YR 2 PHARMACOLOGY UNIT EXAMINATION 3 -- May 14, 1998.

CHOOSE THE SINGLE **BEST** ANSWER FOR QUESTIONS 1 - 88.

1. Partial seizures:

   A. Include myoclonic, tonic-clonic and absence seizures

   B. Are linked to low threshold calcium currents in thalamic neurons

   C. Can be caused by tumors, strokes or developmental lesions

   D. Are largely unresponsive to drugs

   E. None of the above

2. The strong correlation between plasma concentration and therapeutic and toxic effects dictates that blood levels are monitored for:

   A. Carbamazepine

   B. Ethosuximide

   C. Phenytoin

   D. Valproate

   E. Phenobarbital

3. Drugs considered most effective against absence seizures:

   A. Diazepam and phenobarbital

   B. Phenobarbital and phenytoin

   C. Lamotrigine and gabapentin

   D. Valproate and ethosuximide

   E. Pentylenetetrazol and nifedipine

4. **Major** adverse effects of **phenytoin**:

   A. GI distress and idiosyncratic hepatotoxicity

   B. Neuralgia

   C. Sedation and nausea

   D. Cerebellar signs and gingival hyperplasia

   E. Polydipsia and polyuria

5. All of the following are general principals of therapy with antiseizure drugs **EXCEPT**:

   A. Start with a broad spectrum of antiseizure medications, then remove drugs one at a time as possible

   B. Ascertain the cause of the seizure before drug treatment

   C. Drug-free trials should be considered after weighing the risk factors

   D. Attempt treatment with an adequate dose and length of time before changing medications

   E. Choice of drug depends on the nature of the seizures

6. One of the cardinal features of Parkinson's disease is:

   A. Hyperkinesia

   B. Discokinesia

   C. Bradykinesia

   D. Dopakinesia

   E. Drooling

7. The current **principal** treatment strategy for **Parkinson's disease** is:

   A. Tyrosine loading to increase dopamine synthesis

   B. Cell replacement (transplants)

   C. Muscarinic antagonists

   D. Dopamine replacement or mimicry

   E. Peripheral DOPA decarboxylase inhibition

8. The current **major** limitation of **levodopa** therapy is:

   A. Wearing-off and on-off phenomena

   B. Nausea and vomiting

   C. Hallucinations and confusion

   D. Diet restrictions

   E. Tardive dyskinesia

9. Antimuscarinic drugs:

   A. Have only modest therapeutic effects in Parkinson's disease

   B. Are most useful in the treatment of bradykinesia in Parkinson's disease

   C. May help memory loss more than the movement disturbances in Parkinson's disease

   D. Are only poorly distributed to the CNS

   E. Are devoid of adverse effects when used in Parkinson's disease

QUESTIONS 10 AND 11 ARE RELATED TO THE FOLLOWING CASE HISTORY.

An elderly man suffering from rheumatoid arthritis is given naproxen (an ibuprofen-like NSAID). The man already is being treated for diabetes mellitus, hypertension and cardiac failure.

10. Which of the following drug interactions are likely in this patient?

   A. Decreased anti-hypertensive effect of ACE inhibitors, such as captopril.

   B. Decreased anti-hypertensive effect of AT-1 antagonists, such as losartan.

   C. Decreased diuretic effect of furosemide.

   D. Both A and C are correct.

   E. A, B and C are correct.

11. The basis for the interaction is:

A. Naproxen has alpha-1 agonist properties.

B. Direct stimulation of adenylate cyclase by naproxen.

C. Inhibition of NO synthetase by naproxen.

D. Inhibition of cyclooxygenase by naproxen.

E. Inhibition of 5 -lipoxygenase by naproxen.

QUESTIONS 12 AND 13 ARE RELATED TO THE FOLLOWING CASE HISTORY.
A 55 yr. old woman with a rare autoimmune thyroiditis had been treated with prednisone for 6 months. Because she was concerned about her appearance, the patient abruptly quit taking the drug several weeks ago.

