

UNIVERSITI SAINS MALAYSIA

PROGRAM SARJANA FARMASI

SEMESTER II 1993/94

APRIL 1994

FCP 552: FARMAKOTERAPEUTIK II

(2 HOURS)

This examination consists of two sections.

Section A consists of 50 multiple choice questions.

Section B consists of two (2) long questions.

Answer ALL questions.

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

...2/-

INDEX NO: _____

Section A

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

Each question has only one correct or most appropriate answer or statement.

1. Which of the following is the major mechanism of drug - induced renal problems?

- (a) Direct toxicity on renal cells.
- (b) Drug creating a condition within patients that lead to deterioration in renal function.
- (c) Immunologic reactions.
- (d) Mechanical obstruction.

2. Which of the following is the least common form of drug induced renal problem?

- (a) Acute tubulo-interstitial disease.
- (b) Chronic tubulo-interstitial disease.
- (c) Glomerulonephritis.
- (d) Acute tubular necrosis.

...3/-

INDEX NO: _____

3. Which of the following is not an appropriate step that can be taken to reduce the incidence of drug-induced nephropathy?

- (a) Hydration with chloride anion during cisplatin therapy.
- (b) Urinary acidification to prevent methotrexate nephropathy.
- (c) Sodium chloride repletion to prevent amphotericin toxicity.
- (d) Calcium supplement during aminoglycoside therapy.

4. Provide an estimate for the creatinine clearance for Mr. TH who has a serum creatinine of 250 $\mu\text{mol/L}$?

- (a) 24 ml/min.
- (b) 34 ml/min.
- (d) 44 ml/min.
- (e) 54 ml/min.

...4/-

(FCP552)

INDEX NO: _____

5. Which one of the following drugs requires a dose modification in a patient with a creatinine clearance of 15 ml per minute?

- (a) Clindamycin.
- (b) Chloramphenicol.
- (c) Erythromycin.
- (d) Ampicillin.

6. Which of the following drugs prevents creatinine secretion in the kidney tubules?

- (a) Ascorbic acid.
- (b) Probenecid.
- (c) Cefoxitin.
- (d) Penicillin (high dose).

...5/-

INDEX NO: _____

7. Which of the following drugs does not interfere with creatinine measurement?

- (a) Ascorbic acid.
- (b) Probenecid.
- (c) Cefoxitin.
- (d) Penicillin (high dose).

8. Which of the following statements about creatinine and its clearance is not true?

- (a) The production of creatinine is dependent on muscle and correlates with body weight and body size.
- (b) There is an apparent circadian rhythm in creatinine excretion, with a greater amount excreted in the afternoon.
- (c) A morning fasting serum creatinine concentration drawn during the urine collection period should be used to calculate creatinine clearance.
- (d) The Jelliffe 1971 equation is more reliable and accurate than the Cockcroft-Gault equation in estimating creatinine clearance.

...6/-

INDEX NO: _____

9. Which of the following conditions does not affect the predictive performance of equations to estimate creatinine clearance?

- (a) Patients not on urinary catheter (if a complete urine collection cannot be guaranteed).
- (b) Use of lean body weight instead of total body weight.
- (c) Unstable renal function.
- (d) Medical conditions that interfere with serum creatinine assays.

10. Which of the following statements is/are true?

- (i) Nephrotic syndrome is characterized by severe proteinuria, hypoalbuminemia and pulmonary edema.
- (ii) Nephritic syndrome is characterized by hematuria, hypertension and hypoalbuminemia.
- (iii) Both nephrotic syndrome and nephritic syndrome can occur in a patient with SLE.
- (iv) Hypertension is not a characteristic of nephrotic syndrome.

...7/-

INDEX NO: _____

- (a) None of the above statements is true.
- (b) All of the above statements are true.
- (c) Only statements (i) and (ii) are true.
- (d) Only statements (iii) and (iv) are true.

