



VA NATIONAL CENTER FOR PATIENT SAFETY

Moderate Sedation Toolkit for Non-Anesthesiologists

High-Fidelity Simulation Cases 1 Through 4

*Content Produced by
The Durham VAMC Patient Safety Center of Inquiry (PSCI)*



Case 1: Orientation to Simulator and Training Sessions

Appropriate for following learning groups:

Medical Students

(year): 4

Nursing Students: Advanced Practice

CRNA

SRNA

Residents (PGY): 1 2 3 4 5 6 7

Attendings: CME

Specialties: Anesthesiology

Surgery

Critical Care

Emergency Medicine

Gastroenterology

Pulmonary

Radiology

Curricular Information

Learning objectives:

1. Perform a rapid and thorough assessment of the patient who is to undergo a procedure under moderate sedation, including allergies, co-morbidities and review of complimentary studies
2. Perform a pre-procedure time-out
3. Safely conduct the administration of moderate sedation:
 - a. M.D.: Supervise administration of sedative medications and titrate these according to patient needs
 - b. R.N.: Monitor patient responses to medication, alert the supervising physician about unwanted effects or changes in patient condition, provide constructive interventions
4. **Communicate appropriately with the other members of the sedation team**
5. **Become familiar with the uses and limitations of the medical simulator and set a reference for expectations**

Assessment instruments:

- Successful completion of simulated case, including a pre-procedure assessment, completion of pre-procedure time-out, and recognition of upper airway obstruction and implementation of adequate supportive treatment, as detailed below.

Preparation

Monitors required: EKG, non-invasive blood pressure, pulse oximeter, capnograph

Other equipment required: Patient monitor, airway adjunct equipment (bag-valve mask, oral and nasal airways), syringes, and supplemental oxygen equipment

Supporting files: Patient records, including pre-procedure assessment

Time duration:

Set-up	5 min
Preparation	5 min
Simulation	10 min
Debrief	10 min

Case Background Information

Mr. E. is a 47 year-old veteran who consulted his primary care provider with complaints of dysphagia following a Nissen fundoplication and is scheduled to undergo an upper GI endoscopy and esophageal dilatation. He is complaining of back pain this morning and says he feels somewhat anxious about the procedure. His last meal was the preceding evening at 7PM, and he did take his omeprazole with a sip of water, as instructed. He is lying on a stretcher, dressed in a hospital gown. His wife is outside in the waiting area and has agreed to drive him home after the procedure.

Scenario Set-up

Case of routine upper GI endoscopy with regular staffing: GI attending (M.D.), GI fellow (M.D.), moderate sedation nurse and circulating nurse or technician for assistance.

Patient Data Background and Baseline State

Patient history:

Mr. E is a 47 year-old gentleman with a past medical history that is significant for obesity and chronic low back pain, and he has had a Nissen fundoplication in the past. He has never smoked and drinks alcohol occasionally.

Review of systems:

CNS: Occasional headaches

Cardiovascular: None

Pulmonary: None

Renal / hepatic: None

Endocrine: None

Hematologic: None

Current medications and allergies:

Omeprazole, 20 mg QD

Prazosin 2 mg Q pm (for nightmares)

Ranitidine 150 mg QD

Hydrocodone/ APAP prn

Ibuprofen 800 mg BID

Physical examination:

General: Well appearing obese man in no distress, lying supine

Weight: 106kg, **Height:** 193cm, **BMI** 31

Vital signs: T 36.1° C BP 128/87, HR 58, SpO₂ 95% on room air, RR 18, Pain 7/10

Airway: Mallampati class II, thyromental distance is 6cm; good mouth opening

Lungs: Clear to auscultation bilaterally

Heart: Regular rhythm, normal S1, S2; no rubs, murmurs or gallops; no JVD; radial pulses present bilaterally

Laboratory, radiology, and other relevant studies:

CXR: None on file

EKG: Sinus rhythm, rate 77, axis 60⁰, normal PR and QT intervals, no ST segment abnormalities

Scenario Development

State name 1: *Baseline*

Vital signs: T 36.1°C, BP 128/87, HR 55, SpO₂ 96% on room air, RR 16, Pain 7/10

Neurologic: Awake and alert, anxious

Respiratory: Normal breath sounds bilaterally

Cardiovascular: Mildly hypertensive

Gastrointestinal: Normal

Patient data: Patient already in the right lateral decubitus position

What do you envision in this state? Learners will demonstrate appropriate pre-procedure routine, including extraction of the relevant medical information from the electronic medical record system, ID and consent checks and appropriate placement of monitors, and appropriate performance of time-out procedure.

Learners' response: M.D. to look at patient record, inform team of pertinent issues, nurse to check patient ID and consent, place monitors, check IV patency, begin written record, perform time-out.

Trigger to move to next state: Time-out performed

State name 2: *Start of Sedation*

Patient data: Will become sedated 2 minutes after 2mg of midazolam and 100mcg of fentanyl are administered, slurred speech. Vital signs: BP 110/75, HR 50, SpO₂ 92%, RR 8

What do you envision in this state? Learners will demonstrate familiarity with Ramsay Scale of sedation, recognition of respiratory effects of sedation medications, and the appropriate time to begin procedure.

Learners' response: Administer medication, observe monitors and clinical signs, and assess sedation with stimulation maneuvers.

Trigger to move to next state: Statement: "The patient is ready," "OK to start" or similar

State Name 3: *Start of Procedure*

Patient data: Placement of endoscope, patient moves slightly but appears otherwise comfortable. Vital signs: BP 140/90, HR 80, SpO₂ 98%, RR 24

What do you envision in this state? Learners will demonstrate understanding of titrating medication to level of stimulation, and continuous monitoring of vital and clinical signs.

Learners' response: As procedure begins, there will be continuous monitoring of vital and clinical signs, constant communication among all members of the moderate sedation team.

Trigger to move to next state: Manually proceed to State 4 a few minutes after procedure start time

State name 4: *Inadequate Sedation*

Patient data: The patient appears uncomfortable, reaching for the endoscope with his hands and moaning in protest

Vital signs: BP 160/80, HR 100, SpO₂ 98%, RR 27

What do you envision in this state? Learners will demonstrate awareness of inadequate sedation, act to pause the procedure and titrate drugs to patient need.

Learners' response: Recognize inadequate sedation, request a pause in the procedure, administer additional sedation and signal when to proceed.

