Health Workers

Managerial Strategies

aim to structure and guide decisions made by healthcare providers

- Implementation of STGs
- MUEs (audit and feedback)
- Clinical pharmacy program
- Medicine restrictions
 - Facility specific medicine list and Procurement Lists
 - Structured Order Forms
 - Automatic Stop Orders
- Avoiding Perverse Financial Incentives on Medicine

Facility specific medicine list and Procurement Lists

The most common method to restrict medicine availability

- useful for limiting the number of antibiotics,
- restrict the use of medicines by limiting the number and types of medicine that will be made available at each level of health care.

Structured Order Forms

- the use of a structured order form that requires certain antibiotics to be prescribed (as listed on the form) for certain indications only.

Automatic Stop Orders

- enforce restrictions on the duration of medicine use.
- This method has been found to provide valuable controls on the extended use of medicines, especially antibiotics and narcotics.

Regulatory strategies

➤ aim to restrict or limit the decisions of healthcare providers

i). Pharmaceutical registration

ii). Control of drug promotion activities

iii). Licensing of outlets

iv). Professional licensing

v). Regulatory measures and law enforcement

Strategies to Improve Drug Use.....

Economic Strategies

- i). Financial Incentives
- ii). Health Insurance

Generally, WHO advocates 12 key interventions to promote more rational use.

- ➡ Establishment of a multidisciplinary national body to coordinate policies on medicine use
- ➡ Use of clinical guidelines
- ➡ Development and use of national essential medicines list
- ➡ Establishment of medicine and therapeutics committees in districts and hospitals
- ➡ Inclusion of problem-based pharmacotherapy training in undergraduate curricula

WHO advocates 12 key interventions to promote more rational use.....

- ⇒ Continuing in-service medical education as a licensure requirement
- ⇒ Supervision, audit and feedback
- ⇒ Use of independent information on medicines
- ⇒ Public education about medicines
- ⇒ Avoidance of perverse financial incentives
- ⇒ Use of appropriate and enforced regulation
- ⇒ Sufficient government expenditure to ensure availability of medicines and staff.

Monitoring and evaluation

- Generally rational drug use should be monitored and evaluated to take the necessary corrective measures on time based on results obtained by developing sample indicators like:
 - Whether drugs are dispensed in the right quantity, with adequate written information as well as verbal instruction
 - Provision and appropriateness of the health education
 - Proper drug information access to prescribers
 - Communication development of prescribers with patients



Thank You!