

# CARDIOVASCULAR AND DIURETICS PHARMACOLOGY\_SELF-STUDY QUESTIONS

1. Name a non-selective beta-blocker without intrinsic sympathomimetic or local anaesthetic activity that is used for the treatment of ventricular arrhythmias? *PCT, Int Inhib. CA*
2. State the mechanisms of diuretic actions for the following diuretics? A. Acetazolamide B. Frusemide C. Hydrochlorothiazide D. Spironolactone E. Amiloride and triamterene F. Mannitol *Loop D. x 2 x PCT*  
*osmotic* *1/2 CT NaCl/2x* *K Sp* *Frusemide* *Acetazolamide*
3. Give an example of a diuretic that you would use to manage the following conditions: A. Frusemide induced hypokalaemia B. Hypertensive emergency C. Oliguria D. Glaucoma E. Hypercalcaemia F. Hypercalciuria G. Ascites in liver cirrhosis H. Conn's syndrome *Loop Diuretic* *Thiazides* *Loop Frusemide* *Alders Ant-i*
4. Name the groups of diuretics that would cause these adverse effects? A. Hypokalaemia B. Hyperkalaemia C. Hyponatremia D. Hyperglycaemia E. Hyperuricaemia F. Metabolic acidosis G. Metabolic alkalosis H. Hypercalcaemia I. Hypocalcaemia J. Hypomagnesaemia K. Hyponatremia *Loop Frusemide* *Thiazide* *Frusemide* *Thiazide* *Spironolactone* *Con* *Frusemide*
5. Name two diuretics that conserve potassium without blocking aldosterone *Amiloride* *Triamterene*
6. Which group of diuretics reduces calcium excretion in urine? *Thiazides*
7. Which diuretic that is commonly used for treatment of life-threatening pulmonary edema in congestive heart failure? *Frusemide*
8. List the mechanisms by which organic nitrates exert anti-anginal effects
9. Which group of calcium channel blockers is associated with ankle oedema, constipation and reflex tachycardia?
10. Name four anti-hypertensive drugs [from different classes] that you would recommend for treating hypertension in pregnancy
11. What are the effects of angiotensin converting enzyme inhibitors on: A. Peripheral vascular resistance B. Afterload C. Preload D. Cardiac output
12. What is the effect of the following drugs on heart rate [increase or reduction] at therapeutic doses? A. Digoxin B. Hydralazine C. Verapamil D. Clonidine E. Sodium nitroprusside

*Verapamil (Verapamil)*  
*felodipine*  
*Amlodipine*  
*1*  
*diltiazem*  
*nifedipine*  
*Amlodipine*

ACE : Lisinopril  
Enalapril  
Captopril  
Quinapril

13. Name a drug that you would recommend as drug of first choice for the management of ventricular tachycardia following acute myocardial infarction?

biguanin

14. Name two groups of drugs used in the management of hypercholesterolaemia that are associated with myositis

Fibrates Statins

15. Which group of drugs would you recommend for the treatment of tachyarrhythmias associated with hyperthyroidism?

Amiodarone

16. Name three groups of drugs used for ventricular rate control in the management of atrial fibrillation

Ca channel Blocker class I II III  
K channel Blockers. Digoxin

17. Name five drugs [from different classes] that are used in the management of hypertensive emergencies?

Amiodarone  
Guanidine

18. Name three groups of drugs that improve long-term prognosis in congestive cardiac failure

beta-blockers, statins, ACE inhibitors

19. Give the mechanisms of action of the following drugs in angina pectoris? A. Nitroglycerin B. Verapamil C. Propranolol D. Nifedipine

20. Which electrolyte/metabolic adverse effects should be monitored in a patient on treatment with amiloride?

Hyperkalemia Metabolic Acidosis

21. What are the effects of acetazolamide on excretion of (1) bicarbonate (2) sodium (3) hydrogen ions?

$\text{HCO}_3^-$  highly excreted,  $\text{Cl}^-$  like eff,  $\text{H}^+$  spared causing Acidosis

