YR 2 PHARMACOLOGY UNIT EXAMINATION 2 -- MARCH 29, 1999.

CHOOSE THE SINGLE BEST ANSWER FOR QUESTIONS 1 - 75.

1. Cyclosporine:

   A. Metabolized to phosphoramide mustard.

   B. Binds to CD3 receptor on lymphocytes.

   C. Binds to cyclophilins and inhibits calcineurin.

   D. Increased trapping of nuclear factor kB.

   E. Blocks alpha chain of interleukin-2 receptor.

2. Tacrolimus:

   A. Inhibition of inosine monophosphate dehydrogenase.

   B. Interferes with signal transduction in T-lymphocytes during G1.

   C. Blocks activated interleukin-2 receptor.

   D. Metabolized to thioinosinic acid and thioguanylic acid.

   E. Inhibits calcineurin dependent translocation of NF-AT.

3. Which of the following is a property of glucocorticoids that accounts, in part, for their use as immunosuppressives?

   A. Metabolized to phosphoramide mustard.

   B. Binds to CD3 receptor on lymphocytes.

   C. Binds to cyclophilins and inhibits calcineurin.

   D. Increased trapping of nuclear factor kB.

   E. Blocks alpha chain of interleukin-2 receptor.

4. Azathiaprine:

   A. Inhibition of inosine monophosphate dehydrogenase.

   B. Interferes with signal transduction in T-lymphocytes during G1.

   C. Blocks activated interleukin-2 receptor.

   D. Metabolized to thioinosinic acid and thioguanylic acid.

   E. Inhibits calcineurin dependent translocation of NF-AT.

5. Which of the following agents has the greatest potential for inducing a hypoglycemic reaction:

   A. Troglitazone.

   B. Glyburide.

   C. Dexamethasone

   D. Metformin.

   E. Acarbose

6. Which of the following insulin preparations would remain effective in maintaining near normal glucose levels 8 hrs post sub-cutaneous injection:

   A. NPH insulin

   B. Insulin lispro

   C. Crystalline insulin

   D. Porcine insulin

   E. Regular insulin

7. Which agent is associated with the greatest risk of inducing lactic acidosis in a patient suffering from NIDDM:

   A. Troglitazone.

   B. Glyburide.

   C. Dexamethasone.

   D. Metformin.

   E. Acarbose.

8. Causes of hypothyroidism include all of the following, EXCEPT:

   A. Insufficiency of dietary iodine

   B. Excess TIF release by pituitary

   C. Presence of goitrogens (agents which inhibit iodine organification) in diet.

   D. Autoimmune destruction of thyroid

   E. Graves

9. The best immediate treatment for an acute episode of thyroid storm is:

   A. Thyrotropin

   B. Radioactive iodine

   C. Dexamethasone.

   D. Reverse T3.

   E. Propanolol.

10. Which of the following would NOT be utilized in the treatment of Graves disease:

   A. Sodium iodide

   B. ^{131}I

   C. Reverse T_3

   D. Propylthiouracil

   E. Methimazole

11. An agent used to treat a severe migraine attack is:

   A. Ergotamine.

   B. Ergonovine.

   C. Bromocryptine.

   D. Propanolol.

   E. Amitriptyline.

12. Synthetic ADH derivatives with antagonistic actions at V1 receptors, should:

A. Function as vasodilators.

B. Function as vasoconstrictors.

C. Function as a diuretic.

D. Function as an anti-diuretic.

E. Be effective for treating nephrogenic diabetes insipidus.

13. An agent likely to produce unwanted diuresis:

A. Lithium carbonate.

B. Desmopressin.

C. Lypressin.

D. Angiotensin II.

E. Aldosterone.

14. A Class 1 antiarrhythmic agent that prolongs action potential duration without exhibiting reverse use dependence inhibition of K^+ channels:

A. Procainamide

B. Lidocaine

C. Flecainide

D. Esmolol

E. Amiodarone

15. Potent Na^+ channel blocker (Class 1C antiarrhythmic agent); useful for supraventricular arrhythmias, producing increased mortality with treatment of premature ventricular contractions (PVCs) after a myocardial infarction.