Trigger to move to next state: Administration of additional sedation and signal to M.D. to proceed

DEBRIEF DISCUSSION POINTS:

1. **Medical point:** None
2. **Practical point:** Familiarization with medical simulator
3. **Teamwork and communication point:** Routine communication among moderate sedation team members

State name 5: *Resolution and completion of procedure*

Patient data: The patient awakens as soon as the endoscope is removed, appears comfortable.

Vital signs: BP 120/80, HR 60, SpO₂ 95%, RR 16

What do you envision in this state? Learners will demonstrate continued vigilance of the patient during completion of the procedure, transport and handover of care to recovery personnel.

Learners' response: Complete procedure and remove endoscope, discontinue monitoring, move to stretcher, transport to recovery area and give report to recovery personnel.

DEBRIEF DISCUSSION POINTS:

Medical point: None

Practical point: Familiarization with medical simulator

Teamwork and communication point: Routine communication among moderate sedation team members

State	Patient Status	Student Learning Outcomes or Actions Desired and Trigger to Move to Next State	
1. Baseline	BP – 128/87 HR – 55 SpO2 – 96% RR - 16 Awake and alert, cooperative, IV already in place	Learners' actions: <ul style="list-style-type: none"> • Pre-procedure routine <ol style="list-style-type: none"> 1. Check ID and consent 2. Obtain history 3. Place monitors • Time-out 	Operator: <ul style="list-style-type: none"> • Patient already in lateral position Teaching points: <ul style="list-style-type: none"> • Appropriate pre-procedure routine • Appropriate time-out procedure Trigger: Time-out confirmation/ start sedation
2. Start of sedation	BP – 110/75 HR – 50 SpO2 – 92% RR – 8 Patient becomes sleepy, slurred speech	Learners' actions: <ul style="list-style-type: none"> • Ramsay Scale of sedation • Recognition of respiratory effects of sedation medications 	Operator: <ul style="list-style-type: none"> • None Teaching points: <ul style="list-style-type: none"> • Recognition of respiratory effects of sedation medications Trigger: “Patient ready” or “OK to start”
3. Start of procedure	BP - 140/90 HR – 80 SpO2 – 98% RR – 24 Murmurs	Learners' actions: <ul style="list-style-type: none"> • Demonstrate understanding of titration of medication to level of stimulation • Continuous monitoring of vital and clinical signs 	Operator: <ul style="list-style-type: none"> • Placement of endoscope • Patient movement • Verbal discomfort Teaching points: <ul style="list-style-type: none"> • Understanding of titration of medication to level of stimulation • Continuous monitoring of vital and clinical signs Trigger: Manual

<p>4. Inadequate sedation</p>	<p>BP - 160/80 HR – 100 SpO2 – 98% RR – 27</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Recognize inadequate sedation and treat accordingly • Ask M.D. to interrupt procedure • Give additional medication 	<p>Operator:</p> <ul style="list-style-type: none"> • None <p>Teaching points:</p> <ul style="list-style-type: none"> • Proper level of sedation • Situational awareness <p>Trigger: Administration of additional sedation and signal to M.D. to proceed</p>
<p>5. Resolution and completion of procedure</p>	<p>BP – 120/80 HR – 60 SpO2 – 95% RR – 16</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Continued vigilance • Transport • Handover 	<p>Operator:</p> <ul style="list-style-type: none"> • Wake patient up <p>Teaching points:</p> <ul style="list-style-type: none"> • End of procedure • Transport • Handover

NOTE:

The Ramsay Scale is referenced here as it has traditionally been the most widely used method for documenting depth of sedation. However, the Richmond Agitation Sedation Scale (RASS) is often preferred as it includes objectively measured variables and gradations on both ends of the spectrum from unresponsive to combative.

Case 2: Upper Airway Obstruction

Appropriate for following learning groups:

Medical Students

(year): 4

Nursing Students: Advanced Practice

CRNA

SRNA

Residents (PGY):

1

2

3

4

5

6

7

Attendings:

CME

Specialties:

Anesthesiology

Critical Care

Gastroenterology

Surgery

Emergency Medicine

Pulmonary

Radiology

Curricular Information

Learning objectives:

1. Perform a rapid and thorough assessment of the patient who is to undergo a procedure under moderate sedation, including allergies, co-morbidities and review of complimentary studies
2. Perform a pre-procedure time-out
3. Safely conduct the administration of moderate sedation:
 - a. M.D.: Supervise administration of sedative medications and titrate these according to patient needs
 - b. R.N.: Monitor patient responses to medication, alert the supervising physician about unwanted effects or changes in patient condition, provide constructive interventions
4. Communicate appropriately with the other members of the sedation team
5. **Recognize intra-procedural upper airway obstruction**
6. **Become familiar with maneuvers that relieve upper airway obstruction**
7. **Become familiar with the treatment of intra-procedural hypertension**

Assessment instruments:

- Successful completion of simulated case, including a pre-procedure assessment, completion of pre-procedure time-out, recognition of intra-procedural hypertension and institution of appropriate treatment, and recognition of upper airway obstruction and implementation of adequate supportive treatment, as detailed below.

Preparation

Monitors required: EKG, non-invasive blood pressure, pulse oximeter, capnograph

Other equipment required: Patient monitor, airway adjunct equipment (bag-valve mask, oral and nasal airways), syringes, supplemental oxygen equipment

Supporting files: Patient records, including pre-procedure assessment

Time duration:

Set-up	5 min
Preparation	5 min
Simulation	10 min
Debrief	10 min

Case Background Information

Mr. G is a 69-year-old veteran who is undergoing a routine follow-up upper GI endoscopy for his history of peptic ulcer disease. He appears comfortable and tranquil. His last meal was last night at 10PM and he did not take his blood pressure medicines as he was instructed not to eat or drink anything after midnight. He lies in the left lateral decubitus position on a stretcher, dressed in a hospital gown. His daughter is outside in the waiting area and will drive him home after the procedure.

Scenario Set-up

Case of routine upper GI endoscopy with regular staffing: GI attending (M.D.), GI fellow (M.D.), moderate sedation nurse and circulating nurse or technician for assistance.

Patient Data Background and Baseline State

Patient history:

Mr. G. is a 69-year-old gentleman with a past medical history that is significant for hypertension, hyperlipidemia, prostate cancer treated with brachytherapy, osteoarthritis, gastroesophageal reflux disease and obstructive sleep apnea.

