



# FRANZCR Examination

## Phase 2 Radiation Oncology

**Pathology**

**February 2017**

**Time Allowed: 3 Hours**

### **INSTRUCTIONS**

**ALL QUESTIONS** are to be attempted.

There are a total of SIX (6) questions.

All questions are of equal value.

The marks allocated to each sub-part of the questions are indicated in brackets.

Hand **all** papers to the invigilator.

No papers are allowed to be taken from the examination room.

**THIS INCLUDES THE QUESTION PAPERS.**

**Question 1**

- a. With regard to the following primary epithelial liver tumours:
- Hepatocellular carcinoma (HCC)
  - Cholangiocarcinoma (CCA)

Compare and Contrast:

- i Epidemiology, aetiology and risk factors. **(2.5)**
  - ii Histopathological (gross macroscopic & microscopic) features. **(2.5)**
  - iii Immuno-histochemical features. **(1)**
  - iv Serum tumour markers which may assist in establishing diagnosis. **(1)**
  - v Biological behaviour and patterns of spread. **(1)**
- b. A patient with a background history of hepatitis C induced cirrhosis is found to have a solitary 3 cm mass lesion in the liver raising suspicion of a HCC. **(2)**
- i How would radiological and blood investigation help?
  - ii Briefly describe the role fine needle aspiration/ needle core biopsy in establishing the diagnosis

**Question 2**

- a.** A 9 year old presents with a MRI showing a large posterior fossa mass. List the differential diagnoses of posterior fossa mass. **(2)**
- b.** Name the histopathological and molecular subtypes of medulloblastoma. **(1)**
- c.** What is the clinical importance of molecular subtyping? **(1)**
- d.** Describe the microscopic, immunohistochemical features and cytogenetics of classical medulloblastoma. **(3)**
- e.** Discuss the pathological features and biological behaviour of the desmoplastic variant of medulloblastoma. **(3)**

**Question 3**

A 35 year old woman presented with lower abdominal pain. Imaging shows a non-specific pelvic mass.

- a.** What relevant serum tumour markers would you request and how may they help to inform diagnosis? **(2)**
  
- b.** Apart from diagnosis, briefly describe the other roles of serum tumour markers in the management of malignancy. Give an example for each role. **(3)**
  
- c.** With regards to paraneoplastic syndrome, define the term “paraneoplastic syndrome” and list the ones that may cause delirium in a cancer patient. **(1)**
  
- d.** Describe the mechanisms of malignancy-related hypercalcaemia. Include in your answer the malignancy/ies most commonly associated with each mechanism. **(4)**

**Question 4**

A 15 year old boy presents with pain and swelling around the distal half of his right femur. Imaging investigations are highly suspicious of a primary malignant bone tumour.

- a.** Describe the principals that ought to be adhered to in undertaking a biopsy to establish the diagnosis. **(2)**
- b.** The differential diagnoses for this patient include Ewing's Sarcoma and Osteosarcoma. Compare and contrast these two tumours using the following features:
- i** Imaging characteristics seen on plain X-Ray and CT scan imaging. **(1.5)**
  - ii** Aetiological / Risk factors. **(1)**
  - iii** Pathogenesis and microscopic histopathological features. **(3)**
  - iv** Immuno-histochemical staining characteristics. **(1)**
- c.** How is response to neo-adjuvant chemotherapy assessed histologically in both tumours? **(1.5)**

**Question 5**

A 60 year old man presents with a moderately firm mass in his right anterior neck, suspected to be a malignancy in the thyroid gland.

- a.** Briefly describe the investigations you would recommend. Provide a justification for each. **(2)**
  
- b.** List the advantages and disadvantages of FNA biopsy of a thyroid mass. **(2)**
  
- c.** Describe the biological behaviour and microscopic features (including immunohistochemistry) of the following: **(6)**
  - i** papillary carcinoma
  - ii** medullary carcinoma
  - iii** undifferentiated (anaplastic) carcinoma

**Question 6**

- a.** Describe the timing of onset and pathogenesis of radiation pneumonitis and fibrosis. **(7)**
  
- b.** List the clinical features and underlying pathological changes of potential late skin side effects. **(3)**



# FRANZCR Examination

## Phase 2 Radiation Oncology

**Clinical Oncology**

**February 2017**

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**Question 1**

- a. In general, what challenges are there in treating elderly patients with cancer? **(4)**
  
- b. If you were designing a comprehensive geriatric assessment tool, what essential elements you would include? **(3)**

An 87 year old woman presents with locally advanced, node positive, triple negative breast cancer. Staging shows no distant metastatic disease.

