



FRANZCR Examination

Phase 2 Radiation Oncology

Pathology

February 2016

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

Regarding Wilms' Tumour of the kidney:

- a. Briefly describe the epidemiology and any associated genes. (3)
- b. Describe the macroscopic and microscopic features. (3)
- c.
 - i. List the differential diagnoses for a mass in the kidney in a child compared with an adult? (1)
 - ii. Name three hereditary conditions associated with renal cancer? (1)
- d. What are the factors associated with poorer prognosis? (2)

Question 2

A 49 year old man presents with a large left parietal lobe mass with some surrounding oedema.

- a. List your differential diagnosis. (2)

A frozen section analysis of a surgical biopsy shows glioma.

- b. Compare and contrast the radiological, microscopic and molecular features of astrocytoma and oligodendroglioma. (3)
- c. Describe the microscopic features of Grade IV glioma. (1)
- d. List four commonly seen molecular markers in glioma and describe their clinical significance. (4)

Question 3

In regards to adenocarcinoma of the cervix:

- a. Describe the epidemiology and risk factors. How do these differ from those for squamous cell carcinoma of the cervix? (3)
- b. Describe the pathogenesis and clinical presentation. (3)
- c. Using immunohistochemistry how does one differentiate between the most common subtype of adenocarcinoma of the cervix (Endocervical/NOS) and well differentiated endometrial carcinoma (Type 1 endometrioid carcinoma)? (1)
- d. List the salient features to be included in the synoptic histopathology report after a radical hysterectomy. (3)



Question 4

- a. List the infectious agents with oncogenic potential, and their associated malignancies. **(2)**
- b. Describe the similarities and differences between viral and bacterial carcinogenesis? **(4)**
- c. **(4)**
 - i Describe the epidemiology and clinical presentation with regards to Classical and AIDS related Kaposi's sarcoma.
 - ii What are the microscopic and immunohistochemical features for Kaposi's sarcoma?

Question 5

A 72 year old male presents with widespread metastases from a primary cancer originating in the prostate gland.

- a. Describe the molecular and cellular events involved in:
 - i the development of the primary tumour. **(2)**
 - ii the metastatic cascade. **(5)**
- c.
 - i Describe the Gleason scoring system for prostate cancer. Include mention of any differences between how the pathologist assigns the Gleason score on prostate biopsy specimens and a radical prostatectomy specimen **(2)**
 - ii What are the limitations of the Gleason scoring system and how does the consensus from ISUP address these limitations? **(1)**

Question 6

- a. List the subtypes of non-Hodgkin lymphoma which occur within the hollow organs of the gastrointestinal tract. **(2)**
- b. A 40 year old man presents with a mass in the anterior mediastinum. **(4)**
 - i What is your differential diagnosis for this mass?
 - ii Describe the different approaches to obtaining a histological diagnosis for this mass, including specimen handling, plus advantages and disadvantages of each method described.
- c. **(4)**
 - i Compare and contrast the histological features of primary mediastinal B cell lymphoma and seminoma?
 - ii How could ancillary techniques be used to distinguish these entities?



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Clinical Oncology

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Question 1

A previously well 50 year old woman presents with a short history of headaches and having experienced a generalised seizure. Twelve months ago she underwent definitive surgery for non small cell lung cancer. A CT scan demonstrates a single 2cm lesion in the anterior right temporal lobe.

- a. Describe your immediate management and investigations and justify your answer. **(2)**
- b. Investigations show this to be a solitary lesion with no other evidence of disease. Discuss the options for managing this patient now, giving the advantages and disadvantages of each. Of the above options, what is your preferred management plan? Justify your answer. **(5)**
- c. In general, discuss the late toxicity of whole brain irradiation and the strategies that can be employed to minimise late toxicity. **(3)**

Question 2

- a. Recently, there have been attempts in many countries to set up Adolescent/Young Adult (AYA) cancer services. What are the specific issues that this group of patients face that require the establishment of such services? **(3)**
- b. You are invited to participate in a national planning group for AYA services. Given the issues that you have outlined above, select **6 priority areas** that the national AYA service needs to address and discuss strategies for meeting and managing these needs. **(7)**

Question 3

- a. A 66 year old woman presents with locally advanced cholangiocarcinoma. She has pruritis, jaundice, 6 kg weight loss and anorexia. **(6)**
 - i. Discuss the different management options for her pruritis and jaundice.
 - ii. Define cancer related cachexia and discuss its aetiology and treatment in this patient.
- b. Discuss the role of chemotherapy for extrahepatic cholangiocarcinoma include in your answer what drugs might be used. **(2)**
- c. The patient fails to respond to palliative radiation and systemic therapies and is referred to the palliative care team with intractable pain secondary to progressive local disease. Discuss the options available to manage her pain. **(2)**



Question 4

A 40 year old man recently treated for breast cancer has been found to have a BRCA-2 mutation.