11. Which of the following statements is/are true?

- (i) Glomerulonephritis, pyelonephritis and anticoagulant therapy are all known causes of hematuria.
 - (ii) Pyelonephritis and tuberculosis can cause both hematuria and proteinuria.
 - (iii) Multiple myeloma is a known cause of proteinuria.
 - (iv) Proteinuria can be benign.
-
- (a) None of the above statements is true.
 - (b) All of the above statements are true.
 - (c) Only statements (i) and (ii) are true.
 - (d) Only statements (iii) and (iv) are true.

...8/-

INDEX NO: _____

12. Which of the following statements is/are true?

- (i) Glomerulonephritis is the most common cause of nephrotic syndrome.
- (ii) The mercurials and penicillamine are known to cause nephrotic syndrome.
- (iii) Prednisolone is effective in treating nephrotic syndrome in 80% of patients.
- (iv) Cyclophosphamide is only effective in nephrotic syndrome secondary to SLE.

- (a) None of the above statements is true.
- (b) All of the above statements are true.
- (c) Only statements (i) and (ii) are true.
- (d) Only statements (iii) and (iv) are true.

13. Which of the following statements is/are true?

- (i) Anemia is only associated with chronic

renal failure and not acute renal failure.

- (ii) Dietary supplements play no role in the treatment of anemia of renal failure.
- (iii) Recombinant erythropoietin is indicated in the treatment of anemia of renal failure.
- (iv) Blood transfusion may sometimes be indicated in the treatment of anemia of renal failure.

- (a) None of the above statements is true.
- (b) All of the above statements are true.
- (c) Only statements (i) and (ii) are true.
- (d) Only statements (iii) and (iv) are true.

...10/-

INDEX NO: _____

14. Which of the following statements is/are true?

- (I) Aluminum hydroxide is used to lower serum calcium in patients with chronic renal failure.
 - (ii) Vitamin D supplements are useful to treat the anemia of chronic renal failure.
 - (iii) Dietary protein should be restricted in patients with chronic renal failure.
 - (iv) Potassium binding resin can cause sodium overload in patients with chronic renal failure.
-
- (a) None of the above statements is true.
 - (b) All of the above statements are true.
 - (c) Only statements (i) and (ii) are true.
 - (d) Only statements (iii) and (iv) are true.

...11/-

INDEX NO: _____

15. Which of the following statements is true?

- (a) Administration of bicarbonate to a patient with acute renal failure can cause hyperkalemia.
- (b) Insulin is eliminated from the body through the kidneys.
- (c) Calcium carbonate is used in patients with chronic renal failure as a calcium supplement.
- (d) Dialysis is not an efficient way to remove excessive body potassium.

16. Which of the following statements is true?

- (a) Packed cells transfusion is more suitable than whole blood in patients with renal failure because there is less sodium.
- (b) Atenolol is the β -blocker of choice in renal failure because it is excreted in the liver.
- (c) Hypertension can both be a cause and a consequence of renal failure.
- (d) Captopril may be useful to reverse the proteinuria of nephrotic syndrome.

...12/-

INDEX NO: _____

17. Which of the following statements is/are true about treatment of hyperkalemia?

- (i) Calcium administration will cause a shift of potassium from ECF to the ICF.
 - (ii) Sodium bicarbonate administration temporarily antagonizes the cardiac and neuromuscular effects of hyperkalemia.
 - (iii) Cation-exchange resins bind potassium in exchange for another cation in the blood.
 - (iv) Dialysis is the treatment of choice for hyperkalemia.
-
- (a) None of the above statements is true.
 - (b) All of the above statements are true.
 - (c) Only statements (i) and (ii) are true.
 - (d) Only statements (iii) and (iv) are true.

