1. Which of the following sites are ranked correctly from the highest rate of absorption to the lowest rate of absorbtion of local anaesthetic agent?

a) intercostal > epidural > caudal > brachial plexus > sciatic nerve
b) intercostal > caudal > epidural > brachial plexus > sciatic nerve
c) intercostal > tracheal mucosa > epidural > brachial plexus > sciatic nerve
d) caudal > intercostal > epidural > brachial plexus > sciatic nerve
e) intercostal > caudal > epidural > sciatic nerve > brachial plexus

2. All the following are true of bupivacaine EXCEPT:

a) It is more lipid soluble than lignocaine and hence more potent than lignocaine
b) Binds extensively to proteins
c) Pain & temperature nerves (δ fibres) are more sensitive to blocackade than postganglonic sympathetic fibres
d) Has a greater cardiac toxicity than Ropivacaine
e) Toxicity can be reduced by co-administration of adrenaline

3. Thiopentone; Which one is true?

a) Has a pH of 5.5.
b) Has a $T_{1/2}\beta$ of 5 min.
c) Phentobarbital is a metabolite.
d) 5% is excreted unchanged in the urine.
e) The rectal dose is apprximately double the IV dose.

4. Propofol: All the following are true except:

a) Clearence is greater than hepatic blood flow.
b) Causes less drop in B.P. than thiopentone
c) Has no proarrhythmic effects
d) Causes pain on injection
e) Inhibits the larygeal reflexes

1. b
2. c
3. c
4. b

PHARMACOLOGY MCQ'S 6-10

6. Which of the following statements about capacity limited elimination is false.

a. If dosing rate exceeds elimination capacity, steady state cannot be achieved.
b. Capacity limited elimination is important for ethanol, phenytoin, and aspirin.
c. Clearance varies depending on the concentration of the drug.
d. Capacity limited elimination occurs due to a low blood supply to an organ of elimination.
e. Capacity limited elimination generally does not apply to high extraction drugs.

7. Which of the following statements about half life is false.

a. Half life is the amount of time required to change the amount of drug in the body by one half during elimination.
b. Half life = 0.7 times Clearance / Volume of distribution
c. Disease states can affect the half life.
d. It takes 3-5 half lives to reach a steady state with regular dosing.
e. More frequent dosing produces smaller fluctuations in peak and trough concentrations.

8. Which of the following statements about the kinetics of elimination is false.

a. In zero order kinetics the rate of elimination of a drug is said to be capacity limited
b. In first order kinetics rate of elimination is proportional to drug concentration.
c. In mixed order kinetics metabolism is initially first order but then becomes zero order as the metabolizing enzymes become saturated.
d. Phenytoin toxicity is not uncommon because it is subject to zero order kinetics within the therapuetic dose range.
e. Ethanol and aspirin are both subject to first order kinetics.

9. Which of the following is false in relation to renal clearance of drugs.

a. If a drug is an acid, the presence of another acid drug competing for active tubular secretion sites in the renal tubule will cause an increase in the rate of elimination of the drug.
b. For drugs which are reabsorbed renal clearance increases as urine flow rate increases.
c. If renal drug clearance changes when urine pH changes it is likely that the drug is reabsorbed.
d. Renal clearance = filtration + secretion – reabsorption.
e. Clearance by glomerula filtration = fraction of unbound drug in the blood times GFR.

10. Which of the following is false in relation to hepatic clearance of drugs.

a. Suicide inhibitors are drugs that are metabolized to products which irreversibly inhibit the metabolizing enzyme.
b. Induction usually results from increased synthesis of cytochrome P450-dependent drug oxidizing enzymes in the liver.
c. Phase 2 reactions convert the parent drug to more polar or more reactive products by unmasking or inserting a polar functional group such as –OH, -SH or _NH2.
d. Hepatic clearance = hepatic blood flow times hepatic extraction ratio.
e. If the liver has low enzyme activity for metabolizing a drug then the main determinant of hepatic clearance will be the hepatic blood flow.

ANSWERS

6. D. Capacity limited elimination is not limited by the blood supply to the organ of elimination.
7. B. Half life = 0.7 (volume of distribution) / clearance.
8. E. Ethanol, aspirin and phenytoin undergo mixed order elimination.
9. A. A competitor for an active tubular secretion site will cause a decrease in secretion and therefore a decrease in renal clearance of the drug.
10. C. The description given is for a phase 1 reaction.

January 2006

1. All of the following antibiotics bind to the 50S subunit of the ribosome thereby inhibiting proteinsynthesis EXCEPT
   a. Chloramphenicol
   b. Erythromycin
   c. Linezolid
   d. Doxycycline
   e. Clindamycin

2. Pharmacokinetics of doxycycline
   a. 20% bound by serum proteins
   b. 60-70% absorption after oral administration
   c. Absorption is impaired by divalent cations, Al^{3+}, and antacids
   d. Widely distributed especially into the CSF
   e. Is eliminated via renal mechanisms

3. Which of the following inhibits DNA gyrase?
   a. Penicillin
   b. Trimethoprim
   c. Chloramphenicol
   d. Ciprofloxacin
   e. Gentamicin

4. Resistance to Penicillin and other β lactams is due to
   a. Modification of target PBPs
   b. Impaired penetration of drug to target PBPs
   c. Presence of an efflux pump
   d. Inactivation of antibiotics by β lactamase
   e. All of the above

5. All of the following are recognised adverse effects of isoniazid EXCEPT
   a. Hepatitis
   b. Peripheral neuropathy
   c. Retrobulbar neuritis
   d. $\downarrow$ Phenytoin metabolism $\rightarrow \uparrow$ Phenytoin blood levels and toxicity
   e. CNS toxicity

6. Regarding fluoroquinolones
   a. Ciprofloxacin is ineffective in the treatment of gonococcus
   b. Norfloxacin and Ciprofloxacin are predominantly faecally excreted
   c. Norfloxacin and Ciprofloxacin have long half lives (12 hours)
   d. They have poor oral bioavailability
   e. May damage growing cartilage in children less than 18 years of age

7. 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 protein synthesis
   c. 60% of vancomycin is excreted by glomerular filtration
   d. Parenteral vancomycin is commonly used for treatment of infections caused by methicillin susceptible staphylococci
   e. Adverse reactions to vancomycin are encountered in about 10% of patients

8. 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 orally
    e. They work by reduction of ergosterol synthesis by inhibition of fungal cytochrome P_{450} enzymes

9. The fluoroquinolones
    a. May be administered to patients with severe campylobacter infection
    b. Work by inhibiting dihydrofolate reductase
    c. Have little effect against gram positive organisms
    d. Are heavily metabolised in the liver
    e. Are safe to give to breast feeding mothers

10. Clindamycin
    a. Inhibits bacterial cell wall synthesis
    b. Is often used for prophylaxis of endocarditis in patients with Valvular disease who are undergoing dental procedures
    c. Penetrates through BBB into CSF well
    d. Works well against enterococci and gram negative aerobic organisms
    e. Is 10% protein bound

11. Which of the following is a second generation cephalosporin?
    a. Ceftazidime
    b. Cephalothin
    c. Cefotaxime
    d. Cefaclor
    e. Cephalexin

12. The cephalosporin with the highest activity against gram positive cocci is
    a. Cefaclor
    b. Cephalothin
    c. Cefuroxime
    d. Cefepime
    e. Cefotaxime

13. Regarding the penicillins
    a. Penicillin ix excreted into breast milk to levels 3-15% of those present in the serum
    b. Absorption of amoxyl is impaired by food
    c. Benzathine penicillin is given PO
    d. Penicillins are 90% excreted by glomerular filtration
    e. Dosage of nafcillin should be adjusted in the presence of renal failure

14. Rifampicin
    a. Inhibits hepatic microsomal enzymes
    b. Inhibits DNA synthesis
    c. Is bactericidal for mycobacteria
    d. Is not appreciably protein bound
    e. Is predominantly excreted unchanged in the urine

15. Regarding resistance to antibiotics
    a. Penicillinases cannot inactivate cephalosporins
    b. Macrolides can be inactivated by transferases
    c. Mutation of aminoglycoside binding site is its main mechanism of resistance
    d. Tetracycline resistance is a marker for multidrug resistance
    e. Resistance to antibiotics is rarely plasmid encoded

16. Concerning toxicity of antibiotics
    a. Enamel dysplasia is common with aminoglycosides
    b. Grey Baby Syndrome occurs with rifampicin use
    c. A disulfiram like reaction can occur with macrolides
    d. Haemolytic anaemias can occur with sulphonamide use
    e. Nephritis is the most common adverse reaction with isoniazid

17. Which of the following is considered to be bacteriostatic?
    a. Penicillin
    b. Chloramphenicol
    c. Ciprofloxacin
    d. Cefoxitin
    e. Tobramycin

18. Half life of amphotericin B is
    a. 2 seconds
    b. 20 minutes
    c. 2 hours
    d. 2 weeks
    e. 2 months

19. Regarding antiseptic agents – all of the following are true EXCEPT
    a. Sodium hypochlorite is an effective antiseptic for intact skin
    b. Potassium permanganase is an effective bactericidal agent
    c. Formaldehyde may be used to disinfect instruments
    d. Chlorhexidine is active against gram positive cocci
    e. Ethanol is an effective skin antiseptic because it denatures microbial proteins

20. Ciprofloxacin
    a. Is a defluorinated analogue of nalidixic acid
    b. Inhibits tropoisomerases 2 and 3
    c. Has no gram positive cover
    d. Has bioavailability of 30%
    e. May cause an arthropathy

21. Flucloxacillin
    a. Is ineffective against streptococci
    b. Is active against enterococci and anaerobes
    c. Blocks transpeptidation and inhibits peptidoglycan synthesis
    d. Is poorly absorbed orally
    e. Has excellent penetration into CNS and prostate

22. Aminoglycosides
    a. Have a β lactam ring
    b. Can produce neuromuscular blockade
    c. Are DNA gyrase inhibitors
    d. Normally reach high CSF concentrations
    e. Have good oral absorption but high first pass metabolism

23. Ribosomal resistance occurs with
    a. Sulphonamides
    b. Penicillin
    c. Fluoroquinolones
    d. Macrolides
    e. Trimethoprim

24. Regarding antivirals
    a. Delvindine is a nucleoside reverse transcriptase inhibitor (NRTI)
    b. Zidovudine (AZT) is a non nucleoside reverse transcriptase inhibitor (NNRTI)
    c. NRTIs activate HIV-1 reverse transcriptase
    d. Abacavir is a protease inhibitor
    e. NRTIs require intracytoplasmic activation to the triphosphate form

25. All of the following are true regarding metronidazole EXCEPT
    a. It is used to treat giardia
    b. It causes a metallic taste in the mouth
    c. It inhibits alcohol dehydrogenase
    d. It is used to treat gardnerella
    e. It is useful against trichomonoas vaginalis

Antibiotic MCQs - Answers
June 2004

1. d
2. c
3. d
4. e
5. c
6. e
7. e
8. e
9. a
10. b
11. d
12. b
13. a
14. c
15. c
16. d
17. b
18. d
19. a
20. d
21. c
22. b
23. d
24. e
25. c

1. All of the following are true regarding penicillins EXCEPT
    a. Most penicillins only cross the blood brain barrier when the meninges are inflamed.
    b. Penicillins don't require dosage adjustment in renal failure
    c. Penicillins inhibit cross linkage of peptidoglycans in the cell wall
    d. Piperacillin is a penicillin active against pseudomonas
    e. Only about 5 to 10% of people with a past history of penicillin allergy have a reaction on re exposure

2. Ciprofloxacin
    a. Is a defluorinated analogue of nalidixic acid
    b. Inhibits tropoisomerases 2 and 3
    c. Has no gram positive cover
    d. Has a bioavailability of 30%
    e. May cause an arthropathy

3. Resistance to B lactams
    a. Can be due to an efflux pump
    b. Is most commonly due to modification of the target PBPs
    c. Does not involve penetration of drug to target PBPs
    d. Infers resistance only to penicillinc
    e. Can involve up to 5 different B lactamases

4. Macrolides
    a. Have enhanced activity at acidic pH
    b. Have little activity against legionella
    c. Have half lives which increase in patients with anuria
    d. Induce cytochrome p450 enzymes
    e. Are contraindicated in neonates

5. Flucloxacillin
    a. Is ineffective against streptococci
    b. Is active against enterococci and anaerobes
    c. Blocks transpeptidation and inhibits peptidoglycan synthesis
    d. Is poorly absorbed orally
    e. Has excellent penetration into CNS and prostate

6. All of the following inhibit nucleic acid synthesis EXCEPT
    a. Norfloxacillin
    b. Chloramphenicol
    c. Trimethoprim
    d. Rifampicin
    e. Sulfasalazine

7. Which of the following is a second generation cephalosporin?
    a. Cefaclor
    b. Ceftazidime
    c. Cephalexin
    d. Cefotaxime
    e. Cephalothin

8. Regarding the pharmacokinetics of the tetracyclines
    a. Tetracyclines are 40 to 80 % bound by serum proteins
    b. Absorption is enhanced by coadministration of antacids
    c. Tetracyclines cross the blood brain barrier easily
    d. Doxycycline is excreted predominantly by the kidney
    e. Demeclocyline is a short acting tetracycline drug

9. All of the following are recognized adverse effects of isoniazid EXCEPT
    a. Hepatitis
    b. Peripheral neuropathy
    c. Retrobulbar neuritis
    d. Decreased phenytoin metabolism – increased phenytoin blood levels / toxicity
    e. CNS toxicity

10. Vancomycin
    a. 90% of vancomycin is excreted by glomerular filtration
    b. Inhibits proteinsynthesis in bacteria
    c. Is bactericidal against gram negative bacilli
    d. Is well absorbed from the GIT
    e. One adverse reaction to infusions of vancomycin is the "blue man" syndrome

11. Regarding mechanisms of antiviral drug action
    a. blockage of viral uncoating is caused by rifampicin
    b. Zidovudine is a protease inhibitor
    c. Amantidine blocks viral DNA packaging and assembly
    d. Indinavir is a reverse transcriptase inhibitor
    e. Acyclovir inhibits viral DNA synthesis

