Clinical and Experimental Radiobiology Course

Tutorial 9

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Tutorial 7

- **Lecture 24: Combined Radiotherapy and Chemotherapy**
  - ***Dr. Andrew Hope***
- **Lecture 22: Predictive Biomarkers**
  - ***Dr. Scott Bratman***
- **Lecture 23: Combined Radiotherapy and Immunotherapy**
  - ***Dr. Shane Harding***
- **Lecture 21: Radiation-Induced Malignancies**
  - ***Dr. David Hodgson***

Lecture 24: Radiotherapy & Chemotherapy

A phase III study comparing concomitant chemotherapy with radiotherapy with sequential chemo and radiation for head and neck cancer shows improved overall survival and local control with no difference in the distant metastasis rate.

Which of the following is *true*?

A. Chemotherapy is improving outcome through spatial co-operation

B. The addition of chemotherapy to radiation improves the therapeutic ratio compared to radiotherapy alone

C. Chemotherapy provides a supra-additive interaction with radiotherapy to improve outcome

D. None of the above

Reference: L24 slide 4

Lecture 24: Radiotherapy & Chemotherapy

Which of the following clinical scenarios *does not* describe the combination of chemotherapy and radiotherapy to achieve spatial co-operation to improve outcome?

A. Prophylactic cranial irradiation for small cell lung cancer patients

B. Sequential chemotherapy and involved field radiotherapy for early-stage Hodgkin's Disease

C. Whole body irradiation for leukemia patients prior to high dose chemotherapy preceding autologous stem cell transplantation

D. Adjuvant breast radiotherapy following lumpectomy and chemotherapy for locally advanced breast cancer

Reference: L24 slide 4

Lecture 24: Radiotherapy & Chemotherapy

Which of the following chemotherapy agents primarily interferes with M phase?

A. Bleomycin

B. Paclitaxel

C. 5-FU

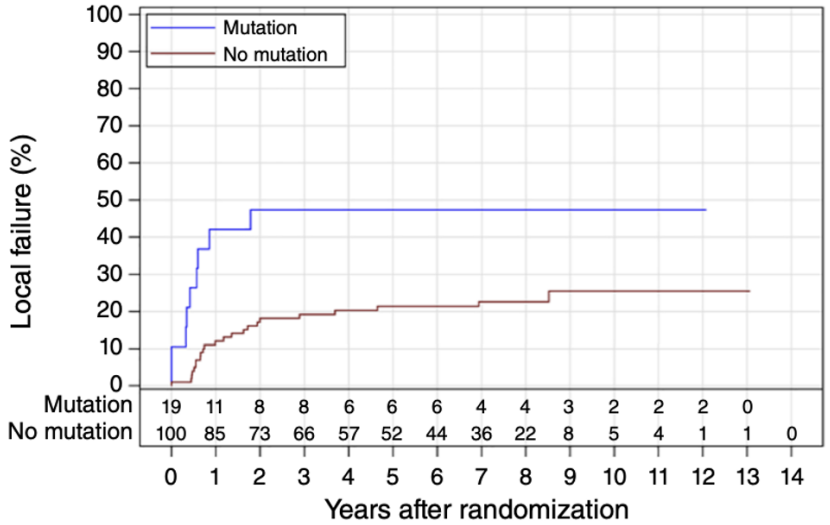
D. Carboplatin

E. None of the above

Reference: L24 slide 26

Lecture 22: Biomarkers

Mutations in Nrf2 pathway genes have been found to result in higher local failure in patients treated with radiotherapy for T2N0 larynx cancer:



Based only on this information, which of the following statements is most correct?

A. A mutation in a Nrf2 pathway gene constitutes a predictive assay for T2N0 larynx cancer patients treated with radiotherapy

B. A mutation in a Nrf2 pathway gene constitutes a prognostic assay for T2N0 larynx cancer patients treated with radiotherapy

C. A mutation in a Nrf2 pathway gene constitutes a predictive biomarker for T2N0 larynx cancer patients treated with radiotherapy

D. A mutation in a Nrf2 pathway gene constitutes a prognostic biomarker for T2N0 larynx cancer patients treated with radiotherapy

Reference: L22 slides 30, 31

Lecture 22: Biomarkers

All of the following are potential clinical applications of ctDNA detection assays, *EXCEPT*:

A. **Prognostication prior to initiating a course of RT**
B. **In vitro culture for RT sensitivity testing**
C. **Early assessment of response to RT**
D. **Identification of minimal residual disease following completion of RT**
E. **Early detection of recurrence**

Reference: L22 slides 7

Lecture 23: Radiotherapy / Immunotherapy

DNA end-joining repair deficiency causes:

A. Radioprotection

B. Defective B- and T-cell production

C. Reduced sister chromatid exchanges

D. Increased immune infiltration

E. All of the above

F. none of the above

Reference: L23 slide 5

Lecture 23: Radiotherapy / Immunotherapy

Immuno-modulatory cytokine production post-RT is likely to be reduced by:

A. Senolytic (senescent cell killing) drugs

B. DDR suppressive drugs

C. TREX1 expression

D. cGAS/STING activation

E. A and C

Reference: L23 slides 7, 16

Lecture 23: Radiotherapy / Immunotherapy

Identify challenges associated with immunotherapy/radiotherapy combinations

A. **Determining which IO agent(s) to use**

B. **Determining which RT fractionation to use**

C. **Determining which RT dose distribution to use**

D. **Determining the sequencing between IO and RT**

E. **All of the above**

Reference: L23 slides 35, 42

Lecture 21: Malignancies

Which of the following has been shown to affect the radiation dose-risk relationship for breast cancer risk after chest radiotherapy in young females?

A. Age at menarche

B. Duration of intact ovarian function after RT

C. Age at first pregnancy

D. Family history of breast cancer

Reference: L21 slides 44, 45

Lecture 21: Malignancies

Which of the following is true about the relationship between radiation dose and second cancer risk?

A. Second cancers tend to occur in the intermediate dose area.

B. The risk increases linearly up to 60Gy and then declines.

C. The risk increases linearly up to 10Gy and then declines.

D. The dose-risk relationship is tissue-specific

Reference: L21 slides 22-26

Lecture 21: Malignancies

Doing a literature search, you find studies report SIRs of breast cancer after RT ranging from 2.0-15.0. This variation may be due to:

A. Some investigators are incompetent.

B. Differences in follow-up time between studies.

C. Differences in age at exposure between study populations.

D. Differences in attained age between study populations.

E. Any of B-D