

LECTURE NOTES
ON
Community pharmacy

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II PHARMD (JNTUA-R17)



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Unit I

ROLES AND RESPONSIBILITIES OF HOSPITAL PHARMACIST

The consultative group of the WORLD HEALTH ORGANISATION listed the following responsibilities as the professional responsibility of the community pharmacy

- The international pharmaceutical federation also confirms the same

They are four methods

Central pharmacist responsibilities

Patient care area responsibilities

Direct patient care area responsibilities

General responsibilities

To ensure that established policies and

- Checks for the accuracy of doses prepared
 1. Intravenous admixtures
 2. Unit dose
- Provides for proper drug control
- Ensures that drugs are stored and dispensed

Eg:- Investigational drugs

The pharmacist seek to collect and integrate information about the patients drug history

- Should clarify patients understanding of the intended regimen and method of administration
- Should advise the patient of drug related precaution
- Evaluate the therapeutic response Performs direct nursing tasks including taking Assists in drug-product and entity selection Monitors patients total drug therapy Side Toxicities Allergic drug reactions Drug interaction Counsels patients on discharge medications Participates in cardiopulmonary emergencies

General responsibilities of community pharmacy are

- Processing of the prescription
- Dispensing
- Health promotions
- Drug information services
- Patient counseling

The pharmacist verifies the legality and safety and appropriateness of the prescription order

- Checks the patient medication record before dispensing the prescription
- Counsel the patient to take proper medication
- It is a pharmacist responsibility to be fully aware of the patients past and current drug history

Dispensing means to prepare and supply of medicine to an individual in accordance with the prescription of a practitioner.

- Check the doses of preparations which are meant for internal use
- Checks there is no incompatibility in the preparation
Collect the correct container and closure
- Prepare the label as per requirement of the container
- Make the preparation, transfer it into a container and polish it
- Fix the label to the container Check the finished preparation
- Maintain the record of the preparation which is dispensed

The pharmacist can take part in health promotion campaigns, locally and nationally

- On a wide range of health-related topics and particularly on drug-related topics like

Rational use of drugs

Alcohol abuse Tobacco use Poison prevent

Topics concerned with other health problems like

Diarrheal disease Tuberculosis Leprosy

HIV

Family planning

- They may also take part in the educational of local community groups in health promotions

General information is provided to patient for

- It also promotes adverse drug reaction (ADK)
- The centre also participates in the ADR ensure drug safety by guidance in the event
- Eg :- color change in tablet or participate

Dialogues between patient and physician regarding the indication, proper use and adverse effects of non–prescription drugs (NPDs) should be different as compared.

- In the era, the cost considerations are greater then ever, NPDs should be considered and referred when appropriate, as alternatives to prescription drug.

Unit II

Community Pharmacy Management

Drug information and their actions.

Drug utilization.

Drug distribution.

Drug selection (or) patient counselling

Drug information and their actions:

Besides proper understanding of biological and physical science community pharmacy also provides grasp on pharmacology, toxicology, route of administration stability and their information regarding drugs.

Drug utilization:

Stock control reports on prescription and controlled drugs dispense, drug purchases, inspection and improvement in operations and such other aspects which demand attention.

Drug distribution:

Quantities of drugs are localised physically outside of the pharmacy to have control for the internal distribution for patients.

Drug selection: Rational drug therapy
Training of health care professionals.

Maintenance based on clinical guidelines.

Essential drug concept

Role of community pharmacist

Central pharmacist responsibilities.

- Patient care area responsibilities.
- Direct patient care responsibilities.

- General responsibilities

To ensure that established policies and procedures are followed

Check up for accuracy of dosages prepared

Unit dose formulations

Intravenous mixture

Provide for proper drug control

Ensure that drugs are stored and dispensed properly. Eg:- Investigational drugs

Ensure that all state federal drugs laws are followed

To ensure that good techniques are used in compounding intravenous mixtures and extempore preparations.

- Provide for proper record keeping and billing.
- Patient medication records.
- Extempore compound records.
- Intravenous mixtures records billing.
- Investigational drug records.
- Reports (monthly loaded records)

General responsibilities of a pharmacist:

- Dispensing (or) compounding of drugs.
- Patient counselling.

- Drug information services to physician.
- Health care promotions (or) health services.
- Respond to the symptoms and minor elements.
- Consultation to pregnant women, children, geriatric patients regarding to health care.

Direct patient care area:

- Effective / ineffectiveness of drugs.
- Side effects.
- Toxicity of drugs.
- Allergic drug reactions.
- Drug interactions.
- Appropriate therapeutic outcome.

Patient counselling area:

- Medication to be self administered in the hospital.
- Discharge medication.
- Provide education to the pharmacists, clerks, students, residents and other nursing staff.
- Sometimes provide information to physician and medical students regarding the new drug information.

PHARMACEUTICAL CARE

Pharmaceutical care is the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life . These outcomes are

- cure of a disease;
- elimination or reduction of a patient's symptomatology;
- arresting or slowing of a disease process; or
- preventing a disease or symptomatology.

Principles of Practice for Pharmaceutical Care

Preamble

Pharmaceutical Care is a patient-centered, outcomes oriented pharmacy practice that requires the pharmacist to work in concert with the patient and the patient's other healthcare providers to promote health, to prevent disease, and to assess, monitor, initiate, and modify medication use to assure that drug therapy regimens are safe and effective. The goal of Pharmaceutical Care is to optimize the patient's health-related quality of life, and achieve positive clinical outcomes, within realistic economic expenditures. To achieve this goal, the following must be accomplished:

A. A professional relationship must be established and maintained.

Interaction between the pharmacist and the patient must occur to assure that a relationship based upon caring, trust, open communication, cooperation, and mutual decision making is established and maintained. In this relationship, the pharmacist holds the patient's welfare paramount, maintains an appropriate attitude of caring for the patient's welfare, and uses all his/her professional knowledge and skills on the patient's behalf. In exchange, the patient agrees to supply personal information and preferences, and participate in the therapeutic plan. The pharmacist develops mechanisms to assure the patient has access to pharmaceutical care at all times.