- c. Outline the treatment options and the factors you would consider in determining the best management strategy for her. **(3)**

**Question 2**

- a.** What are the basic principles of obtaining valid consent for medical treatment? **(3)**
- b.** Using the headings listed below, what points would you include in your discussion when obtaining consent for a course of radiation therapy: **(5)**
- Diagnosis
  - Treatment
  - Other practical issues regarding treatment planning and delivery
- c.** Identify the special circumstances where obtaining valid consent is difficult and what methods can be used to overcome these difficulties? **(2)**

**Question 3**

A 66 year old man presents with bone pain, and a large lesion involving the sternum. Biopsy of the sternum shows abundant plasma cells.

- a. How would you investigate this patient? Justify your answer. **(4)**
  
- b. Describe available staging systems for multiple myeloma and the factors that they use to determine prognosis. **(2)**
  
- c. In general, what are the treatment options for newly diagnosed Multiple Myeloma? Include in your answer the role of radiation therapy. **(4)**

**Question 4**

- a.** Describe the important elements of a peer review process in radiation oncology. **(4)**
  
- b.** What specific components of a treatment plan need to be evaluated in a peer review process? **(3)**
  
- c.** What are the potential problems in conducting peer review? **(3)**

**Question 5**

- a. Describe the difference between a predictive and a prognostic factor. **(2)**
- b. What are the most important molecular and/or genetic markers in high grade glioma and outline their prognostic and predictive significance. **(4)**
- c.
- i Name one class of biological therapy and two classes of immunological therapies that may be used for disseminated melanoma and give an example of each. **(1)**
  - ii What are the molecular targets of these therapies and what molecular tests if any may identify suitable patients and/or predict response? **(1.5)**
  - iii What are the response rates and median survival for patients treated with each of these therapies? **(1.5)**

**Question 6**

- a. In general, what factors need to be considered when offering a pregnant woman radiation? **(4)**
- b. In general, what strategies can be employed to reduce the foetal dose? **(4)**
- c. What are the potential risks to a foetus if a man with an LDR 125 Iodine prostate implant comes into close proximity with a pregnant woman? **(2)**



# FRANZCR Examination

## Phase 2 Radiation Oncology

**Radiation Therapy 1**

**February 2017**

**Time Allowed: 2.5 Hours**

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**Question 1**

A fit 38 year old man presents with left flank pain. A CT scan reveals a heterogeneous tumour measuring 7cmx6cmx8cm in the left retroperitoneum above the pelvic brim.

- a.**
- i** What are the most likely malignant diagnoses in this patient? **(1)**
  - ii** Describe the initial assessment and work-up for this man. Justify your answer. **(2)**

A biopsy shows high grade liposarcoma. Staging investigations shows no metastatic disease.

- b.**
- i** What are the management options for this patient now? **(1)**
  - ii** What are the advantages and disadvantages of each option? **(2)**
- c.** A decision is made to treat with preoperative radiation therapy. Describe a suitable radiation therapy technique and dose fractionation schedule. **(4)**



**Question 2**

A 68 year old woman is diagnosed with muscle invasive, node negative bladder cancer (T2N0) following TURBT and CT staging.

- a.** What are the factors that should be taken into account when deciding on the optimal treatment modality? **(3)**
  
- b.** The treatment recommendation is for radical chemo radiation therapy. Describe a suitable chemotherapy schedule, radiation therapy technique and dose fractionation schedule. **(4)**
  
- c.**
  - i** For this patient, what are the patterns of recurrence and likely outcomes in terms of local control, bladder preservation and cure. **(2)**
  
  - ii** What are the potential significant late complications and what is their incidence? **(1)**

**Question 3**

A 39 year old woman present with PR bleeding and a 4cm mass in the anal canal.

- a. How you would further evaluate this patient? Justify your answer. **(3)**

The patient has a biopsy proven squamous cell carcinoma of the distal anal canal. Investigations reveal a 2cm right internal iliac node. The decision is made to treat with concurrent chemotherapy and radiation therapy.

- b. Describe a suitable radiation therapy technique and dose fractionation schedule. **(4)**
- c. Outline your follow up program for this patient. **(1)**
- d. If there is residual disease palpable on digital rectal examination at the first post treatment review, how would you manage this? **(2)**

**Question 4**

A patient presents with a 4x3cm left sided Level 2 lymph node. Biopsy confirms squamous cell carcinoma.

- a. What further information do you require to manage this patient? Justify your answer. **(2)**

The patient has a 4cm left tonsillar SCC extending to the midline on the soft palate. A decision is made to treat with radical cisplatin based chemo-radiation therapy.

