Van Leeuwen: Davis’s Comprehensive Manual of Laboratory and Diagnostic Tests with Nursing Implications, 8e

**Rationales**

**Multiple Choice**

1. A nurse is caring for a patient with a diagnosis of chronic myelogenous leukemia (CML). The patient was admitted to an acute care unit with a temperature of 100.4°F (38°C) and weight loss over the past 2 to 3 months. The nurse notes that the patient’s white blood cell (WBC) count is 23 × 103/microL (SI = 23 × 109/L), and the physical examination shows splenomegaly. The priority nursing intervention should be:

1. avoiding falls.

2. managing pain.

3. preventing infection.

4. promoting adequate nutrition.

ANS: 3

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|   | Feedback |
| 1. | This is incorrect. Although avoiding falls is important, it is not the main priority for a patient presenting with a diagnosis of CML and leukocytosis. Preventing opportunistic infections should be the priority. |
| 2. | This is incorrect. Although managing pain is important, it is not the main priority for a patient presenting with a diagnosis of CML and leukocytosis. Preventing opportunistic infections should be the priority. |
| 3. | This is correct. The nurse’s priority should be planning interventions to prevent opportunistic infections for the patient with CML and significant leukocytosis. |
| 4. | This is incorrect. Although promoting adequate nutrition is important, it is not the main priority for a patient presenting with a diagnosis of CML and leukocytosis. Preventing opportunistic infections should be the priority. |

2. A patient with diabetes requires assessment of long-term glucose control. Which test would be most appropriate for this patient?

1. Glycated hemoglobin (Hgb)

2. Glucose

3. Glucose-6-phosphate dehydrogenase (G6PD)

4. Glucose tolerance test

ANS: 1

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|   | Feedback |
| 1. | This is correct. Glycated hemoglobin is used to indicate long-term glycemic management.  |
| 2. | This is incorrect. Glucose levels are used to assist in the diagnosis of diabetes and to evaluate disorders of carbohydrate metabolism such as malabsorption syndrome |
| 3. | This is incorrect. Glucose-6-phosphate dehydrogenase is used to identify an enzyme deficiency that can result in hemolytic anemia. |
| 4. | This is incorrect. The glucose tolerance test is used to evaluate blood glucose levels to assist in diagnosing diabetes.  |

3. A nurse notes that a patient has a urine pH of 7.2. Which information in the patient’s history may be related to this result?

1. Maintaining a vegetarian diet

2. Training for a marathon

3. Recent febrile illness

4. Use of cranberry supplements daily

ANS: 1

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|   | Feedback |
| 1. | This is correct. Vegetarian diets may result in an elevated urine pH. |
| 2. | This is incorrect. Metabolic or respiratory acidosis that may result from intense physical training results in a lower pH. |
| 3. | This is incorrect. Although febrile illness increases urine glucose ketones, it does not influence pH. |
| 4. | This is incorrect. Ingestion of cranberries decreases urine pH and therefore would not result in an elevated pH. |

4. A patient with pernicious anemia has a laboratory order to test for intrinsic factor (IF) antibodies. A nurse scheduling this test should instruct the patient to:

1. begin a bowel prep 24 hours prior to the examination.

2. eliminate red meat from the diet for 72 hours before the test.

3. take nothing by mouth for 12 hours before the test is to take place.

4. withhold vitamin B12 for 2 weeks before the test is to take place.

ANS: 4

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|   | Feedback |
| 1. | This is incorrect. Bowel prep is not needed prior to this test. |
| 2. | This is incorrect. There are no food restrictions unless by medical direction. |
| 3. | This is incorrect. There are no food or fluid restrictions unless by medical direction. |
| 4. | This is correct. Administration of B12 should be withheld 2 weeks before testing because B12 can invalidate the results. |

5. A nurse observes that a patient admitted to the emergency department with decreased level of consciousness has urine with a very fruity odor. Based on this observation, the nurse should plan interventions to manage:

1. alcohol withdrawal.

2. diabetic ketoacidosis (DKA).

3. fibromyalgia.

4. Lyme disease.

ANS: 2

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|   | Feedback |
| 1. | This is incorrect. Excessive alcohol use may lead to ketoacidosis, but alcohol withdrawal will not. |
| 2. | This is correct. Elevated levels of ketone bodies are evidenced by fruit-smelling breath and therefore the nurse should plan interventions to manage the diabetic ketoacidosis. |
| 3. | This is incorrect. Fibromyalgia does not influence the level of ketones in urine. |
| 4. | This is incorrect. Lyme disease does not influence the level of ketones in urine. |

6. A patient must undergo pulmonary angiography but has a history of allergic reaction to some medications. Which of the following actions should be taken in response to this finding?