B. Patient-specific medical information must be collected, organized, recorded, and maintained.

Pharmacists must collect and/or generate subjective and objective information regarding the patient's general health and activity status, past medical history, medication history, social history, diet and exercise history, history of present illness, and economic situation (financial and insured status). Sources of information may include, but are not limited to, the patient, medical charts and reports, pharmacist-conducted health/physical assessment, the patient's family or caregiver, insurer, and other healthcare providers including physicians, nurses, mid-level practitioners and other pharmacists. Since this information will form the basis for decisions regarding the development and subsequent modification of the drug

therapy plan, it must be timely, accurate, and complete, and it must be organized and recorded to assure that it is readily retrievable and updated as necessary and appropriate. Patient information must be maintained in a confidential manner.

C. Patient-specific medical information must be evaluated and a drug therapy plan developed mutually with the patient.

Based upon a thorough understanding of the patient and his/her condition or disease and its treatment, the pharmacist must, with the patient and with the patient's other healthcare providers as necessary, develop an outcomes-oriented drug therapy plan. The plan may have various components which address each of the patient's diseases or conditions. In designing the plan, the pharmacist must carefully consider the psycho-social aspects of the disease as well as the potential relationship between the cost and/or complexity of therapy and patient adherence. As one of the patient's advocates, the pharmacist assures the coordination of drug therapy with the patient's other healthcare providers and the patient. In addition, the patient must be apprised of (1) various pros and cons (i.e., cost, side effects, different monitoring aspects, etc.) of the options relative to drug therapy and (2) instances where one option may be more beneficial based on the pharmacist's professional judgment. The essential elements of the plan, including the patient's responsibilities, must be carefully and completely explained to the patient. Information should be provided to the patient at a level the patient will understand. The drug therapy plan must be documented in the patient's pharmacy record and communicated to the patient's other healthcare providers as necessary.

D. The pharmacist assures that the patient has all supplies, information and knowledge necessary to carry out the drug therapy plan.

The pharmacist providing Pharmaceutical Care must assume ultimate responsibility for assuring that his/her patient has been able to obtain, and is appropriately using, any drugs and related products or equipment called for in the drug therapy plan. The pharmacist must also assure that the patient has a thorough understanding of the disease and the therapy/medications prescribed in the plan.

E. The pharmacist reviews, monitors, and modifies the therapeutic plan as necessary and appropriate, in concert with the patient and healthcare team.

The pharmacist is responsible for monitoring the patient's progress in achieving the specific outcomes according to strategy developed in the drug therapy plan. The pharmacist coordinates changes in the plan with the patient and the patient's other healthcare providers as necessary and appropriate in order to maintain or enhance the safety and/or effectiveness of drug therapy and to help minimize overall

healthcare costs. Patient progress is accurately documented in the pharmacy record and communicated to the patient and to the patient's other healthcare providers as appropriate. The pharmacist shares information with other healthcare providers as the setting for care changes thus helping assure continuity of care as the patient moves between the community setting, the institutional setting, and the long-term care setting.

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Practice Principles

1. Data Collection

1.1 The pharmacist conducts an initial interview with the patient for the purposes of establishing a professional working relationship and initiating the patient's pharmacy record. In some situations (e.g. pediatrics, geriatrics, critical care, language barriers) the opportunity to develop a professional relationship with and collect information directly from the patient may not exist. Under these circumstances, the pharmacist should work directly with the patient's parent, guardian, and/or principal caregiver.

1.2 The interview is organized, professional, and meets the patient's need for confidentiality and privacy. Adequate time is devoted to assure that questions and answers can be fully developed without either party feeling uncomfortable or hurried. The interview is used to systematically collect patient-specific subjective information and to initiate a pharmacy record which includes information and data regarding the patient's general health and activity status, past medical history, medication history, social history (including economic situation), family history, and history of present illness. The record should also include information regarding the patient's thoughts or feelings and perceptions of his/her condition or disease.

1.3 The pharmacist uses health/physical assessment techniques (blood-pressure monitoring, etc.) appropriately and as necessary to acquire necessary patient-specific objective information.

1.4 The pharmacist uses appropriate secondary sources to supplement the information obtained through the initial patient interview and health/physical assessment. Sources may include, but are not limited to, the patient's medical record or medical reports, the patient's family, and the patient's other healthcare providers.

1.5 The pharmacist creates a pharmacy record for the patient and accurately records the information collected. The pharmacist assures that the patient's record is appropriately organized, kept current, and accurately reflects all pharmacist-patient encounters. The confidentiality of the information in the record is carefully guarded and appropriate systems are in place to assure security. Patient-identifiable information contained in the record is provided to others only upon the authorization of the patient or as required by law.

2. Information Evaluation

2.1 The pharmacist evaluates the subjective and objective information collected from the patient and other sources then forms conclusions regarding: (1) opportunities to improve and/or assure the safety, effectiveness, and/or economy of current or planned drug therapy; (2) opportunities to minimize current or potential future drug or health-related problems; and (3) the timing of any necessary future pharmacist consultation.

2.2 The pharmacist records the conclusions of the evaluation in the medical and/or pharmacy record.

2.3 The pharmacist discusses the conclusions with the patient, as necessary and appropriate, and assures an appropriate understanding of the nature of the condition or illness and what might be expected with respect to its management.

3. Formulating a Plan

3.1 The pharmacist, in concert with other healthcare providers, identifies, evaluates and then chooses the most appropriate action(s) to: (1) improve and/or assure the safety, effectiveness, and/or cost-effectiveness of current or planned drug therapy; and/or, (2) minimize current or potential future health-related problems.

3.2 The pharmacist formulates plans to effect the desired outcome. The plans may include, but are not limited to, work with the patient as well as with other health providers to develop a patient-specific drug therapy protocol or to modify prescribed drug therapy, develop and/or implement drug therapy monitoring mechanisms, recommend nutritional or dietary modifications, add non-prescription medications or non-drug treatments, refer the patient to an appropriate source of care, or institute an existing drug therapy protocol.

3.3 For each problem identified, the pharmacist actively considers the patient's needs and determines the desirable and mutually agreed upon outcome and

incorporates these into the plan. The plan may include specific disease state and drug therapy endpoints and monitoring endpoints.

3.4 The pharmacist reviews the plan and desirable outcomes with the patient and with the patient's other healthcare provider(s) as appropriate.