...13/-

INDEX NO: _____

18. Which of the following statements is/are true in relation to the management of renal failure?

- (i) Protein intake should be reduced.
 - (ii) Both hypotension and hypertension must be treated promptly.
 - (iii) Aluminum hydroxide containing antacids are used to reduce absorption of phosphate.
 - (iv) Mild acidosis does not require treatment.
-
- (a) None of the above statements is true.
 - (b) All of the above statements are true.
 - (c) Only statements (i) and (ii) are true.
 - (d) Only statements (iii) and (iv) are true.

19. Which of the following statements is/are true about glomerulonephropathies?

- (i) About 80% of adults with minimal change disease responds to steroid.
- (ii) Steroids are the mainstay in the treatment of lupus nephritis.
- (iii) There is no specific therapy for poststreptococcal glomerulonephritis.
- (iv) In focal glomerulonephritis, the disease involves some parts of some glomeruli.

...14/-

INDEX NO: _____

- (a) None of the above statements is true.
- (b) All of the above statements are true.
- (c) Only statements (i) and (ii) are true.
- (d) Only statements (iii) and (iv) are true.

20. Which of the following statements is/are true about nephrotic syndrome?

- (i) It is characterized by proteinuria (3.5G/day), hypoalbuminemia, hypolipidemia and edema.
- (ii) Aggressive diuretic therapy is usually indicated to manage the edema.
- (iii) Hypercoagulable state can occur.
- (iv) Dietary protein restriction may be appropriate for patients with renal insufficiency.

- (a) None of the above statements is true.
- (b) All of the above statements are true.
- (c) Only statements (i) and (ii) are true.
- (d) Only statements (iii) and (iv) are true.

...15/-

INDEX NO: _____

21. Which of the following statements is/are true?

- (i) Renal failure results in phosphate retention with a reciprocal fall in serum calcium.
 - (ii) Aluminum from Amphojel can cause osteomalacia in patients with chronic renal failure.
 - (iii) Anemia of renal failure generally does not require specific treatment.
 - (iv) Digoxin can be removed from the body by hemodialysis.
-
- (a) None of the above statements is true.
 - (b) All of the above statements are true.
 - (c) Only statements (i) and (ii) are true.
 - (d) Only statements (iii) and (iv) are true.

...16/-

INDEX NO: _____

22. Which of the following statements is true?

- (a) Hydrochlorothiazide can cause hypocalcemia.
- (b) Frusemide is effective even at glomerular filtration rate less than 25 ml/min.
- (c) Frusemide reduces glomerular filtration rate.
- (d) Thiazides increase glomerular filtration rate.

23. Which of the following statements is/are true?

- (i) Extracellular fluid compartment consists of plasma and interstitial fluid.
- (ii) Total body water makes up 10% of body weight.
- (iii) The major extracellular fluid anion is chloride.
- (iv) The major intracellular fluid cation is potassium.

...17/-

INDEX NO: _____

- (a) Only statements (i) and (ii) are true.
- (b) Only statements (i), (ii) and (iii) are true.
- (c) Statements (i), (ii), (iii) and (iv) are all true.
- (d) Only statement (iv) is true.

24. Which of the following statements regarding renal blood flow is/are true?

- (i) Hydrostatic pressure is higher in glomerular capillaries than in renal vein.
- (ii) Reduction of renal blood flow is associated with decreased secretion of renin.
- (iii) Oncotic pressure of plasma albumin will retain fluid within the capillary.
- (iv) Autoregulatory mechanisms maintain the glomerular filtration rate.

...18/-

INDEX NO: _____

- (a) Only statements (I) and (ii) are true.
- (b) Only statements (i), (ii) and (iii) are true.
- (c) Statements (i), (ii), (iii) and (iv) are all true.
- (d) Only statement (iv) is true.

25. Which of the following statements regarding renal blood flow is/are true?

- (i) Glomerular filtration rate (GFR) is reduced in the elderly.
 - (ii) GFR is measured by collecting a 24-hour urine specimen.
 - (iii) Plasma creatinine varies with dietary protein intake.
 - (iv) Blood urea depends on lean body mass.
- (a) Only statements (i) and (ii) are true.
 - (b) Only statements (i), (ii) and (iii) are true.
 - (c) Statements (i), (ii), (iii) and (iv) are all true.
 - (d) Only statement (iv) is true.

