

Formulating Technique Charts

Multiple Choice

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

- _____ 1. Where does a radiographer find the established guidelines for selecting exposure factors for a radiographic examination?
- Technique chart
 - Generator control panel
 - Examination requisition
 - B or C
- _____ 2. What is the purpose of a technique chart?
- To decrease patient exposure by always using the highest kVp required
 - To ensure consistent image quality
 - To reduce repeat imaging due to technique error and, in turn, reduce patient exposure
 - B and C
- _____ 3. A technique chart should be established for:
- Each radiographer
 - Each radiographic tube
 - Each radiologist
 - A and C
- _____ 4. Which of the following is/are true regarding development of an effective technique chart?
- The radiographic equipment must be operating properly.
 - A good quality control program is in place.
 - The equipment must be from the same manufacturer.
 - A and B
- _____ 5. What are calipers used for?
- To measure the mA
 - To select the kVp
 - To select focal spot size
 - To measure the part
- _____ 6. Which of the following is **not** part of a standardized technique chart?
- SID
 - OID
 - mA
 - kVp
- _____ 7. What is the appropriate change in kVp when using a variable kVp-fixed mAs technique chart for a 1 cm change in tissue thickness?
- 2 kVp
 - 4 kVp
 - 6 kVp
 - 10 kVp
- _____ 8. If a part measures 14 cm and requires the use of 75 kVp, how much kVp would a part measuring 18 cm require when using a variable kVp-fixed mAs technique chart?
- 67 kVp

- b. 77 kVp
- c. 83 kVp
- d. 91 kVp

- ___ 9. What kind of chart uses a kVp value that is high enough to adequately penetrate the part but does not diminish radiographic contrast?
- a. A variable kVp technique chart
 - b. A fixed kVp technique chart
 - c. A fixed mAs technique chart
 - d. A and C
- ___ 10. When using a fixed kVp-variable mAs technique chart, if part thickness increases by 5 cm, what needs to happen to the mAs?
- a. It should be halved.
 - b. It should be doubled.
 - c. It should be quartered.
 - d. It should be tripled.
- ___ 11. Departmental standards, such as the SID or whether an examination is done tabletop or Bucky, should be determined:
- a. Prior to the development of technique charts
 - b. After the development of technique charts
 - c. At the same time as the development of technique charts
 - d. Whenever the department can come to an agreement
- ___ 12. Accurate patient measurement is most critical for the:
- a. Variable kVp-fixed mAs technique chart design
 - b. Variable kVp-variable mAs technique chart design
 - c. Fixed kVp-variable mAs technique chart design
 - d. Fixed kVp-fixed mAs technique chart design
- ___ 13. Radiographic contrast would be standardized with the:
- a. Variable kVp-fixed mAs technique chart design
 - b. Variable kVp-variable mAs technique chart design
 - c. Fixed kVp-variable mAs technique chart design
 - d. Fixed kVp-fixed mAs technique chart design
- ___ 14. Generally speaking, patient dose will be decreased with the:
- a. Variable kVp-fixed mAs technique chart design
 - b. Variable kVp-variable mAs technique chart design
 - c. Fixed kVp-variable mAs technique chart design
 - d. Fixed kVp-fixed mAs technique chart design
- ___ 15. A variable kVp-fixed mAs chart may be most effective with:
- a. Geriatric patients
 - b. Trauma patients
 - c. Patients imaged with mobile equipment
 - d. Pediatric patients
- ___ 16. A patient measuring 26 cm requires 20 mAs at 75 kVp based on a fixed kVp-variable mAs technique chart. What technique should be used for the next patient, who measures 34 cm?
- a. 40 mAs at 75 kVp
 - b. 80 mAs at 75 kVp

- c. 20 mAs at 91 kVp
 - d. 40 mAs at 91 kVp
- _____ 17. Using the concept of comparative anatomy, if a child's elbow measures the same as an adult wrist and all other procedural variables are the same (i.e., SID, image receptor type, etc.), the child's elbow will require _____ in comparison to the adult wrist.
- a. Less mAs
 - b. More mAs
 - c. The same mAs
 - d. Higher kVp
- _____ 18. Exposure technique charts are possibly more important when using digital image receptors because:
- a. The equipment is more expensive.
 - b. It's obvious when the wrong exposure factors have been used with digital IRs.
 - c. Visual cues for underexposure or overexposure are missing.
 - d. All of the above
- _____ 19. To take advantage of the fact that that digital image processing allows adjustment of the image contrast, optimal kVp for the fixed kVp-variable mAs technique chart for a digital room can be:
- a. Significantly lower
 - b. Slightly lower
 - c. The same
 - d. Higher

True/False

Indicate whether the statement is true or false.

