ACEP Simulation Case Template

SIMULATION CASE TITLE: Ruptured AAA
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PATIENT NAME: John Bailey
PATIENT AGE: 72 year old male
CHIEF COMPLAINT: Back Pain

Brief narrative description of case *Include the presenting patient chief complaint and overall learner goals for this case*	72yo M with hx of HTN, DL is BIBA from home for severe mid-back pain. He appears in distress and is borderline hypotensive upon arrival. The goals for this case are to recognize the emergent nature of a ruptured abdominal aortic aneurysm (AAA) and the importance of using bedside US in conjunction with the clinical history to obtain definitive treatment in the OR.
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*	- Identify risk factors for an AAA - Resuscitate a hypotensive patient- large bore IVs, central venous access if needed, crystalloids, pRBC - Perform a bedside US of the aorta - Consult the appropriate service (Vascular Surgery) in an expedited manner for definitive treatment
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.*	- IV, O2 Monitor - Bedside US of aorta- recognize AAA and in the setting of hypotension and back pain, suspect rupture - Order blood products, possibly even massive transfusion protocol - Consult Vascular Surgery
Learner Preparation *What information should the learners be given prior to initiation of the case?*	72yo M presents to the ER with severe back pain.
Required Equipment *What equipment is necessary for the case?*	Cardiac Monitor Ultrasound Cordis

INITIAL PRESENTATION	
Initial vital signs	HR: 115/min BP: 85/50 RR: 20 / min O₂SAT: 95 % T: 37 °C
Overall Appearance *What do learners see when they first enter the room?*	Elderly male in distress due to pain, pale in color, mildly diaphoretic
Actors and roles in the room at case start *Who is present at the beginning and what is their role? Who may play them?*	EMS providing brief history and interventions performed en route Nurse taking report
HPI *Please specify what info here and below must be asked vs what is volunteered by patient or other participants*	72yo M in usual state of health this afternoon with sudden onset mid-back pain 30 minutes ago (volunteered) Feels lightheaded and clammy (asked) Nauseous (asked) No trauma (asked) No leg weakness or numbness or incontinence (asked) No urinary symptoms (asked) Smoker: 30 pack-year history (asked)

Past Medical/Surg History	Medications	Allergies	Family History
HTN DM	HCTZ Atenolol Metformin Glipizide Aspirin	NKDA	HTN, DM, CAD

Physical Examination	
General	patient in moderate distress. diaphoretic
HEENT	Normal
Neck	Normal
Lungs	Clear to auscultation, mild tachypnea
Cardiovascular	Tachycardic, regular rhythm, normal S1/S2, 2/6 systolic murmur
Abdomen	Abd soft, nontender, no bruising noted; no CVA ttp

Neurological	Normal
Skin	Diaphoretic, no rash
GU	Normal, good rectal tone
Psychiatric	Mildly anxious

PATIENT STATUS	LEARNER ACTIONS, MODIFIERS & TRIGGERS TO MOVE TO THE NEXT STATE	
1. Baseline State Rhythm: NSR HR: 115/min BP: 85/50 RR: 20 / min O$_2$SAT: 95 % T: 37 ^{o}C	Learner Actions ● 2 large bore IVs, O2, Cardiac Monitor ● Obtain brief history from patient and EMS ● Elicit risk factors of HTN, DM, smoker ● Start 1L crystalloid bolus	Modifiers *Changes to patient condition based on learner action* ● If not IV or crystalloid started, BP drops to 70/40 and pt becomes unresponsive ● If IV and crystalloid started, BP stable but pt complains of lightheadedness Triggers *For progression to next state* ● IV fluids started
2. Rhythm: NSR HR: 115/min BP: 85/50 RR: 20 / min O$_2$SAT: 95 % T: 37 ^{o}C	Learner Actions ● Bedside US identifies AAA (if FAST done, no free fluid identified) ● Order blood products (at least 4u pRBC and 1u plt as patient takes aspirin, if not massive transfusion protocol)	Modifiers ● If no US done, pt becomes more hypotensive 70/40 ● If CT ordered, nurse prompts learner that pt is too unstable to go to CT scanner ● If no blood ordered, BP 70/40 Triggers ● US diagnosis of ruptured AAA

3. Rhythm: NSR HR: 115/min BP: 78/45 RR: 20 / min O$_2$SAT: 95 % T: 37 °C	Learner Actions ● Place Cordis ● Start transfusion ● Consult vascular surgery	Modifiers ● If blood not started, BP 65/palp ● If not Cordis place, nurse tells learner that IV infiltrated Triggers ● Vascular surgeon arrives to take patient to OR

SUPPORTING DOCUMENTS, LAB RESULTS AND MULTIMEDIA	
Lab Results	CBC: 11.7/9/27/130 Chem7: wnl Coags: wnl Trop neg
EKG	Normal sinus rhythm with no ST elevations
CXR CT imaging	CXR - normal mediastinum, no ptx, mild cardiomegaly, no pleural effusions or opacities noted CT- none
Ultrasound Video Files	AAA- longitudinal and transverse FAST- negative

SAMPLE QUESTIONS FOR DEBRIEFING

1) What are risk factors for a AAA?

2) What is the diagnostic criteria for a AAA?

3) What will you see on a bedside ultrasound of the aorta in the case of a ruptured AAA? What about a FAST?

4) What is the mortality rate of a ruptured AAA?

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

The learners enter the room to find a patient who appears unwell. He is in pain, is pale and diaphoretic, and has a borderline blood pressure. They should immediately place the patient on a cardiac monitor and order 2 large bore IVs to be started. They should ask EMS to provide any history they have obtained. An elderly male with a history of HTN, DM, and heavy smoker should prompt an immediate bedside US of the aorta as this patient is at high risk for AAA. If they do not, the patient's blood pressure will continue to decrease and the nurse should point out a pulsatile mass to the abdomen. If the learners order a CT to diagnose the ruptured AAA, the nurse should point out that the patient is too unstable to be transported.
After the diagnosis of AAA is made with bedside US, and concern for rupture is present given they persistent hypotension despite crystalloids. Massive transfusion protocol should be ordered and vascular surgery should be consulted immediately for transport to the OR.

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

For example:

1. *Difficulty with bedside monitors: We found when using this case with medical students that many of our learners did not know how to properly connect EKG leads to the bedside monitor. We modified our sessions to include an introduction to simulation cases that includes a tutorial for connecting patients to bedside monitoring.*
2. *Failure to recognize the utility of bedside US diagnosis of AAA: In the unstable patient where there is concern for AAA, a bedside US should be done to confirm presence of a AAA. Furthermore, if the patient is hypotensive with symptoms consistent with ruptured AAA, the diagnosis of rupture should be made without a CT.*
3. *Failure to initiate aggressive resuscitation including massive transfusion protocol: The mortality of a ruptured AAA is very high. These patients need resuscitation with blood products, not just crystalloid. There should not be delay in obtaining blood, and a significant amount will be required. Therefore, MTP is appropriate to initiate as soon as the diagnosis is suspected.*