...19/-

INDEX NO: _____

26. Which of the following is not a cause of acute renal failure?

- (a) Hemorrhage.
- (b) Septicemia.
- (c) Amphotericin B.
- (d) Minimal-change
glomerulonephritis.

27. Which of the following is/are appropriate as an urgent treatment of hyperkalemia?

- (i) Intravenous calcium.
 - (ii) Glucose and insulin infusion.
 - (iii) Sodium infusion.
 - (iv) Infusion of bicarbonate.
- (a) Only (i) and (ii) are appropriate.
 - (b) Only (i), (ii) and (iii) are appropriate.
 - (c) (i), (ii), (iii) and (iv) are all appropriate.
 - (d) Only (iv) is appropriate.

...20/-

INDEX NO: _____

28. Which of the following statements regarding the management of renal failure is/are true?

- (i) The use of loop diuretics should be considered only after a full fluid replacement.
 - (ii) Protein intake should be restricted.
 - (iii) Dialysis is indicated if serum potassium is more than 7.0 mmol/L.
 - (iv) Hypocalcemia is treated with 1,25-dihydroxycholecalciferol.
-
- (a) Only (i) and (ii) are appropriate.
 - (b) Only (i), (ii) and (iii) are appropriate.
 - (c) (i), (ii), (iii) and (iv) are all appropriate.
 - (d) Only (iv) is appropriate.

...21/-

INDEX NO: _____

29. Which of the following statements regarding chronic renal failure (CRF) is/are true?

- (i) The commonest cause is chronic glomerulonephritis.
 - (ii) Hypernatremia is commonly due to volume overload.
 - (iii) The use of glibenclamide is contraindicated.
 - (iv) The use of aminoglycoside is contraindicated.
-
- (a) Only statements (i) and (ii) are true.
 - (b) Only statements (i), (ii) and (iii) are true.
 - (c) Statements (i), (ii), (iii) and (iv) are all true.
 - (d) Only statement (iv) is true.

...22/-

INDEX NO: _____

30. Which of the following is/are cause(s) of anemia in CRF?

- (i) Reduced survival of the red blood cells.
 - (ii) Gastrointestinal bleeding.
 - (iii) Bone marrow depression.
 - (iv) Edema.
-
- (a) Only (i) and (ii) are true.
 - (b) Only (i), (ii) and (iii) are true.
 - (c) (i), (ii), (iii) and (iv) are all true.
 - (d) Only (iv) is true.

31. Which of the following statements regarding renal bone disease is/are true?

- (i) It is due to the failure of the kidney to convert cholecalciferol to 1,25 dihydroxy-cholecalciferol.
- (ii) Serum alkaline phosphatase is elevated.
- (iii) It can be treated with 25-hydroxy-cholecalciferol.
- (iv) It causes ricketts in adults.

...23/-

INDEX NO: _____

- (a) Only statements (i) and (ii) are true.
- (b) Only statements (i), (ii) and (iii) are true.
- (c) Statements (i), (ii), (iii) and (iv) are all true.
- (d) Only statement (iv) is true.

32. Which of the following regarding the therapy of chronic renal failure is/are true?

- (i) Hyperphosphatemia is treated with calcium carbonate.
- (ii) Restricting fluid to 400 ml plus the volume of the previous day urine output will avoid volume overload.
- (iii) Hypercalcemia is treated with Resonium A®.
- (iv) Subcutaneous erythropoietin is used to treat anemia.

...24/-

INDEX NO: _____

- (a) Only statements (i) and (ii) are true.
- (b) Only statements (i), (ii) and (iii) are true.
- (c) Statements (i), (ii), (iii) and (iv) are all true.
- (d) Only statement (iv) is true.

