

UNIVERSITI SAINS MALAYSIA

PROGRAM SARJANA FARMASI
SEMESTER II 1994/95

APRIL 1995

FCP 554: PRAKTIS FARMASI KLINIKAL

(3 HOURS)

This examination consists of two sections.

Section A consists of 100 multiple choice questions.

Section B consists of two(2) long questions.

Answer ALL question.

Answers to section A must be entered into the scripts provided.

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Section A

Mark (/) the answers on the opposite space corresponding to a correct or most appropriate answer for each question. Each question has only correct or most appropriate answer or statement.

Q1. Which of the following is not true about hypersensitivity adverse drug reactions?

- A. They include diarrhea, flatulence, rash and anaphylaxis.
- B. Prior exposure to the component is a necessity.
- C. They are independent of dose.
- D. They are associated with the presence of IgE antibodies.

Q2. Which of the following is/are true regarding methods of detecting and reporting adverse drug reactions ?

- I. The restrospective method mostly depends on voluntary physician reporting and drug use evaluation programs.
 - II. The prospective method allows circumstances surrounding the event to be evaluated.
 - III. The concurrent method does not allow evaluation of circumstances surrounding the event.
 - IV. The prospective method requires time and resources commitment; thus it is limited to selected patients only.
- A. I and III only.
 - B. I,II and III only.
 - C. II and IV only.
 - D. IV only.

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Q3. Which of the following is not relevant in the systematic evaluation of the likelihood that a reaction is drug related ?

- A. Evaluation of previous ADR experience with the drug.
- B. Reappearance of reaction when the drug is rechallenged.
- C. Devaluation of diagnosis for use (indication) of the drug.
- D. Evaluation of chronologic sequence of events (timing of events) in relation to drug administration.

Q4. Which of the following is not an appropriate characteristic consistent for the use of therapeutic drug monitoring (TDM) for a neuroleptic 'H' in a schizophrenic patient?

- A. Drug H having a well defined concentration - outcome relationship.
- B. Drug H having a rapid onset of action.
- C. Detection of early toxicity of drug H is complicated by the disease.
- D. Metabolism of drug H is affected by genetic differences.

Q5. Which of the following statements about *in-vitro* inactivation of aminoglycosides is not true?

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- A. Significant inactivation of gentamicin can occur if the serum contains both gentamicin and carbenicillin.
- B. Significant inactivation of gentamicin can occur if serum is left exposed at room temperature.
- C. Tobramycin is the least stable and Amikacin is the most stable aminoglycoside in the presence of all concentrations of penicillins.
- D. Keeping samples under refrigeration or frozen can arrest the inactivation process.

Q6. Which of the following statements regarding methods of analysis is not true?

- A. High Performance Liquid Chromatography (HPLC) is more specific than immunoassay methods.
- B. More than one drug can be analysed using an immunoassay method from the same sample.
- C. With the Fluorescence Polarisation Immunoassay method, the lower the concentration of a drug is, the higher the polarisation reading will be.
- D. With the Enzyme Multiplied Immunoassay technique, the lower the concentration of a drug the lower the absorbance reading will be.

Q7. Which of the following statements regarding sampling times for TDM is true?

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- A. It is not practical to assay for the peak concentration of gentamicin if the sample is taken 2 hours after the infusion completes.
- B. The 6 - 8 hour post dose sampling time does not apply to a patient taking digoxin who is already at steady-state.
- C. In a patient who is already at steady-state, sampling time for phenytoin does not need to be at pre-dose.
- D. All samples for TDM must be drawn only when the patient has reached a steady-state condition.

Q8. Which of the following statements regarding TDM is not true ?

- A. TDM is appropriate for drugs showing linear pharmacokinetics only.
- B. TDM provides useful information for drugs showing variabilities in metabolism.
- C. TDM is appropriate for drugs with delayed onset of action.
- D. TDM is still useful even when to stop drug treatment is to be stopped.

Q10. Which of the following statements is/are not true about aminoglycoside-induced nephrotoxicity?

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- I. Nephrotoxicity is generally reversible upon discontinuing treatment.
- II. Maintenance of serum aminoglycoside concentrations within the therapeutic range prevents nephrotoxicity.
- III. Persistent trough gentamicin concentration above 2 ug/ml is associated with nephrotoxicity.
- IV. A rise in serum creatinine precedes changes in the elimination of aminoglycoside.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q11. Which of the following is not true regarding drug-induced hepatic disease?

- A. Lactose dehydrogenase (LDH) is usually elevated in cholestatic disease.
- B. Aspartate transaminase (AST) and alanine transaminase (ALT) are indicators of necrotic lesions within the liver.
- C. Paracetamol-induced hepatotoxicity is an example of predictable adverse drug reaction.
- D. Isoniazid-induced hepatotoxicity is an example of idiosyncratic adverse drug reaction.