3.5 The pharmacist documents the plan and desirable outcomes in the patient's medical and/or pharmacy record.

4. Implementing the Plan

4.1 The pharmacist and the patient take the steps necessary to implement the plan. These steps may include, but are not limited to, contacting other health providers to clarify or modify prescriptions, initiating drug therapy, educating the patient and/or caregiver(s), coordinating the acquisition of medications and/or related supplies, which might include helping the patient overcome financial barriers or lifestyle barriers that might otherwise interfere with the therapy plan, or coordinating appointments with other healthcare providers to whom the patient is being referred.

4.2 The pharmacist works with the patient to maximize patient understanding and involvement in the therapy plan, assures that arrangements for drug therapy monitoring (e.g. laboratory evaluation, blood pressure monitoring, home blood glucose testing, etc.) are made and understood by the patient, and that the patient receives and knows how to properly use all necessary medications and related equipment. Explanations are tailored to the patient's level of comprehension and teaching and adherence aids are employed as indicated.

4.3 The pharmacist assures that appropriate mechanisms are in place to ensure that the proper medications, equipment, and supplies are received by the patient in a timely fashion.

4.4 The pharmacist documents in the medical and/or pharmacy record the steps taken to implement the plan including the appropriate baseline monitoring parameters, and any barriers which will need to be overcome.

4.5 The pharmacist communicates the elements of the plan to the patient and/or the patient's other healthcare provider(s). The pharmacist shares information with other healthcare providers as the setting for care changes, in order to help maintain continuity of care as the patient moves between the ambulatory, inpatient or long-term care environment.

5. Monitoring and Modifying the Plan/Assuring Positive Outcomes

5.1 The pharmacist regularly reviews subjective and objective monitoring parameters in order to determine if satisfactory progress is being made toward achieving desired outcomes as outlined in the drug therapy plan.

5.2 The pharmacist and patient determine if the original plan should continue to be followed or if modifications are needed. If changes are necessary, the pharmacist works with the patient/caregiver and his/her other healthcare providers to modify and implement the revised plan as described in "Formulating the Plan" and "Implementing the Plans" above.

5.3 The pharmacist reviews ongoing progress in achieving desired outcomes with the patient and provides a report to the patient's other healthcare providers as appropriate. As progress towards outcomes is achieved, the pharmacist should provide positive reinforcement.

5.4 A mechanism is established for follow-up with patients. The pharmacist uses appropriate professional judgement in determining the need to notify the patient's other healthcare providers of the patient's level of adherence with the plan.

5.5 The pharmacist updates the patient's medical and/or pharmacy record with information concerning patient progress, noting the subjective and objective information which has been considered, his/her assessment of the patient's current progress, the patient's assessment of his/her current progress, and any modifications that are being made to the plan. Communications with other healthcare providers should also be noted.

Prepared by the APhA Pharmaceutical Care Guidelines Advisory Committee, approved by the APhA Board of Trustees, August 1995.

Appendix

Pharmaceutical care is a process of drug therapy management that requires a change in the orientation of traditional professional attitudes and re-engineering of the traditional pharmacy environment. Certain elements of structure must be in place to provide quality pharmaceutical care. Some of these elements are: (1) knowledge, skill, and function of personnel, (2) systems for data collection, documentation, and transfer of information, (3) efficient work flow processes, (4) references, resources and equipment, (5) communication skills, and (6) commitment to quality improvement and assessment procedures.

Knowledge, skill, and function of personnel

The implementation of pharmaceutical care is supported by knowledge and skills in the area of patient assessment, clinical information, communication, adult teaching and learning principles and psychosocial aspects of care. To use these skills, responsibilities must be reassessed, and assigned to appropriate personnel, including pharmacists, technicians, automation, and technology. A mechanism of certifying and credentialing will support the implementation of pharmaceutical care.

Systems for data collection and documentation

The implementation of pharmaceutical care is supported by data collection and documentation systems that accommodate patient care communications (e.g. patient contact notes, medical/medication history), interprofessional communications (e.g. physician communication, pharmacist to pharmacist communication), quality assurance (e.g. patient outcomes assessment, patient care protocols), and research (e.g. data for pharmacoepidemiology, etc.). Documentation systems are vital for reimbursement considerations.

Efficient work flow processes

The implementation of pharmaceutical care is supported by incorporating patient care into the activities of the pharmacist and other personnel.

References, resources, and equipment

The implementation of pharmaceutical care is supported by tools which facilitate patient care, including equipment to assess medication therapy adherence and effectiveness, clinical resource materials, and patient education materials. Tools may include computer software support, drug utilization evaluation (DUE) programs, disease management protocols, etc.

Communication Skills

The implementation of pharmaceutical care is supported by patient-centered communication. Within this communication, the patient plays a key role in the overall management of the therapy plan.

Quality Assessment/Improvement Programs

The implementation and practice of pharmaceutical care is supported and improved by measuring, assessing, and improving pharmaceutical care activities utilizing the conceptual framework of continuous quality improvement.

This document will not cover each and every situation; that was not the intent of the Advisory Committee. This is a dynamic document and is intended to be revised as the profession adapts to its new role. It is hoped that pharmacists will use these principles, adapting them to their own situation and environments, to establish and implement pharmaceutical care.

(1)Although "drug therapy" typically refers to intended, beneficial effects of pharmacologic drugs, in this document, "drug therapy" refers to the intended, beneficial use of drugs -- whether diagnostic or therapeutic -- and thus includes diagnostic radiopharmaceuticals, X-ray contrast media, etc. in addition to pharmacologic drugs. Similarly, "drug therapy plan" includes the outcomes oriented plan for diagnostic drug use in addition to pharmacologic drug use.

Unit VI

PATIENT COUNSELLING

Patient counseling refers to the process of providing information, advice and assistance to help patients use their medications appropriately. The information and advice is given by the pharmacist directly to the patient or to the patient's representative, and many also include information about the patient's illness or recommended lifestyle changes. •During counseling, the pharmacist should assess the patient's understanding about his or her illness and the treatment, and provide individualized advice and information which will assist their medications in the patient to take their medications in the most safe and effective manner. Good communication skills are required to gain the patient's confidence and to motivate the patient to adhere to the recommended regimen.

