ACEP Simulation Case Template

SIMULATION CASE TITLE: Small Bowel Obstruction
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PATIENT NAME: Julius Rourke
PATIENT AGE: 75 yo M
CHIEF COMPLAINT: Abdominal pain

Brief narrative description of case *Include the presenting patient chief complaint and overall learner goals for this case*	75 year old male with PMH of HTN, HLD presenting with concern of right sided abdominal pain for 3 days, progressively worsening. He appears uncomfortable and is tachycardic on arrival. The goals for this case are to recognize the differential diagnosis and the role of using bedside POCUS to diagnose and expedite care.
Primary Learning Objectives *What should the learners gain in terms of knowledge and skill from this case? Use action verbs and utilize Bloom's Taxonomy as a conceptual guide*	- Describe and recognize the clinical manifestations of a bowel obstruction - Understand and apply the role of ultrasound in the presentation of small bowel obstruction (SBO) - Demonstrate appropriate management of an SBO - Identify risk factors for SBO
Critical Actions *List which steps the participants should take to successfully manage the simulated patient. These should be listed as concrete actions that are distinct from the overall learning objectives of the case.*	- Establish IV access and administer fluid bolus - Request diagnostic imaging, including but not limited to: CT abdomen and pelvis w/ IV contrast, bedside US or upright x-ray - Give medications for pain management - Determine that the patient is too unstable for CT - Resuscitate patient with IV fluids and pressors as necessary - NGT placement for gastric decompression - Consult and admit to Surgery
Learner Preparation *What information should the learners be given prior to initiation of the case?*	- 75 year old male presenting to the emergency department with abdominal pain and vomiting.

Required Equipment *What equipment is necessary for the case?*	- Human patient manikin - Vital signs monitor simulator - Ultrasound machine or prop for ultrasound - NGT

INITIAL PRESENTATION			
Initial vital signs	HR: 122 BP: 130/80 RR: 18 O_2SAT: 98% on RA T: 36.6 ^oC		
Overall Appearance *What do learners see when they first enter the room?*	Elderly male, uncomfortable and pale-appearing.		
Actors and roles in the room at case start *Who is present at the beginning and what is their role? Who may play them?*	Nurse - is in the room with learners, helps with case progression and to perform tasks within their role as an ED nurse.		
HPI *Please specify what info here and below must be asked vs what is volunteered by patient or other participants*	75 year old male with PMH of HTN, HLD presenting with concern of right sided abdominal pain for 3 days. Pt volunteers that the pain is crampy, coming intermittently and associated with vomiting. He volunteers he cannot eat or drink anything without vomiting. If asked, the pt states the pain has been progressively worsening. If asked, his last episode of vomiting was in the waiting room. If asked on review of symptoms the pt denies fevers, chills, diarrhea, trouble breathing, chest pain, or urinary symptoms. If asked, the patient's last bowel movement was 2 days ago, and he normally goes every other day. If asked, the patient reports not passing flatus but is unsure the last time he did.		
Past Medical/Surg History	**Medications**	**Allergies**	**Family History**
HTN HLD Prior cholecystectomy (If asked)	Amlodipine Atorvastatin	Sulfa drugs– Hives	HTN, CAD
Physical Examination			
General	Uncomfortable appearing, retching. **If asked-** bedside vomit bag contains bilious emesis		

HEENT	Normal
Neck	Normal
Lungs	CTAB, no wheezing
Cardiovascular	Tachycardic, RRR, no murmurs
Abdomen	Distended, diffuse tenderness to palpation, surgical incision in the RUQ, hyperactive bowel sounds, no rebound
Neurological	Normal
Skin	Diaphoretic, no rash
GU	Normal
Psychiatric	Normal

1) **SCENARIO STATES, MODIFIERS AND TRIGGERS**
2) *This section should be a list with detailed description of each step that may happen during the case. If medications are given, what is the response? Do changes occur at certain time points? Should the nurse or other participant prompt the learners at given points? Should new actors or participants enter, and when? Are there specific things the patient will say or do at given times?*

PATIENT STATUS	LEARNER ACTIONS, MODIFIERS & TRIGGERS TO MOVE TO THE NEXT STATE	
1. Baseline State Rhythm: Sinus Tachycardia HR: 122 BP: 120/72 RR: 18 O_2SAT: 98% on RA T: 37 ^oC	Learner Actions ● Request IV access, ECG, Cardiac Monitor ● Obtain history from patient ● Elicit PMH/PSH ● Start fluid bolus ● Give pain medications	Modifiers *Changes to patient condition based on learner action* ● If no fluid bolus given, BP drops to 98/60 ● If IV fluid bolus given, pt complains of worsening pain Triggers *For progression to next state* ● IV fluid bolus given
2. After Fluid Bolus Rhythm: Sinus tachycardia HR: 115 BP: 124/78 RR: 22 O_2SAT: 98% on RA T: 37 ^oC	Learner Actions ● Order labs ● Request US to evaluate abdomen for SBO ● Interpret US images of patient's abdomen as SBO ● Describe and demonstrate proper placement for gastric decompression ● Order IV antibiotics ● Consult General Surgery ● Disposition to OR	Modifiers ● If learners request a CT or an X-ray, they will be told that it is unavailable, and the patient will become hypotensive with blood pressure 89/45. The nurse will note that the vital signs are unstable to go for imaging and no portable is available. Additional fluid boluses will not improve the blood pressure. ● If learners don't ask for an US,