1. Remove all metallic objects from the area to be examined.

2. Administer an antianxiety agent, as ordered.

3. Use a nonionic contrast medium.

4. Notify the health-care provider (HCP) to cancel the procedure.

ANS: 3

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|   | Feedback |
| 1. | This is incorrect. Removal of all metallic objects is a standard intervention before any x-ray imaging. |
| 2. | This is incorrect. The nurse can administer an antianxiety agent, as ordered, but this will not influence the risk of an allergic reaction. |
| 3. | This is correct. Use of nonionic contrast may be considered for patients who have experienced allergic reactions to medications in the past. |
| 4. | This is incorrect. There is no need to cancel the procedure because a nonionic contrast medium can be used. |

7. A patient’s laboratory test results following amniotic fluid analysis indicate elevated α1-fetoprotein (AFP) levels and presence of acetylcholinesterase (AChE). Which of the following conditions should the nurse most suspect given these findings?

1. Respiratory distress syndrome

2. Fetal hemolytic disease

3. Neural tube defect

4. Fetal immaturity

ANS: 3

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|   | Feedback |
| 1. | This is incorrect. A lecithin/sphingomyelin ratio of less than 2:1 and absence of phosphatidylglycerol at term indicate fetal lung immaturity and possible respiratory distress syndrome. |
| 2. | This is incorrect. Elevated bilirubin levels indicate fetal hemolytic disease. |
| 3. | This is correct. Elevated AFP levels and presence of AChE indicate a neural tube defect. |
| 4. | This is incorrect. Creatinine concentration greater than 2 mg/dL (greater than 176.8 micromol/L) indicates fetal maturity (at 36 to 37 weeks) if maternal creatinine is also within the expected range. |

8. A college student who is admitted to the hospital with newly diagnosed type 1 diabetes has a C-peptide level of 0.6 ng/mL (SI = 0.2 nmol/L) and serum glucose level of 256 mg/dL (SI = 14.2 mmol/L). Based on these results, which instruction should the nurse provide to this patient?

1. “Based on these results, your diabetes will be controlled by oral medications and diet.”

2. “If you lose weight, you may be able to manage your diabetes with diet alone.”

3. “Because you are already an adult, this result confirms that you have type 2 diabetes.”

4. “You will need to take insulin for the rest of your life.”

ANS: 4

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|   | Feedback |
| 1. | This is incorrect. A low C-peptide indicates insufficient production of insulin by the pancreas and therefore insulin is necessary. |
| 2. | This is incorrect. Type I diabetes requires insulin and cannot be managed with diet alone. |
| 3. | This is incorrect. C-peptide levels are typically increased in type 2 diabetes.  |
| 4. | This is correct. A low C-peptide indicates type 1 diabetes with an elevated blood glucose, so the nurse should instruct the patient that insulin will be required. |

9. Which laboratory test should a nurse monitor to determine whether a patient is responding to the administration of iron for iron-deficiency anemia?

1. Eosinophils

2. Lymphocytes

3. Monocytes

4. Reticulocytes

ANS: 4

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|   | Feedback |
| 1. | This is incorrect. Eosinophil count is used to assist in the diagnosis of conditions related to immune responses, such as asthma, dermatitis, and hay fever and also assist in the identification of parasitic infections. |
| 2. | This is incorrect. Lymphocytes are white blood cells produced in the bone marrow and thymus and are used to assess infection. |
| 3. | This is incorrect. Monocytes are white blood cells that are used to assess infection.  |
| 4. | This is correct. If the patient is responding to the administration of iron for iron-deficiency anemia, the nurse would expect to see increased reticulocytes, immature red blood cells produced by the bone marrow. |

10. A patient has had an indwelling urinary catheter inserted to collect urine for a 24-hour creatinine clearance test. To begin the test, the nurse should:

1. collect all urine during any 24-hour period by labeling the drainage collection bag with the date and time most recently emptied.

2. clamp the urinary catheter and then drain all urine into the container specified by the laboratory and repeat every 6 hours times 4.

3. empty all urine in the urinary drainage bag at 0600 and then save all urine until the next day at 0600.

4. increase meat portions in the diet for at least 48 hours prior to the planned start of the collection.

