

SIMULATION

Mesenteric Ischemia

Shannon Toohey, MD*

*University of California, Irvine, Department of Emergency Medicine, Orange, CA

Correspondence should be addressed Shannon Toohey, MD at stoohey@uci.edu

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ABSTRACT:

Audience: This simulation session is appropriate for emergency medicine residents at any level or medical students.

Introduction: Mesenteric ischemia is a rare, but serious cause of abdominal pain. Practitioners must recognize the diagnosis quickly. The clinical course rapidly advances from bowel ischemia to infarction, sepsis, and frequently death. Mesenteric ischemia accounts for approximately 1% of all emergency department cases of abdominal pain in the elderly, but the mortality is as high as 93%.

Objectives: At the end of this simulation session, the learner will: 1) recognize signs and symptoms of mesenteric ischemia; 2) order appropriately imaging and labs in the workup of an elderly patient with abdominal pain; 3) manage a patient with mesenteric ischemia, a rare, but serious cause of abdominal pain in the elderly; 4) discuss anchoring bias, specifically related to patients referred to the ED with an established diagnosis by outside specialists.

Methods: This educational session is a high-fidelity simulation.

Topics: Mesenteric ischemia, simulation, abdominal pain in the elderly, sepsis, lactic acidosis, anchoring bias.



USER GUIDE

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Learner Audience:

Medical Students, Interns, Junior Residents, Senior Residents, NPs, PAs

Time Required for Implementation:

Instructor preparation: 30-60 minutes

Time for case: 10-15 minutes

Time for debriefing: 15-30 minutes

Recommended Number of Learners per Instructor/Case:

2-5

Topics:

Mesenteric ischemia, simulation, abdominal pain in the elderly, sepsis, lactic acidosis, anchoring bias.

Objectives:

By the end of this simulation, the participant will:

1. Recognize signs and symptoms of mesenteric ischemia.
2. Review appropriately imaging and labs in the workup of an elderly patient with abdominal pain.
3. Discuss management a patient with mesenteric ischemia, a rare, but serious cause of abdominal pain in the elderly.
4. Discuss anchoring bias, specifically related to patients referred to the ED with an established diagnosis by outside specialists.

Linked objectives and methods:

Mesenteric ischemia is a relatively rare diagnosis that some learners may not encounter during their training. By using simulation, learners will diagnose and manage a patient with mesenteric ischemia. They will experience how quickly a patient with this disorder can decompensate and implement the appropriate steps in the workup and management. In doing so, learners climb to the third tier of Miller's pyramid by "showing how" to manage mesenteric ischemia. A debriefing session can stimulate discussion on cognitive bias, particularly anchoring bias.

More specifically, during the simulation learners will be required to recognize the signs and symptoms of mesenteric

ischemia (objective 1), order appropriate imaging and work-up (objective 2), they will manage the patient with mesenteric ischemia and can further discuss the management during the debriefing (objective 3). Furthermore, anchoring bias and its dangers can be discussed during debriefing (objective 4).

Recommended pre-reading for instructor:

Any resource to review mesenteric ischemia would be appropriate. For suggestions see reference list below. In addition, instructors should review material on anchoring bias in order to facilitate a discussion during debriefing. We recommend citations 3-5 listed in "references/further readings" below.

Results and tips for successful implementation:

This can be completed on a high- or moderate- fidelity simulation, or could be incorporated as a mock oral board case. The patient should initially present as well appearing, in order to demonstrate the importance of reassessment in an elderly patient with abdominal pain. Furthermore, providing the presenting stimulus (the patient is sent in by his oncologist who believes he is having an adverse reaction to chemotherapy) will help to demonstrate anchoring bias.

This simulation case was built based on an actual patient case. The simulation case was piloted on 12 PGY-1 through PGY-3 residents. The case received excellent verbal feedback. We have made a few adjustments to the case, specifically for clarification of the scenario and learning points, after the pilot implementation.

