ACEP Simulation Case Template SIMULATION CASE TITLE: AUTHORS: Dana Resop, MD Reviewed by: Zachary Boivin, MD	
PATIENT NAME: Gwendolyn Flores PATIENT AGE: 64 CHIEF COMPLAINT: Intractable vomiting	
Brief narrative description of case *Include the presenting patient chief complaint and overall learner goals for this case*	A previously healthy 64 year old female presenting 10 days post bladder sling repair operation with intractable vomiting, bilateral flank, and abdominal pain. Her vital signs are relatively normal, and her nausea improves with several treatments for nausea. Her exam reveals abdominal pain and flank pain, so a point of care ultrasound is done, showing moderate hydronephrosis right > left with hydroureter bilaterally and a foley balloon in a mostly decompressed bladder. She is admitted to urology for bilateral ureteral decompression and revision of her surgery due to physical obstruction of ureters.
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*	- Connect the location of discomfort with the need to perform a renal ultrasound. - Perform renal point-of-care ultrasound - Diagnose hydronephrosis on point of care ultrasound - Recognize importance of new-onset hydronephrosis in the setting of post-operative pelvic surgery - Treat symptoms of uremia - Rule out urinary tract infection
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.*	- Treat symptomatic patient with dehydration and intractable vomiting - (fluids/nausea medicine) - Perform **p**oint-of-care ultrasound - Recognize hydronephrosis - Consult urology for surgical complication of bilateral ureter obstruction.
Learner Preparation *What information should the learners be given prior to initiation of the case?*	64-year-old woman 10 days post-op bladder sling repair presenting with intractable vomiting x 3 days.

Required Equipment *What equipment is necessary for the case?*	Point of care ultrasound Vital sign monitor

INITIAL PRESENTATION			
Initial vital signs	HR: 110 BP: 131/100 RR: 34 O_2SAT: 93% T: 37.1°C		
Overall Appearance *What do learners see when they first enter the room?*	64 year old woman sitting on the stretcher, clutching an emesis bag and leaning forward. She does not appear in distress but appears uncomfortable and mildly pale		
Actors and roles in the room at case start *Who is present at the beginning and what is their role? Who may play them?*	Patient is on her own. Gynecology clinic called prior to her arrival and left a message that she is 10 days s/p bladder sling repair and came to clinic for scheduled foley removal. As she was unable to urinate**,** they replaced the foley, gave her a dose of Toradol for abdominal pain and sent her to ED for intractable vomiting.		
HPI *Please specify what info here and below must be asked vs what is volunteered by patient or other participants*	EMS: brought from clinic for abdominal pain and intractable nausea. Post—op foley replaced. (minimal history as clinic is near-by) From patient: "I cannot keep anything down" 64-year-old female presents to the emergency department from Gyn clinic with intractable vomiting. She had bladder sling repair 10 days ago and since has been in "a continuous state of nausea." Was at gynecology clinic for foley removal, but was unable to urinate, so new foley placed. She has been taking opiate suppositories for pain but it is not well controlled. She has not been able to keep anything down for 3 days, with vomit appearing non-bloody and green/yellow.		
Past Medical/Surg History	Medications	Allergies	Family History
OA: right hip replacement, Cholecystectomy	Glucosamine, vitamin D	None	HTN, DM
Physical Examination			
General	Mildly pale woman with slightly increased respiratory rate. Pale. Clutching emesis bag and leaning forward to vomit/retch.		
HEENT	Normal		
Neck	Normal, flat JVD		

Lungs	Clear bilaterally, slightly rapid rate with good airflow
Cardiovascular	Mildly tachycardic, regular rhythm
Abdomen	Mildly tender at laparoscopic incisions, but these are dry and intact. Mild discomfort diffusely.
Neurological	A+O x 4, moving all extremities.
Skin	Cool, but cap refill <2 seconds.
GU	Foley in place. CVA pain bilaterally **r**ight more than **l**eft.
Psychiatric	Tired but appropriate.

