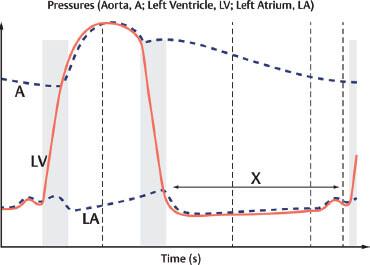
Introduction Text:

The quiz has 20 questions. Two minutes is allowed for each question. For each incorrect response you will be asked a follow-up question asking why you thought you got the question incorrect. At the end of the quiz, there is a brief survey, which should take about 5 minutes.

1. A 48-year-old woman visited her physician complaining of constant thirst and frequent urination. She was admitted to the hospital to determine the cause of her polydipsia and polyuria. She was not given fluids for 6 h, and no change in her urine osmolarity was measured during this time. When given an infusion of a non pressor dose of an antidiuretic hormone (ADH) agonist, she experienced a rapid increase in urine osmolarity. What diagnosis is most likely to account for the woman’s polydipsia and polyuria?
2. Central diabetes insipidus
3. Compulsive overconsumption of water
4. Nephrogenic diabetes insipidus
5. Type 1 diabetes mellitus
6. Type 2 diabetes mellitus
7. A 61-year-old man with a previous myocardial infarction presents with shortness of breath and fatigue. An electrocardiogram is ordered. The trace reveals wide QRS complexes in all leads. Which of the following changes to cardiac innervation or conduction is most likely responsible for the wide QRS complexes?
8. Decreased parasympathetic innervation to the heart
9. Decreased conduction rate along the bundle branches
10. Decreased conduction rate from the SA node to the AV node
11. Sinus bradycardia
12. Sinus tachycardia
13. A 55-year-old man presents with complaints of dizziness and shortness of breath on exertion. The physician detects a heart murmur heard during the portion of the cardiac cycle labeled X on the image. Which of the following heart valve pathologies would most likely produce this murmur?



1. Aortic valve stenosis
2. Mitral valve stenosis
3. Pulmonic valve stenosis
4. Tricuspid valve regurgitation
5. Mitral valve regurgitation
6. A patient with right heart failure presents with shortness of breath. Tests reveal right ventricular hypertrophy, a systolic murmur, and pitting leg edema. There is no indication of left ventricular failure. Which of the following hemodynamic changes is expected in the pulmonary capillaries?
7. Decreased pulmonary capillary hydrostatic fluid pressure
8. Decreased pulmonary interstitial colloid osmotic pressure
9. Decreased pulmonary capillary filtration coefficient
10. Increased pulmonary interstitial hydrostatic fluid pressure
11. Increased pulmonary capillary colloid osmotic pressure
12. A 75-year-old woman complains of bilateral temporal hemianopsia, and imaging of the head reveals a suprasellar granular cell tumor. The tumor is excised, and immunohistochemical studies using biomarkers are performed in order to determine the tumor cell origin. A positive reaction for which of the following hormones would indicate that the tumor is of neuroectodermal origin?
13. Adrenocorticotropic hormone
14. β-endorphin
15. Luteinizing hormone
16. Oxytocin
17. Thyroid-stimulating hormone
18. A 21-year-old woman presents with weight loss, nervousness, sweating, and fatigue. Her neck examination shows a soft, diffuse, nonnodular mid-line mass that is mobile on swallowing. Mild exophthalmia is also noted. Her resting pulse is 100/min and blood pressure 135/90 mm Hg. The patient’s thyroid function tests are below. What is the most likely diagnosis?

| Variable | Patient’s Data | Normal Range |
| --- | --- | --- |
| Serum TSH | 0.2 mU/ | (0.5–5.0 mU/L) |
| Total thyroxine (TT4) | 14 μg/d | (5–12 μg/dL) |

