PBL TITLE	**Bed sore**
YEAR/BLOCK	**YEAR 1 BLOCK 3 2017/2018**
DURATION	Total contact hours: 4 hours (2 hours x 2 weeks)
PBL MODULE DESIGNED BY	DR. AYE THI KHAING @ ZULAIKHA BANU
AIM	To expose students to the concepts of and approach to infected pressure sore, with specific focus on elder patient with co-mobid diseases
LEARNING OUTCOMES	At the end of this PBL module students should be able to: 1. describe anatomy of sacrum 2. describe blood supply and nerve supply sacrum 3. explain the mechanism of pus formation 4. define the ulcer 5. describe type of ulcer and their etiologies 6. describe epidemiology and pathogenesis of pressure sore 7. describe intrinsic and extrinsic risk factors of pressure sore 8. explain the staging of pressure sore 9. describe categories wound healing 10. describe the sequence of events of wound healing 11. approach to investigations in pressure sore patient 12. define MRSA and its treatment 13. describe principle management and prevention of bed sore 14. discuss the Islamic perspective of alternative / complementary medicine 15. synthesize the information provided to come to possible diagnoses 16. apply problem solving skills related to cases of bedsore 17. apply self-directed learning in the search of information 18. apply communication skills in discussing the case

TRIGGER 1: CHIEF COMPLAINT

AB, 75-year old, Malay lady was admitted to Tengku Afzan Ampuan Hospital with the complaint of yellowish white discharge from the open sore at her sacral area for 2 days duration.

STUDENTS' TASKS

1. Are there any term that you do not understand?
2. Identify the chief complaint – FACTS.
3. Discuss your IDEAS (hypotheses) by integrating relevant basic medical sciences and clinical sciences knowledge into the case.
   (please note that ideas/hypotheses are not necessarily confined to 'the diagnoses')
4. Decide on further information needed in the history and give reasons (what you NEED to know)
5. During the discussion identify 1-3 KEY (PRIMARY) LEARNING ISSUES (IMPORTANT **basic medical sciences** and or **clinical sciences** knowledge that the group need to find out more in order to work through the case).
   Other issues that require further research can be categorised as SECONDARY LEARNING ISSUES

FACILITATOR NOTES	
FACTS (What you know)	• 75-year-old woman • Malay • open sore at her sacral • Yellowish white discharge • 2 days
IDEAS (Hypotheses)	• The patient is most probably suffering from ulcer with pus discharge at the sacrum • The problem is most probably acute • **Possible causes include:** **Traumatic causes:** • Mechanical • Physical- electrical, radiation • Chemical **Vascular insufficiency:** • Arterial • Venous **Neoplastic conditions:** • Squamous cell carcinoma • Basal cell carcinoma • Malignant melanoma **Metabolic causes:** • Carbuncle **Neurogenic causes:** • Bed sores

	• Perforating ulcer • Spinal cord lesion • Peripheral neuropathies **Infective ulcers:** Tuberculous ulcer, *Syphilitic* ulcer **Other causes:** • Bazin ulcer: Erythema induratum • Martorell's: Very painful very at legs in poorly control hypertensive patients
What you NEED to know:	• Analyze the discharge such as character, amount, color and odor *Reason: A healing ulcer will show scanty serous discharge, but the spreading and inflamed ulcer will show purulent discharge. Serosanguineous discharge is often seen in a tuberculous ulcer or a malignant ulcer.* • The onset of the ulcer whether the ulcer has developed following a trauma or spontaneously? *Reason: will suggest the possible underlying cause of the ulcer.* • How long is the duration present there? *Reason: Chronic ulcer will suggest malignancy.* • Analyze the ulcer such as site, size and shape *Reason: Site of the ulcer will determine the underlying causes.* • *Varicose ulcer: medial malleolus of lower lime shows varicose veins.* • *Neurogenic ulcer: usually at pressure point such as shoulder blades, hip, lower back or tailbone.* • *Malignant ulcer: Commonly on the lips, tongue, breast, penis and anus but can also occur at the sacrum.* *Reason: Size and shape* • *Tuberculous ulcer: oval with irregular crescentic border* • *Varicose ulcer: Vertically oval* • *Syphilitics ulcer: circular/semilunar, unite to form a serpiginous ulcer* • Other symptoms such as: • Fever: *Reason: to assess the presence of infection and the possible source. Grading and pattern of fever also indicated the type of infection.* • Bleeding: Whether the ulcer bleeds on touch *Reason: suggest malignant ulcer* • Is the ulcer painful? *Reason: Inflammatory ulcers will be painful.* *Syphilitic and tropic ulcers resulting from nerve diseases are painless.* *Tuberculous ulcers are slightly painful.* *Ulcers from malignant diseases such as epithelioma or basal cell carcinoma are absolutely painless to start with and never become*

