

Dental Pharmacology 2005
EXAM IV
April 29, 2005

1. Which of the following agents can be administered to *prevent* the adverse effects of high-dose methotrexate?

- A. Methoprim
- B. Leucovorin
- C. EDTA
- D. Cyclophosphamide
- E. 5-Fluorouracil

2. Which of the following is a typical side-effect associated with the administration of Doxorubicin?

- A. Feminization
- B. Hypoglycemia
- C. Myelostimulation
- D. Chronic halitosis
- E. Cardiomyopathies

3. Which of the following agents inhibits dihydrofolate reductase to limit purine biosynthesis?

- A. Doxorubicin
- B. Methotrexate
- C. Bleomycin
- D. 5-Fluorouracil
- E. Cisplatin

4. Which of the following agents directly inhibits dTMP synthesis?

- A. Doxorubicin
- B. Methotrexate
- C. Bleomycin
- D. 5-Fluorouracil
- E. Cisplatin

5. Which of the following agents crosslinks DNA specifically at guanine residues?

- A. Doxorubicin
- B. Methotrexate
- C. Bleomycin
- D. Cyclosporine
- E. Cisplatin

6. Which of the following agents induces DNA damage in a process requiring Fe^{2+} or Cu^{2+} ?

- A. Mitoxantone
- B. Methotrexate
- C. Bleomycin
- D. Taxol
- E. Cyclophosphamide

7. All of the following are major types of anticancer agents **EXCEPT**

- A. dealkylating agents.
- B. antibiotics.
- C. anti-metabolites.
- D. microtubule inhibitors.
- E. anti-hormones.

8. Tamoxifen is an effective chemotherapeutic agent because it

- A. selectively enters cancer cells.
- B. crosslinks DNA to inhibit DNA replication.
- C. inhibits dihydrofolate reductase.
- D. enhances the rate of seminiferous tubule formation.
- E. is an antagonist of estrogen

9. Which of the following agents is a phase *non-specific* drug that covalently modifies DNA?

- A. Cyclophosphamide
- B. Cyclosporine
- C. Hydroxyurea
- D. Vincristine
- E. 6-mercaptopurine

10. Which of the following is *not* a major problem/complication of chemotherapy?

- A. Alopecia
- B. Acute myelosuppression
- C. Weight gain
- D. Vomiting
- E. Depression

11. Which drug is used to inhibit topoisomerase activity to induce DNA strand breaks?

- A. Etoposide
- B. Vincristine
- C. Taxol
- D. Cyclosporine
- E. Bleomycin

12. Hydroxyurea is a chemotherapeutic agent that inhibits which of the following metabolic enzymes?

- A. Aromatase
- B. Cytochrome P450
- C. Luteinizing hormone
- D. DNA polymerase
- E. Ribonucleotide reductase

13. Which of the following statements regarding Rituximab, a monoclonal antibody, is CORRECT?

- A. Used extensively in the treatment of non-Hodgkin's lymphoma
- B. Has no side effects
- C. Can be administered orally
- D. Penetrates cell to induce cell death
- E. Works great with Tums and Rolaids

14. AraC (Cytarabine) is an

- A. antagonist of the estrogen receptor.
- B. antagonist of the androgen receptor.
- C. inhibitor of DNA polymerase.
- D. inhibitor of L-asparaginase.
- E. inhibitor of thymidylate synthase.

15. Thioguanine acts as a chemotherapeutic agent by inhibiting

- A. DNA mutagenesis.
- B. the purine salvage pathway.
- C. DNA repair.
- D. transcription.
- E. DNA methylation patterns specifically at GC sites.

16. Which of the following agents inhibits mitosis by promoting tubulin polymerization?

- A. Cyclophosphamide
- B. Taxol
- C. 6-Mercaptopurine
- D. Doxorubicin
- E. Bleomycin

17. All of the following statements regarding local anesthetics are correct EXCEPT

- A. amide class local anesthetics are more stable in solution than those of the ester class.
- B. ester class local anesthetics have a high risk of allergic reactions, especially when applied topically.
- C. both classes act by blocking Ca^{2+} channels.
- D. ester class local anesthetics are metabolized predominately by pseudocholinesterases.
- E. amide class local anesthetics are metabolized by liver cytochrome P450 enzymes.