Q12. Which of the following is/are not true regarding drug-induced hematologic disorders?

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- I. The adverse reaction may be caused by an abnormal sensitivity of a stem cell population.
- II. In penicillin-induced hemolytic anemia, penicillin is adsorbed to the red blood cells (RBC) surface which are later coated with antibodies.
- III. These adverse reactions may have a genetic predisposition.
- IV. In quinidine-induced hemolytic anemia, quinidine forms antibody complex which is then attached to RBC's.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. I, II, III and IV.

Q13. Which of the following statements regarding catheter related infection in total parenteral nutrition (TPN) patient is/are not true?

- I. It is more common in patient with multiple intravenous line.
- II. It is more common with central parenteral nutrition.
- III. It is more common with triple lumen catheter.
- IV. It is best avoided by frequent monitoring.

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- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q14. Which of the following statements regarding the use of TPN in hepatic failure is/are true?

- I. Fat preparation is preferred as the main source of energy.
- II. Aromatic amino acids will accelerate the development of encephalopathy.
- III. Carbohydrate is the best source of energy in a patient with hepatic failure.
- IV. Elevation of ammonium levels indicates protein intolerance.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q15. Which of the following statements regarding pediatric parenteral nutrition solution is/are true?

- I. It is best prepared to contain one kilocalorie per millilitre.
- II. It is best administered peripherally.
- III. Fat emulsion is always given separately.
- IV. Heparin is always added into the TPN solution to prevent coagulation.

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- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q16. Which of the following steps is/are appropriate for the management of catheter-related infection in a TPN patient ?

- I. Addition of heparin into the TPN solution.
- II. Withdrawal of catheter is mandatory in all septic cases.
- III. Antibiotic should be administered through the catheter to eradicate the infecting microorganisms.
- IV. TPN should be discontinued immediately and replaced with dextrose 10 % .

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q17. Which of the following is/are common sources of central catheter related infections?

- I. Contamination of TPN solutions.
- II. The use of TPN line for the administration of other solution.
- III. Translocation of microorganisms.
- IV. Inappropriate dressing.

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- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q18. Which of the following complications is/are associated with central line catheters?

- I. Thrombocytopenia.
 - II. Haemolysis.
 - III. Leucocytosis.
 - IV. Air embolism.
-
- A. I and III only.
 - B. I, II and III only.
 - C. II and IV only.
 - D. IV only.

Q19. Which of the following statements is/are true regarding hyperglycaemia in a patient receiving parenteral nutrition?

- I. Hypoinsulinemia is the most common cause.
- II. Heparin is used to increase glucose elimination.
- III. Discontinuation of TPN is mandatory.
- IV. Reduction of glucose concentration in subsequence TPN is recommended.

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- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q20. Which of the following problems is/are associated with the use of drugs in patients receiving parenteral nutrition?

- I. Interference with laboratory analysis.
 - II. Acceleration of the rate of TPN infusion.
 - III. Alterations of the pharmacokinetic of drugs.
 - IV. Thrombophlebitis.
-
- A. I and III only.
 - B. I, II and III only.
 - C. II and IV only.
 - D. IV only.

Q21. Which of the following statements regarding the use of total parenteral nutrition infusion line is/ are true ?

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- I. The use for administration of other drugs is strictly prohibited.
- II. The administration of drugs with known compatibility is allowed.
- III. The administration of other drugs could be done through the "Y" connector.
- IV. The use of "Y" connector requires pre and post flushing procedures with normal saline.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q22. Which of the following statements regarding the rate of infusion of central parenteral nutrition is/are true?

- I. It should be increased gradually.
- II. The infusion could stopped abruptly.
- III. The rate of 40 ml/hr is recommended for the initiation of TPN.
- IV. The maximum rate should not exceed 100 ml/hr.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

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Q23. Which of the following is/are parameters used to monitor improvements of nutritional status in a TPN patient ?

- I. Nitrogen balance.
- II. Creatinine height index.
- III. Visceral protein levels.
- IV. Abdominal girth.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q24. Which of the followings is/are complication(s) associated with excessive protein supplements in TPN?

- I. Hypoammonemia.
- II. Elevation of transferrin level.
- III. Albuminuria.
- IV. The development of encephalopathy in a patient with liver problem.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

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Q25. Which of the following parameters should be monitored prior to the initiation of TPN ?

- I. Type and volume of fluid intake.
 - II. Serum biochemistry.
 - III. Central catheter for central TPN.
 - IV. Peripheral catheter for peripheral TPN.
-
- A. I and III only.
 - B. I, II and III only.
 - C. II and IV only.
 - D. IV only.

Q26. Which of the following conditions increase(s) zinc losses?