12. The patient might present as follows:

A. Low fasting blood glucose level.

B. Elevated serum ACTH level.

C. Lethargic.

D. Both A and C are correct.

E. A,B and C are correct.

13. Besides changes in appearance, the long course with prednisolone could have caused all of the following EXCEPT:

A. Peptic ulcer

B. Hyperglycemia

C. Emotional depression and paranoia

D. Prednisolone hypersensitivity

E. Osteoporosis

QUESTIONS 14 and 15 ARE RELATED TO THE FOLLOWING CASE HISTORY.

A 27 year old woman was given sulfamethoxazole-trimethoprim to treat a urinary tract infection. After several days of self-administration of the drugs, she presented in the emergency room with a bright red rash on her arms, legs, back and chest. She complained of severe itching and had a temperature of 102 F.

14. Appropriate treatment for this patient might include:

    A. Intracardiac epinephrine.

    B. A single very high dose of prednisolone followed by 7-14 days of treatment with a moderate anti-inflammatory doses.

    C. Replace sulfamethoxazole with another sulfonamide.

    D. Replace trimethoprim with methotrexate.

    E. All of the above are correct.

15. Her reaction suggests that she may also be allergic to hydrochloro-thiazide, furosemide and which of the following agents?

    A. Tolbutamide.

    B. Spironolactone.

    C. Metoprolol.

    D. Ampicillin.

    E. Nifedipine.

16. At doses that have equipotent glucocorticoid effects, which of the following has the highest sodium retaining effect?

    A. Cortisol.

    B. Dexamethasone.

    C. Prednisone

    D. Prednisolone.

    E. They all are about equipotent in sodium retention.

17. Zafirlukast is:

A. An inhibitor of 5 -lipoxygenase activity

B. A selective inhibitor of cyclooxygenase 2

C. An antagonist of the angiotensin II AT-1 receptor

D. An antagonist of the leukotriene D4 receptor.

E. None of the above is correct.

18. Aspirin can be used appropriately for all of the following conditions **EXCEPT**:

A. Rheumatoid arthritis.

B. An analgesic for the pain of peptic ulcer.

C. To lower fever in adults infected with influenza virus.

D. Gouty arthritis.

E. Both B and D are exceptions.

19. Which of the following drugs would potentiate the orthostatic hypotension often seen with prazosin?

A. Chlorpromazine.

B. Quinidine.

C. Imipramine.

D. Tranylcypromine

E. All of the above.

20. Which of the following drugs would be least likely to add to the sedative effects of ethanol?

A. Aspirin.

B. Chlordiazepoxide.

C. Chlorpromazine.

D. Morphine.

E. Imipramine.

21. The anti-metabolite, 6-mercaptopurine, is metabolized by xanthine oxidase. Which of the following would be most likely to reduce the purine load in a leukemic patient treated with 6-mercaptopurine without affecting the anti-tumor agent s **metabolism**?

A. Indomethacin.

B. Allopurinol

C. Colchicine

D. Probenicid

E. Phenylbutazone.

22. Among the drugs used in combination chemotherapy that do not have marrow suppression as their primary adverse reaction is:

A. Fluorouracil

B. Doxorubicin

C. Bleomycin

D. Methotrexate

E. Cyclophosphamide

23. A primary site of toxicity of very low-dose fluorouracil is:

A. The heart muscle

B. The inner ear

C. Palms of hands and soles of feet

D. Hair follicles

E. Nasal mucosa

24. A drug which is highly-selective against cells in the S phase of the cell cycle is:

A. Nitrogen mustard

B. Cyclophosphamide

C. Cytosine arabinoside

D. Vincristine

E. Taxol

25. Multidrug resistance to doxorubicin, vinca alkaloids, taxol and actinomycin D results when:

A. Cells have an enhanced ability to repair the DNA damage caused by these agents.

B. The cell doubling time is too slow to permit these agents to kill significant numbers of cells in S phase.

C. There is an outward transport system that pumps these drugs from cells before any toxic effect can occur.

D. The drugs are detoxified by the liver.

E. Activity of tumor DNA repair enzymes is deleted.

26. Aminophylline and salbutamol are often co-administered for asthma treatment since:

A. These two drugs both produce increased pulmonary blood flow.

B. These two drugs are low cost

C. These two drugs increase the cellular cyclic AMP level through different routes.

D. These two drugs are actually the same drug with different name.

E. The absorption of the aminophylline can be improved when salbutamol is co-administered.

27. High-dose systemic corticosteroids are the only effective treatment for asthma patients with the Stage IV clinical symptom hypoxemia since:

A. Corticosteroids have a rapid acting anti-inflammatory effect.

B. The hypoxemic patient has low response to $beta_2$-agonists

C. Corticosteroids have no adverse effects

D. Suppression of corticotropin levels increases alveolar oxygen exchange.

E. The side effects of corticosteroid treatment are less severe than the side effects of other asthma drugs.

28. Which of the following statements concerning the use of aminophylline is **INCORRECT?**

A. Aminophylline has a very narrow margin of safety.

B. Plasma concentrations should be monitored if aminophylline is administered intravenously.

C. Seizure, arrhythmia, hypotension, and cardiac arrest are the cardiovascular adverse effects of aminophylline when the plasma concentrations reach toxic levels.

D. Caffeine containing beverages are allowed if aminophylline is administered.

E. Nausea and vomiting are CNS adverse effects of aminophylline.

29. Methamphetamine (ice, crank) overdose can produce a prolonged toxic reaction, the symptoms of which can be managed acutely with:

A. Naloxone

B. Desipramine

C. Clonidine

D. Fluoxetine

E. Lorazepam

30. A patient presenting in the Emergency Room as comatose, with miotic pupils and severely depressed respiration, should be titrated immediately with:

A. Clonidine

B. Sertraline

C. Diazepam

D. Haloperidol

E. Naloxone

31. Which of the following drugs is most safe and efficacious (best risk:benefit ratio) for managing the detoxification of an opiate-dependent patient?

A. Naltrexone

B. Fluoxetine

C. Clonidine

D. Diazepam

E. Codeine

32. The "typical" single serving (dose) of an alcoholic drink contains about _____ of pure ethanol.

A. 100-250 mg

B. 1-2 gm

C. 10-15 gm

D. 25-30 gm

E. 100-150 gm

33. Acute effects of ethanol on psychomotor function are characterized by:

A. A hyperbolic dose-effect curve

B. A half-life of approximately 1 hour

C. Rapid redistribution to fat depots

D. Excitation followed by depression

E. Mixed agonist/antagonist action

34. Combined horizontal and vertical nystagmus is a characteristic concomitant of severe intoxication with:

A. Amphetamine

B. Phencyclidine

C. Tetrahydrocannabinol

D. Psilocybin

E. Heroin

35. Which of the following statements about ambulance calls and poisoning in the U.S. is CORRECT?

A. About 1% of all ambulance calls are poison-related and about 50% of all poisonings involve children.

B. About 1% of all ambulance calls are poison-related and about 90% of all poisonings involve children.

C. About 10% of all ambulance calls are poison-related and about 50% of all poisonings involve children.

D. About 10% of all ambulance calls are poison-related and about 90% of all poisonings involve children.

E. About 25% of all ambulance calls are poison-related and about 90% of all poisonings involve children.

36. All of the following statements about the potential toxicity of chemicals are true **EXCEPT**:

A. Any chemical can be poisonous at a given dose and route of administration.

B. Drug metabolism enzymes and protective chemicals in the gastrointestinal tract are the first line of defense against ingested poisons.

