Sepsis/Septic Shock Unfolding Reasoning Case Study
Clinical Day One Dr. Smith

This is a case study that mimics a real patient in the hospital. As you read the scenario, information is given to you about the patient as it becomes available. You need to fill in what data is relevant and tell why it has clinical significance. You can work on this as an individual or with your peers. Turn this into my dropbox by 1430 today.

Student Name: Michael Aranda _____
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 Jack Holmes, 72 years old

Primary Concept(s)
Perfusion & Gas Exchange
Interrelated Concepts
• Inflammation • Infection • Tissue Integrity • Clinical Judgment • Patient Education • Communication

HISTORY OF PRESENT PROBLEM:

Jack Holmes is a 72-year-old Caucasian male brought to the ED by ambulance from a skilled nursing facility (SNF). According to the report from the paramedic, the SNF nursing staff attempted to wake him up this morning and he would not respond. His BP was 74/40 with a MAP of 51. He has a history of Parkinson's disease, COPD, CHF, HTN, depression, and a stage IV decubitus ulcer on his coccyx that developed three months ago. He does not follow commands, is unresponsive to verbal stimuli, but responds to a sternal rub with grimacing and withdrawing from stimulus.

PERSONAL/SOCIAL HISTORY:

He has lived at the SNF for the past 3 years and has been bed bound the past year due to his advanced Parkinson's disease. He was a heavy smoker, 1 PPD for 40 years until he moved to the SNF. He has no next of kin listed.

What data from the histories are Relevant and must be interpreted as clinically significant by the nurse?

RELEVANT data from the present problem	**What is the clinical significance of this data? What should you be looking for as the nurse?**
Not Responsive, low B/P, MAP of 51, and stage IV ulcer.	It looks like he may be septic from his ulcer possibly and it has gotten worse. I would look for any signs of hypoperfusion. I would look at capillary refill, pulses, and be worried about the confusion since his MAP is low. I would also want to look at the ulcer and maybe do a culture to see if maybe there is an infectious organism causing the present problem.
RELEVANT data from the social history	**What is the clinical significance of this data? What should you be looking for as the nurse?**
Bed bound for the past year. Heavy smoker. No family listed.	The clinical significance is that he has been bed bound and that is what possibly caused his ulcer on his coccyx. Him also being depressed and having advanced Parkinson's disease could have also been a factor in not wanting to get up or speak up about having any pain.

VITAL SIGNS:

Patient Care Info upon arrival to ED

Vital Signs	PQRST Pain Assessment	
T 103.4 F P 135 (irregular) R 32 (regular, shallow) BP 76/39 MAP 51 O2 91% 2L NC Weight 242 lbs	Provoking/Palliative Quality Region/Radiation Severity Timing	Not responsive verbally, withdraws to pain, no other indications of pain

What data from the vital signs and pain assessments are Relevant and must be interpreted as clinically significant by the nurse?

RELEVANT data from the vital signs & pain assessment	What is the clinical significance of this data? What should you be looking for as the nurse?
103.45 temperature 135 irregular pulses 32 respirations MAP of 51 B/P of 76/39 Not responsive	These signs and symptoms show a clinical significance of a possible infection. As the nurse, I would look for signs of progression into sepsis. I want to draw labs and then start broad spectrum antibiotics. Also staring to fluids to increase cardiac output to improve perfusion.

ASSESSMENT DATA:

Current Assessment:	
General Appearance	Pale, warm to touch. Appears tense
Respirations	Tachypneic, working hard to breath, intercostal and suprasternal retractions present. Breath sounds diminished and light crackles in the lower lobes bilaterally. Nail beds have noticeable clubbing, barrel chest present
Cardiac	Pale, 1+ pitting edema lower extremities, systolic murmur with an irregular rhythm, radial weak pulses/thready, cap refill >3 seconds
Neuro	Does not open eyes to sound or pain, withdraws to pain, incomprehensible sounds to painful stimuli, does not follow commands but does not resist when moved on to a stretcher. PERRL
GI	Distended abdomen, firm/nontender, bowel sounds hypoactive in all quadrants
GU	Foley catheter placed to monitor UO, 50 mL tea colored urine with no sediment, no odor present
Skin	Stage IV decubitus to coccyx 1 cm X 0.5 cm X 0.5 cm depth, wound bed with visual bone noted at the base with large areas of necrosis on both sides of the sacrum bone. When dressing was removed, a large amount of yellow/green purulent drainage was noted with a foul odor. Surrounding mucus membranes were dry and pale.

