

## Radiation Oncology Syllabus

For each of the tumour sites in table 1 below, the trainee should be able to:

- Contribute effectively to tumour board discussions
  - a. Explain the pathological factors that determine treatment decisions
  - b. Discuss the optimal imaging staging strategy including national or international guidelines
  - c. Stage the cancer appropriately
  - d. Apply national or international guidelines to the management of an individual patient
  - e. Apply research evidence to the management of an individual patient
  - f. Discuss the role of radiotherapy
  - g. Discuss the role of systemic therapy in the neoadjuvant, concomitant, adjuvant and palliative setting. This may include but is not limited to chemotherapy, monoclonal antibody therapy, immunotherapy etc)
  - h. Discuss the role of surgery
  - i. Describe at a basic level the operations that are indicated for particular cancers
  - j. Discuss the role of surgery in enabling optimal radiotherapy treatment (for example, placement of clips to mark a tumour bed, fiducials to facilitate IGRT or pelvic spacers)
  - k. Discuss the scheduling of radiotherapy, systemic therapy or surgery in patients treated with combined modality therapy
  - l. Discuss how radiotherapy, surgery, systemic therapies may interact during the therapeutic phase of treatment
  - m. Discuss the implications of hereditary gene mutations on the management of a patient



- n. Discuss the management of a patient when there is therapeutic uncertainty, complexity and ambiguity
- o. Identify when a patient should be offered the opportunity to enter a research trial
- p. Justify a decision that radiotherapy, systemic therapy and surgery are not indicated
- q. Discuss the role of palliative care in the management of the patient
- Undertake the initial outpatient consultation
  - a. Structure the consultation effectively
  - b. Take a focused history, undertake a careful clinical examination and order relevant imaging and laboratory examinations
  - c. Elicit and manage psychosocial factors
  - d. Evaluate and discuss the possible management strategies taking into account the factors related to the cancer, the patient's goals, their comorbidities and frailty and the adverse effects of the possible options
  - e. Facilitate shared decision making with the patient and their family
  - f. Explain the implications of hereditary genetic abnormalities and refer appropriately for genetic counselling
  - g. Discuss a radiotherapy treatment strategy including:
    - i. Pre-treatment procedures which may be required such as dental review
    - ii. Goals of treatment
    - iii. Simulation procedures (including immobilization, use of contrast, fusion etc)
    - iv. Fractionation regimen
    - v. Acute toxicities and supportive measures
    - vi. Late toxicities
  - h. Identify when brachytherapy, stereotactic cranial radiotherapy SCRT, stereotactic body radiotherapy (SBRT), proton therapy, intraoperative radiotherapy (IORT) or other specialist techniques may be of value and outline the procedure to the patient
  - i. Identify when systemic therapy alone or combined with radiotherapy may be of value and outline the process to the patient
  - j. Describe the acute and long term toxicities of the commonly used systemic therapies either alone or combined with radiotherapy
  - k. Identify when emergency surgery is indicated e.g. bowel obstruction or perforation or upper airways obstruction



- l. Identify when surgery may palliate symptoms or prolong life e.g., bile duct obstruction, hydronephrosis
  - m. Diagnose and initiate appropriate management of oncological emergencies including:
    - i. Spinal cord compression
    - ii. SVC obstruction
    - iii. Neutropenic sepsis
    - iv. Thromboembolic disease
    - v. Metabolic abnormalities such as hypercalcaemia, hyponatraemia and hyperkalaemia
- Implement the treatment strategy
    - a. Request the appropriate simulation procedure(s)
    - b. Determine and outline the GTV, CTV, ITV, PTV, OAR and PRV using appropriate diagnostic scanning techniques including CT, MRI and PET/CT for external beam and brachytherapy plans, using planning atlases when indicated
    - c. Evaluate the dose constraints for normal tissues as defined on a DVH
    - d. Evaluate the external beam/brachytherapy treatment plan in collaboration with physicists and RTTs including conformal 3D and IMRT plans
    - e. Know the ICRU guidelines for prescribing, recording and reporting dose
    - f. Critically evaluate the dose distribution in the tumour volume and the OAR
    - g. Identify an adequate plan and suggest options for improving an inadequate plan
    - h. Take overall responsibility for the treatment plan
    - i. Evaluate the risks and benefits of an external beam/brachytherapy treatment plan
    - j. Balance tumour control against potential damage to OAR and resulting toxicities
    - k. Modify treatment plan according to individual characteristics such as comorbidities and systemic treatment
    - l. Verify radiotherapy treatments, describe techniques available for real time image guidance.
    - m. Assess accuracy of patient set up and recommend adjustments
    - n. Know the level of tolerance accepted for set up margins in the department and how this influences PTV
    - o. Discuss the indications and aims of brachytherapy.
      - i. Describe the methods available
      - ii. Describe the principles of dose prescription
    - p. Discuss the indications and aims of use of radioactive isotopes