C. Highly lipophilic agents do not produce dermal toxicity because of poor absorption.

D. The liver is highly exposed to orally administered drugs because of the first-pass effect.

E. The kidneys are highly exposed to drugs because of the high renal blood flow relative to tissue mass.

37. During overdose or poisoning, most drugs or toxins are eliminated by zero-order kinetics. If the zero-order rate constant for elimination of a drug is 200 mg per hour and 2 g are ingested, how long will it take to eliminate 90% of the drug?

A. 9 hours

B. 36 hours

C. 4.5 hours

D. 18 hours

E. 10 hours

38. Each of the following is associated with inorganic lead poisoning **EXCEPT**:

A. A characteristic neurological finding called wrist drop.

B. Abnormalities in porphyrin metabolism.

C. CNS abnormalities, including convulsions and coma in severe cases.

D. Extensor muscle weakness without sensory disturbances.

E. Eventually, 95% of body burden of lead is found in muscles.

39. Which of the following statements about differences between inorganic mercury salts and organic mercurials is TRUE?

A. Inorganic mercury readily binds to sulfhydryl groups whereas organic mercurials bind mostly to amino groups.

B. Inorganic mercury accumulates mostly in liver and kidneys whereas organic mercurials accumulate mostly in the CNS.

C. Inorganic mercury salts are more completely absorbed through the GI tract than are organic mercurials.

D. Inorganic mercury produces no neurotoxicity whereas organic mercurials produces mostly CNS effects.

E. Organic mercurials are excreted more rapidly than inorganic mercury salts.

40. Properties exhibited by an effective metal chelating agent should include all of the following **EXCEPT**:

A. Good water solubility.

B. Ready excretion of the chelate.

C. Greater affinity of the chelator for the metal than for endogenous compounds.

D. Readily metabolized.

E. Metal chelates should be less toxic than the free metal ions.

41. Which of the following chelators is matched **INCORRECTLY** with its description?

A. Dimercaprol: Some adverse cardiovascular effects, useful for As, Pb, but not for Cd.

B. EDTA: Efficient chelator of many divalent cations, penetrates membranes poorly, limited by binding essential calcium.

C. Penicillamine: Used primarily for Cd and As, chronic use relatively safe with few adverse effects.

D. Desferoxamine: Binds iron very avidly, is toxic so used only when severity of poisoning justifies it.

E. 2,3-Dimercaptosuccinate (DMSA): Congener of BAL, more water soluble and less adverse effects than BAL because it acts primarily extracellularly.

42. Treatment of carbon monoxide poisoning involves all of the following **EXCEPT**:

A. Administration of amyl nitrite to react with hemoglobin to hasten CO excretion.

B. Removal of individual from source of exposure.

C. Maintenance of respiration.

D. Administration of pure oxygen.

E. Maintenance of cardiovascular function in severely affected individuals.

43. Correction of formate-induced acidosis is critical to a patient s survival in poisoning with which chemical?

A. Cyanide

B. Ethylene glycol

C. Methanol

D. Organochlorine insecticides

E. Acetaminophen

44. N-Acetylcysteine (Mucomist) is an effective agent in the treatment of acetaminophen overdosage because it:

A. Binds to acetaminophen, thus preventing it from interacting with cellular proteins.

B. Inhibits acetaminophen metabolism.

C. Increases acetaminophen excretion.

D. Iinhibits acetaminophen absorption.

E. Can function like glutathione as well as being a precursor for glutathione synthesis.

45. A patient taking captopril indulges in the recreation use of cocaine. The patient's blood pressure rises dramatically. This is an example of what type of drug-drug interaction?

