

Definition of terms and concepts

The science that deals with drugs; ie the study of drugs

Drug; substance or product that is used or intended to modified or explore physiological systems or pathological states for the benefit of the recipient, to prevent or cure disease.

Therapeutics; the branch of medicine concerned with cure of disease or relieve of symptoms and includes drug treatment

Pharmacy; science concerned with identification and preservation standardization compounding and dispensing of medical substances.

Pharmacognosy; the science of identification of drugs

Pharmacokinetics; study of process whereby drugs concentrate at effector sites are achieved maintained and diminished ie the study of the absorption distribution metabolism and excretion o drugs. It deals with what the body does with the drug

Pharmacodynamics; study of biological and therapeutic effects of drugs in the body ie action upon cells tissues and organs

Pharmacogenetics; study of relationships between genetic factors and the response of the drugs

Chemotherapy; this is use of specific chemical agents to arrest or eradicate microorganisms and parasites living and multiplying in a living organism without causing irreversible injury to healthy tissues. It also includes the treatment of cancer.

Pharmacopeia; it's an official code containing a selected list of the established drugs and dismal proportion with of their physical properties and tests for their identity and potency. It defines the standards that these preparations must meet and there and their average dose of an adult. Every pharmacopeia also includes a list of drugs added in that particular edition and list of selected drugs and list. Examples of pharmacopoeia are British, India and USA

Toxicology; it's the science of poisons including measurements and detection of poisons as well as treatment poisons. Many drugs in large doses act as poisons

Metabolisms of drugs; it's the process of chemical alteration of drugs in the body.

Biological lag; this is the time between the administration of a drug and development of response.

Bioavailability of a drug; it's the fraction of the drug dose that reaches the systemic circulation.

Biological half life of a drug; it the time required to reduce the concentration of a drug in the body compartments by 50%.

Drug interactions; action of one drug upon the effectiveness or toxicity of another drug

Note; a drug is a single chemical substance that forms the active ingredient of a medicine (substance) or a mixture of substance used in restoring or preserving energy.

A medicine may contain many other substances to deliver the drug in a stable form acceptable and convenient to the patient. The terms are often used interchangeably for convenience.

General principles of therapeutics

Use of drugs

Used in three principle ways

- Curative

As a primary therapy as in (bacterial and parasitic) e.g. use of antibiotics to eradicate an infection. It can be an auxiliary therapeutics with an anesthetic to enhance performance of a procedure.

- Suppressive

This is suppression of a disease or symptoms used continuously or intermittently to maintain health without attaining cure. eg hypertension, Diabetes mellitus, epilepsy and asthma. To control symptoms e.g. pain or cough while awaiting cure from causative disease eg paracetamol, cough syrup,

- Preventive prophylactic

A person doesn't have the condition but to be prevented from it eg, vaccination, antimalarial;

-primary prevention use vaccine

-secondary prevention, here the patient has the disease and the objective is to reduce these factors and have progress eg use of aspirin lipid lowering drugs and other opioids in post myocardial infarction.

Factors to consider before treating any patient with drugs

1. Whether you should interfere with the patient at all
2. What alteration in the a patient condition you ought to achieve
3. The drug you want to use is the most capable to bring this about
4. How you will know when you objectives have been achieved
5. That you can administer the drug in such a way that it's the right time place and duration
6. What other effects the drug may have whether this may be harmful
7. How you would decide to stop the drug
8. Whether the likely benefit and its importance out ways the likely hood damage of its importance

NB— drug therapying involves matching the name of the drug and disease. It requires knowledge judgment and skill and wisdom but above all absence of responsibilities.

Factors influencing patient's response to drugs

Patients are not treated in a vacuum and they response to a variety of search forces around them in addition to specific therapeutic agents.

