Medical Technology

ASCP-BOC

ASCP Histotechnician (HT) Exam (ASCP BOC)

Latest Version: 6.0

Question: 1

Heat fixation should NOT be used for which of the following stains?

A. Capsular staining
B. Gram stain
C. Endospore staining
D. Acid-fast stain

Answer: A

Explanation:
Most bacteria produce a capsule or alvcocalyx, just outside the cell wall. This capsule is usually made up of Dolvsaccharides. Heat fixation will cause this moist slime laver to shrink. making it difficult to see once stained. Also heat fixing may cause a bacterial cell to shrink creating a clear zone around the cell that appears like a capsule when one does not truly exist. Therefore. when staining to view a bacterial capsule, a sample is air-dried and then a negative stain is generally used for visualization.

Question: 2

Which of the following is an example of a noncoagulant fixative?

A. Picric acid
B. Zinc salts
C. Ethanol
D. Formaldehyde

Answer: D

Explanation:
Coagulant fixatives allow solutions to readily enter into the interior of the tissue. but they destroy or distort cvtoplasmic organelles such as mitochondria and Ivsosomes. Noncoagulant fixatives. such as formaldehyde. cross-link the structural macromolecules of the tissue creating a gel that preserves organelles well but inhibits the penetration of solutions into the tissue.

Question: 3

Which of the following methods could be used to remove mercury pigment, a fixation artifact?

A. Treat the specimen with an iodine solution followed by bleaching with sodium thiosulfate
B. Treat the specimen with saturated alcoholic picric acid

C. Treat specimen with 10% ammonium hydroxide in 70% ethyl alcohol
D. Treat the specimen with 1% acid alcohol

Answer: A

Explanation:
Mercury Diament can be removed by treating the specimen with an iodine solution followed by bleaching with sodium thiosulfate. Formalin Diament and malarial Diament can both be removed by either treating the specimen with saturated alcoholic picric acid or by treating the specimen with 10% ammonium hydroxide in 70% ethyl alcohol. Chromic oxide pigment can be removed using 1% acid alcohol.

Question: 4

Which of the following fixative reagents causes tissue swelling?

A. Mercuric chloride
B. Picric acid
C. Acetic acid
D. Ethanol

Answer: C

Explanation:
Acetic acid causes swelling of tissue. On the other hand, nicric acid. mercuric chloride, and ethanol all cause tissues to shrink. Bouin solution, a fixative compound, balances these effects by combining acetic acid with picric acid.

Question: 5

Which of the following fixative reagents does NOT cause tissue hardening?

A. Picric acid
B. Formalin
C. Acetone
D. Mercuric chloride

Answer: A

Explanation:
Formalin acetone, and mercuric chloride all cause tissue hardening: therefore, it is important to make sure the fixation time is not prolonged when using these reagents to prevent tissues from becoming too brittle.

Question: 6

Which of the following is NOT a primary purpose of fixation?

A. To prevent putrefaction
B. To prevent autolysis
C. To enhance differences in the refractive indexes of various tissue structures
D. To expose antigen sites for immunohistochemical staining

Answer: D

Explanation:
Fixation has many purposes including preventing autolysis and putrefaction enhancing differences in refractive indexes of tissue structures. maintaining proper relationship between cells and extracellular substances and making the tissue firmer so dissection and cutting is easier. However, fixation can have the downside of masking antigenic sites, resulting in poor immunohistochemical staining.

Question: 7

Autolysis is defined as the following:

A. Postmortem decay caused by bacteria
B. Denature of proteins in the tissue caused by chemical fixation
C. The process of removing calcium from bone or tissue
D. Destruction of tissues by enzymes normally present in the cells

Answer: D

Explanation:
Autolysis or the destruction of tissues by enzymes. can continue to occur even after the blood supply to the tissue has been cut off. Fixatives prevent autolvsis. Autolvsis is more severe in tissues that contain high enzyme levels such as the liver, brain, and kidneys. Areas of the tissue that have undergone autolysis will stain poorly.

Question: 8

When processina delicate specimens using a standard closed tissue processor, dehydration should be done by which of the following methods to minimize tissue distortion?

A. A graded series of reagents of increasing concentration
B. A graded series of reagents of decreasing concentration
C. A single reagent at a single concentration
D. Delicate specimens do not require a dehydration step

Answer: A

Explanation:
Dehydration should be done slowly. If the concentration gradient differs significantly between the inside and the outside of the tissue. the resulting diffusion currents could produce cell distortions. This is why slowly replacing the water through a graded series of reagents of increasing concentration is necessary to maintain proper structure before clearing and subsequent infiltration with a medium such as paraffin.

Question: 9

When preparing a sample for electron microscopy, which of the following embedding materials should be used?

A. Paraffin
B. Agar
C. Gelatin
D. Resin

Answer: D

Explanation:
Resins are the only embedding material used for electron microscopy. Resins are harder than wax; therefore, it is possible to cut the ultrathin sections commonly used for electron microscopy.

Question: 10

Which of the following is NOT an advantage of tissue processing using a microwave oven?

A. Shorter processing time
B. Does not require monitoring, calibration, or manual transfer of tissues
C. Does not require graded concentrations of solutions
D. Does not require the use of xylene, which eliminates the associated toxic fumes

Answer: B

Explanation:
Microwave ovens increase the internal heat of specimens, thus accelerating reaction times. so solutions diffuse into tissues more quickly. Also. only one dehydrating step is necessary. Combined. these factors decrease the overall time of processing. The use of more environmentally friendly reagents is another benefit of usina microwave ovens for processing. One disadvantage, though, is the need to manually transfer the tissue from one reagent to the next.

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