Determine the current Glasgow Coma Scale Score based on the neurological assessment data:

Eye opening	
Spontaneous	4
To Sound	3
To Pain	2
No response	1
Motor Response	
Obeys Commands	6
Localizes Pain	5
Normal flexion (withdrawal)	4
Abnormal flexion	3
Extension	2
None	1
Verbal Response	
Oriented	5
Confused conversation	4
Inappropriate words	3
Incomprehensible sounds	2
None	1
Total	4

Cardiac Telemetry Strip:

What data from the cardiac telemetry strip are Relevant and must be interpreted as clinically significant by the nurse?

Regular or Irregular? P wave present? QRS normal or abnormal?
Interpretation of strip: Irregular, No P wave present, and QRS is abnormal. This interpretation is SVT.
Clinical Significance
SVT is clinically significant here because this is irregular rhythm and vital signs show he has a pulse that is irregular.

DIAGNOSTIC RESULTS:

What data from the diagnostic testing are Relevant and must be interpreted as clinically significant by the nurse?

Radiology: Chest X Ray	
Results:	**Clinical Significance:**
Cardiac silhouettes slightly enlarged. No infiltrates present.	**The enlarged parts of the heart could be making the heart work harder, thus contributing to the out-of-range vital signs.**

LAB RESULTS:

Complete Blood Count (CBC)					
	WBC	HGB	PLTs	% Neuts	Bands
Current:	18.5 ↑	13.1 trending ↓	250 ↑	85.2 ↑	3
Most Recent:	12.4	13.2	175	64	0

Basic Metabolic Panel (BMP)					
	Na	K	Gluc.	reate.	
Current:	147 ↑	5.2 ↑	172 ↑	1.6 ↑	

Misc.					
	Lactate	PT/INR	GFR		
Current:	7.4	1.6	45		
Most Recent:	n/a	0.9	>60		

Liver Panel					
	Albumin	Total Bili	Alk. Phos.	ALT	AST
Current:	2.9 ↓	5.1 ↑	285	134	175
Most Recent:	3.1	0.9	48	17	12

What data from the serum lab results are Relevant and must be interpreted as clinically significant by the nurse?

RELEVANT lab data	What is the clinical significance of this data? What should you be looking for as the nurse?
WBC of 18.5 Lowering HGB PLT increasing Neutrophils increasing Lactate of 7.4 Elevated Bilirubin (5.1) Elevated ALK Elevated ALT Elevated AST Low GFR Glucose elevated	These lab values show signs of infection and possible progression to MODS. As the nurse, I would look at the urine output because of the lowering GFR, the elevated glucose can make it harder for the patient to fight infection. The elevated bilirubin can show signs of liver damage and can cause jaundice. The PLT increasing could mean the patient is clotting, which can cause less perfusion to tissues. The ALT and AST also show signs of damaged liver because they are elevated. The lactate level is high, which could mean the anaerobic metabolism. The increases WBC show signs of infection since they are elevated. The lowering hemoglobin lowering is also contributing to the lack of perfusion to tissues.

Urinalysis + UA Micro										
	Color:	Clarity:	Sp. Gr.	Protein	Nitrite	LET	RBCs	WBCs	Bacteria	Epithelial
Current:	Tea	Clear	1.050	NEG	NEG	NEG	<5	<5	NEG	None
Most Recent:	Yellow	Clear	1.025	NEG	NEG	NEG	<5	<5	NEG	None

What data from the Urinalysis results are Relevant and must be interpreted as clinically significant by the nurse?