12. Regarding toxicity of antibiotics
    a. Enamel dysplasia is common with aminoglycosides
    b. Gray baby syndrome occurs with rifampicin use
    c. Haemolytic anaemias can occur with sulphonamide use
    d. Nephritis is the most common adverse reaction with isoniazid
    e. Disulfiram like reaction can occur with macrolides

13. Chloramphenicol
    a. Does not penetrate the blood brain barrier
    b. Must be administered parenterally
    c. Can be safely used in premature infants
    d. Can cause depression of bone marrow function
    e. Can cause discoloration of developing teeth when given to children

14. Spironolactone
    a. Has a steroid structure
    b. Is a partial agonist
    c. Promotes sodium retention
    d. Increases potassium loss
    e. Is a loop diuretic

15. Which of the following drugs cause diuresis by the mechanisms indicated?
    a. Ethanol – by preventing the reabsorption of sodium from renal tubular fluid
    b. Digoxin – by inhibiting release of ADH
    c. Dopamine – by inhibiting active transport of chloride over the entire length of the descending limb of the loop of Henle
    d. Frusemide – by inhibiting carbonic anhydrase
    e. Chlorothiazide – by inhibiting active sodium transport in the ascending limb of the loop of Henle

Antibiotics Pharmacology Answers

1. B
2. E
3. A
4. C
5. C
6. B
7. A
8. A
9. C
10. A
11. E
12. C
13. D
14. A
15. E

CNS Drugs – MCQs 28th November 2006

1. Diazepam
   a. Is less lipid soluble than lorazepam
   b. Binds sparingly to plasma proteins
   c. Is potentiated by flumazenil
   d. Undergoes microsomal oxidation in the kidney
   e. Is mainly metabolised to desmethyl diazepam

2. Flumazenil
   a. Is cleared renally
   b. Predictably reverses benzodiazepine induced respiratory depression
   c. Antagonises CNS effects of opioids
   d. Can precipitate seizures in mixed overdose
   e. Has a half life of around 10 hours

3. Regarding phenytoin toxicity
   a. Vitamin D metabolism abnormalities can occur
   b. Nystagmus is a late complication
   c. Alopecia is a complication
   d. Agranulocytosis occurs commonly
   e. ↑ deep tendon reflexes are a manifestation of phenytoin toxicity

4. Regarding adverse effects of propofol
   a. Severe acidosis can occur with its use in paediatric respiratory infection
   b. Tremors are a common side effect
   c. Post op vomiting is common
   d. Hypertension is a complication
   e. It is positively inotropic

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

6. Suxamethonium
   a. Is a non-depolarising neuromuscular blocking agent
   b. Is contraindicated in all eye operations
   c. Stimulates cardiac muscarinic receptors and autonomic ganglia
   d. Its action is directly terminated by the action of plasma cholinesterase
   e. Should not be administered to patients with burns > 24 hours old because of its hypercalcaemic effect

7. Which of the following side effects most occurs with haloperidol
   a. Hypotension
   b. Extrapyramidal side effects
   c. Arrhythmias
   d. Anti muscarinic side effects
   e. Toxic confusional state

8. Regarding non-depolarising muscle relaxants
   a. Pancuronium is eliminated via the kidney
   b. Rocuronium is an isoquinolone derivative
   c. Rocuronium undergoes Hoffman elimination
   d. Vecuronium is eliminated predominantly via the kidney
   e. Atracurium is eliminated via plasma pseudocholinesterase

9. Lithium
    a. Has rapid onset of action
    b. Is partly renally excreted
    c. Has no interaction with NSAIDs
    d. Is the treatment of choice for severe unipolar depression
    e. Is contraindicated in sick sinus syndrome

10. Thiopentone
    a. Has low lipid solubility
    b. May worsen cerebral oedema
    c. Is not significantly metabolised
    d. Has effects on the brain that are terminated by redistribution
    e. Is likely to ↑ MAP

11. Carbamazepine
    a. Can be used in the treatment of bipolar disorder, trigeminal neuralgia and epilepsy
    b. Like phenytoin, enhances GABA activity at therapeutic concentrations
    c. Has a rate of absorption that does not vary widely among different patients
    d. Can cause a mild, but persistent leukopaenia and this is an indication to stop treatment
    e. Has cytochrome p450 inhibiting properties

12. Which of the following is a direct serotonin agonist
    a. Fluoxetine
    b. Amitriptylline
    c. Moclobemide
    d. Ondansetron
    e. Sumatriptan

13. The opiate associated with seizures when given in high doses to patients with renal failure is
    a. Morphine
    b. Pethidine
    c. Methadone
    d. Fentanyl
    e. Codeine

14. Methadone is used in the treatment of narcotic addiction because
    a. It is a less efficacious analgesic compared with morphine
    b. It produces a short withdrawal when ceased
    c. It is a phenylpiperidine class narcotic agonist
    d. It produces predictable effects when given orally
    e. It does not produce constipation

15. Regarding the alcohols
    a. Alcohols can cause a wide anion gap metabolic acidosis
    b. Formaldehyde is responsible for the toxic effects of methanol
    c. A normal non-tolerant adult can metabolise 30-40grams of alcohol/hour
    d. Ethanol is a potent vasoconstrictor
    e. The volume of distribution of ethanol is 3L/kg

Answers

1.	E	6.	C	11.	A
2.	D	7.	B	12.	E
3.	A	8.	A	13.	B
4.	A	9.	E	14.	D
5.	C	10.	D	15.	A

1. Regarding H_2 receptor antagonists
   a. They can be used to treat systemic mastocytosis
   b. They are capable of >90% reduction in gastric acid secretion after a single dose
   c. Up to 20% of ulcers may fail to heal with 4 weeks of conventional H_2 antagonist/antacid treatment
   d. Cimetidine may cause reversible gynaecomastia and confusional states as side effects
   e. All of the above are true

2. Agents promoting GI motility (ie prokinetic) include all of the following EXCEPT
   a. Cisapride
   b. Sucralfate
   c. Metaclopromide
   d. Bethanechol
   e. Neostigmine

3. Regarding drugs that act on the colon
   a. Lactulose is a stimulant laxative
   b. Diphenoxylate is a weak analogue of fentanyl
   c. Loperamide is safe for use in patients with diarrhoea from ulcerative colitis
   d. Senna has a delayed onset of action
   e. Kaolin is an adsorbent and is more effective in treatment of diarrhoea than loperamide or diphenoxylate

4. Proton pump inhibitors
   a. Reversibly inhibit the gastric parietal cell proton pump H^+/K^+/ATPase
   b. Are prodrugs
   c. Are ineffective as part of the combination tx for eradication of H pylori – famotidine should be used instead
   d. A single daily dose inhibits 94% of gastric acid secretion
   e. Have been shown to cause carcinoid tumours in humans when chronically administered

5. Regarding antiemetics
   a. Diphenhydramine has a use for nausea associated with motion sickness
   b. Prochlorperazine is a nonsedating antiemetic
   c. Metaclopramide works peripherally, ie it does not enter the CNS
   d. Ondansetron has higher efficacy and less adverse effects when compared with granisetron
   e. Dexamethasone has antiemetic properties secondary to its clear effect on the CTZ

6. Glipizide
   a. Initially binds to a specific receptor associated with a sodium channel in pancreatic B cells
   b. Chronic administration reduces glucagon levels in NIDDMs
   c. Has a half life of 6-8 hours
   d. Is more efficacious than chlorpropamide
   e. >80% is excreted unchanged in the urine

7. Insulin (subcut)
   a. Is up to 60% cleared by the kidney
   b. Inhibits protein synthesis
   c. Causes lipodystrophy at injection sites as its most common adverse effect
   d. Short acting insulin lasts 10 hours in the system
   e. None of the above are true

8. Examples of vaccines using live agents include all of the following EXCEPT
   a. Measles
   b. Mumps
   c. Small pox
   d. Influenza
   e. Yellow fever

9. All of the following H_1 antagonists may cause moderate – marked sedation EXCEPT
    a. Diphenhydramine
    b. Cyproheptadine
    c. Pyrilamine
    d. Promethazine
    e. Loratadine

10. Histamine
    a. Causes ↑ BP by vasoconstricting effects
    b. Stimulates gastric acid production
    c. Is produced by bacteria in ciguatera fish causing GI upset and cardiovascular effects
    d. Has insignificant effects on nerve endings
    e. All of the above are correct

11. H_2 antagonists
    a. Irreversibly compete with histamine at H_2 receptors
    b. Also bind to H_1 receptors
    c. Famotidine inhibits the cytochrome P 450 system
    d. Ranitidine is 7 times more potent than famotidine in treatment of duodenal ulcers
    e. Ranitidine may ↑ bioavailability of ethanol by >40% in normal individuals

12. Regarding the ergot alkaloids
    a. Ergotism may be defined as a spectrum of hallucinations, convulsions and "fiery limb pains"
    b. Bromocriptine has profound effects on uterine smooth muscle stimulation
    c. Methysergide is a peptide alkaloid
    d. PCP is an ergot alkaloid
    e. Ergotamine constricts most human blood vessels and is short acting

13. Regarding drugs affecting serotonin
    a. Sumatriptan is a serotonin antagonist
    b. Buspirone is a 5 HT_{1a} agonist
    c. Cyproheptadine is a competitive serotonin blocker in doses of 120 – 160mg/day
    d. Ketanserin blocks 5 HT receptors and B receptors
    e. Ondansetron is a 5 HT_2 antagonist

14. Methylxanthines
    a. Have negative inotropic/chronotropic effects
    b. Have antidiuretic effects
    c. Inhibit the enzyme phosphodiesterase at high concentrations
    d. Theophylline has less selective smooth muscle effects compared with caffeine
    e. Have no effect on skeletal muscle

15. Regarding drugs used to treat asthma
    a. Antimuscarinic agents are much more potent than B2 agonists in reversing bronchospasm
    b. Salmeterol has a duration of action of 4 – 6 hours
    c. Isoproterenol is a potent bronchodilator but may cause cardiac arrhythmias
    d. Cromolyn sodium is an excellent agent for treatment of acute asthma
    e. Aminophylline contains 66% theophylline by weight

16. H_1 antagonist toxicities include all of the following EXCEPT
    a. Blurred vision
    b. Diarrhoea
    c. Orthostatic hypotension
    d. Sleepiness
    e. Dry mouth

17. Which of the following H1 antagonists is also a potent local anaesthetic agent
    a. Loratadine
    b. Cyclizine
    c. Chlorpheniramine
    d. Promethazine
    e. Cetirazoline

18. Regarding sulfonylureas
    a. They increase insulin release from the pancreas by inhibition of sodium ion flux
    b. They stimulate insulin synthesis
    c. Tolbutamide is a second generation drug which should be used with caution in elderly diabetics
    d. Glipizide therapy is contraindicated in patients with significant hepatic impairment
    e. Chlorpropamide has the shortest half life of all the sulfonylureas

19. Metaclopromide
    a. Is a dopamine agonist
    b. Is prokinetic
    c. Increases gastric secretion
    d. Releases adrenaline from neurons in the enteric nervous system's myenteric plexus
    e. Has a half life of 8 hours – so is given 3 x per day

20. Which of the following statements about laxatives is correct
    a. Magnesium sulphate is well absorbed from the GIT
    b. The action of castor oil depends on its lubricant properties
    c. Senna contains substances that on hydrolysis yield chemicals which increase colonic activity
    d. Sodium sulphate acts as an irritant purgative
    e. Liquid paraffin acts by osmotically increasing the volume of gut contents

21. 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 B agonist agents in reversing Bronchospasm
    e. Is useful if given IV

22. Regarding asthma treatment
    a. Salmeterol is a potent selective B_2 agonist with a short duration of action
    b. Corticosteroids work in asthma by direct action on relaxing airway smooth muscle
    c. Cromolyn sodium is an excellent agent given IM 3 monthly to prevent exercise induced 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

23. Regarding antacids
    a. Calcium carbonate can cause milk alkali syndrome as an adverse effect
    b. Aluminium hydroxide can cause constipation
    c. Sodium bicarbonate is a highly soluble salt
    d. Magnesium hydroxide is one of the constituents in Mylanta
    e. All of the above are true

24. In which capacity does adrenaline act when it is given to treat asthma
    a. Partial agonist causing mild bronchodilation
    b. Physiological antagonist of histamine
    c. Competitive antagonist of histamine
    d. Chemical antagonist of histamine
    e. An irreversible antagonist

25. Salbutamol
    a. Stimulates adenylyl cyclase in smooth muscle cells
    b. Rarely causes tachycardia
    c. Is a B_1 selective adrenoceptor agonist
    d. Should be used with caution in hyperkalaemic patients
    e. Rarely results in tolerance through high use

MCQs 10 August 2004
Answers

1.	E
2.	B
3.	D
4.	B
5.	A
6.	B
7.	A
8.	D
9.	E
10.	B
11.	E
12.	A
13.	B
14.	C
15.	C
16.	B
17.	D
18.	D
19.	B
20.	C
21.	D
22.	D
23.	E
24.	B
25.	A

Q1: All of the following may cause seizures directly or indirectly except.

A: Tramadol
B: M3G
C: M6G
D: Hydromorphone
E: Flumazenil

Q2: The following opiate with the least intrinsic activity is.

A: Propoxyphene
B: Alfentanil
C: Codeine
D: Nefopam
E: Meperidine

Q3: Regarding spinal pain transmission and the opiates one is false.

A: Pre-synaptic terminals have mu, delta and kappa receptors.
B: Binding mu receptors on post-synaptic terminal opens K+ channels.
C: Decrease in Ca++ influx pre-synaptically can be mediated by opiate binding.
D: Opiates affect afferent pain transmission but also efferent pain modulation.
E: NMDA blockade increases tolerance to opiates.

Q4: Complications related to COX-2 inhibitors include.

A: Gastrointestinal bleeding.
B: Renal failure.
C: Increase in adverse cardiovascular events.
D: Sulphur allergy.
E: All of the above.

Q5: Medication with anti-inflammatory properties in gout include all except.

