

## Questions from the 2006 ACVR(RO) Certifying Examination

### General, Basic and Clinical Knowledge Section

Question: Cells of the histiocytic lineage are generally positive for which one of the following antigens?

- A. CD3
- B. CD8
- C. CD45a
- D. CD18
- E. CD79

Answer: D CD18

Objective: Basic cancer related immunology and molecular biology

Reference: Vail D. Histiocytic disorders. In: Small Animal Clinical Oncology, 3rd ed. Withrow, MacEwen, pp667-670.

### Clinical Aspects of Radiation Oncology, Including Image Interpretation

Question: The Veterinary Radiation Therapy Oncology Group has published a “Late Radiation Morbidity Scoring Scheme”. It lists three (3) categories of morbidity scoring for skin/hair. Please list at least one clinical finding for each category.

Answer:

Category 1: alopecia, hyperpigmentation, leukotrichia

Category 2: asymptomatic induration (fibrosis)

Category 3: severe induration causing physical impairment, necrosis

Objective: The response of normal tissues to irradiation.

Reference: LaDue T et al: Vet Radiol Ultrasound 2001:476.

### Radiation Biology and Related Topics

Question: There is a difference in the delivery of low dose rate versus high dose rate brachytherapy. With high dose rate brachytherapy it is necessary to deliver therapy as a number of fractions over time. What is the radiobiological rationale for fractionation with high dose rate brachytherapy considering the effect on normal tissue?

Answer: The short treatment times with HDR brachytherapy due to the high dose rate do not allow repair of sublethal damage in normal tissues. Hence, the treatments have to be fractionated requiring multiple treatments.

Objective: The radiobiologic aspects of variations in dose rate.

References: Radiobiology for the Radiologist, Hall, 5<sup>th</sup> ed., Chapter 5 Repair of Radiation Damage and The Dose-Rate Effect.

Nag S, Orton C, Thomadsen B. Remote controlled high dose rate brachytherapy. Critical Reviews in Oncology/Hematology 1996;22:127-150.

## **Radiation Physics and Dose Calculation**

Question: Match the imaging cassette in **Column A** to the appropriate characteristic in **Column B**.

### **Column A**

- A. Diagnostic imaging cassette
- B. Portal imaging cassette

### **Column B**

- \_\_\_\_\_ 1) Primarily Compton interactions prevail.
- \_\_\_\_\_ 2) Contains high atomic number fluorescent screens.
- \_\_\_\_\_ 3) Primarily photoelectric interactions prevail.
- \_\_\_\_\_ 4) Contains a metal front plate to generate electrons which expose the film.

Answer: 1) B, 2) A or A&B as some but not all portal cassettes contain fluorescent screens, 3) A, 4) B.

Objective: The physics and principles involved in port film technology and application.

References: Van Dyk, editor, The modern technology of radiation oncology, 1999, Medical Physics Publishing, page 484.

Walker MA. Steinheimer DN. Weir VA. Homco LD. Green RW. Morris EL. Hess ME. A review of portal screen-film technology and five radiologists' evaluations of some existing products. Veterinary Radiology & Ultrasound. 40(3):318-22, 1999 May-Jun.

Additional reference – Kodak ECL portal film product guide – Kodak Web page.

The Physics of Radiation Therapy, Faiz M. Khan, Lippincott, Williams & Wilkins, Philadelphia, 2003 241-145