Effective Patient counseling aims to produce the following results(or) out come of patient counseling:

- Better patient understanding of their illness and the role of medication in its treatment.
 - Improved medication adherence.
 - More effective drug treatment.
 - Reduced incidence of medication errors, adverse and unnecessary healthcare cost.
 - Improved quality of life of patients.
 - Better coping strategies for medication-related adverse effects.
- Improved professional rapport between the patient and pharmacist.

Steps of patient counseling : Counseling is a two-way communication process and interaction between the patient and the pharmacist is essential for counseling to be effective.

1.PREPARING FOR THE SESSION: The success of counseling depends on the knowledge and skill of the counselor. The pharmacists should know as much as possible about the patient and his/her treatment details. If the patient is receiving a medication which is unfamiliar to the pharmacist, then a drug information reference should be consulted before counseling commences.

2.OPENING THE SESSION: The first phase of counseling is used for information gathering. The pharmacist should introduce him or herself to the patient and greet them by name. It is the best to use titles such as M , Mrs. and

Mr. and then switch over to the first name. The pharmacist should identify the purpose the session very clearly. For example, “Hello Mr. sreenivas! I am vinod, your pharmacist. I would like to tell you about your medication. Do you have a few minutes to spend with me?” Patient may be disturbed and distressed due to their illness, a few kind words to demonstrate empathy and understand in will assist the counseling process. During counseling, the pharmacist should avoid asking question in a direct or embarrassing way, show excessive curiosity, discuss the patient ’ s personal problems, pass moral judgments, interrupt when the patient is speaking, make premature interpretations or argue with the patient.

3.COUNSILING CONTENT: The counseling content is considered to be the heart of the counseling session. During this stage the pharmacist explains to the patient about his or her medications and the treatment regimen. Topics commonly covered include:

- Name and strength of the medication.
- The reason why it have been prescribed (if known), or how it works. •How to take the medication.
- Expected duration of the treatment.
- Expected benefits of the treatment.
- Possible adverse effects.
- Possible medications or dietary interactions. •Advice on correct stage.
- Minimum duration required to Show therapeutic benefit.
- What to do if a dose is missed.
- Special monitoring requirements, for example, blood tests

Information which is given should be tolerated to the individual patient. In some situations it is important not to jump to conclusions about why a particular medication has been prescribed. For example, tri cyclic anti depressants are often used for conditions other than depression, such as neuropathic pain, in continence. Asking questions such as what has the doctor told you about his medications? Can help avoid misunderstandings in this type of situation

4. CLOSING THE SESSION: Before closing the session, it is essential to check the patient’s understating. This can be assessed by feedback questions, such as “Can you remember what this medication is for?” or “for how long should you take this medication?” during the discussion some of the patient’s information needs may have been cleared, but the patient may have new questions or doubts. Before final

closure and if time permits, summarize the main points in a logical order. If appropriate, the pharmacist can supply their telephone number to encourage the patient to make contact if they need advice or information.

Unit VII

Patient medication adherence

Factors affecting medication adherence:

- Age of the patient.
- Gender of the patient.
- Income.
- Education.
- Patient intelligence.
- Knowledge about the disease.
- Illness being treated. Actual seriousness of disease.
Actual susceptibility of disease.
 - Actual efficiency of the treatment.
 - Physician prediction of adherence.
 - Marital state.
 - Number of people in household.
 - Clinical settings.
 - Future of the disease.
 - Therapeutic regimen.

Social and economic factor:

Social and economic factor for non – adherence medication includes

- low health illiteracy

- busy schedule
- limited access to health care facilities
- inability or difficulty to accesses to the pharmacy
- high cost of medication
- cultural and lay benefits about illness and treatments.
- **Health care system factors:**
- Factors under the health care system contribute to the medication non – adherence includes
 -
 - poor relationship between the provider and the patient
 - poor communication to the provider
 -
 - dispensary between health benefits model of the provider and the patient.
 -
- **Conditions related to factors (diseases/disorder factor):**

Conditions related to factors includes
 decrease in symptom severity
 disappearance of symptoms of patient
 patient with depression may not show the
 interest to take medication
 patients with psychiatric disorder do not
 take the medication

Patient related factors:

Patient related factors include

visual impairment
cognitive impairment
impair mobility or
swallowing problems
poor understanding about
the disease conditions
Adverse effects
psycho social stress
anxiety and anger.

Formula for calculation of medication adherence:

$$\text{Percentage adherence} = \frac{\text{total no of actual dose of the patient has consumed since last appointment}}{\text{Total no of calculated dose to be consumed.}}$$

Role of pharmacists in medication adherence:

Be friendly and approachable to the patient.
Improve communication skills.
Take into account the spiritual and psychological needs of the patient.
Improve in patient education

Encourage the patient to discuss their main concern without interruption or premature closing.

Elicit the patient perception of the illness and the associated feelings and expectations.

Learning methods of active listening and empathy.

Give clear explanation (regarding disease and drugs).

Check the patient understanding

Simplify the therapeutic regimen

Monitor the side effects

Monitor the beneficial effects

Speak the same language of patient.

Involvement of the patient treatment discussion.

Through the patient interview, the pharmacist can assist the patient knowledge of their drug therapy and usual medication habits. For example, dose of the patient have a set routine and his family support available to supervise the medication use.

The pharmacist is also able to identify if the patient has any specific problem with the medication such as swallowing of large tablets or difficulty opening of child proof containers.

Unit VIII

HEALTH SCREENING SERVICES

Certain tests are performed in order to diagnose a disease or extent/stage of a disease.

These tests are done at almost health screening center which are commonly available in community pharmacy.

These tests are called health screening tests.

Ex: Estimation of blood glucose levels.

Estimation of blood cholesterol.

Blood pressure.

ECG

Lung function tests.

Patient

Doctor

Diagnose

Primary Secondary screening Screening services

Treatment

RELATIONSHIP BETWEEN PRIMARY AND SECONDARY SCREENING:

•PRIMARY HEALTH SCREENING TEST: Those tests are performed either when the physician prescribed or when a patient himself undergo such test after the onset of symptoms. Such tests are helping in diagnosis of disease and stages also. •SECONDARY HEALTH SCREENING TESTS: These tests are performed after the diagnosis of disease or its stage. Such tests are only carried out when the physicians prescribe them.

