

**Dental Pharmacology 2006**  
**EXAM 2**  
**March 2, 2006**  
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**INSTRUCTIONS**

1. There are 40 questions on this exam. Please use pencil on the answer sheet.
2. Turn in the answer sheet. **KEEP the exam.**
3. There are several **BONUS** questions at the end of the exam. You are NOT required to answer these. If you answer them, *nothing* will be deducted for a wrong answer. However, if you answer correctly, I will use that question to replace a question on the regular exam that you answered incorrectly. That is, if you get 30 of the 40 questions correct and answer 3 of the bonus questions correctly, then your score would be 33/40 or 82.5%.

1. The bacterial enzymes that inactivate penicillins and cephalosporins are
  - A. *mef* efflux proteins.
  - B. DNA gyrases.
  - C. *erm* methylases.
  - D.  $\beta$ -lactamases.
  - E. topoisomerases.
  
2. Among the enzymes responsible for synthesizing bacterial cell walls are
  - A. transpeptidases and carboxypeptidases (penicillin binding proteins, PBPs).
  - B. ligases.
  - C. phospholipases.
  - D. esterases.
  - E. methyl formylases.
  
3. Imipenem is a unique  $\beta$ -lactam because it
  - A. has a very short half life.
  - B. serves to inactivate both penicillin binding proteins and  $\beta$ -lactamases.
  - C. acts on aminoglycoside transferases.
  - D. interferes with DNA segregation.
  - E. inhibits DNA gyrase, in addition to inhibiting  $\beta$ -lactamase activity.
  
4. A known side effect of tetracyclines is that they
  - A. stain the enamel of teeth.
  - B. causes nail discoloration.
  - C. interferes with mental functions by inhibiting GABA transmission.
  - D. causes heart arrhythmias.
  - E. promote constipation.

5. While in general quinolones are safe antibiotics, a recognized side effects is
- A. arthritis (tendonitis).
  - B. tinnitus.
  - C. ataxia.
  - D. incontinence.
  - E. constipation.
6. Pill dysphagia is seen with
- A. tetracycline.
  - B. nitrofurantoin.
  - C. trimethoprim.
  - D. erythromycin.
  - E. sulfamethoxazole.
7. Interference with folate synthesis is seen with
- A. clindamycin.
  - B. tetracycline.
  - C. chloramphenicol.
  - D. sulfamethoxazole.
8. Which of the following antibiotic classes interfere with bacterial protein synthesis?
- A. Metronidazole
  - B. Quinolones
  - C. Penicillin
  - D. Macrolides
9. The most likely antibiotic to cause prolongation of the prothrombin time when patients are taking coumadin are
- A. tetracycline.
  - B. chloramphenicol.
  - C. trimethoprim.
  - D. rifampin.
10. Which of the following drugs is **NOT** used to treat *Mycobacterium tuberculosis*?
- A. Isoniazid
  - B. Rifampin
  - C. Ethambutol
  - D. Streptomycin
  - E. Clindamycin
11. A known side effect of isoniazid is
- A. tinnitus.
  - B. arthralgias.
  - C. hepatitis.
  - D. peripheral neuropathy.
  - E. Parkinson's syndrome/disease.

12. Which of the following drugs should **NOT** be used to treat influenza in the first 36 hours?
- A. Amantadine
  - B. Rimantadine
  - C. Erythromycin
  - D. Zanamivir (Relenza)
13. All of the following are drugs used to treat HIV infection **EXCEPT**
- A. AZT.
  - B. DDI.
  - C. 3TC.
  - D. quinolones.
14. Which of the following drugs has **NO** antiinflammatory properties?
- A. Aspirin
  - B. Rofecoxib (Vioxx)
  - C. Ibuprofen
  - D. Acetaminophen
  - E. Cortisol/Prednisone
15. Use of COX-2 selective NSAIDs are possibly indicated for which of the following classes of patients?
- A. Patients with a history of ulcers and/or GI bleeding
  - B. Initial onset of rheumatoid arthritis
  - C. Severe headache
  - D. Patients with a previous history of myocardial infarction or stroke
16. The mechanism of action of AZT is best described by which of the following?
- A. Molecular rearrangements within DNA
  - B. DNA translocation
  - C. DNA inversion
  - D. DNA chain termination
17. Which of the following is the drug of first choice in treating trigeminal neuralgia?
- A. Phenobarbital
  - B. Buspirone
  - C. Disulfiram
  - D. Carbamazepine
  - E. Naltrexone
18. The following receptors are all ligand-gated ion channels **EXCEPT**
- A. GABA<sub>A</sub> receptor.
  - B. dopamine D<sub>2</sub> receptor.
  - C. nicotinic acetylcholine receptor.
  - D. 5HT<sub>3</sub> receptor.
  - E. NMDA (Glutamate receptor).