A: Prednisone
B: Colchicine
C: Tolmetin
D: Indomethacin
E: Celecoxib

Q6: Diet supplementation with fish eicosapentaenoic acid

A: Decreases inflammation by elevating vitamin D levels.
B: Is not as efficient as NSAIDs at reducing inflammation.
C: Is a saturated fatty acid.
D: Forms eicosanoids several orders less potent than usual.
E: Effects have not been clinically studied.

Q7: Regarding carbon monoxide one is false.

A: It is readily formed by incomplete combustion of carbon.
B: The fetus is protected by the maternal circulation from toxic effects.
C: The hemoglobin affinity is 220 times that of oxygen.
D: The half life is 5 hours and 20 mins breathing air.
E: Smokers can exibit carboxyhemoglobin levels of 5-10 per cent.
Q8: Bio-accumulation is a feature of which substance.

A: Carbamates.
B: Organophosphates.
C: Ozone.
D: Mercury.
E: None of the above.

Q9: Chelation therapy for heavy metal poisoning.

A: Chelation for lead has little compelling evidence in the asymptomatic individual.
B: Deferoxamine therapy increases susceptibility to Yersinia enterocolitica infection.
C: Chelation therapy is useful in cadmium intoxication.
D: Peanut allergy is a contraindication to the use of intramuscular dimercaprol.
E: L-Penicillamine frequently causes pyridoxine deficiency.

Q10: A primarily bacteriostatic antibiotic is.

A: Metronidazole
B: Chloramphenicol
C: Penicillin
D: Vancomycin
E: Gentamicin

Q11: If penicillin together with tetracycline is tested for synergy and is found in combination to achieve MIC at 3mg/L of penicillin and 3mg/L of tetracycline compared to a MIC of 0.5mg/L for each drug on its own then the FIC index is.

A: 3
B: 6
C: 9
D: 12
E: 1/6

Q12: For Question 11 one of the following statements is false.

A: Damage to the bacteria at two sites simultaneously has not enhanced synergy.
B: Antibiotics displaying indifference of effect approach a FIC index of 2.
C: Antibiotics displaying similar action without synergy approach FIC index of 1.
D: Synergy is an increase in expected effect above the sum of individual antibiotic effects had they been acting alone.
E: Synergy is seen at greater than or equal to 4.

Q13: Cefoxitin and Piperacillin interact in the following way to achieve antagonism.

A: Induction of enzymatic inactivation by beta-lactamase for some species.
B: Competitive inhibition at PBPs.
C: Cidal inhibition by static agent.
D: Achieve high levels of synergy.
E: Are not available in Australasia and are irrelevant.

Q14: All the penicillins need dose adjustment in renal failure except.

A: Penicillin G
B: Dicloxacillin
C: Amoxicillin/ Clavulanate
D: Ticarcillin
E: Penicillin V

Q15: For cross reaction/ hypersensitivity one of the following is incorrect.

A: Penicillins/ Monobactams no cross reactivity.
B: Vancomycin: release of histamine.
C: Penicillins/ Cephalosporin 20% cross reactivity.
D: Penicillins/ Carbapenems 50% cross reactivity.
E: Penicillin/ Erythromycin no cross reactivity.

Q16: The best CSF penetration of the beta lactam containing antibiotics is achieved by.

A: Cefotaxime
B: Ceftriaxone
C: Meropenem
D: Penicillin G
E: Aztreonam

Q16: Chloramphenicol has the following features except one.

A: In doses above 50mg/kg/d in infants may cause grey baby syndrome.
B: It is an inhibiter of microsomal enzymes.
C: It binds reversibly to the 50s subunit inhibiting protein synthesis.
D: It penetrates virtually every tissue to near serum levels.
E: Agranulocytosis is idiosyncratic, 1: 24-40,000 cases and tends to be reversible.

Q18: A lactone ring is a feature of all the following drugs except:

A: Erythromycin
B: Clindamycin
C: Amphotericin B
D: Clarithromycin
E: Ivermectin

Q19: MLS Resistance will give resistance to all the following antibiotics except.

A: Quinupristin/ Dalfopristin
B: Linezolid
C: Roxithromycin
D: Clindamycin
E: Lincomycin.

Q20: Sulphonamide antibiotics.

A: Do not affect mammalian cells as they rely on exogenous folate.
B: Act as PABA analogues inhibiting Dihydrofolate reductase.
C: Gain synergy from other folate metabolic pathway inhibitors acting at alternat sites.
D: Have activity against protozoa, fungi and bacterial species.
E: Share hypersensitivity with COX2 inhibitors/ carbonic anhydrase inhibitors/ loop diuretics and oral hypoglycaemic agents.

Q21: Fluoroquinolones exibit all the following except.

A: Risk of tendinitis and arthropathy.
B: QTc prolongation worsened by erythromycin administration.
C: Resistance arising with 1: 10 to the 7-9 due to point mutations.
D: Act via inhibition of topoisomerase II and IV
E: The newest agents including moxifloxacin have improved pseudomonal cover.

Q22: With the anti-Tubercular drugs the following associations are true except.

A: Rifampcin: yellow staining of soft contact lenses.
B: Pyrazinamide: taken up by phagocytes and more active in this acidic environment.
C: Streptomycin: well tolerated orally and given as fourth agent pending sensitivity.
D: Isoniazid: inhibition of mycolic acid production in cell wall.
E: Ethambutol: red green colour blindness.

Q23: One of the following is true for the imidazoles vs the triazoles.

A: The triazoles are more specific for fungal p450
B: The imidazoles are less toxic parenteral.
C: Fluconazole has poor CSF penetration due to insolubility in water.
D: Both these medications act to activate p450 digestion of fungal cell walls.
E: Flucytosine is a close relative with similar action.

Q24: The neucleotide-like antivirals include all except.

A: acyclovir
B: ganciclovir
C: zidovudine
D: lamivudine
E: nevirapine

Q25: The most generally active of the following antimicrobials is.

A: Sodium hypochlorite
B: Phenols
C: Alcohols
D: Chlorhexidine
E: Sodium bicarbonate

Q26: You are treating a patient with P.falciparum form rural Thailand and you are primarily worried about.

A: The residency status of your patient.
B: The risk of catching malaria.
C: Mefloquine induced psychosis.
D: Multi- drug resistance.
E: Difficulty clearing the liver of hypnozoites.

Q27: Agents used in the treatment of P jiroveci include all except.

A: Oxygen
B: Pentamidine
C: Co-trimoxazole
D: Atovaquone
E: Ciprofloxacin

Q28: Albendazole shares a similar mechanism of action with.

A: piperazines
B: opiates
C: colchicine
D: ivermectin
E: praziquantel

Answers from Katzung
Q1: C page 500, 512, 360
Q2: A page 499 note Nefopam non-opioid and not in Katzung
Q3: E page 503, 500
Q4: E page 582, 583, 584
Q5: C page 583, 597
Q6: D page 595
Q7: B page 960
Q8: D page 976
Q9: C page 978. Others A-973; B-980; D-978; E-980
Q10: B page 842
Q11: D page 846
Q12: E page 846
Q13: A page 847
Q14: B page 738
Q15: C page 747 (5-10 per cent) note D from Guide to pathogens and AB treatment
Q16: A page 845
Q17: E page 755
Q18: B page 761 and 792 and 890
Q19: B page 759 and 762
Q20: B page 773 and 775
Q21: E page 777
Q22: C page 786
Q23: A page 795
Q24: E page 817
Q25: A page 830
Q26: debatable but probably D from page 864
Q27: E page 880
Q28: C page 886 and page 597

1. Which of the following drugs has an average half life of 50 hours?
   a. Nortriptylline
   b. Digoxin
   c. Trimethoprim
   d. Valproic acid
   e. Lithium

2. All of the following have 100% oral bioavailability EXCEPT
   a. Valproic acid
   b. Trimethoprim
   c. Digoxin
   d. Diazepam
   e. Lithium

3. All of the following drugs are >90% plasma protein bound EXCEPT
   a. Diazepam
   b. Frusemide
   c. Fluoxetine
   d. Gentamicin
   e. Warfarin

4. Which of the following drugs has a volume of distribution >2000 ℓ/70kg?
   a. Aspirin
   b. Imipramine
   c. Digoxin
   d. Propranolol
   e. Chloroquine

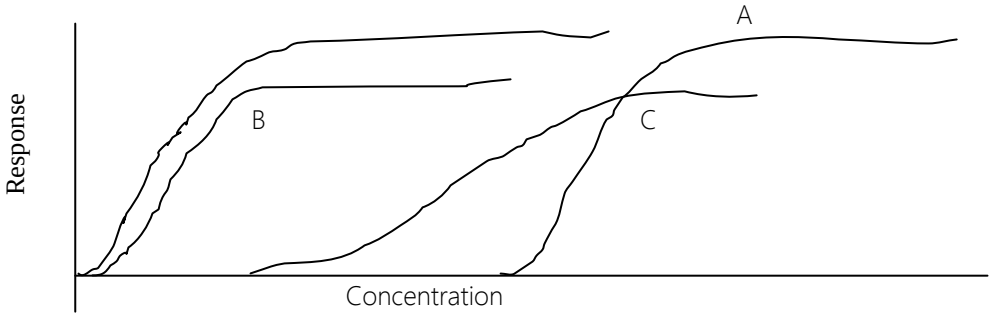
5. What is the half life of a drug with a volume of distribution of 100ℓ/70kg and a clearance of 7ℓ/hr/70kg
   a. 5 hours
   b. 10 hours
   c. 12.5 hours
   d. 15 hours
   e. 20 hours

6. All of the following drugs exhibit flow dependent elimination EXCEPT
   a. Atenolol
   b. Isoniazid
   c. Propoxyphene
   d. Amitriptylline
   e. Lignocaine

7. Which of the following undergoes a phase I hydrolysis reaction? (biotransformation)
   a. Ethanol
   b. Naloxone
   c. Morphine
   d. Lignocaine
   e. Diazepam

8. Which of the following undergoes acetylation in the liver? (Phase 2 biotransformation)
   a. Isoniazid
   b. Acetaminophen
   c. Salicylic acid
   d. Epinephrine
   e. Diazepam

9



Which of these drugs is the most efficacious?

a. Drugs A and B
b. Drug C
c. Drugs A and D
d. Drugs D and C
e. Drug A

10. Referring to the graph in question 9 – which of the drugs is most potent?

a. A
b. B
c. C
d. D
e. A and B

11. EC50 is

a. Measured with a radioactive receptor
b. Always equal to Kd
c. Drug concentration with 50% receptors bound
d. Representation of the receptors affinity for drug binding
e. Drug concentration with 50% of maximal drug effect

12. Which of the following will NOT alter the volume of distribution of a drug?

a. Cardiac failure
b. Clearance
c. Age
d. Burns
e. Pleural effusion

13. Volume of distribution equals

a. Dose given/plasma concentration
b. Total amount of drug in the body/plasma concentration
c. Urine drug concentration/plasma concentration
d. Dose given/urine concentration
e. Urine drug concentration/plasma concentration

14. Which of the following drugs undergoes rate limited elimination?

a. Lignocaine
b. Morphine
c. Warfarin
d. Propanolol
e. Aspirin

15. Ligand gated channel receptors include all of the following EXCEPT

a. GABA
b. Aspartate
c. Glycine
d. Glutamate
e. Ach-muscarinic

16. Regarding receptor regulation
    a. Receptor down regulation occurs over hours – days
    b. Receptor responses to drugs often "desensitise" with time – this desensitisation is usually irreversible
    c. The mechanism of agonist induced desensitisation of the nicotinic Ach receptor has been worked out in detail
    d. All "internalised" receptors are degraded by lysosomes
    e. None of the above are correct

17. Which of the following acts on intracellular receptors
    a. Serotonin
    b. Glucagon
    c. Corticosteroids
    d. GABA
    e. Insulin

18. Which of the following has ↑ bioavailability in the neonate when compared with older children/adults?
    a. Penicillin
    b. Digoxin
    c. Acetaminophen
    d. Diazepam
    e. Phenobarbital

19. First order kinetics
    a. Means rate of reaction is proportional to concentration
    b. Are more common than zero order kinetics
    c. Apply to exponential processes
    d. Generally apply to high plasma concentrations (>20mg/100ml) of ethanol
    e. Result in steady state concentrations after multiple dosing

20. A single compartment model means that
    a. One exponential term describes the decreasing plasma concentration of the drug
    b. A single exponential term describes the rise in plasma concentration following oral administration
    c. The drug does not penetrate tissues
    d. The drug is restricted to the ECF
    e. The drug is highly ionised

Answers – Pharmacodynamics & Pharmacokinetics
10 August 2004

1.	B	11.	E
2.	C	12.	B
3.	D	13.	B
4.	E	14.	E
5.	B	15.	E
6.	A	16.	A
7.	D	17.	C
8.	A	18.	A
9.	C	19.	D
10.	A	20.	A

Part I FACEM - MCQ.

1. If 5 μg of aldosterone was injected as a single dose into the Ao of an adrenalectomized dog all of the following would occur except:
   a. a K^+ diuresis
   b. a decrease in K^+ levels in the brain
   c. a decrease in Na excretion
   d. an increase in ECF Na^+
   e. an increase in urine acidity

2. Circulating substances producing vasoconstriction include all of the following *except:*
   a. vasopressin
   b. angiotensin II
   c. noradrenaline
   d. atrial natriuretic peptide
   e. adrenaline

3. The single most important factor in the increased urine flow following intravenous infusion of isotonic saline is:
   a. secretion of ADH
   b. secretion of aldosterone
   c. GFR which induces glomerulotubular imbalance
   d. secretion of atrial natiuretic peptide
   e. total reabsorption of H_2O/salt from the proximal tubules

4. All of the following are true of the β-blockers except:
   a. they may paradoxically stimulate β-receptors
   b. an increased number of β-receptors may occur with chronic use
   c. glucagon can be used for treatment of overdose as it stimulates the β receptor independently
   d. they may exhibit class III antiarrhythmic activity
   e. lignocaine toxicity may be seen if used concomitantly

5. Concerning the disinfectants all of the following are correct except:
   a. they act by denaturing or altering proteins in the cytoplasmic membrane of bacteria.
   b. the phenols are both sporocidal and bactericidal.
   c. the halogens are inactivated by organic matter.
   d. formaldehyde is both bactericidal and sporocidal.
   e. isopropyl alcohol is optimally bactericidal in aqueous solution at concentrations of 70-75%.

