

YR 1 CLINICAL NUTRITION UNIT EXAM -- April 14, 1998.

CHOOSE THE SINGLE BEST ANSWER FOR QUESTIONS 1 - 45.

1. The respiratory quotient of a patient is found to be 0.98. Therefore, this patient:
  - A. Is primarily using glucose as fuel
  - B. Has lower than normal basal metabolic rate
  - C. Is primarily using fatty acids as fuel
  - D. Has higher than normal basal metabolic rate
  - E. Is primarily using amino acids as fuel
  
2. The key role of enteropeptidase is to:
  - A. Activate procolipase
  - B. Convert pepsinogen to pepsin
  - C. Hydrolyze small peptides to free amino acids for absorption in the small intestine
  - D. Convert trypsinogen to trypsin
  - E. Activate procarboxypeptidase
  
3. Cholecystokinin:
  - A. Catalyzes the conversion of cholesterol to colestipol in the small intestine
  - B. Participates in the activation of bile salt-stimulated lipase
  - C. Causes the contraction of the gall bladder
  - D. Causes the release of vitamin B<sub>12</sub> attached to food protein
  - E. Is derived from cholesterol

4. One of the following nutrients becomes a dietary essential to the patient when excessive phenylpyruvic acid is found in this patient's urine:
- A. Glycine
  - B. Cysteine
  - C. Taurine
  - D. Cystine
  - E. Tyrosine
5. A one year old child maintained on a diet deficient in protein and calories can develop a syndrome known as:
- A. Cheilosis
  - B. Hartnup disease
  - C. Celiac disease
  - D. Wernicke s encephalopathy
  - E. Marasmus
6. Pectin:
- A. Is a polymer of glucose units with  $\beta$ 1,4 glucosidic bonds
  - B. Is water soluble
  - C. Hastens the rate of glucose absorption from the small intestine
  - D. Is a polymer made up of phenylpropane units
  - E. Participates in the conjugation of glycine with cholic acid

7. Cholestyramine:
- A. Is an inhibitor of HMG CoA reductase
  - B. Has the ability to bind bile salts
  - C. Can be hydrolyzed by the enzymes in the gastrointestinal tract to cholesterol and tyramine
  - D. Can be converted to bile acids in the liver
  - E. Causes a decrease in the activity of mevalonate kinase
8. One of the following is considered to have antioxidant action:
- A. Myeloperoxidase
  - B. Orexin
  - C. Catalase
  - D. Linetin
  - E. Epoxide hydratase
9. An individual is consuming a daily average of 250 grams of digestible carbohydrate, 10 grams of cellulose, 50 grams of protein, 50 grams of fat and a glass of wine containing 8 grams of alcohol. His total daily energy intake is approximately:
- A. 1650 calories
  - B. 1700 calories
  - C. 1750 calories
  - D. 1800 calories
  - E. 1850 calories

10. An individual wants to lose four pounds of body weight. This amounts to a total reduction in consumption of:
- A. 11600 Calories
  - B. 12800 Calories
  - C. 14000 Calories
  - D. 15200 Calories
  - E. 16400 Calories
11. Which one of the reactions occurs as light strikes the retina?
- A. Rhodopsin all trans-retinal + opsin
  - B. Retinol retinal
  - C. Rhodopsin 11-cis retinal + opsin
  - D. Retinal retinoic acid
  - E. Rhodopsin retinol + opsin
12. The post translational modification of specific glutamate residues to gamma carboxyl glutamate residues in osteocalcin of bone requires the participation of:
- A. Phytyl menaquinone
  - B. Tocotrienol
  - C. Cytochrome P450
  - D. Pyridoxine
  - E. Calcium
13. One of the following will be observed in a patient deficient in biotin:
- A. Defective oxidation of palmitate to acetyl CoA
  - B. Decreased formation of succinate to malate
  - C. Defective synthesis of palmitate from acetyl CoA
  - D. Nyctalopia
  - E. Decreased conversion of glycogen to glucose

14. Which one of the following can be converted to a vitamin in a normal healthy individual?
- A. Lysine
  - B. Threonine
  - C. Leucine
  - D. Tryptophan
  - E. Tyrosine
15. In humans methylene tetrahydrofolate is required for:
- A. Catabolism of purines
  - B. Conversion of pyruvate to oxaloacetate
  - C. Formation of taurine from cysteine
  - D. Conversion of uridylic acid to thymidylic acid
  - E. The activity of delta-amino levulinic acid synthetase
16. In humans eicosapentaenoic acid can be formed from dietary:
- A. Linoleic acid
  - B. Sterculic acid
  - C. Oleic acid
  - D. Linolenic acid
  - E. Palmitoleic acid
17. During fasting which one of the following cannot serve as a substrate for gluconeogenesis?
- A. Alanine
  - B. Pyruvate
  - C. Palmitate
  - D. Oxaloacetate
  - E. Fructose-1-phosphate

