UNIVERSITI SAINS MALAYSIA

PEPERIKSAAN PERTAMA
PROGRAM SARJANA FARMASI
1993/94

NOVEMBER

FCP 555.20 : PHARMACOTHERAPEUTIC IV

(2 HOURS)

This examination consists of **two sections** and 29 printed pages.

Section A consists of **50** multiple choice questions.

Section B consists of **two (2)** long questions.

Answer **ALL** questions.

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

...2/-

INDEX NUMBER: _____

Section A

Mark (//) all 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 statements regarding migraine are true?

   (i) Diplopia is an aura in common migraine.

   (ii) Complicated migraine is manifested as headache followed by neurological deficit.

   (iii) It is a headache that comes after gastrointestinal disturbances.

   (iv) It is more common in female with a family history of migraine.

   ..... (a) (i) and (ii) only.

   ..... (b) (i), (ii) and (iii) only.

   ..... (c) (i), (ii), (iii) and (iv).

   ..... (d) (ii) and (iv) only.

2. Which of the following statements regarding classical migraine are true?

   (i) The patient usually experiences audiovisual disturbances 24 hours prior to an attack.

   (ii) Ergotamine is the drug of choice in the management of classical migraine.

   (iii) Dexamethasone tablet 1.5 mg p.o b.d. is the best alternative in prolonged classical migraine attack.

   (iv) Pizotifen 0.5 mg po tds is one of the drug used in the prophylactic therapy of classical migraine.

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..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv).

..... (d) (ii) and (iv) only.

3. Which of the followings is the best choice to abort migraine headache?

..... (a) 6 mg SQ sumatriptan at the onset of migraine.

..... (b) 2 tablets of Cafergot(R) at the onset of migraine.

..... (c) 40 mg I.V. propranolol at the onset of migraine.

..... (d) 250 mg PO naproxen at the onset of migraine.

4. Which of the following Cafergot(R) regimens is appropriate for the treatment of migraine?

..... (a) 1 tab. at the onset of migraine followed by 1 tab. every 8 hours.

..... (b) 2 tab. at the onset of migraine followed by 1 tab. every 30 minutes to the maximum of 6 tab.

..... (c) 2 tab. at the onset of migraine followed by 2 tab. every 30 minutes to the maximum of 6 tab./day or 10 tab./week.

..... (d) 2 tab. at the onset of migraine followed by 1 tab. every 30 minutes to the maximum of 6 tab./day or 10 tab./week.

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5. Which of the following statements regarding the pathophysiology of migraine are true?

(i) Vasogenic theory propose that migraine is due to vascular instability followed by neurological disorders.

(ii) Neurogenic theory propose that migraine is due to neurologic disorders followed by vascular changes.

(iii) Peripheral theory propose that migraine is due to changes in the 5HT level followed by vascular changes.

(iv) Migraine is actually a headache caused by stress that lead to vascular changes.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv).

..... (d) (ii) and (iv) only.

6. Which of the following conditions will increase cerebral pressure?

(i) Cerebral ischemia.

(ii) Cerebral hypoxia.

(iii) Ventriculitis.

(iv) Meningitis.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv).

..... (d) (ii) and (iv) only.

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7. Which of the following drugs reduces the intracranial pressure by stabilizing cell membrane?

..... (a) Glycerol.

..... (b) Mannitol.

..... (c) Dexamethasone.

..... (d) Pentobarbitone.

8. Which of the following statements regarding the nonpharmacologic management of increased intracranial pressure are true?

(i) Elevation of head by 30^{o}.

(ii) Lowering the body temperature.

(iii) Increase the PCO_2

(iv) Increase hydration.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv).

..... (d) (ii) and (iv) only.

9. Which of the following statements regarding the use of mannitol in the treatment of increased intracranial pressure (ICP) is true?

..... (a) Long term mannitol will lead to the localized shrinkage of the brain.

..... (b) It is very effective in the management of ICP secondary to cerebral tumor.

..... (c) It is only effective when given at early stage of ICP.

..... (d) Rebound ICP is not the side effect of mannitol.

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INDEX NUMBER: _____

10. Which of the following statements regarding the use of pentobarbital coma in the management of ICP is true?

..... (a) The dose of pentobarbital should be increased until the flattening of EEG is achieved.

..... (b) The pentobarbital mechanism action in reducing ICP is by stabilizing the cell membrane.

..... (c) Pentobarbital coma is the treatment of choice in ICP secondary to cereberal haemorrhage.