6. Which of the following is not correct. Chlorpromazine:
   a. causes central dopamine blockade at D_2 receptors
   b. is not bound significantly to plasma proteins
   c. may cause galactorrhoea
   d. may cause ↑QT interval on an ECG
   e. may cause grey-blue pigmentation of the skin

7. Which of the following is not true of the nitrates:
   a. they are contraindicated in left ventricular outflow obstruction
   b. their mechanism of action is via generation of nitric oxide and cGMP
   c. depletion of sulfhydral groups may cause nitrate tolerance
   d. they cause vasodilatation only in the presence of intact endothelium
   e. they reduce the myocardial oxygen demand

1. B 2. D 3. C 4. C 5. B 6. B 7. D

Pharmacology MCQs: Antihypertensives, vasodilators, angina drugs, cardiac glycosides. 04/06/02

1. Diuretics
    a. Work to lower BP initially by decreasing peripheral vascular resistance
    b. Thiazide diuretics are potassium sparing
    c. Are effective in lowering Bp by 20 – 25 mmHg in most patients
    d. BP response to thiazides continues to increase at doses greater than usual therapeutic dose.
    e. Diuretics may impair glucose tolerance

2. Methyl dopa
    a. Lowers the heart rate and cardiac output more than clonidine does
    b. Causes reduction in renal vascular resistance
    c. Has minimal CNS side effects
    d. Has 80% bioavailability
    e. Usual therapeutic dose is about 1 – 2 mg/day

3. Propranolol
    a. Is a B1 specific blocker
    b. Causes prominent postural hypotension
    c. Inhibits the stimulation of renin production by catecholamines
    d. Has a half life of 12 hours
    e. Has no effect on plasma lipids

4. Hydralazine
    a. Dilates veins but not arterioles
    b. Is contraindicated in the treatment of preeclampsia
    c. Can cause an SLE type syndrome in up to 10 – 20% of patients
    d. Causes orthostatic hypotension in many cases
    e. Is extremely useful as a single agent in treatment of hypertension

5. Which of the following drug's metabolism characteristics are bimodally distributed in the population?
    a. Sodium nitroprusside
    b. Clonidine
    c. Minoxidil
    d. Hydralazine
    e. Phentolamine

6. The ACE inhibitors
    a. Inhibit peptidyl dipeptidase thus preventing the inactivation of bradykinin
    b. Captopril is a prodrug
    c. Are to be used with caution in patients with IHD as reflex sympathetic activation occurs 2ry to the hypotensive effects of the ACE inhibitors
    d. Have no role in treating the normotensive diabetic patients
    e. Are useful antihypertensive agents in late pregnancy

7. The following drugs when combined with ACE inhibitors may produce troublesome problems EXCEPT
    a. Diclofenac
    b. Potassium supplements
    c. Spironolactone
    d. Lithium
    e. Theophylline
8. The nitrates
    a. Have an antianginal effect via vasodilation of arterioles only
    b. Serve to increase preload
    c. Have a direct effect on cardiac muscle to cause a decrease in anginal symptoms
    d. All have high oral bioavailability
    e. Are contraindicated in the presence of increased intracranial pressure

9. Regarding Calcium channel blockers
    a. Calcium channel blockers are not bound to plasma proteins
    b. Nifedipine has less vascular potency than verapamil
    c. Felodipine has been shown to inhibit insulin release in humans
    d. Diltiazem has a plasma half life of 3 – 4 hours
    e. Verapamil has high affinity for cerebral blood vessels thus decreasing vasospasm post subarachnoid haemorrhage

10. Which of the following calcium channel blockers is excreted predominantly in the faeces?
    a. Nifedipine
    b. Felodipine
    c. Diltiazem
    d. Nimodipine
    e. Verapamil

11. Which of the following calcium channel blockers has the longest plasma half life?
    a. Felodipine
    b. Diltiazem
    c. Amlodipine
    d. Nimodipine
    e. Verapamil

12. The following include major actions of digoxin on cardiac electrical functions EXCEPT
    a. Decreased PR interval on ECG
    b. Decreased conduction velocity at the AV node
    c. Increased automaticity of the atrial muscle
    d. Decreased effective refractory period in purkinje system/ventricles
    e. Bigeminy can be induced by digoxin

13. Which of the following increases the risk of digoxin induced arrhythmias?
    a. Hyperkalaemia
    b. Hypercalcaemia
    c. Hypermagnesaemia
    d. Hyperuricaemia
    e. Hypernatraemia

14. Digoxin
    a. Is poorly lipid soluble
    b. Is extensively metabolized
    c. Has a half life in the body of 40 hours
    d. Has minimal GI toxicity
    e. Is 80% bound to plasma proteins

15. Drugs which may increase digoxin effect include all of the following EXCEPT
    a. Amiodarone
    b. Diltiazem
    c. Frusemide
    d. Quinidine
    e. Antacids

16. Which of the following drugs has the smallest volume of distribution?
    a. Chloroquine
    b. Verapamil
    c. Imipramine
    d. Warfarin
    e. Digoxin

Antihypertensives, vasodilators, angina drugs, cardiac glycosides.
04/06/02 Answers

1. E
2. B
3. C
4. C
5. D
6. A
7. E
8. E
9. D
10. C
11. C
12. A
13. B
14. C
15. E
16. D

1. The TD 50 is
   a) the drug concentration at 50% of maximal effect
   b) the drug concentration at 50% of toxic effect
   c) the ratio of median potency to efficacy
   d) the dose required to produce toxicity in 50% of animals
   e) the inverse of the therapeutic index

2. The volume of distribution of fluoxetine is
   a) 4 ℓ/kg
   b) 10 ℓ/kg
   c) 40 ℓ/kg
   d) 100 ℓ/kg
   e) 1000 ℓ/kg

3. The oral bioavailability of lignocaine is
   a) 1%
   b) 2%
   c) 10%
   d) 20%
   e) 35%

4. All of the following drugs inhibit drug metabolism EXCEPT
   a) Allopurinal
   b) Cimetidine
   c) Phenytoin
   d) Ethanol
   e) Disulfiram

5. In developing a new drug a phase 3 trial answers the question
   a) does it work in animals?
   b) is it safe in animals?
   c) does it work in humans?
   d) is it safe in humans?
   e) does it work in a double blind trial?

6. Muscarinic agonists
   a) constrict the bronchial tree
   b) relax the bladder detrusor
   c) inhibit lacrimation
   d) cause mydriasis
   e) cause vasoconstriction

7. The calcium channel blocker with the highest vascular to cardiac potency is:-
   a) nifedipine
   b) nicardipine
   c) diltiazem
   d) verapamil
   e) felodipine

8. All of the following fit into the Vaughan Williams classification of antiarrhythmics EXCEPT
   a) propafenone
   b) imipramine
   c) phenytoin
   d) sotalol
   e) adenosine

9. Methylxanthines
    a) act by adenosine antagonism
    b) decrease intracellular c AMP concentrations
    c) inhibit secretion of gastric acid
    d) have an adverse effect on diaphragmatic contractility
    e) increase blood viscosity

10. The inhalational anaesthetic with the highest MAC is
    a) methoxyflurane
    b) nitrous oxide
    c) halothane
    d) isoflurane
    e) enflurane

11. Atracurium is eliminated by
    a) plasma
    b) liver
    c) kidney
    d) kidney and liver
    e) none of the above

12. Most streptococci are resistant to gentamycin because
    a) the micro-organism produces adenylation enzymatic inactivators
    b) the micro-organism produces acetylation enzymatic inactivators
    c) the micro-organisms produces phosphorylation enzymatic inactivators
    d) the drug doesn't reach ribosomes in the cell
    e) the receptor protein on the 30S ribosome subunit is deleted

FACEM PART 1
PRACTIC EXAM ANSWERS / REFERENCES

1.	Katzung 6th	pp 28 - 29	D
2.	Katzung 6th	p 35	C
3.	Katzung 6th	p 35	E
4.	Katzung 6th	p 57	C
5.	Katzung 6th	pp 61 & 67	E
6.	Katzung 6th	pp 92 & 93	A
7.	Katzung 6th	p 181	B
8.	Katzung 6th	pp 215-224	E
9.	Katzung 6th	pp 310 - 312	A
10.	Katzung 6th	p 383	B
11.	Katzung 6th	p 408	E
12.	Katzung 6th	pp 699 - 700	D

48 Popular Questions

1. With regards to prazosin, which one is correct?
    A. reflex tachycardia
    B. 1st dose hypotension
    C. reflex bradycardia
    D. unfavourable effect for lipids
    E. acts to reduce preload and afterload

2. Overdosed young man presented with dilated pupils, tachycardia, fever. which drug is least likely?
    A. aspirin
    B. atropine
    C. Datura
    D. chlordiazepoxide
    E. amitriptyline

3. Bisphosphonates
    A. 10% excreted unchanged
    B. increase osteoblast activity
    C. has low bioavailability
    D. 90% distributed in bones

4. Young man treated with normal dose drug with HT and mydriasis. Which is most likely?
    A. dobutamine
    B. atropine
    C. adrenaline

5. which of the following can you NOT develop passive immunity?
    A. pertusis
    B. rabies
    C. Redback venom
    D. tuberculosis
    E. hepatitis A

6. which of the following is a live vaccine?
    A. HAV
    B. VZV
    C. rabies
    D. measles

7. which one the following is correct?
    A. ondansetron is a dopamine antagonist
    B. metoclopramide increases lower esophageal sphincter tone
    C. erythromycin is a prokinetic agent

8. which one of the following regarding anti-emetics is correct?
    A. ondansetron is a dopamine antagonist
    B. marijuana acts on central chemoreceptors
    C.

9. adenosine
    A. has t ½ of 5 min
    B. works on Ca dependent action potential
    C. increase K influx to decrease AV conductivity
    D. decrease SA node firing

10. paracetamol toxicity is caused by
    A. phase II reaction
    B. depletion of sulfates
    C. depletion of glutathione

11. bioavailability
    A. inversely proportional to extraction ratio
    B. transdermal route undergoes 1st pass metabolism
    C. rectal route does not undergo 1st pass metabolism

12. adverse effect of penicillin
    A. seizures
    B. 50% of people who claim allergy will have an allergic reaction on further exposure

13. beta blockers
    A. cannot be topically absorbed
    B. can cause glaucoma
    C. glucagon can be used as an antidote

13. antibiotic resistance
    A. erythromycin resistance is caused by changes in 50s receptor
    B. bacteria resistant to sulphonamides still need PABA

14. mechanism of P450 induction
    A. rER hypertrophy
    B. sER hypertophy
    C. increase in acetylation

15. which congenital defect match is correct
    A Ethanol and Ebstein (syndrome?)
    B Thalidomide and neural tube defects
    C ACEIs and Nephrotoxicity (correct)

17. A patient presents to the ED post ictal and is found to have a sub therapeutic serum level of phenytoin. What ould be the least likely cause.
    A HypoAlbuminaemia (correct)
    B Poor patient compliance
    C carbamazepine co treatment
    D Isoniazid co treatment
    E Phenobarbitol co treatment

18. Allopurinol
    - is used for acute gout
    -is metabolized by xanthioxidase (correct)
    -has low bioavailability

19. Aspirin
    - is an irreversible cyclooxygenase inhibitor

20. Which of the following is a weak base
    -Warfarin
    -Penicillinase
    -Aspirin
    -Amphetamine (correct)
    -Ibuprofen

21. Ibuprofen
    -has less GIT affects than Aspirin (correct)
    -Excretion is unchanged
    -is a COX II selective something

22. Eicosanoids
    -are the only Arachadonic Acid derivatives
    -are vasodilators
    -Includes Prostaglandins, Leukotrienes, Thromboxane A2 (correct)

23. Nitrates
    -act on afterload
    -act on atherosclerotic vessels to dilate them
    -decreases both pre / after loads
    (?)

24. Calcium channel blockers
    -act on P channels / Lchannels (?)
    -Diltiazem is a prototype of DiHydroPyridines (?)

25. ACEIs
    -are used in diabetes
    -cause hypoKalaemia
    -Are lipid soluble and reach the CNS.

26. Loop Diuretics
    -cause alkalosis
    -cause hypermagnesemia
    -cause ototoxicity by increasing lithium toxicity
    (?)

27. Metronidazole
    -is used for tricomonasis (correct)

28. Which of the following techniques is an appropriate form of sterilization.
    -Fibreoptics treated in an autoclave at 120 degress for 2 minutes
    -Bleach diluted 1/10 for blood for 10 minutes
    - Chlorhexidine (single) wipe over skin for 2 minutes for neurosurgery
    -Chlorhexidine some how used to treat spores
    -Iodine some how used to also treat spores.
    (?)

29. Ethylene glycol poisoning (antifreeze fluid)
    -Renal dysfunction increases its' toxicity
    -Somehow involved with formic acid (?treated by)
    -Oxalic (something illegible)
    (?)

30. Concerning Diazepam
    -Oxazepam is metabolized into diazepam (correct?)
    -Flumazenil is an irreversible anatogist to

31. Concerning SSRIs
    -They are metabolized into inactive metabolites
    -are the best drug of choice for treating Obsessive Compulsive Disorder
    -Fluoxetine induces liver enzymes
    -Diazepam and SSRIs together can cause serotonin syndrome

32. Choose the correct matching stems
    -cisapride causes a prolonged QT interval (correct?)
    -others(?)

33. Cimetidinde
    -options?

34. The safest antibiotic of choice for use in renal failure is
    -Doxycycline
    -Tetracycline
    -Erythromycin
    -Penicilline
    -other

35.Antivirals
    -Valacyclovir is converted into Acyclovir
    -Valacyclovir can be given Intravenously
    -Acyclovir blocks the transcription of viral DNA to RNA
    -Nomonovir acts on HIV I (?)
    (?)

