

**UNIVERSITY OF SWAZILAND  
FACULTY OF HEALTH SCIENCES  
FINAL EXAMINATION MAY 2018**

**TITLE OF PAPER: ADVANCED PHARMACOTHERAPEUTICS ACROSS THE LIFE SPAN**

**COURSE CODE: GNS 606**

**TIME ALLOWED: THREE (3) HOURS**

**PAGES: 14 INCLUDING COVER PAGE**

**MARKS: 100**

**INSTRUCTIONS**

1. THERE ARE FIVE (5) QUESTIONS IN THIS PAPER
2. ANSWER ALL QUESTIONS
3. WRITE LEGIBLY

**THIS PAPER IS NOT TO BE OPENED UNTIL THE INVIGILATOR HAS GRANTED PERMISSION.**

**QUESTION 1**

**MULTIPLE CHOICE:** Choose the one best answer from the options given, write your response in your answer sheet e.g. 1. B

1. You see a 28-year-old man with a complaint of purulent eye drainage times three days. His 6-year-old daughter was recently diagnosed with bacterial conjunctivitis. Which of the following is the best choice of eye medication to prescribe initially to treat his infection? He is allergic to sulpha.
  - A. Sulphacetamide 1% ophthalmic solution Dispense 15 ml. Apply one drop to each eye three times a day for one week.
  - B. Chloramphenicol 1% ophthalmic solution. Dispense 15 ml. Apply one drop to each eye four times a day for 7 days.
  - C. Oxymetazoline 0.05% solution. Dispense 15 ml. Apply one drop each eye every 6 hours for 7 days.
  - D. Pilocarpine 2% Dispense 15 ml. Apply one drop to each eye twice a day for a month.
  
2. In consultation with the eye doctor, you decide that a patient needs dexamethasone 0.1% plus chloramphenicol 0.5% ophthalmic eye drops. What is the most important measure that must be done prior to his starting the drops?
  - A. You instruct the patient in the use of the drops.
  - B. Patient does a return demonstration on the administration of eye medications.
  - C. That the patient has a slit lamp examination of the cornea to rule out abnormalities creating risk for corneal ulceration.
  - D. That you write out the instructions for administration along with the prescription.

3. A 30-year-old woman presents with an uncomplicated urinary tract infection. She is not pregnant. You choose an antibiotic that is **MOST** likely to be effective against E. coli. The best choice of the following antibiotics is:
- A. Gentamicin
  - B. Erythromycin
  - C. Co-trimoxazole
  - D. Ciprofloxacin
4. What is the best rationale for your choice in question #3?
- A. It is better to start with a broad-spectrum antibiotic to assure that you cover the causative organism.
  - B. It is best to always use an antibiotic that is safe in pregnancy when treating a woman of child-bearing age.
  - C. The most common causative organism is E. coli and this medication covers gram negative rods well.
  - D. Our clinic always treats UTIs with this antibiotic.
5. Hearing loss is a potential toxic effect of which medication?
- A. Furosemide
  - B. Atorvastatin
  - C. Penicillin
  - D. Hydrochlorothiazide

6. Musa is on first-line therapy (TDF [Tenofovir] + 3TC [Lamivudine] + EFV [Efavirenz]) for HIV. When he started a year ago his creatinine clearance was 75 ml per minute. Today it is 60 ml per minute. What is the best course of action to take?
- A. Immediately stop ART.
  - B. Continue current regimen and repeat the test in 3 months.
  - C. Evaluate for possible cause(s) of false creatinine elevation, repeat the test.
  - D. Place him on second-line treatment.
7. Furosemide is protein-bound. If a person has a low serum albumin how would you adjust the dose to assure efficacy?
- A. Increase
  - B. Decrease
  - C. Adjustment is not necessary
8. The serious side effect of zidovudine (AZT) treatment that can cause imminent illness or death is
- A. Lactic acidosis
  - B. Nail discolouration
  - C. Anaemia
  - D. Abdominal obesity
9. Since the adoption of test and treat strategy, wasting syndrome related to HIV has become much less common. The reason for this is
- A. The newer medications cause much less wasting than the old ones.
  - B. ART reduces the incidence of Co-infection with tuberculosis (TB).
  - C. Diarrhoea is eliminated.
  - D. Patients start on ART while they are still relatively healthy.

