Clinical Pharmacy

Q) Defination, scope, development of clinical pharmacy in India.

→ Defination :- The service provided by pharmacist to promote rational drug therapy that is safe, appropriate & cost effective are defined as clinical pharmacy.

Or

It is defined as the branch of pharmaceutical science dealing with utilization of pharmacist knowledge, skill and judgement related to biomedical and pharmaceutical science, to prove the safety, the cost and the precision of drug usage in patient care.

- Scope :-

1) Preparation of patient medication History :-
- This will help in saving physician time and efforts.
- The result is faster & more accurate selection of drug therapy.

2) Rational prescription :- The clinical pharmacist can suggest the physician and help him to selecting right drug.

3) Bioequivalence

3) Bioequivalence & generic :- Selection of proper drug equivalence of formulation therapy based on bioequivalence & it dosage form.

4) Patient monitoring :- Help in identify the route of administration, sign symtoms, overdose, side effect, contraindication etc.

5) Adverse drug reaction :- May suggest the alternat therapy by identify adv of drug

6) Drug - drug interaction :- Inform the drug - drug or drug - food interaction to the physician.

7) Retail pharmacy store :- At retail store, clinical pharmacist maintain records, patient drug profile, prescription etc.

8) Discharge counselling & & Drug therapy patient compliance can be improved several times by educating the patient at time of discharg

9) Education program :- Conduct Clinical trials & educate patients for the drug action & it important.

10] Medical Audit :- The clinical pharmacist is either the inhibitor or a very member of a function committee.

* Development

In 1953 - The term clinical pharmacy was first used.

↓

In 1960 - The concept of clinical pharmacology started in 1960's with two incidence

↓

In 1962 - The thalidomide tragedy, where in it was found that consumption of popular sedative thalidomide result in birth of babies with baked limbs

↓

In 1968 :- Phenytoin toxicity was reported in Australia which was because of change in formulation i.e. switching over from calcium sulfate to lactose as an inert excipient in tablet

Q2 Discuss about Verbal & non verbal communication during counseling

Ans Verbal communication :-

- It include ability to listen, understand and respond to what people say

- Also ability to interpret the non-verbal communication & respond in way that encourages continued interaction

(a) Active listening :- Good listening skill is important to promote a good interactive communication and obtained information
- focus on patient, family member or healthcare professional
- It make person feel like centre of attention
- Should have open, relaxed & unhurried attitude
- Give attention like keep eye contact, asking question etc.
- Tone & modulation of voice, in b/w pauses make patient relicable.

(b) Observation & Assessment :-
- Effective two way communication requires continual observation, assessment of how the person is communicating.

- Body language and gesture provide important clues for pharmacist, patient and health care professional.

(c) Open communication :- Sitting or standing at eye level or leaves project a non-threatning, equalising body posture.
- Physically be close to patient, family member or healthcare professional.

(d) Language :- For reliable communication, use a language in which both parties are fluent & comfortable.

- Abbreviations & terms used for prescribing medicines represent a specialised type of communication.

- Try to avoid medical terms.

- Non-Verbal Communication.

(I) Eye contact :- It include confidence, attention and honesty to patient

(II) Face expression :- An important indicator of emotional state.
- Do not do any facial expression related to diseases.

(III) Body Posture :- Message can be conveyed through body posture.

e.g. closed body posture :- Person sitting with his leg and arms crossed in front of body.

- A relaxed stance with uncrossed legs & arms lead to ~~bad~~ open body posture.

(IV) Tone of voice :- Soften voice etc can also influence the communication.

(V) Proximity / closeness of position :- The pharmacist and patient must maintain a minimum distance of 45cm.

(VI) Another form of non verbal Message :- To convey information through the use of diagrams

Q3 = Define drug utilization, evaluation, DUE & it cycle.

→ ~~Acco~~ Definition :- According to WHO, Drug Utilization evalution is defined as the marketing, distribution, prescription and use of drug in society, with special emphasis on resulting medical, social & ~~Econ~~ economic consequences.

- DUE is an ongoing authorized & systemic quality improvement process.

* Types *

There are 4 type of DUE.

(i) Drug focused :- Drug utilization evalution of a single drug or class of drug is tested.

(ii) Indication focused :- Evalution of drug or drug that is used for specific indication is Examined for their use

~~(iii) Quantitative :- Include collection, organizing & ~~estimating~~~~

(iii) Quantitative :- Include collecting, organizing & estimating of drug useage in figure in the patient of drug acquisition, prescribing & dispensing etc.

civ) Qualitative :- This type of DUE helps in evalution the quality of drug therapy & it outcome by company comparing practice with predetermined criteria & standerd.

* Junction :-

- The committee should draft and approve the policies & procedure.
- Establish and maintain adequate mean of communication ~ hospital administration & other relevant hospital committee.
- Medical & hospital staff should understand that the DUE programme is a continuously quality improvementing designed
- Review the data generated from study.
- ~~inter~~ quarterly meeting may be sufficient.
- The committee should develeop or review standard and criteria of DUE studies based on knowledge, experience & literature finding.

* Role :-

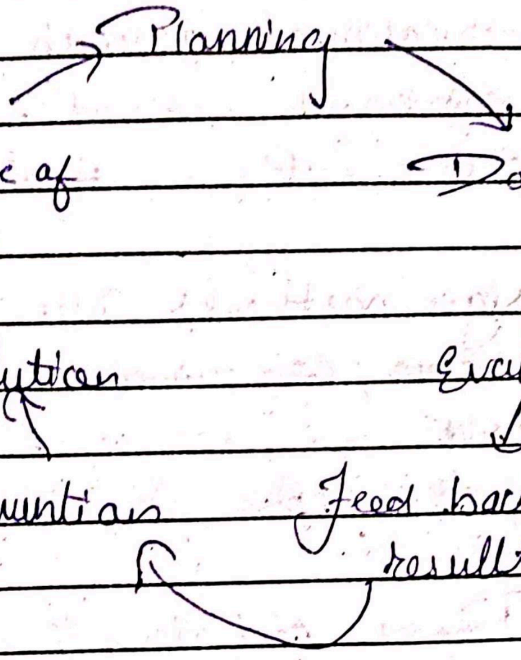
① Planning, organizing & implementation a DUE

② Programme, development, supervision & conduction

③ Education of hospital staff about DUE in conceptual an practical exam.