- I. Peritoneal dialysis.
 - II. Severe diarrhoea.
 - III. Renal failure.
 - IV. Ileostomy.
-
- A. I and III only.
 - B. I, II and III only.
 - C. II and IV only.
 - D. IV only.

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Q27. Which of the following conditions is/are (a) feature(s) of protein-calorie malnutrition?

- I. Generalised oedema.
- II. Renal failure.
- III. The presence of flag sign.
- IV. Abdominal distension.

- A. I and III only.
- B. I, II and III only.
- C. II and IV only.
- D. IV only.

Q28. Which of the following statements regarding indications for TPN in surgical patients is/are true?

- I. TPN is indicated in all surgical cases with multiple organ failure.
- II. TPN is used in patients with paralytic ileus post-operation.
- III. TPN is used during the first 48 hours to prevent complications associated with catabolism.
- IV. TPN is used in prolonged fistulae.

- A. I and III only are true.
- B. I, II and III only are true.
- C. II and IV only are true.
- D. IV only is true.

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Q29. Which of the following does not constitute a patient drug-taking problem?

- A. Modifying drug dosages.
- B. Taking a homeopathic drug.
- C. Experiencing an exacerbation of asthma.
- D. Misinterpretation of drug labelling.

Q30. Which of the following contents of pharmacist communications with the prescriber to clarify a prescription is considered unprofessional?

- A. A clear and brief description of the potential problem.
- B. Citation of a literature reference indicating the clinical significance of the identified problem.
- C. Providing an alternative plan to solve the prescription problem.
- D. None of the above.

Q31. Which one of the following activities is important to assist pharmacists to improve their counselling skills?

- A. Reading of books on related subject.
- B. Practising and obtaining feedbacks.
- C. Attending a counselling workshop.
- D. All of the above.

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Q32. Which of the following is/are part of a patient's drug-taking behaviour that can lead to noncompliance?

- A. Belief that the therapy will not work.
- B. Disagreeing with the diagnosis.
- C. Fear of side-effects.
- D. All of the above.

Q33. Which of the following contribute to the optimal, teachable moment in a pharmacist's counselling session?

- A. A private consultation area.
- B. Unhurried pace of the pharmacist.
- C. Calling a patient by his/her name.
- D. All of the above.

Q34. Which one of the following methods of compliance assessment seems to be the most practical means of monitoring compliance in clinical practice?

- A. Patient's self-report.
- B. Pill counting.
- C. Electronic monitoring device.
- D. Monitoring of drug serum concentration.

Q35. Which of the following activities of the outpatient pharmacist is considered inappropriate?

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- A. Detection and diagnoses of adverse drug reactions and drug interactions.
- B. Detection and overcoming incompatibilities in drug mixtures.
- C. Performing drug utilization review and drug use evaluations.
- D. None of the above.

Q36. The followings are examples of a prescribing errors that should be identified during prescription screening process, except

- A. prescription of two drugs to obtain the benefit of their additive effects.
- B. prescription of a drug for an unapproved indication.
- C. prescription of a drug to treat another drug side-effects.
- D. prescription of two drugs that act antagonistically at the receptor site.

Q37. The most important reason for preferring a plasma drug level as a measurement for patient compliance is

- A. because there is no other method of measuring compliance that is sufficiently accurate.
- B. because the plasma level can easily be obtained at the time of clinic appointment.
- C. because this allows us to determine whether the prescribed regimen is therapeutic.
- D. because the level cannot be faked by the patient.

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Q38. Patient counselling process should be tailored to the individual needs as to

- A. exploring what the patients want to know.
- B. determining what the patients need to know.
- C. determining the scope of discussion with patients.
- D. all of the above.

Q39. The pharmacists can most efficiently have a positive impact on patients by

- A. using written material to supplement counselling activities.
- B. selecting patients most in needs of compliance oriented counselling.
- C. notifying patients about their refills dates.
- D. all of the above.

Q40. The needs for a systematic process during prescription screening is/are to

- A. serve as a guide for the pharmacists to identify potential or actual drug-related problems.
- B. identify and document all prescribing errors.
- C. protect patients from any unnecessary drug risk.
- D. all of the above.

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Q41. Which of the following factors may influence patient's drug-taking behavior?

- A. Doctor-patient communication.
- B. Patient's past experience with the prescribed drug.
- C. Patient's belief about the prescribed therapy.
- D. All of the above.

Q42. Which of the following is considered irrational prescribing?

- A. To obtain a curative effect of a drug.
- B. To obtain a placebo effect of a drug.
- C. To get an economic gain from the prescribed drug.
- D. All of the above.

Q43. Which of the following activities can be performed by the community pharmacists?

- A. Screening for disease risk factors.
- B. Assessment of the patient's signs/symptoms.
- C. Monitoring for drug adverse reactions.
- D. All of the above.

Q44. Which of the following is/are reason(s) for stopping drug therapy that is/are most commonly cited by patients?

