Sepsis of Urinary Origin

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Keywords: Altered mental status, urosepsis, sepsis, infection, shock
Procedures: Foley catheter, central line

LEARNING OBJECTIVES

1. Recognize when an adult has an immediate life-threatening condition
2. Manage a patient with impending shock
3. Create a broad differential for a patient with altered mental status
4. Order appropriate studies to elucidate the cause of patient's clinical deterioration
5. Recognize what imaging and labs are most appropriate for the chief complaint of altered mental status
6. Understand the treatment for sepsis

CRITICAL ACTIONS

- ✓ Obtain IV access with two large bore peripheral IVs
- ✓ Place patient on monitors with continuous oxygen saturation monitoring
- ✓ Ask for a full set of vital signs including HR, BP, oxygen saturation, and temperature
- ✓ Obtain EKG, CXR
- ✓ Recognize urinary retention and place urinary catheter
- ✓ Ask for and interpret appropriate labs (CBC, BMP, Cardiac biomarkers, UA, Urine Culture, Blood Cultures, VBG w/ lactate, procalcitonin)
- ✓ Administration of IV fluids
- ✓ Administration of antibiotics
- ✓ Recognize need for central venous catheter placement and describe procedure correctly.
- ✓ Obtain post-procedure CXR
- ✓ Reassessment of patient and vital signs
- ✓ Appropriate consultations called (MICU)
- ✓ Closed loop communication
- ✓ Synthesis of the case
- ✓ Disclose appropriate information to the patient/family

CASE ONE-LINER

87-year-old female presents with altered mental status from the nursing home with EMS

PRESENTATION

SETTING	Hospital ED
ADDITIONAL ROLES	Sim operator, sim RN, debrief manager **CONSULTANTS:** MICU
PATIENT	87yo female
CHIEF COMPLAINT	Altered mental status at nursing home
Hx of PRESENTING ILLNESS	An 87-year-old female with history of dementia brought from nursing home by EMS for altered mental status noted this morning. EMS REPORT: She reported chills, lower abdominal pain, inability to urinate, and weakness last night before bed. This morning, she did not report to breakfast. When staff went to investigate they found her still in bed, disoriented. EMS was called and transported the patient to the ED.
ROS	Unable to obtain due to AMS
PMH/PSH	Dementia, allergic rhinitis
MEDICATIONS	Donepezil, "something for allergies"
ALLERGIES	None
SOCIAL Hx	Never smoker, no drugs, no alcohol

INITIAL VITAL SIGNS

HR	BP	RR	PULSE OXIMETRY	TEMP	WEIGHT
123	80/40	28	98% on room air	101.5F	59 kg

PHYSICAL EXAM

Items in red need to be verbalized

GENERAL: Disoriented, poor skin turgor
HEENT: Normocephalic, atraumatic, PERRL/TM physiologic, dry mucous membranes
NECK: No JVD, no crepitus
CV: Tachycardic, regular rhythm, no murmurs, rubs, or gallops
PULM: CTAB in all fields, equal spontaneous respirations
ABD: Soft, suprapubic distension and tenderness, no rebound
EXT: No edema, moving all symetrically
SKIN: Mottled, delayed capillary refill, no decubitus ulcers, no rash
NEURO: Gross motor normal, CN exam normal. Does not follow commands or answer questions appropriately. Not oriented to self

PHASE 1: INITIAL PRESENTATION				
TIME	**CLINICAL PROMPT**	**EXPECTED MANAGEMENT**	**CONSEQUENCES**	**CRITICAL ACTIONS**
00:00-03:00	87-year-old female presents with altered mental status noticed by nursing home caregivers	• Order full set of vital signs, cardiac monitors, continuous pulse oximetry • Order 2 large-bore IVs • Obtain a focused history and physical examination • Introduce self to patient and EMS team • Confirm allergies • Conduct bedside US or order bladder scan to evaluation for urinary retention	• RN prompts, "Do you want vitals/patient on the monitor/ IV access?" if not requested • RN prompts, "I wonder if she's holding her urine. Looks pretty distended. Want me to bladder scan?" if none ordered or conducted	**Obtained a complete set of vital signs?** I P N **Obtained a focused history?** I P N **Performed a focused physical exam?** I P N **Ordered 2-large bore IVs?** I P N **Recognized abnormal VS?** I P N **Recognized possible urinary retention?** I P N