RELEVANT lab data	What is the clinical significance of this data? What should you be looking for as the nurse?
Tea colored urine Specific gravity	The tea-colored urine could mean the patient is dehydration. The urine specific gravity is also a little high, which could also mean he urine is very concentrate, thus contributing to the dehydration. The nurse could look for other signs like poor skin turgor or dryness of the skin.

Lab Planning: Creating a Plan of Care with a PRIORITY Lab:

Which lab value would you be most concerned about at this point?

LAB Current Value	NORMAL VALUE	Clinical Significance	Nursing assessments and interventions required
18.5 WBC	5000-10000	Signs of infections	Draw blood cultures and check temperature.
7.4 Lactate	<1.0	Signs of hypoperfusion	Capillary refill, HR, and LOC
172 glucoses	<140	High sugar	Check blood glucose

Clinical Reasoning Begins…

1. Interpreting relevant clinical data, what is the primary problem? What primary signs and symptoms does this primary problem represent? (Management of Care/Physiologic Adaptation)

Problem	Pathophysiology of Problem in your own words	What would you anticipate could happen and what s/s would you watch for?
The patient is progressing to sepsis due to hypoperfusion.	The patient has a stage IV wound which causes inflammation and increased capillary permeability, which causes the hypotension because all the fluid is moving into the tissue. The inflammation also damages the epithelial cells of the blood vessels. The WBC start to leak	I would anticipate the patient may go into septic shock. I would watch for a decrease in urine output, decreased capillary refill, and a low reading on the pulse oximeter. I would also watch out for an increase in fever, worsening tachycardia and a low central venous pressure.

	into the tissue to try and fight infection and may also bring in the immature WBC, which are called bands. This is all leading to the organs not being perfused the way they should be. The high HR is because the hypoperfusion causes an increase in need for cardiac output which also causes the increased in respiratory rate.	The patient could also maybe have GI problems where the bacteria can lead to other organs and cause MODS.

Collaborative Care: Medical Management

(Pharm and Parenteral Therapies)

Physician Orders	Rationale	Expected outcome
Fluid Bolus 0.9% Sodium Chloride 30 mL/kg	Better perfusion or organs by increasing C/O.	Better cap refill Urine output of 30 mls/hour Higher B/P Higher CVP
Blood cultures X 2	To identify infectious organism	Decrease in temperature
Urine Culture	To check for UTI	No bacteria
Wound culture	To see if wound is infected	No bacteria
Vancomycin 2 g IV after cultures collected	Antibiotic broad spectrum	Decreasing WBC
Clindamycin 600 mg IV every 6 hours	Antibiotic to help rid infection	A decrease in WBC
Cardiac Telemetry	Monitor cardiac function	Better functioning of the heart
VS every 15 minutes	To check for improvement	Higher BP, lower HR
Acetaminophen 1000mg PR every 6 hours PRN for temp >101	Decrease in temperature	Decrease in temperature
If MAP remains <65 after 2250 mL fluid bolus, start	To maintain a MAP of 65 or	Better perfusion of organs

norepinephrine 1-12 mcg/min to maintain MAP >65	greater	
If MAP remains <65 after norepinephrine at 12 mcg/min start vasopressin 0.01-0.03 units/min to maintain map >65	To maintain a map of 65 or greater	To help with perfusion

PRIORITY Setting: Which orders do you implement first and why?