19. Benzodiazepines exert their anxiolytic effects by
- enhancing the actions of dopamine.
  - inhibiting the actions of serotonin.
  - inhibiting dopamine reuptake.
  - enhancing the actions of GABA.
  - enhancing norepinephrine biosynthesis.
20. Disulfiram, a drug used in treating alcohol abuse, exerts its effects primarily by
- blocking activation of the GABA<sub>A</sub> receptor.
  - inhibiting activation of the NMDA glutamate receptor.
  - blocking serotonin reuptake.
  - inhibiting dopamine reuptake.
  - blocking aldehyde dehydrogenase.
21. Anticonvulsants exert their effects by all of the following mechanisms **EXCEPT**
- depressing the action of dopamine.
  - modifying the activity of voltage-gated Na<sup>+</sup> channels.
  - enhancing the action of  $\gamma$ -aminobutyric acid (GABA).
  - depressing the action of glutamate.
  - inhibiting ~~both~~ voltage-gated Na<sup>+</sup> channels and thus enhancing GABA<sub>A</sub> receptor activity.
22. Gingival hyperplasia is a common side effect of
- phenytoin.
  - tiagabine.
  - morphine.
  - gabapentin.
  - carbamazepine.
23. Which of the following statements concerning benzodiazepines is **NOT** correct?
- The duration of action of a benzodiazepine can be dependent on the half-life of an active metabolite.
  - Benzodiazepines inhibit glutamate receptor activation.
  - Benzodiazepines can be sedating.
  - Benzodiazepines cause short-term memory impairment.**
24. Which of the following statements about Carbidopa, a drug used to treat Parkinson's disease, is **CORRECT**?
- Carbidopa crosses the blood-brain barrier.
  - Carbidopa activates dopamine  $\beta$ -hydroxylase.
  - Carbidopa inhibits aromatic L-amino acid decarboxylase.
  - Carbidopa inhibits monoamine oxidase.
  - Carbidopa is converted to the false transmitter carbidopamine.

25. 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. antipsychotics act within a few days.
  - ✓ D. antipsychotics can cause Parkinsonian-like side effects.
  - ✓ E. dopamine agonists exacerbate schizophrenia.
26. Bacteria can rapidly evolve to develop resistance to antibiotics by all of the following mechanisms **EXCEPT**
- A. inactivation of enzymes that metabolize antibiotics.
  - B. altering the structure of the target of the antibiotic.
  - C. expressing efflux pumps for the antibiotic.
  - D. altering porin channels.
  - E. secretion of antitoxins.
27. Which of the following drugs is contraindicated in women of child-bearing age?
- A. Aspirin
  - B. Prednisone
  - C. Misoprostol
  - D. Ibuprofen
  - E. Acetaminophen
28. A patient who has been taking large quantities of aspirin might show increased postoperative bleeding because aspirin inhibits
- A. synthesis of thromboxane and prevents platelet aggregation.
  - ~~B.~~ synthesis of prostacyclin and prevents platelet disaggregation.
  - ~~C.~~ synthesis of prostaglandin and prevents production of blood platelets.
  - D. thrombin and prevents formation of the fibrin network.
  - E. intestinal absorption of vitamin K and prevents synthesis of blood clotting factors.
29. Which of the following pharmacologic actions is **NOT** produced by prostaglandins?
- A. Pyrexia ✓
  - B. Uterine contraction *Lev. s.*
  - C. Decreased gastric acid secretion ~~✗~~
  - D. Increased renal vasoconstriction
  - E. Decreased sensitivity to pain ~~✗~~ *pain*
30. Which of the following conditions or effects does **NOT** result from prolonged treatment with corticosteroids?
- A. Gastric ulcer ✓
  - B. Osteoporosis ✓
  - C. Hyperglycemia ✓
  - D. Skeletal muscle atrophy ✓

