

[LJ 0816]

AUGUST 2016

Sub.Code :1931

B.Sc. RADIOTHERAPY TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Major morphologic consequences of radiation injury in individual organs.
2. Write brief notes on Epidemiology of Cancer. Explain in detail about the role of environmental factors and acquired pre – disposing conditions in cancer.
3. Describe in detail about the diagnosis procedures of X – Ray, Ultrasound, CT – Scan, MRI, Mammography and Radio – nuclide (Nuclear Science) Investigations used for tumor in addition to pathology localization.

II. Write Notes on:

(8 x 5 = 40)

1. Fine-Needle Aspiration Cytology (FNAC).
2. Pathways of Spread.
3. Angiogenesis.
4. Grading of Tumors.
5. Cellular Metabolism and Mitochondrial Function.
6. Viral Infection in Immuno – compromised People.
7. Sensitizing and Protection agents of Radiation.
8. Application of Radiotherapy in non – malignant disease.

III. Short Answers on:

(10 x 3 = 30)

1. Metaplasia.
2. Barrett Esophagus.
3. Oncogenic RNA Virus.
4. Apoptosis.
5. Cancer Cachexia.
6. Leukemia.
7. Choice of treatment for Skin Melanoma.
8. Role of Electron Therapy.
9. Hyperthermic and Photo – dynamic Injuries.
10. Radiation effects on Embryo and Fetus.

[LK 0217]

FEBRUARY 2017

Sub.Code :1931

B.Sc. RADIOTHERAPY TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Discuss about characteristics of benign and malignant neoplasm. What are the common pathways of spread?
2. Mechanism of invasion of Extra – Cellular Matrix (ECM) and Metastasis.
3. Discuss about the methods of Treatment of Malignant Disease (Cancer) – Chemotherapy, Hormone Therapy, Radiotherapy and Surgery. Write notes on Palliative and Radical Radiotherapy.

II. Write Notes on:

(8 x 5 = 40)

1. Opportunistic Mycosis.
2. Childhood Tumors.
3. Fungal Infection in Immuno – compromised People.
4. Waste Disposal by Lysosomes and Proteasomes.
5. Acute effects of irradiation on hematopoietic and lymphatic system.
6. Microbial Carcinogens.
7. Radio sensitivity of different tissues, skin reaction and their management.
8. Application of Radiotherapy in Malignant Condition and comparison of Radiotherapy with Surgery.

III. Short Answers on:

(10 x 3 = 30)

1. Metaplasia.
2. Oncoproteins.
3. Carcinoembryonic Antigen.
4. Necrosis.
5. Lymphoma.
6. Oncogenic DNA Virus.
7. Treatment for Small Brain Tumor.
8. Difference between Stereotactic Radiotherapy and Three – dimensional Conformal Radiotherapy.
9. Genetic and Somatic Hazards.
10. Choice of Treatment for Nasopharynx Cancer.

B.Sc. RADIOTHERAPY TECHNOLOGY
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SECOND YEAR

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on: **(3 x 10 = 30)**

1. Discuss in detail the natural history and spread of cancer.
2. 28 year old lady presented with bleeding per rectum and found to have an ulceroproliferative growth 6cm from the anal verge. Discuss the diagnostic work up, pathology and radiotherapy techniques of carcinoma rectum.
3. Elaborate on the clinical features, pathology, mode of spread and diagnostic investigations of carcinoma lung.

II. Write Notes on: **(8 x 5 = 40)**

1. Role of heredity in cancer.
2. What are physical carcinogens? Give examples.
3. Prophylactic Cranial Irradiation (PCI) with radiotherapy prescription.
4. What is palliation? What are the general principles of palliative radiotherapy? Provide two examples.
5. Describe the radiotherapy technique and portals for carcinoma of vocal cord T1N0.
6. Discuss the methods of delivering post operative radiotherapy for carcinoma of endometrium T2N0M0.
7. Discuss the radiotherapy techniques used for treating pituitary adenoma.
8. What the side effects of cytotoxic chemotherapy?