ANS: 3

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|   | Feedback |
| 1. | This is incorrect. The collection bag should include the urine total volume, test start and stop times/dates, and any medications that may interfere with test results. |
| 2. | This is incorrect. All urine voided for the 24-hour collection period must be included in one collection or else inaccurate results may be obtained. |
| 3. | This is correct. The accuracy of the creatinine clearance test requires careful collection of urine over a defined 24-hour period, so the nurse must empty all urine in the urinary drainage bag or, if the patient is not catheterized, ask the patient to void and discard the first specimen at 0600. Then save all urine until the next day at 0600. |
| 4. | This is incorrect. Meat is metabolized to creatinine and excreted by the kidneys and therefore may invalidate results.  |

11. A nurse is preparing to assist with performing a lumbar puncture to collect a specimen for diagnosis of Alzheimer disease. Which position should the nurse ask the patient to assume for this test?

1. Knee-chest

2. Side-lying

3. Prone

4. Standing

ANS: 1

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|   | Feedback |
| 1. | This is correct. To perform a lumbar puncture, position the patient in the knee-chest position at the side of the bed. Provide pillows to support the spine or for the patient to grasp. |
| 2. | This is incorrect. The side-lying position is not appropriate for this test. |
| 3. | This is incorrect. The prone position is not appropriate for this test. |
| 4. | This is incorrect. The standing position is not appropriate for this test. |

12. Which blood tests should a nurse monitor to determine whether a patient’s blood level of warfarin [CA = warfarin sodium] is within the therapeutic range?

1. Activated partial thromboplastin time (aPTT)

2. Bleeding time

3. Platelet count and aPTT

4. Prothrombin time (PT) and international normalized ratio (INR)

ANS: 4

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|   | Feedback |
| 1. | This is incorrect. The aPPT time represents the time required for formation of a firm fibrin clot after tissue thromboplastin reagents and calcium are added to a plasma specimen. |
| 2. | This is incorrect. Bleeding time studies provide measurable responses that represent the time it might take for platelet closure to occur after a vascular injury. |
| 3. | This is incorrect. Platelet counts are used to assist in diagnosing and evaluating treatment for blood disorders and to evaluate coagulation status. aPTT is used to indicate factor deficiencies and assists in assessing coagulation disorders.  |
| 4. | This is correct. The PT and INR should both be monitored to determine the therapeutic range for a patient receiving warfarin. |

13. A nurse has just conducted hearing loss audiometry testing on a 10-year-old patient. The patient’s pure tone average was 52 dB. Which category of hearing of the American Speech-Language-Hearing Association (ASHA) does this result represent?

1. Normal

2. Slight loss

3. Moderate loss

4. Profound loss

ANS: 3

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|   | Feedback |
| 1. | This is incorrect. Normal range is −10 to 15 dB. |
| 2. | This is incorrect. Slight loss is 16 to 25 dB. |
| 3. | This is correct. Moderate loss is 41 to 55 dB. |
| 4. | This is incorrect. Profound loss is greater than 91 dB. |

14. A nurse has just administered an IV nucleotide to a patient before a gallium scan. The nurse should instruct the patient to return for the first scanning in how many hours, typically?

1. 6

2. 24

3. 48

4. 72

ANS: 1

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|   | Feedback |
| 1. | This is correct. After the IV radionuclide is administered, the patient is instructed to return for scanning at a designated time after injection. Typical scanning occurs at 6, 24, 48, 72, 96, and/or 120 hours post-injection, depending on diagnosis. |
| 2. | This is incorrect. The first scan occurs at 6 hours postinjection, depending on diagnosis. |
| 3. | This is incorrect. The first scan occurs at 6 hours postinjection, depending on diagnosis. |
| 4. | This is incorrect. The first scan occurs at 6 hours postinjection, depending on diagnosis. |

15. A nurse notes that a patient’s laboratory results show an acetylcholine receptor antibody (AChR) of 2.46 nmol/L. Based on this information, the nurse should assess this patient for clinical manifestations of:

1. malignant hyperprexia.

2. myasthenia gravis.

3. multiple myeloma.

4. muscular dystrophy.

ANS: 2

Page: 1

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|   | Feedback |
| 1. | This is incorrect. Malignant hyperprexia is a complication of general anesthesia. |
| 2. | This is correct. The nurse should assess the patient with an increased AChR level for clinical manifestations of myasthenia gravis because the muscle weakness associated with this disease is related to destruction of acetylcholine receptor sites. |
| 3. | This is incorrect. Multiple myeloma is assessed using albumin levels, and not AChR. |
| 4. | This is incorrect. Muscular dystrophy is assessed using aldolase levels, and not AChR. |

16. A patient is suspected of having increased risk for stroke. Which type of angiography should be performed to detect this condition?