Review of systems:

CNS: None

Cardiovascular: None

Pulmonary: Occasional shortness of breath with exercise

Renal / hepatic: None

Endocrine: None

Hematologic: None

Current medications and allergies:

Aspirin 81 mg daily

Lisinopril 20 mg daily

HCTZ 25mg daily

Atorvastatin 20 mg daily

Omeprazole 20 mg QD

Citalopram 40 mg

Physical examination:

General: Well appearing obese man in no acute distress, lying supine

Weight: 119kg, **Height:** 178cm, **BMI** 38

Vital Signs: T 36.5° C BP 124/76, HR 89, SpO₂ 95% on room air, RR 16, Pain 4/10

Airway: Mallampati class III, thyromental distance is 6cm; good mouth opening

Lungs: Clear to auscultation bilaterally

Heart: RRR; no rubs, murmurs or gallops; no JVD; radial pulses present bilaterally.

Laboratory, radiology, and other relevant studies:

CXR: None on file

EKG: NSR

Scenario Development

State name 1: *Baseline*

Vital signs: T 36.5° C BP 124/76, HR 89, SpO₂ 95% on room air, RR 16, Pain 4/10

Neurologic: Awake and alert, comfortable

Respiratory: Normal breath sounds bilaterally

Cardiovascular: Mildly hypertensive

Gastrointestinal: Normal

Patient data: Patient already in the right lateral decubitus position

What do you envision in this state? Learners will demonstrate appropriate pre-procedure and time-out procedures, including extraction of the relevant medical information for the electronic medical record system, ID and consent checks and appropriate placement of monitors.

Learners' response: M.D. to look at patient record, inform team of pertinent issues, nurse to check patient ID and consent, place monitors, check IV patency, begin written record, perform time-out.

Trigger to move to next state: Time-out performed

State name 2: *Start of sedation*

Patient data: The patient will become increasingly sedated and will reach a Ramsay sedation scale of 4 with a total of 2 mg of midazolam and 100mcg of fentanyl

Vital signs: 110/65, HR 85, SpO₂ 93%, RR 8

What do you envision in this state? The learners will demonstrate familiarity with Ramsay Scale of sedation, recognition of respiratory effects of sedation medications, and the appropriate time to begin the procedure.

Learners' response: Administer midazolam and fentanyl in increasing doses until Ramsay scale of 4, observe monitors and clinical signs, and assess sedation with stimulation maneuvers.

Trigger to move to next state: Statement: "the patient is ready", "OK to start" or similar

State name 3: *Start of procedure*

Patient data: Placement of endoscope, patient moans in protest

Vital signs: BP 130/60, SpO₂ 96%, RR 24

What do you envision in this state? The learner will demonstrate understanding of titration of drugs to level of stimulation as well as continuous monitoring of vital signs and clinical state.

Learners' response: Learner will titrate medications to level of sedation and continuously monitor vital and clinical signs.

Trigger to move to next state: Time trigger, 2-3 minutes after the endoscope is placed

State name 4: *Sedation and hypertension*

Patient data: Patient murmurs slightly at first, but then becomes quiet again. Vital signs: BP 170/80, HR 105, SpO₂ 92%, RR 20

What do you envision in this state? The team will need to decide whether to proceed or not (inadequately treated hypertension versus inadequate sedation).

Learners' Response:

Option 1: The moderate sedation nurse points out that the patient is not agitated and that an anti-hypertensive agent may be indicated rather than more sedation (especially as he missed his medications that morning). The endoscopist acknowledges this assessment and orders the administration of such an agent (e.g. labetalol 10mg IV).

Option 2: Additional sedation is administered.

Trigger to move to next state: If additional sedation is administered, then go to **State 5**; otherwise, allow team to complete the procedure and go to **State 7**

State name 5: *Airway obstruction*

Patient data: Capnography drops to zero and breath sounds disappear. Respiratory efforts continue if possible to simulate obstruction. 90 seconds later, oxygen saturation level falls from 95% to 60% over 20 seconds. Other vital signs: BP increases to 180/100, HR 120

What do you envision in this state? Recognize airway obstruction, perform airway support maneuvers, place nasal or oral airway, consider reversal agent, inform team and request to interrupt procedure, call for assistance.

Learners' response: Learners will demonstrate recognition of upper airway obstruction and treat accordingly (airway support maneuvers: chin lift, jaw thrust, oral or nasopharyngeal airway placement), and consider administering reversal agents (naloxone and/ or flumazenil). The circulating nurse will ask if she should call for assistance.

Trigger to move to next state: If the team administers a reversal agent and/ or performs airway support maneuvers, then go to **State 7** otherwise, go to **State 6**.

State name 6: *Pre-arrest/cardiac arrest*

Patient data: If no recognition of upper airway obstruction occurs, saturation reaches 50% and remains low. After 2 minutes of no intervention, ST segment elevation occurs, then bradycardia to HR 42, degenerating to pulseless ventricular tachycardia.

What do you envision in this state? Learners will activate the emergency response team and begin ACLS resuscitation protocols.

Learners' response: The GI attending or fellow M.D. will take command of the situation and begin directing the code. The technician will call for help outside the room and retrieve the code cart. The moderate sedation nurse will support the airway using bag valve mask and 100% oxygen. The circulating nurse will activate the emergency response team and administer fluids and drugs.

DEBRIEF DISCUSSION POINTS:

1. **Medical point:** Management of upper airway obstruction, inadequate sedation versus uncontrolled hypertension
2. **Practical point:** If code is successful, should the case be completed?
3. **Teamwork and communication point:** Roles during a code, leadership

State name 7: **Completion of the procedure**

Patient data: Patient awakens slowly, vital signs: BP 170/85, HR 100, SpO₂ 93%, RR 20

What do you envision in this state? Provide continued support as case concludes, continuous monitoring during transport and report to recovery personnel.

Learners' response: Learners will demonstrate continued airway support if needed, continuous monitoring of vital and clinical signs as case is concluded and during transport, and give report to recovery personnel.