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- A. Bored with taking the medications.
- B. Experiencing drug side-effects.
- C. Perception of drug ineffectiveness.
- D. All of the above.

Q45. Which of the following is/are the main reason(s) for the reluctance of the community pharmacists to engage in clinically-orientated services?

- A. Interprofessional conflicts among the health-care providers.
- B. Reimbursement and economic gain from such services.
- C. Inadequate drug information sources.
- D. All of the above.

Q46. For an effective counter prescribing or responses to symptoms, the community pharmacists should be able to

- A. explore the patient's self-medication activities.
- B. differentiate between minor illness and major disease.
- C. conduct medication history taking.
- D. any two of the above.

Q47. The meaning of drug responses from the patient's point of view is

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- A. the behavioral and physical changes upon taking the medications.
- B. that portion of the change (emotional/physical/behavioral) that is due to the pharmacologic action of the drug.
- C. the pharmacokinetic and pharmacodynamic changes produced by the drug.
- D. none of the above.

Q48. Which of the following is not a significant barrier to the provision of effective counselling services?

- A. Cultural diversity of the pharmacy's patient population.
- B. Lack of complete information regarding each prescription.
- C. Poorly developed communication skills.
- D. A low educational level of the patient population.

Q49. Which of the following factors is the least important to be considered in the appropriate drug selection?

- A. Patient-related characteristics.
- B. Comparative efficacy.
- C. Comparative safety.
- D. Marriage status.

Q50. Which of the following statements is the goal of the appropriate drug regimen?

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- A. To provide the correct dose, frequency, route, dosage form, and mode.
- B. To increase patient's compliance.
- C. To minimize patient's financial problem.
- D. To reduce hospital cost.

Q51. Which of the following statements regarding drug allergies or intolerante is true?

- A. Intolerance to a medication is generally unimportant when you select a drug therapy.
- B. Patients with medication allergies or intolerances should be counselled to carry a wallet card or wear jewelry that warns health professionals in an emergency.
- C. Health professional should not worry when prescribing drugs previously known to cause significant side effect.
- D. A patient may see multiple physicians to ask about the appropriateness of his/her medication currently being taken.

Q52. Which of the following is a reason for assessing drug-related problems?

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- A. Frequently ill patients have end-stage renal failure.
- B. Patient with hypertension and diabetes have a high risk to develop drug side effects.
- C. Many times, these adverse drug reactions are overlooked by other health professionals. These reactions can cause severe medical problems and may present a significant risk to the patient.
- D. Frequently, multiple drugs use contains unacceptable therapeutic duplication.

Q53. How can age be a factor in an adverse drug event?

- A. Some drugs or drug dosage may be appropriate in one age group and do not cause adverse effect but may cause serious sequelae in another age group.
- B. Age is an initial indicator to determine drug-drug interactions.
- C. Adverse drug reaction is less significant in a patient who is above 40 years old.
- D. Elderly patients requires oral administration to minimize drug adverse effects.

Q54. Which of the following can enhance the quality of unit dose drug distribution services?

- A. Clinical services.
- B. Patients attitude.
- C. Nurses-patients relationship.
- D. Prescription of less expensive drug.

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Q55. Which of the following is the purpose of a quality assurance program in drug distribution service?

- A. To ensure that the correct drug, dose, dosage form, frequency and route of administration is given to patient.
- B. To promote pharmacist-nurse relationship.
- C. To reduce hospital budget.
- D. To increase pharmacy skill in prescription screening.

Q56. Which of the following statements regarding criteria or measures of quality in a quality assurance activity is true?

- A. Subjective measures are much easier to assess.
- B. They should be based on standards which reflect optimal but achievable measures.
- C. Measures should be based on patients' financial status.
- D. Pharmacist's workload is the best measure of quality in drug distribution system.

Q57. Which the following statements regarding therapeutic duplication is true?

- A. Patients who see multiple prescribers have an increased likelihood for therapeutic duplication.
- B. Multiple drugs used for one disease state is always considered as an unacceptable therapeutic duplication.
- C. Duplications in a patient's drug therapy cause a high mortality in emergency situations.
- D. Therapeutic duplication is always recommended in hypertensive treatment.

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Q58. Which of the following is not an advantage of a unit dose system?

- A. Reduction in the incidence of medication errors.
- B. Greater control by the pharmacist over pharmacy workload patterns and staff scheduling.
- C. Reduction in the size of drug inventories located in patient-care areas.
- D. Greater number of drug credits.

Q59. Which of the following drug-related problems is difficult to identify on a unit dose profile screening?

- A. Drug-drug interaction.
- B. Polypharmacy.
- C. Underdosage or overdosage.
- D. Noncompliance.

Q60. Which of the following drug-related problems is easy to identify on unit dose profile screening?

