

BioE 1330 - Quiz 2            2/18/2010  
Answer Sheet - Correct answer is A for all questions

1. All of the following are true about fluoroscopy *except*
- A. It is essentially safer than planar radiography using film.
  - B. It displays moving images, whereas film radiography displays still images.
  - C. It is capable of showing a sword being swallowed as it passes along the esophagus.
  - D. It typically employs the opposite brightness scheme from film radiography; thus in fluoroscopy bone and metal are darker than soft tissue.
  - E. It is based on the differential absorption of x-ray in the body.

**Explanation:** Fluoroscopy delivers a much higher dose than planar radiography using film, and can cause radiation burns.

[ *imaging0242.mcq* ]

2. Rank the following in order from more to less absorptive of x-rays:

- a. Fat
- b. Tissue/Water
- c. Bone/Metal
- d. Air

- A. c-b-a-d
- B. c-a-b-d
- C. a-b-c-d
- D. b-c-a-d
- E. None of the others is correct.

**Explanation:** Absorption of x-rays is proportional to the atomic number raised to approximately the fourth power, and is also related to the density of atoms. Fat is less dense than water/tissue and comprised of atoms with a lower average atomic number.

[ *imaging0243.mcq* ]

3. Which of the following best describes the appearance of clear edges in planar radiograph images around structures such as the kidneys, heart, and blood vessels in the lung, in their normal non-pathologic state?

- A. Distinct differences in absorption of x-rays between the structure and the surrounding material.
- B. Bending of x-rays around the boundaries of objects
- C. Increased absorption of x-rays in the most exterior layer of such structures.
- D. Increased scattering where the absorption of x-rays changes abruptly.
- E. The lack of pathologic states (such as blood around the kidney or pneumonia in the lung), which block all x-rays from passing.

**Explanation:** The kidney's boundary is visible due to surrounding fat, and the heart and blood vessels in the lung are visible because of surrounding air in the lung. In the pathological states described, x-rays still get through, but differences between the structures and the surroundings are diminished.

[ *imaging0244.mcq* ]