

Part 15: PERSONNEL MONITORING DEVICES

1. The purpose of measuring occupational exposure is to
 - a) identify undesirable practices and unexpected sources of high exposure
 - b) promptly apply controls to limit exposure
 - c) provide information regarding exposure of the individual, permitting a comparison with long-term limits
 - d) all of the above
 - e) a and c only

2. Personnel monitoring for external exposure shall be performed on all occupationally exposed individuals who may receive >___% of the applicable MPD during the normal course of their duties or through accidental exposure
 - a) 5
 - b) 10
 - c) 15
 - d) 20
 - e) 25

3. Which of the following occasional visitors must be badged?
 - a) Messengers
 - b) Servicemen
 - c) Deliverymen
 - d) all of the above
 - e) none of the above

4. Long term visitors to controlled areas should be regarded as occupationally exposed persons if it is likely that they will receive a dose equivalent exceeding _____ mRem per year.
 - a) 5
 - b) 10
 - c) 50
 - d) 100
 - e) 500

5. The ideal personnel monitoring device must accurately measure the biological dose in Rems received by parts of the body considered to be most vital from the standpoint of chronic low level exposure, i.e.,
 - a) bone marrow and gonads.
 - b) skin and bones
 - c) spleen and liver
 - d) heart and lungs
 - e) breast and thyroid

6. Measurement of internal radiation dose must be independent of
 - a) type of radiation producing the internal dose
 - b) energy of radiation producing the dose
 - c) a and b
 - d) neither a nor b

7. Personnel monitoring records must be preserved
 - a) for 1 year
 - b) for 3 years
 - c) for 5 years
 - d) for 10 years
 - e) until the US NRC authorizes disposition.

8. Reportable exposure records include
 - a) Those dealing with whole body measurements
 - b) Those dealing with finger measurements
 - c) Results of any measurements, analyses, or calculations of radioactive material deposited or retained in the body
 - d) All of the above
 - e) None of the above

9. Exposure records MUST BE furnished to which ONE of the following:
 - a) any currently employed occupational worker who requests it- on a quarterly basis
 - b) any formerly employed occupational worker who requests it- within 24 hours
 - c) The individual and the NRC/State in the case of an overexposure- within 30 days
 - d) A colleague requesting it on behalf of a former employee

10. Personnel monitoring devices

- a) are designed to measure the accumulated external exposure and internal dose that a person receives over a time interval.
- b) are integrating devices
- c) provide an instantaneous readout of the dose rate at a specific moment in time
- d) all of the above
- e) a and b only

11. Which of the following is NOT a consideration in the use of film badges and other personnel monitoring devices?

- a) size and weight
- b) cost
- c) color
- d) reliability
- e) type of radiation being monitored

12. Which of the following statements regarding film badges is/are FALSE?

- a) film badges are excellent for monitoring extremity exposure
- b) film badges are excellent for monitoring whole body exposures.
- c) both a and b
- d) neither a nor b

12. Correct answer: a) film badges are more suited for measuring whole body exposure, while TLD-based ring badges are more suitable for measuring hand and finger exposure.

13. Which ONE of the following statements regarding film badges is false?

- a) they are the most popular type of monitoring device
- b) they contain a lithium fluoride chip functioning as a thermoluminescent dosimeter
- c) they contain photographic emulsion mounted in plastic and then over-wrapped in light-tight paper
- d) they are designed to measure whole body exposure
- e) they are able to distinguish the type of radiation to which wearer is exposed

14. Film badges can distinguish among different energy photons because

- a) they contain internal circuitry sensitive to different photon energies
- b) they contain small metallic filters of different densities, enabling them to distinguish among higher energy photons
- c) they contain a lithium fluoride chip functioning as a thermoluminescent dosimeter
- d) they only absorb the lowest energy photons

15. The companies that determine our exposure from film badges
- a) read the values off a “glow curve”
 - b) use an optical densitometer
 - c) measure the weight of the film badge before and after use to determine amount of silver bromide that has been converted to elemental silver by ionizing radiation
 - d) none of the above
16. Which one of the following statements regarding film badges is FALSE?
- a) they provide a permanent record of individual exposure
 - b) relatively inexpensive
 - c) require no technical knowledge of user
 - d) they are sensitive down to the 3 mR level
 - e) it takes several weeks to obtain results of film badge monitoring
17. TLD ring badges are very important for individuals involved in eluting generators, preparing kits, and injecting patients. Which ONE of the following statements is TRUE?
- a) thermoluminescent dosimeters typically contain the phosphor lanthanum fluoride
 - b) TLDs trap protons excited by exposure to ionizing radiation
 - c) TLDs are used one time and then discarded
 - d) The TLD is heated and the amount of light emitted is compared to a “glow curve” to determine radiation exposure
 - e) TLDs are unreliable above about 1000 mRem
18. Which of the following statements regarding pocket dosimeters is TRUE?
- a) Pocket Dosimeters are useful in those situations in which large exposures are expected on an infrequent schedule.
 - b) A “Glow Curve” is required to obtain a reading of the absorbed dose
 - c) A pocket dosimeter is considered an integrating device
 - d) a and c only
 - e) All of the above
19. Which of the following statements regarding pocket dosimeters is TRUE?
- a) Compared to a TLD, a Pocket Dosimeters is a fragile device
 - b) Pocket dosimeters can give both instantaneous and integrated reading
 - c) A pocket dosimeter is more expensive than a film badge
 - d) a and c only
 - e) All of the above

20. To measure the absorbed radiation dose during a 4-hr visit to a radiopharmacy, which of the following devices would be the most appropriate one to use?

- a) GM Counter
- b) Film badge
- c) TLD
- d) Pocket dosimeter