36. Procloperazine
    -works mainly on the GIT
    -Is (somehow) similar to Tricyclic antidepressants
    -(?)

37. Tricyclics Antidepressants
    -Phenothiazines similar structurally to tricyclics

(NB. not clear if 36 - 37 were two questions or actually only one, any help here would be appreciated)

38. Opiates
    -cause diuresis
    -cause urinary retention
    -somehow affect bladder control
    -(?) ganglion blockers will improve urinary flow

39. Concerning Antithrombolytic agents (possibley which of the following is one of these)
    -aspirin
    -plasminogen
    -Aminocaproic Acid
    -Heparin
    -Warfarin

40. Lignocaine acts
    -rapidly on hyperpolarizing nerves
    -on rapidly firing nerves
    -on thicker nerves
    -last one affected are motor nerves
    (?)

41. Methyldopa
    -causes a positive (direct or Not direct) Coombs test
    -Can be given either I.V or Oral
    -Can precipitate a SLE like syndrome
    -causes aggitation
    -(?)

42.

-Theophylline
-causes Hyperkalaemia
-causes seizures without preceeding neurological symptoms
-works on adenosine
-receptor antagonists

43. Omeprazole

- is category X in pregnancy
-acts on epithelium in the GIT (?gut)
-is not indicated in Zollinger-Ellision syndrome

44. Volume of Distribution

-is inversely proportional to clearance
-is affected by pKa
-others (?)

45. Aspirin

-in moderate doses can cause an increase in respiratory rate
-toxicity causes metabolic alkalosis
- Acidify the urine to increase excretion
-others (?)

46. Ketamine

-is a cardiac stimulant
-reduces laryngeal reflexes
-is given as an inhaled anaesthetic with N.O
-others (?)

47. Muscle Relaxants

-aminoglycosides enhance muscle relaxants
-Vecuronium is a steroid derivative

48. Lithium

-needs regular monitoring as can cause Diabetes Mellitus
- has a broad therapeutic Index
-Diuretics cause lithium toxicity in stable patients
-pregnancy causes changes in metabolism /excretion (?)

Assumed answers:

1 B, E	2 D	3 C	4 C	5 D	6 D	7 C	8 B	9 B	10 C	11 A	12 A
13 C	13 A, B	14 ?	15 C	17 D	18 B	19 A	20 D	21 A	22 C	23 C	24 A?
25 A	26 A	27 A	28 B	29 C	30 A	31 B	32 A	33 ?	34 C	35 A	36 B
37 A	38 B	39 C	40 D	41 A	42 B,C	43 B	44 B?	45 A (?meaning of "moderate")			
46 A	47 A,B	48 C,D									

Pharmacokinetics / Pharmacodynamics MCQs | May 2006

1. Which of the following is >90% bound to plasma proteins?
    a. Atenolol
    b. Diazepam
    c. Gentamycin
    d. Lithium
    e. Theophylline

2. Which of the following has the largest volume of distribution?
    a. Digoxin
    b. Imipramine
    c. Lithium
    d. Chloroquine
    e. Trimethoprim

3. Which of the following has the shortest half life?
    a. Theophylline
    b. Diazepam
    c. Aspirin
    d. Lithium
    e. Digoxin

4. Which of the following is a phase one reaction?
    a. Reduction
    b. Acetylation
    c. Glucuronidation
    d. Methylation
    e. Sulphate conjugation

5. Clearance of which drug involves capacity limited elimination?
    a. Theophylline
    b. Gentamycin
    c. Digoxin
    d. Lithium
    e. Phenytoin

6. An example of drugs that undergo chemical antagonism is
    a. Insulin - glucagon
    b. Protamine - heparin
    c. Prednisone - glipizide
    d. Morphine - naloxone
    e. Phenoxybenzamine - prazosin

7. Regarding first order kinetics - all of the following are true EXCEPT
    a. First order kinetics means rate of reaction is proportional to concentration
    b. First order kinetics is more common than zero order kinetics
    c. First order kinetics apply to exponential processes
    d. First order kinetics generally apply to high plasma concentrations (>20 mg / 100 ml) of ethanol
    e. First order kinetics result in steady state concentrations after multiple dosing.

8. Bioavailability is
    a. The difference between the amount of drug absorbed and the amount excreted
    b. The proportion of the drug in a formulation that is found in the systemic circulation
    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

9. Which of the following drugs has a high extraction ratio?
    a. Diazepam
    b. Theophylline
    c. Phenytoin
    d. Warfarin
    e. Propranolol

10. What is the half life of a drug with a volume of distribution of 700l/70kg and clearance of 49l/hour/70kg?
    a. 5 hours
    b. 7 hours
    c. 10 hours
    d. 12.5 hours
    e. 15 hours

11. Regarding biotransformation
    a. Phase one reactions always precede phase two reactions
    b. Skin is an organ involved in drug biotransformation
    c. Water conjugation is a phase one reaction
    d. CYP2D6 accounts for the majority of P450 activity
    e. Epoxidation is phase two biotransformation

12. Which of the following receptor - ligand pathway is correct?
    a. Insulin - G protein receptor
    b. Mineralocorticoid - tyrosine kinase receptor
    c. Vitamin D - intracellular receptor
    d. Adrenaline - ligand gated channel receptor
    e. Platelet derived growth factor - cytokine receptor

13. Age associated changes in pharmacokinetics include
    a. Reduction in creatinine clearance in 2/3 population
    b. Decreased body fat
    c. Increase body water
    d. A greater reduction in conjugation compared with oxidation
    e. A decreased absorption related to age alone

14. The metabolic pathway of detoxification that become increasingly important in paracetamol toxicity is
    a. Conjugation with glucuronide
    b. Oxidation
    c. Reduction
    d. Methylation
    e. Cytochrome p450 dependent glutathione conjugation

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

16. Drugs that enhance other drug metabolism include all of the following EXCEPT
    a. Rifampicin
    b. Ketoconazole
    c. Phenobarbital
    d. Griseofulvin
    e. Phenytoin

17. Which is the safest to give in pregnancy?
    a. Lithium
    b. Phenytoin
    c. Gentamycin
    d. Heparin
    e. ACE inhibitors

18. Regarding pharmacology principles
    a. Diffusion is directly proportional to thickness and inversely proportional to surface area
    b. LD50 - 50% of the dose that kills most people
    c. Efficacy is the maximum response produced by a drug
    d. A partial agonist is always less potent than a full agonist
    e. EC50 = concentration of agonist that results in maximal response in 50% of patients

19. Reports of cardiac arrhythmias caused by unusually high blood levels of 2 antihistamines (terfenadine and astemizole) are best explained by
    a. Concomitant treatment with phenobarbital
    b. Use of these drugs by smokers
    c. Use of antihistamines by persons of Asian background
    d. A genetic predisposition to metabolise succinylcholine slowly
    e. Treatment of these patients with ketoconazole

20. Which of the following statements is correct?
    a. The half life is the time taken for a parameter to fall to 1/4 its original value
    b. Partial agonists act at receptor sites to cause maximal pharmacological effect at high doses
    c. Diazepam has a high extraction ratio and is thus subject to flow dependent elimination
    d. Morphine and pethidine have the same potency
    e. A patient with oedema will have an increased volume of distribution of tobramycin

Answers: Pharmacokinetics / pharmacodynamics April 2004

1. B
2. D
3. C
4. A
5. E
6. B
7. D
8. B
9. E
10. C
11. B
12. C
13. A
14. E
15. E
16. B
17. D
18. C
19. E
20. E

Pharmacology MCQs: July 2nd

1. Regarding histamine
   a. H1 receptors occur in cardiac muscle
   b. H2 receptor blockers include promethazine
   c. Adrenaline is a physiologic antagonist of histamine
   d. Histamine works on bronchiolar smooth muscle to bronchodilate it
   e. Brain H3 receptors are predominantly postsynaptic

2. Histamine
   a. Causes increased BP via potent vasoconstricting effects
   b. Stimulates gastric acid secretion
   c. Is produced by bacteria in ciguatera fish causing GI upset and cvascular effects
   d. Has insignificant effects on nerve endings
   e. All of the above are correct

3. All of the following H1 antagonists may cause moderate- marked sedation EXCEPT
   a. Diphenhydramine
   b. Cyproheptadine
   c. Pyrilamine
   d. Loratadine
   e. Promethazine

4. Regarding H2 antagonists
   a. They can be used to treat systemic mastocytosis
   b. They are capable of >90% reduction in gastric acid secretion after a single dose
   c. Up to 20% of ulcers may fail to heal with 4 weeks of conventional H2 antagonist/antacid treatment
   d. Cimetidine may cause reversible gynaecomastia and confusional states as side effects
   e. All of the above are true

5. Agents promoting GI motility (i.e are prokinetic) include all of the following EXCEPT
   a. Cisapride
   b. Sucralfate
   c. Metaclopromide
   d. Bethanechol
   e. Neostigmine

6. Regarding drugs which act on the colon
   a. Lactulose is a stimulant laxative
   b. Diphenoxylate is a weak analogue of fentanyl
   c. Loperamide is safe for use in patients with diarrhoea from ulcerative colitis
   d. Senna has a delayed onset of action
   e. Kaolin is an adsorbent and is more effective in treatment of diarrhoea than loperamide or diphenoxylate

7. All of the following drugs / diseases cause prolonged QT interval / potentially lethal ventricular arrhythmias when combined with astemizole EXCEPT
   a. Rifampicin
   b. Patients with liver disease
   c. Ketoconazole
   d. Erythromycin
   e. Itraconazole
8. H2 antagonists
   a. Irreversibly compete with histamine at H2 receptor sites
   b. Also bind to H1 receptors
   c. Famotidine inhibits the cytochrome P450 system
   d. Ranitidine may increase bioavailability of ethanol by >40% in normal individuals
   e. Ranitidine is 7 times more potent than famotidine in treatment of duodenal ulcers

9. Cimetidine may increase the pharmacologic effect of all of the following EXCEPT
    a. Lignocaine
    b. Ketoconazole
    c. Warfarin
    d. Phenytoin
    e. Barbiturates

10. Regarding drugs affecting serotonin
    a. Sumatriptan is a serotonin antagonist
    b. Buspirone is a 5HT1a agonist
    c. Cyproheptadine is a competitive serotonin blocker in doses of 120 to 160 mg/day
    d. Ketanserin blocks 5HT receptors and B receptors
    e. Ondansetron is a 5 HT 2 antagonist

11. Regarding the ergot alkaloids
    a. Bromocriptine has profound effects on uterine smooth muscle stimulation
    b. Methysergide is a peptide alkaloid
    c. Ergotamine constricts most human blood vessels and is short acting
    d. PCP is an ergot alkaloid
    e. Ergotism may be defined as a spectrum of hallucinations, convulsions and "fiery limb pains"

12. All of the following drugs stimulate renin release EXCEPT
    a. Clonidine
    b. Nitroprusside
    c. Isoproterenol
    d. Alpha antagonists
    e. Thiazides

13. All of the following vasoconstrict EXCEPT
    a. Vasopressin
    b. Ergotamine
    c. Angiotensin 2
    d. Substance P
    e. Endothelin

14. Regarding NSAIDs
    a. Aspirin reversibly acetylates and blocks platelet cyclo oxygenase
    b. Piroxicam has the shortest half life of all the NSAIDS
    c. Serious haematological problems have occurred with indomethacin use
    d. Ibuprofen is excreted predominantly unchanged in the urine
    e. Naproxen = selective COX 2 inhibitor

15. Methyxanthines (theophylline)
    a. Have negative chronotropic/inotropic effects
    b. Have antidiuretic effects
    c. Inhibit the enzyme phosphodiesterase at high concentrations
    d. Theophylline has less selective smooth muscle effects compared with caffeine
    e. Have no effect on skeletal muscle

16. All of the following pairings are correct EXCEPT

    a. PGE1 = vasodilation
    b. PGE2 = relaxes gut longitudinal muscle
    c. PGF 2 alpha = bronchoconstricts
    d. PGF2alpha = oxytocic actions
    e. PGI 2 = inhibits platelet aggregation

17. PGE 1 has all of the following effects EXCEPT
    a. Maintains patent ductus in some congenital heart disease
    b. Contracts intestinal smooth muscle
    c. Vasodilates
    d. Inhibits platelet aggregation
    e. Decreases water and sodium excretion by the kidney

18. Regarding drugs used to treat asthma
    a. Antimuscarinic agents are much more potent than B2 agonists in reversing asthmatic bronchospasm
    b. Salmeterol has a duration of action of 4 – 6 hours
    c. Isoproterenol is a potent bronchodilator but may cause cardiac arrhythmias
    d. Cromolyn sodium is an excellent agent for treatment of an acute asthma attack
    e. Aminophylline contains 66 % theophylline by weight

Answers Pharm 2nd July

1. C
2. B
3. D
4. E
5. B
6. D
7. A
8. D
9. E
10. B
11. E
12. A
13. D
14. C
15. C
16. B
17. E
18. C

Pharmacology MCQs: 07/05/02 Local anaesthetics and skeletal muscle relaxants

1. Regarding local anaesthetic agents
   a. Lignocaine is also an antiarrhythmic of the Vaughan Williams classification group 1A
   b. At normal tissue pH the larger fraction of local anaesthetic in the body fluids will be 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.