- q. Apply radiation protection principles when assessing patients
- r. Assess and manage early radiation reactions in patients receiving external beam, brachytherapy and combined modality treatment
- s. Know the common acute toxicities of systemic therapies when given as single modalities and when combined with radiotherapy
- t. Take clinical responsibility for delivery of radiation therapy
- u. Assess the acute toxicities of systemic therapies combined with radiotherapy and manage them or collaborate with other specialties to do so
- v. Modify treatment to adjust for gaps in treatment using the principles of radiobiology
- w. Evaluate response to treatment using RECIST and other commonly used criteria for formally evaluating response
- Manage survivorship
  - a. Develop a long term strategy for follow up of the patient
  - b. Discuss modification of lifestyle factors as appropriate
  - c. Construct a plan for patient specific rehabilitation
  - d. Take a focused history to diagnose the common psychological sequelae following a cancer diagnosis and treatment for cancer, manage them or refer appropriately to other specialties
  - e. Take a focused history, undertake a careful clinical examination and order relevant investigations to diagnose long-term toxicities from cancer therapies including secondary malignancies and multiple cancers
  - f. Discuss the options for managing these and implement them or refer appropriately to other specialties
  - g. Discuss the physical and psychological impacts of surgery at a basic level
  - h. Identify patients who may benefit from surgical procedures to ameliorate these e.g., resiting of a stoma
  - i. Discuss the role of surgery in improving function, ameliorating deformities and improving cosmesis including treatment for long term toxicities from radiation therapy
- Manage patients with relapsed disease
  - a. Take a focused history, perform a careful clinical examination and request relevant investigations to diagnose relapsed disease
  - b. Evaluate the possible management strategies taking into account the factors related to the cancer including whether there is a possibility of curative



- treatment, the patient's goals, their comorbidities and frailty and the adverse effects of the possible options
- c. Discuss the benefits and toxicities of radiotherapy treatment including reirradiation
  - d. Describe when surgery may be curative e.g. liver metastasis
  - e. Discuss the role and timing of surgery in palliative care
  - f. Discuss the role of radiofrequency ablation and cryotherapy in the management of metastases
  - g. Discuss the role, benefits and common toxicities of systemic therapies in palliative care and refer appropriately
  - h. Implement the radiotherapy treatment strategy
  - i. Recognise when radiotherapy, systemic therapy and surgery are not indicated
  - j. Discuss the role of palliative care in the management of the patient
  - k. Implement treatment to control symptoms or refer appropriately to other specialties

**Table 1: tumor sites**

	<b>MAJOR TUMOUR SITES</b>	<b>LESS COMMON TUMOUR SITES</b>
<b>BREAST</b>	Breast Cancer	
<b>THORAX</b>	Non Small Cell Lung Cancer Small Cell Lung Cancer	Mesothelioma Tumours of the Mediastinum
<b>HEAD AND NECK</b>	Mucosal Cancers Salivary Gland	
<b>SKIN</b>	Non Melanomatous Skin Cancer Melanoma	Kaposi's Sarcoma



	<b>MAJOR TUMOUR SITES</b>	<b>LESS COMMON TUMOUR SITES</b>
<b>MALE REPRODUCTIVE SYSTEM</b>	Prostate Cancer Seminoma of the Testis	Non Seminomatous Germ Cell Tumours of the Testis Penile Cancer
<b>FEMALE REPRODUCTIVE SYSTEM</b>	Cervical Cancer Uterine Cancer	Ovarian Cancer Vulval Cancer Vaginal Cancer Gestational Trophoblastic Disease
<b>URINARY TRACT</b>	Bladder Cancer	Kidney Cancer Cancer of the Ureter
<b>GASTROINTESTINAL TRACT</b>	Oesophageal Cancer Gastric Carcinoma Pancreatic Cancer Rectal Cancer Anal Cancer	Biliary Tract & Gall Bladder Cancers Hepatocellular Carcinoma Gastrointestinal Stromal Tumours Carcinoid Tumour Colon Cancer Liver Metastases
<b>CENTRAL NERVOUS SYSTEM</b>	Adult Glioma Meningioma	Ependymoma Pineal & Germ Cell Tumours Acoustic Neuroma



	<b>MAJOR TUMOUR SITES</b>	<b>LESS COMMON TUMOUR SITES</b>
	Pituitary Tumours Medulloblastoma Primitive Neuroectodermal Tumour Cerebral Metastases	Cerebral Arteriovenous Malformations
<b>HAEMATOLOGY</b>	Hodgkin Lymphoma Non Hodgkin Lymphoma	Leukaemia Multiple Myeloma
<b>MUSCULOSKELETAL &amp; CONNECTIVE TISSUE</b>	Soft Tissue Sarcoma Bone Metastases	Primary Tumours of the Bone Aggressive Fibromatoses
<b>PAEDIATRIC</b>		Paediatric Cancers
<b>ENDOCRINE</b>	Thyroid Cancer	Adrenal Tumours
<b>METASTATIC DISEASE</b>	Metastatic Carcinoma of Unknown Primary Site	
<b>NON MALIGNANT</b>		Non Malignant diseases treated with radiation therapy
<b>PALLIATIVE CARE</b>	Symptom Control Quality of Life	
<b>ONCOLOGICAL EMERGENCIES</b>	Malignant Spinal Cord Compression	



	<b>MAJOR TUMOUR SITES</b>	<b>LESS COMMON TUMOUR SITES</b>
	Superior Vena Caval Obstruction	

## Tumour sites and required level of competency

The level of competency expected varies according to tumour site:

- For major tumour sites, trainees are expected to reach level 4-6 with level 6 in the majority,
- For less common tumour sites, trainees are expected to reach levels 2-3
- Level 1 only in is accepted in certain specific areas like some rare /paediatric tumours, total skin electron treatment, proton treatment

**Table 1: Level of competency**

<b>Level 1</b>	Knowledge	Trainee has knowledge of procedure, has not observed procedure in clinical practice
<b>Level 2</b>	Observation only	Trainee observes a competent practitioner
<b>Level 3</b>	Perform with direct proactive supervision	Supervisor present in the same room
<b>Level 4</b>	Perform with indirect reactive	Supervisor is easily available if



	supervision	necessary
<b>Level 5</b>	Perform without immediate supervision	Post hoc report or remote supervision
<b>Level 6</b>	Trainee supervises more junior trainees	Trainee can perform procedure independently

