

## Variable kVp Technique Chart

### Multiple Choice

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

- \_\_\_ 1. In order to reduce patient exposure, \_\_\_ kVp and \_\_\_ mAs should be used when possible.
- Lower, higher
  - Higher, higher
  - Higher, lower
  - It makes no difference.
- \_\_\_ 2. Which of the following are types of technique charts?
- Variable mAs and fixed mAs
  - Variable mAs and variable kVp
  - Variable kVp and fixed kVp
  - Variable kVp and fixed mAs
- \_\_\_ 3. What is an advantage of the variable kVp technique chart?
- It is easier to calculate.
  - The overall image contrast is lower, which can provide greater visibility of detail.
  - It prompts less patient exposure on most examinations.
  - It produces fewer heat units per exposure.
- \_\_\_ 4. Which of the following may be a cause of technique chart “failure”?
- Incorrect mA station selection
  - Excessive exposure time
  - Insufficient exposure time
  - kVp level not optimum to penetrate the part
- \_\_\_ 5. Which of the following would cause a radiograph to have too much contrast?
- kVp level set too low
  - kVp level set too high
  - mA station too low
  - mA station too high
- \_\_\_ 6. Using excessive kVp with a digital IR results in:
- increased scatter reaching the IR
  - decreased image contrast after computer adjustment
  - increased patient exposure
  - A and C
- \_\_\_ 7. Which type of body habitus is the thinnest, requiring a reduction in exposure factors?
- asthenic
  - hypersthenic
  - sthenic
  - hyposthenic
- \_\_\_ 8. The variable kVp–fixed mAs technique chart adjusts \_\_\_\_\_ as the part thickness changes and the \_\_\_\_\_ remains constant.

- a. kVp; kVp
  - b. mAs; mAs
  - c. mAs; kVp
  - d. kVp; mAs
- \_\_\_ 9. When using a variable kVp–fixed mAs technique chart, the kVp is increased by 2 for every \_\_\_\_\_ increase in part thickness.
- a. 1 cm
  - b. 2 cm
  - c. 5 cm
  - d. 8 cm
- \_\_\_ 10. If the variable kVp–fixed mAs technique chart indicates that an abdomen measuring 26 cm requires 24 mAs @ 70 kVp, what exposure factors should you use for a 30 cm thick abdomen?
- a. 24 mAs @ 74 kVp
  - b. 24 mAs @ 78 kVp
  - c. 28 mAs @ 74 kVp
  - d. 28 mAs @ 78 kVp
- \_\_\_ 11. A variable kVp–fixed mAs technique chart is most effective when used for:
- a. large parts
  - b. small parts
  - c. both small and large parts
  - d. it has never been effective
- \_\_\_ 12. The optimal kVp for digital image receptors should be \_\_\_\_\_ than that for film-screen image receptors.
- a. higher
  - b. lower
  - c. the same as
  - d. two times
- \_\_\_ 13. A child’s knee measures the same thickness as an adult’s elbow, and the elbow was imaged well using 4 mAs @ 60 kVp. Based on the concept of comparative anatomy:
- a. 2 mAs @ 60 kVp should work for the child’s knee
  - b. 4 mAs @ 60 kVp should work for the child’s knee
  - c. 2 mAs @ 50 kVp should work for the child’s knee
  - d. none of the above
- \_\_\_ 14. A lateral ankle position requires less exposure than an AP ankle projection because:
- a. all lateral positions require less exposure
  - b. all lateral positions require more exposure
  - c. part thickness is greater from front to back
  - d. part thickness is greater from side to side
- \_\_\_ 15. Which of the following is/are true regarding development of an effective technique chart?
- a. The radiographic equipment must be operating properly.
  - b. A good quality control program is in place.
  - c. The equipment must be from the same manufacturer.

d. A and B

- \_\_\_\_\_ 16. 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?
- a. 67 kVp
  - b. 77 kVp
  - c. 83 kVp
  - d. 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

**True/False**

*Indicate whether the statement is true or false.*

- \_\_\_\_\_ 1. With digital imaging, the same mAs and kVp should be used for an AP lumbar spine and a lateral lumbar spine.
- A. True
  - B. False
- \_\_\_\_\_ 2. The technique chart will provide information as to how to recognize and compensate for additive pathology.
- A. True
  - B. False

## Variable kVp Technique Chart Answer Section

### MULTIPLE CHOICE

1. ANS: C  
Using a higher kVp and lower mAs is best, because the higher kVp provides more penetration, requiring less patient exposure.  
  
PTS: 1                      OBJ: 14
2. ANS: C                      PTS: 1                      REF: Page 121
3. ANS: B                      PTS: 1                      REF: Page 124
4. ANS: D                      PTS: 1                      REF: Page 127
5. ANS: A                      PTS: 1                      REF: Page 124
6. ANS: D  
Using kVp that is too high results in more scatter reaching the IR as well as increased and unnecessary patient exposure. The image contrast will be adjusted by the computer to an appropriate level.  
  
PTS: 1                      OBJ: 7
7. ANS: A  
The asthenic patient is the thinnest, requiring a decrease in exposure factors.  
  
PTS: 1                      OBJ: 14
8. ANS: D  
The variable kVp–fixed mAs technique chart adjusts kVp as the part thickness changes and the mAs remains constant.  
  
PTS: 1                      OBJ: 16
9. ANS: A  
When using a variable kVp–fixed mAs technique chart, the kVp is increased by 2 for every 1 cm increase in part thickness.  
  
PTS: 1                      OBJ: 16
10. ANS: B  
The variable kVp–fixed mAs technique chart requires that the mAs remain constant (24) and the kVp increase by 2 for every cm of thickness difference. In this case, the part is 4 cm thicker, requiring an 8-kVp increase.  
  
PTS: 1                      OBJ: 16
11. ANS: B  
A variable kVp–fixed mAs technique chart is most effective when used for small parts such as extremities.  
  
PTS: 1                      OBJ: 16
12. ANS: A

In that the digital system can adjust image contrast after exposure, using a higher kVp allows use of lower mAs while the contrast remains appropriate.

PTS: 1                    OBJ: 16

13. ANS: B

If both parts measure the same thickness and the kVp is sufficient for penetration, the same mAs and kVp should work for both examinations.

PTS: 1                    OBJ: 16

14. ANS: C

Because the ankle is thicker from front to back than from side to side, less exposure is needed for the lateral ankle position.

PTS: 1                    OBJ: 17

15. 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

16. ANS: C

Increasing part thickness by 4 cm requires an increase of 8 kVp (2 kVp per centimeter).

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

## TRUE/FALSE

1. ANS: F

The thickness of the part is significantly greater for the lateral lumbar spine as compared to the AP projection. Therefore, more radiation is needed in order to produce a quality image.

PTS: 1                    OBJ: 15

2. 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