2. The most potent local anaesthetic agent in this list is
   a. Procaine
   b. Lignocaine
   c. Cocaine
   d. Bupivacaine
   e. Prilocaine

3. Regarding amide local anaesthetics (LA)
   a. Lignocaine is metabolised in the liver faster than any of the other amide local anaesthetics
   b. Allergies to amide local anaesthetics are more common than with the ester Las
   c. Prilocaine is the most cardiotoxic amide LA
   d. Cocaine is an amide LA which is often used as a drug of abuse
   e. The half life of lignocaine may be increased 3 to 4 fold in a patient with severe liver disease

4. Regarding LA effects on nerve action
   a. Unmyelinated fibres tend to become blocked before myelinated fibres of the same diameter
   b. Proprioceptive fibres are blocked first
   c. Block by LA drugs is more marked in nerves with higher frequencies of depolarisation and longer action potential duration
   d. In large nerve trunks sensory nerves are usually located circumferentially therefore exposed first to drug
   e. None of the above statements are true

5. Suxamethonium
   a. Is a nondepolarising neuromuscular blocking agent
   b. Is contraindicated in all eye operations
   c. Stimulates cardiac muscarinic receptors and autonomic ganglia
   d. Its action is directly terminated by the action of plasma cholinesterase
   e. Should not be administered to patients with burns > 24 hours old because of its hypercalcaemic effect

6. The skeletal muscle relaxant with the longest duration of action is
   a. Suxamethonium
   b. Mivacurium
   c. Vecuronium
   d. Pancuronium
   e. Rocuronium

7. The nondepolarising muscle relaxant which is not dependent on renal or hepatic mechanisms for termination of action is
   a. Pancuronium
   b. Atracurium
   c. Vecuronium
   d. Gallamine
   e. Tubocurarine
8. Regarding nondepolarising muscle relaxants
   a. Jaw and eye muscles are paralysed before the limb and trunk muscles
   b. Rocuronium is the most potent nondepolarising skeletal muscle relaxant
   c. Atracurium is a steroid derivative
   d. Vecuronium blocks cardiac muscarinic receptors thus inducing moderate increase in heart rate
   e. The nondepolarising agents produce a nonsurmountable blockade

9. All of the following are potential side effects of suxamethonium EXCEPT
    a. Hyperkalaemia
    b. Prolonged duration of action in elderly patients
    c. Muscle pain
    d. Second dose bradycardia
    e. Increased intraocular pressure

10. Which of the following drugs is said to have 100% oral bioavailability?
    a. Acylovir
    b. Paracetamol(acetaminophen)
    c. Lithium
    d. Propranolol
    e. Digoxin

Answers

1. E
2. D
3. E
4. C
5. C
6. D
7. B
8. A
9. B
10. C

Pharmacology Questions May 06

1. The drug with the highest first pass metabolism is
   a. Chlorpropamide
   b. Diazepam
   c. Verapamil
   d. Theophylline
   e. Warfarin

2. Loading dose
   a. Is inversely proportional to volume of distribution
   b. Is proportional to accumulation factor
   c. Is independent of rate of administration to multicompartment pharmacokinetics
   d. Equals target concentration X accumulation factor
   e. Of theophylline administered IV in a normal 70kg person = 100mg

3. Half life
   a. Is not a useful parameter in drug dosage
   b. Depends on the volume of distribution and clearance of a drug
   c. Is defined as he time required for a third of the drug to be eliminated
   d. Does not vary with age
   e. Is not altered with certain disease states

4. Ribosomal resistance occurs with
   a. Sulphonamides
   b. Penicillin
   c. Macrolides
   d Fluoroquinolones
   e. Trimethoprim

5. Volume of distribution
   a. Is directly proportional to concentration
   b. May be defined only in respect to blood
   c. Can vastly exceed any physical volume in the body
   d. Is not influenced by plasma binding
   e. Has no influence upon half life

6. Clearance of which drug involves capacity limited elimination
   a. Phenytoin
   b. Theophylline
   c. Propranolol
   d. Lithium
   e. Gentamicin

7. Regarding biotransformation
   a. Phase 1 reactions always precede phase II
   b. Skin is an organ involved in biotransformation of drugs
   c. Water conjugation is phase I biotransformation
   d. CYP2D6 accounts for the majority of p450 activity
   e. Epoxidation is phase II biotransformation

8. Age associated changes in pharmacokinetics include
   a. A reduction in creatinine clearance in two thirds of the population
   b. A decrease in body fat
   c. An increase in body water
   d. A greater reduction in conjugation compared with oxidation

e. A decreased absorption related to age alone

9. Regarding biotransformation, which of the following is true
   a. Ethanol enhances methanol metabolism
   b. Grapefruit juice inhibits cyclosporin metabolism
   c. Phenytoin inhibits theophylline metabolism
   d. Rifampicin inhibits oral contraceptives metabolism
   e. Griseofulvin inhibits warfarin metabolism

10. Clearance
   a. Is the amount of drug eliminated divided by the concentration of the drug
   b. Is constant for most drugs in clinical settings at therapeutic levels
   c. Is very high for lithium
   d. Is independent of concentration for phenytoin
   e. Is inversely proportional to volume of distribution

11. The metabolic pathway of detoxification that becomes increasingly important in paracetamol toxicity is
   a. Conjugation with glucoronide
   b. Oxidation
   c. Reduction
   d. Cytochrome P-450 dependent glutathione conjugation
   e. Methylation

12. Phase II reactions in metabolic biotransformation include all of the following EXCEPT
   a. Water conjugation
   b. Cytochrome P-450 dependent oxidations
   c. Acetylation
   d. Methylation
   e. Glucuronidation

13. Which of the following is NOT a phase I drug metabolising reaction
   a. Acetylation
   b. Deamination
   c. Hydrolysis
   d. Oxidation
   e. Reduction

14. Regarding first-pass metabolism
   a. Sublingual drug administration completely bypasses the liver
   b. Approximately 50% of a rectally administered dose bypasses the liver
   c. First-pass elimination does not occur in drugs administered by inhalation
   d. The inferior haemorrhoidal vein drains into the portal system
   e. Oral bioavailability is completely determined by hepatic metabolism

15. Which of the following t½ lives is correct
   a. Enalapril t ½ = 3 hours
   b. Warfarin t ½ = 37 hours
   c. Digoxin t ½ = 20 hours
   d. Cimetidine t ½ = 1.9 hours
   e. Acetaminophen t ½ = 2 hours

16. All the following drugs enhance drug metabolism EXCEPT
   a. Rifampicin
   b. Phenylbutazone
   c. Pyridostigmine
   d. Glutethimide
   e. Benzo [a] pyrene

17. The following drugs exhibit low first pass metabolism EXCEPT
    a. Phenytoin
    b. Tolbutamide
    c. Theophylline
    d. Chlorpropamide
    e. Morphine

18. What is the half life of a drug which has a volume of distribution of 500 1/70kg and a clearance of 7 1 /70kg?
    a. 10 hours
    b. 50 hours
    c. 70 hours
    d. 150 hours
    e. 350 hours

19. Examples of drugs which are extensively bound to plasma proteins include all of the following EXCEPT
    a. Lithium
    b. Nifedipine
    c. Phenytoin
    d. Cyclosporin
    e. Salicylic acid

20. Regarding agonists/antagonists
    a. Phenoxybenzamine is a reversible alpha blocker
    b. The presence of an irreversible antagonist always changes the EC50 of the agonist
    c. Protamine is a physiological antagonist of heparin
    d. Theophylline produces some of its effects by competitive inhibition of cGMP degradation
    e. Prednisone has a greater EC50 than dexamethasone

Pharmacology Answers December 03

1. C
2. B
3. B
4. C
5. C
6. A
7. B
8. A
9. B
10. B
11. D
12. B
13. A
14. B
15. C
16. C
17. E
18. B
19. A
20. E

1. Regarding diuretics
   a. They work to lower BP initially by ↓ peripheral vascular resistance.
   b. Thiazide diuretics are potassium sparing.
   c. They are effective in lowering BP 20-25mmHg in most patients.
   d. BP response to thiazides continues to increase at doses greater than usual therapeutic dose.
   e. Diuretics may impair glucose tolerance.

2. Which of the following drug's metabolism characteristics are bimodally distributed in the population?
   a. Sodium nitroprusside
   b. Clonidine
   c. Minoxidil
   d. Hydralazine
   e. Phentolamine

3. Regarding the ACE inhibitors
   a. They inhibit peptidyl dipeptidase thus preventing the inactivation of bradykinin.
   b. Captopril is a prodrug
   c. They are used with caution in patients with IDH as reflex sympathetic activation occurs 2° to the hypotensive effects of the ACE inhibitors.
   d. They have no role in treating the normotensive diabetic patients.
   e. They are useful antihypertensives in late pregnancy.

4. Which of the following calcium channel blockers is excreted predominantly in the faeces?
   a. Nifedipine
   b. Felodipine
   c. Diltazem
   d. Nimodipine
   e. Verapamil

5. Which of the following increases the risk of digoxin induced arrhythmias?
   a. Hyperkalaemia
   b. Hypercalcaemia
   c. Hypermagnesaemia
   d. Hyperuricaemia
   e. Hypernatraemia

6. Propanolol
   a. Is a β1 specific blocker
   b. Causes prominent postural hypotension
   c. Has no effect of plasma lipids
   d. Inhibits the stimulation of rennin production by catecholamines
   e. Has a +1/2 of 12 hours

7. Hydralazine
   a. Dilates veins but not arterioles
   b. Is contraindicated in the treatment of pre-eclampsia
   c. Can cause an SLE type syndrome in up to 10-20% of patients
   d. Causes orthostatic hypotension in many cases
   e. Is extremely useful as a single agent in the treatment of hypertension

8. Regarding atropine
   a. It is a quaternary amine alkaloid ester of tropic acid
   b. About 60% of the dose of atropine is excreted unchanged in the urine
   c. Atropine has prominent stimulant CNS effects when given in standard usual doses
   d. It causes irreversible blockade of the actions of cholinomimetics at muscarinic receptors
   e. It causes diarrhoea

9. β blockers have many different properties. Which of the following statements is correct?
   a. Atenolol has high lipid solubility
   b. Esmolol has partial agonist activity
   c. Labetalol is β1 selective
   d. The elimination half life of sotalol is 12 hours
   e. Timolol has prominent local anaesthetic activity

10. Digoxin has all of the following actions on cardiac electrical function EXCEPT
   a. ↓ atrial muscle automaticity
   b. ↓ AV node conduction velocity
   c. ↓ refractory period in Purkinge system and ventricles
   d. ST depression on ECG – especially with chronic use
   e. Bigeminy can occur

11. Amiodarone (oral)
   a. Has a half life of 5 days
   b. Increases clearance of warfarin, theophylline and other drugs
   c. Has high affinity for activated sodium channels
   d. Causes torsades de pointes frequently because of prolongation of the QT interval
   e. Causes photodermatitis in about 25% of patients

12. Loop diuretics
   a. Consist of spironolactone and bendrofluazide
   b. Inhibit the Na^+ K^+ $2Cl^-$ transport pump in the distal tubule of the kidney
   c. Can cause a usually irreversible ototoxic reaction
   d. Can cause hyperuricaemia and precipitate gout
   e. Inhibit renal prostaglandin synthesis

13. Regarding the alpha blockers
   a. Phenoxybenazmine binds to α receptors causing irreversible blockade
   b. Prazosin has a much higher affinity for α_2 receptors compared with α_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

14. Sotalol
   a. Is a selective β1 blocker
   b. Is only effective in treatment of supraventricular arrhythmias
   c. Is extensively metabolised in the liver
   d. Causes torsade de pointes when plasma concentrations of sotalol are normal-low
   e. Has a usual effective dosage of 80-320mg twice daily

15. Which of the following drugs causes cinchonism?
   a. Tocainide
   b. Lignocaine
   c. Quinidine
   d. Flecainide
   e. Procainamide

16. Which of the following IV antihypertensive drugs also inhibits insulin release?
   a. Diazoxide
   b. Hydralazine
   c. Labetalol
   d. Fenoldopram
   e. Nitroprusside

17. LMW heparin
    a. MW = 15000
    b. Inhibits activated factor X
    c. Has unpredictable pharmacokinetics
    d. Can be used with minimal problems in renal failure
    e. Is readily reversed with protamine sulphate

18. Lignocaine
    a. Is class 1A antiarrhythmic
    b. Blocks both activated and inactivated sodium channels
    c. Has good oral bioavailability
    d. Is the treatment of choice for most SVTs
    e. Elimination half life is decreased in patients with hepatic impairment

19. Flecainide
    a. Is a class III antiarrhythmic
    b. Half life is approximately 2 hours
    c. Potently blocks potassium channels
    d. Is extensively hepatically metabolised
    e. Has potent antimuscarinic effects

20. Heparin
    a. May cause severe thrombocytopaenia in 25% of patients
    b. Binds to antithrombin 3 thereby stimulating production of more clotting factors
    c. Is contraindicated in pregnancy
    d. Action can be revered by protamine
    e. Can be administered SC, IM, or IV

21. Regarding fibrinolytic agents
a. Streptokinase is synthesised by staphylococci
    b. They all activate fibrinogen
    c. They are all of similar cost
    d. TPA is safer than streptokinase in elderly patients
    e. Streptokinase causes systemic fibrinolysis

22. Regarding calcium channel blockers
    a. Calcium channel blockers are not bound to plasma proteins
    b. Nifedipine has less vascular potency than verapamil
    c. Felodipine has been shown to inhibit insulin release in humans
    d. Diltiazem has a plasma half life of 3 – 4 hours
    e. Verapamil has a high affinity for cerebral blood vessels thus decreasing vaso spasm post subarachnoid haemorrhage

23. Digoxin
    a. Is poorly lipid soluble
    b. Is extensively metabolised
    c. Has minimal GI toxicity
    d. Is 80% bound to plasma proteins
    e. Has half life in the body of 40 hours

24. Drugs which may increase digoxin effect include all of the following EXCEPT
    a. Antacids
    b. Diltiazem
    c. Frusemide
    d. Quinidine
    e. Amiodarone

25. Methyldopa
    a. Lowers the heart rate and cardiac output more than clonidine does
    b. Causes reduction in renal vascular resistance
    c. Has minimal CNS side effects
    d. Has 80% bioavailability
    e. Usual therapeutic dose is about 1-2mg/day

26. All of the following drugs may share cross reactivity secondary to the presence of a sulphonamide moiety EXCEPT
    a. Acetazolamide
    b. Chlorothiazide
    c. Frusemide
    d. Bymetanide
    e. Amiloride

27. Verapamil
    a. Is contraindicated in treatment of SVT because of the side effect of hypotension
    b. Is the agent of choice for treatment of arrhythmias in children less than one
    c. Is not hepatically metabolised
    d. Is a class 3 antiarrhythmic
    e. Can cause VF

28. In patient on warfarin, an increase is INR tends to occur with
    a. Cholestyramine
    b. Vitamin K
    c. Metronidazole
    d. Rifampicin
    e. Phenobarbital

29. Sodium nitroprusside
    a. ↑ cGMP by release of nitric oxide
    b. ↓ vascular resistance but ↑ blood pressure by direct action on sympathetic nervous system
    c. Is a complex of calcium and cyanide groups
    d. Is predominantly as arteriodilator
    e. Has onset of action in 10-15 minutes

