

**YLLSoM SENIORS TEACHING INITIATIVE  
M3 PROGRAMMES AY14/15**

**CASE-BASED SESSION 2**

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## **SUMMARY OF CASES**

<b>Case</b>	<b>Stem</b>
<b>Case 1</b>	60 year-old gentleman with nausea and headache.
<b>Case 2</b>	25 year-old gentleman with generalized weakness
<b>Case 3</b>	16 year-old female with abdominal pain
<b>Case 4</b>	60 year-old gentleman with shortness of breath
<b>Case 5</b>	78 year-old female with functional decline and delirium

## **CASE 1: 60 YEAR-OLD CHINESE GENTLEMAN WITH HEADACHE AND NAUSEA**

You are the House Officer on duty. You are called to review Mr Ng, a 60 year old Chinese gentleman, due to an abnormal renal panel.

<b>Parameter</b>	<b>Values</b>
Sodium	120 mmol/L
Potassium	4.8 mmol/L
Chloride	110 mmol/L
Urea	4.5 mmol/L
Creatinine	80 umol/L

**Q1) Please interpret this renal panel.**

**Q2) What are the etiologies of hyponatremia? How can you classify the etiologies?**

**Q3) Name some signs and symptoms that a patient with hyponatremia may experience. Describe the pathophysiology.**

**Q4) How will you take a history and perform a physical examination to elicit the underlying etiology of the hyponatremia?**

*Further history taking and physical examination reveals that he has just undergone a total knee replacement two days ago. He still experiences pain over the surgical site and has poor appetite. He has some headache and nausea. He has a past medical history of diabetes mellitus type 2, chronic renal failure and ischemic heart disease.*

*On physical examination, you noticed that he is euvolemic and he is receiving a 5% dextrose infusion. You checked the input and output chart (positive fluid balance). He weights 60kg.*

**Q5) Post-operative hyponatremia is a common post-operative problem and can be due to many causes. What are the 3 most likely etiologies in this patient?**

**Q6) Name 3 investigations (other than the renal panel) that you would like to perform to help you find the cause of the derangement. Explain your rationale.**

**Q7) You decided to replace the sodium as he has symptoms of acute hyponatremia (e.g. nausea, headache). How will you replace his sodium? Write out your order.**

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**Q8) In a patient with prolonged duration (chronic) hyponatremia, it is essential not to replace the sodium levels too quickly. What is the feared complication? Describe signs and symptoms of this complication and the proposed pathophysiology?**

## **CASE 2: A 25 YEAR-OLD GENTLEMAN WITH WEAKNESS**

*You are the doctor in the emergency department.*

*John, a 25 year-old Chinese Gentleman, was brought in by his mother as he experienced fatigue and generalized weakness which occurred suddenly over the past one day.*

**Q1) What are the etiologies of generalized weakness?**

**Q2) How will you take a history and physical examination?**

*History reveals that this is the first time he is experiencing such symptoms. The weakness started in the morning and became progressively worse and affects all 4 limbs, particularly the proximal muscles. There is no numbness or other neurological deficit. He recalled having a particularly intense weight lifting training session the previous day.*

