

1. Which of the following benzodiazepines has the shortest elimination half life?
 - a. Lorazepam
 - b. Diazepam
 - c. Triazolam
 - d. Temazepam
 - e. Alprazolam

2. You are given a vial with 15ml of 0.5% prilocaine to do an arm block. How many mg of prilocaine are you injecting?
 - a. 7.5mg
 - b. 15mg
 - c. 30mg
 - d. 50mg
 - e. 75mg

3. The inhaled general anaesthetic with the highest blood gas partition coefficient is:
 - a. Methoxyflurane
 - b. Seroflurane
 - c. Nitrous oxide
 - d. Isoflurane
 - e. Halothane

4. Regarding local anaesthetic agents
 - a. Lignocaine is also an antiarrhythmic of the Vaughan Williams group 1A classification.
 - b. At normal tissue pH the larger fraction of local anaesthetic in the body fluids will be in the uncharged form.
 - c. Bupivacaine may cause an apparent cyanosis in some patients.
 - d. The duration of action of procaine will be increased in the presence of liver disease.
 - e. Local anaesthetic agents block conduction in small myelinated axons prior to blockade of other axons.

5. Regarding opiate analgesic agents
 - a. Codeine has a low oral:parenteral potency.
 - b. Most opioids are metabolised in the liver to polar metabolites.
 - c. Kappa opioid receptors are responsible for the respiratory depressant properties of morphine.
 - d. Miosis is one action of opioids to which tolerance develops.
 - e. The usual dose of naloxone is 1-4mg IV repeated as necessary.

6. All of the following may occur with marijuana **except**
- Miosis
 - Increased pulse rate
 - Tremor
 - Reddened conjunctivae
 - Decreased blood pressure
7. Suxamethonium
- Is a nondepolarising neuromuscular blocking agent.
 - Is contraindicated in all eye operations.
 - Stimulates cardiac muscarinic receptors and autonomic ganglia.
 - Its action is directly terminated by the action of plasma cholinesterase.
 - Should not be administered to patients with burns >24 hours old because of its hypercalcaemic effect.
8. Inhalational anaesthetics
- Enflurane is proconvulsant.
 - Isoflurane is the inhalational agent of choice in patients with active ischaemic heart disease.
 - Nitrous oxide is a useful adjunct to volatile anaesthetic use in women in the first trimester of pregnancy.
 - Halothane has a MAC of 0.75% - making it less potent than desflurane.
 - Desflurane is extensively metabolised via the liver.
9. Phenytoin
- Is 20-30% bound to albumin.
 - Is the drug of choice in treatment of absence seizures.
 - Undergoes flow limited elimination.
 - Steady state mean plasma concentration varies disproportionately with the dose.
 - Preferentially binds to activated state sodium channels.
10. Regarding drugs used in Parkinson's disease
- Bromocriptine is the first line drug to treat Parkinson's disease in psychotic patients.
 - 80-90% of a single dose of Levodopa enters the brain unaltered
 - Patients taking selegiline to treat Parkinson's disease are limited in what they can eat because of the tyramine reaction phenomenon.
 - Amantadine has anti Parkinsonian effects and is administered at a dose of 100mg twice a day.
 - Antimuscarinic drugs are of benefit in elimination of bradykinesia in Parkinson's.

11. Which of the following antipsychotics (in excess dose) is responsible for cardiac arrhythmias?
- Chlorpromazine
 - Thiothixene
 - Thioridazine
 - Haloperidol
 - Clozapine
12. Regarding the penicillins
- Penicillin is excreted into breast milk to levels 3-15% of those present in the serum.
 - Absorption of amoxyl is impaired by food.
 - Benzathine penicillin is given orally.
 - Penicillins are 90% excreted by glomerular filtration.
 - Dosage of nafcillin should be adjusted in the presence of renal failure.
13. All of the following antibiotics bind to the 50S subunit of the ribosome therefore inhibiting protein synthesis **except**
- Chloramphenicol
 - Doxycycline
 - Erythromycin
 - Linezolid
 - Clindamycin
14. Regarding the pharmacokinetics of the tetracyclines
- Tetracyclines are 40-80% bound by serum proteins.
 - Absorption is enhanced by coadministration of antacids.
 - Tetracyclines cross the BBB easily.
 - Doxycycline is excreted predominantly via the kidney.
 - Demeclocycline is a short acting tetracycline drug.
15. Regarding fluoroquinolones
- Ciprofloxacin is ineffective in the treatment of gonococcus.
 - Norfloxacin and Ciprofloxacin are predominantly faecally excreted.
 - Norfloxacin and Ciprofloxacin have long half lives (12 hours).
 - They have poor oral bioavailability.
 - May damage growing cartilage in children less than 18 years of age.
16. All of the following are recognised adverse effects of isoniazid **except**
- Hepatitis
 - Peripheral neuropathy
 - Retrobulbar neuritis
 - ↓ phenytoin metabolism - ↑ protein blood levels and toxicity
 - CNS toxicity