PHASE 2: REASSESSMENT AND SECONDARY INTERVENTION				
TIME	**CLINICAL PROMPT**	**EXPECTED MANAGEMENT**	**CONSEQUENCES**	**CRITICAL ACTIONS**
3:01-6:00	Pt remains in severe pain, groaning, disoriented **Repeat Vital Signs (after IVF bolus)** BP: 88/50 HR: 100 RR: 20 Pox: 99% on RA or 2LNC **Repeat Vital Signs (if no IV fluids)** BP: 60/40 HR: 148 RR: 28 Pox: 97% on RA or 2LNC If acetaminophen administered, repeat temp 99.0F	• Order STAT labs (CBC, BMP, urinalysis, urine culture, blood cultures x 2, VBG, procalcitonin, troponin, etc.) • Order STAT EKG • Order STAT CXR • Order STAT head CT w/o contrast • Order IV fluid resuscitation • Place Foley catheter • Order IV antibiotics (vancomycin + cefepime or equivalent) • Confirm code status (patient is FULL code)	• RN to prompt, "Did you want any imaging/ labs?" if none ordered. • RN to prompt, "I saw Dr. EMRA place a Foley catheter for this once" if no Foley placed • RN to prompt, "Did you want any treatment for the BP?" if no IV fluids ordered • RN to prompt, "Seems like there is a lot going on. Is she full code?" if no code status discussion or confirmation conducted	**Ordered STAT labs?** I P N **Ordered STAT EKG?** I P N **Ordered STAT CXR?** I P N **Ordered STAT head CT?** I P N **Placed Foley catheter?** I P N **Ordered IV fluids?** I P N **Ordered appropriately broad-spectrum antibiotics?** I P N **Confirmed code status?** I P N

PHASE 3: REASSESSMENT, TERTIARY INTERVENTION, RESULTS, RESOLUTION				
TIME	**CLINICAL PROMPT**	**EXPECTED MANAGEMENT**	**CONSEQUENCES**	**CRITICAL ACTIONS**
6:01-10:00	Patient disoriented; grows more alert after ABx begin but still disoriented **Repeat Vital Signs (after norepinephrine)** BP: 100/50 HR: 105 RR: 20 Pox: 99% sat on RA or 2LNC	• Formulate differential including: infectious, toxidrome, neurological, endocrine, etc. • Place central venous catheter (must describe procedure) • Start appropriate vasopressor (norepinephrine) • Ordered post-procedure CXR • Call appropriate consultants • Provide update to family/ nursing home	• Labs result at 7:00 • RN to prompt, "What did the imaging/ labs show?" if no interpretation shared • RN to prompt, "I wonder if infection could cause her AMS?" if DDx does not include sepsis • RN to prompt, "Do you want any medications?" if no ABx or vasopressor ordered • RN to prompt, "Doesn't seem like she's getting better with the fluids" if no CVC placed • RN to prompt, "How can we verify the location of the line?" if no post-procedure imaging ordered • RN to prompt, "Who's admitting the patient?" if no consult called	**Formulated broad DDx?** I P N **Interpreted test results accurately?** I P N **Ordered broad-spectrum IV antibiotics?** I P N **Accurately described central line placement?** I P N **Central line placed?** I P N **Ordered post-procedure CXR?** I P N **Updated patient/family/ nursing home at any point?** I P N **Called MICU?** I P N **Presented case to specialist succinctly and directly?** I P N

PHASE 4: CONCLUSION & DEBRIEFING	
TIME	**ACTIONS**
10:00-20:00	Debrief Q&A Session/Teaching Evaluations

DEBRIEFING POINTS

GENERAL POINTS	SCENARIO-SPECIFIC POINTS
• What went well? • What are some opportunities for improvement? • Did you identify any gaps in knowledge? • Was there any delay in treatment? • How was communication between team members?	• Differential for altered mental status in a geriatric patient • Management of sepsis in terms of IV fluids, antibiotics, and vasopressors • Central line placement and troubleshooting • Discuss role of POCUS