33. Which of the following about the management of nephrotic syndrome is/are true?

- (i) Salt intake should be restricted.
 - (ii) Water restriction is not required in stable patients.
 - (iii) The use of diuretic to reduce edema is safe.
 - (iv) Caloric intake should be reduced.
- (a) Only statements (i) and (ii) are true.
 - (b) Only statements (i), (ii) and (iii) are true.
 - (c) Statements (i), (ii), (iii) and (iv) are all true.
 - (d) Only statement (iv) is true.

...25/-

INDEX NO: _____

34. Which of the following is/are complication(s) of nephrotic syndrome?

- (i) Cellulitis.
- (ii) Thrombosis.
- (iii) Hypercholesterolemia.
- (iv) Peritonitis.

- (a) Only (i) and (ii) are true.
- (b) Only (i), (ii) and (iii) are true.
- (c) (i), (ii), (iii) and (iv) are all true.
- (d) Only (iv) is true.

35. Which of the following conditions is/are likely to respond to both steroid and cytotoxic therapy?

- (i) Minimal-change nephrotic syndrome.
- (ii) Wegner's granulomatoses.
- (iii) Henoch Schoelein syndrome.
- (iv) Focal segmental glomerulosclerosis.

- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) All (i), (ii), (iii) and (iv).
- (d) (iv) only.

...26/-

INDEX NO: _____

36. Which of the following problems is/are more suggestive of nephrotic rather than nephritic syndrome?

- (i) Hematuria.
- (ii) Hypertension.
- (iii) Oliguria.
- (iv) Hypercholesterolemia.

- (a) (i) and (ii) only.
- (b) (i), (ii) and (iii) only.
- (c) All (i), (ii), (iii) and (iv).
- (d) (iv) only

37. Which of the following statements regarding symptoms of renal disease is/are true?

- (i) Renal colic is commonly caused by renal stone.
- (ii) Dysuria means painful urination.
- (iii) Urgency implies a sudden urge to pass urine.
- (iv) Frequency means frequent passage of urine.

...27/-

INDEX NO: _____

- (a) Only statements (i) and (ii) are true.
- (b) Only statements (i), (ii) and (iii) are true.
- (c) Statements (i), (ii), (iii) and (iv) are all true.
- (d) Only statement (iv) is true.

38. Which of the following statements regarding acute glomerulonephritis is/are true?

- (i) It commonly occurs within ten days of a β -hemolytic streptococcal infection.
 - (ii) It can lead to renal failure.
 - (iii) It usually presents as nephrotic syndrome.
 - (iv) It is more common among adults.
- (a) Only statements (i) and (ii) are true.
 - (b) Only statements (i), (ii) and (iii) are true.
 - (c) Statements (i), (ii), (iii) and (iv) are all true.
 - (d) Only statement (iv) is true.

...28/-

(FCP552)

INDEX NO: _____

39. Which of the following statements regarding the effects of cyclosporin-amphotericin B interaction is true?

- (a) There is enhanced nephrotoxicity.
- (b) There is an increase in hypertrichosis.
- (c) There is prolonged paralysis.
- (d) There is prolonged rhabdomyolysis.

40. Which of the following statements regarding infections in renal transplant patients is true?

- (a) The rate is generally less than 5%.
- (b) Antibiotic prophylaxis is not recommended before the procedure to prevent infections.
- (c) The infective agents are limited to bacteria.
- (d) Infection with cytomegalovirus can lead to graft rejection, loss or death.

...29/-

INDEX NO: _____

41. Which of the following complications is the most common in patients receiving continuous ambulatory peritoneal dialysis (CAPD)?

- (a) Meningitis.
- (b) Skin rash.
- (c) Peritonitis.
- (d) Urinary tract infection.

42. Which of the following statements regarding hemodialysis is true?

- (a) Solute and fluid are removed through the patient's peritoneum.
- (b) During dialysis, blood is pumped from the patient through a column of adsorbent material and recirculated back into the patient.
- (c) The duration of dialysis is usually more than 24 hours.
- (d) During dialysis, blood is most commonly pumped through a cylindrical cartridge dialyser where solutes and fluids are removed by diffusion through a synthetic membrane.