18. Microcephaly and microphthalmia are the characteristics of:
- A. Menke s disease
  - B. Fetal alcohol syndrome
  - C. Wilson s disease
  - D. Keshan disease
  - E. Refsum s disease
19. Human lactogen:
- A. Is one of the hormones secreted by the ovaries
  - B. Is a polymer of lactose units
  - C. Is a steroid hormone secreted by the fetus
  - D. Functions in the mammary gland to facilitate synthesis of milk sugar
  - E. Is a polypeptide hormone secreted by the placenta
20. In humans as a percent of body weight the lipid concentration is highest at:
- A. Birth
  - B. 4 months of age
  - C. One year of age
  - D. Two years of age
  - E. Three years of age

21. If the lactating mother's diet is deficient in protein, fat, calcium and lactose her milk:
- A. Volume secreted per day will be low
  - B. Protein content will be low
  - C. Fat content will be low
  - D. Calcium content will be low
  - E. Lactose content will be low
22. The full term new born infant decreased efficiency of:
- A. Starch digestion
  - B. Casein digestion
  - C. Sucrose digestion
  - D. Lactose digestion
  - E. Maltose digestion
23. In comparison to cow's milk, human milk contains:
- A. Less cysteine
  - B. More taurine
  - C. Less lactose
  - D. More protein
  - E. Less lactoferrin

24. Which one of the following when ingested in pharmacologic amounts (gram quantities) can lower plasma VLDL and LDL?
- A. Alpha tocopherol
  - B. Ascorbic acid
  - C. Flavonoids
  - D. A high carbohydrate diet
  - E. Niacin
25. A patient has been on total parenteral nutrition for several months. The level of hypoxanthine and xanthine in his blood and urine are increased. This is the sign of:
- A. Molybdenum deficiency
  - B. Selenium deficiency
  - C. Zinc deficiency
  - D. Chromium deficiency
  - E. Manganese deficiency
26. Thiamine pyrophosphate is required for the activity of:
- A. Amino acid conjugase
  - B. Pyruvate carboxylase
  - C. Transketolase
  - D. Phosphoenol pyruvate carboxykinase
  - E. NADPH oxidase



27. Individuals with hereditary fructose intolerance are deficient in the liver enzyme:
- A. Fructokinase
  - B. Fructose 1 phosphate aldolase
  - C. Triose kinase
  - D. Fructose 2, 6 biphosphatase
  - E. Fructose 1, 6 biphosphatase
28. Maple syrup urine disease is characterized by elevated levels in plasma of:
- A. Valine
  - B. Fructose
  - C. Lysine
  - D. Maltose
  - E. Threonine
29. A physician beginning a primary care adult practice today should expect what percentage of his patients to be elderly over the next 20 years, based simply on demographics?
- A. 10%
  - B. 25%
  - C. 40%
  - D. 55%
  - E. 60%

30. The elderly often consume less food than younger adults because:
- A. They have decreased sense of taste
  - B. They get filled up quickly
  - C. They have lower energy needs
  - D. They have more dental problems
  - E. All of the above
31. The vitamin D requirement of the elderly is altered because they:
- A. Have reduced muscle mass
  - B. Have reduced bone density
  - C. Have high gastric pH
  - D. Have decreased immune function
  - E. Take more aspirin than younger people
32. Which of the following is NOT a major complication of diabetes mellitus?
- A. Peripheral neuropathy
  - B. Myocardial infarction
  - C. Pulmonary dysfunction
  - D. Stroke
  - E. Nephropathy
33. The strongest rationale for treating type 2 diabetes is:
- A. Improving insulin action
  - B. Losing weight
  - C. Increasing blood cell number
  - D. Improving eye sight
  - E. Eliminating dietary carbohydrate

34. Goal(s) of nutritional therapy of diabetes is(are):
- A. Improving serum lipid profile
  - B. Weight management
  - C. Normal body growth and development
  - D. All of the above
  - E. None of the above
35. Which one of the following statements about vitamin D is CORRECT?
- A. It is synthesized in the small intestine
  - B. Plant-derived vitamin D (and its metabolites) is not as potent as vitamin D and metabolites from animal sources.
  - C. 1,25-dihydroxyvitamin D (calcitriol) is the most biologically active form
  - D. 25 hydroxyvitamin D is the most biologically active form
  - E. It is important for cardiac muscle function
36. Osteoporosis is most common in:
- A. African-American men older than age 70
  - B. Post-menopausal non-Hispanic white women
  - C. Asian teenagers
  - D. School teachers
  - E. People from the upper peninsula
37. Which one of the following drug therapies is NOT associated with an increased likelihood of osteoporosis?
- A. Anticonvulsants
  - B. Thyroxine
  - C. Estrogen
  - D. Corticosteroids
  - E. Anticoagulants