References/suggestions for further reading:

1. Espinoza T. Mesenteric ischemia. In: *Rosen & Barken's 5-Minute Emergency Medical Consult*. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins. 2010:694-695.
2. O'Keefe KP, Sanson TG. Mesenteric ischemia. Adams JG, Barton ED, Collings JL, DeBlieux PM, Gisondi MA, Nadel ES, eds. *Emergency Medicine: Clinical Essentials*. 2nd ed. Philadelphia, PA: Elsevier; 2013:293-295.
3. Bogardus ST, Holmboe E, Jekel JF. Perils, pitfalls, and possibilities in talking about medical risk. *JAMA*. 1999;281(11):1037-1041. doi: 10.1001/jama.281.11.1037
4. Croskerry P. Achieving quality in clinical decision making: cognitive strategies and detection of bias. *Acad Emerg Med*. 2002;9(11):1184-1204. doi: 10.1197/aemj.9.11.1184
5. Croskerry P, Wears RL, Binder LS. Setting the educational agenda and curriculum for error prevention in emergency medicine. *Acad Emerg Med*. 2000;7(11):1194-1200.



USER GUIDE



INSTRUCTOR MATERIALS

Case Title: Mesenteric Ischemia or Severe Dehydration from Gastroenteritis?

Case Description & Diagnosis (short synopsis): The patient is referred to the emergency department (ED) from an oncology clinic. The oncologist called the ED and requested that physicians order basic labs and admit the patient for acute gastroenteritis due to his fluorouracil (5-FU) chemotherapy. On arrival, the patient is uncomfortable appearing, but non-toxic. He has a benign abdominal exam, but is in significant pain. Labs are unremarkable, including a normal lactate. The patient's pain continues to be uncontrolled with narcotics. Reassessment will show worsening tachycardia and hypotension. Learners should consider mesenteric ischemia and order computed tomography angiogram (CTA) of the abdomen and pelvis to evaluate for mesenteric ischemia. Radiology will call the learner to inform them that there is evidence of mesenteric ischemia. Learners should recognize the need for emergent surgical consultation, however, the patient will suffer cardiac arrest and the patient dies.

Equipment or Props Needed:

High- or moderate-fidelity simulator

Infusion pumps

Defibrillator

Crash cart

Antibiotics

Intubation/airway tray

Blood pressure cuff

Cardiac monitor

Two-lead electrocardiogram

Pulse oximeter

Confederates needed:

Simulation needs a confederate or narrator from the simulation control room to give the initial report from the oncologist and a nurse to assist with management of the patient.

Stimulus Inventory:

#1 Comprehensive metabolic panel (CMP)

#2 Lactate

#3 Lipase

#4 Complete blood count (CBC)

#5 Abdominal X-ray



INSTRUCTOR MATERIALS

Background and brief information: The patient's daughter transports the patient to the ED in after being referred from oncology clinic for gastroenteritis due to his chemotherapy. The oncologist called the ED physician before the patient arrived advising that he seems to have gastroenteritis due to his 5-FU chemotherapy and recommends labs and admission to medicine for intravenous (IV) hydration.

Initial presentation: That patient is placed in a bed after being triaged. He complains of significant abdominal pain, vitals are within normal limits, except for tachycardia.

How the scenario unfolds: Participants should take an initial history and complete a physical exam. They should then consider the differential for the patient's abdominal pain, order appropriate labs and pain medications, anti-emetics, and IV fluids. Labs will be unremarkable but pain will be difficult to control.

The patient will start to become hemodynamically unstable with worsening tachycardia and dropping blood pressure. The nurse or patient will also advise the learner that the patient's pain has not been controlled by pain medications. The learners need to recognize this change and order appropriate imaging CTA abdomen/pelvis to evaluate for mesenteric ischemia given his pain out of proportion to exam and worsening clinical status. If learners order a repeat lactate, it will rise. If learners do not order a CTA abdomen/pelvis, or if they order a normal CT abdomen/pelvis, the patient will rapidly decompensate and code. Resuscitation will be unsuccessful and the patient will die.

If a CTA is ordered by the learners, radiology will call and advise the learners that the CTA shows mesenteric ischemia. Participants should recognize the need for emergent surgical consultation. However, prior to surgical evaluation the patient will rapidly worsen, his heart rate will further rise with dropping blood pressure, he will then code. Resuscitation attempts will be unsuccessful and the patient will die.

