

## Pharmacology MCQ

1. Regarding first order kinetics – all of the following are true EXCEPT
  - a. 1<sup>st</sup> order kinetics means rate of reaction is proportional to concentration
  - b. 1<sup>st</sup> order kinetics = more common than zero order kinetics
  - c. 1<sup>st</sup> order kinetics apply to exponential processes
  - d. 1<sup>st</sup> order kinetics generally apply to high plasma concentrations (>20mg/100ml) of ethanol
  - e. 1<sup>st</sup> order kinetics result in steady state concentrations after multiple dosing
  
2. Glyceryl trinitrate
  - a. Is the treatment of choice in CHF
  - b. Has to be converted to a nitrite before it is effective
  - c. Has a duration of action of several hours following buccal absorption
  - d. Has no effect on blood pressure
  - e. Can increase exercise tolerance if taken immediately before exercise
  
3. Which of the following drug interactions may occur in patients treated with MAO inhibitors?
  - a. Hypertension after administration of L-dopa
  - b. Antagonism of the hypotensive actions of guanethidine
  - c. A hypotensive response following ingestion of foods containing tyramine
  - d. A decreased response to tolbutamide
  - e. Decreased action of pethidine
  
4. Heparin
  - a. Is effective when swallowed
  - b. Produces its anticoagulant effect primarily by reducing platelet adhesiveness
  - c. Is effective in vitro
  - d. Is antagonised by vitamin K
  - e. Is potentiated by protamine
  
5. Which of the following statements about laxatives is correct?
  - a. The action of castor oil depends on its lubricant properties
  - b. Liquid paraffin acts by osmotically increasing the volume of gut contents
  - c. Sodium sulphate acts as an irritant purgative
  - d. Senna contains substances that on hydrolysis yield chemicals which increase colonic activity
  - e. Magnesium sulphate is well absorbed from the GI tract
  
6. Lithium

- a. Is used as an anxiolytic
  - b. Has a large therapeutic/toxic ratio
  - c. Is best given at 4 hourly intervals
  - d. Is more toxic in sodium depleted patients
  - e. Toxicity can be reversed by a thiazide diuretic
7. Toluene
- a. Has been associated with causing leukaemia
  - b. Exposure to 800ppm can lead to severe fatigue and ataxia
  - c. Is extremely myelotoxic
  - d. Has no effect on the central nervous system
  - e. Can cause metabolic alkalosis
8. Which of the following drugs has increased bioavailability in the neonate when compared with older children/adults
- a. Acetaminophen
  - b. Digoxin
  - c. Phenobarbital
  - d. Diazepam
  - e. Penicillin
9. Regarding the sulphonylureas
- a. They mainly work by increasing insulin release from the liver
  - b. Chlorpropamide is a 1<sup>st</sup> generation sulphonylurea with a short half life
  - c. 90% of glipizide is excreted unchanged in the urine
  - d. The 2<sup>nd</sup> generation agents are more efficacious than chlorpropamide
  - e. Phenylbutazone inhibits metabolism of tolbutamide – thus causing prolonged hypoglycaemia
10. Bioavailability is
- a. The difference between the amount of drug absorbed and the amount excreted
  - b. The proportion of drug in a formulation that is found in the systemic circulation (plasma)
  - c. The AUC relating plasma concentration of drug to time after administration
  - d. Always identical with different formulations of the same drug
  - e. A measure of the rate of absorption of a drug
11. Nitrous oxide
- a. Can be used with oxygen, as a carrier gas for halothane
  - b. Has poor analgesic properties
  - c. Forms a vapour that is explosive
  - d. Sensitises the heart to the actions of catecholamines
  - e. Is an effective agent for inducing anaesthesia
12. Methylxanthines

- a. At low doses can cause convulsions
- b. Are weak diuretics
- c. Have negative chronotropic and inotropic effects on the heart
- d. Tolerance may develop to the bronchodilatory action of methylxanthines
- e. Children clear theophylline slower than adults do