The responses are the resultants of numerous factors;

- i. The pharmacodynamics effects of a drug and interaction of any other drug that the patient may be taking
- ii. The pharmacokinetics of the drug and the condition of the individual due to genetic influences, disease and other drugs
- iii. The physiological state of the end organ whether over or under active
- iv. The act of medication including the route of administration and the presence or absence of the doctor
- v. The doctors mood personality attitude and believes
- vi. The patients moods personality and beliefs
- vii. What the doctor has told the patient
- viii. The patients past experience of the doctors

- ix. The patient's past estimate of what has been received and what ought to happen as a result.
- x. The social environment eg supportive or disparity
- xi. The pharmacodynamics effect of drugs and the interactions with other drugs the patient may be taking

Benefits and risk of drug abuse

There are many benefits of using drugs however risks are involved when you use a drug. When a drug is used a risk is taken, and risks may be due to;

- a) Adverse reactions to the drug
- b) Physician induced (iatrogenic) disease due to misguided treatment, eg polypharmacy even in self limiting illnesses. The clinician must weigh the likelihood of gain against the likelihood of loss of the patient

Unavoidable risks

A risk free drug would be that at which;

- A physician knew exactly what action was required and used the drug correctly
- The drug did that and nothing else either by through biological selectivity or by its selection targeted delivery
- Exactly the right amount of action not too little or too much easily achieved

Criteria for a risk free drug are not met for the following risks;

- Drugs may be insufficiently selective, as the concentration rises a drug that is highly selective at low concentration will begin to affect other target sites (receptors)
- Drugs may be highly selective but the mechanism selected has wide spread functions and interfere with, it cannot be limited by one side only
- Prolonged modification of cellular mechanisms can lead to permanent change in structure and functions eg carcinogenic

- Insufficient knowledge of the disease process and drug action can lead to interventions that through undertaking with the best intentions are harmful
- Patients are genetically heterogeneous to an enormous degree and may have an unpredictable immunological response to drugs
- Dosage adjustments according to need is often unavoidable imprecise eg depression
- Ignorant and casual prescribing, prescribing without due care and attentions

Grades of risks

1. Unacceptable—where the risk is too much
2. Acceptable—where risk is minor
3. Negligible— not measurable

Reduction of risks

- Better knowledge of diseases
- Site specific delivery, drug targeting
- Target selective carriers, by topical application
- Site specific effect, by molecular application
- Informed carefully and responsible prescribing

Patient's compliance

This the degree to which a patient adhere to treatment plan quite often patients fail to comply to the treatment given. There are two major aspects of patient's non compliance;

-Non comprehension of instructions so that the patient can not comply, could be due to inadequacy of the doctor or patient.

-comprehension of instructions but failure to carry them out

Major factors associated with non compliance

1. Patient dissatisfaction with the doctor. poor patient doctor relationship
2. Lack of motivation to take medicine as prescribed particularly where the patient doesn't feel ill, side effect are immediate and benefits are preserved to the remote
3. Un intentional incompliance or forgetfulness
4. Lack of information(oral information alone is not enough)
5. Anxiety- this is barrier to both comprehension and retention of information
6. Psychiatric diagnosis
7. Frequency and complexity of drug regimen eg polypharmacy
Polypharmacy- where patient is given more than three drugs to be taken concurrently
8. Inappropriate health beliefs including the idea that medicine can be stopped as soon as the patient gets better
9. Adverse drug reactions, eg itchiness
10. Cost, very costly drugs not affordable particularly for long term treatment.
11. Natural declination to take injections
12. Family disability
13. Lower education ignorance of importance of finishing the dose
14. Poverty homelessness and drug abuse
15. Time wasting or inconvenient clinics

How to increase patient's compliance

- a. Use of appropriate regimens

- b. Use of appropriate routes
- c. Use of shortest possible time of treatment
- d. Sympathetic discussion about the difficultness of drug administration and the possible adverse reaction
- e. Educating the patient on the need to follow the regimen and the compliance of the course of treatment
- f. Provide written information adapted to the client understanding , give the patient an opportunity to ask questions
- g. Plan administration of drugs to fit the patient's lifestyle eg associate drug taking with cues in lifestyle eg breakfast, bedtimes etc
- h. Use patients friendly packaging eg calendar packs where appropriate
- i. See the patient regularly, ask the patient to come for review

What the patient needs to know

- i. The name of the medicine
- ii. The objective of the medicine, ie to treat the disease, to relief symptoms, or how important is the medicine
- iii. How and when to take the medicine
- iv. Whether it matters if a dose is missed, and what to do if anything happens like that
- v. How long is the medicine likely to be needed
- vi. How to recognize adverse effects, and any action that should be taken including effect on driving
- vii. Any interruption with alcohol or other medicine or food.