DEBRIEF DISCUSSION POINTS:

1. **Medical point:** Management of upper airway obstruction, inadequate sedation versus uncontrolled hypertension
2. **Practical point:** If code is successful, should the case be completed?
3. **Teamwork and communication point:** Roles during airway obstruction episode

State	Patient Status	Student learning outcomes or actions desired and trigger to move to next state	
1. Baseline	BP – 124/76 HR – 89 SpO ₂ – 95% RR – 16 Awake and alert, cooperative, IV already in place	Learners' actions: <ul style="list-style-type: none"> • Pre-procedure routine <ol style="list-style-type: none"> 1. Check ID and consent 2. Obtain history 3. Place monitors Time-out	Operator: <ul style="list-style-type: none"> • Patient already in lateral position Teaching points: <ul style="list-style-type: none"> • Appropriate pre-procedure routine • Appropriate time-out procedure Trigger: Time-out confirmation/ start sedation

<p>2. Start of sedation</p>	<p>BP – 110/65 HR – 85 SpO2 – 93% RR – 8</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Ramsay Scale of sedation • Recognition of respiratory effects of sedation medications 	<p>Operator:</p> <ul style="list-style-type: none"> • Patient becomes sleepy, slurred speech <p>Teaching points:</p> <ul style="list-style-type: none"> • Recognition of respiratory effects of sedation medications <p>Trigger: Manual</p>
<p>3. Start of procedure</p>	<p>BP – 130/60 HR – 95 SpO2 – 96% RR – 24</p> <p>Murmurs (enough to warrant 2nd dose of sedation)</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Demonstrate understanding of titration of medication to level of stimulation, gives additional sedation as needed • Continuous monitoring of vital and clinical signs 	<p>Operator:</p> <ul style="list-style-type: none"> • Placement of endoscope • Patient movement • Verbal discomfort <p>Teaching points:</p> <ul style="list-style-type: none"> • Understanding of titration of medication to level of stimulation • Continuous monitoring of vital and clinical signs <p>Trigger: Administers additional sedation</p>
<p>4. Sedation and hypertension</p>	<p>BP - 170/80 HR – 105 SpO2 – 92% RR – 20</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Recognize that hypertension is not necessarily related to inadequate sedation • Nurse requests pause in procedure, questions request for additional sedation • Second attempt to question order by physician 	<p>Operator:</p> <ul style="list-style-type: none"> • None <p>Teaching points:</p> <ul style="list-style-type: none"> • Proper levels of sedation • Situational awareness • How to question an order that is perceived as inappropriate <p>Trigger: If the team administers additional sedation, go to State 5; otherwise, go to State 7</p>

<p>5. Airway obstruction</p>	<p>BP 180/100 HR 120 SpO2 – 60%'s RR - 0</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Recognize airway obstruction and use rescue method (jaw lift, nasal/oral airway, consider reversal agents) • Request M.D. to stop procedure • Consider calling for assistance 	<p>Operator:</p> <ul style="list-style-type: none"> • Capnography to 0 • Breath sounds disappear • Continued breathing efforts • After a delay of 90 seconds, the SpO₂ falls to 60% over 20 seconds <p>Teaching points:</p> <ul style="list-style-type: none"> • Recognition and treatment of airway obstruction • Appropriate request for assistance • Appropriate request for interruption of procedure <p>Trigger: If team administers reversal agents or provides airway support, go to State 7; if no action within 120 seconds, then go to State 6</p>
<p>6. Pre-arrest/ cardiac arrest</p>	<p>BP – 60/20 HR – 42 SpO2 – 50s RR – 0 Rhythm may deteriorate to ventricular tachycardia if resuscitation not adequate</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Call for help • Manually ventilate with bag/valve mask • Administer atropine • Stop procedure immediately 	<p>Operator:</p> <ul style="list-style-type: none"> • Vital signs deteriorate over 20 seconds • Follow ACLS protocols for resuscitation <p>Teaching points:</p> <ul style="list-style-type: none"> • Appropriate request for assistance • Management of the hypoxic, bradycardic, pre-arrest patient <p>Trigger: Team administers atropine and provides adequate ventilation</p>

7. Resolution and completion of procedure	BP - 170/80 HR – 100 SpO2 – 93% RR – 20	Learners' actions: <ul style="list-style-type: none">• Continued vigilance• Transportation• Handover	Operator: <ul style="list-style-type: none">• Wake patient up Teaching points: <ul style="list-style-type: none">• End of procedure• Transport• Handover
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NOTE:

The Ramsay Scale is referenced here as it is has traditionally been the most widely used method for documenting depth of sedation. However, the Richmond Agitation Sedation Scale (RASS) is often preferred as it includes objectively measured variables and gradations on both ends of the spectrum from unresponsive to combative.

Case 3: A Difficult to Sedate Patient

Appropriate for following learning groups:

Medical Students

(year): 4

Nursing Students: Advanced Practice

CRNA

SRNA

Residents (PGY): 1 2 3 4 5 6 7

Attendings: CME

Specialties:

Anesthesiology

Critical Care

Gastroenterology

Surgery

Emergency Medicine

Pulmonary

Radiology

Curricular Information

Learning objectives:

1. Perform a rapid and thorough assessment of the patient who is to undergo a procedure under moderate sedation, including allergies, co-morbidities and review of complimentary studies
2. Perform a pre-procedure time-out
3. Safely conduct the administration of moderate sedation:
 - a. M.D.: Supervise the administration of sedative medications and titrate these according to patient needs
 - b. R.N.: Monitor patient responses to medication, alert the supervising physician about unwanted effects or changes in patient condition, provide constructive interventions
4. Communicate appropriately with the other members of the sedation team
5. **Recognize the paradoxical response to benzodiazepines**
6. **Become familiar with the treatment of intra-procedural agitation**
7. **Practice constructive intervention**

Didactics:

Cognitive aid

References

Assessment instruments:

Successful completion of simulated case, including a pre-procedure assessment, completion of pre-procedure time-out and recognition of paradoxical response to benzodiazepines and implementation of adequate supportive treatment, as detailed below.

Preparation

Monitors required: EKG, non-invasive blood pressure, pulse oximeter, capnograph

Other equipment required: Patient monitor, airway adjunct equipment (bag-valve mask, oral and nasal airways), syringes, and supplemental oxygen equipment

Supporting files: Patient records, including pre-procedure assessment

Time duration:

Set-up	5 min
Preparation	5 min
Simulation	10 min
Debrief	10 min

Case Background Information

Mr. H is 60-year-old veteran from Rocky Mount, NC who is scheduled for a routine screening colonoscopy. He states he is hungry this morning and would like to eat something as soon as possible after the procedure is over. He is also somewhat anxious and smells of tobacco. He has not had anything to eat or drink since 8 p.m. last night. A friend dropped him off, but will need a ride home after the procedure.

Scenario Set-up

Case of routine lower GI endoscopy with regular staffing: GI attending (M.D.), GI fellow (M.D.), moderate sedation nurse and circulating nurse.