ORAL BOARDS PEARLS

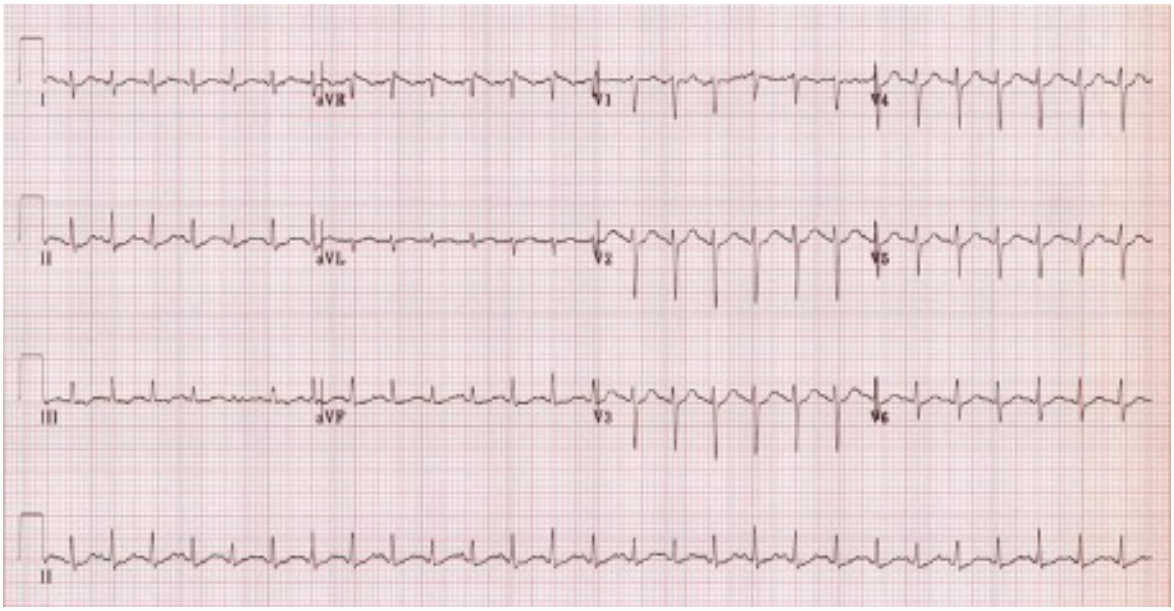
- Have a format for how you would like to approach each case
- Remember to make the patient NPO, re-assess the vital signs, re-assess after each intervention, and follow up on any studies
- Remember to explain to the patient/family the same way you would in real life
- Ensure a thorough skin and extremity exam is conducted for any sources of infection (eg, decubitus ulcer)
- If the examiner attempts to cue you or ask "anything else", take a moment to synthesize what has been done to help organize your thoughts (this may be your final chance to correct something you forgot!) and ensure the examiner recorded all of your intended actions

SCENARIO STIMULI

Complete Blood Count		VBG	
WBC	24.0 (Normal 5.0 - 14.5 x 10^3/mL)	pH	7.20
Hemoglobin	12.5 (Normal 11.5-15.5 gm/dL)	pCO2	32
HCT	40.5 (Normal 35%-45%)	pO2	82
Platelets	220 (Normal 150-450 x 10^3/mL)	SO2	57
MCV	84 (Normal 76-90 fL/red)	Lactate	3.7
Basic Metabolic Panel		**Urinalysis**	
Sodium	136 (Normal 136-145 mEQ/L)	Color	Yellow, hazy (Normal: Yellow)
Potassium	4.0 (Normal 3.5-5.5 mEQ/L)	Specific Gravity	1.005 (Normal 1.005-1.030)
Chloride	105 (Normal 95-105 mEQ/L)	pH	6 (Normal 5.5 - 7.5)
CO_2	14 (Normal 17-29 mEQ/L)	Blood	Negative (Normal: Negative)
BUN	89 (Normal 5-20 mg/dL)	Nitrate	2+ (Normal: Negative)
Creatinine	2.14 (Normal 0.5-1.1 mg/dL)	Leukocyte Esterase	3+ (Normal: Negative)
Glucose	125 (Normal 70-110 mg/dL)	Bacteria	3+ (Normal: None)
Fingerstick Glucose	139 (Normal: 70-110 mg/dL)	Troponin I	<0.02
Troponin I	<0.03 (Normal: <0.08 ng/mL)	WBC	1164
Acetaminophen	Negative	RBC	25
Salicylate	Negative		

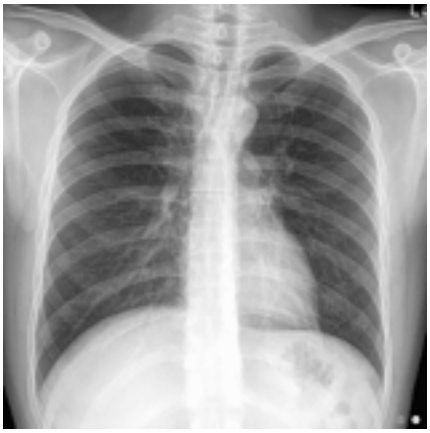
IMAGING

Representative EKG



Interpretation: Sinus tachycardia

Representative CXR



Representative CT