Reading Hospital School of Health Sciences
Medical Imaging Program

MI132 – Imaging Principles and Equipment
Unit 7 Study Guide
2022-2023

This study guide is recommended to be completed but is not required. If you want faculty to review your answers, please submit to Course Faculty (Stacy Oskam) via e-mail. This must occur by 12:00 PM the day prior to the exam.

1. What is the primary reason AEC is used over a manual technique?

2. Explain how AEC devices work.

3. What technical factor setting does AEC control?

4. What is the most common type of radiation detector used in an AEC system? Where are they located?

5. Explain how an **increase** in mA / kVp affect **exposure time** and **receptor exposure** when using AEC.

6. Explain what the mAs readout is.

7. Define minimum response time.

8. If MRT is longer than the amount of time needed to terminate the exposure, you will get **increased / decreased** receptor exposure.

a. How would this affect patient dose?

b. What are likely causes of this?

c. How would you troubleshoot this problem?

9. Define Back-up Timer / Back-up mAs. Why is it necessary to set a back-up time/mAs?

10. The back-up time should be set at _____ of expected exposure time or _____ the expected mAs value.

11. What are possible causes of back-up timer being reached?

12. What factor does the radiographer need to adjust when using AEC in order to change the amount of preset radiation detection values (electrical charge)?

13. Decreasing the density setting, **decreases / increases** receptor exposure and **decreases / increases** exposure time.

14. Each change in the density setting typically represents a _____ increase/decrease in receptor exposure.

15. List and explain how detector selection, patient centering and detector size influence receptor exposure.
    a. Detector selection

    b. Patient centering

    c. Detector size

16. When imaging a larger patient using AEC, a **shorter / longer** exposure time is required for appropriate receptor exposure.

17. When imaging a patient with an additive pathology using AEC, a **shorter / longer** exposure time is required for appropriate receptor exposure. The overall receptor exposure will be **increased / decreased**.

18. How does a positive contrast media affect exposure time when using AEC?

19. If using AEC and the active detector is not located within the collimation field, **under-exposure / over-exposure** of the detector will occur.

20. Decreased collimation could cause **excessive / insufficient** receptor exposure.

21. Having the active detector over denser tissue than the anatomy of interest will lead to a **shorter / longer** exposure time and **increased / decreased** receptor exposure.

22. Describe why small body parts should not be imaged using AEC.

23. When using AEC, what are the 3 factors you should always check first when an image demonstrates under- or over-exposure of the IR.

24. What are two acceptable methods for body part measuring?

25. Describe each of the following technique systems: Variable kVp, Fixed kVp, APR

26. If a patient measures 21 cm and the technique book indicates 70 kVp, 20 mAs for a patient that measures 25 cm, how would you adjust your technique using a variable kVp system? How would you adjust your technique using a fixed kVp system?

27. Describe how you would adjust kVp, mAs, and/or exposure time when using manual/fixed techniques for the following:
    a. Fiberglass cast –

b. Plaster cast –

c. Additive pathology –

d. Destructive pathology –

e. Soft tissue technique –

f. Positive contrast media –

g. Pediatric patient –

h. Geriatric patient –

i. Uncooperative patient –

j. Bariatric patient –

k. CR cassette as compared to Digital (free detector) –