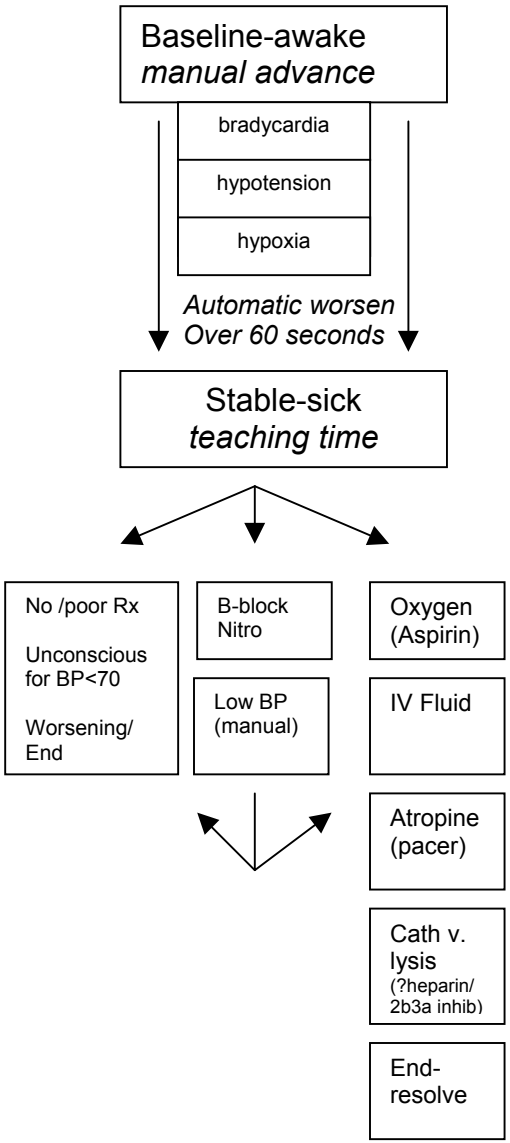
1. Inferior Myocardial Infarction -- ACLS

(Panel One)

Scenario Algorithm

(standard man awake)



(Panel two – may continue algorithm if necessary)

Learning Objectives

Level One:

1. Recognize the symptoms of a heart attack/myocardial infarction (MI)
2. Recognize that a heart attack and peptic ulcer disease or "indigestion" may share some of the same symptoms—and learn how to distinguish between the two by history, physical exam, and ancillary studies
3. Understand the differences between an anterior and inferior MI
4. Understand the need for immediate diagnosis and reperfusion for the acute MI victim

Level Two:

1. The role of oxygen and aspirin therapy in acute MI patients
2. The role of atropine for symptomatic bradycardia in inferior MI
3. The role of intravenous fluids in the hypotensive patient with suspected inferior/right ventricle infarct
4. The role of anticoagulants, thrombolytic therapy, and heart catheterization in the acute MI patient (and a history of peptic ulcer disease)
5. The contraindications of acute beta-blockade and nitrates in the hypotensive MI patient

Critical Actions:

1. Interview and exam
2. Vitals/monitor
3. Oxygen, IV fluids, (atropine)
4. EKG/recognize an inferior MI (CXR)
5. Give an aspirin (? heparin/2b3a inhibitor)
6. Need for pressor agent if persistent hypotension despite fluid
7. Plan for immediate reperfusion

Suggested Patients:

55 year-old male

(Panel three)

Scenario Background

Chief complaint:

"Chest pain, I think it's my ulcer acting up"

Past medical history:

- *Peptic ulcers*
- *Diabetes*

Drug allergies:

- *Penicillin*

Medications:

- *"those little blue pills"*

*Social/Family History & Review of Systems

- "longtime" smoker
- *brother w/ MI age 55*

(Panel four)

Scenario Scene

(History of Present illness)

Patient woke up with dull pressure in epigastrium, persistent for the past hour. Feels a little sweaty, nauseated, and lightheaded.