30. The toxic effects of organic nitrates include
    a. Met haemoglobinaemia
    b. Cyanide poisoning
    c. Bradycardia
    d. Precipitating glaucoma
    e. Bronchospasm

31. Most β blockers
    a. Have a small volume of distribution
    b. Have poor bioavailability
    c. Have ½ lives of 3 – 10 hours
    d. Are highly lipid soluble and hence cross the blood brain barrier
    e. Are rarely excreted unchanged

32. Which of the following antihypertensive drugs acts on the vasomotor centre
    a. Prazosin
    b. Clonidine
    c. Hydralazine
    d. Reserpine
    e. Losartan

33. Regarding streptokinase
    a. The GUSTO trial showed a higher risk of haemorrhagic shock compared to tPA
    b. It is administered IV as a single rapid bolus dose
    c. It converts plasmin to plasminogen
    d. There are no in vivo inhibitors for the streptokinase – proactivation complex
    e. Urokinase is made by bacteria

34. Concerning toxicity of lignocaine
    a. Lignocaine is highly cardiotoxic compared to other local anaesthetics
    b. Side effects are not dose related
    c. Lignocaine exacerbates ventricular arrhythmias in about 10% of patients
    d. Hypotension is very common with lignocaine toxicity
    e. Neurological side effects are uncommon with lignocaine toxicity

35. Noradrenaline
    a. Is more potent that Salbutamol at $\beta 2$ receptors
    b. Is less potent than isoprenaline at α receptors
    c. Antagonises the effects of dopamine
    d. Has similar potency to adrenaline at $\beta 1$ receptors
    e. Is less potent than adrenaline at α receptors

36. The adverse effects of captopril include
    a. Hypokalaemia
    b. ↑ cholesterol
    c. Polycythaemia
    d. Dry cough
    e. Hypoglycaemia

MCQs 18 May 04
Answers

1.	E	19.	C
2.	D	20.	D
3.	A	21.	
4.	C	22.	D
5.	B	23.	E
6.	D	24.	A
7.	C	25.	B
8.	B	26.	D
9.	D	27.	E
10.	A	28.	C
11.	E	29.	A
12.	D	30.	A
13.	A	31.	C
14.	E	32.	B
15.	C	33.	D
16.	A	34.	C
17.	B	35.	D
18.	B	36.	D

1. 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 stops the pulmonary lesions occurring
   e. Paraquat doesn't affect hepatic or renal functions

2. Regarding NSAIDs
   a. Piroxicam has a half life of >50 hours
   b. Aspirin reversibly inhibits COX
   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

3. 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

4. Regarding lead toxicity
   a. Lead can induce an anaemia that is macrocytic
   b. Young children absorb about 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

5. Regarding agents used to treat gout
   a. As little as 8mg of colchicine taken over 24 hours may be fatal
   b. Allopurinol is a xanthine oxidase stimulator
   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

6. All of the following may be seen in organophosphate poisoning EXCEPT
   a. Salivation
   b. Tachycardia
   c. Fibrillation of muscle fibres
   d. Bronchospasm
   e. Vomiting

7. Regarding aspirin
   a. The average anti-inflammatory dose of aspirin is 0.6g up to 4 hourly
   b. Aspirin's main side 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

8. The main mechanism of action of colchicine is
   a. Inhibition of polymorphonuclear leucocytes
   b. Inhibition of synoviocyte phagocytosis
   c. Reduced formation of leukotriene D4
   d. Inhibition of mononuclear phagocytes
   e. Decreasing the body pool of urate

9. Aspirin inhibits all of the following EXCEPT
    a. Cyclo oxygenase
    b. Recurrent miscarriages
    c. Protacyclin synthesis
    d. Kallikrein system
    e. Lipo oxygenase

10. Acetaminophen (paracetamol) can undergo all of the following biotransformation reactions EXCEPT
    a. Deamination
    b. N-oxidation
    c. Glucuronidation
    d. Sulphation
    e. Glutathione conjugation

11. Aspirin
    a. Is hydrolysed to acetone and salicylate
    b. Exhibits first order kinetics with elimination in low doses
    c. Is mostly conjugated by the liver and excreted in the bile
    d. Reversibly blocks the cyclooxygenase enzyme
    e. Causes an immediate doubling of bleeding time

12. Regarding NSAIDs
    a. At high doses diclofenac demonstrates zero order kinetics
    b. Aspirin is a reversible inhibitor of cyclooxygenase
    c. Aspirin at doses of <2g/day reduces uric acid levels
    d. All NSAIDs can be found in synovial fluid after repeated dosing
    e. Use of ibuprofen and aspirin together increases the anti inflammatory effect

13. The metabolic pathway of detoxification that becomes increasingly important in paracetamol toxicity is
    a. Conjugation with glucuronide
    b. Oxidation
    c. Reduction
    d. Cytochrome p-450 dependent glutathione conjugation
    e. Methylation

14. Which of the following NSAIDs has a t1/2 of about 1 hour
    a. Diclofenac
    b. Naproxen
    c. Piroxicam
    d. Indomethacin
    e. Ibuprofen

15. Which of the following symptoms of aspirin toxicity occurs at plasma salicylate concentrations of 100mg/dl?
    a. Tinnitus
    b. Vasomotor collapse
    c. Metabolic acidosis
    d. Gastric intolerance
    e. Renal failure

16. All of the following drugs can cause a wide anion gap metabolic acidosis EXCEPT
    a. Lithium
    b. Methanol
    c. Cyanide
    d. Salicylates
    e. Isoniazid

17. Which of the following drug overdoses may be amenable to the elimination technique of haemodialysis
    a. Calcium channel blockers
    b. Benzodiazepines
    c. Valproate
    d. Quinidine
    e. Opioids

18. Which of the following antidote – drug pairings is INCORRECT
    a. Acetaminophen → n-acetyl cysteine
    b. β blockers → glucagon
    c. Opioids → naloxone
    d. Benzodiazepines → Flumazenil
    e. Tricyclic antidepressants → physostigmine

19. Regarding carbon monoxide poisoning
    a. CO has an affinity for Hb that is about 2000 times that of oxygen
    b. Hyperbaric oxygen is indicated as a treatment for all patients with CO Hb levels >20%
    c. The average concentration of CO in the atmosphere is about 0.1ppm
    d. With room air at 1atm the elimination half time of CO is about 80 minutes
    e. The foetus is resistant to the effects of CO exposure

20. "Erethism" is seen in which of the following intoxications
    a. Lead
    b. Mercury
    c. Arsine gas
    d. Penicillamine
    e. Arsenic

21. All of the following are NSAIDs EXCEPT
    a. Sulindac
    b. Piroxicam
    c. Gemfibrozil
    d. Ketorolac
    e. Diflunisal

22. Drugs which enhance other drug metabolism include all of the following EXCEPT
    a. Rifampicin
    b. Ketoconazole
    c. Phenobarbital
    d. Griseofulvin
    e. Phenytoin

23. Which of the following has a high extraction ratio
    a. Trimethoprim
    b. Valproic acid
    c. Lignocaine
    d. Metronidazole
    e. Diazepam

24. Heparin and protamine used together is an example of
    a. Physiologic antagonism
    b. Chemical antagonism
    c. Partial agonism
    d. Irreversible antagonism
    e. Agonal agonism

25. The half life of a drug with a Vd of 200ml/70kg and clearance of 10ℓ/hr/70kg is
    a. 10 hours
    b. 14 hours
    c. 20 hours
    d. 40 hours
    e. Indeterminate

Analgesics/Toxicology MCQs - Answers
1 July 2004

1. c
2. a
3. e
4. c
5. a
6. b
7. c
8. a
9. e
10. a
11. b
12. d
13. d
14. a
15. c
16. a
17. c
18. e
19. c
20 b
21. c
22. b
23. c
24. b
25. b

1. Regarding antipsychotics as a group
   a. Metabolites are important to the action of these drugs
   b. Haloperidol has a higher systemic availability than thioridazine or chlorpromazine
   c. Elimination half lives of these drugs range between 3 – 6 hours
   d. This group of drugs generally has short clinical duration of action
   e. Clozipine is a member of the dihydroindolone group

2. Which of the following antipsychotics (in excess dose) is responsible for cardiac arrhythmias?
   a. Chlorpromazine
   b. Clozapine
   c. Thioridazine
   d. Haloperidol
   e. Thiothixene

3. Plasma lithium levels (assuming no change in daily lithium dose) may become toxic in the presence of all of the following EXCEPT
   a. Pregnancy
   b. Use of thiazides
   c. Dehydration
   d. Use of some non-steroidal anti-inflammatory drugs
   e. Post partum state

4. Regarding pharmacokinetics of antidepressants
   a. Most are highly protein bound
   b. Fluoxetine is poorly absorbed
   c. Tricyclics are predominantly excreted unchanged in the urine
   d. Plasma half lives of antidepressants are mostly less than 10 hours
   e. The half life of the older MAOIs is helpful in governing doses

5. Which of the following drugs is potentially dangerous in a single drug overdose
   a. Moclobemide
   b. Paroxetine
   c. Sertraline
   d. Trazodone
   e. Amoxapine

6. Which of the following drugs is 99% protein bound in plasma
   a. Gentamicin
   b. Theophylline
   c. Carbamazepine
   d. Atenolol
   e. Diazepam

7. Which of the following drugs is contraindicated (absolutely) in a patient with porphyria
   a. Zolpidem
   b. Chloral hydrate
   c. Buspirone
   d. Phenobarbitone
   e. Diazepam

8. Regarding local anaesthetic agents
    a. Lignocaine is also an antiarrhythmic of the Vaughan Williams classification group 1A
    b. At normal pH the larger fraction of local anaesthetic in the body fluids will be in the unchanged 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

9. Regarding IV anaesthetic agents
    a. Ketamine is the induction agent of choice in a head injured patient
    b. Propofol has a slow offset of action
    c. Etomidate causes hypotension more commonly than thiopentone
    d. Ideal agents for neuroleptanalgesia are fentanyl and droperidol
    e. Thiopentone is metabolised at a rate of 40-50% per hour in humans following a single dose

10. Suxamethonium
    a. Is a non-depolarising neuromuscular blocking agent
    b. Is contraindicated in all eye operations
    c. Stimulates cardiac muscarinic receptors and autonomic ganglia
    d. Its action is directly terminated by the action of plasma cholinesterase
    e. Should not be administered to patients with burns >24 hours old because of its hypercalcaemic effect

11. Inhalational anaesthetics
    a. Enflurane is proconvulsant
    b. Isoflurane is the inhalational agent of choice in patients with active IHD
    c. Nitrous oxide is a useful adjunct to volatile anaesthetic use in women in the first trimester of pregnancy
    d. Halothane has a MAC value of 75% making it less potent than desflurane
    e. Desflurane is extensively metabolised via the liver

12. Phenytoin
    a. Is 20-30% bound to albumin
    b. Is the drug treatment of choice in absence seizures
    c. Undergoes flow limited elimination
    d. Steady state mean plasma concentrations varies disproportionately with the dose
    e. Preferentially binds to activated state sodium channels

13. Drugs of abuse can be extremely dangerous in the wrong hands! Which of the following is correct
    a. Ketamine is structurally related to psilocybin
    b. LSD acts on various 5 HT receptor subtypes to produce its mind altering effects
    c. Marijuana causes mydriasis and conjunctival infection
    d. Cocaine has a long plasma half life
    e. Amphetamine like drugs cause marked stimulation of appetite

14. Flumazenil
    a. Is cleared renally
    b. Predictably reverses benzodiazepine induced respiratory depression
    c. Antagonises CNS effects of opioids
    d. Can precipitate seizures in mixed overdose
    e. Has a half life of around 10 hours

15. Regarding non-depolarising muscle relaxants
    a. Pancuronium is eliminated via the kidney
    b. Roacuronium is an isoquinolone derivative
    c. Roacuronium undergoes Hoffman elimination
    d. Vecuronium is eliminated predominantly via the kidney
    e. Atracurium is eliminated via plasma pseudocholinesterase

16. Which of the following is a direct serotonin agonist
    a. Fluoxetine
    b. Amitriptylline
    c. Moclobemide
    d. Ondansetron
    e. Sumatriptan

17. The opiate associated with seizures when given in high doses to patients with renal failure is
    a. Morphine
    b. Pethidine
    c. Methadone
    d. Fentanyl
    e. Codeine

18. 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

19. Which of the following local anaesthetic agents is an ester
    a. Bupivacaine
    b. Ropivacaine
    c. Prilocaine
    d. Procaine
    e. Lignocaine

20. 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 causes less hangover than nitrazepam
    d. It causes rebound insomnia
    e. It increases REM sleep

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

22. Benzodiazepines
    a. Increase the duration of GABA gated chloride channel openings
    b. Will depress (in high doses) the CNS to the point known as stage 3 of general anaesthesia
    c. Bind to GABAβ receptors
    d. Have extensive cardiodepressant effects in doses used to cause hypnosis
    e. Decrease the duration of stage 2 NREM sleep

23. Regarding drugs used in Parkinson's disease
    a. Bromocriptine is the first line drug to treat Parkinson's disease in psychotic patients
    b. 80-90% of a single dose of Levodopa enters the brain unaltered
    c. Patients taking Selesiline to treat Parkinson's disease are limited in what they can eat because of the tyranine reaction phenomenon
    d. Amantadine has anti Parkinsonian effects and is administered at a dose of 100mg bd
    e. Anti muscarinic drugs are of benefit in elimination of bradykinesia in Parkinson's

24. A patient complains of post op muscle pain. This is most likely to be due to
    a. Suxamethonium
    b. Propofol
    c. Isoflurane
    d. Atracurium
    e. Ketamine

25. Lithium
    a. Has rapid onset of action
    b. Is partially renally excreted
    c. Has no neurological side effects
    d. Has no contraindications to be given in conjunction with NSAIDS
    e. Is contraindicated in sick sinus syndrome

26. With respect to opioid receptors
    a. Fentanyl works predominantly at the kappa receptors
    b. Both U and delta receptors contribute to respiratory depression
    c. Methadone is used for heroin withdrawal because its actions are predominantly at the delta receptors
    d. Opioid receptors are coupled to a tyrosine kinase mechanism of action
    e. Physical dependence and tolerance is caused by the rapid disintegration of receptors