	painful unless they infiltrate structures supplied by pain nerve endings. • Associated diseases such as diabetes, depression, peripheral vascular disease, immunodeficiency, corticosteroid effects, malignancies, Tabes dorsalis and syringomylia *Reason: If present-* *Tabes dorsalis, syringomylia may result in an ulcer.* *Syphilis at the primary stage gives rise to chancre and in tertiary stage gives rise to gummatous ulcer.* *Diabetes mellitus and peripheral vascular diseases cause impairment in blood supply and nerve supply of the skin and might give rise to delay wound healing* *Lack of motivation to stick the treatment usually found in depressed patient.* • Past medical history of similar problem *Reason: will suggest a recurrent cause* • Past surgical history *Reason: whether eventful outcomes after major surgery such as poor wound healing might lead to prolonged bed rest and enhance bed sore* • Drug history *Reason: To check the compliance of patient to long-terms drug therapy*

KEY LEARNING ISSUES
1. Anatomy of plevic
2. Definition and type of ulcers
3. Mechanims of pus formation

TRIGGER 2: HISTORY

HISTORY OF PRESENTING ILLNESS

AB was apparently well until one month prior to the visit. 2 days ago, she started to notice the yellowish white discharge from her lower back. The discharge was thick and vicious in nature and amount was approximately 1 tablespoonful as well as foul smelling in odour. She also mentioned that apart from having low grade fever, she suffered neither pain nor bleeding from the open sore. According to the history taken from her son, he stated that about 1 month ago, his mother complaint of numbness at her lower back and he also noted that the skin over the tailbone was intact but showed redness which did not fade while he pressured. He also claimed that the skin had an odd texture as well as seemed slightly warmer than adjacent area. About 2 weeks later, the blister developed and gradually damage to overlying skin and finally developed to open sore. At the beginning, it was 50 cent coin size and proceeded to large ulcer with discharge.

Upon further questioning, she actually underwent hip opertion 2 month ago. The operation was uneventful. After discharge from the hospital, she was adviced to do physiotherapy. However, she claimed that she experiened tingling and numbness sensation at her back whenever she walked. That made her lack of motivation to walk and, she eventually became bedridden one.

Moreover, she also stated that her son was working from 7 am to 7 pm, therefore, no one was taking care of her during her daytime. This morning, she wound condition seemed worsened and her son brought her to the hospital.

On systemic review there were no other significant symptoms.

PAST MEDICAL HISTORY

She was diagnosed with type II diabetes 12 years ago. She complied to the treatment well, however, her blood sugar level became few weeks ago before admission. She had no history of hypertension.

PAST SUGICAL HISTORY

She had undergone total hip replacement therapy for hip fracture 2 months ago. According to her son statement who accompanied her, the post- operative was uneventful throughout her hospital stay.

DRUG HISTORY:

The patient is taking oral hypoglycaemic drugs. There was no history of drug allergy.

FAMILY HISTORY

She was the eldest out of five siblings. One of her sisters also has diabetes mellitus.

SOCIAL HISTORY:

She is a widow, retired teacher, lived with her son. She has no income and depends on her son's income. They lived in single-story terrace house. She did not smoke nor consume alcohol.

STUDENTS' TASKS

1. Are there any term that you do not understand?
2. Summarize the additional information obtained from the trigger- FACTS
3. Discuss further your IDEAS (hypothesis) based on the additional information provided by integrating relevant basic medical sciences and clinical sciences knowledge into the case.
4. List the physical examination findings you would look for and give reasons (what you NEED to know)
5. During the discussion identify 1-3 KEY (PRIMARY) LEARNING ISSUES (IMPORTANT **basic medical sciences** and or **clinical sciences** knowledge that the group need to find out more in order to work through the case).
   Other issues that require further research can be categorised as SECONDARY LEARNING ISSUES

