USMLE-STEP-1 Q&As

United States Medical Licensing Step 1

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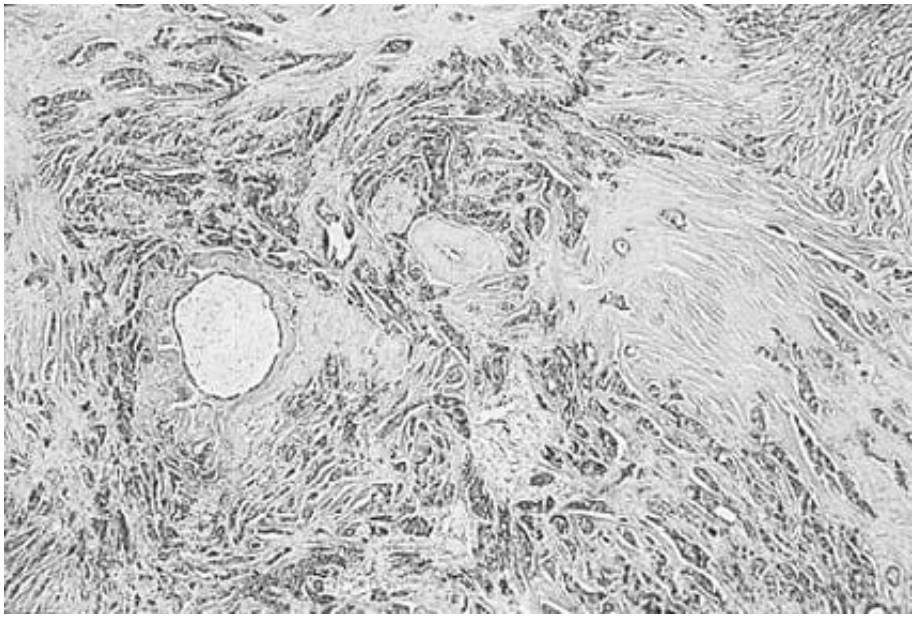
QUESTION 1

A 53-year-old woman recently noticed a firm, 2-cm nodule in her right breast during monthly self-examination. The histology of her breast biopsy tissue is displayed in below figure. Which of the following is an adverse prognostic indicator that may be seen with this disorder?



A. estrogen receptor positive

B. low S phase

C. overexpression of Her2/neu oncogene

D. progesterone receptor positive

E. well-differentiated histology, grade I of III

Correct Answer: C

Section: Pathology and Path physiology Overexpression of NEU oncogene in invasive breast carcinoma (shown in figure) is an adverse prognostic indicator. Breast cancers that are estrogen-receptor positive (choice A), have a low S phase (choice B), are progesterone-receptor positive (choice D), and are well differentiated (choice E), considered to have more favorable prognostic implications. Size of the primary breast carcinoma and the status of the axillary lymph nodes are also major factors that influence the prognosis of invasive ductal breast adenocarcinoma.

QUESTION 2

Altered plasma renin levels can occur in both normal and pathologic conditions. Which of the following states is associated with a decrease in plasma renin levels?

A. heart failure

B. primary aldosteronism

C. renal artery stenosis

D. salt restriction

E. upright posture

Correct Answer: B

Section: Physiology Most patients with primary aldosteronism (Conn syndrome) have an adrenal adenoma. The increased plasma aldosterone concentration leads to increased renal Na+ reabsorption, which results in plasma volume expansion. The increase in plasma volume suppresses renin release from the juxtaglomerular apparatus and these patients usually have low plasma renin levels. Secondary aldosteronism is due to elevated renin levels and may be caused by heart failure (choice A) or renal artery stenosis (choice C). Salt restriction (choice D) and upright posture (choice E) decrease renal perfusion pressure and therefore increase renin release from the juxtaglomerular apparatus.

QUESTION 3

In the brain, the amygdala plays an important role in emotional processing. Patients with lesion of the amygdala display impairment in enhanced perception of emotionally salient events. Which of the following is a major output pathway from the amygdala?

A. fasciculus arcuatus

B. fasciculus cuneatus

C. fasciculus of Vicq d\\'Azyr

D. fornix

E. stria terminalis

Correct Answer: E

Section: Anatomy The stria terminalis or fasciculus of Foville is one of the major output pathways from the amygdala to the septal, hypothalamic, and thalamic nuclei. Another main amygdaloid output pathway is the ventral amygdalofugal pathway. The fasciculus arcuatus (choice A) or superior longitudinal fasciculus is a bundle of fibers in the cerebrum connecting ipsilateral regions of the frontal, temporal, parietal, and occipital lobes. The fasciculus cuneatus (choice B) carries ascending sensory fibers in the dorsal funiculus of the spinal cord and terminates in the nucleus cuneatus of the medulla oblongata. The fasciculus of Vicq d\\'Azyr (choice C) or mammillothalamic tract connects the mammillary bodies to the anterior nuclei of the thalamus. This bundle of fibers forms part of Papez circuit, which is also involved in emotional processing. Another part of Papez circuit is the fornix (choice D), a large efferent pathway from the hippocampus.

QUESTION 4

Which of the following is useful in rheumatoid arthritis because it binds tumor necrosis factoralpha (TNFalpha)?

A. leflunomide

B. infliximab

C. methotrexate

D. paclitaxel

E. trastuzumab

Correct Answer: B

Section: Pharmacology Infliximab is a chimeric monoclonal antibody that binds TNF-alpha and is useful in rheumatoid arthritis, ulcerative colitis, and several other immune diseases. Leflunomide (choice A) inhibits ribonucleotide synthesis and thereby reduces T-cell proliferation. Methotrexate (choice C) is an antimetabolite that inhibits cell proliferation. It is useful in rheumatoid arthritis. Paclitaxel (choice D) is a microtubule-binding agent that is cytotoxic in certain neoplasms and slows restenosis in coronary stents. It is not used in autoimmune diseases. Trastuzumab (choice E) is an antibody to the human epidermal growth factor receptor and is useful in metastatic breast cancer.

QUESTION 5

A 45-year-oldman is admitted to the hospital for elective gastrointestinal surgery. On the third postoperative day, the patient experiences a fever of 101.5?, and reports having a slight cough, but is otherwise asymptomatic. Chest x-ray demonstrates a small, interstitial infiltrate in the left lower lobe. Three sets of blood cultures (two bottles each) are drawn and sent to the laboratory. Culture results report positive Staphylococcus epidermidis growth from one bottle of the first culture set, and negative growth from the second and third culture sets. Based on this information, which of the following is the best interpretation of these blood culture results?

A. intermittent bacteremia associated with postsurgical abscess formation

B. postoperative septicemia secondary to infective endocarditis

C. postoperative septicemia secondary to pneumonia

D. postoperative septicemia secondary to surgical manipulation of the gastrointestinal tract

E. skin flora contamination and not septicemia

Correct Answer: E

Section: Pathology and Path physiology True positive blood cultures are defined by positivity in multiple cultures in a series, whereas contaminates generally are not found in repeat cultures. For example, finding S. epidermidis (found in normal skin flora) in only one bottle of six in three blood culture sets (as in this patient) most probably represents skin contamination. If, however, S. epidermidis were isolated from all six bottles drawn from a patient suspected of having infectious endocarditis, this would be interpreted as a true positive. Thus, the results do not support a diagnosis of either bacteremia or septicemia (choices A through D).