

NAME ~~XXXXXXXXXX~~

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MAILBOX # 40

**DENTAL PHARMACOLOGY  
EXAMINATION # 1**

*February 4, 2002*

You have ONE (1) hour and 15 minutes to complete this examination. The examination contains 50 questions, each worth 2 points.

Answer all questions on the computer sheet provided; use a soft lead pencil. Be sure that you have correctly identified your answer sheet by PRINTING your name and social security number and correctly filling in the grid spaces. Please turn in your exam booklet and answer sheet at the end of the exam. The exam booklet will be returned to you.

This examination is being administered under the Honor Code of Temple University Dental School.

Questions 1 - 48: Select the single, most appropriate answer.

1. Which of the following statements best describes the mechanism for amphetamine-induced increases in blood pressure?

- B
- A. Stimulation of GABA receptors
  - B. Indirect release of endogenous catecholamines
  - C. Metabolism to false neurochemical transmitters
  - D. Inhibition of catecholamine metabolism
  - E. Beta-2 adrenergic receptor agonism

2. In addition to lithium carbonate, which of the following drugs controls the manic phase of bipolar depression?

- A
- A. Sodium valproate
  - B. Fluoxetine
  - C. Paroxetine
  - D. Doxepin
  - E. Desipramine

3. All of the following statements apply to propranolol EXCEPT:

- B
- A. Is a competitive antagonist of beta adrenergic receptors
  - B. Is the drug of choice in patients with bronchial asthma
  - C. Possesses high lipid solubility
  - D. Is used for the prophylactic management of angina pectoris
  - E. Is used for the prophylactic management of migraine headache

4. Clinically used, effective bronchodilator:

- A
- A. Albuterol
  - B. Prazosin
  - C. Guanethidine
  - D. Metoprolol
  - E. Bethanechol

5. Most effective treatment for status epilepticus:

- C
- A. Phenobarbital followed by topiramate
  - B. Ethosuximide
  - C. Diazepam followed by fosphenytoin
  - D. Lamotrigine
  - E. Dantrolene *malig. hyperthermia*

6. All of the following statements apply to chlorpromazine EXCEPT:

- B
- A. Blocks muscarinic receptors
  - B. Stimulates histamine receptors
  - C. Increases the rate of secretion of prolactin
  - D. Causes orthostatic hypotension
  - E. Is a member of the phenothiazine class of antipsychotic agents

7. All of the following statements apply to phenylephrine EXCEPT:

- B
- A. Constricts small vessels in the nasal mucosa
  - B. Reduces secretions by inhibiting parasympathetic stimulation
  - C. Reverses hypotension during anesthesia
  - D. Is primarily a direct-acting alpha adrenergic receptor agonist
  - E. Is added to local anesthetic solutions to prolong anesthesia

8. Which of the following drugs is a non-benzodiazepine anxiolytic?

- E
- A. Flumazenil
  - B. Triazolam
  - C. Clozapine
  - D. Bupropion
  - E. Buspirone

9. A cardioselective adrenergic receptor blocker:

- A
- A. Atenolol
  - B. Phentolamine
  - C. Propranolol
  - D. Timolol
  - E. Bethanechol

10. Flumazenil reverses the behavioral depressant effects of which of the following drugs?

- C
- A. Haloperidol
  - B. Thioridazine
  - C. Chlordiazepoxide *Librium (anti-anxiety)*
  - D. Morphine
  - E. Phenobarbital

11. Causes gingival hyperplasia as a side effect:

- A
- A. Phenytoin *Dilantin*
  - B. Valproic acid
  - C. Lamotrigine
  - D. Ethosuximide
  - E. Carbamazepine

12. Diazepam is suitable for all of the following indications EXCEPT:

- A. Generalized anxiety disorder
- B. Acute alcohol withdrawal
- C. Obsessive-compulsive disorder
- D. Musculo-skeletal disorders
- E. Oral sedation in dentistry

piazac fluoxetine

13. A selective serotonin <sup>SERT</sup> reuptake inhibitor, used as an antidepressant:

- A. Paroxetine
- B. Isocarboxazid
- C. Dantrolene
- D. Oxazepam
- E. Lithium carbonate

paril

14. All of the following drugs are used in the treatment of parkinsonism EXCEPT:

- A. Benztropine
- B. Levodopa
- C. Amantadine
- D. Clonidine
- E. Bromocriptine

15. Identify the correct statement about parkinsonism:

- A. Carbidopa releases stores of endogenous dopamine in the central nervous system
- B. N-methyl-4-phenyl-1,2,3,6-tetra-hydropyridine (MPTP) causes parkinsonism in primates and humans
- C. Bromocriptine acts by blocking the reuptake of dopamine
- D. Atropine can produce parkinson-like symptoms
- E. Chlorpromazine reduces symptoms of parkinsonism