- A. The actual problems of drug overdoses.
- B. The actual problems of drug interactions.
- C. The actual problems of drug administrations.
- D. The potential problems of drug-disease interactions.

Q61. Which of the following laboratory monitoring skills is least needed by a pharmacist?

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- A. Monitor laboratory tests to assess the therapeutic and adverse affects of a drug.
- B. Monitoring laboratory tests to determine proper drug doses.
- C. Monitoring laboratory tests to prevent misinterpretations resulting from drug interference with laboratory.
- D. Monitor laboratory tests to confirm a patients diagnoses.

Q62. Which of the following characteristics is unique to unit dose medication systems?

- A. Medication order screening is performed by a pharmacist.
- B. Transcribing order is always done by nurses.
- C. Emergency drugs are always kept in pharmacy satellite.
- D. Medication supply is only for twenty four hours.

Q63. Which of the following components is usually not included in a unit of use medication system?

- A. Medication trolley.
- B. Physician order form.
- C. Drug administration records at the nursing station.
- D. Individual administration partition.

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Q64. Which of the following is not an advantage of decentralized unit dose satellite?

- A. Improvement of communication with other professionals via person-to-person interactions.
- B. Shared use of space and personnel for clinical activity.
- C. Lower setup and operating costs.
- C Require more manpower to implement the system.

Q65. On pharmacy rounds, a gentlemen who was receiving chloramphenicol capsule for typhoid fever was found to keep the capsule under his pillow. The pharmacist should ...

- A. reprimand the patient for not taking the capsule.
- B. just leave the patient be.
- C. advise the doctor in-charge to talk to the patient.
- C interview the patient privately and explore possible reasons for not taking the capsule.

Q66. Which of the following statements regarding unit-of-use is true?

- A. The system is error free and ideal for small hospitals.
- B. The system does not use medication trolley.
- C. It involves the combination of ward stocks and unit dose packets.
- C Medication is supplied for more than twenty four hours. (i.e. 3-5 days).

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Q67. Which of the following drug-related problems can most likely be detected by drug therapy monitoring?

- A. Potential problems of drug - drug interactions.
- B. Actual problems of polypharmacy.
- C. Potential problems of subtherapeutic doses.
- C Actual problems of patient not receiving the drug.

Q68. Which of the following statements are true?

- I The therapeutic ranges for most drugs commonly monitored were established in well designed clinical trials.
 - II Plasma concentrations of drugs generally reflect the drug concentrations at the sites of action.
 - III Drugs can be given in doses that may result in concentrations above their conventional therapeutic ranges.
 - IV Therapeutic ranges may vary for different patients with different clinical conditions.
- A. I and II only.
 - B. III and IV only.
 - C. I, II, III and IV.
 - D. II, III and IV only.

Q69. Which of the following statements are true?

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- I Digoxin has a narrower therapeutic index compared to gentamicin.
 - II The therapeutic range of phenytoin may be altered in patients with nephrotic syndrome.
 - III A higher plasma concentration of digoxin may be required to control atrial fibrillation compared to that required to treat heart failure.
 - IV A lower plasma concentration of theophylline may be required to control neonatal apnea compared to that required to control bronchospasm.
- A. I and II only.
 - B. III and IV only.
 - C. I, II, III and IV.
 - D. II, III and IV only.

Q70. Which of the following statements are true?

- I Toxicity can occur even when a drug concentration is within the therapeutic range.
 - II Maintaining gentamicin concentrations within the therapeutic range will not guarantee freedom from gentamicin toxicity.
 - III Peak gentamicin concentrations above 8 mg/L is associated with nephrotoxicity.
 - IV Amikacin is more potent than gentamicin.
- A. I and II only.
 - B. III and IV only.
 - C. I, II, III and IV.

D. II, III and IV only.

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Q71. Which of the following statements are true?

- I. The pH at the site of infection will influence the therapeutic range of gentamicin.
- II. Local sensitivity patterns can influence the therapeutic range of gentamicin.
- III. Peak tissue concentrations of gentamicin occur at the same time as the peak plasma concentrations.
- IV. Gentamicin nephrotoxicity is generally irreversible.

- A. I and II only.
- B. III and IV only.
- C. I, II, III and IV.
- D. II, III and IV only.

Q72. Applying the rule of eight for dosing gentamicin, what is the appropriate dosing interval for a male patient who has a serum creatinine of 240 $\mu\text{mol/L}$?

- A. Every eight hourly.
- B. Every twelve hourly.
- C. Every twenty-four hourly.
- D. Every forty-eight hourly.

Q73. What is an appropriate dosage regimen for IV gentamicin in a male patient weighing 50 kg and having an estimated creatinine clearance of 10 ml/hour?

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- A. 100 mg every 18 hourly.
- B. 80 mg every 12 hourly.
- C. 80 mg every 48 hourly.
- D. None of the above is appropriate.