A. Additivity.

B. Synergism.

C. Pharmacological antagonism.

D. Potentiation.

E. Physiological antagonism.

46. This chemical's toxicity is decreased by depletion of glutathione or inhibition of gamma-glutamyltransferase, and is increased by inhibition of cytochrome P-450. This chemical may be:

A. Acetaminophen.

B. Trichloroethylene.

C. Benzo(a)pyrene.

D. Bromobenzene.

E. Carbon tetrachloride.

47. Psychological studies in both animal and human subjects have demonstrated that drugs of abuse reinforce behavior. One reason for this is the "reward" they provide that is associated primarily with activation of these pathways in the limbic system:

A. Noradrenergic

B. Cholinergic

C. Opioidergic

D. Dopaminergic

E. Serotonergic

48. The **unique** property of the biotransformation of ethanol as compared with other psychotropic drugs is that is:

A. Is metabolized by hepatic microsomal P450 enzymes

B. Is metabolized by gastrointestinal dehydrogenase

C. Induces the synthesis of metabolic enzymes

D. Has metabolites that are conjugated with glucuronide

E. Exhibits a first order pharmacokinetic profile

49. An indigent person has consumed excessive amounts of alcohol for 15 years has enhanced risk for:

A. Enhanced sexuality

B. Diminished serum HDL

C. Peripheral neuropathy

D. Megaloblastic anemia

E. Tardive dyskinesia

50. The common alcohol withdrawal syndrome is characterized by:

A. Onset at 48 hours

B. Severe hyperpyrexia

C. Depressed reflexes

D. Profound diaphoresis

E. Visual hallucinations

51. Which of the following agents can be employed to decrease ethanol craving following uncomplicated alcohol withdrawal?

A. Disulfiram

B. Chlorpromazine

C. Pilocarpine

D. Buspirone

E. Naltrexone

52. A patient presents in the Emergency Room with florid hyperirritability, stereotypy, suspiciousness to the point of paranoia, and hostility. His blood pressure, heart rate and respiration are all elevated. His forearms show excoriations with inflammatory sequelae. Friends who have brought the patient in report that he has been using drugs recently, but they aren't sure which ones. They say that they "have never seen him this bad." You suspect that the patient most likely is experiencing:

A. Phencyclidine toxicity

B. Overdose of heroin

C. Cocaine intoxication

D. Ethanol withdrawal

E. Psilocybin overdose

53. A patient presenting in the ER with complaints of intense GI cramping, diarrhea, tremor, mydriasis and elevated BP, HR, respiration and temperature should be considered for specific short term stabilization using:

A. Haloperidol

B. Lorazepam

C. Naltrexone

D. Propranolol

E. Methadone

54. Anandamide, a substance which is normally found heterogeneously distributed in the CNS, is thought to be a natural ligand for these receptors:

A. Central nicotinic

B. Benzodiazepine

C. Cannabinoid

D. Sigma opioid

E. Alpha-2 adrenergic

55. Use of excessive anabolic steroids can have a feminizing effect on men because anabolic steroids used in this way:

A. Stimulate pituitary LH/FSH secretion

B. Enhance synthesis of progesterone

C. Broadly suppress the immune system

D. Transform to estrogen in the liver

E. Inhibit the synthesis of prolactin

56. A patient has been treated with propranolol to reduce the frequency of anginal episodes. Because he is experiencing a serious bradycardia, the treatment is suspended. Then the patient experiences episodes of tachycardia. Which of the following might account for the increased heart rate?