1. Addison’s disease
2. Conn’s disease
3. Cushing’s disease
4. Graves’ disease
5. Hashimoto’s disease
6. A 50-year-old man presents with headache and weakness for several weeks. On investigation, he is hypertensive and hypokalemic. Serum aldosterone is elevated, so imaging is performed. The result shows an adenoma in the adrenal zona glomerulosa, so primary hyperaldosteronism is suspected. Additional tests are ordered. Which of the following changes to serum renin and serum angiotensin II would support the initial diagnosis?

|  | **Serum renin** | **Serum angiotensin II** |
| --- | --- | --- |
| **A.** | ↑ | ↑ |
| **B.** | ↓ | ↓ |
| **C.** | ↑ | ↓ |
| **D.** | ↓ | ↑ |
| **E.** | ↔ | ↔ |

1. **A.**
2. **B.**
3. **C.**
4. **D.**
5. **E.**
6. A 26-year-old woman is brought to the emergency department because of a 4-day history of flu-like symptoms accompanied by vomiting following each attempt to eat or drink. Her temperature is 38.5 C (101.3 F), pulse is 93/min, respirations are 24/min, and blood pressure is 105/70 mmHg. Physical examination shows no other abnormalities. Which of the following additional findings is most likely in this patient?
7. Decreased serum ADH (vasopressin) concentration
8. Increased serum aldosterone concentration
9. Increased serum atrial natriuretic peptide
10. Increased urine sodium and chloride concentrations
11. Increased urine volume
12. A 49-year-old man presents with a dry cough and progressively worsening dyspnea over 10-weeks. Physical exam reveals clubbed digits, and fine inspiratory crackles are heard on auscultation. A lung function test is ordered, and all lung volumes are reduced, but the FEV1 : FVC ratio is unchanged or slightly higher than normal. Based on the likely diagnosis, which curve or line on the figure most likely represents the expected changes reflecting the lung compliance in this patient?
13. **A.**
14. **B.**
15. **C.**
16. **D.**
17. **E.**



1. A teenage girl is found in a closed garage with her car running and with a suicide note on the seat. It is unknown how long she was exposed to carbon monoxide (CO), but she is breathing on her own and her skin color is cherry red. Which of the following findings is expected to be decreased in this girl?
   1. Alveolar PO2
   2. Arterial O2 concentration
   3. Arterial PCO2
   4. Arterial PO2
   5. Hemoglobin-oxygen affinity
2. Using the following table and assuming that renal perfusion pressure remains constant, which of the following combined changes in afferent and efferent arteriolar resistance would result in an immediate increase in renal plasma flow and glomerular filtration rate?

|  | Afferent Arteriole Resistance | Efferent Arteriole Resistance |
| --- | --- | --- |
| A | ↑ | ↑ |
| B | ↑ | ↓ |
| C | ↑ | ↔ |
| D | ↓ | ↓ |
| E | ↓ | ↔ |