13. Vancomycin

- a. Is never orally administered as it is poorly absorbed from the GIT
- b. Binds to the 30S unit on the ribosome and inhibits proteinsynthesis
- c. 60% of Vancomycin is excreted by glomerular filtration
- d. Parenteral Vancomycin is commonly used for treatment of infection caused by methicillin susceptible staphylococci
- e. Adverse reactions to Vancomycin are encountered in about 10% of patients

14. Regarding paraquat poisoning

- a. The interval between ingestion and death is usually hours because of immediate pulmonary toxicity
- b. Mechanism of action involves single electron oxidation of the herbicide to free radical species
- c. Probable human lethal dosage is = 50 – 500mg/kg
- d. Oxygen high flow helps stop the pulmonary lesions occurring
- e. Paraquat doesn't affect hepatic or renal functions

15. Which of the following non depolarising skeletal muscle relaxants blocks cardiac muscarinic receptors?

- a. Atracurium
- b. Tubocurarine
- c. Pancuronium
- d. Mivacurium
- e. Vecuronium

16. Effects of atropine include all of the following EXCEPT

- a. Miosis
- b. Dry mouth
- c. Urinary retention
- d. Bronchodilation
- e. Tachycardia (moderate dose)

17. Digoxin

- a. Is >50% metabolised in the liver
  - b. Has a half life in the body of 10 hours
  - c. Causes decreased conduction velocity in atrial muscle
  - d. Often causes constipation in the elderly
  - e. Hypokalaemia facilitates the enzyme inhibiting actions of digoxin, hence potentiates toxicity
18. Which of the following is <15% bound to plasma proteins?
- a. Aspirin
  - b. Diazepam
  - c. Theophylline
  - d. Gentamycin
  - e. Warfarin
19. Ethanol
- a. Is lipid soluble
  - b. Is metabolised by the MEOS system at blood concentrations below 100mg/dl
  - c. Is a vasodilator
  - d. The most frequent neurological abnormality in chronic alcoholism is asymmetrical peripheral nerve injury specific to hands and feet
  - e. Alcohol is estimated to be responsible for approximately 10% of cases of hypertension
20. Frusemide toxic effects include all of the following EXCEPT
- a. Hypokalaemia
  - b. Hyperuricaemia
  - c. Hypomagnesaemia
  - d. Reversible ototoxicity
  - e. Metabolic acidosis
21. Regarding the non steroidal antiinflammatory drugs
- a. Piroxicam has a half life of >50 hours
  - b. Aspirin reversibly inhibits cyclooxygenase
  - c. Diclofenac is a selective  $COX_1$  inhibitor
  - d. Indomethacin is relatively free of adverse side effects
  - e. Ibuprofen is predominantly excreted unchanged in the urine
22. Regarding the "azole" group of antifungals

- a. Fluconazole has low water solubility
  - b. Ketoconazole may be given IV/PO
  - c. Itraconazole undergoes renal elimination
  - d. Clotrimazole is the treatment of choice for systemic candidiasis – given IV
  - e. They work by reduction of ergosterol synthesis by inhibition of fungal cytochrome P450 enzymes
23. Propylthiouracil
- a. Volume of distribution is large
  - b. Plasma half life is 1.5 hours
  - c. A single 100mg dose can inhibit 20% of iodine organification for seven hours
  - d. Doesn't cross the placental barrier
  - e. The most common adverse effect to this drug is polyserositis
24. Regarding histamine receptor antagonists
- a. The second generation H<sub>1</sub> antagonists are more sedating compared with the first generation drugs
  - b. Promethazine also has marked anticholinergic activity
  - c. Significant cardiac toxicity can occur if loratadine is combined with ketoconazole
  - d. Cimetidine can cause irreversible cholestatic effects
  - e. Famotidine significantly increases the bioavailability of ethanol by inhibiting its gastric first pass metabolism
25. Which of the following local anaesthetic agents is an ester?
- a. Bupivacaine
  - b. Ropivacaine
  - c. Procaine
  - d. Lignocaine
  - e. Prilocaine
26. Regarding paracetamol (acetaminophen)
- a. Less than 5% is excreted unchanged
  - b. Acetaminophen has no anti-inflammatory properties
  - c. The half life of paracetamol is 2 – 3 hours
  - d. Haemolytic anaemia has rarely been noted with paracetamol
  - e. All of the above are true
27. Regarding the clinical pharmacologic properties of antiarrhythmic drugs

