Digital Simulation Script: Pediatric Sickle Cell Vaso-Occlusive Crisis

Scene 1: Welcome & Prebrief

Intro: "Welcome to the Pediatric Emergency Department Simulation: Managing Vaso-Occlusive Crisis in a Patient with Sickle Cell Disease. In this interactive experience, you will guide the clinical care of Tobiloba Johnson, a 15-year-old boy with sickle cell disease presenting with severe pain."

Learning Objectives:

- Recognize clinical symptoms of vaso-occlusive crisis (VOC) and possible acute chest syndrome (ACS)
- Assign interprofessional roles and coordinate care
- Provide timely and evidence-based pain management
- Communicate effectively with cultural humility
- Identify and mitigate clinical bias and stigma in SCD care

Scene 2: EMS Handoff

Visual: Emergency department, stretcher with adolescent patient, EMS handing over

EMS: "This is Tobiloba Johnson, 15, known HbSS. Developed severe bilateral leg pain after running at summer camp. He took acetaminophen and ibuprofen with no relief. He's alert, oriented, in visible distress. Pain rated 10/10."

Vitals:

- HR: 126 bpm
- BP: 126/79
- RR: 24
- SpO2: 98%
- Temp: 37.0°C

Prompt: Select actions:

- A. Delay meds and observe
- B. Begin focused assessment, establish IV, draw labs
- C. Administer oral meds and discharge

Correct Answer: B

Feedback: Early aggressive management of VOC is key. Delay can worsen outcomes and risk ACS.

Discussion Prompt: What might the consequences of selecting A or C be? How can implicit bias affect provider responses to Black youth presenting with pain?

Scene 3: Initial Assessment

Visual: Patient room with Tobiloba and his mother

Patient: "My legs hurt so bad. I can't move them."

Parent: "This happens sometimes, but not like this. Please don't delay his care."

Interactive Exam:

- Dry mucous membranes
- Guarding limbs, warm to touch
- Clear lung sounds

Cultural Safety Prompt: "How do you respond to the parent?"

- A. "We treat everyone the same."
- B. "I understand your concern. We're taking his pain seriously."
- C. "Let's wait and see if it gets worse."

Correct Answer: B

Feedback: Cultural humility involves affirming parental concern and demonstrating commitment to pain relief.

Discussion Prompt: Why might parents of children with SCD feel the need to advocate strongly? How can providers reduce this burden?

Scene 4: Initial Management

Visual: Vitals monitor, medication cart

Prompt: Choose initial interventions:

- Administer morphine IV within 30 minutes (0.1 mg/kg)
- Start IV hydration (1.5x maintenance fluids)
- Order CBC, retic count, CMP
- Continuous pulse oximetry

Feedback: Effective analgesia and hydration are the cornerstones of VOC management (CMAJ 2016, NHLBI 2014).

Scene 5: Team Communication

Visual: Huddle at nurse's station

Prompt: Construct SBAR:

- **Situation:** 15-year-old with VOC
- **Background:** HbSS, exertion-related pain onset
- **Assessment:** 10/10 pain, stable vitals, no infection
- **Recommendation:** Continue analgesia, monitor, escalate if pain persists

Feedback: Clear interprofessional communication improves coordination and care efficiency.

Scene 6: Reassessment (30 minutes)

Vitals: HR 128 | BP 130/80 | Pain 9/10

Patient: "Still really bad. Maybe a little better."

Prompt: Next action?

- Repeat opioid
- Reassess labs
- Consider consult to hematology

Feedback: Persistent pain despite opioids requires reevaluation for ACS or complications.

Scene 7: Clinical Bias Challenge

Visual: Nurse comments quietly

Nurse: "He just wants more meds, probably exaggerating."

Prompt: How do you respond?

- A. Ignore it
- B. Address privately and reinforce SCD pain protocols
- C. Agree silently

Correct Answer: B

Feedback: Addressing bias is critical. Studies show SCD patients often face stigma and inadequate analgesia.

Discussion Prompt: How can healthcare providers balance concerns around opioid prescribing with adequate pain treatment? What do we know about the actual pain severity of VOCs?

Scene 8: Complication Risk

Visual: Oxygen monitor shows drop to 94%

Prompt: What do you suspect?

- Acute Chest Syndrome

Select Orders:

- Chest X-ray
- O2 via nasal cannula
- Notify hematology

Feedback: ACS is life-threatening. Early signs include desaturation and pain. Escalation is vital (Brandow & Liem, 2011).

Scene 9: Admission Planning

Visual: Computer order screen

Prompt: Select all that apply:

- Admit under pediatric hematology
- Continue IV opioids and fluids
- Monitor vitals and SpO2 continuously
- Educate family on hydroxyurea compliance and stress reduction

Interactive: Build SBAR handoff for inpatient team

Scene 10: Debrief & Reflection

Visual: Feedback summary screen

Narrator Voiceover: "You've completed the Pediatric Sickle Cell VOC Simulation. Let's review your performance."

Scoring Categories:

- Timely Pain Management
- Clinical Judgment
- Communication
- Cultural Safety
- Bias Mitigation

Prompt: What did you learn from this experience?

Links

- https://pmc.ncbi.nlm.nih.gov/articles/PMC3172721/
- https://pmc.ncbi.nlm.nih.gov/articles/PMC4938685/
- https://bmcemergmed.biomedcentral.com/articles/10.1186/s12873-025-01192-1
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