(Simulator-enabled findings):

Vital signs: *heart rate 36; blood pressure 90/50; respiratory rate increased; pulse ox 92%*

Heart: *bradycardic rate, regular rhythm, no murmur/rub/gallop*

Lungs: *scattered* ronchi

Neuro: *pt sounds anxious in conversation*

1. Inferior Myocardial Infarction -- ACLS

(Panel One)

Scenario States

1. **Baseline**

   (Automatic advance)

2. **Bradycardia**

   (Automatic advance)

3. **Hypotension**

   (Automatic advance)

4. **Hypoxia**

<u>STABLE-SICK LEVEL</u>

(auto advance if BP<70)

5. **Unconscious**

   (manual advance)

6. **Resolution**

(Panel two

Case advances automatically to "stable-sick" level, where patient continues to get worse, but there is some time for reflection and instruction (instructor may manually make worse or better at anytime to fit custom objectives). At this point intervention may be guided by the instructor, or initiated by the student. Student interventions may or may not "work" depending on the instructor's preference and/or the state of the model. If severe hypotension progresses, patient automatically becomes unconscious. Manual progression to resolution improves patient state, but without reperfusion, the awake patient still complains of severe chest pain.

(Panel three)

Equipment / Supplies Needed

NIBP—yes
Art Line—desired*
ECG monitor—yes
Temp—optional
SpO2—yes
EtCO2—optional
PA line—optional
CVP—optional
Anest Machine-optional
Pumps—optional

<u>Other</u>
Pacer/pads—desired
Defibrillator—desired
IV Pole/line—yes
Ambu-bag—yes
O2 mask/tank/line—yes
Nebulizer—optional
Intubat. Equip—desired
CXR/viewer—desired
EKG with inf. MI—yes

**Pre-existing ECG monitor hookup and "arterial line" tracing for continuous blood pressure monitoring is often helpful for instructional purposes—if more realism is desired, the student must ask for/hook up monitor on own and use NIBP cuff.*

(Panel four)

Instructor Support Notes

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The transmitted "voice" of the patient – simulator is critical to the exercise. Facilitators should reference the "chief complaint" & "scenario scene" to guide the patient's verbalization and response to student interview (should mimic an actual patient encounter). When the patient becomes unconscious in a scenario (i.e. eyes close) remember that patient will stop "speaking."

Students should elicit as much history as possible by interview with the "patient," otherwise the information is not provided. Student should perform an appropriate physical exam and the facilitator (or "patient") should verbalize physical findings that the student is seeking but are not enabled by the simulator (i.e. pain on palpation).

Ancillary studies (i.e. EKG, CXR, labs) and equipment (i.e. IV/O2) are not initially provided until the student asks for them. They may be simulated (i.e. verbalized) or actual.

Debriefing and instruction after the scenario (or during "stable-sick" state of algorithm) are critical (see "learning objectives"). Students/instructors may wish to view a videotape of the scenario afterward for instructional/debriefing purposes.