- E. Redistribution of body fat
31. All of the following agents useful for treatment of rheumatoid arthritis can be used simultaneously with anakinra **EXCEPT**
- A. aspirin.
  - B. celecoxib (Celebrex).
  - C. infliximab (Etanercept).
  - D. methotrexate.
  - E. prednisone.
32. The most prominent acute toxic effect associated with acetaminophen use is
- A. hemorrhage.
  - B. renal nephropathy.
  - C. hepatic necrosis.
  - D. gastric ulceration.
  - E. respiratory alkalosis.
33. Benzodiazepines are used primarily to treat which of the following conditions?
- A. Psychosis
  - B. Depression
  - C. Anxiety
  - D. Parkinson's disease
  - E. Trigeminal neuralgia
34. Which of the following drugs or classes of drugs does **NOT** bind to or interact with GABA<sub>A</sub> receptors?
- A. Barbiturates
  - B. Benzodiazepines
  - C. Catecholamines
  - D. Ethanol
35. Tetracycline antibiotics are considered "broad-spectrum" antibiotics because they are effective against all of the following **EXCEPT**
- A. most Gram-positive bacteria growing aerobically
  - B. most Gram-negative bacteria growing anaerobically
  - C. mycobacteria
  - D. fungal pathogens
36. All of the following can be used to treat depression **EXCEPT**
- A. SSRI's.
  - B. monoamine oxidase inhibitors.
  - C. gabapentin.
  - D. tricyclic antidepressants.

37. All of the following statements concerning cephalosporins are correct **EXCEPT**
- A. they are effective inhibitors of cell wall synthesis.
  - B. most oral anaerobic bacteria are insensitive to cephalosporins.
  - C. they contain a modified  $\beta$ -lactam ring.
  - D. they are related to penicillins.
38. Which of the following classes of antibiotics can cause ototoxicity at high doses?
- A. Tetracyclines
  - B. Vancomycin
  - C. Aminoglycosides
  - D. Penicillins
  - E. Erythromycin
39. All of the following statements concerning prostanoid synthesis *via* the COX-1 isoform of cyclooxygenase are correct **EXCEPT**
- A. COX-1 expression is constitutive.
  - ~~B.~~ arachidonic acid is the primary substrate of COX-1.
  - ✓ C. COX-1 is expressed primarily in macrophages, monocytes and the vascular endothelium.
  - ✓ D. the downstream prostanoid synthases are soluble cytosolic enzymes.
  - ✓ E. aspirin and ibuprofen selectively inhibit COX-1 *versus* COX-2.
40. Among the following receptor types, antipsychotic drugs primarily antagonize
- A. GABA<sub>A</sub> receptors.
  - B. catecholamine receptors.
  - C. glutamate receptors. →
  - D. acetylcholine receptors.
  - E. dopamine receptors. →
- Too much Dopamine.*

## IT'S THE BONUS ROUND!!!!!!

41. Two drugs, A and B, have the same mechanism of action. Drug A in a dose of 5 mg produces the same magnitude of response as Drug B in a dose of 500 mg. Which of the following statements is CORRECT?
- A. Drug A is less toxic.
  - B. Drug A is more efficacious (greater maximal effect).
  - C. Drug A is more potent.
  - D. Drug A has a shorter duration of action.
  - E. Drug A is a better drug to use when a maximal response is desired.
42. The rate of absorption of a drug will determine
- A. steady-state plasma concentration.
  - B. systemic clearance.
  - C. bioavailability.
  - D. peak plasma concentration.
  - E. intrinsic clearance.
43. Opportunistic infections in HIV infected patients can occur when the CD4 cell count is less than
- A. 200 cells/cc
  - B. 500 cells/cc
  - C. 2000 cells/cc
  - D. 5000 cells/cc
  - E. 20,000 cells/cc
44. Which of the following agents inhibits the release of arachidonic acid from the membrane?
- A. Ibuprofen *cox 1*
  - B. Acetaminophen *cox 3*
  - C. Benzodiazepines *x*
  - D. Corticosteroids *←*
  - E. Cephalosporins
45. The Browns will win the Super Bowl in 2007 because
- A. the Red Sox finally won the World Series, so miracle's can happen.
  - B. Art Modell will sell the Ravens and buy the Browns from the Lerner family.
  - C. LeBron signs for \$25M to play quarterback for the Browns.
  - D. palm trees will suddenly sprout up on our country's "North Shore".
  - E. George Bush drafts all the players on the other teams and sends them to Iraq.