Medical Technology

ARRT-CT

Computer Tomography (CT) exam

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Question: 1

Which of the following questions does not need to be included in the pre-screening for a contrast CT exam on a 35-year-old female?

A. Chance of pregnancy?
B. Allergies?
C. Diabetic?
D. Imaging history?

Answer: D

Explanation:
It is important to always ask women of child bearing age if there is any chance of pregnancy prior to any CT exam. If there is a chance, a pregnancy test needs to be negative prior to scanning the patient. All patients should be asked about allergies prior to a CT scan. The patient may have a latex allergy or a known IV contrast reaction history. Diabetes can affect a patient's renal function, so lab work may be required prior to an IV contrast injection to make sure the kidneys can excrete the contrast from the blood. Also, certain diabetic medications also affect renal function. These medications may need to be stopped before and/or after IV contrast injections until renal function tests are performed. Pre-screening questions should be asked again by the CT technologist immediately prior to the scan.

Question: 2

State law requires patients to sign consent forms in which of the following situations:

A. Prior to any injection of contrast materials
B. Prior to sedation for surgical procedures
C. Prior to hospital admission
D. Signed consent forms are not required by law in all states

Answer: D

Explanation:
There are many variations of consent forms available that vary by state and by facility. Signed consent forms are required at some facilities prior to administering IV contrast during a CT scan. This is done to prove that the patient was informed about the risks and side effects and still agrees to have the contrast injection. There are currently no universal laws that mandate a signed informed consent.

Question: 3

Thorough patient preparation and education prior to a CT scan will do all of the following except:

A. Reduce repeat radiation exposure
B. Eliminate patient anxiety
C. Ensure best possible images
D. Increase probability of patient adherence to pre-scan instructions

Answer: B

Explanation:
Many patients are apprehensive about getting a CT scan. When a patient knows exactly what to expect they usually feel less anxious and are able to follow the scan instructions. Proper pre-scan preparations with oral prep, NPO instructions, and dress attire will minimize the risk for needing portions of the exam or even the entire procedure to be repeated thus reducing radiation dose to the patient and attaining the best possible images for that patient.

Question: 4

What laboratory test(s) should be performed prior to CT exams that require IV contrast media injections to determine renal function?

A. Blood urea nitrogen (BUN) and creatinine
B. Prothrombin time (PT)
C. Platelet count and complete blood count (CBC)
D. Liver enzymes

Answer: A

Explanation:
BUN and creatinine levels indicate the ability of the patient's renal systems to clear the contrast media from the blood. The BUN provides information about the ability of the kidneys to remove impurities from the blood. Elevated creatinine levels indicate an impairment of the ability of the kidneys to excrete creatinine from the blood. Renal disease impairs the ability of the kidneys to remove impurities from the blood. IV contrast media is considered an impurity and can cause a nephrotoxic effect in the patient. It is important to pre-screen most patients prior to administering IV contrast to ensure that they can clear the contrast from their blood.

Question: 5

What is considered a normal range for blood urea nitrogen (BUN)?

A. 30-55 mg/dl
B. 0.6-1.7 mg/dl
C. 5-25 mg/dl
D. 155-190 mg/dl

Answer: C

Explanation:
Every facility interprets the normal range somewhat differently, but these are typical normal ranges. Urea is a waste product produced in the breakdown of protein in the liver, released in the bloodstream, filtered in the kidneys, and excreted in urine. When the kidneys are not properly working, there is a rise in blood urea nitrogen. Many other things can affect BUN levels such as certain medications, high protein foods, age, sex, dehydration, and pregnancy.

Question: 6

Which CT procedure requires prothrombin time (PT) and partial thromboplastin time (PTT) laboratory results prior to starting the procedure?

A. CT abdomen and pelvis with IV contrast
B. CTA PE chest
C. CT guided liver biopsy
D. CT soft tissue neck with IV contrast

Answer: C

Explanation:
If the patient is having any kind of interventional procedure with CT guidance, lab tests to determine the blood's ability to coagulate need to be done. The imaging staff need to be sure that the patient's blood has the correct clotting ability so the patient doesn't bleed internally. Such procedures may include all types of CT guided biopsies of any area, CT guided drainages, and ablations. If the PT or PTT are abnormal, the procedure may be cancelled.

Question: 7

What method must be utilized for all peripheral venipuncture procedures to reduce the risk of microbial contamination and infection?

A. Hand washing
B. Aseptic technique Correct
C. Proper patient identification
D. Wearing sterile gloves

Answer: B

Explanation:
Aseptic technique is a method that prevents the introduction of unwanted organisms into an environment that may cause an infection. Nosocomial infections are common in hospitals, and it is the medical staff that is responsible for lowering the incidence of hospital acquired infections. Anytime the skin is broken, a chance of infection is possible. Aseptic technique helps to prevent infection. Hand

washing, gloves, sterile supplies, and proper skin preparation are all a part of utilizing an aseptic technique for peripheral IV access.

Question: 8

Peripheral IV access for an optimal CT angiogram study should meet which criteria:

A. 20-gauge minimum needle size
B. Located in the distal extremity
C. Must have mid-line access
D. Arterial access must be obtained

Answer: A

Explanation:
CT angiograms are scanning the patient during the bolus or arterial phase of the IV contrast injection. Faster scanners also require faster injection times. Peripheral venous access with a smaller needle will not safely allow the technologist to inject the contrast at an optimal rate to catch the arterial phase. In addition to the size of the needle, the site should be anti-cubital and proximal. Certain mid-lines are rated for the contrast injection rate and PSI that are needed for a CTA injection. These specific catheters must be documented in the patient chart.

Question: 9

What are the three phases of IV contrast enhancement?

A. Velocity, bolus, venous
B. Bolus, non-equilibrium, equilibrium
C. Equilibrium, portal venous, arterial
D. Arterial, venous, delayed

Answer: B

Explanation:
Enhancement times are directly related to injection rate, volume of contrast media, velocity of blood flow, and patient cardiac output. The first phase of enhancement is the bolus phase. This is an optimal phase for CTAS. There is a significant density difference between the abdominal aorta and IVC. The second phase is the non-equilibrium phase. During this phase, the bolus disperses into the capillaries then into the veins. The two phases of enhancement within this phase are the hepatic arterial and portal venous. The non- equilibrium phase provides the best differentiation of structures in soft tissue like the liver and pancreas. The third phase is equilibrium. During this phase, the concentration of contrast in the veins and arteries are similar and soft tissue differentiation becomes diminished.

Question: 10

What factor must be considered to determine the automatic power injector flow rate during a CT exam?

A. 64-slice scanner will scan much slower
B. 4-slice CT scanner will scan much faster
C. Soft tissue neck CT will require a slower rate
D. CT Angiogram will require a slower rate

Answer: C

Explanation:
If the IV manufacturer of a .22-gauge needle is only rated for a certain rate and PSI, the technologist must adhere to those limitations. Injecting too fast through a smaller needle catheter may cause an infiltration or cause the injector to stop the injection due to pressure limiting. The type of CT exam will also determine the flow rate. A CT Angiogram will require a faster rate and a soft tissue neck will require a slower rate. A 64- slice scanner will scan much faster than a 4-slice CT scanner. The technologist may miss a particular necessary diagnosing phase if these factors are not taken into consideration while selecting a proper flow rate.

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