- _____ 1. When using a technique chart, it is more critical to have precise part measurement when using a digital imaging system.
- A. True
 - B. False
- _____ 2. Technique charts are still needed when using AEC.
- A. True
 - B. False
- _____ 3. The technique chart will provide information as to how to recognize and compensate for additive pathology.
- A. True
 - B. False
- _____ 4. Two identical rooms having the same generator and tube and installed at the same time do not require development of separate technique charts. The chart for one room can accurately be used in the other.
- A. True
 - B. False
- _____ 5. Optimal kVp values for each anatomic area have been established by law.
- A. True
 - B. False

- _____ 6. If a technique chart is being used, and the IR is overexposed, the radiographer should assume the chart is inaccurate and come up with his or her own exposure factors.
- A. True
 - B. False

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Answer Section

MULTIPLE CHOICE

1. ANS: A
A technique chart will provide the radiographer with established guidelines for selecting exposure factors.

PTS: 1 OBJ: 13
2. ANS: D
Technique charts are useful in maintaining consistent image quality, reducing the number of repeat exposures, and reducing patient dose.

PTS: 1 OBJ: 13
3. ANS: B
A technique chart should be developed for each tube, even when tubes are located in the same room or share a generator.

PTS: 1 OBJ: 13
4. ANS: D
In order for a technique chart to be effective, image processing must be consistent and the equipment must be calibrated to ensure the accuracy of the tube output.

PTS: 1 OBJ: 13
5. ANS: D
Calipers are used to measure the thickness of the part being examined. The technique chart should indicate where the part thickness should be measured.

PTS: 1 OBJ: 13
6. ANS: B
Object to image receptor distance (OID) is not included in the technique chart information. Typically OID should be as little as possible, but patient condition may affect the OID.

PTS: 1 OBJ: 13
7. ANS: A
A 1 cm change in tissue thickness calls for a 2 kVp change when using a variable kVp-fixed mAs technique chart.

PTS: 1 OBJ: 13
8. ANS: C
Increasing part thickness by 4 cm requires an increase of 8 kVp (2 kVp per centimeter).

PTS: 1 OBJ: 13
9. ANS: B
A fixed kVp technique chart identifies an optimal kVp, one that is high enough to ensure penetration but not so high that the contrast will be diminished.

PTS: 1 OBJ: 13

10. ANS: B
Increasing part thickness by 4 to 5 cm requires a doubling of the mAs when using a fixed kVp-variable mAs technique chart.
- PTS: 1 OBJ: 13
11. ANS: A
Because a goal of a technique chart is to standardize exposure factors, it is essential that departmental standards be developed prior to creation of technique charts.
- PTS: 1 OBJ: 13
12. ANS: A
In that the exposure factors will change with every 1 cm change in part thickness, accurate patient measurement is most critical with the variable kVp-fixed mAs technique chart.
- PTS: 1 OBJ: 13
13. ANS: C
In that kVp controls the level of radiographic contrast, the fixed kVp-variable mAs technique chart will best standardize the radiographic contrast.
- PTS: 1 OBJ: 13
14. ANS: C
Patient dose is typically lower with the fixed kVp-variable mAs technique chart because the optimal kVp is higher than that used with a variable kVp chart.
- PTS: 1 OBJ: 13
15. ANS: D
A variable kVp-fixed mAs technique chart may be more effective for pediatric patients or for small body parts, due to the lower kVp needed.
- PTS: 1 OBJ: 13
16. ANS: B
In that a fixed kVp-variable mAs technique chart is being used, the kVp must remain at 75. The patient measuring 34 cm (8 cm larger than the first) requires the mAs to be four times the original (twice the mAs for every increase of 4 to 5 cm).
- PTS: 1 OBJ: 13
17. ANS: C
If both parts measure the same thickness and all other factors are the same, there should be no change in the amount of mAs used.
- PTS: 1 OBJ: 13
18. ANS: C
Because digital imaging automatically adjusts the image's brightness level, a technique chart is more important to maintain image quality and limit patient exposure.
- PTS: 1 OBJ: 13
19. ANS: D
A higher kVp can be used, because patient exposure will be reduced, and the image contrast can be manipulated after exposure.

PTS: 1

OBJ: 13

TRUE/FALSE

1. ANS: F

Due to digital imaging systems' wider exposure latitude, part measurements can be less precise; patients can be categorized as small, medium, or large.

PTS: 1

OBJ: 13

2. ANS: T

Technique charts are still highly useful when using AEC, because many procedural factors (i.e., kVp, detectors, SID, focal spot size, etc.) need to be standardized.

PTS: 1

OBJ: 13

3. ANS: F

The technique chart cannot provide information for all patient variables. It is up to the radiographer to use critical thinking skills to assess the patient and make adjustments.

PTS: 1

OBJ: 13

4. ANS: F

Even though the rooms seem identical, individual technique charts should be developed for each tube.

PTS: 1

OBJ: 13

5. ANS: F

Optimal kVp levels have not been established. Each department needs to determine the optimal kVp for each anatomic area.

PTS: 1

OBJ: 13

6. ANS: F

Radiographers need to problem-solve when an image is overexposed. There are many variables that contribute to image quality, and chart effectiveness is only one.

PTS: 1

OBJ: 13