Patient Data Background and Baseline State

Patient history: Mr. H is a 60-year old gentleman with a past medical history significant for hypertension, heavy alcohol use, depression, gastroesophageal reflux, elevated liver enzymes and a laryngeal neoplasm several years ago.

Review of systems:

CNS: none

Cardiovascular: none

Pulmonary: chronic productive cough Renal/ Hepatic: none

Endocrine: none

Heme/ Coag: none

Current medications and allergies:

Vicodin PRN,

HCTZ 25 mg QD

Omeprazole 20 mg QD

Physical examination:

General: Thin male appearing older than his stated age

Weight: 58 kg, **Height:** 67 inches

Vital signs: T 36.7° C BP 158/92, HR 84, SpO₂ 95% on room air, RR 16, Pain 9/10

Airway: No loose teeth, Mallampati class I, thyromental distance is 6cm; good mouth opening

Lungs: bilateral expiratory wheezes, some ronchi on the left lung fields

Heart: Regular rhythm, normal S1, S2; no rubs, murmurs or gallops; no JVD; radial pulses present bilaterally

Laboratory, radiology, and other relevant studies: None

Scenario Development

State name 1: *Baseline*

Vital signs: T 36.1° C BP 158/92, HR 84, SpO₂ 95% on room air, RR 16, Pain 9/10

Neurologic: Awake and alert, anxious

Respiratory: Mild expiratory wheezing bilaterally

Cardiovascular: RRR, moderately hypertensive

Gastrointestinal: Normal

Patient data: Patient already in the left lateral decubitus position

What do you envision in this state? Learners will demonstrate appropriate pre-procedure and time-out procedures, including extraction of the relevant medical information for the electronic medical record system, ID and consent checks and appropriate placement of monitors.

Learners' response: M.D. to look at patient record and inform team of pertinent issues. Moderate sedation nurse to check pt. ID, place monitors, check IV patency, begin written record and perform time-out.

Trigger to move to next state: Time-out performed

State name 2: *Start of sedation*

Patient data: Patient will be agitated at first, but will later become sedated once a total of 2 mg of midazolam and 100mcg of fentanyl are administered. Vital signs: 130/60, 75, 92%, 12. Pulse oximetry readings are intermittent due to agitation and displacement of the sensor.

What do you envision in this state? The team will be unsure about the adequacy of sedation, (if desired, a confederate may urge the team to start)

Learners' response: Administer medications, observe monitors and clinical signs, and assess sedation with stimulation maneuvers.

Trigger to move to next state: Statement: "patient is ready" or "OK to start"

State name 3: *Start of procedure*

Patient data: Placement of endoscope, the patient moves, verbalizes discomfort, Vitals: BP 120/60, HR 70, SpO₂ 95%, RR 12

What do you envision in this state? Learners will demonstrate understanding of titration of medication to level of stimulation, and continuous monitoring of vital and clinical signs

Learners' response: Continuous monitoring of vital and clinical signs

Trigger to move to next state: Manual

State name 4: *Mild to moderate agitation*

Patient data: Patient becomes increasingly verbal and confused and tries to roll on his back.
Vitals: BP 167/88, HR 95, RR 22, SpO₂ 94%

What do you envision in this state? Learners will recognize that the patient is becoming agitated, and provide additional sedation. They may recognize that additional benzodiazepine use is exacerbating agitation (paradoxical) and avoid administering additional midazolam or administer reversal agent.

Learners' response: Titration of drug to level of sedation, ask M.D. to hold procedure until adequate level of sedation is obtained.

Trigger to move to next state: Total doses of midazolam 6mg and fentanyl 400mcg

State name 5: *Barely adequate sedation persists until end of procedure*

Patient data: Patient becomes severely agitated and combative, pulls IV lines and tries to sit up.
Vitals: BP 179/96, HR 98, RR 25, SpO₂ 94%

What do you envision in this state? The team will diagnose a paradoxical response to benzodiazepines and determine the need to interrupt the procedure or choose to cancel procedure and reschedule with anesthesia assistance.

Learners' response: Benzodiazepines are held due to paradoxical response, there is good verbal communication between team members. The decision to interrupt the procedure is quickly reached in conjunction among all members of the moderate sedation team

State Name 6: *Post-procedural airway obstruction/respiratory depression*

Patient data: Patient becomes less agitated, oxygen saturation begins to drop as soon as scope is removed from 95% to 88% in 45 seconds. If reversal agents (naloxone and/or flumazenil) are administered, the patient begins to awaken; otherwise, he remains sedated and mildly confused/disoriented, but ventilating adequately. Vitals: BP 140/70, HR 80, RR 4, oxygen saturation to 70's slowly

What do you envision in this state? The team will interrupt the procedure promptly and provide continued support until the patient is discharged safely.

Learners' response: The GI fellow will remove the endoscope, place the patient supine and administer supplemental oxygen. Then, the team will transport the patient to the recovery area, place appropriate monitors, ensure that he continues to ventilate adequately, and give adequate report to recovery personnel.

DEBRIEF DISCUSSION POINTS:

1. **Medical point:** Paradoxical response to benzodiazepines
2. **Practical point:** Treatment of intra-procedural agitation
3. **Teamwork and communication point:** Decision-making as a team

State Name 7: *Resolution*

Patient data: Patient begins to awaken after being stimulated by team with airway support. Vital signs: BP 130/75, HR 75, RR 16, SpO₂ 95%.

What do you envision in this state? The team will recognize excessive sedation and upper airway obstruction, move to support his airway, and manually stimulate him until he begins to respond appropriately.

Learners' response: The team will provide airway support with chin lift, jaw thrust or even mask ventilation as necessary, while attempting to rouse the patient.