SIGNIFICANCE OF HEALTH SCREENING SERVICES:

•*Accuracy and reliability*: those are very small tests and accurate and can be trusted for a period of perfect diagnosis of a disease.

- Easily available* : primary health care tests are easily available near the community or health care center. Even certain pharmacist can also perform such tests like blood pressure, blood glucose estimation etc.
- Cost effective*: Those tests do not involves high cost. Such tests can be affordable by most of the population. Whenever they feel need of them i.e. at a point of occurrence of symptoms etc.

Can be performed anywhere : Today most of the tests are performed by digital portal devices. These, can be carried out by anywhere. Even the cost of digital devices are not too high and common man can be easily affordable for such devices.

Side effects : Certain secondary health screening services have their own side effects. But no side effects are adverse effects on the body where observed with primary health screening services.

IMPORTANCE OF LABORATORY TEST RESULTS:

- To assess the therapeutic and ADR effects of a drug.
- To determine the proper drug dose and dosing interval.
- To assess the need of additional or alternative drug therapy.

CHECKING OF BLOOD PRESSURE:

Blood pressure is basically a pressure exerted by the blood on the walls of arteries. These pressure is produced by the blood grouping/blood pumping action of heart.

Two types of blood pressure is exerted by the blood

1. Systolic blood pressure.
2. Diastolic blood pressure.

Systolic blood pressure is always higher than diastolic blood pressure.

1.Systolic pressure: It is the maximum pressure in an artery at the moment when the heart is beating and pumping blood throughout the body.

2.Diastolic pressure: The lowest pressure in the artery in the movement between beats when the heart is resting.

Blood pressure varies from individual and is depending upon the no. of factors.

1. Age
2. Physical conditions (anxiety, stress)
3. Weight
4. Gender

The classical normal reading for an adult between 18-45 age
Hypertension-140/90

Hypotension-100/70

Heart rate-72beats/minute

TYPES OF ESTIMATION OF BLOOD PRESSURE: There are three methods for the estimation of the blood pressure. They are: •Palpitatory method •Oscillatory method •Auscultatory

1. Study of pulse from wrist region or neck region. It is done only if proper instruments are not available or in emergency cases.
2. These method is used in digital meters and involves the study of oscillations produced due to blood.
3. This method done by applying pressure over the artery and to stop the blood and then study the blood pressure by releasing pressure slowly.

Based on the last two methods there are certain devices to measure blood pressure:

1. Mercury sphygmomanomet
- er. 2. Finger monitors.
3. Digital monitors.

4. Aneroid sphygmomanometer

Finger monitors: Those are the digital monitors. They have small cut that can be tried around the figure. After few seconds, the monitor automatically shows reading. Such devices need proper calibration before usage.

•*Digital monitors:* Those are the digital monitors which can be cut off tied on the upper elbow region and then monitor studies the oscillations produced in the blood vessels due to pulsatory movement of the blood.

Aneroid sphygmomanometer:

Aneroid

is

mo

1. A cut of the inflamed is wrapped around your upper arm and kept in the place with equipment.
2. A tube lead out of the cut off to a rubber bulb.
3. Another tube lead from the cut off to a reservoir of mercury at the bottom of vertical glass column.
4. Doctor puts a stethoscope your arm and listens the pulse and the air is slowly let out again.
5. The systolic pressure is measured when the doctor first hears the pulse.
6. This second will be more distant and finally disappear.
7. The diastolic pressure is measured from the moment when the doctor is unable to hear the sound of pulse.

8. Blood pressure is measured in mm/Hg. 9. It does not need calibration.

ESTIMATION OF BLOOD GLUCOSE LEVEL:

Glucose test: It is done by blood sample or urine sample. Blood test is more accurate as replaced by urine sample.

Frequency of testing of glucose: •Fasting level

30minutes prior to meals.

- 2 hours after meals.
- Bed time.
- Blood glucose fasting levels

70-110mg/dl •

2 hours post prandial

110-140mg/dl •

After meal

140-180mg/dl

•In case of skin puncture makes the procedure possible for the patient to perform at home.

•Skin puncture is performed by an automatic device

Self testing can be performed by 2 methods

1. Reading of a reagent strip.
2. Use of reluctant meter(Aqua-check meter) Both the methods requires large drop of blood.

Sites of blood sample

Ear lobes

Performed fingers-middle finger, ring finger.

DIGITAL GLUCOMETER/ BLOOD GLUCOSE METER: A glucometer is an electronic device for measuring of blood glucose level. A relatively small drop of blood is placed on a disposal test strip which interference with a digital meter with several seconds the level of blood glucose will be shown on the digital display.

GOD/POD Test: This test is also called as glucose oxidase peroxidase test.

In this test, glucose sample react with the water and oxygen in the presence of glucose peroxidase enzyme. This reaction takes place and D-glucose gets converted in to D-gluconic acid.

Ex: Blood sample+ Hydrogen peroxide glucose oxidase

D-Gluconic acid

+ Hydrogen peroxide

UNIT IX

OTC MEDICATION

OTC MEDICATION

- Medications are broadly classified as 2 types:

1. Prescription controlled medication.
2. Prescription decontrolled medication.

Prescription controlled medication:

- This class involves all the drugs and medicines which needed a signed prescription of eligible authority i.e.; physician / a registered medical practioner (RMP).

Prescription decontrolled medication:

- This class includes all those drugs and medicines which do not require a written prescription of a physician (or) medical practioner. Such medications can be directly purchases over the chemist bench.

General introduction of OTC medication:

- OTC medication is those medications that can be obtained over the counter (or) from the chemist bench without any prescription of a RMP and consultation with a physician
- Hence medicines can be categorized on the basis of their distribution to the patient into prescription and NPDS.

OTC medications (reasons):

- 1. Shortage of time and comfort.
- 2. Cheaper in price.
- 3. Availability
- 4. Level of literacy and awareness.

- 5. Self care.
- 6. Advertisement.

Shortage o time and comfort:

- Usually people in cities and towns due to their busy schedule do not get proper time for visiting the physicians and for getting proper medications but OTC medications are very less time consuming and easily available.

