

## Intro to CT



### Multiple Choice

Identify the choice that best completes the statement or answers the question.

- Each major development in beam and detector geometry is called a:
  - generation
  - gantry
  - detector
  - none of the above
- This translate-rotate scanner used a single detector.
  - first generation
  - second generation
  - third generation
  - fourth generation
- This is the only generation of CT scanners that used parallel beam geometry.
  - first generation
  - second generation
  - third generation
  - fourth generation
- This translate-rotate scanner used approximately 30 detectors and a narrow fan beam.
  - first generation
  - second generation
  - third generation
  - fourth generation
- This CT scanner took approximately 5 minutes to produce a single image.
  - first generation
  - second generation
  - third generation
  - fourth generation
- This scanner uses a wide fan beam and a rotating array of detectors.
  - first generation
  - second generation
  - third generation
  - fourth generation
- This scanner uses a wide fan beam and a fixed array of detectors that encircle the patient.
  - first generation
  - second generation
  - third generation
  - fourth generation
- Most modern CT scanners are based on \_\_\_\_\_ technology.
  - first generation
  - second generation
  - third generation
  - fourth generation

9. EBCT was developed to be fast enough to image the:
  - a. lungs
  - b. heart
  - c. diaphragm
  - d. skull
10. This is the process that allows the tube to continue rotating around the patient without the need to rewind.
  - a. spiral CT
  - b. multislice CT
  - c. slip-ring technology
  - d. cone beam
11. This advancement has the tube rotating inside the gantry while the patient and table move through the gantry in a continuous motion.
  - a. spiral CT
  - b. multislice CT
  - c. slip-ring technology
  - d. cone beam
12. Using a detector array with multiple rows allows this type of scanning.
  - a. spiral CT
  - b. multislice CT
  - c. slip-ring technology
  - d. cone beam
13. As a result of using multiple rows of detectors, the x-ray beam becomes wider and is called:
  - a. spiral CT
  - b. multislice CT
  - c. slip-ring technology
  - d. cone beam
14. Spiral scanning collects data for:
  - a. one slice at a time
  - b. 5-10 slices at a time
  - c. the entire volume of tissue being imaged
  - d. none of the above
15. Which of the following statements is not an advantage of CT (computed tomography) over conventional imaging?
  - a. Can adjust the contrast or gray scale
  - b. Can display anatomy in a series of slices
  - c. Can measure attenuation of specific tissues
  - d. Exposes the patient to less radiation
16. Which generation of CT scanner first used a fixed ring of detectors?
  - a. Second
  - b. Third
  - c. Fourth
  - d. None of the above
17. What is the major advantage of volume CT over standard CT imaging?
  - a. Generates less tube heat units
  - b. Allows cardiovascular scanning because of shorter scanning times
  - c. Allows a volume of tissue to be examined rather than individual slices only
  - d. Requires less dose be given to the patient
18. Which of the following is NOT an advantage of a multislice CT scanner?
  - a. Has fast imaging speed
  - b. Acquires large number of slices rapidly
  - c. Minimizes patient motion
  - d. Reduces patient dose
19. Multislice CT is not recommended for abdomen studies.
  - a. True
  - b. False
20. The first generation of computed tomography used \_\_\_\_\_ detector(s).
  - a. one
  - b. two
  - c. three
  - d. four

## Intro to CT Answer Section

### MULTIPLE CHOICE

1. ANS: A

Each major development in beam and detector geometry is called a generation.

PTS: 1 OBJ: 3

2. ANS: A

The first-generation scanner used a single detector and had to both translate and rotate.

PTS: 1 OBJ: 3

3. ANS: A

The first-generation scanner is the only one to have x-ray beams that are parallel to each other making up the data.

PTS: 1 OBJ: 3

4. ANS: B

Second-generation scanners had an array of approximately 30 detectors instead of just one, but the fan did not cover the anatomy so the tube had to translate and rotate.

PTS: 1 OBJ: 3

5. ANS: A

First-generation scanners took approximately 5 minutes to produce a single slice.

PTS: 1 OBJ: 3

6. ANS: C

The third-generation scanner has a fan beam wide enough to cover the entire anatomy (avoiding the translate motion) and an array of hundreds of detectors that rotate opposite from the x-ray tube.

PTS: 1 OBJ: 3

7. ANS: D

Fourth-generation scanners no longer have to translate because the x-ray beam is wide enough to cover the anatomy but, instead of having an array of detectors that rotate, this scanner's detectors are fixed in position all around the gantry.

PTS: 1 OBJ: 3

8. ANS: C

Most modern CT scanners are based on third-generation technology.

PTS: 1 OBJ: 3

9. ANS: B

EBCT was the first scanner that could produce an image so quickly it could image the beating heart.

PTS: 1 OBJ: 3

10. ANS: C

Slip-ring technology allows the tube to continue rotating around the patient without the need to rewind.

PTS: 1                    OBJ: 3

11. ANS: A

Spiral CT uses the slip-ring technology to have the tube continuously rotate and the patient continuously move through the gantry.

PTS: 1                    OBJ: 3

12. ANS: B

Multislice CT uses a detector array with multiple rows, allowing multiple slices to be imaged each rotation of the tube.

PTS: 1                    OBJ: 3

13. ANS: D

MSCT has resulted in the need to open up the collimation along the Z-axis, changing the shape of the beam from a fan to a cone.

PTS: 1                    OBJ: 3

14. ANS: C

Spiral scanning collects data for an entire volume of tissue.

PTS: 1                    OBJ: 3

15. ANS: D                    PTS: 1                    REF: 697

16. ANS: C                    PTS: 1                    REF: 697

17. ANS: C                    PTS: 1                    REF: 698

18. ANS: D                    PTS: 1                    REF: 698

19. ANS: B                    PTS: 1                    REF: 697

20. ANS: A

The first generation of computed tomography used one detector.

PTS: 1                    DIF: Moderate                    REF: page 439

OBJ: List and describe the various generations of CT imaging systems.