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Vendor:USMLE

Exam Code:USMLE

Exam Name:United States Medical Licensing
Examination

Version:Demo

QUESTION 1

A neonate does not pass meconium until 48 hours after his birth. Two weeks later his mother reports that he has not been passing stool regularly. Anorectal manometry reveals increased internal anal sphincter pressure on rectal distention with a balloon. Radiographic studies reveal massive dilation of the colon proximal to the rectum. The findings in this case indicate a developmental abnormality of which of the following embryonic tissues?

- A. Ectoderm
- B. Endoderm
- C. Neural crest
- D. Neural ectoderm
- E. Splanchnic mesoderm

Correct Answer: C

Explanation:

The infant has Hirschsprung disease, which is due to an absence of ganglion cells in the wall of the colon. Neural crest cells contribute to the formation of many adult structures. Among these are all of the postganglionic neurons of the autonomic nervous system and the sensory neurons of the peripheral nervous system. Ectoderm forms the epidermis of the skin and the parenchymal cells of glands associated with the skin, such as the sweat glands, sebaceous glands, and mammary glands. Endoderm forms the epithelial lining of the gut tube and the parenchymal cells of glands associated with the gut tube, such as the liver and pancreas. Neural ectoderm forms the CNS, the somatic motor neurons of the peripheral nervous system, and the preganglionic neurons of the autonomic nervous system. Splanchnic mesoderm forms the visceral peritoneum, the visceral pleura, the visceral pericardium, and the stroma and muscle of the wall of the gut, among other structures.

QUESTION 2

Thyroid Hormone T3 does not have which of the following functions?

- A. Stimulate bone development and growth
- B. Create beta-adrenergic responses
- C. Cause brain development
- D. Decrease calcium re-absorption

Correct Answer: D

QUESTION 3

A 5-year-old child, who has not had routine pediatric care, develops a febrile disease with cough and a blotchy rash and is brought to the emergency department. On physical examination, there is cervical and axillary lymphadenopathy. Also

noted is an erythematous, maculopapular rash behind the ears and along the hairline, involving the neck and, to a lesser extent, the trunk. Examination of this patient's oropharynx would most likely reveal which of the following lesions?

- A. Adherent thin, whitish patch on gingiva
- B. Cold sores on the lips
- C. Curdy white material overlying an erythematous base on the oral mucosa
- D. Large shallow ulcers on the oral mucosa
- E. Multiple small white spots on the buccal mucosa

Correct Answer: E

Explanation:

The question stem describes the typical presentation of measles (rubeola), which is caused by a Morbillivirus, an RNA virus belonging to the Paramyxovirus family. Koplik spots, which are pathognomonic for measles, are small, bluish-white spots on the buccal mucosa in the early stages of the disease. These lesions appear just before the onset of the characteristic rash (which can also involve the extremities) and fade as the rash develops. Leukoplakia is a premalignant condition characterized by adherent whitish patches on the gingiva and other sites in the oral cavity. Cold sores of the lips are due to infection with Herpes viruses. Candida infection (thrush) produces curdy white material loosely attached to an erythematous base. Aphthous ulcers are large shallow ulcers of the oral mucosa, commonly known as canker sores.

QUESTION 4

A 6-day-old breast-fed boy is brought to the emergency department by his mother because of poor weight gain and irritability since delivery, and a 2-hour history of vomiting. Physical examination shows jaundice and hepatomegaly. A reducing substance test result of the urine is positive, and a glucose oxidase test result is negative. The concentration of which of the following metabolites in liver is most likely increased in this patient?

- A. Fructose 1, 6-bisphosphate
- B. Galactose 1-phosphate
- C. Glucose 1-phosphate
- D. Glucose 6-phosphate

Correct Answer: B

QUESTION 5

Which of the following hormones causes increased atrial pressure and decreases sodium reabsorption in the kidneys?

- A. Atrial natriuretic peptide
- B. PTH

- C. Aldosterone
- D. Vasopressin

Correct Answer: A

QUESTION 6

Which of the following types of cytokines is secreted by macrophages?

- A. IL-1
- B. IL-2
- C. IL-3
- D. IL-4

Correct Answer: A

QUESTION 7

Which of the following is not true related to endotoxins?

- A. Endotoxins are secreted from cells.
- B. Can be linked to Meningococemia
- C. Produced by gram negative microorganisms
- D. Can cause fever

Correct Answer: A

QUESTION 8

A 42-year-old female comes to the emergency department with shortness of breath and palpitations. An ECG is obtained which reveals sustained ventricular arrhythmias which are found to be unresponsive to several medications. The attending physician finally prescribes bretylium. Bretylium works by

- A. acting as a magnesium analog
- B. blocking beta-1 receptors
- C. blocking calcium channels

- D. blocking potassium channels
- E. blocking sodium channels

Correct Answer: D

QUESTION 9

Which of the following syndromes corresponds to: can be caused by high doses of Tetracyclines?

- A. Dubin-Johnson syndrome
- B. Fanconi's syndrome
- C. Edward's syndrome
- D. Cri-du-chat syndrome

Correct Answer: B

QUESTION 10

Which of the following arteries if ruptured can cause an oculomotor palsy?

- A. ACA
- B. MCA
- C. PCA
- D. Lateral striate

Correct Answer: C

QUESTION 11

During a study of renal glomeruli, a healthy animal kidney is kept in a vascular bath preparation at a constant afferent arterial pressure of 100 mmHg. If the efferent arteriole is constricted with a vascular clamp, which of the following Starling forces is most likely to change in the glomeruli?

- A. Decreased filtration coefficient (Kf)
- B. Decreased hydrostatic pressure
- C. Decreased oncotic pressure

D. Increased hydrostatic pressure

E. Increased oncotic pressure

Correct Answer: D

QUESTION 12

A drug ending in the suffix (tidine) is considered a _____.

A. Antidepressant

B. Protease inhibitor

C. Beta antagonist

D. H2 antagonist

Correct Answer: D