22. Which group of diuretics is most likely to cause ototoxicity?

loop diuretics

23. What are the effects of thiazide diuretics on excretion of (1) uric acid (2) potassium (3) magnesium (4) calcium?

24. What are the effects of loop diuretics on excretion of (1) uric acid (2) potassium (3) magnesium (4) calcium?

(1) hyperuricemia (2) excreted  $\uparrow$  (3) (4) causes hypercalcemia

25. What are the effects of potassium sparing diuretics on excretion of hydrogen ions?

retains them thus  $\uparrow$  Metabolic Acidosis

$\uparrow$  Inhibits  $\text{H}^+$  release

26. Which diuretics conserve potassium without blocking aldosterone?

Amilorone Triamterene

27. Which is the diuretic of choice in patients with ascites secondary to liver cirrhosis?

Spirolactone

28. Name two groups of diuretics that have no role in the management of hypertension

K sparing diuretics. Osmotic

29. Name two groups of diuretics that can cause hyperglycaemia

loop diuretics  
Thiazides

30. Which group of diuretics can be used in the management of nephrogenic diabetes insipidus? *Thiazides.*
31. Which group of diuretics can be used in the management of renal calculi due to hypercalciuria? *Thiazides.*
32. Which group of diuretics can promote the loss of sodium even in patients having low rate of glomerular filtration (< 25ml/min)? *C.A.F.*
33. Which diuretic is used in the management of acute glaucoma? *Acetazolamide.*
34. Name a diuretic that might be of great use in the management of acute comatose patient with brain injury and cerebral edema *Osmotic Mannitol.*
35. Name the diuretic that is commonly used for rapid treatment of life-threatening pulmonary edema in congestive heart failure *Furosemide*
36. Name two groups of inotropic drugs used in the management of heart failure and describe their mechanisms of action in increasing myocardial contractility
37. What are the mechanisms by which organic nitrates exert anti-anginal effects?
38. Which ion channel when blocked results in prolongation of action potential?
39. Which calcium channel blocker has the greatest negative myocardial chronotropic and inotropic effect?
40. Which two groups of anti-hypertensive drugs are associated with producing an unfavourable lipid profile?
41. Name five anti-hypertensive drugs (from different groups) that are relatively safe in pregnancy
42. Which group of drugs would you recommend as first choice for the treatment of tachyarrhythmias associated with hyperthyroidism?
43. Name five drugs (from different classes) that are used in the management of hypertensive emergencies
44. Which group of anti-hypertensive drugs is associated with causing a persistent dry cough?
45. Name four groups of drugs that improve prognosis in congestive cardiac failure
46. What are the actions of angiotensin converting enzyme inhibitors on the cardiovascular system?

*Dopamine: Action on  $\alpha_1$ ,  $\alpha_2$ ,  $\beta_1$ ,  $\beta_2$  Adrenergic Receptors  
 are sympathomimetics of Cardiac activity. Cardiac Inotropic*



He is also concerned about maintaining perfusion to the kidneys and thus an agent that increases renal blood flow is desirable. Which drug would you recommend? What are the pharmacodynamic effects of the drug you have recommended?

62. A 23-year old woman presents with hypertension, anxiety and palpitations. A CT scan shows a unilateral pheochromocytoma. The surgeon should start therapy with which drug prior to removal of the tumour? What are the pharmacodynamic actions of the drug you have recommended?
63. In a patient with Addison's disease, which class of diuretic agents would not have any diuretic effect?
64. What is the anti-hypertensive drug of choice for a hypertensive crisis due to monoamine oxidase inhibitors?
65. Which two classes of anti-arrhythmic drugs (Vaughan-William classification) are associated with Torsades de pointes? What is the drug of choice for Torsade de pointes?
66. Explain the mechanism by which digitalis glycosides slow the heart rate
67. Explain the mechanism by which digitalis glycoside increase myocardial contractility
68. Name two catecholamines recommended to treat cardiogenic shock
69. Which catecholamine is recommended for treatment of anaphylactic shock?
70. Compare and contrast the pharmacodynamics of dopamine and dobutamine on the cardiovascular system
71. How would you explain the rapid heart rate sometimes seen after nitroglycerin administration?
72. Explain the rationale for the use of digitalis glycosides in the treatment of atrial flutter
73. Name two electrolytes whose deficiency would lead to serious cardiac arrhythmias when digitalis therapy is initiated
74. Name three drugs that are recommended for treatment of ventricular arrhythmias that arise due to digitalis toxicity
75. Name the specific antidote for digitalis overdose
76. Name the drug that is associated with thiocyanate toxicity
77. What are the actions of organic nitrates on the cardiovascular system?