17. Regarding antifungals – all of the following pairings are correct **except**
- Ketoconazole = inhibition of cytochrome P450 enzymes.
 - Fluconazole = good CSF penetration
 - Amphotericin B = renal impairment
 - Griseofulvin = insoluble, derived from species of penicillin
 - Nystatin = useful IV antifungal agent
18. We use antiretroviral agents in ED every day NOT! But here is a question on them anyway
- Lamivudine is active against the hepatitis B virus
 - Didanosine may cause pancreatitis
 - Zidovudine has neutropaenia and anaemia as side effects
 - Ritonavir is a protease inhibitor
 - All of the above are correct
19. Drugs which enhance other drug metabolism include all of the following **except**
- Rifampicin
 - Ketoconazole
 - Phenobarbitol
 - Griseofulvin
 - Phenytoin
20. Which of the following has a high extraction ratio?
- Trimethoprim
 - Valproic acid
 - Lignocaine
 - Metronidazole
 - Diazepam
21. Which of the following has the greatest apparent volume of distribution?
- Furosemide
 - Lithium
 - Nortriptylline
 - Chloroquine
 - Propranolol
22. Heparin and protamine used together is an example of
- Physiologic antagonism
 - Chemical antagonism
 - Partial agonism
 - Irreversible antagonism
 - Agonal agonism

23. The half life of a drug with a Vd of $-200\text{L}/70\text{kg}$ and clearance of $10\text{l}/\text{hr}/70\text{kg}$ is:
- 10 hours
 - 14 hours
 - 20 hours
 - 40 hours
 - indeterminate
24. Acetaminophen (paracetamol) can undergo all of the following biotransformation reactions **except**
- Deamination
 - N-oxidation
 - Glucuronidation
 - Sulphation
 - Glutathione conjugation
25. Atropine
- Is a quaternary amine alkaloid ester of tropic acid.
 - About 60% of the dose of atropine is excreted unchanged in the urine.
 - Atropine has prominent stimulant CNS effects when given in usual doses.
 - Causes irreversible blockade of the actions of cholinomimetics at muscarinic receptors.
 - Causes diarrhoea.
26. Regarding sympathomimetic drugs
- Amphetamine is a powerful stimulant of appetite.
 - Phenylephrine effectively causes miosis.
 - Ephedrine acts primarily through the release of stored catecholamines.
 - Dobutamine is a B₂ selective agent.
 - Cocaine works by inhibiting GABA reuptake into neurons in the "pleasure centres" of the brain.
27. B blockers have many different properties. Which of the following statements is correct?
- Atenolol has high lipid solubility.
 - Esmolol has partial agonist activity.
 - Labetalol is B₁ selective.
 - The elimination half life of sotalol is 12 hours.
 - Timolol has prominent local anaesthetic activity.

28. Regarding the ACE inhibitors
- Captopril is a prodrug
 - They stimulate the renin angiotensin system and inhibit the kallikrein kinin system
 - They are safe in pregnancy
 - Enalapril should be given at least 3 times a day
 - They can be used safely in persons with ischaemic heart disease
29. Which of the following drugs is most extensively bound to plasma proteins?
- Morphine
 - Gentamicin
 - Warfarin
 - Carbamazepine
 - Theophylline
30. Nitrates are used in ED often. Which of the following statements is correct?
- Arteries are more sensitive to relaxant effects of nitroglycerin than veins.
 - Nitrates are absolutely contraindicated in patients with glaucoma.
 - Nitroglycerin works by being denitrated – thus releasing nitrate ion which vasodilates.
 - The duration of action of isosorbide dinitrate (oral) is 10-60 minutes.
 - Smooth muscle can develop tachy phylaxis to nitrates.
31. Examples of vaccines using live agents include all of the following **except**
- Smallpox
 - Influenza
 - Mumps
 - Measles
 - Yellow fever
32. Regarding calcium channel blockers and treatment of angina pectoris
- Nifedipine is selective for cerebral blood vessels.
 - Verapamil is 70% eliminated by the GI tract.
 - Diltiazem has a greater ratio of smooth muscle effects relative to cardiac effects than amlodipine does.
 - Nimodipine has the shortest half life of all the calcium channel blockers.
 - Ca²⁺ channel blockers also have a skeletal muscle depressant effect.
33. Digoxin has all of the following actions on cardiac electrical function **except**
- ↓ atrial muscle automaticity
 - ↓ AV node conduction velocity
 - ↓ refractory period in perkinge system and ventricles
 - ST segment depression on ECG – especially with chronic use
 - Bigeminy can occur