Critical Actions:

1. Order appropriate labs: complete blood count (CBC), complete metabolic panel (CMP), lipase, and lactate.
2. Order fluids and medications for symptom control.
3. Recognize possibility of mesenteric ischemia.
4. Order CTA abdomen and pelvis.
5. Consult surgery and consider heparin to treat mesenteric ischemia.



INSTRUCTOR MATERIALS

Case title: Mesenteric Ischemia or Severe Dehydration from Gastroenteritis?

Chief Complaint: 56-year-old male with a history of stage 4 gastric cancer is sent to the ED by his oncologist for chemotherapy-induced gastroenteritis requiring IV fluid hydration. Patient states he has had abdominal pain, nausea, vomiting and diarrhea for 1 day.

Vitals: Heart rate (HR) 108 Blood pressure (BP) 118/76 Respiratory rate (RR) 22
Temperature (T) 37.1°C Oxygen saturation (O₂Sat) 99%

General Appearance: Cooperative gentleman who appears stated age. Actively vomiting when MD arrives to room, in moderate distress.

Primary Survey:

- **Airway:** Patent, protected and phonating
- **Breathing:** mild tachypnea, no increased work of breathing
- **Circulation:** mild tachycardia, strong femoral pulses

History:

- **History of present illness:** Patient is oncology patient, last received his chemotherapy five days ago. Presented to his oncologist for diarrhea, nausea and vomiting for one day, associated with generalized abdominal pain. His oncologist believes he has acute gastroenteritis due to his 5-FU chemotherapy (which he states is a common side effect). He wants the patient admitted for IV fluid hydration.
- **Past Medical history:** Stage 4 gastric cancer with multiple metastases
- **Past Surgical history:** None, cancer was considered non-resectable
- **Patients Medications:** Zofran, morphine, reglan
- **Allergies:** No known drug allergies
- **Social history:** Previous heavy alcohol and tobacco use (20-pack-year history) but quit 4 months ago when he was diagnosed with gastric cancer. No illicit drug use.
- **Family history:** Reviewed and non-contributory

Secondary Survey/Physical Examination:

- **General Appearance:** cooperative, moderate acute distress, continuing to vomit
- **HEENT:**
 - **Head:** dry mucous membranes, normocephalic, atraumatic
 - **Eyes:** within normal limits



INSTRUCTOR MATERIALS

- **Ears:** within normal limits
- **Nose:** within normal limits
- **Throat:** within normal limits
- **Neck:** within normal limits
- **Heart:** tachycardic, regular rhythm, no murmurs
- **Lungs:** breath sounds bilaterally without wheezing or rales
- **Abdominal/GI:** soft, non-tender, no rebound or guarding
- **Genitourinary:** within normal limits
- **Rectal:** within normal limits
- **Extremities:** within normal limits
- **Back:** within normal limits
- **Neuro:** within normal limits
- **Skin:** within normal limits
- **Lymph:** within normal limits
- **Psych:** within normal limits



INSTRUCTOR MATERIALS

Results:

#1 *Comprehensive metabolic panel (CMP)*

Sodium (Na)	131 mEq/L
Potassium (K)	3.3 mEq/L
Chloride (Cl)	101 mEq/L
Carbon dioxide (CO ₂)	28 mEq/L
Glucose	97 mg/dL
Blood urea nitrogen (BUN)	35 mg/dL
Creatinine (Cr)	1.4 mg/dL
Aspartate aminotransferase (AST)	54 Units/L
Alanine aminotransferase (ALT)	46 Units/L
Alkaline phosphatase (Alk phos)	126 Units/L
Albumin	1.9 g/dL
Total bilirubin	1.3 mg/dL

#2 *Lactate*

1.2 mEq/L

#3 *Lipase*

Lipase 31 Units/L

#4 *Complete blood count (CBC)*

White blood cells (WBC)	10.1 x10 ³ /mm ³
Hemoglobin (Hgb)	10.8 g/dL
Hematocrit (Hct)	31.1%
Platelets	221/mm ³