III. Short Answers on: **(10 x 3 = 30)**

1. What is TNM classification? What is its use?
2. How does carcinoma of Nasopharynx spread?
3. What is metaplasia? Give an example.
4. List the side effects of Cranio Spinal Irradiation (CSI).
5. Therapeutic ratio.
6. Histopathological classification of lymphomas.
7. What are the etiological factors of oral malignancy?
8. Name three malignancies commonly seen in childhood.
9. Discuss the boost techniques of carcinoma breast after breast conservation surgery after completion of whole breast irradiation.
10. Hormonal management of prostate cancer.

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SECOND YEAR

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Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. Discuss the role of radiotherapy for carcinoma prostate with special mention of brachytherapy methods.
2. Classify Lymphomas. What is Involved Field Radio Therapy (IFRT)? Discuss the methods of delivering IFRT.
3. List the indications of Cranio Spinal Irradiation (CSI). Discuss the precautions to be taken prior to planning a child of 8 years for CSI. Discuss in detail the technique and the radiotherapy prescription.

II. Write Notes on:

(8 x 5 = 40)

1. Write short notes on precancerous lesions.
2. Classify neoplasms based on cell of origin.
3. What are the histological types of thyroid malignancy? Mention the best prognostic histological type.
4. Explain the radiotherapy planning for palliation of painful vertebral metastases.
5. Discuss the radiotherapy techniques used for treating craniopharyngioma.
6. List the benign conditions which benefit with treatment with radiotherapy? Discuss the dose, fractionation and technique of one of the benign conditions.
7. What the side effects of cytotoxic chemotherapy?
8. Carcinogenesis.

III. Short Answers on:

(10 x 3 = 30)

1. List the side effects of radiotherapy to chest wall of a patient with carcinoma of left breast.
2. What is extended field of radiotherapy? Where is it used?
3. Define neoplasia.
4. Name the major and minor salivary glands. What is the commonest histology of malignancy of salivary glands?
5. Effect of radiotherapy on reproductive organs.
6. Mention two drugs used concurrently with radiation. Explain how it influences Treatment.
7. Anatomy, lymphatic drainage and pathology of carcinoma of oesophagus.
8. Hormonal management of breast cancer.
9. Discuss the pathology of skin cancers.
10. Discuss the boost techniques of carcinoma breast after breast conservation surgery and completion of whole breast irradiation.

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SECOND YEAR

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on: **(3 x 10 = 30)**

1. Describe the process of Carcinogenesis.
2. Elaborate on the anatomy, lymphatic drainage, pathology and clinical features of carcinoma of oesophagus.
3. Staging, pathology and methods of delivering radiation for carcinoma cervix.

II. Write Notes on: **(8 x 5 = 40)**

1. Differentiate benign and malignant neoplasms.
2. What are chemical carcinogens? Give examples.
3. Discuss the boost techniques of carcinoma breast after breast conservation surgery and completion of whole breast irradiation.
4. Hormonal therapy and cancer.
5. Discuss various palliative radiotherapy schedules for bone metastases.
6. How do you treat the posterior neck after spine tolerance dose in conventional head and neck radiotherapy?
7. Discuss the radiotherapy technique used for treating stage I and II seminomas.
8. What are the malignant tumours of urinary bladder? List the investigations needed for diagnosis and staging.

III. Short Answers on: **(10 x 3 = 30)**

1. Define hypertrophy and hyperplasia and give on example for each.
2. Radiotherapy technique of soft tissue sarcoma after limb salvage surgery.
3. List the side effects of radiotherapy treatment to carcinoma of pelvis.
4. Name three childhood malignancies.
5. Stochastic effect of radiation.
6. What are occupational cancers? Mention two examples.
7. What is neoadjuvant chemotherapy? Give an example.
8. Radiotherapy technique of carcinoma of parotid.
9. Classification of brain tumours.
10. Discuss the pathology of skin cancer.

B.Sc. RADIOTHERAPY TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on: (3 x 10 = 30)

1. Classification of tumors? Explain about contrasting features of benign and malignant tumors?
2. What are the characteristics of electron beam? Write in detail about the techniques in total skin electron therapy TSET?
3. Steps involved in simulation, dose fractionation, treatment techniques, field borders in treatment of carcinoma oropharynx?