..... (d) Pentobarbital coma is least likely to produce marked changes in brain size.

11. Which of the following antipsychotic drugs does not produce postural hypotension?

..... (a) Clozapine.

..... (b) Thiothixene.

..... (c) Thioridazine.

..... (d) Chlorpromazine.

12. Under the biogenic amine hypothesis, mania is thought to be due to .....

..... (a) an excess of adrenaline activity.

..... (b) an excess of noradrenaline activity.

..... (c) an excess of dopamine activity.

..... (d) a deficiency of dopamine activity.

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13. Which of the followings is the most prominent symptom of tardive dyskinesia?

..... (a) Uncontrolled fine movement of the extremities.

..... (b) Torticollis.

..... (c) Buco-lingual-masticatory.

..... (d) Occulogyric crisis.

14. Which of the following antipsychotic drugs has the least anticholinergic side effects?

..... (a) Aliphatic phenothiazine.

..... (b) Piperidine phenothiazine.

..... (c) Piperazine phenothiazine.

..... (d) Dibenzodiazepine.

15. Which of the following factors indicates a good prognosis for psychosis?

..... (a) Good premorbid adjustment.

..... (b) Poor premorbid adjustment.

..... (c) Insidious onset.

..... (d) The absent of precipitating factors.

16. Which of the following cranial nerves innervate the extra-ocular muscles?

(i) Cranial Nerve III

(ii) Cranial Nerve IV

(iii) Cranial Nerve V

(iv) Cranial Nerve II

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..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv)

..... (d) (ii) and (iv) only.

17. Which of the followings are the features of cerebellar lesion?

(i) Dysarthria.

(ii) Intention tremor.

(iii) Nystagmus.

(iv) Hypertonia.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv)

..... (d) (ii) and (iv) only.

18. Features of upper motor neurone lesion are.....

(i) hypertonia.

(ii) exaggerated deep tendon reflexes.

(iii) fasciculation.

(iv) wasting.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv)

..... (d) (ii) and (iv) only.

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19. Which of the following statements regarding epilepsy are true?

(i) Juvenile Myoclonic Epilepsy (JME) is associated with chromosome 6 abnormalities.

(ii) JME is associated with absence seizure.

(iii) Complex partial seizure is inherited by autosomal recessive gene.

(iv) Most febrile convulsion in childhood progress to epilepsy in adult.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv)

..... (d) (ii) and (iv) only.

20. Which of the followings are true?

(i) Carbamazepine is better than Sodium valproate in the treatment of complex partial seizure.

(ii) Clonazepam may be useful in catamenial seizure.

(iii) Lignocaine may be used in treatment of status epilepticus.

(iv) Sodium valproate is the treatment of choice in focal seizure.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv)

..... (d) (ii) and (iv) only.

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21. Which of the followings is not a generalised seizure?

..... (a) Complex partial seizure.

..... (b) Atonic seizure.

..... (c) Absence seizure.

..... (d) Myoclonic seizure.

22. Which of the following statements regarding lower cranial nerve are true?

(i) Sensation over the pharynx is supplied by Glassopharyngeal nerve.

(ii) Vocal cord is innervated by the vagus nerve.

(iii) Pectoralis major is supplied by accessory nerve.

(iv) Muscle of the tongue is supplied by hypoglossal.

..... (a) (i) and (ii) only.

..... (b) (i), (ii) and (iii) only.

..... (c) (i), (ii), (iii) and (iv)

..... (d) (ii) and (iv) only.

23. Posterior column sensation includes.....

..... (a) pain.

..... (b) temperature.

..... (c) two point discrimination.

..... (d) joint position.

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24. Which of the following drugs is commonly use in status epilepticus?

..... (a) Sodium valproate.

..... (b) Carbamazepine.

..... (c) Phenytoin.

..... (d) Diazepam.

25. Which of the following statements regarding treatment of epilepsy is true?

..... (a) Treatment is indicated in all patient with seizure.

..... (b) Treatment must be continued for at least 2 years after seizure is controlled.

..... (c) Majority of patient need only a single anti-epileptic to control their seizure

..... (d) Tappering of phenobarbitone regimen must be done every 4 to 5 days to avoid withdrawal seizure.

26. Which of the following statements best describe seizure prophylaxis in patient with head trauma?

..... (a) Risk factors for the development of late posttraumatic seizures include loss of conciousness for more than 24 hours and depressed skull fractures.