18. Local anesthetics produce anesthesia primarily through phasic (or frequency-dependent) blockade of

- A. Mg^{2+} channels
- B. Na^{+} channels
- C. K^{+} channels
- D. Ca^{2+} channels
- E. Chloride channels

19. All of the following agents can bind to and inactivate Na^{+} channels EXCEPT

- A. local anesthetics.
- B. general anesthetics.
- C. dihydropyridine class Ca^{2+} channel antagonists.
- D. frog toxins.
- E. β -adrenergic antagonists.

20. All of the following agents or conditions can affect local anesthetic potency and/or efficacy EXCEPT

- A. vasoconstrictors.
- B. alkalization of blood or tissue.
- C. pregnancy.
- D. site of injection.
- E. protein binding.

21. All of the following are signs of CNS toxicity from local anesthetics EXCEPT

- ~~A.~~ vertigo.
- ~~B.~~ flushing (of the skin).
- ~~C.~~ tinnitus.
- D. circum-oral numbness.
- ~~E.~~ garrulousness.

22. Compared to local anesthesia, general anesthesia has all of the following advantages EXCEPT

- ~~A.~~ patient cooperation is not completely essential
- ~~B.~~ the patient is unconscious.
- ~~C.~~ the patient has amnesia regarding the surgery/trauma.
- D. titration of the level of anesthesia is easier.
- ~~E.~~ cardiovascular toxicity is more easily avoided.

23. For volatile anesthetics, the rapidity of onset of anesthesia is determined primarily by

- ~~A.~~ lipid solubility.
- ~~B.~~ the rate of liver metabolism.
- C. the blood:gas partition coefficient.
- ~~D.~~ solubility in muscle.
- ~~E.~~ metabolism by blood pseudocholinesterases.

24. All of the following are potential adverse effects of general anesthetics EXCEPT

- ~~A.~~ pneumothorax with nitrous oxide.
- ~~B.~~ malignant hyperthermia.
- ~~C.~~ fulminant hepatic necrosis with halothane.
- ~~D.~~ coma
- E. peripheral pain sensitization with volatile anesthetics.

25. Compared to most other agents used parenterally, midazolam has the desirable property of producing ^{unconsciousness}

- ~~A.~~ loss of consciousness.
- ~~B.~~ analgesia.
- ~~C.~~ decreased salivation.
- D. amnesia.
- ~~E.~~ lack of hallucination upon recovery.

26. Which of the following agents must be taken immediately before meals to be most effective?

- A. Misoprostol
- B. Cimetidine
- C. Sucralfate
- D. Omeprazole *prilosec*
- E. Aspirin

27. Which of the following ions secondarily stimulates acid secretion in the stomach and thus is not a preferred component of antacids?

- A. Magnesium
- B. Calcium
- Aluminum
- D. Sodium
- E. Potassium

28. Of the following classes of agents, which is most effective at blocking all routes of hormonal stimulation of acid secretion in the stomach?

- A. H₁-receptor agonists
- B. H₁-Receptor antagonists
- C. H₂-receptor antagonists
- D. Prostaglandin E receptor agonists
- F. Prostaglandin E receptor antagonists

29. Pseudoephedrine and oxymetazoline are marketed as nasal decongestants. They are α -adrenergic agonists. Which of the following effects is likely from oral administration of pseudoephedrine but not after intranasal administration of oxymetazoline?

- A. bradycardia
- B. increased blood pressure
- C. decreased blood pressure
- D. tachycardia
- E. bronchoconstriction

30. Which of the following drugs is highly likely to cause skin rash and allergic reactions when applied topically?

- A. antibiotic ointments
- B. benzocaine
- C. Lubriderm
- D. selenium sulfide
- E. hydrocortisone

31. All of the following statements about drugs sold over-the-counter (OTC) are correct EXCEPT

- A. previously prescription-only drugs now available OTC are often sold in sub-optimal dosing forms.
- B. OTC drug formulations often contain agents that have no therapeutic effect.
- C. OTC drugs must meet the same safety and effectiveness standards as prescription drugs.
- D. generic forms of OTC drugs are generally as effective as the original name-branded drugs.
- E. drug formulations often contain one or more agents in sub-optimal doses compared to other drugs in the formulation

32. The mechanism of action of omeprazole and other drugs of this class is to

- A. block muscarinic cholinergic receptors
- B. stimulate prostaglandin E receptors.
- C. inhibit Na^+, K^+ -ATPase in the stomach.
- D. inhibit H^+, K^+ -ATPase in the stomach
- E. block histamine H_2 receptors.