78. Name the sympathomimetic agent which may promote diuresis by a direct effect on the kidney
79. For which type of angina are beta blockers contra-indicated?
80. Which class of anti-arrhythmic drugs has been associated with increased mortality in patients with myocardial infarction?
81. What characteristic do all the drugs in the Vaughan-Williams's Class III antiarrhythmic drugs share in common?
82. What is the drug of choice for paroxysmal supraventricular tachycardia?
83. Name a non-selective beta blocker which slows heart rate and also prolongs action potential duration by blocking transmembrane potassium currents
84. List the major adverse effects associated with prazosin
85. Name two groups of anti-hypertensive drugs that act directly on vascular smooth muscle by altering calcium transport
86. List three groups of drugs may be used to control the ventricular rate in atrial fibrillation
87. What are the cardiovascular effects of clonidine?
88. Name three contraindications of angiotensin converting enzyme inhibitors
89. Name a calcium channel blocker that is most likely to cause headache, ankle oedema, constipation and reflex tachycardia
90. What are the uses and major adverse effects of adenosine
91. Explain why sublingual nifedipine is not recommended in the management of hypertensive crises
92. Which potassium channel opener is used in the management of angina pectoris
93. Name four potassium channel openers used in the management of cardiovascular disorders and state the conditions for which they are used
94. Briefly describe the drug management of atrial fibrillation

**Concerning hypertensive emergencies:**

- A. List advantages and disadvantages of oral versus parenteral drug therapy for a patient with severely elevated blood pressure

- B. Compare and contrast the intravenous anti-hypertensives used for treating hypertensive emergencies with regard to: mechanism of action, efficacy, onset and duration of action, safety and special indications
- C. What are the treatment goals for a patient with a hypertensive emergency?

**Concerning management of chronic hypertension:**

- A. What are the goals for the treatment of hypertension?
- B. Describe (with suitable examples) how you would select an appropriate anti-hypertensive regimen based on patient-specific characteristics and concurrent disease states.
- C. Compare and contrast the drugs used in the long-term treatment of hypertension (i.e. non-emergency setting) with regard to: mechanism of action, efficacy, safety, special indications and contra-indications
- D. Design an appropriate monitoring plan for each group of anti-hypertensive drugs

**Concerning the drug management of heart failure:**

- A. What are the goals for the pharmacologic management of heart failure?
- B. Describe the medications used in the short- and long-term management of heart failure and give the rationale for the use of each drug you mention
- C. What clinical and laboratory parameters are needed to evaluate the therapy for achievement of the desired therapeutic outcome and to detect and prevent adverse events?
- D. What is the role of beta-adrenergic blockers in the management of heart failure?

**Ischaemic heart disease (IHD) and acute coronary syndromes (ACS)**

- A. List the goals for pharmacotherapy in IHD and describe the pharmacotherapeutic options available for treating IHD. How does each drug you mention meet the therapeutic goals?
- B. Describe how you would optimise medical therapy in a patient with persistent angina (with consideration of co-morbidities). How would you assess the clinical response to anti-anginal therapy for efficacy and adverse effects?
- C. Compare and contrast the anti-platelet drugs used in the management of acute coronary syndromes with regard to mechanism of action, efficacy, safety, special indications and role played in the management of ACS
- D. Describe how you would design an optimal therapeutic plan for management of acute myocardial infarction and describe how the drugs you would select achieve the therapeutic goals
- E. What is the role of low-molecular-weight heparins in the management of acute coronary syndromes?

**Arrhythmias**

- A. Describe how treatment for lone atrial fibrillation differs from that associated with identifiable underlying causes
- B. What pharmacotherapeutic regimens would you recommend to achieve and maintain ventricular rate control in patients with atrial fibrillation? List the benefits and risks of the drugs you mention.
- C. What therapies are available to convert atrial fibrillation to normal sinus rhythm?

- D. How would you treat acute-onset ventricular tachycardia and what are your goals for treatment? How would you monitor the patient to evaluate the therapy for achievement of the desired therapeutic outcome and to prevent toxicity?
- E. What prophylactic interventions against ventricular tachycardia/ventricular fibrillation after a myocardial infarction are available?

### **Hyperlipidaemias**

- A. List the factors you would consider when deciding which patients with hyperlipidaemia are candidates for therapeutic interventions
- B. What pharmacotherapeutic options are available for the management of hyperlipidaemias? Explain the mechanism of action for each drug you mention. For each regimen you give, design an appropriate monitoring plan including laboratory parameters and time intervals for follow-up.
- C. Describe the factors that you would consider when planning a pharmacotherapeutic regimen for a patient you have decided needs to be treated for hyperlipidaemia. What considerations would you make in patients with the following features: (1) Alcohol abuse (2) Young pregnant woman (3) Diabetes mellitus (4) Chronic hepatitis C (5) End-stage renal disease on haemodialysis three days per week
- D. In what circumstances would you discontinue therapy with HMG-CoA reductase inhibitors?



