

**BMSN2603 (Physiology)****Tutorial #3: Renal System and Kidney Disease**

Name: \_\_\_\_\_ UID: \_\_\_\_\_ Tutor: \_\_\_\_\_

**Tutorial Activities**

- Please **complete** and **submit** your answers before the tutorial day via appropriate links on Moodle. Deadline for submission of your work is on **12 Oct 2023 (Thursday) at 11:59 pm**.
- Late submission/submission to the wrong link will NOT be entertained.
- During the tutorial students are expected to actively engage in the discussion and answering tutor's questions. Your tutor will randomly choose students to answer questions.
- Please refer the instructions and marking criteria posted on Moodle.
- **NO model answer** will be posted on Moodle.
- Please also note that the tutorial content may be assessed in mid-term test and/or the final examination.

**Scenario**

Peter, a 45-year-old man, visited the clinic complaining of tiredness, mild fatigue and headache. During examination, he looks pale and showed slight swelling of extremities. He had a blood pressure of 165/90 mm Hg and foamy urine. It was suspected that Peter might have chronic kidney disease. A sample of blood was collected for analysis and the results were as follows:

• Potassium	5.8 mmol/L	(Ref: 3.5 – 5.1 mmol/L)
• Bicarbonate	15 mmol/L	(Ref: 23 – 29 mmol/L)
• Calcium	2.07 mmol/L	(Ref: 2.11 – 2.55 mmol/L)
• Creatinine	362 µmol/L	(Ref: 50 – 110 µmol/L)
• Urea	19.8 mmol/L	(Ref: 2.9 – 8.2 mmol/L)
• Albumin	32 g/L	(Ref: 35 – 50 g/L)

- Q1. What is chronic kidney disease (CKD)? How is CKD different from acute kidney failure?
- Q2. What are the possible causes of acute and chronic kidney failure respectively?
- Q3. How is GFR normally measured in clinical practice?
- Q4. What are the 5 stages of CKD as defined by glomerular filtration rate?
- Q5. What is end stage renal failure (ESRF)?
- Q6. What abnormalities in Peter's blood test indicated that he might have chronic kidney damage?
- Q7. Apart from those listed in Peter's blood test, what other abnormalities you would also expect to see in Peter's urine?
- Q8. Apart from urinalysis and blood tests, what other investigations can be conducted to evaluate CKD?

Q9. What are the signs and symptoms of CKD?

Q10. Why is acidosis often observed in CKD patients?

Q11. Why are hypertension and hyperkalaemia often observed in CKD patients?

Q12. Why is anaemia often observed in CKD patients?

Q13. Why are hypocalcaemia and osteoporosis often observed in CKD patients?

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**It is confirmed that Peter has an estimated GFR of 32 mL/min/1.73 m<sup>2</sup>.**

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Q14. Which stage of CKD does Peter have?

Q15. What other treatments may Peter receive before his condition progresses to end stage renal failure?

Q16. What are the treatment options for end stage renal failure (Stage 5 CKD)?

Q17. What is the major difference between haemodialysis and peritoneal dialysis?