A. Increased sensitivity of the myocardium to catecholamines.

B. Increased stimulation of vascular beta2 receptors.

C. Previously existing hypothyroidism has been unmasked.

D. Both A and C are correct.

E. A,B and C are correct.

57. Digitalis has well known cardioselective parasympathetic effects including:

A. Increased vagal activity.

B. An atropine-like effect.

C. Decreased ventricular contraction.

D. Both A and C are correct.

E. A, B and C are correct.

58. Lidocaine:

A. Interferes with neuronal voltage gated sodium channels.

B. Is metabolized by serum esterases.

C. Has its initial effects on A-type and C-type fibers.

D. Both A and C are correct.

E. A, B and C are correct.

59. Propofol:

A. Causes both myocardial and vascular depression.

B. Is extensively metabolized to inactive products in the liver.

C. Has a short duration of action because it is rapidly redistributed from the CNS.

D. Both A and C are correct.

E. A, B and C are correct.

60. Morphine:

A. Can only be administered by a parenteral route.

B. Increases the sensitivity of respiratory centers to carbon dioxide.

C. May prolong labor during childbirth.

D. Generally depresses all sensory modalities

E. All of the above are correct.

61. Chlorpromazine s tendency to produce Parkinson s-like untoward effects is mitigated by:

A. Its dopaminergic blocking properties.

B. Its noradrenergic blocking properties.

C. Its muscarinic cholinergic blocking properties.

D. Its histaminergic blocking properties.

E. None of the above is correct.

62. The treatment of manic-depressive disorder in pregnant patients with lithium is associated with:

A. Diabetes insipidus.

B. Congenital cardiac abnormalities.

C. Edema.

D. A and C are correct.

E. A, B and C are correct.

63. Benzodiazepine sedative-hypnotics (such as diazepam):

A. Increase chloride flux through the $GABA_A$ receptor.

B. Actions are mediated via a binding protein.

C. Have active metabolites that contribute to sedation.

D. Interact with antihistamines to produce greater sedation.

E. All of the above.

64. Carbidopa:

A. Inhibits DOPA decarboxylase.

B. Readily passes the blood brain barrier

C. Is used as an antagonist in l-DOPA overdose

D. Is used as an antagonist in trihexyphenidyl overdose

E. All of the above are correct.

65. A patient being treated for manic-depressive disorder develops a diuresis (10 L of urine per day). The urine is dilute. This condition can be treated appropriately by:

A. Increasing fluid consumption to compensate for the loss.

B. Administering large doses of antidiuretic hormone.

C. Administering a thiazide diuretic (e.g. hydrochlorothiazide).

D. Both A and C are correct.

E. A, B and C are correct.

66. Which of the following calcium channel blockers is most likely to INCREASE cardiac output?

A. Diltiazem.

B. Nicardipine.

C. Nifedipine.

D. Verapamil.

E. None is likely to increase cardiac output since all calcium channel blockers depress the myocardium to about the same extent.

67. Which of the following compounds would not be given by oral administration due to problems with first pass metabolism?

A. Diethylstilbestrol

B. Ethinyl Estradiol

C. Norethindrone

D. Tamoxifen

E. Estradiol

68. Which of the following is a TRUE statement regarding Postmenopausal Hormone Therapy?

A. Estrogens are administered daily at a relatively large dose to induce normal, menstrual bleeding.

B. Estrogen replacement therapy is routinely prescribed as a prophylactic measure against osteoporosis.

C. In an attempt to mimic normal physiological conditions, it is recommended that estrogen be administered along with a small amount of androgen during hormone replacement therapy.

D. To lower the risk of endometrial cancer, hormone replacement therapy generally includes the combined administration of estrogens and progestins.

E. It is recommended that hormone replacement therapy be initiated with the largest dose consistent with the relief of symptoms.

69. Which of the following is **NOT** a therapeutic use of progestins?

A. Severe endometriosis

B. Refractory anemia

C. Postmenopausal hormone therapy

D. Contraception

E. Metastatic endometrial carcinoma

70. Which of the following is a **FALSE** statement regarding Mifepristone?

A. Mifepristone can act as both an antiprogestin and an antiglucocorticoid.

B. Mifepristone blocks ovulation by preventing the mid-cycle surge of gonadotropins.

C. Due to its antiglucorticoid effects, Mifepristone has been used as an anabolic agent.

D. Mifepristone is a derivative of norethindrone.

E. Mifepristone stimulates menstrual bleeding by stimulating the release of prostaglandins.

71. Which of the following is an adverse side-effect associated with the use of combination, steroidal oral contraceptive agents?