1. A 35-year-old woman presents at the emergency department with flank pain and painful urination. Her ear temperature is 100.6 F and blood pressure is 155/73 mm Hg. Ultrasound reveals a bilateral hydronephrosis, and blood tests reveal a plasma creatinine of 3.1 mg/dL. Which of the following is the most likely cause of her hydronephrosis and elevated plasma creatinine level?
2. Adrenal medulla tumor
3. Blocked urethra
4. Hyperalbuminemia
5. Hypovolemia
6. Renal artery stenosis
7. A newborn was born with ambiguous external genitalia, indicating either an enlarged clitoris or a very small penis. The pediatrician ordered various newborn screening tests, using blood from a heel stick and karyotype analysis. The blood results came back 2 days later and showed some abnormality. The genetic test arrived 14 days later and revealed a 46 XX karyotype. Which of the following is the most likely abnormal result from the blood analysis?
8. 5α-reductase deficiency
9. 17α-hydroxylase deficiency
10. Down’s syndrome
11. Excess maternal androgens
12. Phenylketonuria
13. What force continues to drive blood through the vasculature during ventricular diastole?
14. Ventricular contraction forces blood into the vasculature during ventricular diastole
15. The elastic recoil of the stretched arterial walls provides the force to continue blood flow in the remaining vascular system during ventricular diastole
16. Sympathetic stimulation produces arterial vasoconstriction, which drives the blood forward into the arterioles during ventricular diastole
17. Skeletal muscle contraction squeezes the blood forward from the arteries during ventricular diastole
18. Respiratory movements produce pressure changes in the chest, which establishes a pressure gradient that drives blood forward from the arteries into the microcirculation
19. Which of the following could theoretically result in short stature?
20. Pituitary tumor making excess thyroid-stimulating hormone
21. Mutations that result in inactive IGF-1 receptors
22. Delayed onset of puberty
23. Decreased hypothalamic concentrations of somatostatin
24. Normal plasma GH but decreased feedback of GH on GHRH
25. Which of the following is *not* consistent with primary hyperparathyroidism?
26. Hypercalcemia
27. Increased plasma 1,25-(OH)2D
28. Increased urinary excretion of phosphate ions
29. A decrease in Ca2+ resorption from bone
30. An increase in Ca2+ reabsorption in the kidney
31. Development of normal female internal and external genitalia requires:
32. Anti-müllerian hormone
33. Expression of the SRY gene
34. Insensitivity to circulating testosterone
35. Complete absence of testosterone
36. Absence of a Y chromosome
37. Which is *not* characteristic of a normal postpubertal male?
38. Inhibin from the Sertoli cells decreases FSH secretion
39. Testosterone has paracrine effects on the Sertoli cells
40. Testosterone stimulates GnRH from the hypothalamus
41. Testosterone inhibits LH secretion
42. GnRH from the hypothalamus is released in pulses
43. When body sodium content is below normal:
44. More renin is secreted by the pituitary gland
45. Plasma aldosterone concentration decreases
46. Plasma angiotensin II concentration increases
47. Sodium excretion is increased
48. More sodium will be secreted by the proximal tubules
49. All of the following statements about ACTH are true EXCEPT:
50. It is a protein derived from pro-opiomelanocortin.
51. It binds principally to receptors on cells of the adrenal zona reticularis and zona fasiculata.
52. At high concentrations it stimulates melanocytes.
53. Its production is enhanced by cortisol.
54. It promotes the production of adrenal androgens.

**For each incorrect item, learners will be asked the following question:**

Would you say the reason for getting this question incorrect was:

1. I have not yet mastered the material in this topic
2. There is a problem with the wording of the item:
3. It contained academic vocabulary/medical terminology I did not know
4. The everyday language included complex wording
5. The structure of sentences / grammar was confusing
6. Other: [Please explain your concern with this question]

Demographic survey items at the end of the quiz:

1. Do you receive testing accommodations that provide you with extra time? Y/N
2. What is your sex? Female/Male:
3. What is your race/ethnicity?
   1. White
   2. Black or African American
   3. American Indian or Alaska Native
   4. Asian
   5. Native Hawaiian or Other Pacific Islander
   6. Some other race
   7. Hispanic or Latino
4. How do you rate your English language proficiency?
   1. Native Speaker
   2. Fluent
   3. Advanced
   4. Intermediate
   5. Basic
   6. Beginner

In what country were you and your parents born?

(Please select one response in each column.)

|  | You | Mother | Father |
| --- | --- | --- | --- |
| United States\* |  |  |  |
| Other country |  |  |  |

If you were **not** born in the United States, how old were you when you arrived in the United States?

(Please select from the drop-down menu to answer the question. If you were less than 12 months old, please select age “0-1” (age zero to one).

1. 0-23 months
2. 2-5 years
3. 6-10 years
4. 11-17 years
5. >18 years

What language did you speak or was spoken at home most of the time when growing up?

(Please select one response.)

English

Spanish

Other language