Physician Orders	Order of priority	Rationale:
1. Fluid Bolus 0.9% Sodium Chloride 30 mL/kg	5	To help with hypotension and improving cardiac output.
2. Blood cultures X 2	1	To find causative agent
3. Urine Culture	2	To find causative agent
4. Wound culture	3	To find causative agent
5. Vancomycin 2 g IV after cultures collected	4	Broad spectrum antibiotic to help until cultures come back
6. Clindamycin 600 mg IV every 6 hours	6	Antibiotic to treat specific infectious agent.
7. Cardiac Telemetry	7	To monitor cardiac function
8. VS every 15 minutes	8	To keep an eye on any changes the patient may have
9. Acetaminophen 1000mg PR every 6 hours PRN for temp >101	11	To decrease temperature and to help with decreasing oxygen demand
10. If MAP remains <65 after fluid bolus, start norepinephrine 1-12 mcg/ min to maintain MAP >65	9	If fluids are not sufficient to achieve and maintain a MAP of greater than 65
11. If MAP remains <65 after norepinephrine at 12 mcg/ min start vasopressin 0.01-0.03 units/min to maintain map >65	10	If fluids and first line vasopressor are not sufficient enough to achieve and maintain a MAP of greater than 65

Collaborative Care: Nursing

2. What nursing priority (ies) will guide your plan of care? (Management of Care)

Nursing Priority -what is the priority problem(s) the patient has that needs to be addressed?	Hypotension, decrease tissue perfusion, high HR, stage IV ulcer, and fever.	
Nursing Interventions (priority – top 10)	**Rationale:**	**Expected outcome:**
Draw blood cultures	To find causative agent	To find causative organism to treat the infection
Provide intravenous fluids	Increase tissue perfusion	Increase tissue perfusion and increase MAP
Provide vasopressors	To help with tissue perfusion and MAP	Achieve and maintain MAP of greater than 65
Cluster care	To decrease tissue demand	Decrease tissue demand and improve oxygenation
Check wound	To look for signs of infection	Decreases infection
Keep hydrated	To help flush toxins and keep hydrated	Lighter colored urine and lower urine specific gravity
Treat pain	To help decrease demand for o2	Less demand and workload on the heart
Maintenance of normal temp	To help decrease demand for o2	Less demand and workload on the heart
NG tube	Since patient is not responsive	To start feeding to improve healing
Stress ulcer prophylaxis	Prevent GI bleed	No bleeding due to stress ulcer

3. What body system(s) will you assess most thoroughly based on the primary/priority concern? (Reduction of Risk Potential/Physiologic Adaptation)

Priority Body System(s)	**Priority nursing assessments**
Urinary Hepatic Lungs Cardiovascular GI Neurological Endocrine	Urine output, fluid retention Jaundice, edema, and confusion RR Cap refill, heart sounds, HR Bowel sounds, any bleeding LOC sugars

4. What is the worst possible/most likely complication to anticipated based on the primary problem of this patient? (Reduction of Risk Potential/Physiologic Adaptation)

Complication(s) to anticipate	Septic Sock	
Nursing Interventions to prevent this complication	**Assessments to identify problem early**	**Nursing interventions to rescue if complications occur**
Increase tissue perfusion, decrease infection, and early recognition of decline.	MEWS tool Assessments Monitoring labs	Assisting with intubation Have fluid bolus ready Have antibiotics ready

	Monitoring diagnostics	

5. What psychosocial/holistic care priorities need to be addressed for this patient? (Psychosocial Integrity/Basic Care and Comfort)

Psychosocial priorities	No family and depression.	
Priority nursing interventions:	**Rationale:**	**Expected Outcome:**
CARE/COMFORT	To help the patient cope	Better coping strategies and feel that he has someone to talk to. Also, that he is being listened to.
EMOTIONAL	To help with his depression.	To decrease depression in a way that he wants to get better and feel better.
CULTURAL CONSIDERATIONS	No statement in history about cultural considerations.	N/A

Evaluation:

Evaluate the response of your patient to nursing and medical interventions during your shift. All physician orders that have been implemented are listed under medical management.

Two hours later …

The patient received the fluid bolus of 0.9%NS, and a right internal jugular central line was placed in the ED. He has required norepinephrine 6 mcg/min to maintain a MAP >65. He was transferred to the ICU an hour ago and appears to be resting comfortably. He is now responding to commands. He has received both antibiotics and acetaminophen. His lactate level was repeated and is now 4.8 mmol/L.