- a. What are the implications of a positive BRCA2 mutation on the future medical management of this man? **(3)**
- b. He has a 35 year old sister. How would you counsel her regarding the pros and cons of having a test for a BRCA gene mutation? **(4)**
- c. The sister is found to be a BRCA2 mutation carrier. Discuss the chemoprevention agents available to her to reduce her risk of breast cancer. What are the advantages and disadvantages of these agents? **(3)**

Question 5

A 70 year old patient you are treating with standard adjuvant chemoradiotherapy after an anterior resection for rectal cancer develops severe enteritis four weeks into treatment. This requires discontinuation of treatment, intensive care admission and a bowel resection.

While she is an inpatient, her family puts in a complaint to the hospital that they were not made aware of this possible side effect prior to treatment.

- a. Assuming she was, and remains, competent to give informed consent, what do you need to consider in investigating and subsequently formulating a response? How would you proceed? **(6)**
- b. What aspects of the informed consent process are important in reducing the risk of consent issues such as this? **(4)**

Question 6

A 60 year old man has a history of a Clarke's level IV melanoma of the left thigh excised 5 years ago. He now presents with a groin mass and a biopsy reveals metastatic melanoma. Staging PET scan indicates no further disease. He undergoes a groin dissection.

- a. What further information do you require to determine his further management? Justify your answer. **(2)**

Two years later the man develops in- transit subcutaneous metastatic melanoma nodules affecting the left leg. There is no systemic metastatic disease.

- b. What are the options for his management? **(2)**

He is treated with local therapy with good response but 12 months later he has lung and liver metastases. His tumour is BRAF negative on extended mutation testing.

- c. In the management of metastatic melanoma, describe the mechanism of action, potential benefits and toxicities of **3 forms** of immune therapy. **(6)**



FRANZCR Examination

Phase 2 Radiation Oncology

Radiation Therapy 1

February 2016

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Question 1

A 36 year old man presents with a 4 week history of progressive headaches and nausea. MRI brain demonstrates a mass arising from the 4th ventricle typical of an ependymoma causing early obstructive hydrocephalus.

- a. Describe how you would further investigate and manage the patient. Justify your answer. **(2)**

The patient undergoes surgical resection. Histology shows anaplastic ependymoma WHO grade III. Post-op MRI shows minimal residual disease within the posterior fossa. Staging is otherwise clear.

- b. What treatment would you recommend for this patient? Include in your answer a suitable radiation therapy technique and dose fractionation schedule including normal tissue dose constraints. **(3)**
- c. When consenting the patient for treatment, describe the acute and potential late toxicity that you would discuss with the patient. **(2)**
- d. How would your management change if this patient was 2 years old at presentation? Justify your answer. **(3)**

Question 2

A 63 year old lady presents with interscapular back pain. CT demonstrates a mass at the apex of the left lung, invading the first rib. Core biopsy confirms squamous cell carcinoma (SCC).

- a. What further information do you require to determine the optimal management for this patient? **(2)**

Her disease is localised to the primary tumour only, with no nodes or distant metastases. Her case is reviewed at a multidisciplinary thoracic meeting and the tumour is deemed resectable.

- b. Discuss the treatment options, nominating your preferred option. Justify your answer. **(4)**
- c. How would you define your preoperative target volumes on the planning CT? Describe a suitable radiation therapy technique to deliver the recommended treatment. **(2)**

Eighteen months after completion of treatment and margin-negative resection, she re-presents with left arm pain and numbness. Imaging shows a local recurrence infiltrating into the C7 neural foramina. There is no other disease on restaging. The lesion is not operable.

- d. Discuss the various treatment options for this patient. **(2)**



Question 3

A 75 year old man is referred by his dentist with a lateralised lesion on the left side of his anterior 2/3 of tongue. The lesion is biopsied and is a squamous cell carcinoma (SCC). It is p16 negative. There is no evidence of nodal or more distant spread on staging PET/CT.

- a. What are the management options for this patient? Discuss the advantages of each option. (2)

The decision is made to proceed with a hemiglossectomy and modified radical left neck dissection.

The histology showed a 2.4 cm well differentiated SCC 8mm in thickness. The closest margin was 0.5mm posteriorly. Lymph vascular space invasion (LVI) was present but there was no perineural spread. 3/43 nodes were involved (all within level II). There was no extracapsular extension.

The patient is referred for post-operative radiation treatment.

- b. Describe a suitable radiation therapy treatment technique and dose fractionation schedule. (3)

Two thirds of the way through the course of the radiation treatment the patient has 10% weight loss.

- c. How would assess and manage this clinical scenario? (5)

Question 4

A 75 year old woman presents with a large fungating lesion in the left breast. There are fixed nodes in the left axilla on examination. Biopsies of the breast and nodal masses confirm Grade 2 infiltrating ductal carcinoma.

- a. What is your initial management of this patient? (2)

The breast mass measures 8-10 cms. There is a 4x5 cms axillary mass of matted nodes. There are no further abnormalities on staging investigations. The tumour is ER/PR negative.

- b. What are her management options? (3)

The patient is fit with no other comorbidities. The decision is made to treat with primary radiation therapy.

- c. Describe a suitable radiation therapy technique and dose fractionation schedule. Justify your answer. (5)



Question 5

A 68 year old woman presents with a painful bleeding vulval lesion.