FACILITATOR NOTES	
FACTS (What you know)	• Yellowish white discharge from ulcer for 2 days • Purulent in nature and foul smelling • Low grade fever • No pain and bleeding • Numbness at scrum 1 month ago • Develop redness and progress to ulcer over few weeks • Bed-borne patient due to total hip replacement therapy • Fail to do mobilization • Presence of co-morbidity such as diabetes with less compliance to drug therapy
IDEAS (Hypotheses)	• The patient had the risk factors such as diabetes might predispose impairment in circulation and nutrition of the skin over scrum • The patient was not able to change the position frequently superimposed further impairment in blood supply lead to ulcer • Failure to seek medical attention at early stage gave rise to development of pus forming infection. • The possible diagnoses at this point include: **1. Pressure sore** remains a differential diagnoses (presence of risk factors such as limited mobility, presence of diabetes, pressure from external surface e.g.bed, friction from being unable to move well, shear forces form involuntary movement

	2. Carbuncle is still a differential diagnosis (presence of diabetes, with poor glycaemic control.)
What you NEED to know:	To look for the following signs on physical examination: • Vital signs *Reason: to confirm the presence of* complication such as septicemia or diabetic keto acidosis • Cyanosis *Reason: to assess the severity of* illness such as septicemia or diabetic keto acidosis • Description of pressure ulcer • Inspection • Site & Shape, Number, Position, Edge, Floor, Discharge, Surrounding area, Whole Limb • Palpation • Tenderness, Margin, Base, Depth, Bleeding on touch, Relations with deeper structure *Reason: to assess the staging and healing of ulcer* • Systemic examination *Reason: to exclude the systemic disorders*

KEY LEARNING ISSUES

1. Elaboration and discussion on each of the topic of pressure sore:

- **Epidemiology**
- **Pathogenesis**
- **Risk factors**
- **Clinical presentation**
- **Staging**

TRIGGER 3: PHYSICAL EXAMINATION

GENERAL EXAMINATION:

The patient was febrile and lethargic but well orientated to time, place and person. She was pale and dehydrated with no jaundice.

No oral ulcers and teeth and gums were healthy. Either central or peripheral cyanosis was detected. No lymphadenopathy or thyroid mass palpable.

On exmination of lower limb, pitting oedema of both legs were seen.

Vital signs:

Temperature:	38.5^{o}C (febrile)
Pulse:	100/min, regular (60-90, upper limit normal)
Blood pressure:	110/70 mmHg (Normal for age)
Respiratory rate:	25 minute (20-30)

CARDIOVASCULAR SYSTEM:

The apex beat was in the left fourth intercostal space in the mid clavicular line. There was no thrill or parasternal heave. The first and the second heart sound were heard. No murmurs.

RESPIRATORY SYSTEM:

On inspection, the chest movement is restricted with respiration. Palpation revealed that the trachea was central. Vocal fremitus, percussion and vocal resonance were equal bilaterally. Vesicular breath sound was heard. There was no basal crackles (crepitation) heard over both lungs on auscultation.

ABDOMINAL SYSTEM:

The abdomen was not distended. There was no area of tenderness or guarding. The liver and spleen were not palpable. The kidneys were not ballotable. There were no other masses. There was no fluid thrill or shifting dullness. Bowel sounds were normal.

CENTRAL NERVOUS SYSTEM:

Cranial nerves examination were normal. Muscle tone and power normal. Tendon reflexes were normal and equal bilaterally. Sensory was intact.

LOCAL EXAMINATION OF ULCER

A large, single, red “oval” shaped wound on the sacrum was recorded. The size was 3cm in length x 4cm in width x 1cm in depth. There was a full thickness skin loss involving damage of subcutaneous tissue with undermining of adjacent tissue but not extending to the underlying fascia. Yellowish purulent exudate with foul smelling odour was noted. But, no

necrotic tissue were seen at the base of the ulcer. Induration of the wound edge with unhealthy surrounding skin was also noted. There was no tenderness on palpation of the wound.

STUDENTS' TASKS

1. Are there any term that you do not understand?
2. Summarize the additional information obtained from the trigger - FACTS
3. Discuss further your IDEAS (hypothesis) based on the additional information provided by integrating relevant basic medical sciences and clinical sciences knowledge into the case.
4. List the investigations you would perform and give reasons (what you NEED to know)
5. During the discussion identify 1-3 KEY (PRIMARY) LEARNING ISSUES (IMPORTANT **basic medical sciences** and or **clinical sciences** knowledge that the group need to find out more in order to work through the case).
   Other issues that require further research can be categorised as SECONDARY LEARNING ISSUES