Q74. What is the estimated half-life of gentamicin for the patient in question no. 73 above?

- A. 5.2 hours.
- B. 3.8 hours.
- C. 18 hours.
- D. None of the above.

Q75. What would be the most appropriate loading dose of digoxine to achieve a target concentration of 1 ng/ml for the patient in question no. 73?

- A. 0.500 mg.
- B. 0.375 mg.
- C. 1.000 mg.
- D. None of the above.

Q76. What is the estimated volume of distribution of digoxin for the patient in question no. 73?

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- A. 350 liters.
- B. 700 liters.
- C. 223.2 liters.
- D. None of the above.

Q77. What is the estimated rate constant of elimination of digoxin for the patient in no. 75?

- A. 0.0063 per hour.
- B. 0.0046 per hour.
- C. 0.0023 per hour.
- D. None of the above.

Q78. Which of the following statements are true?

- I The volume of distribution of digoxin is independent of renal function.
- II The volume of distribution of gentamicin is independent of renal function.
- III The rate constant of elimination of gentamicin is a function of creatinine clearance.
- IV The rate constant of elimination of digoxin is a function of renal function.

- A. I and II only.
- B. III and IV only.
- C. I, II, III and IV.
- D. II, III and IV only.

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Q79. Which of the following factors influence(s) the clearance of theophylline?

- I Obesity.
- II Cirrhotic liver disease.
- III Alcohol habits.
- IV Smoking habits.

- A. I and II only.
- B. III and IV only.
- C. I, II, III and IV.
- D. II, III and IV only.

Q80. RJ, a 37-year-old, 70 kg male has been receiving 300 mg of phenytoin sodium nightly for 6 months. Despite this, he still reported one or two seizure attacks per week. A plasma phenytoin level was obtained and determined to be 8.0 mg/L. What is the appropriate maintenance dose with phenytoin capsules to maintain a steady-state level of 15 mg/L?

- A. 400 mg per day.
- B. 330 mg per day.
- C. 360 mg per day.
- D. 300 mg per day.

Q81. What is the estimated V_{max} of phenytoin for the patient in question no. 80?

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- A. 414 mg per day.
- B. 315 mg per day.
- C. 360 mg per day.
- D. None of the above.

Q82. Which of the following statements regarding studies on population pharmacokinetics are true?

- I In the naive pooling approach, data from all subjects are pooled as if from one single subject.
- II A disadvantage of the naive pooling approach is its inability to estimate variability between subjects.
- III In the standard two-stage method, parameters are determined in individual subjects and then pooled to obtain population means and standard deviations.
- IV The iterative two-stage method makes an initial use of population data obtained from the standard two-stage method.

- A. I and II only.
- B. III and IV only .
- C. I, II, III and IV .
- D. II, III and IV only.

Q83. Which of the following computer programs utilize the Bayesian fitting method to estimate patient-specific parameters?

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- I PC NONLIN[®]
- II OPT[®]
- III USC*PACK[®]
- IV Abbott PKS[®]

- A. I and II only.
- B. III and IV only.
- C. I, II, III and IV only.
- D. II, III and IV only.

Q84. Which of the following is/are (a) true description(s) of secondary references?

- I It may be in the form of an abstracting service.
- II It may be in the form of a monograph.
- III It may be in the form of an indexing service.
- IV It may contain original research articles.

- A. I and III only .
- B. II and IV only .
- C. I, II and III only.
- D. IV only .

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Q85. Which of the following is/are (a) reason(s) obtaining background information of the caller?

- I To determine the urgency of the question.
- II To determine the difficulty level of the question.
- III To determine the importance of the question.
- IV To determine the extent of search that needs to be carried out.

- A. I and III only.
- B. II and IV only.
- C. I, II and III only.
- D. IV only.

Q86. Which of the following is a reason to know where drug information question originate?

- A. To determine the background information of the caller.
- B. To determine the difficulty level of the question.
- C. To determine the urgency and importance of the question.
- D. To determine the types of drug information sources that will be searched.

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Q87. Which of the following background information - drug information classification pairs is not needed from the caller when handling queries?

- A. Specific drug in question-adverse drug reaction.
- B. Diagnosis for which drug is prescribed-drug dosing.
- C. Drug country of origin-pharmacokinetics.
- D. Disease state description-drug therapy.

Q88. Which of the following are reasons for making follow-up drug information calls?

- I To determine if the right question was in fact asked.
 - II To determine if the right answer was given.
 - III To determine if the answer was accepted.
 - IV To determine if further assistance is needed.
-
- A. I and III only.
 - B. II and IV only.
 - C. I, II and III only.
 - D. I, II, III and IV.

Q89. Which of the following rules cannot be applied when communicating an answer for drug information queries?