..... (b) Prophylactic treatment with phenytoin exerts a beneficial effect for one year after head injury

..... (c) Approximately 35% of civilian patients suffering brain injuries develop late posttraumatic seizure.

..... (d) Prophylactic treatment with valproic acid exerts a beneficial effect for one month after head injury.

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27. Which of the following conditions is considered to be good prognosticators of successful withdrawal of antiepileptic drug (AED) therapy?

..... (a) Patients who have been seizure free for at least five years.

..... (b) Patients whose seizure were controlled within two years of onset.

..... (c) Patients with a normal EEG.

..... (d) Patients whose onset of seizures occured before two years of age.

28. Which of the followings is not considered to be a principle of the pharmacologic management of chronic seizure disorders?

..... (a) Identify the specific seizure type.

..... (b) Titrate dose to achieve a therapeutic serum anti epileptic drug concentration.

..... (c) Educate the patient.

..... (d) Begin treatment with more than one antiepileptic drugs.

29. Parkinsonism is a disease characterised by the following clinical features except.....

..... (a) disturbance of posture.

..... (b) mental retardation.

..... (c) bradykinesia.

..... (d) tremor.

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30. A patient with Parkinson's disease is being effectively treated with levodapa. Suddenly all therapeutic benefits as well as side effects of levodopa disappeared. Which of the following facts obtained from the medication history would most likely explain this phenomenon?

..... (a) Over-the counter multivitamin were taken to treat a cold .

..... (b) Trihexyphenidyl was added to the drug regimen for a week.

..... (c) Antacids were taken occasionally.

..... (d) The patients occasionally drink a little alcahol.

31. A patient is being effectively treated with levodopa for his Parkinson's disease but was affected by early morning stiffness and rigidity. Which of the following anticholinergics would be most suitable for him ?

..... (a) Diphenhydramine

..... (b) Benztropine mesylate

..... (c) Orphenadrine

..... (d) Procyclidine.

32. A patient with Parkinson's disease was treated with levodopa 1000mg qid . The respons was fairly good except for the excessive adverse effects. In order to overcome this problem the doctor wishes to change the drug to the cabido pa/levodopa combination.

Which of the following dose combinations would be the best alternative for this patient?

..... (a) One 10/100 tablet daily.

..... (b) One 10/100 tablet qid.

..... (c) One 25/250 tablet daily

..... (d) One 25/250 tablet qid.

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33. Which of the following phenothiazines is the least likely to induce extrapyrimidal effects?

..... (a) Thioridazine.

..... (b) Chlorpromazine.

..... (c) Perphenazine.

..... (d) Prochlorperazine.

34. Which of the following potential effects of phenothiazines is irreversible?

..... (a) Tardive dyskinesia.

..... (b) Akathisia.

..... (c) Tremor.

..... (d) Muscle rigidity.

35. Benztropine is often given to patients taking antipsychotic phenothiazines in order to .....

..... (a) reduce the dose of phenothiazines needed.

..... (b) reduce the gut motility so as to ensure the phenothiazines is completely absorbed.

..... (c) eliminate the unpleasant gastrointestinal irritation caused by phenothiazines.

..... (d) reduce the extrapyrimidal side effect of pheno thiazines.

36. Which of the following statements regarding typical extrapyrimidal disorders is/are true?

(i) They are characterised by weakness.

(ii) They are exacerbated by stress.

(iii) They are relieved by alcohol.

(iv) They are characterised by involuntary movements.

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..... (a) (i) and (iii) only.

..... (b) (ii) and (iv) only.

..... (c) (i), (ii) and (iii) only.

..... (d) (iv) only.

37. In assessing the effect of anticholinesterase, the patient is best examined just before and ..... after its administration.

..... (a) 0.5 hour

..... (b) 1 hour

..... (c) 2 hours

..... (d) 4 hours

38. Myasthenia gravis patient to be started on corticosteroid should be hospitalized because .....

..... (a) the steroid causes severe hypertension.

..... (b) the steroid augments muscle weakness initially.

..... (c) the initial dose of the steroid is very high.

..... (d) the steroid must be given parenterally.

39. Which of the following benzodiazepines would be preferred as an anxiolytic drug for an elderly patient with a history of cirrhosis?

..... (a) Chlordiazepoxide.

..... (b) Diazepam.

..... (c) Clorazepate.

..... (d) Lorazepam.

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40. Tricyclic antidepressant should not be used in patients who are also taking.

..... (a) hydrochlorothiazide.

..... (b) methyldopa.