A. Procainamide

B. Lidocaine

C. Flecainide

D. Esmolol

E. Amiodarone

16. Antiarrhythmic used i.v. in patients following myocardial infarction; exhibits significant neurologic side effects and can cause convulsions if delivered too rapidly

A. Procainamide

B. Lidocaine

C. Flecainide

D. Esmolol

E. Amiodarone

17. Isoproterenol:

A. Decreases L-type Ca^{2+} channel current

B. Directly inhibits Na-K-ATPase

C. Leads to cross tolerance with nitrates

D. Decreases heart rate in part by vagal reflex

E. Decreases diastolic blood pressure

18. Which one of the statements is CORRECT?

A. Toxic concentrations of digitalis lead to reduced impulse conduction

B. Toxic concentrations of digoxin produce a different spectrum of cardiac arrhythmias compared to toxic concentrations of digitoxin

C. The dosage of digoxin should be increased with co-administration of quinidine

D. Digoxin has a longer half-life for elimination than digitoxin

E. Digoxin increases AV conduction by a parasympathomimetic mechanism

19. A patient with symptoms of congestive heart failure is given combination therapy of digitalis, ACE inhibitors, and diuretics. Which of the following statements is correct?

A. Systolic but not diastolic blood pressure will be reduced.

B. Serum potassium levels will rise

C. Myocardial remodeling will increase

D. Reduced preload will reduce cardiac output

E. Heart rate will be reduced

20. To decrease O_2 consumption in patients experiencing angina of effort:

A. Nitrates are used for venodilatation

B. Amyl nitrite is used prophylactically

C. Verapamil is contraindicated because of reflex sympathetic responses

D. Isosorbide dinitrate and nitroglycerin must be used alternatively to prevent tolerance

E. Dobutamine is used to increase contractility

21. Carvedilol:

A. Is an alpha-2 receptor antagonist with partial alpha-1 agonist activity

B. Must be used with caution in patients with congestive heart failure

C. Is a partial beta receptor agonist

D. Increases cardiac contractility

E. Is a beta-1 receptor agonist

22. Diltiazem:

A. Is a negative inotrope

B. Is unique among Ca^{2+}-channel blockers in its high plasma protein binding

C. Increases cardiac pacemaker rate

D. Is more potent than dihydropyridines as a vasodilator

E. Is a sodium channel blocker

23. Amiodarone:

A. Is a Class 1A antiarrhythmic agent

B. Is more likely than quinidine to prolong action potentials at lower heart rates

C. Causes skin discolorations in a majority of patients

D. Can cause pulmonary fibrosis

E. Has negligible neurologic effects

24. Adenosine:

A. Has a half life of 10 min

B. Causes rapid depolarization of ventricular cells

C. Inhibits AV conduction

D. Inhibits SA node

E. Must be delivered slowly to achieve its antiarrhythmic effect

25. Administration of digitalis prior to treatment with procainamide for atrial fibrillation is used for:

A. Enhancing antiarrhythmic effect by lowering extracellular K^+

B. Lowering the risk of torsade de pointes

C. Offsetting the negative inotropy of procainamide

D. Offsetting the anti-muscarinic effects of procainamide

E. Increasing Na^+ channel binding

26. Nitrate therapy is useful in all EXCEPT which of the following:

A. Variant angina

B. Unstable angina

C. Reducing mortality after myocardial infarctions

D. Reducing cardiac output

E. Hypertension

27. Nifedipine therapy is associated with all EXCEPT which of the following:

A. Prolongation of Q-T interval

B. Decreased arterial tone in variant angina

C. Reflex sympathetic discharge

D. Half life of approximately 3 h

E. Decreased cardiac output in angina of effort

28. Propranolol:

A. Increases cardiac contractility

B. Reduces mortality in patients after myocardial infarction

C. Generally exhibits very high bioavailability

D. Is relatively specific for beta-1 receptors

E. Increases rate of SA node phase 4 depolarization

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

A. Inhaled chemicals rapidly enter the circulation because of high pulmonary blood flow.

B. Highly lipophilic agents can produce dermal toxicity because of rapid absorption.

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

D. All chemicals possess a threshold dose below which no toxicity is observed.

E. The liver is highly exposed to i.v. administered drugs because of the first-pass effect.

30. Zero-order kinetics is observed in the elimination of drugs at tissue concentrations that are:

A. Below the Vmax for p450.

B. Sufficient to produce toxicity.

C. Saturating for metabolism and elimination.

D. Above 200 ug per ml.

E. Above 500 ug per ml.

31. Lead poisoning:

A. Can occur at blood lead concentrations <10

B. Can be diagnosed by observing increased concentrations of free erythrocyte porphyrin (FEP).

C. Has distinct symptoms that are not shared by other diseases.

D. Cannot be effectively treated with EDTA.

E. Is no longer a health problem because of the phase-out of leaded gasoline.

32. A patient is observed in the emergency room to exhibit the following symptoms: Severe headache, dizziness, dimness of vision, and throbbing in the temples. Oxygen-carrying capacity of red blood cells is significantly reduced. The following diagnosis is made:

A. Carbon monoxide poisoning with 10 to 20% saturation of blood.

B. Methanol poisoning.

C. Ethylene glycol poisoning.

D. Carbon monoxide poisoning with 30 to 40% saturation of blood.

E. Carbon monoxide poisoning with 20 to 30% saturation of blood.

33. Amyl nitrite is used as an antidote for which chemical?

A. Carbon monoxide.

B. Methanol

C. Cyanide

D. Organophosphates.

E. Ethylene glycol.

34. N-Acetylcysteine is used as an effective treatment of acetaminophen poisoning. The best explanation for its mechanism of protection is that N-acetylcysteine:

A. Repletes cellular glutathione content.

B. Supplies cells with cysteine for protein synthesis.

C. Acts as an antioxidant

D. Produces acetyl-CoA for the mitochondrial citric acid cycle

E. Binds the reactive metabolite of acetaminophen.

35. Which of the following statements about chelators is FALSE?

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

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

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

36. Which heavy metal is matched INCORRECTLY with its description?

A. Inorganic lead: Inhibits porphyrin metabolism; chronic poisoning causes symptoms including weakness, anorexia, tremor, GI disturbances.

B. Inorganic mercury: Binds to sulfhydryl groups; is corrosive and precipitates proteins.

C. Pentavalent arsenic: Uncouples cellular respiration.

D. Trivalent arsenic: Binds to sulfhydryl groups on proteins and enzymes.

E. Organic mercury: Binds to amino groups; accumulated primarily by liver.

37. 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 cardiovascular function in severely affected individuals.

D. Administration of pure oxygen.

E. Maintenance of respiration.

38. 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. DDT.

39. Which vitamin is potentially the most toxic of all vitamins, is fat-soluble, and is treated by discontinuation of vitamin administration, reduction of intake of calcium, and generous administration of fluids?

A. Vitamin A.

B. Vitamin C.

C. Vitamin K.

D. Niacin.

E. Vitamin D.

40. Which statement about free radicals is FALSE?

A. Free radicals can be carbon-, nitrogen-, oxygen-, or sulfur-centered.

B. Free radicals are normally short-lived species that can be detected by chemical trapping and special methods.

C. Alterations in cellular macromolecules occur during the propagation phase.

D. Free radicals can be neutral, cationic, or anionic species.

E. All free radicals are toxic.

41. 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

42. 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.

43. 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

44. 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.

45. 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

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

A. Flutamide

B. Fluoxymesterone

C. Oxandrolone

D. Mestranol

E. Clomiphene

47. In a patient already taking furosemide, digoxin and a potassium supplement, naproxen might

A. Lower serum potassium

B. Increase the glomerular filtration rate

C. Reduce inotropy

D. Reduce urine flow

E. Increase heart rate

48. Allopurinol decreases the metabolism of:

A. 5-fluorouracil

B. Probenicid

C. 6-mercaptopurine

D. Colchicine

E. Methotrexate

49. Cromolyn sodium:

A. Most effective when administered orally

B. Prevents the antigen-antibody reaction

C. Relaxes smooth muscle by its action on receptors

D. Administration prior to exercise or pollen exposure reduces asthmatic attacks

E. Inhibits cyclooxygenase 2

50. Zafirlukast:

A. Long acting beta-agonist

B. Inhibits 5'-lipoxygenase

C. Direct acting bronchodilator

D. Inhibits cyclooxygenase 2

E. Blocks a leukotriene receptor

51. Aminophylline:

A. Is a selective beta2-agonist

B. May cause cardiac and CNS stimulation

C. Activates adenyl cyclase

D. Inhibits monoamine oxidase

E. Inhibits xanthine oxidase

52. Salmeterol:

A. May induce skeletal muscle tremors in elderly patients

B. Inhibits phosphodiesterase

C. Is only effective as an aerosol

D. Has a shorter duration of action than terbutaline

E. Inhibits the antiinflammatory effects of leukotrienes

53. Which of the following drugs is least likely to raise serum renin levels?

A. Captopril

B. Propranolol

C. Nicardipine

D. Minoxidil

E. Hydralazine

54. Which of the following drugs would be the best choice to initiate treatment of mild hypertension in a patient who suffers from asthma:

A. Propranolol

B. Hydralazine

C. Labetalol

D. Captopril

E. Pindolol

55. Which of the following drugs is most likely to antagonize the antihypertensive effect of captopril:

A. Colchicine

B. Ibuprofen

C. Probenicid

D. Allopurinol

E. Propranolol

56. Which of the following drugs exerts its antihypertensive effects, in part, by blockade of alpha1-receptors:

A. Clonidine

B. Pindolol

C. Labetalol

D. Propranolol

E. Metoprolol

57. Which of the following diuretics would be most appropriate in a patient who is already being treated for diabetes with glyburide and captopril for hypertension:

A. Furosemide

B. Hydrochlorothiazide

C. Amiloride

D. Spironolactone

E. Mannitol

58. Which of the following antihypertensive agents is most likely to cause reflex tachycardia:

A. Verapamil

B. Atenolol

C. Nifedipine

D. Diltiazem

E. Nicardipine

59. Losartan and captopril share all of the following properties EXCEPT:

A. Both reduce cardiac remodeling due to hypertension

B. Both lower peripheral resistance

C. Both increase bradykinin's half-life

D. Both reduce aldosterone secretion

E. Both increase renin levels

60. All of the following are true of propranolol EXCEPT:

A. Initially, it can cause a hypertension due to beta2-receptor blockade

B. Oral dosages vary among individuals due to "first pass" metabolism

C. It increases renin and angiotensin II levels

D. It increases VLDL and decreases HDL

E. Upon abrupt withdrawal, it can cause severe tachycardia

61. Which of the following drugs is associated with a lupus-like syndrome:

A. Hydralazine

B. Diltazem

C. Verapamil

D. Losartan

E. Minoxadil

62. Which of the following drugs decreases the renal clearance of digoxin:

A. Hydralazine

B. Diltazem

C. Verapamil

D. Losartan

E. Minoxadil

63. In congestive heart failure, cardiac output is determined mainly by:

A. Diuretic dosage

B. Collagen matrix

C. Conductance

D. Compliance

E. Contractility

64. Which of the following is a compensatory mechanism in left ventricular dysfunction:

A. Reduce preload

B. Increase compliance

C. Increase atrioventricular conduction time

D. Reduce calcium influx

E. Increase norepinephrine

65. Increasing endothelin:

A. Increases bradykinin degradation

B. Causes pulmonary vasoconstriction

C. Increases renin turnover

D. Reduces norepinephrine

E. Increases myocardial compliance

66. Expression of the multidrug-resistance phenotype results in the appearance of an outward drug transport system which can prevent the accumulation of many anti-tumor agents and thereby antagonize drug toxicity. This phenomenon can be demonstrated

A. Only in drug-resistance malignant cells

B. Only in metastatic cancer cells

C. Only in cardiac muscle cells

D. Only in kidney tubules

E. In all rapidly-dividing cells

67. If a 5 ìg/ml concentration of cytosine arabinoside will kill 40% of an S-phase tumor cell culture, a 10 ìg/ml concentration is expected to kill what percentage of the total number of cells?

A. 80%

B. 64%

C. 60%

D. 50%

E. 45%

68. The principle advantage of the use of alkylating agents in chemotherapy is their ability to:

A. Spare the bone marrow from toxicity

B. Cross the blood-brain barrier

C. Kill both rapidly- and slowly-dividing tumor cells

D. Delay the development of drug resistance

E. Bind to plasma protein

69. Toxicity of bleomycin to the skin and lung is associated with:

A. Absence of bleomycin hydrolase in those tissues

B. Affinity of the drug for collagen

C. Sensitivity of rapidly-dividing cells to this drug

D. Absence of the multidrug resistance phenotype

E. Poor oxygenation thereby preventing radical formation

70. An important mode of drug resistance that results from impaired signal-transduction pathways in neoplastic cells is:

A. Enhanced outward drug transport

B. Lack of drug metabolism to pharmacologically-active products

C. Enhanced repair of DNA damage

D. Failure of cells to undergo apoptosis after DNA is damaged

E. Inhibition of drug-transport systems

71. Which of these adverse effects of chemotherapy is an example of drug-induced inhibition of DNA synthesis in normal cell types?

A. Skin and CNS toxicity of high-dose cytosine arabinoside

B. Cardiac toxicity of doxorubicin

C. Hemorrhagic cystitis after treatment with cyclophosphamide

D. Bone marrow depression induced by methotrexate

E. Pulmonary fibrosis caused by bleomycin

72. In patient with impaired liver function, the dose of doxorubicin must be reduced because the drug is:

A. Activated by liver enzymes

B. Detoxified by liver enzymes

C. Excreted via the liver and bile

D. Distributed via binding to lipoproteins

E. Is a powerful hepatotoxin