FIVE CHOICE COMPLETION

Directions: Select the **SINGLE** best choice

1. Which is **NOT** an important part of the treatment of intoxication by the nerve agents sarin or VX?

C

A. rapid administration of atropine at the onset of signs of nerve agent intoxication
B. administration of the oxime, 2-PAM-Cl
C. administration of pyridostigmine after the onset of signs of nerve agent administration
D. application of artificial respiration at the onset of respiratory arrest
E. administration of diazepam to control nerve agent induced convulsions

2. Which statement about atropine is **TRUE**?

D

A. It is known to combine directly with the nerve agents (tabun, sarin, soman, and VX) to inhibit further intoxication by these agents.
B. It binds to acetylcholinesterase to prevent the inhibition of this enzyme by the nerve agents.
C. It binds to acetylcholinesterase to prevent "aging" of the nerve agent (sarin, soman) inhibited enzyme.
D. It is administered to reverse the muscarinic signs of nerve agent (sarin) intoxication.
E. It is similar to 2-PAM-Cl in its ability to reactivate acetylcholinesterase inhibited by nerve agent (sarin).

3. Which of the following patients would have a faster induction of anesthesia with the potent inhalational anesthetic agent, sevoflurane?

A. Patient with a minute ventilation (MV) of 6L/min, a cardiac output (CO) of 3L/min, given 6% sevoflurane
B. Patient with a MV of 6L/min, CO of 5L/min, given 6% sevoflurane
C. Patient with a MV of 6L/min, CO of 5L/min, given 3% sevoflurane
D. Patient with a MV of 6L/min, CO of 3L/min, given 3% sevoflurane

4. At a concentration of 2 MAC (minimum alveolar concentration), potent inhalational anesthetic agents **all**

B

A. decrease SVR.
B. increase HR.
C. decrease MAP.
D. increase minute ventilation.

5. You are called to provide anesthesia for a patient with hemorrhagic shock. Which anesthetic medication will best support this patient's blood pressure?

C

A. ketamine
B. halothane
C. thiopental
D. sevoflurane

Directions: Select the **SINGLE** best choice

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Directions: Select the **SINGLE** best choice

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14. 6 Mercaptopurine (6-MP) is a drug used to treat pediatric leukemia. Genetic alteration of what drug-metabolizing enzyme can necessitate a significant dose reduction in 6-MP?

    A. glutathione transferase
    B. CYP3A4
    C. CYP2D16
    D. thiopurine methyltransferase
    E. phosphoribosyltransferase

D

6MP

15. Toxic exposure to which of the following metals is best treated by alkalinization of the urine and increasing urine output without using specific chelation therapy?

    A. elemental mercury
    B. iron
    C. lead
    D. uranium
    E. organic mercury

D

16. Cyanide toxicity is caused by

    A. binding and inhibition of mitochondrial cytochrome oxidase.
    B. binding and inhibition of cytochrome P450 oxidase.
    C. competition with oxygen for hemoglobin binding.
    D. binding and inhibition to sulfhydryl groups in heme synthesis enzymes.
    E. binding and inhibition of rhodanase.

A

17. Identify the **INCORRECT** toxin-antidote combination:

    A. cyanide - thiosulfate
    B. carbon monoxide - oxygen T
    C. lead - deferoxamine T
    D. bromide - chloride T
    E. methanol - ethanol T

C

18. Which statement concerning procainamide metabolism and its drug-induced adverse effect (lupus erythematosus) is **CORRECT?**

    A. Fast acetylators accumulate toxic metabolic products at a faster rate than slow acetylators.
    B. Fast acetylators generate reactive intermediates that are directly toxic.
    C. Slow acetylators have an alternative metabolic pathway not present in fast acetylators.
    D. Slow acetylators do not excrete procainamide in the urine.
    E. Acetylation independent pathways may lead to drug-induced lupus.

E

19. Which of the following is **NOT** an important part of the treatment of intoxication by the nerve agents sarin or VX?