33. Which of the following agents should not be prescribed for women of child-bearing age?

- A. Misoprostol
- B. Cimetidine
- C. Vioxx
- D. Omeprazole
- E. Aspirin

34. All of the following are classes of endocrine hormones EXCEPT

- A. polypeptides.
- B. proteins.
- C. amino acid derivatives.
- D. complex carbohydrates.
- E. steroids derived from cholesterol.

35. Symptoms of hyperthyroidism include all of the following EXCEPT

- A. poor cold resistance.
- B. nervousness.
- C. tremor.
- D. tachycardia.
- E. muscle wasting.

36. All of the following statements concerning glucocorticoids are correct EXCEPT

- A. suppresses immune response.
- B. decreases blood pressure.
- C. causes body fat redistribution.
- D. enhances cataract formation.
- E. blocks arachidonic acid release from membranes.

37. Addison's disease is due to primary adrenocortical insufficiency and is diagnosed by lack of patient response to ACTH. Which of the following drugs can be used to treat this disease?

- A. Tamoxifen
- B. Estrogen
- C. Testosterone
- D. Hydrocortisone
- E. Gonadotropin releasing hormone (GnRH)

38. Although ^{hypogonadism} androgens have therapeutic utility in the treatment of hypogonadism, they may have all of the following adverse effects EXCEPT

- A. increased fertility.
- B. liver damage.
- C. prostate enlargement.
- D. priapism.
- E. impotence.

39. The major clinical use of progestins (progesterone derivatives) is

- A. stimulation of ovulation.
- B. treatment of polycystic ovarian disease.
- C. contraception.
- D. pattern baldness.
- E. halitosis.

40. Which of the following is NOT a typical characteristic of cancer cells?

- A. Limitless replicative potential
- B. Sustained angiogenesis
- C. Metastasis
- D. Sensitivity to growth/cell cycle checkpoints

41. Tamoxifen

- A. blocks androgen receptors.
- B. stimulates prolactin receptors.
- C. antagonizes estrogen receptors.
- D. inhibits dihydrofolate reductase.
- E. stimulates thromboxane receptors.

42. Prednisone is an effective chemotherapeutic agent for which of the following conditions?

- A. Bone resorption
- B. Diabetes mellitus
- C. Leukemias
- D. Androgen insufficiency
- E. Infertility

*- used to tx
Lymphomas +
immunosuppression*

43. All of the following are correct statements EXCEPT

- ~~A.~~ unmanaged hypothyroid patients generally have low blood pressure.
- B. patients being treated with iodide may have gum soreness and increased salivation.
- C. prophylaxis with antibiotics is contraindicated in patients on glucocorticoids.
- ~~D.~~ diabetic patients may exhibit increased incidence of oral infections.
- ~~E.~~ poor control of blood sugar is associated with increased caries.

44. Over-the-Counter (OTC) drugs are significantly different than prescription drugs?

- A. True
- B. False

45. While he was enjoying a siesta in his back yard, the wife of a 60 year-old pharmacology professor "accidentally" sprayed him in the face with a pesticide. In the emergency room, he exhibited tachycardia, lachrymation, increased salivation, and increased anxiety. Which of the following agents is most likely to be an effective antidote?

- ~~A.~~ N-acetylcysteine
- B. Naloxone
- C. Morphine
- ~~D.~~ Ethanol
- E. Pralidoxime

46. The following week, the same pharmacology professor had a root canal performed by student dentists. To alleviate the extreme pain caused by the several hour procedure, he washed down 25 tablets of Tylenol™ with half a bottle of Johnny Walker Black Label. Which of the following agents should be administered as a (hopefully effective) antidote?

- A. N-acetylcysteine
- B. Naloxone
- C. Morphine
- D. Ethanol
- E. Pralidoxime

47. 50. A deficiency of which of the following vitamins can cause gingivitis?