...30/-

INDEX NO: _____

43. Which of the drugs is not appreciably removed by hemodialysis?

- (a) Digoxin.
- (b) Acyclovir.
- (c) Gentamicin.
- (d) Aspirin.

44. Which of the following is the most efficiently removed by hemodialysis?

- (a) Acyclovir.
- (b) Digoxin.
- (c) Vancomycin.
- (d) Ketoconazole.

45. Which of the following statements is true?

- (a) Digoxin reduces GFR in patients with chronic renal failure.
- (b) Nephrotoxicity can occur in patients with hepato-renal syndrome given neomycin orally.
- (c) Frusemide can still exert a diuretic effect even at a GFR of zero.
- (d) The dose of thiazide needs to be reduced in patients with end-stage renal disease.

46. Which of the following statements is true?

- (a) Cellular debris causes an obstruction in the renal tubules of patients who suffers an acute tubular necrosis.
- (b) Mannitol is contraindicated in acute renal failure.
- (c) Potassium supplement is required by all patients given diuretics.
- (d) Methyldopa is contraindicated in acute renal failure.

47. Which of the following statements is true?

- (a) In prerenal azotemia urinary sodium is low.
- (b) Low plasma osmotic pressure causes edema in patients with nephrotic syndrome.
- (c) The production of clotting factors is reduced in patients with nephrotic syndrome.
- (d) High dose frusemide should not be used in patients with prerenal azotemia.

...32/-

(FCP552)

INDEX NO: _____

Questions 48-50 refers to the following case:

A 34 year-old Malay man was admitted to the accident and emergency unit after sustaining a crush injury to the abdomen in a motor-vehicle accident. His blood pressure was found to be 80/? mm Hg, pulse 100/minute and temperature 36°C. A small volume of blood-stained urine was obtained upon catheterization.

48. Which of the following is least appropriate for the above patient?

- (a) Administration of high dose frusemide to induce urine flow.
- (b) Administration of crystalloid to expand plasma volume.
- (c) Transfusion of blood.
- (d) Administration of dopamine after fluid replacement.

...33/-

INDEX NO: _____

49. Which of the following statements is/are true about the possible renal injury in the patient?

- (i) The patient may suffer from prerenal azotemia.
 - (ii) The patient may suffer from acute tubular necrosis.
 - (iii) Correction of hypotension is a most important measure to prevent further renal damage.
 - (iv) The renal failure is likely to be reversible.
-
- (a) None of the above statements is true.
 - (b) All of the above statements are true.
 - (c) Only statements (i) and (ii) are true.
 - (d) Only statements (iii) and (iv) are true.

50. Which of the following parameters are likely to be abnormal in the above patient?

- (i) Blood urea.
- (ii) Serum potassium.
- (iii) Total white cell count.
- (iv) Platelet count.

...34/-

(FCP552)

INDEX NO: _____

- (a) None of the parameters is likely to be abnormal.
- (b) All of the parameters are likely to be abnormal.
- (c) Only parameters (i) and (ii) are likely to be abnormal.
- (d) Only parameters (iii) and (iv) are likely to be abnormal.

...35/-

(FCP552)

SECTION (B)

1. RM is an eighteen year-old Malay female admitted to HUSM for the worsening of body swelling. Two years prior to this admission, RM was diagnosed as having systemic lupus erythematosus with a suspicion of renal involvement and three months prior to admission, she received prednisolone 60 mg daily PO and Naproxen 250 mg BD PO.

On examination, RM was noted to be pale and lethargic. Edema was noted in the face and ankles. Blood pressure 190/110 mm Hg, pulse 72/minute and respiration 20/minute. Lungs were clear and JVP was not elevated.