- a. Flecainide has a half life of 2 – 6 hours
  - b. Quinidine prolongs QT intervals more than what amiodarone does
  - c. Esmolol is equally effective in control of supraventricular versus ventricular arrhythmias
  - d. Adenosine works by a large depressant action on the sino atrial node
  - e. Diltiazem shortens the AV nodal refractory period
28. Ipratropium bromide
- a. Is a tertiary ammonium derivative of datura
  - b. Readily enters the CNS
  - c. Inhibits bronchoconstriction equally in all patients
  - d. Is slightly less effective than  $\beta$  agonist agents in reversing asthmatic bronchospasm
  - e. Is useful if given intravenously
29. Examples of phase 1 biotransformation reactions include all of the following EXCEPT
- a. Acetylation
  - b. Glucuronidation
  - c. Reduction
  - d. Methylation
  - e. Water conjugation
30. Which of the following poison-antidote pairs is correct?
- a. Benzodiazepines – Naloxone
  - b. Fluoride – magnesium
  - c. Anticholinergic agents – pralidoxime
  - d. Methanol – fomepizole
  - e. Iron salts – acetylcysteine
31. Which of the following drugs has a high extraction ratio?
- a. Diazepam
  - b. Theophylline
  - c. Phenytoin
  - d. Propranolol
  - e. Warfarin
32. Inhibition of the angiotensin converting enzyme (ACE)
- a. Prevents the conversion of renin to angiotensin I
  - b. Improves renal function
  - c. Is achieved with  $\beta$  blockers
  - d. Can result in an increase in plasma  $K^+$  concentration
  - e. Increases aldosterone production
33. The fluoroquinolones

- a. Work by inhibiting dihydrofolate reductase
  - b. Have little effect against gram positive organisms
  - c. May be administered to patients with severe campylobacter infection
  - d. Are heavily metabolised in the liver
  - e. Are safe to give to breast feeding mothers
34. Codeine
- a. Occurs in foxglove plants
  - b. Frequently causes diarrhoea
  - c. Is used to treat nausea caused by morphine
  - d. Is equipotent to morphine
  - e. Depresses the cough reflex
35. Regarding the alpha blockers
- a. Phenoxybenzamine binds to  $\alpha$  receptors causing irreversible blockade
  - b. Prazosin has much higher affinity for  $\alpha_2$  receptors compared with  $\alpha_1$  receptors
  - c. They may precipitate urinary retention
  - d. They have no effect on peripheral vascular resistance
  - e. Doxazosin has a short half life of 2 hours
36. All of the following are live virus vaccines EXCEPT
- a. MMR
  - b. Mumps
  - c. Yellow fever
  - d. Oral polio
  - e. Influenza
37. Metaclopramide
- a. Is a potent dopamine agonist
  - b. Is prokinetic in gut
  - c. Dystonic reactions are very rare
  - d. Has a side effect of profound nausea in some patients
  - e. Acts by releasing serotonin from the neurons in the enteric nervous systems's myenteric plexus
38. Regarding the antipsychotic drugs
- a. Chlorpromazine has a high clinical potency
  - b. Haloperidol is highly sedative
  - c. Clozapine causes a great degree of extrapyramidal toxicity
  - d. Pimozide acts almost exclusively on  $D_2$  receptors
  - e. They may cause tardive dyskinesia by their action of dopamine receptor blockade
39. Serotonin – all true EXCEPT