A. therapeutic administration of diazepam to control nerve agent induced convulsions
B. rapid administration of atropine at the onset of signs of nerve agent intoxication
C. application of artificial respiration at the onset of respiratory arrest
D. therapeutic administration of pyridostigmine after the onset of signs of nerve agent intoxication
E. therapeutic administration of the oxime, 2-PAM-Cl, at the onset of signs of nerve agent intoxication

20. Which one of the following statements is **TRUE** about atropine?

A. It is known to combine directly with the nerve agents (sarin, soman, VX, GA) to inactivate the agent and inhibit further intoxication by these agents.
B. It binds to acetylcholinesterase to prevent the inhibition of this enzyme by the nerve agents.
C. It is administered to reverse the muscarinic signs of nerve agent (sarin) intoxication.
D. It binds to acetylcholinesterase to prevent "ageing" of the nerve agent (sarin) inhibited enzyme.
E. It is similar to 2-PAM-Cl in its ability to reactivate nerve agent (sarin) inhibited acetylcholinesterase before "ageing" has occurred.

21. Which patient would have a faster induction of anesthesia with the indicated inhalational anesthetic agent:

Patient	Resp Rate (min^{-1})	Tidal Volume (ml)	Cardiac Output (L/min)	Anesthetic Agent
A.	10	600	5	halothane
B.	20	300	3	halothane
C.	10	600	5	sevoflurane
D.	20	300	3	sevoflurane

22. You are called to provide anesthesia for a patient with increased intracranial pressure and impending brain herniation. Which anesthetic medication will decrease this patient's intracranial pressure?

A. ketamine
B. halothane
C. thiopental
D. morphine

23. All of the following are true of barbiturates **EXCEPT**

A. they decrease cerebral metabolic rate.
B. they cause significant respiratory depression.
C. their short half-life is due to rapid metabolism.
D. they affect $GABA_A$ receptors.

24. Which of the following statements concerning intravenous opioid administration is **TRUE?**

A. Minute ventilation decreases by means of decreased tidal volume.
B. Amnesia is reliably produced.
C. Opioids exert their effect by binding to Mu opioid and GABA receptors.
D. Opioids cause minimal cardiovascular depression in normovolemic patients

25. Which of the following is **TRUE** concerning minimum alveolar concentration (MAC)?

A. MAC is the concentration of an anesthetic that results in the immobility of 50% of patients at surgical incision.
B. All anesthetic agents at 2MAC will have the same effect on the cardiovascular system.
C. MAC is the concentration that results in the immobility of 95% of patients at surgical incision.
D. MAC values are synergistic not additive.

26. Which of the statements about neurotransmission in postganglionic sympathetic nerves is **TRUE?**

A. Acetylcholine activates the postganglionic neurons through nicotinic receptors of the N_M subtype.
B. Cocaine prolongs the presence of norepinephrine in the synaptic space because it inhibits the catecholamine metabolizing enzyme, monoamine oxidase.
C. The transport of dopamine and norepinephrine into the neuronal vesicle is blocked by succinylcholine.
D. The transporter located in the neuronal plasma membrane of sympathetic nerve terminals is selective for norepinephrine and does not transport other agents.
E. Activation of presynaptic α_2 adrenergic receptors decreases the amount of norepinephrine released with subsequent nerve impulses.

27. Sympathomimetic amines may have each of the following effects **EXCEPT**

A. reduction of nasal congestion in acute rhinitis.
B. deleterious effect on urinary outflow in benign prostatic hyperplasia.
C. production of miosis and cycloplegia.
D. bronchiolar dilation.
E. activation of reflex vagal bradycardia.

28. Which of the following agents is a selective D_1 dopamine receptor agonist that can be used to reduce severely elevated blood pressure and can improve renal blood flow in spite of the decreasing arterial pressure?

    A. dobutamine
    B. fenoldopam
    C. metoprolol
    D. prazosin
    E. dopamine

29. Which of the following agents contracts smooth muscle by binding to adrenergic receptors and increasing intracellular inositol-1,4,5-trisphosphate (IP3)?