		nurse will ask whether "that ultrasound machine you use can help" ● If the learners describe how to perform a bedside abdominal US, they will be shown the US images for the case ● If general surgery is called before US, they will be prompted to make a diagnosis and to call them back with the results. <u>Triggers</u> ● If 5 minutes after the initial cue to use bedside US, they do not use it to diagnose SBO, the patient vomits and aspirates, causing hypoxia unresponsive to oxygen. Move to State 3. ● If learners don't accurately interpret US images as SBO, patient aspirates, moving to State 3. ● Admission to Surgery - ends case.
3. Aspiration Rhythm: Sinus tachycardia HR: 135 BP: 110/53 RR: 30 O_2SAT: 79% on RA, 86% on NRB T: 37 ^oC	<u>Learner Actions</u> ● Perform RSI for intubation ● Order IV antibiotics if not already ordered	<u>Modifiers</u> ● After the patient is intubated, they are told that respiratory therapy has placed the patient on the ventilator. <u>Triggers</u> ● Intubation - move to State 4
4. Post-Intubation Rhythm: Sinus tachycardia HR: 125 BP: 108/53 RR: 20 O_2SAT: 95% on Vent T: 37 ^oC	<u>Learner Actions</u> ● Request US to evaluate for SBO ● Interpret US images of patient's abdomen as SBO ● Describe and demonstrate proper placement of NGT for gastric decompression ● Call Surgery for OR management of SBO and admission to ICU-level bed.	<u>Modifiers</u> ● If Surgery is called before US, they will be prompted to perform a bedside US and to call them back with the results. <u>Triggers</u> ● Admission to Surgical ICU bed for SBO diagnosed on US - ends case ● Admission to Medical ICU bed (learners do not diagnose SBO on US) - ends case

SUPPORTING DOCUMENTS, LAB RESULTS AND MULTIMEDIA		
Lab Results	WBC: 14.2 Hgb: 12.6 Hct: 36.7% Plt: 175 PT: 1.0 PTT: 11 INR: 21 Troponin I: <0.04	Na: 142 K: 3.3 Cl: 94 CO_2: 21 BUN: 27 Cr: 1.2 Glucose: 82
EKG	Sinus tachycardia, HR 125 Normal intervals No T-wave abnormalities or signs of ischemia	
CXR CT imaging	Not available	
Ultrasound Video Files		Findings: Dilated loops of bowel >2.5cm, plicae circulares “keyboard sign”, “to and fro” sign, tanga sign.

SAMPLE QUESTIONS FOR DEBRIEFING

1) How are you feeling? What are your thoughts on the case? (Learner reactions)
2) Can someone provide a summary of the case in 1-2 sentences?
3) What are some risk factors for SBO? LBO?
4) What aspects of the case do you think were managed well? Were there any aspects you found challenging?
5) What was the role of ultrasound in the case and the diagnosis of SBO?
6) What signs are suggestive of small bowel obstruction on POCUS?
7) What sign must be present to diagnose small bowel obstruction with POCUS alone?
8) What are the limitations of POCUS for SBO?

Ideal Scenario Flow
Provide a detailed narrative description of the way this case should flow if participants perform in the ideal fashion.

The learners will enter the room to find an elderly male, pale and uncomfortable appearing lying on a stretcher, complaining of right sided abdominal pain. The learners should obtain IV access and ask for vitals. They should notice the patient is tachycardic, normotensive, however RR, SpO2 and temperature are normal. The nurse will let the learners know that EMS brought the patient in from home with the chief complaint of abdominal pain and vomiting. The patient will be able to provide a history when asked. After obtaining an HPI, the learners should deduce that this elderly male, with a history of prior abdominal surgery (cholecystectomy), vomiting, hyperactive bowel sounds and no BM in 2 days has a high positive predictive value for SBO. Learners should obtain an EKG for his tachycardia, give antiemetics (avoiding metoclopramide due to its ability to promote gastric motility), analgesics and give an IV fluid bolus. Should they not give a bolus, the BP will drop. If they do, the patient's pain will get worse. Labs should be ordered at this time. The learners will likely ask for a CT or an X-ray. If they request these the patient will develop worsening hypotension making the patient too unstable for transport. The learner should consider point-of-care ultrasound (POCUS) as an option. If learners do not ask for it, the nurse in the room will suggest using the bedside ultrasound machine that is available to them. If the learner obtains an US, they will be given an US stimulus and they will see the following: dilated loops of bowel >2.5cm with plicae circulares "keyboard sign", "to and fro" sign, and "tanga sign" (triangular shaped extraluminal fluid in between bowel loops), all of which are consistent with a SBO. If they do not order an US or recognize SBO, the patient will begin vomiting more profusely and aspirate becoming tachypneic, hypoxic and unresponsive to oxygen. The patient will then require intubation and ICU admission. If the learner recognizes an SBO, they will need to place an NGT and consult general surgery for OR management/admission.

Anticipated Management Mistakes
Provide a list of management errors or difficulties that are commonly encountered when using this simulation case.

Numbered list, example below

1. *Failure to recognize risk factors for SBO* - Elderly, history of prior abdominal surgery, vomiting and no bowel movement in 2 days should heighten the learners' suspicion for SBO.

2. *Failure to give analgesics or antiemetics* - Treating the patient's symptoms are equally as important as finding the diagnosis in this patient.
3. *Failure to recognize utility of US for SBO diagnosis* - Bedside US can be used to evaluate for SBO. Learners should know that there are additional imaging modalities aside from CT and x-ray to diagnose an SBO. Given the clinical picture with the patient becoming unstable they are pushed to consider additional options.
4. *Failure to place NGT for SBO* - NGT will help decompress the bowels, alleviate the obstruction and help prevent aspiration.