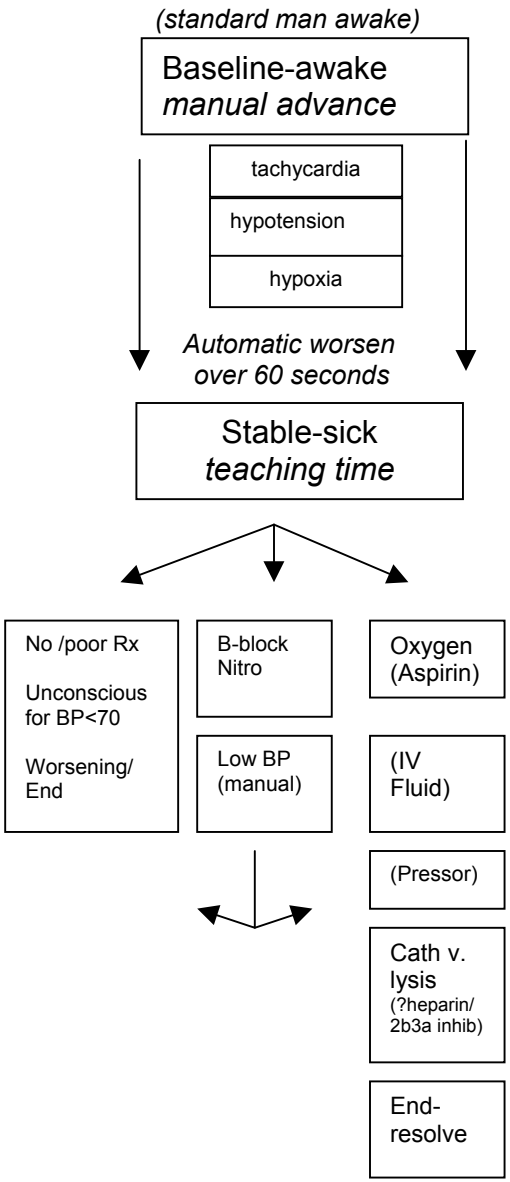
Case author: James A. Gordon, MD, MPA

*Presentation template adapted from Medical Education Technologies, Inc.

2. Anterior Myocardial Infarction -- ACLS

(Panel One)

Scenario Algorithm



(Panel two – may continue algorithm if necessary)

Learning Objectives

Level One:

1. Recognize the symptoms of a heart attack/myocardial infarction (MI)
2. Understand the differences between an anterior and inferior MI
3. Understand the need for immediate diagnosis and reperfusion for the acute MI, especially an anterior MI.

Level Two:

1. The role of oxygen and aspirin therapy in acute MI patients
2. The role of pressors/fluids in the anterior MI patient
3. The role of anticoagulants, thrombolytic therapy, and heart catheterization in the acute MI patient
4. The contraindications of acute beta-blockade and nitrates in the hypotensive MI patient

Critical Actions:

1. Interview and exam
2. Vitals/monitor
3. Oxygen, IV fluid (?CHF)
4. EKG/recognize an anterior MI (CXR)
5. Need for pressor agent if persistent hypotension/heart failure
6. Give an aspirin (?heparin/2b3a inhibitor)
7. Plan for immediate reperfusion

Suggested Patients:

65 year-old female

(Panel three)

Scenario Background

Chief complaint:

"Chest pain"

Past medical history:

- *Hypertension*

Drug allergies:

- *Penicillin*

Medications:

- *"those little red pills"*

*Social/Family History & Review of Systems

- *former smoker*
- *mild cough recently*

(Panel four)

Scenario Scene

(History of Present illness)

Patient noticed severe sharp pressure substernally, with radiation to left arm. Pain persistent for the past hour, onset at rest. Feels short of breath, lightheaded, sweaty.

(Simulator-enabled findings):

Vital signs: *heart rate 110; blood pressure 85/50; respiratory rate increased; pulse ox 93%*

Heart: *mild tachycardia, regular rhythm, +S3 heart sound*

Lungs: scattered rales, mildly dyspneic

Neuro: *pt sounds anxious in conversation*

2. Anterior Myocardial Infarction -- ACLS

(Panel One)

Scenario States

1. **Baseline**

   (automatic advance)

2. **Tachycardia**

   (automatic advance)

3. **Hypotension**

   (automatic advance)

4. **Hypoxia**

STABLE-SICK LEVEL

(auto advance if BP<70)

5. **Unconscious**

   (manual advance)

6. **Resolution**

(Panel two)

Case advances automatically to "stable-sick" level, where patient continues to get worse, but there is some time for reflection and instruction (instructor may manually make worse or better at anytime to fit custom objectives). At this point intervention may be guided by the instructor, or initiated by the student. Student interventions may or may not "work" depending on the instructor's preference and/or the state of the model. If severe hypotension progresses, patient automatically becomes unconscious. Manual progression to resolution improves patient state, but without reperfusion, the awake patient still complains of severe chest pain.

(Panel three)

Equipment / Supplies Needed

NIBP—yes
Art Line—desired*
ECG monitor—yes
Temp—optional
SpO2—yes
EtCO2—optional
PA line—optional
CVP—optional
Anest Machine-optional
Pumps—desired

Other
Pacer/pads--optional
Defibrillator—desired
IV Pole/line—yes
Ambu-bag—yes
O2 mask/tank/line—yes
Nebulizer—optional
Intubat. Equip—desired
CXR/viewer—desired
EKG with ant. MI—yes

**Pre-existing ECG monitor hookup and "arterial line" tracing for continuous blood pressure monitoring is often helpful for instructional purposes—if more realism is desired, the student must ask for/hook up monitor on own and use NIBP cuff.*

(Panel four)

Instructor Support Notes

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The transmitted "voice" of the patient –simulator is critical to the exercise. Facilitators should reference the "chief complaint" & "scenario scene" to guide the patient's verbalization and response to student interview (should mimic an actual patient encounter). When the patient becomes unconscious in a scenario (i.e. eyes close) remember that patient will stop "speaking."