16. All of the following drugs achieve muscular relaxation via action in the central nervous system EXCEPT:

- A. Mephenesin
- B. Diazepam
- C. Baclofen
- D. Dantrolene
- E. Chlordiazepoxide

17. Disulfiram produces nausea after alcohol ingestion by interfering with the breakdown of

- A. Formaldehyde
- B. Acetaldehyde
- C. Formic acid
- D. Acetone
- E. Oxalate

18. Which benzodiazepine is preferred as a hypnotic because of its relatively short duration of action?

- ☒ A. Chlordiazepoxide
- ☐ B. Flurazepam
- ☐ C. Diazepam
- ☐ D. Alprazolam
- ☐ E. Triazolam

19. All of the following effects are caused by acute or chronic alcohol ingestion EXCEPT:

- ☒ A. Lesions of the myocardium
- ☐ B. Decrease in high density lipoproteins
- ☐ C. Cutaneous vasodilation
- ☐ D. Increased fat production in the liver
- ☐ E. Inhibition of testosterone

20. A weakly acidic drug enters the urine by glomerular filtration and active transport in the proximal tubule, and can be reabsorbed by passive diffusion. If the pH of the tubular fluid is altered from pH 7 to pH 5 by administration of an acidifying agent, how would you expect the renal clearance of the drug to be affected?

- ☐ A. Increased
- ☐ B. Unchanged
- ☒ C. Decreased

21. A drug can be made in different forms, to permit its administration by different routes. All of the following statements are true EXCEPT:

- ☒ A. The maximal (peak) plasma concentration attained will be greater when the drug is given by intravenous injection than by sub-cutaneous injection
- ☐ B. Drugs administered by sublingual administration are susceptible to the first-pass effect
- ☐ C. A drug administered orally will be absorbed in the small intestine
- ☒ D. Topical administration may be used for a systemic effect
- ☐ E. The apparent volume of distribution will be the same whether the drug is administered orally or intravenously

22. All of the following reactions are examples of Phase 1 drug metabolism EXCEPT:

- ☐ A. Oxidation of ethanol
- ☐ B. N-oxidation of nicotine
- ☐ C. Hydrolysis of procaine
- ☒ D. Glucuronidation of digoxin
- ☐ E. P450 hydroxylation of phenobarbital

23. A drug has an elimination half-life = 4 hrs. and is given intravenously (100 mg). What is the time for its plasma concentration to fall to 5% of its peak concentration?

A. 2 hrs  
B. 4 hrs  
C. 9 hrs  
D. 17 hrs  
E. 24 hrs

$$\begin{array}{r} 4 \text{ hrs} \\ 4.3 \\ 4 \\ \hline 17.2 \end{array}$$

24. The apparent volume of distribution of the drug in question 23 is 25 L. What is the initial plasma concentration following the 100 mg intravenous dose?

A. 2 mg/L  
B. 4 mg/L  
C. 8 mg/L  
D. 12.5 mg/L  
E. 25 mg/L

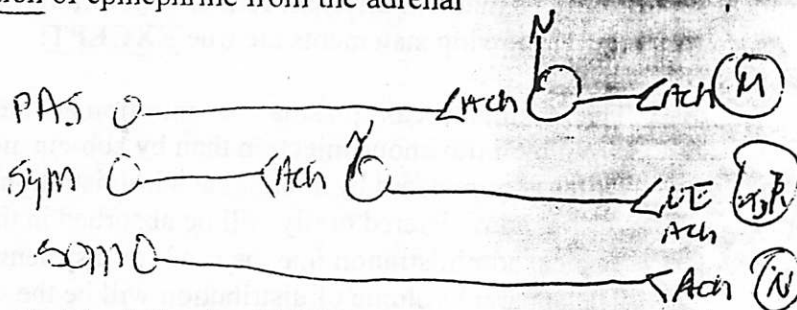
$$\frac{100 \text{ mg}}{25 \text{ L}}$$

25. Stimulation of which of the following receptors is most associated with production of vasoconstriction?

A. Alpha-1 adrenergic  
B. Beta-1 adrenergic  
C. Beta-2 adrenergic  
D. Muscarinic  
E. D-2 dopaminergic

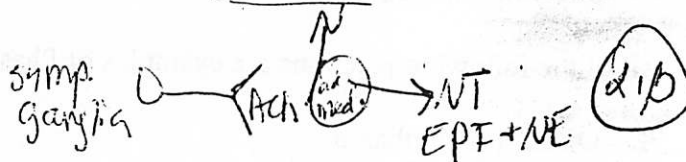
26. Stimulation of which receptor increases secretion of epinephrine from the adrenal medulla?