DEBRIEF DISCUSSION POINTS:

1. Medical point: Balance of sedation with stimulation
2. Practical point: Airway support maneuver, vigilance and monitoring at end of procedure and during transport
3. Teamwork and communication point: Decision-making as a team, handover to recovery personnel

State	Patient Status	Student learning outcomes or actions desired and trigger to move to next state	
1. Baseline	BP – 158/92 HR – 84 SpO2 – 95% RR – 16 Awake and alert, cooperative but not happy to be here, IV already in place	Learners’ actions: <ul style="list-style-type: none"> • Appropriate routine pre-procedure <ol style="list-style-type: none"> 1. ID and consent checks 2. Place monitors 3. Medical history • Time-out procedures 	Operator: <ul style="list-style-type: none"> • Patient already in lateral position Teaching points: <ul style="list-style-type: none"> • Appropriate pre-procedure • Appropriate time-out procedures Trigger: Time-out confirmation/ start sedation
2. Start of sedation	BP - 130/60 HR – 75 SpO2 – 92% RR – 12 Patient becomes sleepy, slurred speech	Learners’ actions: <ul style="list-style-type: none"> • Ramsay Scale of sedation • Recognition of respiratory effects of sedation medications 	Operator: <ul style="list-style-type: none"> • None Teaching points: <ul style="list-style-type: none"> • Recognition of respiratory effects of sedation medications Trigger: Statement: “Patient ready” or “OK to start”
3. Start of procedure	BP - 120/60 HR – 70 SpO2 – 95% RR – 12 Murmurs discomfort quietly but continuously	Learners’ actions: <ul style="list-style-type: none"> • Demonstrate understanding of titration of medication to level of stimulation • Continuous monitoring of vital and clinical signs 	Operator: <ul style="list-style-type: none"> • Placement of endoscope • Patient movement • Verbal discomfort Teaching points: <ul style="list-style-type: none"> • Understanding of titration of medication to level of stimulation • Continuous monitoring of vital and clinical signs Trigger: Manual

<p>4. Mild to moderate agitation</p>	<p>BP – 167/88 HR – 95 SpO2 – 94% RR – 22 Patient becomes increasing verbal but confused, tries to roll on back</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Recognize inadequate sedation and treat accordingly • Recognize that additional sedation is exacerbating agitation (paradoxical) and administer only narcotic (hold benzodiazepine) 	<p>Operator:</p> <ul style="list-style-type: none"> • Adjust vitals by doses given <p>Teaching points:</p> <ul style="list-style-type: none"> • Proper levels of sedation <p>Trigger: Three rounds of administration of sedation. Or manual depending on dose administered</p>
<p>5. Severe agitation</p>	<p>BP – 179/96 HR – 98 SpO2 – 94% RR – 25 Patient becomes quieter, although never completely quiescent</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Continued vigilance • Continued awareness of paradoxical response • Communication 	<p>Operator:</p> <ul style="list-style-type: none"> • Adjust vital signs as extra sedation given <p>Teaching points:</p> <ul style="list-style-type: none"> • Additional narcotic is administered • Benzodiazepine is held due to paradoxical response • There is good verbal communication between team members as to when to hold and when to proceed between drug doses <p>Trigger: Completion of procedure</p>
<p>6. Post-procedure respiratory depression</p>	<p>Patient becomes quiet, oxygen saturation begins to drop as soon as scope is removed BP – 140/70 HR 80 SpO2 – 70's RR - 4</p>	<p>Learners' response:</p> <ul style="list-style-type: none"> • Vigilant monitoring during entire period, especially after completion of procedure • Transport • Report • Provide airway support as needed • Giving reversal agents if saturation does not respond quickly... 	<p>Operator:</p> <ul style="list-style-type: none"> • Oxygen saturation begins to quickly drop as soon as scope is removed <p>Teaching points:</p> <ul style="list-style-type: none"> • Recognize increased risk for respiratory depression on cessation of stimulation <p>Trigger: Airway support or reversal given</p>

7. Resolution	BP - 130/75 HR – 75 SpO2 – 95% RR – 16	Learners' actions: <ul style="list-style-type: none">• Continued vigilance• Transportation• Handoff	Operator: <ul style="list-style-type: none">• Wake patient up Teaching points: <ul style="list-style-type: none">• End of procedure• Transport• Handoff
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NOTE:

The Ramsay Scale is referenced here as it has traditionally been the most widely used method for documenting depth of sedation. However, the Richmond Agitation Sedation Scale (RASS) is often preferred as it includes objectively measured variables and gradations on both ends of the spectrum from unresponsive to combative.

Case 4: Medically Compromised Patient

Appropriate for following learning groups:

Medical Students

(year): 4

Nursing Students: Advanced Practice

CRNA

SRNA

Residents (PGY):

1

2

3

4

5

6

7

Attendings:

CME

Specialties:

Anesthesiology

Critical Care

Gastroenterology

Surgery

Emergency Medicine

Pulmonary

Radiology

Curricular Information

Learning objectives:

1. Perform a rapid and thorough assessment of the patient who is to undergo a procedure under moderate sedation, including allergies, co-morbidities and review of complimentary studies
2. Identify the frail, high-risk patient and adjust moderate sedation drug doses appropriately
3. Perform a pre-procedure time-out
4. Safely conduct the administration of moderate sedation:
 - a. M.D.: Supervise administration of sedative medications and titrate these according to patient needs
 - b. R.N.: Monitor patient responses to medication, alert the supervising physician about unwanted effects or changes in patient condition, provide constructive interventions
5. Communicate appropriately with the other members of the sedation team
6. **Recognize and initiate appropriate diagnostic and therapeutic maneuvers for conditions unrelated to moderate sedation**

Assessment instruments:

Successful completion of simulated case, including a pre-procedure assessment, completion of pre-procedure time-out and recognition of upper airway obstruction and implementation of adequate supportive treatment, as detailed in the case scenario that follows.

Preparation

Monitors required: EKG, non-invasive blood pressure, pulse oximeter, capnograph

Other Equipment Required: Patient monitor, airway adjunct equipment (bag-valve mask, oral and nasal airways), syringes, supplemental oxygen equipment

Supporting Files: Patient records, including pre-procedure assessment

Time Duration:

Set-up	5 min
Preparation	5 min
Simulation	10 min
Debrief	10 min

Case Background Information

Mr. S. is an 82-year-old veteran with a history of adenomatous polyps and colon cancer. He is scheduled for a follow-up colonoscopy. He is lying supine on a stretcher, and his son is in the waiting room to accompany him home.

Scenario Set-up

Case of routine lower GI endoscopy with regular staffing: GI attending (M.D.), GI fellow (M.D.), moderate sedation nurse and circulating nurse.

Patient Data Background and Baseline State

Patient history:

Mr. S. is an 82 year-old gentleman with a history of tubular adenomatous disease of the colon. He has a past medical history significant for severe COPD, congestive heart failure (left ventricular ejection fraction 35 percent), paroxysmal VT (AICD placed 3/01), end-stage renal failure on dialysis, gastroesophageal reflux disease, and ETOH abuse with history of seizures.