Cheaper in price:

- In our country like India where more than 55% of total population is just near the poverty line, majority of people are weak to visit physicians for small health problems and hence prescribe non-prescribed drugs which are comparatively cheaper.

Availability:

- Most of NPDS are easily available at all places. Due to their good availability they are easily preferred by common people for daily health problems.

Level of literacy and awareness:

- Many of the people have either very low awareness due to which they do not prefer to visit a physician. Even such people on counsel a chemist may opt for outpatient treatment for NPDS.

Self care:

- Now a day's people with high literacy and awareness prefer to use of OTC medications. This is because of self care in people that they can take care of own health.

Advertisement:

- Most of the OTC medications producing industry use attractive advertisement for increasing the purchase of

medication. Also people due to previous experiences (or) due to the experience of other people outpatient treatment for OTC medication.

Significance of OTC medications:

- OTC medications are comparatively cheaper and because of poverty in India and also people favour non-prescription drugs.
- The chemist himself may prescribe non-prescription drugs. This is common in India.
- An increased trend for self care and increased tendency of patients to maintain their own health.
- NPDS have generally less number of side effects as compared to the prescription medication.

Benefits of OTC medication:

- Easy to access.
- Improved education of consumers.
- Decreased frequency of visit to physician.
- Decreased cost of third party players.
- Increased autonomy of the patients.

Risks:

- Inaccurate diagnosis.
- Delay in obtaining needed therapy.
- Drug resistance Failure to follow the label instructions.
- Increased cost of the patient due to side effects, adverse reactions, drug interactions.

Reference:

- Textbook of community pharmacy practice by Ramesh adepu.

UNIT X

Balance diet, and treatment & prevention of deficiency disorders

• **Definition:**

- A balanced diet is defined as the diet that contains the required amount of calories, vitamins and minerals that are essential to keep a person healthy.
- A balanced diet is mixture of
 - Carbohydrates (50%),
 - Fats (32%)
 - Proteins (12%)
 - vitamins (3%)
 - Minerals
 - sufficient water

Carbohydrates:

These are chief source of energy (60 – 70% total energy)

Deficiency Disorders

- Acidosis
- Ketosis
- Hypoglycemia
- Fatigue & decreased energy levels
- Unhealthy weight loss

Loss of sodium

Proteins:

These are the fundamental basis of cell structure & function.

Maintains osmotic pressure & have role in clotting of blood, muscle contraction.

Deficiency Disorders:

- Kwashiorkor
- Marasmus
- Mental retardation
- **Dietary vitamins and minerals Disorders**

Vitamin Deficiency

- **Vitamin B₁ (thiamine) Disorders**
- **Vitamin B₂ (riboflavin) Disorders**
- **Vitamin B₅ (pantothenic acid) Disorders**
- **Vitamin B₆ (pyridoxine) Disorders**
 - **Vitamin B₇ (biotin) Disorders**
 - **Vitamin B₉ (folic acid) Disorders**

Calcium deficiency disorder

- Osteoporosis

- Rickets
- Tetany

Iodine deficiency disorder

- Goiter

Iron deficiency disorder

- Iron deficiency anemia

Protein Deficiency Disorders

Kwashiorkor:

- Also called wet-protein energy malnutrition.
- Form of PEM characterized by protein deficiency.
- Refers to an insufficient protein consumption but with sufficient calorie intake.

Usually appear in the age of 12 months when breast feeding is discontinued.

Signs and symptoms

Change in skin pigment.

Diarrhea.

Decreased muscle mass.

Swelling(edema).

Fatigue.

Hair changes

Lethargy.

Increased & more severe infection due to damaged immune system.

Failure to gain weight & grow.

MANAGEMENT:

- The children affected with kwashiorkor should be fed with dietary protein gradually.
- Kwashiorkor can be corrected by eating more protein and more calories overall, especially if treatment is started early.
- You may first be given more calories in the form of carbohydrates, sugars, and fats. Once these calories provide energy, you will be given foods with proteins.
- Foods must be introduced and calories should be increased slowly because you have

been without proper nutrition for a long period. Your body may need to adjust to the increased intake.

MARASMUS:

- Severe protein calorie malnutrition characterized by energy deficiency and emaciation
- Causes stunted growth and wasting of muscles and tissue
- Develop between the age of 6 months & 1 years in children who weaned from breast feeding/who suffer from weakening conditions like chronic diarrhea.
- **Symptoms**
- Severe growth retardation.

- Loss of subcutaneous fat.
- Severe muscle wasting.
- Child looks thin and limbs
- Wrinkled skin.
- Bony prominence.
- Frequent watery diarrhea & acid stools.
- Temperature is abnormal.
- Edema absent.
- **Vitamin A deficiency disorder**
- ***Functions of vitamin A***
- Vitamins plays several roles in the body for
- Vision
- Gene transcription
- Immune function
- Embryonic development and reproduction
- Bone metabolism
- Hematopoiesis
- Skin and cellular health
- Antioxidant activity
- **Deficiency Disorders**
- Night blindness,
- Xerophthalmia,
- Keartomalacia Complete blindness
- Impaired immune function Birth defects
- ***Management***
- Deficiency of vitamin a can be achieved by eating vitamin A rich foods and external supplementation of vitamin A Preparations.
- ***Foods rich in vitamin A***
- **Vitamin A is found naturally in many foods:**
- Liver (beef, pork, chicken, turkey, fish) Cheddar cheese (256 µg)
- Carrot (835 µg)
- Spinach (469 µg) Sweet potato (709 µg) Butter (684 µg)
- Egg (140 µg)
- Apricot (96 µg)
- Papaya (55 µg)
- Mango (38 µg)
- Pea (38 µg)
- Milk (28 µg)
- **Vitamin D deficiency disorder**
- ***Function of vitamin D***
- Maintain the normal calcium and phosphorus levels in the body to build strong bones, teeth and nails.
- Supporting the cell functions and other neuromuscular functions in the body.