A. Alpha-2 adrenergic  
B. Muscarinic  
C. Nicotinic  
D. D-2 dopaminergic  
E. Beta-2 adrenergic



27. Stimulation of muscarinic receptors produces all of the following EXCEPT:

A. Pupillary constriction  
B. Increase in salivary secretions  
C. Reduction in heart rate  
D. Vasodilatation  
E. Contraction of skeletal muscle



28. Therapeutic uses of cholinergic agonists include all of the following EXCEPT:

- B
- A. Treatment of myasthenia gravis
  - ☒ B. Treatment of bronchial asthma
  - C. Treatment of nonobstructive atony of the bladder
  - D. Treatment of Alzheimer's disease
  - E. Treatment of glaucoma

29. Which of the following drugs is a "cholinesterase re-activator" useful in treatment of organophosphate intoxication?

- A
- A. Pralidoxime
  - ☒ B. Propranolol
  - C. Atropine
  - D. Albuterol
  - ☒ E. Physostigmine

30. Which of the following drugs is most useful in prevention of motion sickness?

- B
- A. Pyridostigmine
  - ☒ B. Scopolamine
  - C. Timolol
  - D. Nicotine
  - E. Bethanechol

31. Adverse reactions produced by atropine include:

- D
- A. Excessive salivary secretions
  - B. Diarrhea and incontinence
  - C. Bronchoconstriction
  - ☒ D. Blurred vision and tachycardia
  - E. Hypothermia

dry as a bone  
red as a beet  
blind as bat  
hot as pistol  
mad as a hatter

32. The purpose of including epinephrine in lidocaine preparations is to:

- A
- A. Decrease the absorption of lidocaine into the blood stream
  - ☒ B. Decrease the metabolism of lidocaine
  - C. Increase the pH of the preparation
  - D. Increase the binding of lidocaine to the binding site
  - E. Increase the penetration of lidocaine through excitable membranes



33. All of the following statements about local anesthetics are true EXCEPT:

- A. Benzocaine is used only for topical application
- B. Tetracaine is metabolized primarily by plasma esterases
- ☒ C. At physiological pH, a local anesthetic (pKa 9.4) will be mostly non-ionized
- D. Procaine acts on the intracellular side of the sodium channel to produce its local anesthetic effects
- E. Effects of local anesthetics are more pronounced in rapidly firing neurons than in slowly firing neurons

34. With inhalation anesthetics, the rate of onset of anesthesia is:

- A. Directly proportional to the solubility of anesthetic gas in the blood
- B. Independent of the partial pressure of the anesthetic gas in the lung
- ☒ C. Inversely proportional to the partial pressure of the anesthetic gas in the lung
- D. Inversely proportional to the solubility of anesthetic gas in the blood
- E. Independent of the solubility of the anesthetic gas in the blood

35. The principal side effect associated with short-term use of nitrous oxide ( $N_2O$ ) is:

- A. Respiratory depression
- B. Cardiovascular depression
- C. Liver toxicity
- D. Hypotension
- ☒ E. Hypoxia

36. All of the following are true of thiopental EXCEPT:

- A. The short duration of action is due to first-pass metabolism by the liver
- B. Is classified as a barbiturate ✓
- C. Is administered intravenously ✓
- D. Is useful for short procedures ✓
- ☒ E. Is a poor analgesic and thus is often used with an analgesic agent ✓

37. Each of the following intravenous anesthetic agents is correctly matched with an associated side effect EXCEPT:

- ☒ A. Propofol – prolonged hangover *? no such thing?*
- B. Thiopental – laryngospasm
- C. Fentanyl – respiratory depression
- D. Etomidate – myoclonic movements
- E. Ketamine – hallucinations



38. All of the following statements about general anesthetic gases are true EXCEPT:

- D
- A. Most produce respiratory depression
  - B. Do not directly inhibit nerve conduction
  - C. Directly modify the activity of receptor-operated ion channels
  - ☒ D. Are best given singly to minimize side effects
  - E. Are soluble in the lipid layer of cell membranes