Review of systems:

CNS: Occasional headaches

Cardiovascular: None

Pulmonary: Occasional shortness of breath

Renal/ Hepatic: On dialysis, last dialyzed yesterday

Endocrine: None

Hematologic: None

Current medications and allergies:

Albuterol inh prn

ASA 81mg QD

Digoxin 0.125 mg QD

Formoterol 12 mcg inh bid

Furosemide 20 mg QD

Metoprolol 25 mg QD

Mometasone 440 mcg inh QD

Nitroglycerine SL prn

Quinine 325 mg QD

Ranitidine 150 mg QD

Simvastatin 40 mg QD

Valsartan 40 mg QD

Physical examination:

General: Elderly male appearing older than his stated age, lying supine with his head elevated, mildly dyspneic

Weight: 69 kg

Height: 70 inches

Vital signs: T 36.7° C BP 134/75, HR 74, SpO₂ 97 percent on room air, RR 18, Pain 5/10

Airway: Mallampati class III, thyromental distance is 6cm; good mouth opening, upper dentures

Lungs: Bibasilar end inspiratory crackles

Heart: Regular rhythm, normal S1, S2; no rubs, murmurs or gallops; no JVD; radial pulses present bilaterally.

Laboratory, radiology, and other relevant studies:

HCT: 41 percent

Cr: 4.2 mg/dL

K: 4.1 mmol/L

Scenario Development

State name 1: *Baseline*

Vital signs: T 36.7° C BP 134/75, HR 74, SpO₂ 97 percent on room air, RR 18, Pain 5/10

Neurologic: Awake and alert, mildly anxious

Respiratory: Crackles

Cardiovascular: Mildly hypertensive

Gastrointestinal: Normal

Patient data: Patient already in left decubitus position

What do you envision in this state? Learners will demonstrate appropriate pre-procedure and time-out procedures, including extraction of the relevant medical information for the electronic medical record system, physical examination, ID and consent checks and appropriate placement of monitors

Learners' response: M.D. to look at medical record, inform team of pertinent issues, nurse to check patient ID and consent, place monitors, check IV patency, begin written record, perform time-out

Trigger to move to next state: Time-out performed

State name 2: *Start of sedation*

Patient data: Patient will become sleepy, slurred speech, BP 110/50, HR 60, SpO₂ 91 percent, RR 6, EtCO₂ 50

What do you envision in this state? Learner will demonstrate familiarity with Ramsay Scale of sedation, recognition of respiratory effects of sedation medications, and the appropriate time to begin procedure

Learners' response: Administer medication, observe monitors and clinical signs, and assess sedation with stimulation maneuvers

Trigger to move to next state: Statement: "the patient is ready," "Ok to start" or similar

State name three: *Inadequate sedation*

Patient data: Patient moans loudly, uses profanity, and struggles to sit up, moving his arms and rolling onto his back, BP 150/90, HR 110, SpO₂ 92 percent, RR 12, EtCO₂ 40

What do you envision in this state? Learners will demonstrate awareness of inadequate sedation, act to interrupt procedure and titrate drugs to desired effect

Learner response: Recognize inadequate sedation, request a pause in the procedure, administer additional sedation and signal when to proceed

Trigger to move to next state: Administration of doses of drug or verbal concern raised by team that procedure may have to be aborted due to difficulty sedating this medically compromised patient (manual trigger if necessary)

State name 4: *Hypotension*

Patient data: Patient slowly becomes sedated and mildly hypotensive, BP 86/40, HR 90, SpO₂ 91 percent, RR 6, EtCO₂ 30

What do you envision in this state? Learner will recognize mild hypotension and treat appropriately

Learners' response: Administration of fluid bolus to treat mild hypotension, the BP is checked more frequently and the patient's response to stimulation is assessed, the EKG is assessed

Trigger to move to next state: Fluid bolus administration or manual

State name 5: *Hypotension and bradycardia*

Patient data: Patient well sedated but responsive to stimulation maneuvers if the team tries them, BP 72/35, HR 43, SpO₂ 89 percent, RR 8, EtCO₂ 30

What do you envision in this state? The learner will recognize that the patient is in a pre-arrest state and that an intervention is mandatory. They will consider alternative etiologies for the hypotension and call for assistance while taking action to treat the hypotension promptly.

Learners' response: Abort procedure, call for assistance (anesthesiology, rapid response team), check pulse, check response to stimulation, administer reversal agents, place supine and in Trendelenburg position, assess EKG

Trigger to move to next state: If reversal agents are administered, then go to **State Seven**; if no intervention, then go to **State Six**

State Name Six: **Cardiac arrest**

Patient data: Vital signs worsen and patient remains unresponsive, BP 50/28, HR 30, SpO₂ 70 percent. ST-segment elevation develops, followed by frequent ventricular extrasystoles and eventually pulseless ventricular tachycardia.

If ACLS is conducted appropriately, rhythm is restored but the patient will remain unresponsive.

Vital signs: BP 155/86, HR 105, SpO₂ 95%, EtCO₂ 50

What do you envision in this state? Learners will activate the emergency response team and begin ACLS resuscitation protocols

Learners' response: The GI attending or fellow M.D. will take command of the situation and begin directing the code. The technician will call for help from the clinic staff and retrieve the code cart. The moderate sedation nurse will control the airway using an Ambu bag and 100 percent oxygen. The circulating nurse will activate the emergency response team and administer fluids and drugs.

DEBRIEF DISCUSSION POINTS:

1. **Medical point:** Although the principal role of the moderate sedation team is to administer sedation, other medical conditions may occur that will require immediate attention (e.g. hypoglycemia, stroke or seizure)
2. **Practical point:** Activation of the back-up system in case of emergency (anesthesiology and rapid response team)
3. **Teamwork and communication point:** Communication with other clinical staff, delegation during emergency, eventual handover to ICU care team

State name 7: **Resolution**

Patient data: Vital signs improve but patient remains unresponsive, BP 95/50, HR 60, SpO₂ 92 percent, RR 12

What do you envision in this state? Learner will consider other causes for unresponsiveness after sedation: Neurologic and metabolic. The team will continue to monitor patient during the recovery period and discuss further work-up and appropriate disposition (ward vs. ICU).

Learners' response: Evaluate severity of episode, decide on disposition, discuss possible etiologies and need for immediate workup, including serum glucose level. Continue to monitor during transport to recovery area, conduct appropriate handover.