- b. Describe a suitable radiation therapy technique and dose fractionation schedule. **(4)**

On review 6 weeks following completion of therapy, a complete response is noted in the tonsillar bed but a 2cm node persists at Level 2.

- c. How would you manage this patient now? **(2)**

- d. What potential late effects would you discuss with this patient? **(2)**

**Question 5**

A well 44 year old woman presents with a 12 months history of post coital bleeding. Clinical examination confirms an expanded 5cm diameter cervix with an ulcerated lesion arising from the posterior lip. A biopsy confirms squamous cell carcinoma of the cervix.

- a. How would you further assess this patient? Justify your answer. **(2)**

The patient has an enlarged right common iliac lymph node measuring 4cmx3cm. She has stage T2bN1M0 (FIGO IIB/TMN) SCC cervix. A decision has been made to offer her radical radiation therapy with concurrent chemotherapy.

- b. What factors would you consider when determining the superior extent of the nodal volume of your external beam treatment? **(3)**
- c. Describe a suitable radiation therapy technique and dose fractionation schedule for this woman's treatment. **(5)**



# FRANZCR Examination

## Phase 2 Radiation Oncology

**Radiation Therapy 2**  
**February 2017**

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**Question 1**

- a. In general, what is the role of radiation therapy in the management of neuroblastoma? **(2)**

A 3 year old girl presents with a biopsy confirmed primary neuroblastoma of the right adrenal gland. After the completion of all relevant staging investigations she is found to have poorly-differentiated, MYCN amplified, INSS Stage IV disease.

- b. Briefly outline an appropriate management plan for this patient. **(2)**
- c. Resection of the primary tumour is attempted but gross residual disease (>1cm<sup>3</sup>) remains. Describe a suitable radiation therapy technique and dose fractionation schedule to treat this girl. **(4)**
- d. What are the expected side effects of this course of radiation therapy? **(2)**

**Question 2**

A 70 year old woman presents with a hard 3cm x 4cm x 4cm mass in the right parotid gland. There are no other findings on clinical examination or CT imaging.

a. What are the differential diagnoses? **(2)**

b. An FNA indicates metastatic Squamous Cell Carcinoma. What factors should be considered in determining her management? Justify your answer. **(3)**

The patient declines surgery and the decision is made to treat with curative radiation therapy alone.

c. Describe a suitable radiation therapy technique and dose fractionation schedule. Justify your treatment volumes. **(3)**

d. What is the: **(2)**

i likely acute and late toxicity?

ii what is the likelihood of locoregional control and how would this compare to other treatment options?

**Question 3**

A 52 year old smoker presents with dyspnoea at rest and inability to lie flat. Examination reveals a plethoric face and engorged neck veins.

- a. Describe your immediate management and further investigations. **(2)**

Investigations reveal a 4cm right middle lobe non small cell lung cancer with involved hilar and mediastinal nodes and no distant metastases.

- b. In this patient, what factors should be considered when determining treatment intent? **(2)**
- c. A decision is made to treat with radical radiation therapy. Describe a suitable radiation therapy technique and a dose fractionation schedule. **(3)**
- d. In general, what are the management options for a fit patient with locally advanced non-small cell lung cancer with mediastinal nodes (pN2) who has undergone a complete surgical resection (R0)? Justify your answer. **(3)**



**Question 4**

A fit 47 year old male with chronic indigestion undergoes gastroscopy. Diffuse thickening of the gastric mucosal folds in the body of the stomach are seen. Multiple endoscopic biopsies confirm MALT/marginal zone lymphoma.

- a.** What is your management plan? **(3)**
  
- b.** The patient has localised gastric MALT lymphoma
  - i** What is the role for radiation therapy? **(1)**
  - ii** Discuss a suitable radiation therapy technique and dose fractionation schedule. **(4)**
  
- c.** What would you tell the patient about their outcome of treatment and follow-up schedule? **(2)**

**Question 5**

A fit 39 year old woman presents with a partial seizure. She is otherwise asymptomatic. Imaging reveals a 4cm lesion in the left temporal lobe with the appearance of a low grade glioma

- a. What management would you recommend and why? **(2)**
- b. The patient refuses medical care. She presents 4 years later with medically refractory seizures. Repeat MRI shows tumour progression **without** high grade features. The tumour is now 6cm. **(5)**
- i What are all the management options available to her?
  - ii What are the advantages and disadvantages of each option?
  - iii What is your preferred option and justify your answer?
- c. A decision is made to manage with radiation therapy treatment. Describe a suitable radiation therapy technique and dose fractionation schedule. **(3)**