Clinical and Experimental Radiobiology Course

<u>Wi-Fi</u>

Network: UofT UTORid: qq560992 Password: aat7eTieye







Piazza

https://piazza.com/utoronto.ca/ winter2025/mbp1301h

Tutorial 5

- Lecture 14: Dose rate
 - Dr. Hedi Mohseni
- Lecture 15: Clinical radiobiology of brachytherapy
 Dr. Amandeep Taggar





Lecture 14: Dose Rate

Identify the correct order of contributing mechanisms with decreasing dose-rate

- A. Proliferation- redistribution- SLD repair- reoxygenation
- **B.** SLD repair- proliferation- reoxygenation- redistribution

C. SLD repair- redistribution- reoxygenation- proliferation

D. Reoxygenation- SLD repair- proliferation- redistribution





Lecture 14: Dose Rate

IMRT and VMAT techniques improve effectiveness of cell killing:

A. True

B. False





Reference: L14 slide 11

Lecture 14: Dose Rate

How do cell survival curves change with reducing dose-rates for most cell lines?

- A. The shoulder becomes more pronounced, and the curve becomes shallower
- **B.** The curve becomes steeper and the shoulder disappears
- C. The curve becomes steeper and the shoulder becomes more pronounced

D. The shoulder disappears and the curve becomes shallower





Reference: L14 slide 7

Lecture 15: Brachytherapy

What characteristics of a malignant tumour would make it particularly suited to treatment with high dose-rate brachytherapy?

A. Low oxygenation

B. Low α/β

- C. High mitotic count
- D. High grade
- E. High vascularity

Temerty Medicine



Reference: L15 slide 56 (HDR Monotherapy for prostate cancer) Clinical and Experimental Radiobiology Course 2025

Lecture 15: Brachytherapy

You are treating an early carcinoma of the penis with brachytherapy, and wish to deliver a dose that would be equivalent to an external beam dose of 60 Gy in 30 fractions.

Which of the following treatment schemes would you choose?

- A. HDR brachytherapy delivered in 5 daily fractions of 10 Gy each
- B. Low dose rate brachytherapy using temporary implant at 50 cGy per hour for 5 days
- C. Pulsed dose rate brachytherapy to deliver 60 Gy over 2.5 days
- D. Permanent seed implant with iodine- 125 to a dose of 60 Gy



Temerty Medicine



Lecture 15: Brachytherapy

A single dose of 15Gy of what type or radioisotope would produce maximum amount of cell death?

Α. י	vLDR
------	------

B. HDR

C. MDR

D. LDR





Reference: L15 slide 22 (Dose rate effect)