- Controls the supply of calcium between the bones and the blood and supports bone mineralization (hardening of bones) and bone remodeling by osteoblasts and osteoclasts.
- Preventing of rickets in children, and osteoporosis or osteomalacia in adults.
- Vitamin D as a powerful antioxidant and anti-carcinogen, it helps in combination depression, prostate cancer, breast cancer, high blood pressure, cardiovascular diseases, phagocytosis activity and boosts
- anti-tumor activity.
- Vitamin D helps in maintaining a health immune system in the body.

- **Deficiency Disorders**

- osteomalacia (softening of the
- bones) in elders
- rickets in children.
- Avoiding the exposure to sun may result in low blood calcidiol (25-hydroxy-vitamin D) and that may causes vitamin D deficiency disorder.

- **Management**

- Dietary supplementation of vitamin D₂ (mushrooms) and vitamin D₃ (fish liver oils, egg and beef liver.

- **Sources of vitamin D**

- The main source of vitamin D exposure of an individual is to sun's UVB rays. Apart from this, vitamin D is found in various types of fish such as herring, mackerel, salmon, and sardines. It is also available in other food sources such as egg yolk, orange juice, cereals, green leafy vegetables, fish liver oils, yogurt, cheese, etc. fortified foods are other common sources of vitamin D.

- **Vitamin E deficiency disorder**

- **Functions**

- Prevents the oxidative damage of the cell membranes
- Prevents unnecessary growth of the smooth muscle.
- Responsible for the repair of wounds
- Vitamin E plays a role in neurological functions.
- It inhibits platelet aggregation.
- Vitamin E also protects lipids and prevents the oxidation of polyunsaturated fatty acids (PUFAs).

- **Deficiency Disorders**

- Spinocerebellar ataxia
- Myopathies
- Peripheral neuropathy
- Ataxia
- Skeletal myopathy
- Retinopathy
- Impairment of the immune response
- Erythrocyte hemolysis

- Male infertility
- **Treatment**
- Individuals who cannot absorb fat may require a vitamin E supplement because some dietary fat is needed for the absorption of vitamin E from the gastrointestinal tract.
- **Dietary sources**
- Vitamin is found mostly abundantly in wheat germ oil, sunflower oil, safflower oil, nuts and nut oils, like almond and hazelnuts palm oil. It is also found in high value green, leafy vegetables like spinach, turnip, broccoli, avocados, asparagus, kiwifruit (green) pumpkin, sweet potato, mangoes, tomatoes, rockfish, and papaya.

• Deficiency Disorders

UNIT XII

RATIONAL DRUG THERAPY

Essential medicines are the drugs that have the best balance of quality, safety, efficacy and cost for a given element and are needed almost to the cure of majority of population.

OBJECTIVES OF RATIONAL DRUG THERAPY

- Main objective is to maximise the effectiveness and safety of medication.
- To identify the patients requiring proper counselling.
- To maximise the risk of medication errors.
- To provide equilibrium among the other factors for a rational drug therapy.
- To make a check on economy related to health care.

PRINCIPLES OF ESSENTIAL DRUG CONCEPT

- Maximum treatment with minimum drugs.
- Adequate drug utilization.
- Economic and efficient carrying out activities.
- Proper information to the patients.

Maximum treatment with maximum drugs

Common health problems of majority of population can be treated with small and careful selected medicines.

Adequate drug utilization

Health professionals routinely use less than 200 medicines. Training and clinical experience should focus on proper use of those selected medicines.

Economic and efficient carrying out activities

Procurement, distribution and other supply activities can be carried out most economically and effectively for a limited number of drug problems.

Proper information to the patients

Patient can be better informed and about the effective use of medicine by the health care professionals.

ROLE OF PHARMACIST IN RATIONAL DRUG THERAPY

COUNSELING OF THE PATIENTS AND PHYSICIANS:

- The counselling about the new drugs, variations in the drug policies, availability of drug etc., should be provided timely to the patient and physician. Patient should be counselled against proper drug usage.

B.STATING ADVERSE DRUGS:

- Adverse drug reactions should be reported to proper monitoring centres like hospital management, regional/ country head office.

C.DRUG PROCUREMENT:

- The section and the range of drug should be based on essential drug concept in accordance with the needs of the situation. Procurement must have cost effective drugs in a right quality and there should be selection of right supplies of right quality products.

D.LIST PREPARATION:

- Pharmacist as being a drug representative in a public state about the physio-social requirement of the prevailing population and can be contribute to prepare the most cost-effective list.

CODE OF ETHICS

Even if your own life be in danger you should not betray or neglect the interests of your patients" should be fondly cherished by all Pharmacists.

encouraging "right" conduct. Law attempts to achieve its purpose profession attempts to achieve its purpose without the intervention care and therefore the attitude of service and sacrifice in the interest.

The Pharmacy Council of India (PCI) formulated the code of ethics.

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Scope of Pharmaceutical Services :

When premises are registered under statutory requirements and opened as a pharmacy, a reasonably comprehensive pharmaceutical service should be provided. This involves the supply of commonly required medicines of this nature without undue delay. It also involves willingness to furnish emergency supplies at all times.

Conduct of Pharmacy

The condition in a pharmacy should be such as to preclude avoidable risk or error or of accidental contamination in the preparation, dispensing and supply of medicines.

The appearance of the premises should reflect the professional character of the pharmacy.

It should be clear to the public that the practice of pharmacy is carried out in the establishment. Signs, notices, descriptions, wording on business, stationary and related indications, should be restrained in size, design and terms.

Descriptions which denote or imply pharmaceutical qualifications should be limited to those of which the use is restricted by law and should not draw invidious distinction between pharmacists.

A notice stating that dispensing under (Employees State Insurance Scheme) E.S.I.S. or any other such other schemes sponsored by Government is carried out may be exhibited at the premises.

In every pharmacy there should be a pharmacist in personal control of the pharmacy who will be regarded as primarily responsible for the observance of proper standards of conduct in connection with it. Any obstruction of the pharmacist in the execution of his duty in the respect by the owner will be regarded as a failure on the part of the owner to observe the standards in question.

Handling of Prescriptions:

When a prescription is presented for dispensing. It should be received by a pharmacist without any discussion or comment over it regarding the merits and demerits of its therapeutic efficiency. The Pharmacist should not men show any physiognomic expression of alarm or astonishment upon the receipt of a prescription; as such things may cause anxiety in patients or their agents and may even shake their faith in their physician. Any question on a prescription should be answered with every caution and care; it should neither offend a patron nor should it disclose any information, which might have been intentionally, withheld from him.

