

WARNING

This material has been reproduced and communicated to you by or on behalf of *Charles Darwin University* in accordance with section 113P of the *Copyright Act 1968 (Act)*.

The material in this communication may be subject to copyright under the Act.
Any further reproduction or communication of this material by you may be the subject of copyright protection under the Act.

Do not remove this notice



Family Name					
Given Name/s					
Student Number					
Teaching Period	Semester 1, 2019				

PHA411 – Therapeutics C	DURATION	
	Reading Time:	10 minutes
	Writing Time:	180 minutes
INSTRUCTIONS TO CANDIDATES		
<p>The examination has THREE (A, B and C) Sections:</p> <p>Section A: Multiple Choice Questions: Answer ALL forty (40) questions on the College 100-MCQ Answer Sheet provided. Total marks allocated: Forty (40). Suggested allocated time: 60 minutes</p> <p>Section B: Extended Answer Questions: Answer any 4 out of 5 questions. Marks as indicated by lecturer. Total marks allocated: Forty (40). Suggested allocated time: 60 minutes.</p> <p>Section C: Case Study Questions: Answer ALL (2) questions. Total marks allocated: Forty (40). Suggested allocated time: 60 minutes</p> <p>Total = 120 marks</p>		
EXAM CONDITIONS		
<p><u>You may begin writing from the commencement of the examination session.</u> The reading time indicated above is provided as a guide only.</p>		
This is a CLOSED BOOK examination		
No calculators are permitted		
No handwritten notes are permitted		
No dictionaries are permitted		
ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED	
No additional printed material is permitted	3 x 16 Page Book 1 x Scrap Paper College Multiple Choice Answer Sheet	

**THIS EXAMINATION IS PRINTED
DOUBLE-SIDED.**

**THIS PAGE HAS BEEN INTENTIONALLY
LEFT BLANK.**

Section A
Multiple Choice Questions
Total No of Marks for this Section: 40

This section should be answered on the College 100-MCQ Answer Sheet provided. Please ensure that your name and student number have been written on the Answer sheet and placed in the completed Answer Booklet.

Answer **ALL** forty (40) questions

Marks for each question are indicated. Suggested time allocation for Section A: 60 mins

Section B
Extended Answer Questions
Total No of Marks for this section: 40

This section should be answered in the Answer Booklet provided.
Answer any FOUR (4) questions only.

Marks for each question are indicated. Suggested Time allocation for Section B: 60 mins

Question 1

- (a) Identify FOUR (4) possible risk factors for erectile dysfunction (ED), and explain why these factors may contribute to ED. (Marks: 4)
- (b) List FOUR (4) major pharmacological classes of medications that can cause erectile dysfunction. (Marks: 2)
- (c) Explain the mode of action of phosphodiesterase-5 (PDE5) inhibitors in managing ED. (you may wish to utilize a drawing or flow diagram to illustrate your answer). (Marks: 3)
- (d) Provide TWO (2) examples of PDE5 inhibitors. (Marks: 1)

Question 2

- (a) Name ONE (1) inherited syndrome which can pre-dispose a person to colorectal cancer. (Marks: 1)
- (b) Besides inherited conditions, identify FOUR (4) risk factors associated with the development of colorectal cancer. (Marks: 2)
- (c) What screening tests are available for early detection of colorectal cancer? From where can patients access these? (Marks: 2)
- (d) Identify FOUR (4) host-related risk factors commonly associated with the development of malignant melanoma. (Marks: 2)

- (e) Features of a mole or a lesion which indicate the need for further assessment, with the possibility of malignant melanoma, can be described using ABCDE. Define and outline what each letter represents.

(Marks: 3)

Question 3

Patients receiving cytotoxic chemotherapy for treatment of cancer are at risk of chemotherapy induced nausea and vomiting (CINV).

- (a) Differentiate between acute CINV, delayed CINV and breakthrough CINV.
(hint: onset and duration).

(Marks: 3)

- (b) Name THREE (3) drug classes which are highly effective in preventing CINV, and provide ONE (1) example from each class used for this purpose.

(Marks: 3)

- (c) Identify FOUR (4) other potential causes of nausea and vomiting in cancer patients which need to be excluded before patients can be diagnosed with CINV.

(Marks: 2)

- (d) Provide TWO (2) examples of chemotherapeutic agents which have high emetogenic risk (i.e. >90% risk of emesis).

(Marks: 2)

Question 4

- (a) Explain why chemotherapy for cancer treatment is given in cycles rather than continuously.

(Marks: 3)

- (b) Explain the process of clinical staging of solid tumours and why this is important.

(Marks: 3)

- (c) Give TWO absolute contraindications to menopausal hormone therapy.

(Marks: 2)

- (d) What is meant by the term “unopposed estrogen” and what is the risk of giving this to a woman who still has her uterus?

(Marks: 2)

Question 5

- (a) What is meant by “targeted treatment” in relation to oncology? Provide FOUR (4) examples of targeted therapy molecules, their site of action (i.e. what they are targeting) and a type of cancer in which each targeted agent may be used.
(Marks: 5)
- (b) In relation to palliative care, discuss FIVE (5) symptoms commonly experienced by patients in the terminal phase. Include in your answer FIVE (5) medications which are commonly utilized at this time.
(Marks: 5)

End of Section B

Section C
Case Study Questions
Total Number of Marks for this section: 40

This section should be answered in the Answer Booklet provided.