- Promotion of goal and objective of DUE
- Development of data collection, analysis & report writing.
- Publication of result in peer-viewed journal.

* DUE cycle.



Step 1:- Planning

- Identify drug or therapeutic area of practice for possible inclusion in the programme
- ABC or VEN analysis is another tool used to identify high priority or target drug
- It divide as

Class A drug :- 75-80% of total value of drug consumed & purchased and higher cost or highest volume item.

Class B :- It consist 15-20% of expenditure
class C :- It consist 5-10% of expenditure.

- Step 2 :- Design of Study

- Research method.
  - It also divide into
  (a) Observational research method
  (b) Experimental method
  (c) Cross-sectional studies

- Other design methods were
  - prospective ; ~~retrospective~~
  - concurrent
  - retrospective etc.

- Step-3 Define criteria & Std.

- After the DUE target has been selected, it is important to conduct a comprehensive literature review.

- Step 4. Design the data collection.
  - ~~It~~ is imp to limit data collection to only most imp drug.

- It is imp to limit data collection to only the most important and relevant aspect of drug and to factor which may influence these

Step 5 :- Data collection.

- Data collection should be chosen carefully and should be familar with how information is arranged in patient care notes.

- Step 6 :- Evalution result
- Data evalution is one of most critical step in DUE.

- To summarize the main categories of result & to identify where exactly the data show deviation are evaluted.

Step 7 :- Provide feedback of result.

Step 8 :- Develop & implement intervention

Step 9 :- Re-evalute to determine if drug used has improved.

Step 10 :- Re-access & revise the DUE programme

Q4 Discuss it objective and guideline for patient medication history interview.

→

Q5 Draw medication chart review.

- Fundamental responsibility of clinical pharmacist.

- It is a systematic review of a patient's drug therapy to ensure that the prescribed medication is appropriate for patient.

- Involve assessment of all current & recent medication order including routine medication and over the counter drug

* Goal of medication chart review
  - Ensuring that Patient receive
    - Right drug
    - Right dose
    - Right frequency
    - Right duration
    - Right dosage form

* Steps *

1) Collection & interpretation of patient specific information, including medication history interview.

- Need to collect information that will assist them to determine the appropriate of drug therapy

- Understand the patient diseases condition, indication of drug & daily clinical progress.

2) Assessment of Therapeutic goal.

- To determine the appropriateness of drug therapy it is essential to understand the therapeutic goal for the individual patient.

- May include one or more of following
  - Cure of diseases
  - Reduction or elimination of sign and symptoms

- Therapeutic goal should based on patient individual circumstance & may differ from patient to patient based on their age, co-morbidities & nature & severity of their illness

3) Identification of drug related problem.

- Reviewing drug therapy should be aimed at identifying and resolving any drug related problem

- A drug related problem is any event or circumstance involve drug treatment that interfere or potentially interfer with the patient achieving an optimum outcome of medical care

4) Individualising medication regiment.

- Once DRP relating to the individual drug on medication chart have resolved, the next step is to consider the patient overall medication regimen

- Important for patient with chronic diseases or those who are on many drug on long term basis.

5. Monitoring treatment outcomes.

- Key to assess whether the therapeutic goal of drug treatment achieved or not.

- Includes review of patient clinical status, laboratory data and other markers of drug therapy response.

6. Medication Chart Endorsement.
- chart endorsement is one of primary responsibilities of the pharmacist is ensuring that medication orders are unambiguous, legible and complete.

7. Documentation
- Pharmaceutical care provided should be an integral part of patient medical record.
- Documentation of pharmaceutical care provided can be made either in medication chart or in case note with a clear title with pharmacist's signature.

Q6] Write a note on pharmacist ~~intervention~~ intervariation in drug therapy monitoring. Classify adverse drug reaction & example in detail.

→ The clinical pharmacist should provide advice to medical staff on appropriate use and timing of TDM & assist in interpretation of result.

It involved in:

- Initial selection of drug regimen. This may involve decisions about the drug choice, dose, dosing interval, route of administration, dosage form etc.

- Adjustment of dosage regimen based on TDM result & patient clinical response.

- Dose adjustment for patient on haemodialysis or peritoneal dialysis. Provision of poison information

- Adverse drug reaction.

- According to WHO define an adverse drug reaction as 'any response to a drug which is noxious & unintended. ~~which occur at dose normally used~~.

- There are 6 type of adverse drug reaction

Definition:

An ADR is a response to a medicine which is noxious and intended and which occurs at doses normally used.

Type of reaction	Features	Examples	Management
Dose related (augmented)	Common Related to a pharmacological action of the drug Predictable Low mortality	Toxic effects: Digoxin toxicity; serotonin syndrome with SSRI's Side effects: Anticholinergic effects of tricyclinc, Antidepressants	Reduce dose or withhold. Consider effects of concomitant therapy
Non dose related (Bizarre)	Uncommon Not related to pharmacological action of the drug Unpredictable High mortality	Hypothalamic pituitary adrenal axis suppression by corticosteroids	Withhold and avoid in future
Dose related and time related (chronic)	Uncommon Related to the cumulative dose	Hypothalamic pituitary adrenal axis suppression by corticosteroids	Reduce dose or withhold; withdrawal may have to be prolonged
Time-related (delayed)	Uncommon Usually dose related Occurs or becomes apparent some time after the use of the drug	Teratogenesis Carcinogenesis Tardive dyskinesia	Often intractable
Withdrawal (end of use)	Uncommon Occurs soon after withdrawal of the drug	Opiate withdrawal syndrome Myocardial ischemia	Reintroduce and withdraw slowly
Unexpected failure of therapy (failure)	Common Dose related Often caused by drug interactions	Inadequate dosage of an oral contraceptive, particularly when used with specific enzyme inducers	Increase dosage Consider effects of concomitant therapy.

Management

Q2 Write in brief for protocol for case presentation

→ Case presentation includes.
- present database
- General Data
- Medication Data.