II. Write Notes on: (8 x 5 = 40)

1. Differences between oncogene and antioncogene?
2. Neoplastic and non-neoplastic complications of ionizing radiation?
3. Tumor markers.
4. Stanford technique.
5. Schematic illustration of molecular basis of cancer?
6. Special categories of tumor.
7. Properties of brachytherapy source.
8. Inverted Y technique.

III. Short Answers on: (10 x 3 = 30)

1. Ir-192.
2. Point A and Point B in brachytherapy.
3. Metastasis.
4. 5 R's of radiotherapy.
5. Surface mould.
6. IFRT.
7. LDR, MDR, HDR in brachytherapy.
8. Radiation effects on Embryo and Fetus.
9. Oncogenic DNA virus.
10. Pathways of spread of tumor.

B.Sc. RADIOTHERAPY TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on: **(3 x 10 = 30)**

1. What are the characteristics of tumor? Write in detail about the spread of tumors?
2. Beam directional devices.
3. Epidemiology of cancer. Write in detail about chronic premalignant and non-neoplastic conditions.

II. Write Notes on: **(8 x 5 = 40)**

1. Grading and staging of cancer.
2. Classify neoplasm based on cell of origin?
3. Cancer susceptibility genes and associated syndromes.
4. Tumor cell markers.
5. Isocentric technique.
6. Lhermitte's sign.
7. Five R's of radiotherapy.
8. Predisposing factors of cancer.

III. Short Answers on: **(10 x 3 = 30)**

1. Histological types of thyroid malignancy.
2. CIN/SIL.
3. Differences between normal cells and cancer cells?
4. Dog leg technique.
5. Cell cycle.
6. Side effects of chemotherapy.
7. 3D Conformal technique.
8. Hyperfractionation.
9. Grading of mucositis.
10. Effect of radiation on reproductive organs.

B.Sc. RADIOTHERAPY TECHNOLOGY
(New Syllabus 2014-2015)

SECOND YEAR

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code: 801931

Time: Three Hours

Maximum : 100 Marks

Answer All Questions

I. Elaborate on:

(3 x 10 = 30)

1. What is carcinogenesis? Mechanism of invasion of ECM and metastasis?
2. Discuss in detail about etiology, pathogenesis, dose fractionation, field border and treatment techniques in treating carcinoma cervix?
3. Total body irradiation (TB).

II. Write Notes on:

(8 x 5 = 40)

1. Radiotherapy simulation for cranial irradiation.
2. Use of wedges in external beam therapy.
3. Precancerous lesion.
4. Mantle field RT simulation.
5. What are the chronic inflammatory conditions associated with tumor formation?
6. IMRT technique.
7. Modified stanford technique.
8. Role of radiotherapy in benign conditions.

III. Short Answers on:

(10 x 3 = 30)

1. Half value layer HVL.
2. Laser in patient positioning.
3. SAD technique.
4. Grading of skin reaction.
5. Point A and Point B.
6. Apoptosis.
7. Cancer cachexia.
8. Baretts esophagus.
9. C0-60 in brachytherapy.
10. Hypofractionation.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0321]

MARCH 2021

Sub. Code: 1931

(AUGUST 2020 EXAM SESSION)

B.Sc. RADIOTHERAPY TECHNOLOGY

SECOND YEAR (Regulations 2014-2015 & 2018-2019)

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code : 801931

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Hyperthermia and its role in radiotherapy.
2. Discuss various methods of treatment of malignant diseases.
3. Describe staging, dose fractionation, treatment techniques, field borders in carcinoma Nasopharynx.

II. Write Notes on:

(8 x 5 = 40)

1. Chemotherapy.
2. CT scan in radiotherapy – advantages and disadvantages.
3. Radiosensitizers.
4. RTOG grading of skin reactions and treatment.
5. Effects of radiation in Embryo and fetus.
6. Photodynamic therapy.
7. Radiotherapy in non-malignant diseases.
8. Tumor carcinogenesis.