10. Lucky is a five-year-old boy living with his mother, who was recently diagnosed with MDR TB. Lucky is also diagnosed with TB. He has no contraindications to treatment and his mother has given permission. Prior to receiving the final laboratory results you would
- A. Hold off treatment until all tests are received because of his young age.
  - B. Start treatment immediately with first line medications.
  - C. Start treatment as if he has MDR TB.
  - D. Start any TB regimen since any treatment is better than none.
11. Wandile has chronic kidney disease with a GFR of 29ml/ minute, which he has been stable for the last 4 months. Which medication will you discontinue because of its risk of lactic acidosis?
- A. Insulin
  - B. Metformin
  - C. Glibenclamide
  - D. Gliclazide
12. Mrs. Simelane was diagnosed with hypothyroidism and started on levothyroxine 50 mcg per day. The best time to take her medicine is:
- A. On an empty stomach 30 minutes before breakfast
  - B. Consistently at dinner
  - C. When she takes her other medication
  - D. At night with bedtime snack
13. Which of the following symptoms might indicate Mrs. Simelane may need to increase her dose of levothyroxine after six weeks?
- A. Persistent fatigue
  - B. Five-pound weight loss
  - C. Frequent loose stools

D. Rapid pulse

14. It is recommended that all patients with *P.falciparum* malaria in low-intensity malaria transmission areas be treated with primaquine to block transmission. What action should the FNP take when prescribing primaquine?

- A. Check for G6PD deficiency before administering the drug
- B. Advise patient to take dose after completing artemisinin-based combination therapy
- C. Check for history of haemolytic anaemia
- D. Advise bed nets and mosquito repellent

15. Which of the following signs or symptoms indicate complicated malaria?

- A. Fever and chills
- B. Nausea and vomiting
- C. Abdominal pain and diarrhoea
- D. Hypotension and shock

16. What is the most important strategy used in Swaziland to prevent or delay resistance to current antimalarial drugs?

- A. Early diagnosis and prompt treatment
- B. Use of rapid diagnostic tests
- C. Appropriate weight-based dosing
- D. Use of combination of two effective antimalarial medications

17. Which antitubercular drug is the most toxic to the liver?

- A. Pyrazinamide
- B. Rifampin
- C. INH (isoniazid)
- D. Ethambutol

18. Over a period of three weeks, a 60-year-old black male patient in the clinic has an average blood pressure of 144/94. The next most appropriate action of the FNP is:
- A. Initiate thiazide-type diuretic
  - B. Determine his risk stratification
  - C. Discuss lifestyle modification and observe for 3 to 6 months
  - D. Initiate a calcium channel blocker
19. Which of the following effects of kidney failure would be **MOST** likely to cause hypoglycaemia in a diabetic patient on insulin?
- A. Metabolic alkalosis
  - B. Anaemia
  - C. Fluid overload
  - D. Impaired drug elimination
20. What is a simple test that can be done to screen for kidney function and results are available immediately?
- A. Urinalysis
  - B. Urine dipstick
  - C. Creatinine clearance
  - D. Blood pressure
21. Nosipo is a 12-year-old girl with migraine headaches. The best management for migraines in a child is preventive treatment combined with this as a rescue medication
- A. Paracetamol
  - B. Oral morphine sulphate
  - C. Sumatriptan
  - D. A non-steroidal anti-inflammatory medication