→ There are main 4 part for case presentation

(i) Clinical Diagnosis
(ii) Paraclinical Diagnostic Procedure
(iii) Treatment.
(iv) Prevention & health promotion

(I) Clinical diagnosis

(a) Identify data from database which can serve as :
- Age / Sex
- Symptoms
- Sign.

(b) Based on pattern recognition & prevalence, decide on the primary secondary diagnoses.

- Primary diagnosis is what you think is most likely diagnosis and Secondary diagnosis is closest second.

(c) Illustrate / explain how you arrive to 1° & 2° clinical diagnosis.

- Use the clinical diagnostic process of pattern recognition & prevalence
- use algorithm as much as possible.

(II) Paraclinical Diagnostic Procedure

(a) Restate your primary and secondary clinical diagnosis

(b) Decide on whether you need a paraclinical diagnosis.

(c) Select two main procedure which give closest result to any diseases.

(d) Present the paraclinical diagnostic procedure that were done on patient

starting with one that you are recommending.

(III) Treatment

(a) State your pretreatment diagnosis 1° & 2°.

(b) State goal of treatment for 1° diagnosis.

(c) Decide on treatment modality.

(d) Decide how you evaluate the result or outcome of your proposed treatment.

(e) If data are available, present the treatment procedure done on patient and their outcome.

(IV) Prevention & Health promotion

(a) State your final diagnosis

(b) Briefly describe how you will advice patient on prevention of disease and health promotion.

Q8 Discuss Q.A. with service of clinical pharmacist.

⇒ Quality assurance in clinical pharmacy is a technique used to ensure quality of practice and it outcome.

Objective and function :-

- To ensure provision of an appropriate service to patient.
- To ensure medicine need
- Monitor and evaluate standard of service provided
- To identify and minimize the risk

Quality assurance services :-

- Patient counselling
- ADR reporting
- Ward round participation
- Drug information services
- Patient interview
- Case note review
- Medication chart review
- Therapeutic consultation
- Drug interactions
- pharmacoeconomics
- Poison management
- News letters
- Initiation and conducting pharmaceutical research and development
- Hospital formulary
- Dosage adjustment calculations
- Therapeutic drug monitoring
- Therapeutic guideline preparations.

Quality assurance in QA services :-

Quality assurance in drug information services should implement standard procedures.

Evaluate every aspect of practice and to improve existing services.

Assessment techniques :-

1) Work load statistics
2) Auditing
3) enquirer's assessment
4) Peer review

Evaluation of patient counselling :-

- Self introduction and patient's introduction
- Purpose of counselling
- Use of patient profile information
- Assess about reason for therapy
- Use of verbal language
- Non-verbal behaviour
- Discuss about present facts
- Provide complete information
- Information about therapy.
- Summarize using key points

- Assessment of QA service.

-Audit :- Clinical audit is a quality improvement process that seeks to improve patient care outcome.

Type of audit.

(a) Self audit

(b) Group audit
(c) External audit

Q9 Elaborate component of medication chart review

→ Same as Q5

Q10 what is Ward round participation.

→ Ward round is a visit made by a medical practitioner, alone or with a team of health care professionals and medical student to hospital in-patient at their bedside to review and follow up the progress in their health.

- Atleast one ward round is considered everyday to review the progress of each patent outcome.

- Participation of pharmacist in ward round help to provide rational drug use.

Goals & Objective.

- Gain an improved understanding of patient's clinical status and progress, current planned investigation & therapeutic goal.

- Optimize therapeutic management by influencing drug therapy selection, drug administration, monitoring and follow-up.
- Detect, manage and prevent, adv. reaction drug interaction
- Participate in the in-patient discharge planning

* Classification of ward rounds :

- It divided into 4 type

(i) Pre-round
(ii) Registrar
(iii) Professor
(iv) Teaching round.

(I) Pre round :-
- Usually by intern or medical post graduate student in teaching hospital.

- Only few managment decision are made during these round

- ~~Trainee~~ Trainee clinical pharmacist may join the interview or PK in their pre round and complete the patient medication and clinical review at ~~their~~ this time.

(II) Registrar

- In teaching hospital, the registrar and the resident individually or as a team conduct ward round
- At least once a day at a fixed time usually in morning.
- Useful round for clinical pharmacist of all level of experience to join

(III) Professor

- In teaching hospital, the chief unit or the professor in a specialty conduct round together with other healthcare professionals.
- Conducted for all patient under their care on a daily basis

(IV) Teaching round

- In teaching hospital, academic medical staff conduct bedside clinical teaching round for resident, medical PG student, Intern, medical UG student & pharm-D student.
- It is usually extensive round and is conducted

only a few time a week

- It provides an opportunity for clinical pharmacist to improve their clinical knowledge.

- A pharmacy intervention is defined as, any action by pharmacist that directly result in a change in patient managment of therapy.

- Major drug related queries that may ~~arise~~ arise during ward round are

1) Dose and frequency
2) choice of medication
3) ADR
4) Drug interaction.
5) Formulation.
6) Actions
7) Drug availibility

- Ward round follow-up

(a) completing documentation.

(b) Making necessary alteration

(c) Discussion with the patient.

Q11 Describe types, procedure & significance of ward round participation.

Same as Q10

Q.2 Detail pharmaceutical care concept.

Ans Pharmaceutical care defined as "the direct, responsible provision of medication-related care for the purpose of achieving definite outcome ~~for~~ that improve a patient quality of life.

~) The outcomes are

(1) Cure of diseases
(2) Elimination or reducing patient symptom
(3) Arresting or slowing of diseases
(4) Preventing a diseases or symptom.

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* Basic Elements of Pharmaceutical Care

① Patient oriented
② Acute & Chronic prblm addressed
③ Documented system on patient record
④ Continuous care in systemic way
⑤ Emphasis on optimizing patient health quality of life
⑥ Emphasis on patient health education and health promotion.

ws There are 3 major function of Pharmaceutical care.

1. Identifying potential and actual drug related problem
2. Resolving actual drug related problem
3. Preventing potential drug related problem.

ws Certain function of pharmacist to perform.