- a. Reuptake into neurons is blocked by clomipramine
  - b. When stored in enterochromaffin cells has a neurotransmitter role
  - c. Cause cause  $\uparrow$  GI motility
  - d. Storage is disrupted by reserpine
  - e. Concentration in nerves is  $\uparrow$  by MAOIs
40. Which of the following steroid agents is most potent (in its anti-inflammatory effect)?
- a. Prednisone
  - b. Betamethasone
  - c. Hydrocortisone
  - d. Triamcinolone
  - e. Methylprednisolone
41. Regarding lead toxicity
- a. Lead can induce an anaemia that is macrocytic
  - b. Young children absorb around 10% of ingested inorganic lead
  - c. Lead induced peripheral neuropathy often involves upper limb extensors resulting in wrist drop
  - d. High dose organic lead poisoning usually results in severe pneumonitis
  - e. All patients with elevated blood lead levels should have chelation treatment whether symptomatic or not
42. Regarding amiodarone
- a. It is a strong calcium channel blocker
  - b. It combines almost exclusively with sodium channels in the activated state, blocking them
  - c. It increases clearance of warfarin and theophylline
  - d. Skin deposits result in photodermatitis in about 55% of patients
  - e. It has a half life of 13 – 103 days
43. Clindamycin
- a. Inhibits bacterial cell wall synthesis
  - b. If often used for prophylaxis of endocarditis in patients with valvular disease who are undergoing dental procedures
  - c. Penetrates through blood brain barrier into CSF well
  - d. Works well against enterococci and gram negative aerobic organisms
  - e. Is 10% protein bound
44. Regarding agents used to treat gout
- a. As little as 8mg in 24 hours of colchicine may be fatal
  - b. Allopurinol treats gout by stimulating the enzyme xanthine oxidase
  - c. Probenecid is an organic alkaline substance
  - d. Colchicine may precipitate acute attacks of gout
  - e. Aspirin is effective against gout as it inhibits urate crystal phagocytosis



45. Overdoses of which of the following antidepressant agents are characterised by severe neurotoxicity?
- Amitriptyline
  - Moclobemide
  - Amoxapine
  - Imipramine
  - Fluoxetine
46. Local anaesthetics
- Block by LAs is more marked in nerves with higher frequencies of depolarisation and with shorter depolarisations
  - Bupivacaine is metabolised faster in the liver than prilocaine
  - Elevated extracellular calcium partially potentiates the action of local anaesthetics
  - Large doses of prilocaine may cause methaemoglobinaemia
  - Block unmyelinated small nerve fibres before myelinated fibres of the same diameter
47. What is the half-life of a drug with a volume of distribution of 700l/70kg and clearance of 49 litres / hour /70kg?
- 5 hours
  - 8 hours
  - 10 hours
  - 12.5 hours
  - 15 hours
48. All of the following may be seen in organophosphate poisonings EXCEPT
- Salivation
  - Fibrillation of muscle fibres
  - Bronchospasm
  - Tachycardia
  - Vomiting
49. Regarding antihypertensive agents
- Hydralazine dilates both arterioles and veins
  - Nifedipine has more cardiodepressant effects than vasodilator effect compared with Verapamil
  - Minoxidil works by opening calcium channels in smooth muscle
  - Nitroprusside is a safe antihypertensive agent in pregnancy
  - Diazoxide is bound extensively to serum albumin
50. Regarding antimycobacterial agents

- a. Isoniazid is a prodrug
- b. Rifampicin inhibits DNA synthesis
- c. About 20% of ethambutol is excreted in faeces
- d. Risk of ototoxicity and nephrotoxicity is increased in the elderly with Streptomycin
- e. All of the above are true

51. Regarding asthma treatment

- a. Salmeterol is a potent selective B<sub>2</sub> agonist with short duration of action
- b. Corticosteroids work in asthma by direct action on relaxing airway smooth muscle
- c. Cromolyn sodium is an excellent first line medication in treatment of acute severe asthma
- d. ≥80-90% of the total dose of aerosol medication is deposited in the mouth/pharynx
- e. Theophylline may produce seizures at blood concentrations around 20mg/l