Vital Signs	**Previous VS**	**PQRST Pain Assessment**	
T 101.4F P 124 (irregular) R 24 (regular, shallow) BP 86/56 MAP 66 O2 93% 2 LNC	T 103.4 F P 135 (irregular) R 32 (regular, shallow) BP 76/39 MAP 51 O2 91% 2L NC Weight 242 lbs	Provoking/Palliative Quality Region/Radiation Severity Timing	Denies pain

Current Assessment:	
General Appearance	Calm, body relaxed, no grimacing, appears to be resting comfortably
Respirations	Breath sounds diminished with crackles in lower lobes bilat, remains tachypneic but breathing is not as labored
Cardiac	Pale, warm and dry, edema to BLE 2%, heart sounds irregular with murmur, pulses weak and equal, cap refill 2 sec
Neuro	Opens eyes to voice, obeys simple commands, oriented to person only, thought he was at the nursing home and has no idea what year it is
GI	Distended abdomen, firm/nontender, bowel sounds hypoactive in all quadrants
GU	Foley catheter with 30 mL tea colored urine last two hours
Skin	Dressing on coccyx replaced in ED, no drainage present on dressing

Determine current Glasgow Coma Scale score based on the current neurological assessment data:

Eye opening	
Spontaneous	4
To Sound	3
To Pain	2
No response	1
Motor Response	
Obeys Commands	6
Localizes Pain	5

Normal flexion (withdrawal)	4
Abnormal flexion	3
Extension	2
None	1
Verbal Response	
Oriented	5
Confused conversation	4
Inappropriate words	3
Incomprehensible sounds	2
None	1
Total	14

1. What data is relevant for the assessment and vital signs and must be interpreted as clinically significant by the nurse? (Reduction of Risk Potential/Health Promotion and Maintenance)

Relevant Vital sign data	Clinical Significance
101.4 HR 124 pulse RR 24 B/P of 86/56 MAP of 66	These all-show signs of improvement and signs that the patient is responding to medical treatment. These also show signs of increasing and maintaining perfusion.
Relevant assessment data	**Clinical significance**
Calm, opens eyes to voice, obeys commands, no drainage from dressing on wound, no grimacing, oriented to person, hypoactive bowel sounds.	Although these show improvements, there is still a problem with the GI part of the assessment. We need to feed the patient enterally to prevent translocation of bacteria to other organs.

2. Has the status of the patient improved or not as expected at this point? Does your nursing priority or plan of care need to be modified in any way after this evaluation assessment? (Management of Care, Physiological Adaptation?

Patient Status	The patient condition did improve. He is not alert and oriented to person. His GCS is now improving. His vital signs also have shown significant improving from the previous vital signs.
Nursing Plan of Care	Nursing plan of care now is to closely monitor the patient, so he does not fall back into his previous status. Interventions include continuing checking vitals, foley, and LOC.

3. Based on your current evaluation, what are your CURRENT nursing priorities and plan of care?

Nursing Priority -what is the priority problem(s) the patient has that needs to be addressed?	Distended abdomen, hypoactive bowel sounds, orientation to person only, foley cath with tea colored urine	
Nursing Interventions (priority – top 10)	**Rationale:**	**Expected outcome:**
Give oxygen	To help with disorientation	Alert and oriented x4
Try to walk	Increase peristalsis	Active bowel sounds
Early feeding	to improve healing	No translocation of bacteria
Maintain hydration	for dehydration	Light colored urine
Monitor foley	to monitor for infection	No signs of infection
Monitor dressing	to monitor for infection	Maintenance of no drainage
Turn patient	relieve pressure	No more pressure ulcers
		Open airway to expand

		lungs and better breathing effort
Deep breathing exercises	prevent pneumonia	Improvement rather than going backwards
Reassessment	to monitor for changes	Patient is able to maintain a state of being calm and relaxed
Maintaining comfort measures	decrease stress for patient	

It is now the end of your shift. You have done an excellent job with this patient.