III. Short Answers on:

(10 x 3 = 30)

1. Tumor doubling time.
2. Mitosis.
3. Human Papilloma virus.
4. Neoadjuvant chemoradiation- advantages and disadvantages.
5. Anaplasia.
6. Trucut biopsy.
7. Functions of lysosome and proteasome.
8. Mention any 5 chemical carcinogens.
9. ALARA.
10. RTOG grading of neutropenia.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0222]

**FEBRUARY 2022
(AUGUST 2021 EXAM SESSION)**

Sub. Code: 1931

**B.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (Regulations 2014-2015 & 2018-2019)
PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS
Q.P. Code : 801931**

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on: (3 x 10 = 30)

1. Describe characteristics of benign and malignant neoplasms. Describe about common pathways of spread in detail.
2. Role of radiotherapy in benign and malignant diseases.
3. Describe staging, dose fractionation, treatment techniques, field borders in carcinoma anal canal.

II. Write Notes on: (8 x 5 = 40)

1. Bystander effect.
2. Cell survival curve.
3. Mammagram.
4. HPV vaccine.
5. Radioprotectors.
6. PET scan.
7. RTOG grading of mucositis and treatment.
8. Radioiodine scan.

III. Short Answers on: (10 x 3 = 30)

1. Dysplasia.
2. Mention organ at risk with doses for carcinoma nasopharynx.
3. Mention routes of spread of cancer.
4. What are carcinomas and give any 3 examples.
5. Mention premalignant lesions of oral cavity.
6. Mention any 5 chemotherapy drugs.
7. Tumor angiogenesis.
8. What is palliative care?
9. Proto oncogenes.
10. Bone scan.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0922]

SEPTEMBER 2022

Sub. Code: 1931

(FEBRUARY 2022 & AUGUST 2022 EXAM SESSIONS)

B.Sc. RADIOTHERAPY TECHNOLOGY

SECOND YEAR (Regulations from 2014-2015 & 2018-2019)

PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS

Q.P. Code : 801931

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Tumour localization in radiotherapy. Describe the role of CT, MRI, PET in detail.
2. What is radiation protection? What are tissue reactions and stochastic effects? Principles of radiation protection and permissible limits for occupational and non-occupational people.
3. Describe staging, dose fractionation, treatment techniques, field borders in carcinoma esophagus.

II. Write Notes on:

(8 x 5 = 40)

1. Biopsy – types and explain any two.
2. Linear Energy Transfer (LET).
3. Hormone therapy in cancer.
4. Lymphatic drainage in carcinoma breast.
5. Direct and indirect effects of radiation.
6. Oxygen effect.
7. Explain benign and malignant diseases.
8. Apoptosis.

III. Short Answers on:

(10 x 3 = 30)

1. Oxygen enhancement ratio.
2. Fine needle aspiration cytology.
3. Mention HIV associated malignancies.
4. Abscopal effect.
5. Adjuvant radiotherapy – advantages and disadvantages.
6. Metaplasia.
7. Meiosis.
8. What is radiation sickness?
9. What is sarcoma? Give any 3 examples.
10. Mention any 5 radioisotopes used in radionuclide therapy.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423]

APRIL 2023

Sub. Code: 1931

**B.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS
Q.P. Code: 801931**

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. What are the characteristics of Benign and Malignant neoplasm? Elaborate about various pathways of spread.
2. Describe in detail about the anatomy, clinical features, investigation and TNM staging of Carcinoma Anal Canal. Elaborate about Radiotherapy treatment portals and volumes.
3. Mention in brief about the major morphological consequences of Radiation injury in individual organs.

II. Write Notes on:

(8 x 5 = 40)

1. Prophylactic cranial irradiation - Indications and Techniques.
2. Tumor Angiogenesis.
3. Cell Survival Curve.
4. Iridium – 192.
5. Precancerous lesions in the oral cavity.
6. Indications for Emergency Radiotherapy. Elaborate any two.
7. Total Skin electron beam therapy.
8. Tumor Cell markers.

III. Short Answers on:

(10 x 3 = 30)

1. Involved field Radiotherapy.
2. Therapeutic ratio.
3. Mention any five Chemotherapy drugs used in Head and Neck cancers.
4. What are the IHC markers evaluated in Carcinoma breast?
5. Mention any five HIV related Malignancies.
6. Intraluminal Brachytherapy.
7. Bone scan.
8. Hyperfractionation.
9. CIN/SIL.
10. Cancer Vaccines.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123]

NOVEMBER 2023

Sub. Code: 1931

B.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS
Q.P. Code: 801931

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on: **(3 x 10 = 30)**

1. Describe briefly about Biological effects of Radiation.
2. Describe about investigation performed for Tumor staging workup in a patient with locally advanced Breast Cancer.
3. Describe in detail about Brachytherapy.