22. For an accurate blood pressure in persons over 60 years of age, which of the following is also necessary?
- A. Patient seated for 3 to 5 minutes with back supported
  - B. Proper cuff size
  - C. Record BP after patient has stood for one minute
  - D. Measure and record BP in both arms
23. A 25-year-old female with asthma has wheezing and shortness of breath daily. She uses inhaled salbutamol (short acting) 200 micrograms for relief. What would be the next step you would advise to better control her symptoms?
- A. Low dose steroid inhaler to control inflammation
  - B. High dose steroid inhaler to control inflammation
  - C. Oral steroid for inflammation
  - D. Long acting beta 2 agonist for bronchodilator
24. A 61-year-old black female with no added risk factors has been started on hydrochlorothiazide 12.5 mg once daily. The nurse practitioner sees the patient one month after she was started on medication and her blood pressure is 148/94. Which of the following would be the **NEXT** most appropriate step?
- A. Increase the dosage of hydrochlorothiazide to 25 mg once daily
  - B. Continue to monitor blood pressure for two more months
  - C. Add nifedipine 10 mg once daily
  - D. Check to see if she has been taking the medication daily



25. A patient with advanced HIV that develops TB would be more likely to present clinically with which of the following symptoms?
- A. fever with night sweats
  - B. haemoptysis
  - C. shortness of breath
  - D. cough for more than 2-3 weeks
26. In treating a urinary tract infection empirically, the FNP would choose an antibiotic with activity against:
- A. Streptococci
  - B. Klebsiella
  - C. Escherichia coli
  - D. Staphylococcus saprophyticus
27. The FNP should not prescribe medications from the penicillin family a child who has had which of the following side effects?
- A. Hives (urticaria) after taking phenoxymethylpenicillin
  - B. Maculopapular rash while taking amoxicillin
  - C. Diarrhoea while taking cloxacillin
  - D. Swollen lips and eyelids after taking second dose of erythromycin
28. Which medication classification is the best choice as a first-line treatment for moderate depression in the outpatient setting?
- A. MAO Inhibitor
  - B. Benzodiazepine
  - C. Dopamine agonist
  - D. Selective Serotonin Reuptake Inhibitor (SSRI)

29. The most common bacterial cause of community-acquired pneumonia in an adult is:

- A. Haemophilus influenza
- B. Streptococcus pneumonia
- C. Chlamydia pneumonia
- D. Mycoplasma pneumonia

30. In treating a patient with Helicobacter pylori, it is important that the FNP prescribe:

- A. Clarithromycin
- B. Amoxicillin
- C. Combination therapy
- D. Omeprazole

**TOTAL = 30 MARKS**

### QUESTION 2

**SHORT ANSWER:** Respond to each question as requested.

1. State three (3) advantages of contraceptive implants. (3 MARKS)
2. Explain in 1-3 sentences the mechanism of action of oestrogen and progesterone in preventing pregnancy. (3 MARKS)
3. A 35-year-old man presents with cellulitis for three (3) days that is worsening. (5 MARKS)
  - a. What is the most likely aetiology?
  - b. According to Swaziland Standard Treatment Guidelines, what medicine would be used to treat the disorder?
  - c. What are contraindications to this treatment, if any?
  - d. Write a description (as though you were charting) of what this patient's cellulitis might look like.
4. List five (5) potential anticholinergic side effects of medications. (5 MARKS)

5. A 50-year-old man has tinea pedis that he has treated with Vaseline for about one month without relief. Answer the following questions about his skin condition.

(4 MARKS)

- a. What causes this disorder?
- b. What medicine would be used to treat this skin disorder?

**TOTAL = 20 MARKS**

### QUESTION 3

**CASE STUDY:** Mr. Musa, a 50-year-old with heart failure from valvular heart disease, comes to your clinic with a two-day history of cough. He has had a recent viral illness that he feels has not gone away. Predominant symptoms are cough, difficulty sleeping lying flat (using 2 pillows), feeling like his heart is racing, and being unable to catch his breath. He is not sure if he had a fever, but he does feel warm at night and has a hard time getting comfortable. He has diabetes and hypertension. Your findings are the following:

BP 154/95 HR 92, irregular T 38 degrees C Respiratory rate 32 Weight 85 Kg

#### **Review of Systems:**

HEENT: recently had irritated eyes, runny nose, nasal congestion and ear pain.