* ① Collection of Data
② Identification of problem
③ Establish outcome goal
④ Evaluate the treatment alternative
⑤ Individual drug regimen
⑥ Monitor outcome.

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iv) There are 4 Type of Pharmaceutical care.

(1) SOAP
(2) CORE
(3) FARM
(4) PRIME

(1) S = Subjective finding
e.g. complains, Sign & Symptoms

O = Objective finding
e.g. laboratory data
- Physical sign

A = Assessment.
- Diagnosis or
- Possible explanation of problem

P = Planning
- Treatment

(2) C = condition or patient need
- Include Non medical condition

O = Outcome
- Desire goal or condition needed

R = Regimen
- Either therapeutic regimen or Behaviour regimen.

E = Evalution parameter.

E = Evaluation parameter to assess outcome achievement.
- Efficacy
- Toxicity

(3) FARM

F = Findings
- Patient information lead to the problem

A = Assessment.
- Additional info, severity or any sort term & long term goal

R = Resolution.
- Intervention or proposed action of pharmacist.
e.g. Counseling, Observation etc.

M = Monitoring & follow up.
- Monitoring of parameters like pain, mood, serum level etc.

(4) PRIME

P = Pharmaceutical care
R = Risk
I = Interaction
M = Mismatch
E = Efficacy.

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Q) Certain function of pharmacist are as:-

Establish pharmacist - patient relationship
↓
Collection data
↓
Interpret data
↓
Drug related problem
↓
Determine priority of drug related problem
↓
Determine desire outcome
↓
Desire Therapeutic goal
↓
Monitoring plan
↓
Implement & follow up pharmaceutical plane

Q3) Write a S.N on approaches of pharmaceutical care.

Ans) Systemic approaches to pharmaceutical care by pharmacist are (Rencling)

Q4 Element Outcome & process in detail.

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Process

Patient requiring pharmaceutical care services

↓

Assess the need and evaluate the drug therapy

↓

Develop a care plan

↓

Implement the care plan

↓

Monitor & review the care plan

① Assess the patient drug therapy.

Pharmacist will be able to identify diseases related and drug therapy related problems in consultation with the patient & health care provider.

Pharmacist review the patient opportunity for risk factor like Age,
Gender,
Weight,
Medical history,
Current complain,
Impairment in any organ,
Allergy to drug etc.

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- This information mainly available in patient medical record.

- Interview the patient or patient.

- Interview the patient for the information of environmental or social factor. such as home environment,
  - Drug use,
  - Family support
  - Health benefit,
  - Perception of drug

(2) Develop the care plan to resolve drug related problem.

- Identify the potential & actual drug related problem.

- Develop the strategies to resolve them and establish patient specific goal in achieving therapeutic outcome.

(3) Implement the care plane

- After deciding care plane, pharmacist care note for ~~prescribe~~ implementation & make sure the implementation

(4) Monitor and review the care plan.

(v) Follow up stage in care plans.

(vi) Consistent monitoring the care plan along with follow up also make sure the improvement in patient health care

* Elements

(1) Patient oriented
(2) Acute & chronic prblm addressed
(3) Documented System or patient record.
(4) Continuous care in systemic way
(5) Emphasis on optimizing patient health quality of life
(6) Emphasis on patient health education and health promotion.

(D5) Write detail of cause. medication error.

(i) Insufficient or inadequate information about the patient

(ii) Lack of knowledge about drug therapy

(iii) Poor communication of drug information

(iv) Poor hand writing
(v) Confusion on misleading drug labelling, packing and nomenclature
(vi) Poor drug storage & stacking
(vii) Problem with standardization & distribution
(viii) Poor safety assessment of drug delivery devices before purchase and during their use
(ix) Misinterpreted verbal order
(x) lack of time.
(xi) Calculation error
(xii) Missing information

Q6 Define medication error & type of error with example & role of pharmacist in critical care management.

→ Any error in the process of ordering, transcribing, dispensing, administering & monitoring a medication is called medication error

→ There are II types of error.

(1) Prescribing Error :- When there is incorrect information of
- Dose
- Dosage form
- length of therapy
- frequency
- Route
- Drug concentration.

(2) Omission Error :- Failure to administer an order dose.

(3) Wrong time Error :- Medication administered outside the time window

(4) Unauthorized drug Error :- Administration of medicine to patient without authorization by prescribes.
- Medication for patient given to another patient

(5) Improper Dose form :- Dose greater or less than prescribed one may give unwanted reaction & increase severity of diseases

(6) Wrong Dosage form :- Different dosage form may be get administered to patient

(7) Wrong drug preparation Error :- Oral suspension with Incorrect volume.

(8) Wrong admin technique Error :- SC that is given too deep.

(9) Deteriorated Drug Error :- Monitoring expiration date is very important
- Degraded drug due to.

(10) Monitoring Error :- Inadequate drug therapy e.g. Insufficient stock of serum drug ~~that~~ that required.

(11) Compliance Error :- Failure to adhere to prescribed the drug regimen
e.g. - Does not complete antibiotic therapy.

* Role of pharmacist in ICU

(1) In ward round participation to provide pharmacotherapeutic managment.

(2) Taking history & review the medication continues to patient.

(3) Monitor patient health

(4) Monitor any adverse drug reaction

(5) Provide information of drug to ICU team

(6) Provide therapy related knowledge

(7) Ensure the safety & effective use of drug

(8) Maintain documentation for record

(9) Modification in regimen.

(10) Development & implementation of drug protocal to maximize drug benefit

Q7 Describe pharmacist approach for management of medication error

(1) Interacting with nurse about medicine

(2) Receiving & examine prescription

(3) Submitting prescription with proper editing

(4) Ensures dose strengths

(5) Provid training to other workers

(6) Maintain medication profide for in & out patient.

(7) Check the dose schedule, drug interaction

(8) In any doubt immediate concern a. P.

Q. Write on DIC

→ DIC is a service unit operated by trained healthcare professional, who are committed to providing drug information as it relate to therapies, pharmacoeconomics education & research programs.

→ DIC provide information answer the queries

→ They keep up to date with pharmacy & therapeutic literature & disseminate relevant

- Establishment of drug information centre

(1) A dic should provide information proactively as well as respond to queries.