27. Lignocaine
    a. Penetrates the axon in its changed form
    b. Is more potent than bupivacaine
    c. Has higher affinity for activated than resting sodium channels
    d. Is a weak acid
    e. Blocks voltage gated sodium channels at their extracellular end

28. Regarding adverse effects of propofol
    a. Post op vomiting is common
    b. Hypertension is a complication
    c. Severe acidosis can occur with its use in paediatric respiratory infections
    d. It is positively inotropic
    e. Tremor is a common side effect

29. Regarding inhaled anaesthetics
    a. They reduce MAP in direct proportion to their alveolar concentration
    b. Nitrous oxide has a relatively low MAC
    c. Halogenated agents have a lower brain:blood partition coefficient
    d. Nitrous oxide causes a decrease in tidal volume and an increase in respiratory rate
    e. They decrease the metabolic rate in the brain by decreasing cerebral blood flow

30. Local anaesthetic agents
    a. Are primarily K^+ channel blockers
    b. Prevent repolarisation of the membrane
    c. Can be used with a vasodilator to prolong local action
    d. Activity is enhanced by high extracellular K^+ concentration
    e. Activity is enhanced by high extracellular Ca^{2+}

31. Which of the following side effects for given drugs is wrong
    a. Phenytoin – gum hypertrophy
    b. Ethosuximide – hirsuitism
    c. Phenobarbital – enzyme induction
    d. Carbamazepine – ataxia
    e. Valproate – idiosyncratic hepatic toxicity

32. The main side effect of benztropine is
    a. Miosis
    b. Confusion
    c. Diarrhoea
    d. GIT haemorrhage
    e. Bronchorrhoea

33. Thiopentone
    a. Is not lipid soluble
    b. Can be used IM or IV to induce anaesthesia
    c. Has good analgesic properties
    d. Can cause convulsive movements
    e. Anaesthetic action is terminated by redistribution from CNS to other highly vascularised tissues

34. Nitrous oxide
    a. Can be used with O_2 as a carrier gas for halothane
    b. Has poor analgesic properties
    c. Forms a vapour which is explosive
    d. Sensitises the heart to the action of catecholamines
    e. Is an effective agent for inducing anaesthesia

35. Codeine
    a. Is more potent than fentanyl
    b. Frequently causes diarrhoea
    c. Is used to treat nausea caused by morphine
    d. Occurs in foxglove plants
    e. Depresses the cough reflex

36. Regarding GABA: all the following are true EXCEPT
    a. Receptor blockers have anticonvulsant activity
    b. Is found in high concentrations in the basal ganglia
    c. Concentrations in the basal ganglia are abnormally low in Huntington's chorea
    d. Metabolism is inhibited by sodium valproate
    e. Receptors are sensitive to the activity of benzodiazepines

37. Regarding local anaesthetics (LA)
    a. Lignocaine is metabolised in the liver faster than any of the other amide LA
    b. Allergies to amide Las are more common than with the ester Las
    c. Prilocaine is the most cardiotoxic LA
    d. Cocaine is an amide LA which is often used as a drug of abuse
    e. The +1/2 of lignocaine may be increased 3-4 fold in a patient with severe liver disease

38. Regarding nondepolarising muscle relaxants
    a. Jaw and eye muscles are paralysed before the limb and trunk muscles
    b. Rocuronium is the most potent nondepolarising skeletal muscle relaxant
    c. Atracurium is a steroid derivative
    d. Vecuronium blocks cardiac muscarinic receptors, thus inducing moderate increase in heart rate
    e. The nondepolarising agents produce a non-surmountable blockade

39. The skeletal muscle relaxant with the longest duration of action is
    a. Suxamethonium
    b. Mivacurium
    c. Pancuronium
    d. Rocuronium
    e. Vecuronium

40. Which of the following DOES NOT increase the susceptibility of a nerve fibre to conduction blockade by a local anaesthetic
    a. Small diameter
    b. Myelination
    c. Location in the periphery of a nerve
    d. High firing rate
    e. Short action potential duration

Pharmacology Answers (CNS drugs)
15 June 2004

1. b
2. c
3. a
4. a
5. e
6. e
7. d
8. e
9. d
10. c
11. a
12. d
13. b
14. d
15. a
16. e
17. b
18. c
19. d
20. e
21. d
22. b
23. d
24. a
25. e
26. b
27. c
28. c
29. a
30. d
31. b
32. b
33. e
34. a
35. e
36. a
37. e
38. a
39. c
40. e

Pharmacology MCQ 2005.1

1. Which of these drugs has a half life closest to 6 hours?
    a. Digoxin
    b. Diazepam
    c. Aspirin
    d. Warfarin
    e. Atenolol

2. Allopurinol
    a. Is metabolized by xanthine oxidase
    b. Increases uric acid secretion
    c. Is effective in acute gout
    d. Has no systemic side effects
    e. Has an active metabolite

3. Prothrombin time in a patient on warfarin is increased by
    a. Griseofulvin
    b. Cholestyramine
    c. Benzodiazepines
    d. Ceftriaxone
    e. Phenobarbitone

4. All are true regarding sulfonamides EXCEPT:
    a. Wide distribution including entry into CNS
    b. Bacteriostatic for E coli
    c. Effective topically for Chlamydia infection of eye
    d. Effective systemically for genital chlamydia infections
    e. Structural analogs of *p*-aminobenzoic acid that competitively inhibit dihydropteroate synthase

5. Which prophylactic agent is correctly matched?
    a. Genital HSV – zidovudine
    b. Anthrax – ciprofloxacin
    c. Cholera – erythromycin
    d. Diphtheria – amphoteracin B
    e. Haemophilus - penicillin

6. Regarding amphoteracin
    a. Amphoteracin A has no clinical use
    b. Interacts with ergosterol in fungal cell membranes to form pores
    c. ?
    d. ?
    e. ?

7. In general, penicillins:
    a. should be given with food
    b. are not sufficient therapy alone for primary syphilis
    c. may cause seizures in renal failure
    d. should never be given to patients with a history of penicillin allergy
    e. can be used as prophylaxis against Haemophilus influenzae b

8. Metronidazole:
    a. Is effective in single dose for Giardia infection
    b. Causes a disulfiram-like effect
    c. Inhibits alcohol dehydrogenase
    d. ?
    e. ?

9. Ketamine:
    a. Is safe to use in patients with raised intracranial pressure
    b. May cause bronchospasm
    c. ?
    d. ?
    e. causes CVS stimulation via a sympathomimetic effect

10. Suxamethonium:
    a. Rapidly crosses the blood-brain barrier
    b. Is safe for use in a patient who sustained burns 48 hours previously
    c. Does not affect serum potassium levels
    d. Is reliably reversed by neostigmine

11. Which is incorrect regarding pethidine?
    a. Increases CSF pressure
    b. Pethidine and fentanyl are structurally similar
    c. Pethidine causes peripheral vasoconstriction
    d. Norpethidine causes seizures in toxic doses
    e. ?

12. Oral iron replacement in a patient with iron deficiency anaemia causes all except:
    a. Reticulocytosis
    b. Abdominal cramps
    c. Nausea
    d. Black faeces
    e. Thrombocytopaenia

13. Regarding thrombolytic agents
    a. Urokinase is inexpensive but is less fibrin-specific
    b. Streptokinase is produced from cultured human cells
    c. Any gastrointestinal bleeding within 12 months is a contraindication
    d. The TIMI trial showed that gastronintestinal bleeding complications were the most severe
    e. Aminocaproic acid is a potent inhibitor of fibrinolysis

14. Ibuprofen:
    a. is selective for COX 2
    b. causes less gastric side effects than aspirin
    c. irreversibly inhibits cyclo-oxygenase
    d. ?

15. Which drug and teratogenic effect is correctly matched?
    a. Ethanol – Ebstein's anomaly
    b. ?
    c. ?
    d. thalidomide – neural tube defects
    e. ACE inhibitors – renal failure

16. Warfarin:
    a. May increase protein C levels initially
    b. Inhibits metabolism of vitamin K dependent clotting factors

17. Effects of glucagon include:
    a. Negative inotropy at cardiac muscle
    b. Negative chronotropy at cardiac muscle
    c. Intestinal contraction
    d. Has no effect on skeletal muscle glycogen
    e. ?

18. A patient recently started on treatment for hyperthyroidism complains of a sore throat. FBP shows granulocytopaenia. Which drug is most likely to be taking?
    a. Carbimazole
    b. Iodide
    c. Radioactive iodine
    d. Propylthiouracil
    e. Propranolol

19. Regarding corticosteroids
    a. Prednisolone has 5 times the anti-inflammatory potency of hydrocortisone
    b. Methylprednisolone has no mineralocorticoid activity
    c. ?
    d. ?
    e. All of the above are true

20. Which of the following is a weak base?
    a. Aspirin
    b. Warfarin
    c. Penicillamine
    d. Lignocaine
    e. Phenobarbitone

21. Promethazine is a weak base with a pK_a of 9.1. Therefore in overdose:
    a. Urinary excretion can be increased by giving sodium bicarbonate
    b. Urinary excretion can be increased by giving ammonium chloride
    c. Only haemodialysis will be effective
    d. ?
    e. ?

22. Tramadol:
    a. Effect is due to an increase in dopamine neurotransmission
    b. Is a strong agonist at mu receptors
    c. Can be completely reversed by naloxone
    d. Causes respiratory depression
    e. Can be inhibited by ondansetron

23. Regarding antiemetics
    a. Marijuana works at the chemoreceptor trigger zone
    b. Metoclopramide is a dopamine agonist
    c. ?
    d. ?
    e. ?
24. Regarding antipsychotics, which is incorrect?
    a. Antipsychotic potency correlates closely with D1-receptor blockade
    b. ?
    c. ?
    d. ?
    e. ?

25. Thiopentone
    a. Redistribution from brain to less perfused tissues is slow
    b. Hepatic metabolism is much slower than redistribution
    c. High doses cause dramatic fall in total peripheral resistance
    d. Induces anaesthesia in 5-10 minutes
    e. ?

26. Regarding diuretics
    a. Chlorothiazide is more potent than frusemide
    b. Frusemide works at the proximal tubule
    c. Thiazides work at the descending limb of the loop of Henle
    d. ?
    e. Thiazides work at the proximal part of the distal tubule

27. Nonselective beta blockers
    a. ?
    b. ?
    c. ?
    d. ?
    e. ?

28. Digoxin
    a. Oral antibiotics may precipitate toxicity
    b. ?
    c. Hypokalaemia decreases toxicity
    d. Hypomagnesaemia decreases toxicity
    e. Is useful in the treatment of arrhythmias in Wolfe-Parkinson-White syndrome

29. Calcium channel blockers
    a. Diltiazem is the prototype of dihydropyridines
    b. Are selective for T-type calcium channels
    c. Verapamil blocks conduction through the AV node
    d. ?
    e. ?

30. Antiarrhythmics
    a. Quinidine and lignocaine block potassium channels
    b. Drugs with membrane-stabilising activity prevent propagation of the depolarizing action potential
    c. ?
    d. Amiodarone prolongs the action potential and QT interval
    e. Verapamil blocks conduction through the Purkinje fibres

31. Methyldopa
    a. Causes a positive Coombs test with long term use
    b. ?
    c. ?
    d. ?
    e. ?

32. Prazosin
    a. Decreases both preload and afterload
    b. ?
    c. ?
    d. ?
    e. ?

33. The role of corticosteroids in asthma management includes:
    a. Directly relax bronchial smooth muscle
    b. Potentiate effects of beta agonists
    c. Inhibit cytokine production
    d. Inhaled steroids may have systemic effects if lipid soluble
    e. ?

34. Regarding the H_2-receptor antagonists in common use, which is incorrect?
    a. ?
    b. ?
    c. ?
    d. can have mental effects
    e. block acid secretion due to stimulation of histamine, gastrin and muscarinic acetylcholine receptors and vagal stimulation

35. Ipratropium bromide
    a. inhaled, has effects lasting more than 4 hours
    b. is equally effective as beta agonists in causing bronchodilation
    c. ?
    d. ?
    e. ?

36. Theophylline
    a. Inhibits cAMP production
    b. Lowers seizure threshold
    c. ?
    d. ?
    e. ?

37. Use of drugs in glaucoma
    a. Timolol – ciliary muscle contraction
    b. ?
    c. Acetazolamide – increased aqueous humor outflow
    d. Pilocarpine – ciliary muscle contraction
    e. Prostaglandins – decreased aqueous humor production

38. A man is given an unknown drug which causes mild tachycardia but no change in mean arterial pressure, decreased sweating and salivation but no erectile dysfunction. It must be:
    a. Antagonist at nicotine receptors
    b. Antagonist at muscarinic receptors
    c. Antagonist at alpha receptors
    d. Agonist at beta receptors
    e. Antagonist at beta receptors

39. Regarding N-acetylcysteine, all are true except:
    a. ?
    b. It may cause bronchoconstriction
    c. It inhibits paracetamol metabolizing enzymes
    d. ?
    e. ?

40. Volume of distribution
    a. If large, implies stronger binding to plasma proteins than tissue proteins
    b. Is affected by pK_a
    c. Invariably increases with age or disease states
    d. Is inversely proportional to clearance
    e. ?

41. Therapeutic index
    a. ?
    b. ?
    c. ?
    d. In animal studies it is the ratio of TD_{50} to ED_{50}
    e. In animal studies is the ratio of ED_{50} to TD_{50}

42. Phase 3 drug trials:
    a. ?
    b. ?
    c. Test the safety of the drug in a small group of normal volunteers
    d. Test whether the drug works in a small number of people with the disease
    e. Test whether the drug is effective in the actual clinical situation with a large number of patients (n<10,000)

1. E
2. E
3. D
4. B
5. B
6. B
7. C
8. B
9. E
10. ?
11. C
12. E
13. E
14. B
15. E
16. ?
17. D
18. D
19. E
20. D
21. ?
22. D
23. ?
24. A
25. B
26. E
27. ?
28. A
29. C
30. D
31. A
32. A
33. B/C
34. ?
35. ?
36. ?
37. D
38. B
39. ?
40. ?
41. D
42. E