A. Cholestatic hepatitis, presenting as jaundice

B. Increased risk of endometrial carcinoma

C. Recurring nausea and vomiting

D. Hypertension

E. Increased risk of hepatic adenocarcinoma

72. Which of the following compounds is commonly used as an anti-androgen?

A. Flutamide

B. Fluoxymesterone

C. Oxandrolone

D. Mestranol

E. Clomiphene

73. The feature of NPH insulin dictating its use in the management of Type I diabetics is:

A. A two amino acid substitution within the natural sequence which enhances solubility.

B. Relative resistance to metabolism by the liver.

C. Oral administration.

D. Compatibility with insulin pump-delivery systems.

E. Lowered solubility relative to regular insulin.

74. The primary site of action of the sulfonylurea anti-diabetic agents is on:

A. beta cell Ca channels.

B. Peripheral tissues, stimulating glucose uptake and utilization through an unknown mechanism.

C. Peripheral tissues, stimulating the regulated insertion of the GLUT4 glucose transporter into the plasma membrane.

D. beta cell K channels.

E. The liver, blocking first pass insulin metabolism.

75. The long-term complications of diabetes mellitus involve impaired peripheral circulation and are best circumvented by:

A. Rigorous management regimens aimed at maintaining blood glucose at near normal levels

B. Long-term management with anti-coagulants, aspirin is preferred.

C. Sulfonylurea antidiabetic agents.

D. Patient counseling regarding the dangers of insulin-induced hypoglycemic coma.

E. Avoidance of allergic reactions through use of recombinant human insulin preparations

76. T4 has a longer serum half-life than T3. What accounts for this difference?

A. The thyroid hormone receptor has a 10-fold greater binding affinity for T3.

B. Thyroxine-binding globulin has a 10-fold greater binding affinity for T4.

C. T3 activity is lost through the actions of peripheral tissue de-iodinases.

D. T3 is largely degraded via first pass metabolism by the liver.

E. T3 is excreted without biotransformation by the kidney.

77. Dietary iodine deficiencies result in all of the following **EXCEPT**:

A. Increased pituitary release of TSH.

B. Exophthalmos.

C. An increased serum ratio of T3 to T4.

D. Goiter.

E. Bradycardia.

78. Goiter development in Graves' disease results from:

A. A deficiency of circulating iodine.

B. Unregulated hyper-secretion of TSH by the pituitary.

C. Hyper-secretion of TRH by the hypothalamus.

D. Aberrant production of antibodies directed against the TSH receptor.

E. Benign or malignant thyroid tumor.

79. Both the nephrogenic and pituitary forms of diabetes insipidus result from:

A. A deficit of circulating vasopressin.

B. Excess circulating vasopressin.

C. Failed plasma membrane insertion of water channels in distal tubule cells.

D. Failed Na+-Cl- symport.

E. Raised cAMP levels in distal tubule cells.

80. The ergot alkaloids are highly effective agents for inducing labor at term and were widely used for this purpose during the 1800's. Today this practice is contraindicated largely because of:

A. The associated pyschotropic actions of these compounds.

B. Their propensity for inducing excessive and uncontrollable postpartum bleeding.

C. The danger of infant anoxia from excessive and sustained uterine contractions.

D. Inefficacy in inducing cervical ripening.

E. Maternal toxicities resulting from associated vasopressor activity.

81. The efficacy of sumatriptan in relieving migraine symptoms, suggest that migraine pathogenesis likely involves:

A. Ergotamine-induced vasoconstriction.

B. beta-adrenergic-induced vasodilatation.

C. Excess prostaglandin synthesis.

D. Lowered intracellular cAMP.

E. A deficit in cerebral serotonin levels.

82. The antioxidant that has been demonstrated to be effective in cardioprotection studies is:

A. Vitamin A

B. beta-carotene

C. Vitamin C (ascorbic acid)

D. Vitamin D

E. Vitamin E (alpha-tocopherol)

83. All of the following are strategies that have been used for prevention of reperfusion injury **EXCEPT**:

A. Use of allopurinol to inhibit xanthine oxidase

B. Addition of superoxide dismutase and catalase when restoring blood flow

C. Addition of ferric iron when restoring blood flow

D. Use of 21-aminosteroids as radical traps

E. Use of N-acetylcysteine as a radical trap

84. The oxygen species that is most damaging to intracellular proteins, lipids and nucleic acids in oxidative stress conditions is:

A. O_2

B. OH^-

C. O_2^-

D. H_2O_2

E. OH

85. If the maintenance infusion for Drug P at 2 mg/min leads to a plasma plateau concentration of 3 mg/L, what is the clearance rate for Drug P?

A. 67 mL/min

B. 120 mL/min

C. 150 mL/min

D. 667 mL/min

E. 1500 mL/min

86. Which of the following pharmacokinetic properties is **NOT** associated with d-tubocurarine.

A. Good oral absorption

B. Renal excretion more important than hepatic metabolism

C. Relatively small volume of distribution

D. Relatively short half-life

E. Poor penetration into the fetal circulation

87. Inhibition of this enzyme allows 5-fluorouracil to be effective when administered by the oral route:

A. Thymidylate kinase

B. Cytochrome P4501A12

C. Xanthine dehydrogenase

D. Dihydrofolate reductase

E. Dihydropyridine dehydrogenase

88. This agent's action, after a single administration, cannot be reversed pharmacologically:

A. Atropine

B. Mecamylamine

C. Succinylcholine

D. Tropicamide

E. Vecuronium

MATCHING ITEMS

In each of the following groups there are two lists. Mark on the answer sheet in the line corresponding to each question number in the lower list (89-100) the letter of the related item of the upper list.

DIRECTIONS: Match each mechanism of cell killing (A-E below) with its drug numbered 89-91.

A. Inhibition of DNA replication via deformation of the DNA helix.

B. Interaction with thymidylate synthase resulting in impaired thymidine biosynthesis

C. Loss of the mitochondrial membrane potential and shut-down of ATP biosynthesis

D. Inhibition of dihydrofolate reductase resulting in impaired thymidine synthesis.

E. Inhibition of tubulin polymerization

89. Methotrexate

90. Fluorouracil

91. Vincristine

USE THE FIGURE REPRODUCED BELOW TO ANSWER QUESTION 92 - 95.

DIRECTIONS: Select the letter that indicates the site at which the immuno-suppresive agent has its principal action. Each letter can be used more than once.

92. Tacrolimus.

93. Cyclosporine.

94. Azathioprine.

95. Cyclophosphamide.

DIRECTIONS: MATCH THE DRUG TO THE DESCRIPTION FOR QUESTIONS 96-100. EACH DRUG MAY BE USED MORE THAN ONCE.

Agent	Oral Availability	Urinary Excretion	Clearance (ml/min/kg)	Vd (L/kg)	Half-life (hr)	Effective Conc. (ng/ml)
A. Atenolol	56%	94%	2.0	0.95	6.1	1000
B. Metoprolol	38%	10%	15.0	4.2	3.2	16
C. Labetolol	18%	5%	25.0	9.4	4.9	130
D. Propranolol	26%	1%	16.0	4.3	3.9	20
E. Timolol	50%	15%	7.3	2.1	4.1	15

96. This agent shows the least first pass metabolism among the nonselective agents above.

97. This agent produces less effect on heart rate and cardiac output than the others because it possesses both alpha and beta antagonistic activities.

98. Patient WT is hypertensive and also suffers from cirrhosis of the liver and mild bronchiolar obstruction. Although the above agents may not be the optimal ones to use, this agent would be the rational choice to try in combination therapy with minoxidil.

99. This agent will require the smallest maintenance dosing rate within the above list.

100. Among the above agents, this drug would exhibit the smallest ratio of (agent in blood/agent in body) at steady state.