(2) Centre is expected to have trained staff with acess to both text & computers

- location :

→ Established in an accessible hospital or University department or any designated centre

→ Medical teaching institution

→ Pharmacy association

The pharmacist Role in DIC

1. Provide medication review to patient & families, health care proffessional
2. Establishing & maintaing a formulary based on scientific evidence of safety, cost.
3. Developing and participating in medication error, reporting and analyses program
4. Developing method of changing patient & provider behaviours.
5. Publish newsletter to educate patients, families & health care.
6. Educationg provides about medication related policies
7. Coordinating investigational drug services
8. Providing continuing education services to the healthcare.
9. Educate student
10. Applying health economic & outcome analysis.

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There are 3 type of DIC

1. Hospital based
2. Industry based
3. community based

* Documentation of Drug Information request

1. Date & time received
2. Requester's name, address, method of contact
3. Person assessing medication information needs
4. Method of delivery
5. Classification of request
6. Question asked
7. Patient - specific information obtained
8. Response provided
9. Reference used
10. Date and time answered.
11. Person responding to request
12. Estimated time in preparation and for communication.

Q9 Write in detail systemic approach in answering DI queries.

There are 7 step approach by which answering the DI queries.

Steps 1 :- Secure demographic of requester.

- The initial question shows the requestor knowledge.
- ~~Determine a method for response~~ time
- Secure name, position & anticipated knowledge of requestor

Step 2:- Obtain background information

- Requestor name
- location & method
- Background info must be taken in limited time
- Requestor profession
- The urgency of request.

Step 3:- Determine & categorize ultimate question

- Referring the requestor question is useful
- Once the ultimate question has been decided and acknowledge, the question is categorized.
- Categorizing help in development of search strategy.

iv) Select the resource with highest probability of containing information.

Step 4:- Strategy development & conduct search.

i) Categorization of ultimate question lead to search of resource.

ii) Select the resource with highest probability of information & evalution.

Step 5: Perform Evalution, analysis & synthesis

i) Perform review on information & evaluate according to skill

ii) Skill differentiate the proffesional to technician.

Step 6. Formulate and provide response.
→ It involve the series of step
step I :- present the competing viewpoint
step II :- State the assessment of literature or information reviewed & claim the superior viewpoint
step III :- Briefly refute major strength & present weakness.
Step IV :- Defend the major strength & present weakness of inferior viewpoint.

Step V :- Reiterate the final assessment in support of viewpoint

Step 7:- Conduct follow up, & documentation

i) Follow up is process of verifying the appropriateness, correctness, & completeness of response

ii) Follow through is the process of readdressing a request based on availability of new data or a change in situation or circumstances

iii) The ultimate question
- Material searched
- The response and
- follow up are documented.

Q10 Discuss organization & information of person information centre

* Organization of PIC.

i) For organizing PIC the question should carefully considered

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(1) To whom will the services be offered initially
(2) Will it be 24 hr
(3) How will it be expanded?
(4) How will advertised to user population?
(5) What are the initial & subsequent staffing requirement?
(6) Are the telephone & other communication system adequate
(7) How to collect full data range from information services
(8) How reliability, accuracy, & usefulness of data be evaluated
(9) How data are updated
(10) Who will access to what type of data & who can modify
(11) For centre to operational it is necessary to
(1) Obtain certain essential literature
(2) Provide the basic training to staff
(3) Print forms for collection of information
(4) Recorder for the calls & cases
(5) compilation of files on chemical used in local product.

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(i) Information can commercial product.

(ii) Most existing poison information centers began by organizing card indexes of basic information of each toxic substance. ~~or natural~~.

(iii) Although this type of information can now be stored in computer files.

(iv) The database should have entries on all product, such as - pharmaceuticals
- household product
- pesticides.

(v) Every poison information centre will have to organize & maintain it own files.

(vi) Poison information are extracted from local pharmacopoeias & government registries.

(vii) Computerized files are generated for natural toxins, poisonous plant & venomous animal.

(viii) Collected data are stored in database.

(ix) Standardized recording of enquiries, including clinical case, will allow the centre centre to - Own clinical data
- Implement toxicovigilance.

- Support statistical studies
- Continuously evalute the quality & efficiency of its services.

Q.12 S.N on ~~evaluation~~ compound of biomedical literature.

→ It is great challenge to review the biomedical literature

→ Knowledge of standard anatomy of article assist the reader to review the Biomedical literature easily

→ Literature evalution is a process of reading & evaluating article, journal, literature & scientific study in systamic way.

→ It help to develop skill to make true judgement of scientific literature.

→ Scientific study
→ It is a written & published report that describes original research result.
→ Scientific study are written in a style that is exceedingly clear.

→ A well written scientific literature explain the author's interest.

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- Author should summarize & give an idea on previous research, and reader should be able to distinguish between previous & current study only.

- Critical appraisal :-
  → It is process of systematically examine research evidence to assess it validity, result & relevance.

- It is a way to asses the scientific value & trustworthiness of study published in research article.

- Selecting the article
  → 1° step in evalution of literature is to select an article which has a greater impact in clinical practice.

- Initally read the title, authors & abstract.

- The title should be comprehensive that the reader can efficiently analyze the article potential.

- Reading :- Reviewing begins with reading & understanding the abstract or short summary that give a brief background about the research

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⇒ Initial reading give concept of objective, methodology & result & proposed significance of study.

Q.11 Evalute the biomedical literature.

1. Title :- ~~It should be~~
It show depth & breadth of current study & indicate methodology used.

⇒ Evalution of Title
① Based on title reader connect : review or discard the study.

② Title should not contain abbrevation, proprietary name, chemical formula, & jargon.

③ Title should not reflect it content.

④ Title should not reflect author's reference

Q.2 Abstract :- An abbreviated accurate representing the content of a document, mainly prepared by it author for publication.

⇒ Abstract can be defined as a summary of each section.

Evalution:- Abstract should outline a brief summary of each section; Intro, objective, scope of investigation, material etc.