- a. Outline your initial management and investigations. Justify your answer. **(2)**
- b. On examination the mass extends from the right labia majora around the posterior fourchette and to the anal verge and lower vagina. Biopsy confirms a squamous cell carcinoma of 7mm depth. Staging investigations reveal no adenopathy. (T3N0M0).
 - i. What are the treatment options and what is your preferred option? Justify your answer. **(3)**
 - ii. A decision is made to treat with definitive chemoradiation therapy. Describe a suitable chemoradiation therapy technique and dose fractionation schedule for this patient. **(3)**

The patient presents 12 months later with a swollen left leg. There is no evidence of disease recurrence or DVT on examination or investigation.

- c. What is the likely diagnosis and what is your management? **(2)**



FRANZCR Examination

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Radiation Therapy 2

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Question 1

A 50 year old man presents with diplopia and palpable lymphadenopathy in the left neck. Investigations revealed a nasopharyngeal mass. Biopsy shows undifferentiated carcinoma.

- a. What further information do you require to determine a management plan for this patient? (2)

Imaging confirms a primary nasopharyngeal tumour invading into the cavernous sinus on the right and bilateral level 2-4 cervical lymphadenopathy <6cm. Staging investigations reveal no distant metastases. (cT4N2cM0). The recommendation of the MDT is definitive chemoradiation.

- b. Describe a suitable radiation therapy technique and dose fractionation schedule. Include in your answer a suitable chemotherapy regimen. (4)
- c. What are the acute and long term toxicities you would discuss with the patient? (2)
- d. In general, xerostomia is a common complication of head and neck radiation treatment. What strategies can be used to reduce the risk of xerostomia? How do you manage a patient with this condition? (2)

Question 2

A 62 year old has a PSA of 17. DRE demonstrates nodularity of the left lobe of the prostate. TRUS and biopsy reveals adenocarcinoma (Gleason 4+3=7, ISUP 3) in all cores from the left side of the gland.

- a. What further information do you require to determine the potential treatment options for this patient? Outline how these factors may influence management options. (2)

The patient is fit and well. He undergoes a robot-assisted radical prostatectomy **without** pelvic lymphadenectomy.

Histology demonstrates; adenocarcinoma (Gleason 4+3=7, ISUP 3) with extensive extracapsular extension at the left base, involvement of the base of the left seminal vesicle and a positive margin of 7mm from the left mid to-base.

At 7 weeks post surgery, the PSA is undetectable and urinary continence has returned.

- b. What potential treatment options would you discuss with this patient (including the place of ADT and whole pelvic radiation therapy)? Include in your answer, the arguments for and against each option. (5)
- c. A decision is made to offer adjuvant radiation therapy. Describe a suitable radiation therapy technique and dose fractionation schedule for this patient. (3)



Question 3

- a. External Beam Radiation Therapy is used to treat benign conditions. What factors influence the risk of normal tissue damage and the incidence of radiation induced malignancy? **(3)**
- b. What is the role of external beam radiation therapy in thyroid eye disease? Include in your answer: **(4)**
- the indications and contraindications to treatment,
 - the target volumes,
 - the radiation dose fractionation schedule and
 - the expected response rate to treatment.
- c. What is the role of external beam radiation therapy in heterotrophic ossification of the hip? Include in your answer **(3)**
- the indications for treatment,
 - the optimal timing of treatment,
 - the target volumes and
 - dose fractionation schedules.

What are the alternatives to radiation therapy?

Question 4

A fit 48 year old woman presents with a painless 4cm mass in the left lower axilla. An excision biopsy is performed. Pathological review demonstrates a lymph node replaced by follicular lymphoma (Grade 1).

- a. What further information do you require to decide on a management plan for this patient? Justify your answer. **(2)**
- b. PET CT shows avidity at the site of the excised node, with a smaller avid mass situated superiorly at the left axillary apex (Stage 1 Follicular lymphoma). **(6)**
- Outline the treatment options available for this patient.
 - If radiation therapy were to be used in her management, describe a suitable radiation therapy technique and dose fractionation schedule.
 - What is the expected response rate to this treatment?

Six years after obtaining a complete response to radiation therapy, the patient represents with a 3 cm painless mass in the post triangle of the right neck. A CT scan shows small volume para-aortic lymphadenopathy. The neck and para-aortic adenopathy are avid on PET CT.

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



Question 5

A 64 year old man presents with a 4 week history of dysphagia. History and examination is otherwise unremarkable. Endoscopy and biopsy, endoscopic ultrasound, CT scan and PET scan reveal a 4cm adenocarcinoma in the distal oesophagus (35–38cm ab oral) invading the adventitia, but no nodal or distant metastatic disease. (T3N0M0).

- a. Discuss the curative treatment options available for this man, giving evidence to support each option. **(5)**
- b. In the definitive chemoradiation setting, there is controversy around prophylactic nodal irradiation. What are the arguments for and against prophylactic nodal irradiation in patients with no overt nodal disease? **(2)**
- c. The decision has been made to give preoperative chemotherapy and radiation therapy. Describe a suitable chemoradiation therapy technique and dose fractionation schedule. **(3)**