..... (c) hydralazine.

..... (d) guanethidine.

41. A new patient treated with amitriptyline 4 days ago return to your pharmacy and complained that the drug makes her very sleepy, dry mouth, and has not helped her depression at all. These symptoms .....

..... (a) indicate that amitriptyline is not effective for this patient and you should inform the prescriber.

..... (b) strongly suggest that an anticholinergic drug is indicated and you should point this out to the prescriber.

..... (c) are expected effects of early treatment of amitriptyline and you would explain this to the patient.

..... (d) indicate early sign of toxicity and you would tell the patient to contact the prescriber.

42. Which of the following benzodiazepines is not significantly affected by cimetidine?

..... (a) Chlordiazepoxide.

..... (b) Diazepam.

..... (c) Flurazepam.

..... (d) Oxazepam.

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43. Lithium is usually being prescribed .....

..... (a) to treat acute manic episodes.

..... (b) as an anti-Parkinson drug.

..... (c) as a hypnotic agent.

..... (d) to treat schizophrenia.

44. Which of the following statements regarding lithium therapy in an outpatient is/are true?

(i) Plasma lithium levels between 2 to 4 mEq/L.

(ii) Blood sampling should be taken 2 hours after dosing.

(iii) Does not need plasma concentration monitoring.

(iv) An oral dosing range of 900 to 1500 mg/daily.

..... (a) (i) and (iii) only.

..... (b) (ii) and (iv) only.

..... (c) (i), (ii) and (iii) only.

..... (d) (iv) only.

45. Which of the following anxiolytics has the least sedating effect?

..... (a) Diazepam.

..... (b) Buspirone.

..... (c) Meprobamate.

..... (d) Chlordiazepoxide.

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46. Which of the following agents is/are <u>not</u> indicated for the treatment of depression?

(i) Phenelzine.

(ii) Amoxapine.

(iii) Doxepin.

(iv) Haloperidol.

..... (a) (i) and (iii) only.

..... (b) (ii) and (iv) only.

..... (c) (i), (ii) and (iii) only.

..... (d) (iv) only.

47. Which of the following statements regarding adverse effects of benzodiazepine antianxiety agents is/are true?

(i) CNS stimulation is the most common adverse effect in elderly.

(ii) A significant tachycardia is commonly experienced by patients during the first few days of treatment.

(iii) Serious cardiovascular complications when take together with antacids.

(iv) Impairment of memory and recall particularly in the elderly.

..... (a) (i) and (iii) only.

..... (b) (ii) and (iv) only.

..... (c) (i), (ii) and (iii) only.

..... (d) (iv) only.

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INDEX NUMBER: _____

48. The common type of hallucination in schizophrenia is.....

..... (a) visual.

..... (b) tactile.

..... (c) somatic.

..... (d) auditory.

49. Characteristic feature of mania is .....

..... (a) pressure speech.

..... (b) conscious of association.

..... (c) flight of idea.

..... (d) persecutory delusion.

50. Behavioral treatment commonly used in anxiety neurosis is .....

..... (a) relaxation training.

..... (b) hypnosis.

..... (c) systemic desensitisation.

..... (d) modelling.

(50 Marks)

...20/-

Section B

Question 1

(A) C.L is a 50 year old Malay lady who came to the clinic with chief complains of recent fit, diarrhea and night sweats. She had been referred to hospital by her general practitioner because of a three-year history of "small stroke". Mrs. C.L described these attacks as starting with a tingling sensation in her abdomen followed by a period of unresponsiveness. Her son who brought her to the hospital also describe that occasionally she developed a vacant, staring look followed by a period of lip-smacking, chewing movements and confusion. Initially the attacks had been infrequent, but now has increased in frequency, up to three to four times weekly.

Past Medical History :

1. Complex partial seizure for three year and was treated with phenytoin 300 mg p.o. q hs.

2. Duodenal ulcer, diagnosed by endoscopy two weeks prior to the visit and treated with Cimetidine 800 mg p.o. q hs and MMT mixture 15 ml p.o b.i.d.

Social History :

A coffee drinker and usually has abdominal pain after the coffee. The pain is relieved by food.

Physical examination :

On examination she was noted to be well dressed, slight discomfort, well spoken women who weighed 50 kg.

VS : BP 130/80 mmHg ; HR 78 beats/min ;T 37^{o}C, RR 16/min

CVS : Normal s_1 and s_2, no S_3 and no murmur.