52. Regarding temazepam – all of the following are true EXCEPT

- a. It produces inactive metabolites
- b. It induces enzymes only to a minimal extent
- c. It increases REM sleep
- d. It causes less hangover than nitrazepam
- e. It causes rebound insomnia

53. Regarding the anti-epileptic drugs

- a. Vigabatrin works by sodium channel blockade
- b. Phenytoin is able to stimulate its own metabolism by enzyme induction
- c. Lorazepam has documented efficacy against absence seizures
- d. Valproate has a large volume of distribution (>500l/70kg)
- e. The most common dose related adverse effects of carbamazepine are diplopia and ataxia

54. Regarding aspirin

- a. The average anti-inflammatory dose of aspirin is 0.6g up to 4 hourly
- b. Aspirin's main adverse effect at usual doses is rash
- c. Aspirin's antiplatelet effect lasts 8 – 10 days
- d. At low toxic doses – respiratory acidosis may occur
- e. Aspirin has a pKa of 4.5

55. Which of the following agents can be given as an anaesthetic without causing cardiovascular depression or stimulation?
- Ketamine
  - Etomidate
  - Propofol
  - Halothane
  - Thiopentone
56. Metronidazole
- Causes pancreatitis uncommonly
  - Is 80% bound to protein
  - Plasma clearance of Metronidazole is decreased in patients with impaired renal function
  - Is the treatment of choice in gonococcal disease
  - Is safe in pregnancy
57. Benzodiazepines
- Increase the duration of GABA gated chloride channel openings
  - Will depress (in high doses) the CNS to the point known as stage 3 of general anaesthesia
  - Bind to GABA<sub>B</sub> receptors
  - Have extensive cardiodepressant effects in doses used to cause hypnosis
  - Decrease the duration of stage 2 NREM sleep
58. Regarding antacids
- Calcium carbonate can cause milk alkali syndrome as an adverse effect
  - Aluminium hydroxide can cause constipation
  - Sodium bicarbonate is a highly soluble salt
  - Magnesium hydroxide is one of the constituents in mylanta
  - All of the above are true
59. Sotalol
- Is extensively metabolised in the liver
  - Is a selective B<sub>1</sub> blocker
  - Has a usual effective dosage of 80 – 320mg bd
  - Causes torsade de pointes when plasma concentrations of sotalol are normal – low
  - Is only effective in supraventricular arrhythmia treatment

60. This MCQ paper has been so tedious it might be good now to take some hallucinogens. All of the following statements are correct EXCEPT
- a. LSD is related to the ergot alkaloids
  - b. PCP can cause loss of proprioception
  - c. Overdosage of LSD commonly is fatal
  - d. Scopolamine causes hallucinogenic effects by blocking the central muscarinic receptors
  - e. PCP acts as an antagonist on the NMDA subtype of glutamate receptors

## Answers

- |     |   |     |   |
|-----|---|-----|---|
| 1.  | D | 35. | A |
| 2.  | E | 36. | E |
| 3.  | A | 37. | B |
| 4.  | C | 38. | D |
| 5.  | D | 39. | B |
| 6.  | D | 40. | B |
| 7.  | B | 41. | C |
| 8.  | E | 42. | E |
| 9.  | 3 | 43. | B |
| 10. | B | 44. | A |
| 11. | A | 45. | C |
| 12. | B | 46. | D |
| 13. | E | 47. | C |
| 14. | C | 48. | D |
| 15. | C | 49. | E |
| 16. | A | 50. | E |
| 17. | E | 51. | D |
| 18. | D | 52. | C |
| 19. | C | 53. | E |
| 20. | E | 54. | C |
| 21. | A | 55. | B |
| 22. | E | 56. | A |
| 23. | B | 57. | B |
| 24. | B | 58. | E |
| 25. | C | 59. | C |
| 26. | E | 60. | C |
| 28. | C |     |   |
| 28. | D |     |   |
| 29. | C |     |   |
| 30. | D |     |   |
| 31. | D |     |   |
| 32. | D |     |   |
| 33. | C |     |   |
| 34. | E |     |   |