1. Abdominal

2. Adrenal

3. Carotid

4. Coronary

ANS: 3

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|   | Feedback |
| 1. | This is incorrect. Abdominal angiography is used to visualize and assess abdominal organs/structure for tumor, infection, or aneurysm. |
| 2. | This is incorrect. Adrenal angiography is used to visualize and assess the adrenal gland for cancer or other tumors or masses, such as pheochromocytoma. |
| 3. | This is correct. Carotid angiography is used to visualize and assess the carotid arteries and surrounding tissues for abscess, tumors, and aneurysm and to evaluate for atherosclerotic disease related to stroke risk. |
| 4. | This is incorrect. Coronary angiography is used to visualize and assess the heart and surrounding structures for abnormalities, defects, aneurysm, and tumors and to diagnose coronary artery disease. |

17. Which factor in a patient’s history may be associated with a decreased creatine kinase (CK) level?

1. Sedentary lifestyle

2. Alcoholism

3. Hypothyroidism

4. Surgery

ANS: 1

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|   | Feedback |
| 1. | This is correct. Sedentary lifestyle is associated with a decreased CK level. |
| 2. | This is incorrect. Alcoholism is associated with an increased CK level. |
| 3. | This is incorrect. Hypothyroidism is associated with an increased CK level. |
| 4. | This is incorrect. Surgery is associated with an increased CK level. |

18. A nurse is preparing to administer a radionuclide to an adult patient for a gastroesophageal reflux scan. With what should the nurse mix the radionuclide?

1. Orange juice

2. Milk

3. Water

4. Soda

ANS: 1

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|   | Feedback |
| 1. | This is correct. The nurse should mix the radionuclide with orange juice and have the patient drink it. |
| 2. | This is incorrect. The nurse should mix the radionuclide with orange juice, not milk, and have the patient drink it. |
| 3. | This is incorrect. The nurse should mix the radionuclide with orange juice, not water, and have the patient drink it. |
| 4. | This is incorrect. The nurse should mix the radionuclide with orange juice, not soda, and have the patient drink it. |

19. A patient is suspected of having multiple myeloma and needs to undergo testing to identify the individual types of immunoglobulins present to confirm a diagnosis. Which test would be most appropriate for this purpose?

1. Immunofixation electrophoresis (IFE)

2. Immunoglobulin E (IgE)

3. Immunoglobulin A (IgA)

4. Immunosuppressant cyclosporine [CA = ciclosporine]

ANS: 1

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| --- | --- |
|   | Feedback |
| 1. | This is correct. IFE is used to identify the individual types of immunoglobulins, to aid in diagnosing diseases such as multiple myeloma, and to evaluate effectiveness of chemotherapy |
| 2. | This is incorrect. IgE testing is used to assess IgE levels to identify the presence of an allergic or inflammatory immune response, such as in hay fever. |
| 3. | This is incorrect. IgA testing is used to evaluate patients suspected of IgA deficiency prior to transfusion and to evaluate anaphylaxis associated with the transfusion of blood and blood products (anti-IgA antibodies may develop in patients with low levels of IgA, possibly resulting in anaphylaxis when donated blood is transfused). |
| 4. | This is incorrect. Testing of the immunosuppressant cyclosporine [CA = ciclosporine] is done to assist in the management of treatments to prevent organ rejection and to monitor for toxicity. |

20. A patient with a history of hypertension has a serum creatinine level of 1.9 mg/dL (SI = 168 micromol/L). When assessing this patient, a nurse should interpret these results as an indication this patient may have:

1. early signs of renal insufficiency.

2. evidence of severe kidney dysfunction.

3. hypertension secondary to kidney disease.

4. normal kidney function.

ANS: 1

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|   | Feedback |
| 1. | This is correct. The nurse should interpret these results as an indication that the patient may have early signs of renal insufficiency. |
| 2. | This is incorrect. Kidney disease is present at levels greater than 3 mg/dL. |
| 3. | This is incorrect. Although hypertension may result from renal insufficiency, additional testing is needed to confirm hypertension. |
| 4. | This is incorrect. Serum creatinine levels are elevated and indicate early signs of renal insufficiency.  |

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1189. The nurse is assisting with the collection of a Pap (Papanicolaou) smear. Place the following steps in their proper order to ensure appropriate results.

1. Assist patient into the lithotomy position.

2. Fix specimens with liquid ethanol.

3. Place specimens on a glass slide.

4. Instruct the patient to void.

ANS: 4, 1, 3, 2

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1. Instruct the patient to void. 2. Assist patient into the lithotomy position. 3. Place specimens on a glass slide. 4. Fix specimens with liquid ethanol.