3. Introduction :- Two purpose in study, creating readers interest in subj & provide them with enough information

→ Evalution:- Should be cleared & bound, the nature & scope of problem investigated.

4. Objectives :- Here it is what author is trying to achieve
→ Specific, clear & succint statement of intended outcome from research.

Evaluation :- (1) New health program established
(2) Implement new policies
(3) Trying to settle a controversy
(4) Showing the validity of new technique
(5) Opening up a new field.

5. Material & Method :- It purpose to decide the method used in experiment.

Evaluation :- Method used & it description should be elucidated.
- Overall length & administration of data in experiment must be mention.

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(5) Study Design :- It is the 1st part of section that is utilized in doing research.
⇒ A sound study design support conclusion & result.

(2) Bias :- It is a systemic variation in which treatment groups under study are treated or measured differently on a consistent bias.
Types
① Missing data bias
② Withdrawal bias
③ Sample size bias
④ Instrument bias.

(3) Statistics :- Knowledge of statistic help an individual to evaluate whether the test in a study are appropriate or not.
Evaluation :- Reader should determine whether the appropriate method or not.
② Inappropriate method will result to misleading conclusion
③ Qualitative & quantitative data are examined.

(4) Study result & analysis :- Result should be described and presented in figure, table & chart as they are heart of literature.

Evaluation:- Reader should be proper understanding of study & should evaluate clinical & statistical study.
② Sometimes confusion present in data result due to improper data collection.
③ In case of negative result involved in study the must be quoted.

⑩ Discussion & conclusion:- It is a study provide an opportunity for the author to interpret result and explain their clinical importance by relating or comparing work or practice.

Q 13 Strategy of Medication Error

① Bar code medication administration
② Smart infusion pump
③ High alert
④ Safe drug nomenclature
⑤ Availability of patient identification
⑥ Pharmacy Maintained medication administration record
⑦ Patient Education.
⑧ Pharmacist role on patient care team
⑨ Discharge counselling
⑩ Integration of documentation
⑪ Patient survey.

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12. Integration of documentation.
13. Increase awarness
14. Patient core round
15. Avoid brand neomenclature
16. Beaware of OTC family.
17. Duplicate therapies should be managed
18. Report Error to improve proess
19. Educate caregivers
20. Educate the ~~non~~ nursing care

Q14 Enlist LFT & LFT produce Excretory product.

Ans There are 4 type of LFT test

(1) Protein synthesis

(a) Albumin.
(b) Prealbumin
(c) PT/INR.

(2) Excretion in bile duct & drainage into duodenum

(a) Bilirubin.
(b) ALP.
(c) 5'-nucleaticlase
(d) GGT

(3) Hepatocellular injury :- (a) Aminotransferase
(b) AST.
(c) ALT.

(4) Detoxification Ammonia (NH_4^+).

① Protein test

(a) Albumin :-

Normal range - 4-5g/dl - Adult
1.9-4.4g/dl - children

- Critical value <2.5 g/dl

- Affect :- ↑es oncotic pressure of plasma carrier protein
- Halftime :- 20 days
Produce :- liver
store :- Serum
Secretion :- liver

Effect High :- Dehydration
- Anabolic steroid
- limited to underlying disorder

low :- ↓es hepatic synthesis
malnutrition
Protein losses
Pregnancy
Edema
- SOB

Drug monitor & test - Parenteral nutrient.

(b) Prealbumin

Normal range :- 17-34 mg/dL

production - liver

Release : liver

Half life :- 2days

us Use in Total parentral nutrition monitoring.

(c) PT/INR

Normal range

PT :- 12.7 - 15.4 sec

INR :- 0.9 - 1.1

Critical Value :- PT > 16 sec

INR > 5

Effected by warfarin

production :- liver

Effect high :- warfarin

malabsorption

- liver disorder

- Bleeding

- Ecchymosis

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m	m	~

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low :- Vitamin K antagonist

② Excretion in bile duct & drainage in duodenum.

(a) Bilirubin.

Normal range D - 0.0 - 0.3 I - 0.2 0.8

Adult :- 0.3 - 1.3 mg/dl

pediatric :- 2 - 4 mg/dl

Critical value :- >12 mg/dl

Production - liver

Store :- Gallbladder

Secretion :- stool & urine

Total bilirubin	Direct	Indirect	diagnosis
Moderately high	within normal limit	moderately high	Hemolysis, Gilbert syndrome, neonatal jaundice
moderately high	moderately high	within normal limit	Congenital syndrome, Dubin Johnson, Rotor
mildly high	Mildly	moderately	Hepatobiliary

(b) ALP

normal range

Adult - Varies but reference as 44 to 147 (IU/L)

Production :- Intracellular enzyme

Storage :- · liver, placenta, bone & small intestine

Effects

High :- Cholestatis
- Bone diseases
- Pregnancy
- Childhood
- Underlying disorders

Low :- Vit D intoxication
Scurvy
Hypothyroidism

(c) 5' nucleotidase

Normal range :- 0-11 unit/L

location :- Heart, brain, liver, blood vessel

within normal limit :- Pregnancy

- Markedly elevated :- Cholestatic syndrome
- Mildly elevated :- Hepatocellular diseases

d) Gama-Glutamyl transferase (GGT)

Normal range :- 9-58 unit/L

within normal limit - Haemolysis
markedly elevated - cholestatic syndrome / Alcoholic d
Moderately high :- Hepatobillary disease

③ Hepatocellular injury

(a) AST

Normal range 10-40
Adult :- 12-38 IU/L
Infant :- 30-100 IU/L

Critical value > 80

Function :- Intracellular enzyme
storage :- liver, cardiac, kidney, brain

High :- Hepatitis
- Hemolysis
- muscular disease
- MI
- Renal injury
- Pulmonary infarction
- Necrotic tumor

(b) ALT

Normal range :-

Adult :- 7 - 40 IU/L

Infant :- 6 - 40 IU/L

Critical value > 60 IU/L

production :- Intracellular ~~enzyme~~ enzyme

Area :- liver, cardiac, kidney, brain

High :- Same as AST

(c) Detoxification :- Ammonia

Normal range :-

Adult :- 19 - 60 mcg/dl

Newborn < 100 mcg/dl

~~(Extra Note~~

Production :- In gut

Secretion :- Urea - metabolism

High :- Liver failure

:- Reye syndrome

- Urea cycle disturb

Hepatic Enchaphelopathy

Q16 urine colour & presence of cell
BUN
Creatinine
Specific gravity
- sediments
- protein
- glucose

(i) BUN (blood urea nitrogen).