INSTRUCTOR MATERIALS

#5 Normal abdominal X-ray

Author's own image





OPERATOR MATERIALS

SIMULATION EVENTS TABLE:

Minute (state)	Participant action/ trigger	Patient status (simulator response) & operator prompts	Monitor display (vital signs)
0:00 (Baseline)	Participants assess airway, breathing and circulation (ABCs)	Patient alert responding to questions, in moderate distress due to abdominal pain. Airway open, normal respirations, 2+ distal pulses.	HR 108 BP 118/76 RR 22 O ₂ sat 99% on RA T 37.1°C
2:00	Obtain focused history and physical Start two large bore IV lines and place on monitors (cardiac and pulse ox)	Patient will reiterate report from oncologist: they are there due to gastroenteritis, a side effect of the chemo. Oncologist wants him admitted for IV fluids.	HR 108 BP 118/76 RR 22 O ₂ sat 99% on RA T 37.1°C
4:00	Participant should order labs and medications for symptom control and IV fluids	If participants are not ordering any labs or pain medication, the nurse can cue them asking “are there any orders you want, doctor?”	HR 116 BP 112/70 RR 22 O ₂ sat 99% on RA T 37.1°C
6:00	Participants should recognize that the patient is still in significant pain	Patient has no improvement despite pain medications and continues to be in distress due to pain, moaning and complaining of pain. If participants do not order additional pain medication, the nurse can cue the participants “the patient is still in pain, would you like to order something else.” Labs are available: CBC, CMP, lipase, lactate	HR 116 BP 112/70 RR 22 O ₂ sat 99% on RA T 37.1°C
8:00	Participants should recognize decompensation and consider differential, order IV fluids, possibly a lactate if not previously ordered. Order CTA	Patient continues to be in distress due to pain, and becomes hypotensive and tachycardic. If no imaging is ordered, the participant can be cued with the daughter asking “why is he getting worse? Could this be something else?”	HR 122 BP 84/46 RR 22 O ₂ sat 99% on RA T 37.1°C



OPERATOR MATERIALS

Minute (state)	Participant action/ trigger	Patient status (simulator response) & operator prompts	Monitor display (vital signs)
10:00	<p>Participant receives call from radiology with evidence of mesenteric ischemia on CT with significant necrotic bowel</p> <p>Participant can consider heparin or papaverine, but needs to call surgery for consult</p>	<p>Surgery will call back and agree to see the patient immediately.</p> <p>However, while pending their consult the patient has worsening mental status and the patient codes. Is found to be in pulseless electrical activity (PEA) arrest.</p>	<p>HR 135 BP 94/56 RR 22 O₂sat 99% on RA T 37.1°C</p> <p>HR 0 BP 0 RR 0 PEA</p>
12:00	<p>Participants should recognize arrest and follow ACLS guidelines (CPR, epinephrine, possible intubation).</p> <p>After several minutes they should recognize the futility and call the code.</p>	<p>Despite ACLS the patient will remain pulseless, the monitor will change to asystole.</p> <p>If participants do not call the code, daughter can prompt them with “is this helping? Do you really think he is going to be ok? I feel like you are hurting him.”</p>	<p>HR 0 BP 0 RR 0 asystole</p>

Diagnosis:

Mesenteric Ischemia progressing to severe sepsis, cardiac arrest and death.

Disposition:

Regardless of learner action the patient will code and die before he is able to receive surgery for definitive therapy.



DEBRIEFING AND EVALUATION PEARLS

Epidemiology:

- Mesenteric ischemia accounts for 1-2% of hospital admissions for abdominal pain
- Most common in patients > 50 years old
- Mortality 60-93%

Pathophysiology

- Caused by hypoperfusion of the intestines and mesentery
- Can be due to arterial embolism (50% of cases), arterial thrombosis, venous thrombosis, and non-occlusive mesenteric ischemia.
- The highest mortality is due to obstructive or embolic phenomena.