34. Toxicity of digoxin may be exacerbated by which of the following
- Hypocalcaemia
 - Hyperkalaemia
 - Hypomagnesaemia
 - Hyperuricaemia
 - Grapefruit juice
35. Which of the following pairings is correct?
- Quinidine – can shorten QT interval on the ECG by shortening the action potential duration.
 - Procainamide – adverse effect = SLE like syndrome.
 - Lignocaine – Vaughan Williams class 1C drug.
 - Flecainide – prominent antimuscarinic effects.
 - Sotalol – extensively metabolised in the liver.
36. Amiodarone (oral)
- Has a half life of 5 days
 - Increases clearance of Warfarin, Theophylline and other drugs.
 - Has a high affinity for activated sodium channels.
 - Causes torsades de pointes frequently because of prolongation of the QT interval.
 - Causes photodermatitis in about 25% of patients.
37. Glucagon
- In large doses produces profound relaxation of the intestine.
 - Is a potent negative inotrope/chronotrope.
 - Serves to raise blood glucose at the expense of skeletal muscle glucagon.
 - Has multiple severe adverse reactions.
 - Therapeutic doses used to reverse hypoglycaemia are 10mg.
38. Regarding sulfonylureas
- They increase insulin release from the pancreas by inhibition of sodium ion influx.
 - They also stimulate insulin synthesis.
 - Tolbutamide is a second generation drug which should be used with caution in elderly diabetics.
 - Glipizide therapy is contraindicated in patients with significant hepatic impairment.
 - Chlorpropamide has the shortest half life of all the sulfonylureas.

39. Which of the following corticosteroids has the greatest anti-inflammatory potency relative to hydrocortisone?
- Prednisone
 - Cortisone
 - Fludrocortisone
 - Triamcinolone
 - Betamethasone
40. Regarding antithyroid drugs
- Propylthiouracil blocks uptake of iodide by the thyroid gland.
 - Radioactive iodine is safe in breast feeding mothers.
 - Lithium may cause inhibition of thyroid hormone synthesis or release.
 - The cross sensitivity between propylthiouracil and methimazole is about 10%.
 - Adverse reactions to iodine are very common.
41. Heparin
- Is a heterogeneous mixture of sulfated fatty acids.
 - Heparin binds to antithrombin and accelerates reactions between antithrombin and clotting factor proteases 100 fold.
 - Heparin causes severe thrombocytopenia in 10% of patients.
 - Heparin crosses the placenta easily and thus should not be used in pregnancy.
 - Long term use of heparin is associated with mineralocorticoid deficiency.
42. All of the following may interact with Warfarin to increase prothombin time **except**
- Amiodarone
 - Cholestyramine
 - Fluconazole
 - Cimetidine
 - Disulfiram
43. Regarding aspirin
- It irreversibly acetylates and blocks platelet cyclooxygenase.
 - Salicylism occurs at aspirin plasma concentrations of 10mg/dl.
 - Is now completely safe in children as Reye's syndrome is a myth.
 - Aspirin in doses of 4g or more per day will elevate uric acid levels.
 - It is very effective for relief of severe visceral pain.