Lungs: Has been coughing for two weeks. Initially his cough was dry but now it is productive of large amounts purulent sputum.

Heart/CV: feels his heart pounding, especially when he tries to sleep at night.

Peripheral vascular: states his legs feel cold

GI: last week nausea; now no nausea, vomiting, or diarrhoea.

Musculoskeletal: generalized weakness.

Neurological: feels dizzy when he stands up suddenly

#### **Physical Examination**

General: Elderly Black male who looks older than stated age, in moderate distress.

HEENT: within normal limits except unable to hear finger rub when placed next to his ear.

Lungs: Scattered ronchi; no wheezes; rales or crackles bilateral bases. Crackles do not clear with cough. Cough is productive of purulent sputum.

Heart: Irregular, unable to appreciate murmurs or gallops

Abdomen-within normal limits

Extremities: 2+ pedal oedema to mid-calf.

FBG 10 mmol/L Creatinine 500  $\mu$ mol/

### Medications

Metformin 500 mg orally twice a day (patient has been on this medication for 15 years)

Atorvastatin 20 mg orally every day

Hydrochlorothiazide 25 mg orally daily

You order a PA and lateral chest x-ray. He has an infiltrate in his bilateral lower lobes indicating pneumonia. You diagnose him with bacterial pneumonia.

1. Before you order any medications for him, you decide that you need to know if he has any impairment of his renal function. Calculate his glomerular filtration rate (GFR) using the Cockcroft-Gault equation. (3 MARKS)

Estimated creatinine clearance =  $\frac{[140 - \text{age}] \times \text{weight kg} [ \times 0.85 \text{ for female} ]}{\text{serum creatinine in } \mu\text{mol}}$   
Answer: \_\_\_\_\_

2. This creatinine clearance indicates (1 MARK)
  - A. Normal kidney function
  - B. Slight impairment
  - C. Severe impairment

3. You have diagnosed Babe with pneumonia. Describe how you would choose an appropriate antibiotic for him. Include how you would determine which organism you are treating, which antibiotic is appropriate for him and why. (3MARKS)

4. Write a prescription including the name of the medication, the form (tablet, suspension, injection, etc.), dose, frequency, and duration. Indicate the number of tablets or the volume of liquid. (5 MARKS)
5. Babe returns to the clinic three days later and he is not improved. His condition has worsened a bit. You decide the antibiotic is not working. Describe the process you will use to decide upon the next treatment for him. (5 MARKS)
6. Babe complains of bilateral knee pain. You diagnose osteoarthritis. What will you order for pain for him? Explain your rationale. (3 MARKS)

**TOTAL = 20 MARKS**

#### QUESTION 4

**CASE STUDY:** Ms. Zwane is mildly obese 45-year-old black woman and has fasting blood glucose of 7.5 mmol/L and her blood pressure has been consistently 150/94, despite three months of trying non-pharmacological measures to control hypertension. She is not on any medications. The following five questions apply to this scenario:

- A. What class of medicine and what specific medicine would you initiate to control Ms. Zwane's type 2 diabetes? (2 MARKS)
- B. What is the rationale for your choice? (4 MARKS)
- C. What is the most common side effect of this medicine? (2 MARK)
- D. What class of medicine and what specific medicine would you initiate to control Ms. Zwane's blood pressure? (2 MARKS)
- E. When should Ms. Zwane be rechecked (1 MARK)
- F. According to the new guidelines, what is the target blood pressure for Ms. Zwane? (4 MARKS)

**TOTAL = 15 MARKS**

**QUESTION 5**

Using either malaria or tuberculosis (TB) as an example, explain the process of drug resistance.

**TOTAL = 15 MARKS**