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- A. Avoidance of statements such as "I think" or "I don't think".
- B. Never guessing an answer.
- C. Formulation of an answer based on abstracts only.
- D. Asking the caller if additional information is required.

Q90. Which of the following is not an important reason for classifying drug information questions?

- A. To guide us as to when background or patient history information is required.
- B. To provide an indication as to the types of preliminary sources needed to answer the question.
- C. To provide an idea as to the type and sophistication of the answers to be generated.
- D. To provide an idea as to the caller's background.

Q91. Which of the following is not part of the circle of quality assurance in drug information?

- A. Development of treatment guidelines.
- B. Development of an auditing system to monitor usefulness of information.
- C. Revising present guidelines.
- D. None of the above.

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Q92. Which of the following is the least important consideration for determining the overall design of a Drug Information Centre (DIC)?

- A. Types of information.
- B. Function of information.
- C. Location of practice.
- D. Quality of leadership.

Q93. Which of the following is not a function of a Drug Information Centre?

- A. Answering drug information queries.
- B. Supporting drug and therapeutics committee.
- C. Coordinating education programmes.
- D. Reporting and monitoring adverse drug reaction occurrences.

Q94. Which of the following are components of a sound quality assurance programme put forward by the Joint Commission on Accreditation of Drug Information Centre?.

- I Identification and assessment of problems
- II Implementation of solutions
- III Monitoring of application of solutions.
- IV Documentation of results

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- A. I and II only.
- B. II and IV only.
- C. I, II and III only.
- D. I, II, III and IV.

Q95. Which of the following references provide the most recent information?

- A. Secondary references.
- B. Primary literature.
- C. General references.
- D. Tertiary references.

Q96. Which of the following will be searched last when conducting a systematic search for drug information?

- A. General references.
- B. Primary literature.
- C. Secondary references.
- D. Tertiary references.

Q97. Which of the following references is least useful for drug dosing information?

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- A. American Hospital Formulary Services. R
- B. Clinical Pharmacy and Therapeutics. R
- C. Drugdex. R
- D. British National Formulary. R

Q98. Which of the following provides information tailored for direct consumption to patients?

- A. United States Pharmacopoeia-Drug Information. R
- B. Martindale. R
- C. British National Formulary. R
- D. Physician Desk Reference. R

Q99. Which of the following would be the most profound reference source for a unit that requires research-based answers?

- A. Clin-Alert. R
- B. Medline. R
- C. Current-Contents. R
- D. Inpharma. R

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Q100. Which of the following is not useful for answering questions related to adverse drug reactions?

- A. Clin-Alert. ^R
- B. Poisonsdex. ^R
- C. Reactions. ^R
- D. Meyler's Side-Effects of Drugs. ^R

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Section B

Question 1A.