44. The nonsteroidal anti inflammatory drug with the longest half life is
- Naproxen
 - Aspirin
 - Ibuprofen
 - Diclofenac
 - Piroxicam
45. Regarding the methylxanthines
- At high concentration these drugs stimulate the enzyme phosphodiesterase.
 - They have antidiuretic action.
 - Tolerance to the bronchodilating effects of theophylline may develop.
 - Improvement in pulmonary function is correlated with plasma theophylline concentration of 5-20mg/l.
 - Neonates clear theophylline from the body faster than adults.
46. Regarding acetazolamide
- 85% of the bicarbonate resorptive capacity is inhibited by acetazolamide in the proximal tubule.
 - Hyperchloraemic metabolic alkalosis may result from acetazolamide administration.
 - Is safe to use in patients with hepatic disease as it is eliminated renally.
 - It decreases phosphate excretion in the kidney.
 - Renal excretion of weak bases is enhanced by acetazolamide.
47. Loop diuretics
- Consist of spironolactone and bendrofluazide.
 - Inhibit the $\text{Na}^+ \text{K}^+ / 2 \text{Cl}^-$ transport pump in the distal tubule of the kidney.
 - Can cause a usually irreversible ototoxic reaction.
 - Can cause hyperuricaemia and precipitate gout.
 - Inhibit renal prostaglandin synthesis.
48. Thiazides can cause all of the following entities **except**
- Hyponatraemia
 - Hyperuricaemia
 - Hypocalcaemia
 - Hyperlipidaemia
 - Metabolic alkalosis

49. Regarding H₁ blockers
- 1st generation H₁ blockers are nonsedating agents.
 - Promethazine is more potent than procaine as a local anaesthetic.
 - Interaction of some 2nd generation H₁ blockers with tomato juice can increase the drug levels leading to torsade de pointes.
 - Cyproheptadine has prominent blocking effects at dopamine receptors as well as being a potent H₁ blocker.
 - Loratadine has a short half life of 2 – 4 hours.
50. Which of the following statements is correct
- Sumatriptan = 5HT_{1A} agonist
 - Buspirone = 5HT_{1D} agonist
 - Cisapride = 5HT₄ agonist
 - Ketanserin = 5HT₃ agonist
 - Ondansetron = 5HT_{1C} agonist
51. Regarding uses of antibiotics – which of the following statements is true?
- Shigella – treat with a quinolone.
 - Chlamydia psittaci – treat with a tetracycline.
 - Legionella – treat with Erythromycin.
 - Clostridium difficile – treat with metronidazole.
 - All of the above are correct.
52. All of the following drugs have different oral drug absorption rates in the neonate **except**
- Phenytoin
 - Acetaminophen
 - Ampicillin
 - Phenobarbital
 - Digoxin
53. One of the following drugs is not affected by age related decrease in hepatic clearance. Which one is it?
- Lignocaine
 - Diazepam
 - Propranolol
 - Theophylline
 - Imipramine
54. Metoclopramide
- Is a dopamine agonist
 - Is a prokinetic agent in the gut
 - Increases gastric secretions
 - Releases adrenaline from neurons in the enteric nervous system's myenteric plexus
 - Has a half life of 8 hours – so is given 3 x per day

55. All of the following may be seen in the classic anticholinergic syndrome **except**
- Flushed skin
 - Dilated pupils
 - Hypothermia
 - Confusion
 - Dry mucous membranes
56. Tardive dyskinesia
- Is an acute dystonic reaction
 - Is secondary to a relative cholinergic excess
 - Older men on chronic antipsychotic treatment are most susceptible to this problem
 - Is sometimes self limited
 - Is estimated to occur in 60% of chronically treated patients
57. Plasma lithium levels (assuming no change in daily lithium dose) may become toxic in the presence of all of the following **except**
- Post partum state
 - Dehydration
 - Use of some non steroidal anti inflammatory drugs
 - Use of thiazides
 - Pregnancy
58. Regarding IV anaesthetic agents
- Ketamine is the induction agent of choice in a head injured patient
 - Propofol has a slow offset of action.
 - Etomidate causes hypotension more commonly than thiopentone.
 - Ideal agents for neuroleptanaesthesia are fentanyl and droperidol.
 - Thiopentone is metabolised at a rate of 40-50% per hour in humans following a single dose.
59. Regarding the alcohols – which I would image you will drink heaps of once the exam is over –
- Formaldehyde is responsible for the toxic effects of methanol.
 - Alcohols can cause a wide anion gap metabolic acidosis.
 - A normal nontolerant adult can metabolise 30-40 grams of alcohol/hour.
 - Ethanol is a potent vasoconstrictor.
 - The volume of distribution of ethanol is 3l/kg.

60. The study of pharmacokinetics is
- a. What the drug does to the body
 - b. Really, really interesting
 - c. What the body does to the drug
 - d. Incredibly boring
 - e. Related to neuroleptokinetics

Pharmacology Answers

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