NEURO: Decrease ankle jerk reflexes otherwise WNL,

EXT : No ecchymosis, petechiae.

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Results of Laboratory test :

Na+ : 136 mmol/L K+ : 3.5 mmol/L Hgb : 14.5gm/dl

Hct : 44% Urea : 7.5 mmol/L Stool : Guiac-positive

Phenytoin level (trough) : 6.0 mcg/ml. Scr : 83 umol/L.

Provisional diagnosis:

(i) Uncontrolled complex partial seizure.

(ii) Duodenal ulcer, diagnosed by endoscopy two weeks ago.

Current medications :

Phenytoin	300 mg p.o q hs
Cimetidine	800 mg p.o q hs
MMT mixture	15 ml p.o b.i.d

(i) What is the definition of drug-related problem (DRP)? List the drug-related problems for C.L.

(4 Marks)

(ii) What are the therapeutic aims of drug therapy in this patient?

(4 Marks)

(iii) What would be your recommendation for each drug-related problem of this patient and how you would monitor the therapy?

(5 Marks)

...22/-

(B) JT has been diagnosed as having major depression single episode with melancholia. Her past medical history showed that she had angina for the last 3 years. Psychotherapy was found not effective in the management of her depression and the doctor plan to start heterocyclic antidepressant treatment.

(i) Briefly describe the clinical features of major depres sion with melancholia.

(5 Marks)

(ii) Recommend the appropriate heterocyclic antidepressant drug for JT and give the rational for your selection.

(3 Marks)

(iii) Why should maintenance drug therapy be prescribed for JT and how long should he be maintained on heterocyclic antidepressant after remission?

(4 Marks)

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Question 2

A 25-year old man was brought to the Accident and Emergency (A&E) department, Hospital USM for wondering tendency, thinking irrelevently, smiling to himself and having poor sleep for the past one month. He also had a high opinion of himself. The condition progressively became worse, he was unmanagable at home for the past three days. He tend to be aggressive and wonder throughout the night at home.

(i) What are the psychiatric symptoms found in this patient?

(5 Marks)

Past Psychiatric History :

The patient had been treated for psychiatric illness since the age of 18. He was admitted 3 times to the psychiatric ward, General Hospital Kota Bharu. The family had more faith with traditional healer.

Mental Status Examination :

The patient was subsequently admitted to the psychiatric ward for further management. He was restless in the first two days. He claimed that all doctors and nurses in the ward were spying him. The patient initially refused to take medication because he claimed that it was a poison. His belief was very strong and could not be changed. He also admitted of hearing voices of two people dismissing about him.

(ii) Describe the perceptual and thought disturbances present in this patient.

(3 Marks)

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Progress and management :

He was diagnosed as relapsed schizophrenia and treated with the following medications.

(a) Haloperidol p.o 5 mg b.d.

(b) Chlorpromazine p.o 2 mg b.d.

(iii) Comment on his medication.

(3 Marks)

(iv) Three days later he developed extrapyramidal syndrome (EPS).

(a) List 2 clinical component of EPS that you expect to see.

(2 Marks)

(b) How do you manage his EPS.

(3 Marks)

(v) Two weeks later the haloperidol was increased to 5 mg p.o tds. Give your comments.

(3 Marks)

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(vi) In view of his poor compliance in the past. You decided to put him on a depot preparation. What would be the drug of choice?

(2 Marks)

(vii) On the day of discharge. You need to counsel the patient and his family. What are the points that need to be stress during the counselling.

(4 Marks)

...26/-

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

...27/-

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 umol S^{-1}/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 (PIt)	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 (CrCI)	105 - 150 ml/min/1.73 m^2	
33.	TT_4	3.0 - 7.5 mcg/dl	
34.	RT_3U	25 - 35%	
35.	FTI	1.3 - 4.2	

..28/-

NORMAL HEMODYNAMIC VALUES AND DERIVED INDICES

Hemodynamic Parameters		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
	$SV = \frac{CO}{\text{Heat Rate}}$		
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}
	$PVR = \frac{MPAP - PCWP}{CO} \times 80$		

...29/-

Hemodynamic Parameters		Normal Value	Units
TPVR	Total Peripheral Vascular Resistance $TPVR = \frac{MBP - RAP}{CO} \times 80$	900 - 1400	dynes.sec.cm^{-5}
LVSWI	Left Ventricular Stroke Work Index LVSWI = (MBP - PCWP) (SVI) (.0136)	35- 80	gm-m/m^2/beat

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