Risk factors

- Elderly, atherosclerosis, congestive heart failure, malignancy, hypercoagulable state, sickle cell disease

Presenting Signs and Symptoms

- Severe pain out of proportion to exam (common, but not 100% sensitive)
- Nausea, vomiting, and diarrhea
- Pain is often unresponsive to narcotics
- Peritoneal findings on exam and GI bleeding are late findings

Diagnosis

- Abdomen and pelvis CTA is the gold standard for diagnosis

Treatment

- Airway, breathing and circulation.
- Consider emergent surgical consultation
- Treatment of contributing cardiac abnormalities (dysrhythmias, heart failure, hypotension)
- Pain control
- Broad spectrum antibiotics
- NG tube to decompress the stomach
- If peritonitis is present, surgical exploration is the treatment of choice to remove necrotic bowel and restore blood flow (via arterial bypass or embolectomy)
- If there is no peritonitis or gastrointestinal bleeding, stenting, thrombolytics, or vasodilators (papaverine) may help prevent the need for surgery.
 - Papaverine is infused locally by IR-guided angiography for all etiologies of mesenteric ischemia
 - IR placement of intravascular stents can be successful in some cases of SMA thrombosis



DEBRIEFING AND EVALUATION PEARLS

- Thrombectomy can be useful for mesenteric vein thrombosis
- For non-peritonitic mesenteric vein thrombosis, anticoagulation can be used instead of surgery, but is also frequently used post-operatively

Anchoring Bias

- Anchoring Bias is a prematurely settling on a diagnosis based on initial presentation and failure to adjust to new information. This can lead to premature closure of diagnosis.
- Ways to improve ability to consider alternative diagnoses:
 - Awareness of this bias is essential
 - In EM, where we need to maintain a “worst first” mentality delay forming an impression until a complete evaluation has been done
 - Write out the differential and revisit when tests are back
 - Force yourself to consider more rare diagnoses for patients (cognitive forcing strategies)
 - Always try to disconfirm your diagnosis

Further Reading:

1. Espinoza T. Mesenteric ischemia. In: *Rosen & Barken's 5-Minute Emergency Medical Consult*. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins. 2010:694-695.
2. O’Keefe KP, Sanson TG. Mesenteric ischemia. Adams JG, Barton ED, Collings JL, DeBlieux PM, Gisondi MA, Nadel ES, eds. *Emergency Medicine: Clinical Essentials*. 2nd ed. Philadelphia, PA: Elsevier; 2013:293-295.
3. Bogardus ST, Holmboe E, Jekel JF. Perils, pitfalls, and possibilities in talking about medical risk. *JAMA*. 1999;281(11):1037-1041. doi: 10.1001/jama.281.11.1037
4. Croskerry P. Achieving quality in clinical decision making: cognitive strategies and detection of bias. *Acad Emerg Med*. 2002;9(11):1184-1204. doi: 10.1197/aemj.9.11.1184
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SIMULATION ASSESSMENT

Mesenteric Ischemia

Learner: _____

Assessment Timeline

This timeline is to help observers assess their learners. It allows observer to make notes on when learners performed various tasks, which can help guide debriefing discussion.

Critical Actions

- | | |
|---|------|
| 1. Order appropriate labs: CBC, CMP, lipase, lactate | 0:00 |
| 2. Order fluids and medications for symptom control | |
| 3. Recognize possibility of mesenteric ischemia | |
| 4. Order CTA Abdomen/Pelvis | |
| 5. Consider options for treating acute mesenteric ischemia, including surgical consultation | |



SIMULATION ASSESSMENT

Mesenteric Ischemia

Learner: _____

Critical Actions:

- Order appropriate labs: CBC, CMP, lipase, lactate
- Order fluids and medications for symptom control
- Recognize possibility of mesenteric ischemia
- Order CTA Abdomen/Pelvis
- Consider options for treating acute mesenteric ischemia, including surgical consultation

Summative and formative comments:

Milestones assessment:

	Milestone	Did not achieve level 1	Level 1	Level 2	Level 3
1	Emergency Stabilization (PC1)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Recognizes abnormal vital signs	<input type="checkbox"/> Recognizes an unstable patient, requiring intervention Performs primary assessment Discerns data to formulate a diagnostic impression/plan	<input type="checkbox"/> Manages and prioritizes critical actions in a critically ill patient Reassesses after implementing a stabilizing intervention