Normal range :-
Adult : 8-23 mg/dl
Pediatric :- 5-18 mg.

(ii) High :-
- Renal insufficiency (obstruction or cancer)
- Urinary blockage (Stone or tumor)
- Heart failure (poor renal perfusion)
- Dehydration
- High protein diet
- Medicines elimination obstruct
- Azotemia

Low :- Mal nutrition
- liver damage inhibit urea cycle. cause less urea formation & increase free ammonia.
- Over hydration

(ii) Creatinine :- By product of muscle energy metabolism.

Normal range
Adult :- 0.6 - 1.2 mg/dl
Pediatric :- 0.2 - 0.7 mg/dl

High :- Dehydration
- Blood loss
- CCF
- Hypotension
- Chronic renal failure
- Glomerulonephritis
- Renal stone
- Obstruction of urinary track

Lows :- Older age
- Muscle mass weakness
- Malnutrition.

(iii) Specific Gravity

Normal range 1.016 - 1.022

High :- Addison diseases
- Heart failure
- loss of body fluid
- Narrowing of renal artery
- sugar
- shock

Lows :- Damage to kidney cell
- Diabetes insipidus
- Overhydration
- Low Na^+ level

(iv) Sediment

(v) Protein

Normal range < 200mg

High :- - Glomerulonephritis
Amyloid
Diabetic nephropathy
lupus nephritis
- Multiple myeloma
- pre eclampsia in pregnancy

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Low :- High BP
- Lower UTI
- fever
- Renal tubules damage
- Excercise
- CCF
- Acute glomerulonephritis

(vi) Glucose
Normally very low glucose in urine
0 to 0.8 mmol/L

High :- Low insulin level in blood
- Tubule damage
- High sugar consumption
- Diabetes

(vii) Urine Colour

① Red to Orange :- Myoglobin
- Hemolysis
- liver disorder
- Drugs :- warfarin,
rifampin
Isoniazid
sulfasalazine etc
- Food :- cold drink dyes
- Beets.

② Blue to green :- Biliverdin
- Bacterial infection
- Drugs :- Methyelen blue
Indomethacin
Amitryptalin

③ Brown to black :- Myoglobin
Bile pigment
Melanin
Methemoglobin
Drugs or chemical

(viii) Presence of cells

① RBC :- Glomerulonephritis.
Tubular injury

② WBC :- Pyelonephritis
- Interstinical nephritis

③ Tubular epithelial :- Necrosis
- cytomegalovirus
- Toxicity of Salicylate & heavy metal

④ Hyaline & granular :- Tubular necrosis
cell Glomerulonephritis

⑤ Waxy cast :- Chronic renal failure

Q17 Anemia test

① RBC
Hgb
Hct
} low in all anemia.

② MCV
MCH
} High in :- B_{12} deficiency
folate

low in :- Iron deficiency
Anemia of chronic diseases

③ RDW :- RBC distribution width
high in :- B_{12} deficiency
folate deficiency
Iron deficiency

④ Reticulocyte count :- High in :- - Iron
- Acute blood loss
- Hemolytic

low in - B_{12} deficiency
- folate
- anemia of chronic diseases

⑤ Serum homocysteine

High :- B_{12} deficiency

Folate "

⑥ Serum iron

Low :- Iron defn

Anemia of chronic diseases

⑦ Plasma haemoglobin :- High in Hemolytic

⑧ Total iron binding capacity

High :- Iron deficiency

Low :- Anemia of chronic diseases

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Q3 Explain in brief about various PFT.

Ans Pulmonary function test is a grp of procedure that measure the function of lungs, revelaing problem in the way of breathes.

* The Rft common test are.

(1) lung volume test :

~~(2) Expiratory reserve volume~~

(a) Tidal volume (TV) :-
Range :- 500 to 700 ml
- Air inhaled or exhaled at rest

(2) Inspiratory volume (IC)
:- ~~Amount~~ Volume of air inhaled after TV. to maximum
:- 3.4 to 3.6 L

(3) Inspiratory reserve volume
:. Amount of air inhaled after normal inhalation
:. 3.1 L

(4) Expiratory reserve volume
:. Amount of air exhaled after normal exhalation :. 1.2 L

⑤ Slow vital capacity (SVC)
∴ Full inhalation - exhalation procedure perform slowly → called SVC

⑥ Residual volume
∴ Amount of air left in lung after full exhalation
- 1.2 L

⑦ Functional residual capacity
∴ Amount of air remain after TV
- 2.4 L

⑧ Vital capacity
∴ IV - RV
∴ 5000ml

⑨ Total lung capacity
Total amount of air 6 L

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② lung flow test.

ⓐ Forced expiratory volume

- change in FVC measurement show airway obstruction.

Normal value: FEV1 :- 0.75 - 5.5 L

ⓑ Peak expiratory flow rate

- Maximum airflow rate measure
  400 - 900 L/min

ⓒ Forced expiratory flow

FEF : 25-75

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* Disease & results

① Obstructive lung diseases, chronic → ↓ FEV/FVC, ↓ FEV, - FVC, RV, TLC → Yes or ⓝ

② Obstructive lung diseas, Reversible or Stable → All ⓝ

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(3) Restrictive lung disease :- Yes FEV/FVC
or
FEV
FVC
RV
TLC
Yes

(4) Mixed Obstructive & restrictive :- FEV/FVC
yes
FEV
FVC
TLC

Yes RV

+ Specialized test.

(1) Bronchial Provocation Test.
: Used to diagnose asthma.
- Effect of drug therapy evalution
- Evaluate drug adverse or hyperactivity

Normally negative / If +ve than asthma

(2) Excercise challenge Testing
- Use to diagnose excercise induce bronchospasm (EIB)

(D2) Compenent of patient case history

ans The patient case history has main 5 primary component that are

① Medical history
② laboratory & diagnostic test
③ Problem list
④ Clinical note
⑤ treatment note

(1) Medical history.