39. All of the following substances are considered second messengers EXCEPT:

- C
- A. Cyclic AMP
  - B. Calcium
  - ☒ C. Sodium
  - D. Diacylglycerol
  - E. Cyclic GMP

40. All of the following are properties of receptors EXCEPT:

- D
- A. Bind to DNA
  - ☒ B. Are protein kinases
  - C. Contain guanylyl cyclase activity
  - D. Contain phospholipase C activity
  - E. Contain ion channels

41. Which of the following drugs is an irreversible inhibitor of monoamine oxidase?

- D
- |  |          |                   |
|--|----------|-------------------|
| A. Amitriptyline                               | Elavil   | } anti depressant |
| B. Nortriptyline                               | panelox  |                   |
| <input checked="" type="radio"/> C. Imipramine | tofranil |                   |
| D. Phenelzine                                  | Nardil   |                   |
| E. Paroxetine                                  | paxil    |                   |
- MAOI

42. Used as premedication for the induction of anesthesia:

- E
- A. Alprazolam
  - B. Bromocriptine
  - C. Isoproterenol
  - ☒ D. Oxazepam
  - E. Midazolam

43. Which of the following drugs, applied topically to the eye, causes mydriasis without producing cycloplegia? dilation

- D
- A. Phenoxybenzamine
  - ☒ B. Atropine
  - C. Pilocarpine
  - D. Phenylephrine
  - E. Neostigmine

44. Benzodiazepines are preferred over barbiturates for use as hypnotics for all of the following reasons EXCEPT:

- A. They have a higher therapeutic index
- ☒ B. They have a longer duration of action
- ☒ C. They interfere less with the actions of other drugs
- ☒ D. They produce less disturbance to rapid eye movement sleep
- ☒ E. They will not induce coma and death when used alone

45. Amantadine is used in the treatment of parkinsonism because

- A. It inhibits the release of acetylcholine
- B. It is a D2 dopamine receptor agonist
- ☒ C. It increases the availability of endogenous dopamine in the striatum
- D. It enhances dopamine's action by inhibiting catechol-O-methyl transferase (COMT)
- E. It is a D1 dopamine receptor agonist

46. Which of the following drugs stimulates salivary glands and is therefore useful in the treatment of xerostomia?

- A. Atropine
- B. Phenylephrine
- C. Nicotine
- ☒ D. Pilocarpine
- E. Pralidoxime

47. Therapeutic uses of muscarinic receptor antagonists include all of the following EXCEPT:

- A. As adjuncts in treatment of bronchial asthma
- B. To produce mydriasis and cycloplegia for an eye exam
- ☒ C. As vasoconstrictors in local anesthetic preparations
- D. As adjuncts in the treatment of Parkinson's disease
- E. To relieve spasm of the gastrointestinal and urinary tracts

48. All of the following statements regarding local anesthetics are true EXCEPT:

- ☒ A. Local anesthetics can cause CNS effects including seizures
- ☒ B. Lidocaine produces tachycardia and hypertension
- C. Etidocaine is metabolized mainly by liver microsomal enzymes
- D. Bupivacaine has been found to be cardiotoxic
- ☒ E. Among all types of nerve fibers, type C fibers are most sensitive to local anesthetics

A<sub>Δ</sub>

Match-Type

Questions 49 thru 50:

For each of the numbered statements, select the single most appropriate lettered drug. You may use each letter once, or not at all.

A. d-Tubocurare

B. Pancuronium

C. Vecuronium *NM blocker*

D. Succinylcholine

E. Hexafluorenum

49. A non-depolarizing neuromuscular blocker that produces no histamine release and no change in heart rate

50. A rapid-acting depolarizing neuromuscular blocker with a short duration of action; is broken down by pseudocholinesterase

END OF EXAM

## Answer Sheet

### Dental Pharmacology

#### EXAM #1

February 4, 2002

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. B  | 11. A | 21. B | 31. D | 41. D |
| 2. A  | 12. C | 22. D | 32. A | 42. E |
| 3. B  | 13. A | 23. D | 33. C | 43. D |
| 4. A  | 14. D | 24. B | 34. D | 44. B |
| 5. C  | 15. B | 25. A | 35. E | 45. C |
| 6. B  | 16. D | 26. C | 36. A | 46. D |
| 7. B  | 17. B | 27. E | 37. A | 47. C |
| 8. E  | 18. E | 28. B | 38. D | 48. B |
| 9. A  | 19. B | 29. A | 39. C | 49. C |
| 10. C | 20. C | 30. B | 40. D | 50. D |