38. The first attack of gouty arthritis most commonly affects the following joints or joint areas:
- A. Small joints of the hands or wrists
  - B. The spine, especially the lumbar area
  - C. Joints of the feet and ankles
  - D. Shoulders
  - E. Hips
39. Which of the following medications can interfere with renal excretion of uric acid and thereby increase the risk of an attack of gouty arthritis?
- A. Glucocorticoids like prednisone
  - B. Colchicine
  - C. Allopurinol
  - D. Estrogens
  - E. Diuretics
40. Gouty arthritis, in its most common form, affects the following groups:
- A. Adult human males
  - B. Pre-menopausal human females
  - C. Adult birds
  - D. Dalmatian dogs
  - E. Members of the royal families of Europe

41. Dietary intake of which one of the following can have the most effect in raising plasma cholesterol?
- A. Myristic acid
  - B. Butyric acid
  - C. Erucic acid
  - D. Vaccenic acid
  - E. Rapeseed oil
42. Cysteine is present in which one of the following?
- A. Leukotriene A<sub>4</sub>
  - B. Thromboxane B<sub>2</sub>
  - C. Leukotriene B<sub>4</sub>
  - D. Prostacyclin I<sub>3</sub>
  - E. Leukotriene E<sub>5</sub>
43. The ingestion of unripe ackee fruit causes vomiting sickness because of the presence of which of the following in the fruit?
- A. Tyramine
  - B. Hypoglycin
  - C. Thiaminase
  - D. Acetaldehyde
  - E. Avidin
44. Excess energy intake accompanied by obesity is associated with higher plasma cholesterol levels because obesity causes:
- A. increase in the activity of key rate-limiting enzyme of cholesterol biosynthesis
  - B. Decrease in hepatic LDL receptor activity
  - C. Increase in the liver production of VLDL fraction
  - D. Decrease in the conversion of cholesterol to cholic acid
  - E. Increase in the formation of HDL cholesterol fraction.

45. The urine of a patient was found to contain excessive amounts of hippuric acid. It suggests that this patient:
- A. Consumed food containing fava beans
  - B. Is more likely to be deficient in manganese
  - C. Consumed food containing the additive sodium benzoate
  - D. Is more likely to be deficient in selenium
  - E. Consumed food containing sweet clover

MATCHING ITEMS

In each of the following groups there are two numbered lists. Mark on the answer sheet in the line corresponding to each question number in the lower list (46-65) the letter of the related item of the upper list.

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 46-47.

- A. Acetyl transferase
- B. Glycosyl transferase
- C. N-methyl transferase
- D. Glucuronyl transferase
- E. 15,15 dioxygenase

46. Which of the following participates in the detoxication of bilirubin?

47. Which of the following participates in the detoxication of sulfa drugs?

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 48-49.

- A. Orange peel
- B. Potatoes
- C. Spinach
- D. Wheat
- E. Lima beans

48. Solanine is found in:

49. Gluten is found in:

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 50-51.

- A. Cytochrome C
- B. Hemosiderin
- C. Carbonic anhydrase
- D. Cytochrome c oxidase
- E. Glucose tolerance factor

50. Copper is part of:

51. Zinc is part of:

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 52-53.

- A. Nicotinamide Adenine Dinucleotide
- B. Coenzyme A
- C. Biotin
- D. Pantothenic acid
- E. Pyridoxal phosphate

52. Aspartate amino transferase requires which of the following for its activity:

53. Glutamate decarboxylase requires which of the following for its activity:



DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 54-55.

- A. Anagyrine
- B. Thyroxine
- C. Coenzyme Q
- D. Flavonoids
- E. Lipoxin

54. The following contains the trace element iodine:

55. The following increases the conversion of riboflavin to flavin mononucleotide?

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 56-57.

- A. Vitamin E
- B. Conjugase
- C. Niacin
- D. Ascorbic acid
- E. Beta carotene

56. It inhibits the formation of nitrosamine from nitrite.

57. It facilitates the absorption of dietary iron

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 58-59.

- A. Eicosatrienoic Acid
- B. Eicosapentaenoic acid
- C. Docosahexaenoic acid
- D. Arachidonic acid
- E. Dihomogamalinolenic acid

58. Is a direct precursor of prostacyclin I<sub>2</sub>

59. Is a precursor of leukotriene D<sub>4</sub>

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 60-61.

- A. Pantothenic acid
- B. Methyl cobalamine
- C. Pyridoxal phosphate
- D. Adenosyl cobalamine
- E. NAD

60. The conversion of homocysteine to methionine requires the participation of:

61. The conversion of propionyl CoA to succinyl CoA requires the participation of:

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 62-63.

- A. Oleic acid
- B. Linoleic acid
- C. Manganese
- D. Chromium
- E. Selenium

62. Dermatitis is one of the signs of deficiency of:

63. Keshan disease is associated with the deficiency of:

DIRECTIONS: Select the option (A-E below) which best fits the descriptions numbered 64-65.

- A. Methyl azoxymethanol
- B. Dicoumarol
- C. Oxalate
- D. Phytic acid
- E. Aminopropionitrile

64. The substance present in sweet clover that affects the function of a vitamin.

65. The substance that is structurally similar to inositol which has the ability to bind calcium ions.