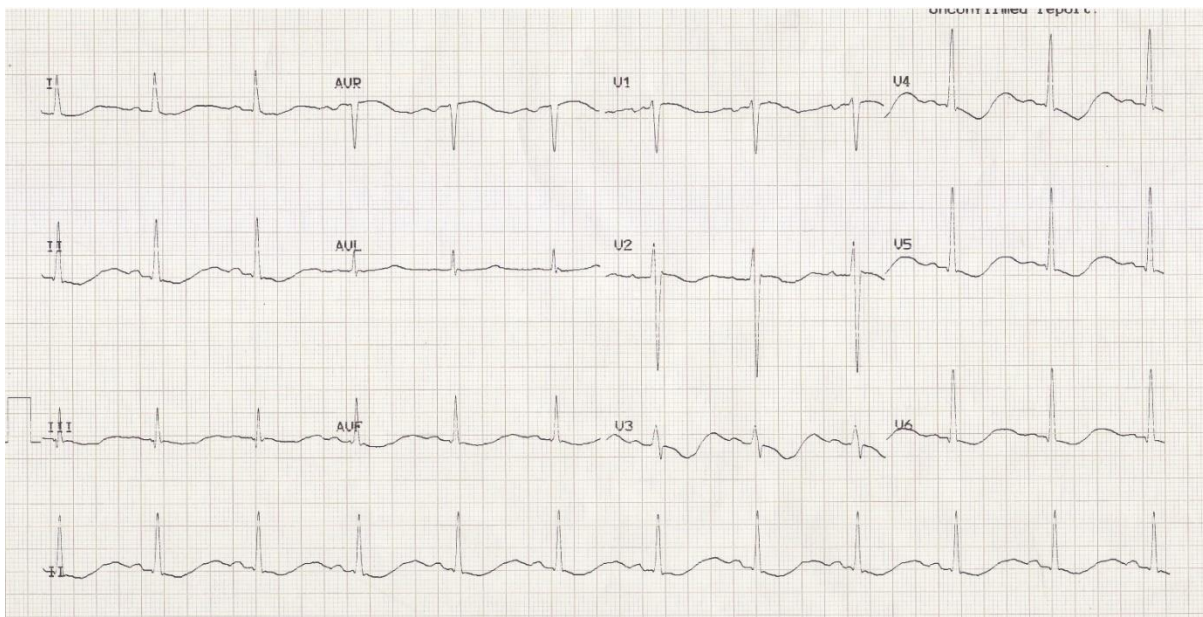
*Physical examination shows flaccid paralysis in all 4 limbs. Power is MRC Grade 3; Deep Tendon Reflexes 1+. Sensory is intact (pinprick and proprioception). Babinski's reflexes are absent in both lower limbs. There are no cranial nerves deficits. Vitals are stable.*

**Q3) What investigations will you order?**

*Renal Panel*

Parameter	Values
Sodium	145 mmol/L
Potassium	1.2 mmol/L
Chloride	120 mmol/L
Urea	5 mmol/L
Creatinine	80 $\mu$ mol/L

*Electrocardiogram*



**Q4) Interpret the Renal Panel and Electrocardiogram.**

*You note the hypokalemia and the associated ECG changes. Immediately, you place a medication order to replace his potassium.*

**Q5) How will you replace his potassium?**

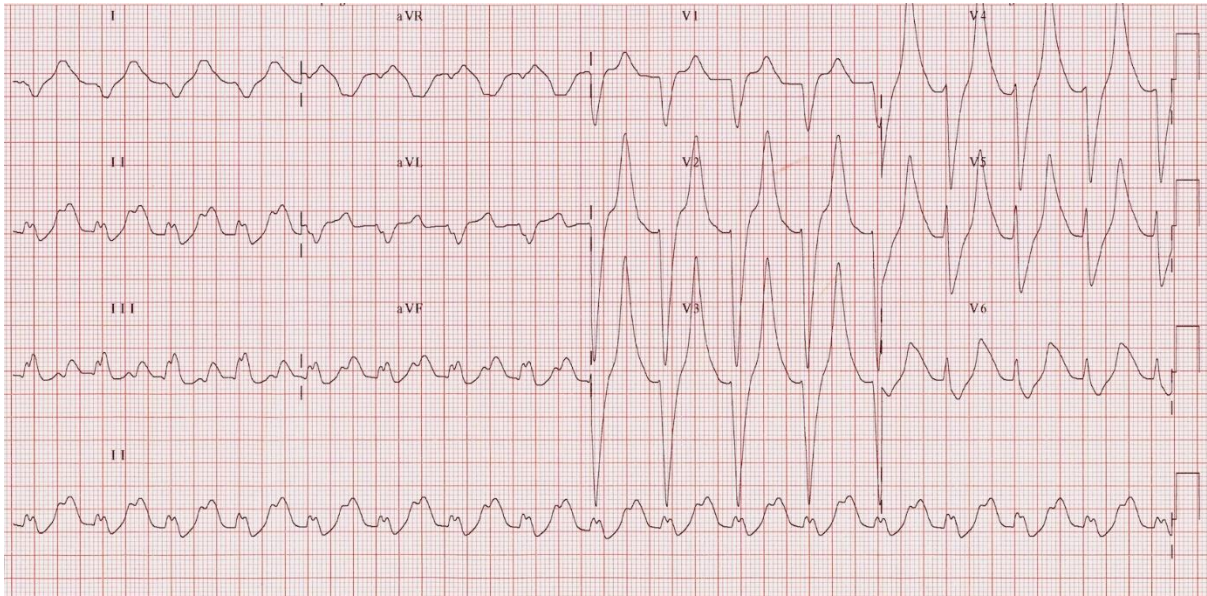
**Q6) What are the etiologies of hypokalemia? How can you broadly classify the etiologies?**