Feedback: Have the patient void before the procedure. Assist the patient into a lithotomy position on a gynecological examination table (with feet in stirrups). Drape the patient’s legs. A plastic or metal speculum is inserted into the vagina and is opened to gently spread apart the vagina for inspection of the cervix. The speculum may be dipped in warm water to aid in comfortable insertion. After the speculum is properly positioned, the cervical and vaginal specimens are obtained. A synthetic fiber brush is inserted deep enough into the cervix to reach the endocervical canal. The brush is then rotated one turn and removed. A plastic or wooden spatula is used to lightly scrape the cervix and vaginal wall. Both specimens that are on the brush and spatula are then plated on the glass slide. The brush specimen is plated using a gentle rolling motion, whereas the spatula specimen is plated using a light gliding motion across the slide. The specimens are immediately fixed to the slide with a liquid or spray containing 95% ethanol. The speculum is removed from the vagina. A pelvic and/or rectal exam is usually performed after specimen collection is completed.

1190. A nurse is performing venipuncture for several laboratory orders. If all of these tubes are required, indicate the order in which the nurse should fill the specimen tubes. Number each option in the correct order of draw from first (1) to last (6).

\_\_ Green-top (heparin) tube

\_\_ Gray-top (fluoride) tube

\_\_ Lavender-top (EDTA) tube

\_\_ Light-blue-top (citrate) tube

\_\_ Red-top tube

\_\_ Blood culture tube

ANS:

4. Green-top (heparin) tube

6. Gray-top (fluoride) tube

5. Lavender-top (EDTA) tube

2. Light-blue-top (citrate) tube

3. Red-top tube

1. Blood culture tube

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Feedback: The order of the draw always begins with blood cultures, followed by the coagulation studies light-blue-top tubes, plain or nonadditive red-top tubes, green-top (heparin) tubes, lavender-top (EDTA) tubes, and gray-top (fluoride) tubes to prevent the carryover of additives that could alter test results. If a nurse is unsure of the order of the draw, reviewing institutional policy or consulting with the laboratory should occur prior to beginning the specimen-collection process.

1191. The nurse is providing instructions for a patient who will undergo a gastric acid analysis to help determine optimal treatment for symptoms of ulceration. Place the following steps in sequential order as they would be explained to the patient for the testing.

1. Insert gastric tube.

2. Apply constant gentle suction.

3. Verify placement with fluoroscopy.

4. Provide gastric stimulant medication.

5. Collect four specimens at 15-min intervals.

6. Collect gastric contents without sending sample.

ANS: 1, 3, 2, 6, 4, 5

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1. Insert gastric tube. 2. Verify placement with fluoroscopy. 3. Apply constant gentle suction. 4. Collect gastric contents without sending sample. 5. Provide gastric stimulant medication. 6. Collect four specimens at 15-min intervals.

Feedback: A cold lubricated gastric (Levine) tube is inserted orally. Alternatively, if the patient has a hyperactive gag reflex, the tube can be inserted nasally. The tube must have a radiopaque tip. Fluoroscopy or x-ray is used to confirm proper position of the tube before the start of the test.

Using a constant but gentle suction, gastric contents are collected. Do not use specimens obtained from the first 15 to 30 min of suctioning. The gastric stimulant is administered, and the peak basal specimens are collected over a 60-min period as four 15-min specimens. Number the specimen tubes in the order in which they were collected. Promptly transport the specimen to the laboratory for processing and analysis.

1192. Below are the steps for performing an A-scan ultrasound. Put them in the correct order.

\_ 1. Instill topical anesthetic in each eye, as ordered.

\_ 2. The ultrasound probe is positioned on the patient’s eye.

\_ 3. A reading is automatically taken.

\_ 4. Instruct the patient to look straight ahead, keeping the eyes open and unblinking.

\_ 5. Seat the patient comfortably.

\_ 6. Ask the patient to place the chin in the chin rest and gently press the forehead against the support bar.

ANS: 5, 4, 1, 6, 2, 3

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Feedback: The steps for performing an A-scan ultrasound are as follows: 1. Seat the patient comfortably. 2. Instruct the patient to look straight ahead, keeping the eyes open and unblinking. 3. Instill topical anesthetic in each eye, as ordered. 4. Ask the patient to place the chin in the chin rest and gently press the forehead against the support bar. 5. The ultrasound probe is positioned on the patient’s eye. 6. A reading is automatically taken.

------ End -----