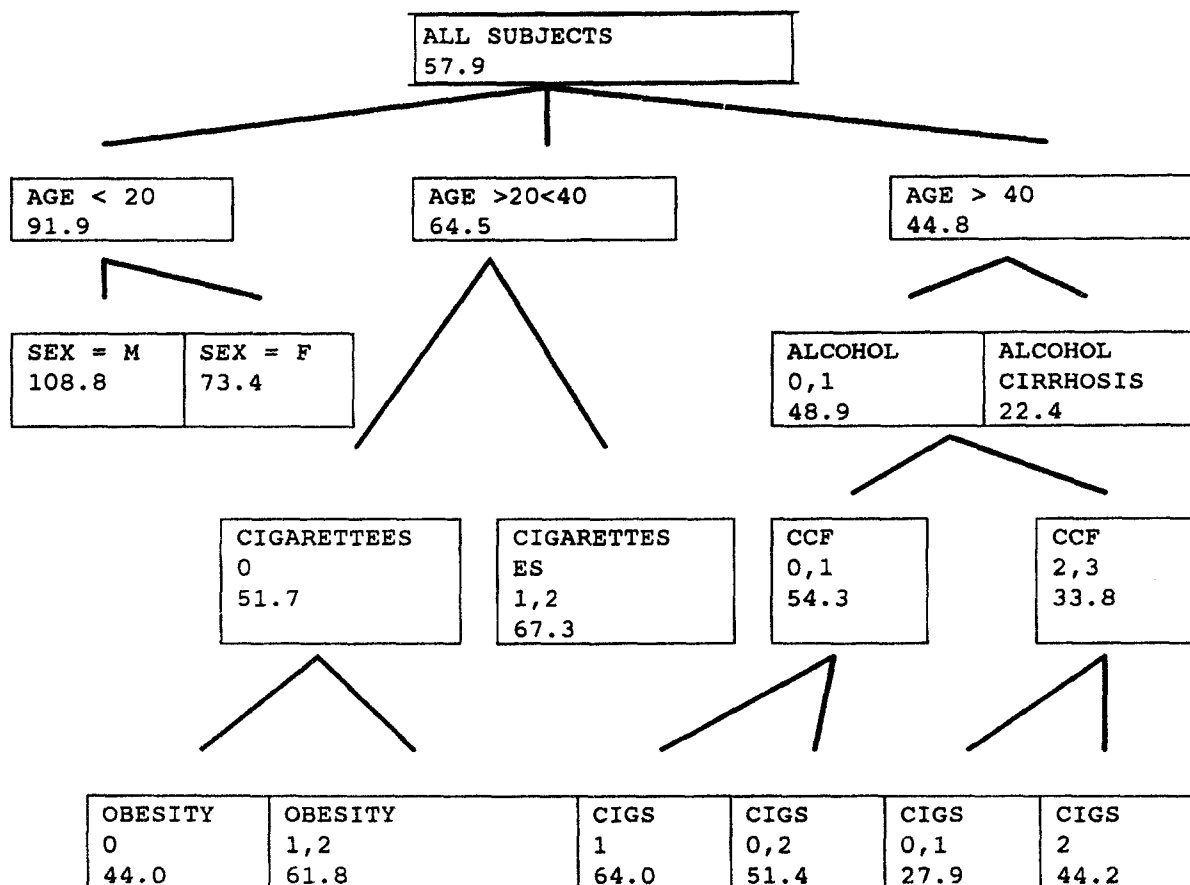


Fig. 1. The above flow chart is an abbreviated version of the theophylline clearance normogram published by Jusko et al. (1979). All clearance values are in units of ml/h/kg ideal body weight. The figures 0,1,2,3 refer to different degrees of the relevant factors.

Based on the above normogram, estimate the oral theophylline dose required to obtain a steady state theophylline concentration of 10 mg/L for a 50 kg, 50-year old male COPD patient. The man is known to be a heavy smoker and is also noted to suffer from a mild to moderate congestive cardiac failure. Provide also an estimate of the time required for the theophylline therapy to reach steady state and based on this, provide a full TDM recommendation that should include:

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- a. Amount of loading dose, if any
- b. Maintenance dosage regimen
- c. Appropriate recommendations on blood level monitoring.

12 Marks

Question 1B

The following cases illustrate a specific type of medication errors;

Case I The pharmacist dispensed chlorpropamide 250mg tablets. The patient's son queried the district nurse who assured him that chlorpropamide and chlorpromazine were the same. The patient suffered irreversible brain damage.

Case II A 79-year old woman was given another patient's 5 mg glibenclamide tablet by mistake. Nonetheless she was discharged, but collapsed from hypoglycemia at home and spent four more days in the hospital.

Case III Amoxicillin was given to a patient known to be allergic to penicillin. Damages were awarded when she developed a florid rash.

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A. What is the type of medication errors for the above case I, case II and case III. Briefly describe all possible risk factors involved in relation to the errors.

(5 marks)

B. Discuss how would steps involved in unit dose medication delivery system help to prevent the errors in Case I, Case II and Case III.

(8 marks)

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Question 2.

MA, a 52 year old man is a known case of colon Cancer since January 1995. He was admitted to HUSM on 23rd March 1995, and was planned for colonectomy on 30 th of April.

His wife complained that he has a loss of appetite and has lost more than 3 kg since diagnosed. Physical examination found a pale cachexic man, weight : 45 kg, height: 165 cm, BP: 110/70 mmHg, PR: 100/min, RR: 30/min and T: 37.5 °C. Review of system found no abnormality except for a hard nontender mass found an abdominal examination.

Summary of laboratory results:

Na ⁺	130	mmol/L
K ⁺	2.8	mmol/L
Ca ⁺⁺	1.9	mmol/L
U	4	umol/l
Glucose	4	umol/L
Hgb	8	g%
HCT	30	%
WBC	2000	/mm ³
Plt	95,00	/mm ³
	0	

The doctor requested the nutritional support team to evaluate the MA's nutritional status and to design a suitable regimen for him.

- A. List the information required by the Nutritional Team in order to design an appropriate nutritional regimen for the patient.

(5 marks)

- B. The nutritional Support Team recommended a (TPN) total parenteral nutritional and requested the clinical pharmacist to calculate the nutritional requirements for Mr. MA. Design a suitable TPN regimen for Mr. MA.

(10 marks)

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- C. The doctor wanted to utilise the TPN (Total Parenteral Nutrition) line for the administration of pack cells and for the monitoring of Central Venous Pressure (CVP). What are the steps needed to be followed to prevent line complication ?

(5 marks)

- D. 5 days after the administration of the recommended regimen, Mr. MA developed a high grade fever but laboratory investigations revealed no abnormalities. Blood was taken and sent for culture and sensitivity test. While waiting for results the doctor requested your advice on the management of Mr. MA. Suggest an appropriate management for Mr. MA.

(5 marks)