Initial laboratory findings were as follows:

Serum sodium	142 umol/L
WBC	13000/mm ³
Serum Potassium	4.5 umol/L
Hemoglobin	7.1 g/L
Blood Urea	11.0 umol/L
Hematocrit	22.4%
Serum Creatinine	117 umol/L
Platelet	236/ mm ³
Serum Protein	37 g/L
Serum Albumin	22 g/L
Serum Globulin	15 g/L

...36/-

Based on history, physical and laboratory findings, the following diagnoses were entered.

1. Systemic lupus erythematosus.
2. Nephrotic syndrome.
3. Hypertension.
4. Lupus nephritis.
5. Anemia.

A. Based on the above diagnoses, explain the following abnormalities found in the patient:

- a) ankle and facial edema.
- b) lethargy.
- c) hypertension.
- d) elevated serum creatinine.

(5 Marks)

...37/-

(FCP552)

After a review by the medical consultant, the following drug therapy was instituted in RM:

Nifedipine 30 mg TDS PO
Frusemide 40 mg BD PO
Spironolactone 50 mg BD PO
Atenolol 50 mg BD PO
Prednisolone 60 mg QD PO
Ferrous sulphate 200 mg QD PO
Folic acid 5 mg QD PO

B. Describe your objectives for the management of RM.

(5 Marks)

...38/-

(FCP552)

C. Discuss the above drug therapy prescribed for RM in relations to his underlying conditions of lupus nephritis, hypertension and edema.

(10 Marks)

A renal biopsy was performed on RM and the following diagnosis was made:

Systemic lupus erythematosus with lupus nephritis, — Class IV with active disease.

A plan was made to treat the patient with cyclophosphamide 750 mgm^{-2} IV.

...39/-

(FCP552)

D. Discuss the role of cyclophosphamide in the above patient.

(5 Marks)

2. Bryan and Stone (Ann. Intern Med. 1975:82:189) proposed an equation to estimate the total daily dose of penicillin for patients with an estimated creatinine clearance of less than 40 ml/min. His formula is as follows:

$$\text{Dose (MU/day)} = 3.2 + \frac{C_{Cr}}{7}$$

(a) What dose of penicillin G should be used for treating meningococcal meningitis in Mr. AB (Age 57, weight 85 kg, serum creatinine 387 $\mu\text{mol/L}$)?

(5 Marks)

...40/-

(FCP552)

(b) Comment on the clinical usefulness of the above equation in individualizing penicillin dose.

(7 Marks)

(c) Discuss possible adverse effects associated with azathioprine administration in renal transplant patients.

(6 Marks)

(d) Discuss the factors that influence the dialyzability of drugs.

(7 Marks)

...41/-

Appendix

Normal Laboratory Values

1.	Ammonia	80-110 mcg/dl	or	47-65 umol/L
2.	Amilase	4-25 IU/ml		
3.	Billirubin			
	- Direct	0-0.2 mg/gl		0-3 umol/L
	- Indirect	0.2-0.8 mg/dl		30-14 umol/L
	- Total	0.2-1 mg/dl		30-17 umol/L
4.	CO ₂	20-30 mEq/L		24-30 mMol/L
5.	pCO ₂	35-45 mmHg		
6.	CI	100-106 mEq/L		100-106 mMol/L
7.	Cpk	50-170 U/L		
8.	Creatinine (SCr)	0.6-1.5 mg/dl		60-130 umol/L
9.	Random blood sugar	70-110 mg/dl		3-10 umol/L
10.	Iron	50-150 mcg/dl		9.0-26.9 umol/L
11.	Lactic dehydrogenase	70-210 IU/L		
12.	Magnessium	1.5-2.0 mEq/L		0.8-1.3 mMol/L
13.	pO ₂	75-100 mmHg		
14.	pH	7.35-7.45		
15.	Acid phosphatase			
	Male	0.13-0.63 IU/ml		36-176 nmol s ⁻¹ /L
	Female	0.101-0.65 IU/ml		2.8-156 nmol s ⁻¹ /L
16.	Alkaline phosphatase	39-117 IU/L		
17.	Phosphorous	3.0-4.5 mg/dl		1.0-1.5 mMol/L
18.	Potassium (K ⁺)	3.5-5.0 mEq/L		3.5-5.0 mMol/L
19.	Calcium (Ca ²⁺)	8.5-10.5 mg/dl		2.1-2.6 mMol/L
20.	Sodium (Na ⁺)	135-145 mEq/L		135-145 mMol/L
21.	Bicarbonate (HCO ₃ ⁻)	24-38 mEq/L		24-28 mMol/L