    A. albuterol
    B. amphetamine
    C. halothane
    D. carbachol
    E. norepinephrine

30. Each of the following drugs is paired with a likely therapeutic use **EXCEPT**

    A. albuterol : hypotension
    B. prazosin : benign prostatic hyperplasia
    C. phentolamine : erectile dysfunction
    D. dobutamine : acute heart failure
    E. propranolol : open-angle glaucoma

31. In contrast to the actions of a non-selective α adrenergic receptor antagonist, a selective α_1 receptor antagonist causes

    A. no adverse side effect of orthostatic hypotension.
    B. an increase in renal vascular resistance.
    C. bronchospasm.
    D. less pre-synaptic enhancement of norepinephrine release.
    E. bradycardia.

32. A 52 year-old sedentary woman receives effective oral drug treatment of her hypertension. She returns to her physician with complaints of weakness. She reports no postural hypotension. Physical examination reveals a slow resting heart rate (50 bpm) and evidence of slow conduction through the A-V node. Which of the following is **MOST LIKELY** to be the antihypertensive agent involved?

    A propranolol
    B phentolamine
    C isoproterenol
    D atropine
    E. prazosin

FIVE CHOICE COMPLETION

Directions: Select the **SINGLE** best choice

33. Administration of atenolol can decrease mean arterial blood pressure because it

A. has intrinsic sympathomimetic activity.
B. activates β_2 receptors in smooth muscle vasculature.
C. increases plasma renin and angiotensin II.
D. decreases myocardial contractile force and heart rate.
E. stimulates adenyl cyclase and cAMP formation.

34. A patient arriving in your emergency room requires injection of a local anesthetic. In which case would you choose procaine over lidocaine?

A. The patient abused cocaine several years ago.
B. The patient is undergoing a course of therapy with a sulfonamide antibiotic.
C. The patient has a history of hypersensitivity (allergic dermatitis) to ester-type local anesthetics.
D. The patient has a recent history of liver dysfunction.
E. You wish to avoid increasing the patient's heart rate and blood pressure.

35. The major effect of local anesthetics is to

A. increase action potential conduction rate in myocardium.
B. prevent the increase in sodium permeability of the neuronal membrane during action potentials.
C. depolarize axons (make the resting membrane potential less negative).
D. block the sodium pump (Na/K ATPase) in all excitable tissue.
E. increase resting permeability of the neuronal membrane to potassium.

36. Which of the following sets of actions **BEST** describes the dose-related nature of the actions of atropine?

	Effect with low dose atropine	Additional effect seen ONLY with high dose atropine
A.	decreased salivation	central nervous system (CNS) excitation
B.	mydriasis and cycloplegia	tachycardia
C.	decreased gastrointestinal secretions	decreased sweating
D.	CNS medullary depression	decreased bladder smooth muscle contraction
E.	increased gastrointestinal secretions	decreased gastrointestinal motility

37. Following major surgery, you administer bethanechol to the patient to prevent urinary retention. The **MOST LIKELY** side effect of this drug is

A. supersensitivity to light due to pupillary dilation.
B. dry mouth.
C. dyspnea due to bronchoconstriction.
D. constipation.
E. increased blood pressure due to increased arteriolar tone.

38. The cholinesterase reactivator pralidoxime (2-PAM)

    A. is less effective than hydroxylamine.
    B. is much more effective than atropine if administered in high dose.
    C. must be administered before exposure to a carbamate anticholinesterase.
    D. is used to treat narrow angle glaucoma.
    E. is not very useful when administered to a soldier brought to a hospital after soman intoxication.

39. The insecticide parathion is

    A. metabolized to the active metabolite paraoxon in the liver.
    B. extremely safe, and causes almost no cases of poisoning.
    C. a carbamate anticholinesterase.
    D. rapidly metabolized to an inactive metabolite by the liver.
    E. too highly charged to enter the body through the skin.

40. Succinylcholine should be chosen over tubocurarine in a patient undergoing surgery, if the

    A. patient has a history of malignant hyperthermia.
    B. nurse anesthetist wishes to avoid central nervous system (CNS) effects of the neuromuscular blocking agent.
    C. patient has low levels of normal plasma cholinesterase.
    D. nurse anesthetist wishes to avoid phase II block of neuromuscular transmission.
    E. surgery is not expected to last more than a few minutes.