**Q7) How will you take a history and physical examination to elicit the underlying cause?**

*He shares that he has been losing weight over the last 3 months even though he is eating a lot. He has heat intolerance and difficulty sleeping at night as well. He noted that he has been experiencing fine tremors of his hands.*

**Q8) What is the likely diagnosis? Name one investigation you will order to confirm your diagnosis.**

*You diagnose him with Thyrotoxic Periodic Paralysis and proceed to replace his potassium and provide beta-blockers. Just as you are completing your shift, a nurse ran over and show you the repeat Electrocardiogram.*



**Q9) Interpret the Electrocardiogram. What is the diagnosis?**

*You order an immediate iSTAT and the serum potassium was 8.0 mmol/L. You realize that you and your colleague had place a duplicate order for Potassium Chloride infusion.*

**Q10) How will you manage this patient? Outline your steps.**

## **CASE 3: 16 YEAR-OLD FEMALE WITH ABDOMINAL PAIN**

*You are the House Officer at the emergency department.*

*Ms Ang Swee Choo, a 16 year-old, Chinese Female presents with abdominal pain.*

**Q1) What are some possible etiologies of abdominal pain in this patient? Name 6.**

**Q2) What are some physical signs you will look for?**

*History reveals:*

- *Pain was dull, ill-localized, started acutely and becoming worse, no radiation. Pain score of 6.*
- *Associated with 2 weeks' duration of polyuria, nocturia and weight loss.*

*Physical examination:*

- *Vitals: Tachycardic with tachypnea, afebrile, normotensive; drowsy.*
- *Peripheries: Dry mucous membrane, decrease in skin turgor*
- *Abdomen: Generalized tenderness, but no guarding or rebound tenderness*
- *Patients weights around 40kg currently.*

**Q3) What investigations will you perform?**

*ABG shows: pH 7.22, PCO<sub>2</sub> 20, HCO<sub>3</sub> 8*

*Renal panel: Na 132, K 5.8, Cl 96, Glucose 31*

**Q4) Interpret the Arterial Blood Gas, Renal Panel and Capillary Blood Glucose. What is the likely diagnosis?**

**Q5) What are the diagnostic criteria for DKA?**

**Q6) Explain the pathophysiology of the patient's symptoms/signs. Choose 4 to elaborate on.**

**Q7) What is the management for DKA? Outline the management principles.**

**Q8) Name at least 5 conditions that can precipitate DKA.**



## **CASE 4: 60 YEAR-OLD MALAY GENTLEMAN WITH SHORTNESS OF BREATH**

*You are the House Officer on duty.*

*Mr Chee is a 60 year-old Malay gentleman who presents with shortness of breath over the last 2 days. He appears very breathless and the nurse informs you that his oxygen saturation is 85%. He has a past medical history of chronic pulmonary obstructive disease, hypertension and hyperlipidemia.*

**Q1) What are the etiologies of shortness of breath?**

**Q2) How will you take a history and perform a physical examination?**

*He shares that he developed cough and an increase in the amount of sputum produced over the last 2 days. He has a decrease in effort tolerance and is breathless even after using the toilet. There is no chest pain, fever, orthopnea, or leg swelling.*

*He is tachypneic (25 breaths/min), tachycardic (105bpm) and using his accessory muscles of respiration. Respiratory examination reveals barrel chest with equal chest expansion, symmetrical breath sounds that are slightly diminished, normal percussion and vocal resonance. There is no trachea deviation. Normal heart sounds are heard. There is no pedal edema.*

**Q3) What is your most likely differential? Explain your choice.**

**Q4) How will you resuscitate him?**

*You give him a venturi mask for him and set the FiO<sub>2</sub> at 35%. His oxygen saturation improved to 94%. You also order salbutamol and ipratropium nebulization.*