It is not within the privilege of a Pharmacist to add, omit or substitute any ingredient or alter the composition of a prescription without the consent of the prescriber, unless the change is emergent or is demanded purely by the technique of the pharmaceutical art and does not cause any alteration in the therapeutic action of the recipe. In case of any obvious error in it due to any ommission, incompatibility or overdosage, the prescription should be referred back to the prescriber for correction or approval of the change suggested. While such an act is imperative in the best interest of the patient, in no case should it be done in a manner, which may jeopardize the reputation of the prescriber concerned.

In matter of refilling prescriptions a pharmacist should solely be guided by the instructions of the prescriber aid he should advise patients to use medicines or remedies strictly in accordance with the intention of the physician as noted on the prescription.

Handling of Drugs

All possible care should be taken to dispense a prescription correctly by weighing and measuring all ingredients in correct proportions by the help of scale and measures: visual estimations must be avoided. Further, a Pharmacist should always use drugs and medicinal preparations of standard quality available. He should never fill his prescriptions with spurious, sub-standard and unethical preparations.

A Pharmacist should be very Judicious in dealing with drugs and medicinal preparations known to be judicious or to be used for addiction or any other abusive purposes. Such drugs and preparations should not be supplied to any one if there is reason to suppose that it is required for such purpose.

Apprentice Pharmacists:

While in-charge of a dispensary, drugstore or hospital pharmacy where apprentice pharmacists are admitted for practical training, a pharmacist should see that the

trainees are given full facilities for their work so that on the completion of their training they have acquired sufficient technique and skill to make themselves dependable pharmacists. No certificate or credentials should be granted unless the above criterion is attained and the recipient has proved himself worthy of the same.

Pharmacists in Relation to his trade

Price Structure

Prices charged from customers should be fair and in keeping with the quality and quantity of commodity supplied and the labor and skill required in making it ready for use, so as to ensure an adequate remuneration to the pharmacist taking into consideration his knowledge, skill, the time consumed and the great responsibility involved, but at the same time without unduly taxing the purchaser.

Fair Trade Practices:

No attempt should be made to capture the business of a contemporary by cut-throat competition, that is, by offering any sort of prizes or gifts or any kind of allurements to patronizers or by knowingly charging lower prices for medical commodities than those charged by fellow pharmacist if they are reasonable. In case any order or prescription genuinely intended to be served by some dispensary is brought by mistake to another, the latter should refuse to accept it and should direct the customer to the right place. Labels, trademarks and other signs and symbols of contemporaries should not be imitated or copied.

3. Purchase of Drugs:

Drugs should always be purchased from genuine and reputable sources and a pharmacist should always be on his guard not to aid or abet, directly or indirectly the manufacture, possession, distribution and sale of spurious or sub-standard drugs.

Hawking of Drugs:

Hawking of drugs and medicinal should not be encouraged nor should any attempt be made to solicit orders for such substances from door to door. `Self-service` method of operating pharmacies and drug -stores should not be used as this practice may lead to the distribution of therapeutic substances without an expert supervision and thus would encourage self-medication, which is highly undesirable.

Pharmacists in Relation to Medical Profession

Limitation of Professional Activity:

Whereas it is expected that medical practitioners in general would not take to the practice of pharmacy by owing drug stores, as this ultimately leads to coded prescriptions and monopolistic practices detrimental to the pharmaceutical profession and also to the interest of patients, it should be made a general rule that pharmacists under no circumstances take to medical practice, that is to diagnosing diseases and prescribing remedies therefore even if requested by patrons to do so. In cases of accidents and emergencies a pharmacist nay, however, render First Aid to the victim.

Clandstine Arrangements:

No pharmacist should enter into any secret arrangements or contract with a physician to offer him any commission or any advantage of any description in return for his favour of patronage by recommending his dispensary or drugstore or even his self to patients.

Liaison With Public:

Being a liaison between medical profession and people, a pharmacist should always keep himself abreast with the modern developments in pharmacy and other allied sciences by regularly reading books, journals, magazines and other periodicals , so that on the one hand he may be in a position to advise the physician on pharmaceutical matters like those of colours, flavours, vehicles and newer forms of administration of medicines, on the other, he may be able to educate the people for maintaining healthy and sanitary conditions of living.

Thus a pharmacist can contribute his share in the nation-building activities of the country. A pharmacist should at all times endeavour to promote knowledge and contribute his quota in the advancement of learning.

Apharmacist should never disclose any information which he has acquired during his professional activities to any third party or person unless requires by law to do so. He should never betray the confidence which his patrons repose in him or which he has won by virtue of his eminent character and conduct.

Professional Vigilance:

It is not only sufficient for a pharmacist to be law-abiding and to deter from doing things derogatory to Society and his profession, but it should be his duty to make others also fulfil the provisions of the pharmaceutical and other laws and regulations. He should not be afraid of bringing or causing a miscreant to be brought to book, may be a member of his own profession. Whereas it is obligatory for a pharmacist to extend help and cooperation to a fellow member in his legitimate needs, scientific, technical or otherwise, he is to be, at the same time, vigilant to weed the undesirable out of the profession and thus help to maintain its fair name and traditions.

Law-abiding Citizens :

Apharmacist engaged in profession has to be an enlightened citizen endowed with a fair knowledge of the land and he should strive to countenance and defend them. He should be particularly conversant with the enactments pertaining to food, drug, pharmacy, health, sanitation and the like and endeavour to abide by them in every phase of his life. Apharmacist is a unit whole and his life cannot be divided into compartments.

Relationship with Professional Organizations :

In order to inculcate a corporate life in his own professional colleagues, a pharmacist should join and advance the cause of all such organisations, the aims and objects of which are conducive to scientific moral and cultural well-being of pharmacists and at the same time are in no way contrary to the code of pharmaceutical ethics.

Decorum and Propriety:

Apharmacist should always refrain from doing all such acts and deeds which are not in consonance with the decorum and propriety of pharmaceutical profession or which are likely to bring discredit or upgrade to the profession or to himself.