- A. Vitamin A
- B. Vitamin C
- C. Vitamin D
- D. Vitamin E
- E. Vitamin K

48. Administration of syrup of ipecac would produce all of the following effects EXCEPT

- A. removal of all toxins from GI tract
- B. stimulation of chemoreceptor trigger zone.
- C. vomiting within 20 minutes.
- D. potential induction of asphyxiation.

49. Which of the following drugs or groups of drugs are responsible for the most accidental overdoses?

- A. Heroin and similar "narcotics"
- B. Prescription drugs
- C. OTC drugs such as analgesics and antihistamines

50. Which of the following age groups exhibits the highest frequency of accidental overdose with OTC drugs?

- A. Young children (5-9 years old)
- B. Adolescents (10-19 yo)
- C. Young adults (20-50 yo)
- D. Older adults (50-70 yo)
- E. Geriatric patients (>70 yo)

BONUS QUESTIONS

51. Phase I drug metabolic reactions include all of the following **EXCEPT**
- A drug reduction reactions.
 - B drug hydrolysis reactions.
 - C cytochrome P450-catalyzed oxidations
 - D acetylation reactions
 - E non cytochrome P450-catalyzed oxidations
52. Which of the following statements concerning a drug's properties is **CORRECT**?
- A An antagonist can block the action of a partial agonist but not the action of a full agonist.
 - B A partial agonist has greater potency than an antagonist.
 - C An antagonist has less potency than an agonist
 - D The effects of a competitive antagonist are reversible
 - E The effects of a non-competitive antagonist are reversible.
53. Which of the following statements concerning pharmacokinetics is **CORRECT**?
- A. Elimination of most drugs follows first order kinetics
 - B. Steady state drug concentration is dependent on V_D
 - C. Loading dose is dependent primarily on Cl
 - D. The rate of absorption of a drug is dependent on its Cl
 - E. The $T_{1/2}$ for elimination of a drug is directly dependent on Cl
54. The rate of gastrointestinal absorption of a drug is generally dependent on all of the following factors **EXCEPT**
- A Intestinal surface area.
 - B the oil/water partition coefficient of the drug
 - C the pK_a of the drug.
 - D the rate of stomach emptying
 - E stomach surface area
55. Which statement accurately describes the mechanisms of action of corticosteroids?
- A Fast-acting anti-inflammatory due to increased calcium release stimulated in inflammatory cells, especially Mast cells
 - B Bind selectively to epithelial cells leading to endogenous β_2 -agonist release
 - C Slow-acting agents that influence protein expression by binding to nuclear receptors which then bind directly to specific DNA sequences
 - D Fast-acting agents that increase chloride secretion across epithelial cells leading to improved airway clearance
 - E. Fast-acting agents that bind to membrane receptors and elevate Ca^{2+}

56. All of the following terms have a distinct medical/pharmacological meaning or definition EXCEPT
- A. opioid.
 - B. opiate.
 - C. dependence.
 - D. addiction.
 - E. narcotic.
57. Which of the following drugs used in the treatment of cardiovascular disease would be contraindicated for someone undergoing major oral surgery?
- A. Nitroglycerin
 - B. Captopril
 - C. Aspirin
 - D. Furosemide
 - E. Propranolol
58. A known side effect of tetracyclines is that it
- A. stains the enamel of teeth.
 - B. causes nail discoloration.
 - C. interferes with mental functions by inhibiting GABA transmission.
 - D. causes prolongation of the QT interval.
59. Benzodiazepines exert their anxiolytic effects by
- A. enhancing the actions of dopamine.
 - B. inhibiting the actions of serotonin
 - C. inhibiting dopamine reuptake.
 - D. enhancing the actions of GABA.
 - E. enhancing norepinephrine biosynthesis.
60. All of the following statements about antipsychotics are correct EXCEPT
- A. Most classical antipsychotic drugs block dopamine receptors in the brain.
 - B. Some of atypical antipsychotics act at serotonin receptors.
 - C. The effects of antipsychotics are immediate.
 - D. Antipsychotics can cause Parkinsonism-like side effects.
 - E. Dopamine agonist drugs exacerbate schizophrenia.