**Q5) What investigations will you order? Explain your rationale.**

**Q6) You performed an ABG, but along the way the ABG results got mixed up. Which ABG is likely to belong to your patient?**

- a. pH 7.2, pO<sub>2</sub> 60, pCO<sub>2</sub> 60, HCO<sub>3</sub> 33
- b. pH 7.2, pO<sub>2</sub> 60, pCO<sub>2</sub> 15, HCO<sub>3</sub> 18

**Q7) What could be the reasons for COPD exacerbation?**

**Q8) How do you manage COPD exacerbation?**

## **CASE 5: 78 YEAR-OLD FEMALE WITH FUNCTIONAL DECLINE AND DELIRIUM**

*Mdm Tan is a 78 year-old Chinese female who is staying in the nursing home. She is not able to ambulate on her own, but is able to feed herself. She craves attention and presses the call bell all the time. 3 days ago, the nurses noted that she became progressive quiet and pressed the bell less often. They were surprised, but glad at the same time. After all, it meant less work! She also had a decrease in appetite. They noticed that her attention fluctuates; she was more alert at times and less at other times. Today, they decided to bring her in after realizing she is very lethargic, is almost unresponsive and have not eaten or drank anything for 2 days.*

**Q1) What is the definition of delirium? What are the possible etiologies for Mdm Tan's presentation? Name at least 6 different etiologies**

**Q2) How will you evaluate this patient through history and physical examination?**

*You are unable to obtain a history from the patient as she is very confused. You manage to check the records in the hospital and find out that she has the following past medical history: (1) Hypertension, (2) Hyperlipidemia, (3) Ischemic Heart Disease, EF of 45%, (4) Chronic Kidney Disease secondary to hypertension (CKD Stage 3). Her current medications include: (1) Atenolol, (2) Aspirin, (3) Lovastatin.*

*Her vitals are: T 36.6 degree Celcius, Blood Pressure 70/50 mmHg, Pulse 90 beats per minute, SpO2 95% on room air.*

*Normal heart sounds are heard with no murmur. There is adequate breath sounds bilaterally with no adventitia breath sounds heard. The patient's abdomen is soft with no masses felt. Pupils are reactive to light and 3mm large. The neck is not stiff. The patient appears dehydrated as the skin turgor is lost and the mucous membrane are dry. Calves are supple and there is no pedal edema.*

**Q3) Your medical student thinks that this patient may be hypotensive. What are the possible causes for hypotension in this patient?**

**Q4) You suspect that the patient may be suffering from a severe infection. Your medical student thinks that it is unlikely as the patient does not have a fever. Does the lack of a febrile response preclude the possibility of an infection in this patient? What are some common features of infection that may be not present in the elderly?**

**Q5) What are some investigations you will perform? Name 8 and describe your rationale.**

*You order various investigations and these are the results:*

### **Full Blood Count**

<b>Parameter</b>	<b>Values</b>
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Hb	12.0 g/L
TW	18.0
Plt	350
Differential count (N/L)	90% / 5%

**Renal Panel**

Parameter	Values
Sodium	123
Potassium	5.4
Chloride	88
Bicarbonate	14
Urea	33.0
Creatinine	341 (baseline: 150)
Glucose	7.0

**Arterial Blood Gas**

Parameter	Values	Reference
pH	7.10	7.35 – 7.45
PaCO <sub>2</sub>	48	40 mmHg
PaO <sub>2</sub>	120	100 mmHg
Lactate	5.0	2.0
Anion Gap		12 (Na – Cl – HCO <sub>3</sub> )
Base Excess	-5	-2 to +2

**Microbiology**

Parameter	Values
Urine Formed Element Microscopy Examination	WBC 15/hpf Bacteria seen RBC 2/hpf Nitrite (+)
Urine Culture	Pending
Chest X-ray	No consolidation seen
CT Abdomen	Radiological feature of

	pyelonephritis
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**Electrocardiogram and Cardiac Enzymes**

Raised with signs of ischemia.

**Q5) What are the complications of hypovolemia? Which of these complications is the patient suffering from?**

**Q6) What is your diagnosis? Summarize your problem list.**

**Q7) How will you resuscitate the patient?**

**Q8) What is your subsequent management plan? Describe the key steps of managing a patient with septic shock.**