DEBRIEF DISCUSSION POINTS:

1. **Medical point:** Although the principal role of the moderate sedation team is to administer sedation, other medical conditions may occur that will require immediate attention (e.g. hypoglycemia, stroke or seizure)
2. **Practical point:** a) Airway support maneuvers; b) Activation of backup support systems
3. **Teamwork and communication point:** Decision-making process to continue versus abort case, importance of adequate handover to recovering personnel

State	Patient Status	Student Learning Outcomes or Actions Desired and Trigger to Move to Next State	
<p>1. Baseline</p>	<p>BP – 134/75 HR – 74 SpO2 – 97 percent RR – 18 Crackles on lung exam, awake and alert, cooperative but mildly anxious, IV already in place</p>	<p>• Learners’ actions:</p> <ul style="list-style-type: none"> • Appropriate pre-procedure assessment • ID and consent checks • Place monitors • Medical history • Time-out procedures 	<p>• Operator:</p> <ul style="list-style-type: none"> • Patient already in lateral position <p>Teaching points:</p> <ul style="list-style-type: none"> • Appropriate pre-procedure routine • Appropriate time-out procedure <p>Trigger: Time-out confirmation/ start sedation</p>
<p>2. Start of sedation</p>	<p>BP – 110/50 HR – 60 SpO2 – 91 percent RR – 6 EtCO2 – 50* Patient becomes sleepy, slurred speech</p>	<p>• Learners’ actions:</p> <ul style="list-style-type: none"> • Ramsay Scale of sedation • Recognition of respiratory effects of sedation medications 	<p>Operator:</p> <ul style="list-style-type: none"> • None <p>Teaching points:</p> <ul style="list-style-type: none"> • Recognition of respiratory effects of sedation medications <p>Trigger: Statement: “patient is ready,” “Ok to start” or similar...</p>

<p>3. Inadequate sedation</p>	<p>BP - 150/90 HR – 110 SpO2 – 92 percent RR – 12 EtCO2 – 40* Patient moans loudly, moves hands, uses profanity, struggles</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Demonstrate understanding of titration of medication to level of agitation • Leaving time for doses to achieve peak effect before proceeding, providing verbal reassurance and reorientation, voicing possibility that procedure may require anesthesiology support • Continuous monitoring of vital and clinical signs 	<p>• Operator:</p> <ul style="list-style-type: none"> • Adjust vital signs according to doses given <p>Teaching points:</p> <ul style="list-style-type: none"> • Understanding of titration of medication to level of agitation • Continuous monitoring of vital and clinical signs <p>Trigger: Administration of two doses of sedatives, or verbal concern raised by team that procedure may have to be aborted due to difficulty sedating compromised patient, (manual trigger if necessary)</p>
<p>4. Hypotension</p>	<p>BP - 86/40 HR – 90 SpO2 – 91 percent RR – 6 EtCO2 – 30* Patient becomes sedated, slowly</p>	<p>Learners' actions:</p> <ul style="list-style-type: none"> • Assess level of sedation • Administration of fluid bolus to treat mild hypotension • Response to stimulation assessed • Assess EKG • Consider calling for assistance (PACU, rapid response team) • Continued vigilance 	<p>Operator:</p> <ul style="list-style-type: none"> • Adjust vital signs according to doses given <p>Teaching points:</p> <ul style="list-style-type: none"> • Proper levels of sedation • Recognize relative hypotension and make a choice as to treatment (fluid bolus is acceptable) • Discussion concerning wisdom of proceeding is preferable • EKG will be examined • BP checked more frequently • Patient's response to stimulation assessed <p>Trigger: Fluid bolus administration or manual trigger</p>

<p>5. Hypotension and bradycardia</p>	<p>BP - 72/35 HR – 43 SpO2 – 89 percent RR – 8 EtCO2 – 30* Patient becomes quieter, although never completely quiescent</p>	<p>• Learners’ actions:</p> <ul style="list-style-type: none"> • Continued vigilance • Abort procedure • Consider calling for assistance (anesthesia, rapid response team) • Check pulse • Check response to stimulation • Administer reversal agents • Place supine and in Trendelenburg position if possible • Assess EKG 	<p>Operator:</p> <ul style="list-style-type: none"> • None <p>Teaching points:</p> <ul style="list-style-type: none"> • Recognize that the patient is in a pre-arrest state and that an intervention is mandatory • Consider alternative etiologies for the hypotension • Consult cognitive aids if available • Call for assistance • Take action to treat the hypotension as soon as possible. <p>Trigger: If reversal agents are administered, or procedure is aborted and assistance requested, go to State Seven; if neither, then go to State Six</p>
<p>6. Cardiac arrest</p>	<p>BP – 50/28 HR – 30 SpO2 – 70 percent RR – 0 EtCO2 – 10*</p>	<p>Learners’ response:</p> <ul style="list-style-type: none"> • Activation of rapid response team or code team • Begin ACLS resuscitation (sedation nurse providing airway support, endoscopist directing code until help arrives, administering fluids and drugs according to protocol 	<p>Operator:</p> <ul style="list-style-type: none"> • ST segment elevation develops, followed by frequent PVCs, and eventually pulseless VT (after a few minutes) • Patient remains unconscious throughout <p>Teaching points:</p> <ul style="list-style-type: none"> • Recognition of arrest state and need for emergent assistance • ACLS resuscitation protocols • Use of cognitive aids in critical events

			<ul style="list-style-type: none"> • Possible differential diagnosis of precipitating event <p>Trigger: If ACLS is conducted appropriately, rhythm is restored but patient will remain unresponsive; disposition should be discussed</p>
7. Abort procedure	BP - 95/50 HR – 60 SpO2 – 92 percent RR – 12	<p>Learners’ response:</p> <ul style="list-style-type: none"> • Evaluate severity of episode • Decide on disposition • Discuss possible etiologies and need for immediate workup • Transport • Handover 	<p>Operator:</p> <ul style="list-style-type: none"> • None <p>Teaching points:</p> <ul style="list-style-type: none"> • Learner will continue to monitor patient during recovery period and team will discuss appropriate disposition: <ul style="list-style-type: none"> ▪ Discharge to home vs floor vs ICU observation period; ▪ Appropriate follow up: medicine consult vs ICU consult • Differential diagnosis of near arrest

*These EtCO₂ figures are those that would be expected using a nasal cannula sampling device: Philips Smart-CapnoLinePlusO₂[®], (M2522A). Values using other sampling devices will vary.

NOTE:

The Ramsay Scale is referenced here as it has traditionally been the most widely used method for documenting depth of sedation. However, the Richmond Agitation Sedation Scale (RASS) is often preferred as it includes objectively measured variables and gradations on both ends of the spectrum from unresponsive to combative.