...42/-

22.	Protein		
-	Total	6.0-8.5 g/dl	60-85 g/L
-	Albumin	3.5-5.0 g/dl	35-50 g/L
-	Globulin	2.3-3.5 g/dl	23-35 g/L
-	Transferrin	200-400 mg/dl	2.0-9.0 g/L
23.	Transaminase (SGOT)	0-40 IU/L	0-0.32 $\mu\text{mol s}^{-1}/\text{L}$
24.	BUN	8-25 mg/dl	2.9-8.9 mMol/L
25.	Uric Acid	3-7 mg/dl	0.18-0.42 mMol/L
26.	Blood Pictures		
	Red blood cell (RBC)		
	Male	4.8-6.4 x 10 ⁶ /mm ³	
	Female	4.2-5.4 x 10 ⁶ /mm ³	
	White blood cell (WBC)	4.0-11.0 x 10 ³ /mm ³	
	P	60-75%	
	L	20-40%	
	M	4-8%	
	B	0-1%	
	E	1-3%	
	Platelate (Plt)	200-400 x 10 ³ /mm ³	
27.	ESR Male	0-10 mm/jam (Wintrobe)	
	Female	0-15 mm/jam (Wintrobe)	
28.	Hematocrit		
	Male	45-52%	
	Female	37-48%	
29.	Hemoglobine (Hgb)		
	Male	13-18 g/dl	
	Female	12-16 g/dl	
30.	Prothrombin time (PT)	75-100% nilai asas	
31.	APTT	25-37 saat	
32.	Creatinine Clearance (CrCl)	105-150 ml/min/1.73 m ²	
33.	TT ₄	3.0-7.5 mcg/dl	
34.	RT ₃ U	25-35%	
35.	FTI	1.3-4.2	

...43/-

NORMAL HEMODYNAMIC VALUES AND DERIVED INDICES

Normal Value Units			
BP S/D/M	Blood Pressure Systolic/Diastolic/Mean	120/80/93	mm Hg
CO	Cardiac Output	4-6	Liters/min.
RAP	Right Atrial Pressure (Mean)	2-6	mm Hg
PAP S/D/M	Pulmonary Artery Pressure Systolic/Diastolic/Mean	25/12/16	mm Hg
PCWP	Pulmonary Capillary Wedge Pressure (mean)	5-12	mm Hg
CI	Cardiac Index	2.5-3.5	Liters/min/m ²
	$CI = \frac{CO}{\text{Body Surface Area}}$		
SV	Stroke Volume	60 - 80	ml/beat
	$SV = \frac{CO}{\text{Heart Rate}}$		
SVI	Stroke Volume Index	30 - 50	ml/beat/m ²
	$SVI = \frac{SVI}{\text{Body Surface Area}}$		
PVR	Pulmonary Vascular Resistance	< 200	dynes.sec.cm ⁻⁵
	$PVR = \frac{MPAP - PCWP}{CO} \times 80$		
TPVR	Total Peripheral Vascular Resistance	900-1400	dynes.sec.cm ⁻⁵
	$TPVR = \frac{MBP - RAP}{CO} \times 80$		
LVSWI	Left Ventricular Stroke Work Index	35-80	gm-m/m ² /beat
	$LVSWI = (MBP-PCWP) (SVI) (.0136)$		