1) SCENARIO STATES, MODIFIERS AND TRIGGERS

2) *This section should be a list with detailed description of each step than 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: 110 BP: 131/100 RR: 34 O_2SAT: 93% RA T: 37.1^{o}C	<u>Learner Actions</u> ● IV, place on monitor ● Obtain brief history from EMS and patient. ● Start 1 L crystalloid bolus ● Administer nausea treatment	<u>Modifiers</u> *Changes to patient condition based on learner action* • If no IV bolus, patient's tachycardia worsens • If no nausea medicine given, patient vomits on learner and continues to do so until treated <u>Triggers</u> *For progression to next state* ● Treat nausea
2. Rhythm: NSR HR: 96 BP: 130/90 RR: 22 O_2SAT: T: 37^{o}C	<u>Learner Actions</u> ● Bedside **POCUS** identifies hydronephrosis bilaterally, +/- foley in place. If SBO **ultrasound** done, negative**. I**f FAST done, negative. ● UA ordered and infection diagnosed (no symptoms as she has foley)	<u>Modifiers</u> • If no ultrasound done, patient complains of severe flank pain • If CT ordered, nurse tells learner the CT scan broke this morning and we are waiting for a tech; expect 8 hours delay • If no UA ordered, patient start to have rigors and become febrile [39^{o}C] <u>Triggers</u> ● US Diagnosis of hydronephrosis

3. Rhythm: NSR HR: 90 BP: 130/80 RR: 22 O_2SAT: 95 T: 37°C	<u>Learner Actions</u> ● Consult urology (or gynecology – who will recommend urology consult) – IR consultation would also be accepted but IR will prompt consult to surgical service ● Check creatinine (normal) ● Diagnose urinary tract infection and start antibiotics	<u>Modifiers</u> • If no consultation, patient starts to have intractable flank pain and asks if she can see her surgeon • If no antibiotics for Pyelo started, patient becomes hypotensive. <u>Triggers</u> ● Surgical OR IR consulted, and antibiotics started

SUPPORTING DOCUMENTS, LAB RESULTS AND MULTIMEDIA	
Lab Results	CBC: 11.8/12.3 hgb/336 plt chem7: WNL UA: Positive Ketones, WBC, RBC, Bacteria
EKG	Sinus tachycardia; QTC okay
CXR KUB	Clear No SBO or free air (image attached)
Ultrasound Video Files	FAST exam with no free fluids, bilateral hydronephrosis Renal ultrasound with bilateral hydro

SAMPLE QUESTIONS FOR DEBRIEFING

1) *What is differential diagnosis for abdominal/pelvic surgery post-operative complications?*

2) *How does the hydronephrosis change the importance of this patient's UTI?*

3) *Would looking for ureteral jets in the bladder help your urologist in this case* (Probably yes, as this woman has complete blockage at right. Urology was able to place a left ureteral stent, but IR had to place a right nephrostomy tube. This could have been predicted by ureteral jet monitoring, but this takes a long time; This woman has no urinary flow from right ureter, so no ureteral jets with monitoring for 5-10 minutes would identify non-patent ureter at that side – but given the inefficiency of a provider or tech monitoring for ureteral jets for this long, this is not a recommended practice in any specialty. *Delair SM, Kurzrock EA. Clinical utility of ureteral jets: disparate opinions. J Endourol. 2006 Feb;20(2):111-4. doi: 10.1089/end.2006.20.111. PMID: 16509793.*

Ideal Scenario Flow

The learners are presented a patient who is very uncomfortable but stable. They should note the stability but also the concerning narrow pulse pressure and tachycardia as possible signs of impending shock. Learners should start monitoring, have 1-2 IVs placed and start symptomatic treatment for nausea as well as treating the vital signs and dehydration. When informed that the ideal imaging study (CT) is not available, they should utilize their bedside ultrasound given the recent surgery and abdominal pain noted on exam. If there are delays in action, the patient will become septic from her urinary tract infection and obstruction and decompensate. The case ends with the learners consult the urology service for admission.

Anticipated Management Mistakes

1. ***Difficulty recognizing importance of patient's symptom relief: This patient has been vomiting since surgery and functionally NPO for several days. Optimizing her symptom management with fluids and nausea treatment so a better exam and history is available can be reinforced by not allowing the simulation to go forwards (no history, no testing accomplished) until learners treat her symptoms adequately.***
2. ***Failure to recognize Hydronephrosis on ultrasound*: The FAST exam is negative for this patient and if learners focus on that, they will miss the critical diagnosis in this case. To reinforce this, that simulated patient can comment on increased pain during the right and left upper quadrant scans, "There was so much pressure when you pushed on my sides with the ultrasound! Are you sure that's not the problem?"**
3. ***Failure to recognize importance of decompressing ureteral obstruction in setting of UTI.* In this case, the patient becomes septic if infection is not treated to reinforce this point. However, as she has had a catheter for over a week and we often see colonization with indwelling foleys, this may be confusing to the learners this this UTI is a problem, when colonized non-obstructed UTIs are not. Usually the acuity of the patient gets this point across, but it may have to be emphasized and reviewed after the case.**