II. Write Notes on: **(8 x 5 = 40)**

1. Stochastic and Deterministic effect of Radiation.
2. Radioprotectors.
3. Concurrent Chemoradiation and its advantages / disadvantages.
4. Oxygen Enhancement Ratio.
5. PET scan.
6. Classify Neoplasm based on Cell of Origin.
7. 1-131.
8. TLD.

III. Short Answers on: **(10 x 3 = 30)**

1. Bystander effect.
2. Apoptosis.
3. What are Proto-Oncogenes? Mention any three.
4. What are the stages of Mitotic Cell Cycles?
5. Direct Effect of Radiation.
6. Radiation Sterility Dose for a) Azospermia and Temporary Sterility
b) Permanent Sterility.
7. Radiation Dermatitis RTOG Grading.
8. Fine Needle Aspiration Cytology (FNAC).
9. What is Metastasis?
10. Mention any five Chemical Carcinogens.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0424]

APRIL 2024

Sub. Code: 1931

B.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS
Q.P. Code: 801931

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on: **(3 x 10 = 30)**

1. Discuss aetiology, pathogenesis, investigations and role of Radiotherapy in Prostate Malignancy.
2. Name Oncological emergencies and describe in detail Superior Vena Caval Syndrome.
3. Describe the various types of Gastric Cancer, investigations, management and role of Radiotherapy.

II. Write Notes on: **(8 x 5 = 40)**

1. Aetiology and management of rectal cancers.
2. Acute Inflammation.
3. Discuss Neuroblastoma and role of Radiotherapy.
4. Describe Soft tissue sarcoma and discuss role of Brachytherapy.
5. Discuss Pituitary Adenoma.
6. Endometrial carcinoma - Aetiology, Pathology and Radiotherapy role.
7. Classify Thyroid tumours and describe Radiotherapy role and Portals.
8. Acute effects of irradiation on Hematopoietic and Lymphatic system.

III. Short Answers on: **(10 x 3 = 30)**

1. Acute and late side effects of Cranio spinal irradiation.
2. Occupational cancers with examples.
3. Oncogenic DNA viruses.
4. Barret's oesophagus.
5. Radiotherapy tolerance of Pelvic organs at risk.
6. Tumour Lethal Dose.
7. Repopulation of Accelerated repopulation.
8. Importance of Haemoglobin in Radiotherapy.
9. Name some paraneoplastic syndrome.
10. Carcino Embryonic Antigen.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1125]

NOVEMBER 2025

Sub. Code: 1931

B.Sc. RADIOTHERAPY TECHNOLOGY
SECOND YEAR (Regulations 2014-2015 & 2018-2019 onwards)
PAPER I – TUMOR PATHOLOGY AND RADIOTHERAPY APPLICATIONS
Q.P. Code: 801931

Time: Three hours

Answer ALL Questions

Maximum: 100 Marks

I. Elaborate on:

(3 x 10 = 30)

1. Describe in detail about Time Dose Fractionation.
2. Describe in detail about Radiation protection with permissible dose limits.
3. Describe in detail about the anatomy, clinical features, investigation and FIGO staging (2018) of Carcinoma Cervix with Radiotherapy treatment portals and volumes.

II. Write Notes on:

(8 x 5 = 40)

1. Radio sensitizers.
2. Hormone therapy in the management of cancer.
3. Cell survival curve.
4. Tumor Angiogenesis.
5. Adjuvant chemoradiation and its significance.
6. Palliative care in treatment of cancer.
7. Stereotactic Body Radiotherapy (SBRT).
8. Relative biological effectiveness.

III. Short Answers on:

(10 x 3 = 30)

1. Necrosis.
2. Indirect effect of radiation.
3. What are Anti-oncogenes?
4. Metaplasia.
5. Mention any five histopathology in Sinonasal Carcinoma.
6. What are Sarcomas? Mention any five.
7. Mammogram.
8. What are Oncogenic Viruses?
9. Radiation Therapy Oncology Group (RTOG) grading of Radiation Mucositis.
10. Iridium192.
