

PathMD™: Board Review Letter

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Clinical Chemistry – Part 1

Volume 1, Number 7

1. Which forms of the elements Arsenic (As) and Mercury (Hg) are considered to be the most toxic?
 - A. All Arsenic and Mercury compounds are highly toxic
 - B. Inorganic Arsenic species such as As(III) and As(V), and inorganic Mercury species such as elemental mercury (Hg^0)
 - C. Organic Arsenic compounds such as arsenobetaine and arsenocholine, and organic Mercury compounds such as methyl Mercury (CH_3Hg^+)
 - D. Organic Arsenic compounds and inorganic Mercury species
 - E. Inorganic Arsenic species and organic Mercury compounds

2. Which of the following are often associated with Wilson's disease?
 - I. Elevated ceruloplasm levels.
 - II. The Presence of Kayser-Fleisher rings
 - III. The Presence of Mees' Lines
 - IV. Increased Free Serum Copper
 - V. Low Urine Serum copper
 - A. all of the above
 - B. I and V.
 - C. II and IV.
 - D. I, III and V.
 - E. IV and V.

3. Which of the following elements are found predominately in erythrocytes while in circulation?
 - A. Organic Mercury compounds.
 - B. Cadmium
 - C. Copper
 - D. Lead
 - E. B and D

4. Which set of elements are all considered to be essential trace elements?
 - A. Selenium, Cobalt, Lead, Cadmium, Zinc, Iron, Nickel
 - B. Mercury, Selenium, Zinc, Iron
 - C. Molybdenum, Selenium, Zinc, Nickel
 - D. Arsenic, Mercury, Iron, Nickel, Manganese
 - E. Mercury, Cadmium, Lead, Cobalt

5. What is the most appropriate sample type for diagnosing suspected acute arsenic exposure in the previous 3 days.
 - A. Whole Blood
 - B. Serum
 - C. EDTA Plasma
 - D. Urine
 - E. Hair samples

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6. Suppose a hypothetical serum marker “factor X” was discovered to be elevated in cases hepatocellular carcinoma (HCC). Two different plate-based ELISA tests for factor X were developed, test A and test B. Examine the ROC curve of the factor X concentration cutoffs (factor X concentration above which a sample is called positive), and determine the most effective test for the detection of HCC and the best “factor X” cutoff concentration. (See Image #1 on the website for this question set)

- A. 85 mg/L using Test A
- B. 100 mg/L using Test A
- C. 85 mg/L using Test B
- D. 100 mg/L using Test B

7. Suppose a study was performed using a third assay for factor X on a group of 1500 individuals with elevated liver enzymes. The prevalence of HCC was 10% in this population. Of the patients with confirmed HCC, 120 were identified as positive by this assay. Unfortunately 150 patients who did not have HCC were also classified as positive by factor X testing. What is the sensitivity (%) of this test?

- A. 10%
- B. 11%
- C. 80%
- D. 89%
- E. 90%

8. What is the specificity (%) of the test described in question 7.

- A. 10%
- B. 11%
- C. 80%
- D. 89%
- E. 90%

9. What is the positive predictive value (%) of the test described in question 7.

- A. 44%
- B. 40%
- C. 56%
- D. 15%
- E. 85%

10. If the same test were performed on an apparently healthy population with a HCC prevalence of 1.0% which of the following values would you expect to change.

- A. Specificity
- B. Sensitivity
- C. Positive predictive value
- D. There would be no change in expected specificity, sensitivity and positive predictive values.
- E. The specificity, sensitivity, and positive predicative value would all change.