The medical practisionar interrogate patien to obtain following info.

(a) Identification & demographics: Name, Address, occupation, Age, sex, Status, contactnumber,

(b) Chief complain :- Major health related issue or problem ~~~~ provide by patient.

(c) History of present illness :- Include complaint. enumerate in C.C

(d) Past medical history :- Include

Q2 LFT test cholestatic & Cirrhosis

(a) There are 4 type of LFT test

① Protein synthesis -

(a) Albumin
(b) Prealbumin
(c) PT/INR

② Excretion in bile duct & drainage in to duodenum

(a) Bilirubin
(b) ALP
(c) 5'-nucleotidase
(d) GGT

③ Hepatocellular injury

(a) Aminotransferase
(b) ALT
(c) AST

④ Detoxification :- (Ammonia)

* liver Cholestatic liver diseases

- Cholestatic liver diseases is a condition that affect the bile duct, result in buildup of bile in liver.

(a) ALP (alkaline phosphate) :-
- Elevated level indicate liver cholestatic

(b) Gamma-glutamyl transferase (GGT) :-
- Elevated in liver cholestatic

(c) Bilirubin :
- It buildup in liver due to bile duct obstruction result in Elevated bilirubin level.

* Liver cirrhosis

- Liver cirrhosis is a condition in which the liver tissue become scarred and damage leads to liver failure.

(a) ALT (alanine aminotransferase)
: Elevated level show liver damage or inflammation

(b) AST (aspartate aminotransferase)
: Elevated level

(c) ALP : Elevated level show damage or obstruction

(d) Total Bilirubin
- Elevated level cause jaundice common in cirrhosis

(e) Albumin
- low level of albumin show liver diseases or damage

(f) Prothrombin time (PT)
- low level of clotting factor lead to delay clotting and hence prolonged prothrombin time due to results in liver damage.

Q3 Non verbal. Verbal communication

Mid 1 - Q 2 CP-1

Q4 Define adr. evalution & reporting of ADR.

(i) Any harmful or unintended reaction of a medication that

(ii) Any response to a drug which is noxious, unintended and occur at doses used as normal dose to treat therapeutic diseases

(iii) There are 5 type of adverse drug reaction based on drug effect.

(iv) The following are the steps involved in the evalution of ADR.

(i) Suspected ADR identification
- This is the first step
- Suspected adr can be identified through various sources by health worker, patient and caregiver

(ii) Causality assessment :- This is the next step of evalution.
- It involves determining which medication likely cause the adr or any other factor involved

- The assessment done by using various tools like Naranjo algorithm or Uppsala Montoring Centre.

(iii) Severity assessment :- It involves determing the degree of harm caused by the reaction, mild → moderate → severe → fatal.

(iv) Frequency assessment :- Involves determining how often the reaction occur in patient taking medication.

(v) Risk assessment :- Last and final step is risk assessment.
- This involves, assessing the risk of ADR occuring in patient taking medication compared to benefit outweigh the risk associated with ADR.

(vi) Dose response relationship :- This include close related ADR response.

(vii) Co-morbidities :- Presence of other medical condition or use of other medication can increase the risk of ADR.

- Reporting

1) Identify the ADR
2) Collect information
3) Report to appropriate authority
4) Provide detail
5) Include Patient information
6) Describe the reaction
7) Follow-up notes
8) Use the standardized ADR form

Winter.

Q4(a) Cardiac Marker.

→ There are several types of cardiac markers are.

1) Troponin
2) Creatine kinase (CK)
3) Myoglobin
4) Brain Natriuretic Peptide (BNP)
5) C-reactive protein (CRP)
6) Lactose dehydrogenase (LDH)
7) Imagine techniques like.
   - ECG
   - Chest radiography
   - Nuclear imagine
   - CT scan.
   - MRI
   - Blood Pool Imaging

* Diseases related abnormality

1) Acute myocardial infraction (AMI)

Troponin :- Yes Normal range :-
CK & MB :- Yes Normal range :-

2) Heart failure

BNP, HR & Galectin - 3 level increase

Normal

Normal range

BNP :- less than 100 pg/ml.
HR :- 60-100 bpm
Galectin 3 :- less than 17.8 ng/ml

3) Angina, CAD, Arrythmia, AF

ECG abnormalities

4) Cardiac myopathy

Troponin :- ↑es N :- less than 0.03 ng/m
CK :- ↑es N :- 26-192 U/l

5) Pericarditis

CRP :- ↑es

6) Myocarditis

Troponin :- ↑es
CK :- ↑es
CRP :- ↑es. (N) :- less than 6.

7) Dilated cardiomyopathy

Troponin :- ↑es
CK :- ↑es

Haematological test.

1. RBC
2. WBC
3. Plt.

1. RBC

N :- 4.3 to 5.2 Mn cell/cmm

low :- CKD, Hemolysis, Hamorrhage, Vessel injury, Haemorrhoids

High :- Tumor, COPD, Emphysema,

2. Hb

N = 14 to 18 g/dl.

low = Anemia, Hemorrhage, Menorrhagia.

High :- COPD, Emphysema, CHDiseases.

③ HCT or PCV.

4R to 52%.

low :- Anemia
Over hydration
Blood loss

High :- Dehydration

④ MCV.

90 ± 10

low :- A
I

High :- B F deficiency

⑤ MCHC :- 34±3

low :- Hypochromia

⑥ RDW :-

High :- B F A I

⑦ Reticulocyte :- (N) 0.1 to 2.4 %

low :- Aplastic anemia

High :- Hemolytic
B-folate
Iron.

⑧ ESR :- (N) 0 to 20 mm/hr

low :- CHF, Hypofibrinogen

High :- chronic infection
Necrosis
- RA
- Auto immune disease

⑨ WBC :- 4000 to 11000 cell/mm³

low :- Bone marrow depression
- Antineoplastic agent

High :- leukemia
- Necrosis
- Infection

Consider pharm d guru

or pharm d notes

for Adverse drug classification chapter