FACILITATOR NOTES	
FACTS (What you know)	• Conscious but febrile and lethargic • Presence of infection • Palpable bilateral inguinal lymph nodes • Bilateral pitting edema of legs • Unstable vital signs • Stage III pressure ulcer at scrum with pus discharge
IDEAS (Hypotheses)	The patient was suffering pressure ulcer due to porlonged immobility Full thickness skin loss with invading bone indicated Stage III Pus discharge indicate presence of infeciton • The possible diagnoses at this point include: 1. **Infected bed sore** is a provisional at this point 2. **Caibuncle** is a less likely diagnosis due to absence of multiple openings on the skin surface
What you NEED to know:	Results of the following investigations: • Full blood picture *Reason: to know the severity and the type of infections* • Urinalysis *Reason: to look for the presence of infection as UTI is a common complication in bedridden patients* • Liver function test and Renal function test *Reason: to look for any derangement in enzymes and baseline parameters in elderly patients* • Chest X-ray *Reason: to look for the presence of chest infection* • Fasting blood sugar and HbA1C

	Reason: to assess glycemic control • Blood culture and wound swab culture and sensitivity *Reason: for diagnosis and treatment of ulcer*

KEY LEARNING ISSUES

1. **Categories and phases of wound healing**
2. **Factors influencing wound healing**
3. **Approach to investigations in a pressure sore patient.**

TRIGGER 4: INVESTIGATION RESULTS

1. Full Blood Count (FBC): [Leucocytosis]

Haemoglobin	12 g/L	(13-18)
Haematocrit:	50 %	(40-52)
MCV	82 fL	(75-87)
MCH	29 pg	(24-30)
MCHC	30 g/dL	(25-33)
Total White Cells	15.4 x 109/L	(4.0-11)
Neutrophils	80 %	(37-80)
Lymphocytes	16 %	(10-50)
Monocytes	3 %	(0-12)
Eosinophils	1 %	(0-7)
Basophils	0 %	(0-2.5)
Platelet count	350 x 10^9/L	(150-450)

2. Renal Profiles:

Urea	7.1 mmol/L	(1.7-8.3)
Sodium	139 mmol/L	(135-154)
Potassium	5.0 mmol/L	(3.5-5.4)
Chloride	105 mmol/L	(98-108)
Calcium	2.2 mmol/L	(2.1-2.6)
Creatinine	90 µmol/L	(70-120)
Uric acid	210 µmol/L	(180-420)

3. Liver Function Test: [Normal]

Total protein	66 g/L	(60-80)
Albumin	42 g/L	(35-55)
Total bilirubin	11.3 µmol/L	(up to17.1)
Direct bilirubin	1.5 µmol/L	(0.8-5.1)

Alkaline Phosphatase	70 U/L	(53-128)
Alanine Transaminase	32 U/L	(up to 42)
Aspartate Transaminase	29 U/L	(up to 40)

Fasting blood glucose: 12.0 mmol/L (3.5-6.1)

HbA1c: 6.9% (<6.5)

Urine analysis:

Colour	turbid
Protein	+
Glucose	+
Ketones	Negative

Electrocardiogram (ECG): Sinus rhythm, No ischaemic changes.

Chest X-ray: Normal findings.

Wound swab culture: Significant growth of Methicillin resistant Staphylococcus aureus was seen.

Blood culture and sensitivity: No growth

STUDENTS' TASKS

1. Are there any term that you do not understand?
2. Discuss the investigation results- FACTS
3. Discuss further your IDEAS (hypothesis) and finalise your diagnosis.
4. During the discussion identify 1-3 KEY (PRIMARY) LEARNING ISSUES (IMPORTANT **basic medical sciences** and or **clinical sciences** knowledge that the group need to find out more in order to work through the case).
   Other issues that require further research can be categorised as SECONDARY LEARNING ISSUES
5. Discuss the **Islamic Perspective of Alternative/Complementary Medicine**.

FACILITATOR NOTES	
FACTS (What you know)	• Normochromic normocytic type of anemia • Neutrophil leucocytosis • Hyperglycemia • Increased HbA1C • Presence of MRSA in wound swab culture
IDEAS (Hypotheses)	**This is a case Stage III infected pressure sore wtih presence of MRSA** • Presented with signs and symptoms related to infected bed sore • On examination there was a infected bedsore at the scaurm • Wound swab indicated Methicillin resistant Staphylococcous aureus growth
What you NEED to know:	• Principles of management

KEY LEARNING ISSUES

1. What is MRSA and risk factors for prevalance of MRSA?
2. Principles of management