Marks for each question are indicated. Suggested Time allocation for Section C: 60 mins

Question 1 (20 marks)

Gary, a 44-year-old man presented with complaints of extreme fatigue with painless, rubbery swelling in his cervical (neck) lymph nodes, occasional fevers, night sweats and unexplained weight loss of 6 kg from his 88kg frame in the past month. Physical examination revealed several enlarged cervical (neck) lymph nodes but with no pharyngeal swelling or redness. Further examination revealed marked lymphadenopathy in the right axillary (armpit) region and left inguinal (groin) nodes. Gary's medical history was unremarkable apart from glandular fever when he was 19 years old, and treatment for *helicobacter pylori* infection 5 years ago. Excisional biopsy of a lymph node and immuno-phenotyping confirmed the diagnosis of diffuse large B-cell lymphoma (CD20+), a form of non-Hodgkin's lymphoma (NLH), stage III_{1B}.

After consulting with his oncologist, Gary elected to receive combination chemotherapy **R-EPOCH** (rituximab, etoposide, prednisolone, vincristine, cyclophosphamide and doxorubicin).

- (a) Briefly discuss the aetiology and pathophysiology of NHL. What is the main difference in the diagnostic feature between NHL and Hodgkin's Lymphoma (HL)?
(Marks: 5)
- (b) Is Gary's lymphoma regarded as limited or advanced? Explain why, with an explanation of the subscript _B.
(Marks: 4)
- (c) What is the goal of treatment for Gary's stage of NHL?
(Marks: 1)
- (d) Describe the mechanisms of action of TWO (2) chemotherapeutic agents used to treat Gary's NHL (**EPOCH** - etoposide, prednisolone, vincristine, cyclophosphamide and doxorubicin). Include in your answer TWO (2) toxicities of each of the TWO (2) agents described.
(Marks: 6)
- (e) Why is rituximab included in Gary's chemotherapy regimen? Include in your answer what rituximab is targeting and the effect it has on cancer cells.
(Marks: 4)

Question 2 (20 marks)

Barbie, a 53 year old menopausal woman (BMI=30kg/m²), was referred to the oncology unit by her general practitioner after she developed an inverted nipple on her right breast. Her mammogram and ultrasound showed a 3cm lesion, and further biopsies revealed a Grade 2 breast cancer with 2 positive sentinel lymph nodes. (early stage IIB T₂N₁M₀).

She opted to undergo breast-conserving surgery (i.e. lumpectomy), and additional tests showed her tumour was estrogen and progesterone receptor (ER+/PR+) positive (i.e. HR+ve) and HER-2 negative. Her post-surgery treatment plan was to receive 4 cycles of doxorubicin 60mg/m² IV and cyclophosphamide 600mg/m² IV infusion every 21 days, with adjuvant external beam radiation therapy to be commenced 4 weeks after completing chemotherapy.

Barbie's medications on admission included:

MEDICATION	DOSE
Estradiol 1mg + norethisterone 0.5mg tablet (<i>Kliovance</i> ®)	1 daily
Fluticasone/salmeterol 250/25mcg MDI	1 puff bd
Metformin tablet	500mg tds
Salbutamol MDI 100mcg/dose	2-3 puffs prn
Rosuvastatin tablet	10mg daily
Perindopril tablet	5mg daily

Barbie had 2 children, a son aged 20 and a daughter aged 17, both of whom were breastfed. Her menarche occurred at 11 years of age. Barbie was taking estradiol 1mg + norethisterone 0.5mg tablets for her menopausal symptoms for 4 years before her diagnosis of breast cancer. Her blood pressure, asthma and diabetes were all well-controlled.

Barbie was a smoker for 15 years but gave it up many years ago when she was pregnant with her first child.

Barbie's family medical histories include;

- Mother passed away from breast cancer 30 years ago
- Father died from heart attack 6 years ago
- Incidence of breast cancer, cervical cancer and stroke in other siblings of her parents (i.e. aunts and uncles).

- (a) Identify Barbie's risk factors for breast cancer. What advice should be given to Barbie about her current medication?
(Marks: 6)
- (b) In relation to breast cancer, explain what is meant by "sentinel lymph node" biopsy? Why is this performed, where are these lymph nodes located and what is the advantage in not removing all the lymph nodes adjacent to the breast?
(Marks: 4)
- (c) Explain what is meant by "*hormone positive (HR+) breast cancer*" and suggest adjuvant endocrine agents which may be considered beneficial in managing Barbie's breast cancer. In your answer, provide TWO (2) examples, elaborate on how they work, and for how long they will likely be taken. What are TWO (2) common side effects of each agent?
(Marks: 6)
- (d) What is the goal of treatment for Barbie's current stage of breast cancer?
(Marks: 2)
- (e) Comment on the potential use of trastuzumab for Barbie.
(Marks: 2)

End of Section C

End of Examination