SIMULATION ASSESSMENT

Mesenteric Ischemia

Learner: _____

	Milestone	Did not achieve level 1	Level 1	Level 2	Level 3
2	Performance of focused history and physical (PC2)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Performs a reliable, comprehensive history and physical exam	<input type="checkbox"/> Performs and communicates a focused history and physical exam based on chief complaint and urgent issues	<input type="checkbox"/> Prioritizes essential components of history and physical exam given dynamic circumstances
3	Diagnostic studies (PC3)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Determines the necessity of diagnostic studies	<input type="checkbox"/> Orders appropriate diagnostic studies. Performs appropriate bedside diagnostic studies/procedures	<input type="checkbox"/> Prioritizes essential testing Interprets results of diagnostic studies Reviews risks, benefits, contraindications, and alternatives to a diagnostic study or procedure
4	Diagnosis (PC4)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Considers a list of potential diagnoses	<input type="checkbox"/> Considers an appropriate list of potential diagnosis May or may not make correct diagnosis	<input type="checkbox"/> Makes the appropriate diagnosis Considers other potential diagnoses, avoiding premature closure
5	Pharmacotherapy (PC5)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Asks patient for drug allergies	<input type="checkbox"/> Selects an medication for therapeutic intervention, consider potential adverse effects	<input type="checkbox"/> Selects the most appropriate medication and understands mechanism of action, effect, and potential side effects Considers and recognizes drug-drug interactions



SIMULATION ASSESSMENT

Mesenteric Ischemia

Learner: _____

	Milestone	Did not achieve level 1	Level 1	Level 2	Level 3
6	Observation and reassessment (PC6)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Reevaluates patient at least one time during case	<input type="checkbox"/> Reevaluates patient after most therapeutic interventions	<input type="checkbox"/> Consistently evaluates the effectiveness of therapies at appropriate intervals
7	Disposition (PC7)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Appropriately selects whether to admit or discharge the patient	<input type="checkbox"/> Appropriately selects whether to admit or discharge Involves the expertise of some of the appropriate specialists	<input type="checkbox"/> Educates the patient appropriately about their disposition Assigns patient to an appropriate level of care (ICU/Tele/Floor) Involves expertise of all appropriate specialists
9	General Approach to Procedures (PC9)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Identifies pertinent anatomy and physiology for a procedure Uses appropriate Universal Precautions	<input type="checkbox"/> Obtains informed consent Knows indications, contraindications, anatomic landmarks, equipment, anesthetic and procedural technique, and potential complications for common ED procedures	<input type="checkbox"/> Determines a back-up strategy if initial attempts are unsuccessful Correctly interprets results of diagnostic procedure
20	Professional Values (PROF1)	<input type="checkbox"/> Did not achieve Level 1	<input type="checkbox"/> Demonstrates caring, honest behavior	<input type="checkbox"/> Exhibits compassion, respect, sensitivity and responsiveness	<input type="checkbox"/> Develops alternative care plans when patients' personal beliefs and decisions preclude standard care



SIMULATION ASSESSMENT

Mesenteric Ischemia

Learner: _____

	Milestone	Did not achieve level 1	Level 1	Level 2	Level 3
22	Patient centered communication (ICS1)	<input type="checkbox"/> Did not achieve level 1	<input type="checkbox"/> Establishes rapport and demonstrates empathy to patient (and family) Listens effectively	<input type="checkbox"/> Elicits patient's reason for seeking health care	<input type="checkbox"/> Manages patient expectations in a manner that minimizes potential for stress, conflict, and misunderstanding. Effectively communicates with vulnerable populations, (at risk patients and families)
23	Team management (ICS2)	<input type="checkbox"/> Did not achieve level 1	<input type="checkbox"/> Recognizes other members of the patient care team during case (nurse, techs)	<input type="checkbox"/> Communicates pertinent information to other healthcare colleagues	<input type="checkbox"/> Communicates a clear, succinct, and appropriate handoff with specialists and other colleagues Communicates effectively with ancillary staff