Students should elicit as much history as possible by interview with the "patient," otherwise the information is not provided. Student should perform an appropriate physical exam and the facilitator (or "patient") should verbalize physical findings that the student is seeking but are not enabled by the simulator (i.e. pain on palpation).

Ancillary studies (i.e. EKG, CXR, labs) and equipment (i.e. IV/O2) are not initially provided until the student asks for them. They may be simulated (i.e. verbalized) or actual.

Debriefing and instruction after the scenario (or during "stable-sick" state of algorithm) are critical (see "learning objectives"). Students/instructors may wish to view a videotape of the scenario afterward for instructional/debriefing purposes.

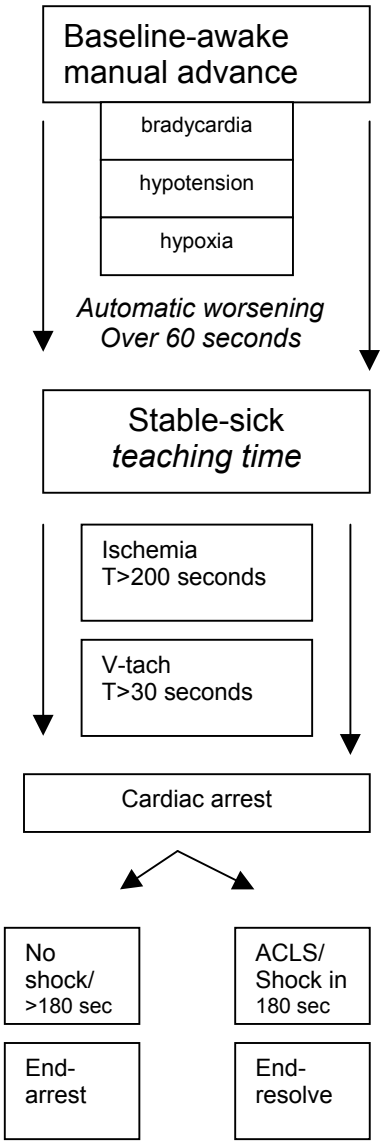
Case author: James A. Gordon, MD, MPA

3. Unstable Angina with Cardiac Arrest – ACLS

(Panel One)

Scenario Algorithm

(standard man awake)



(Panel two – may continue algorithm if necessary)

Learning Objectives

Level One:

1. Recognize the symptoms of unstable angina
2. Recognize malignant arrhythmia/cardiac arrest
3. Understand how an ischemia-induced arrhythmia can cause "sudden death"

Level Two:

1. The importance of oxygen therapy in the anginal patient.
2. The role of medical therapy in the stable anginal patient
3. The importance of immediate defibrillation in the pulseless VT/VF patient
4. The role of immediate/maintenance antiarrhythmic agents in VT/VF arrest patients

Critical Actions:

1. Interview and exam
2. Vitals/monitor
3. Oxygen, IV access
4. Obtain EKG (CXR)
5. Begin medical therapy for angina
6. Recognize a VT/VF cardiac arrest
7. CPR/rapid defibrillation upon arrest/diagnosis of pulseless VT/VF
8. Maintenance antiarrhythmic therapy after arrest/resuscitation.
9. Evaluation of need for further intervention post arrest (symptoms, repeat EKG, consultation)

Suggested Patients:

75 year-old male

(Panel three)

Scenario Background

Chief complaint:

"Chest pain"

Past medical history:

- *Hypertension*
- *Diabetes*

Drug allergies:

- *Penicillin*

Medications:

- *"I bunch, I don't know the names"*

*Social/Family History & Review of Systems

- *appendectomy 1 week ago*

(Panel four)

Scenario Scene

(History of Present illness)

Patient notes severe substernal chest pressure that comes and goes at rest over the past day. Pain has been persistent for the past hour. Feels a little sweaty and nauseated.

(Simulator-enabled findings):

Vital signs: *heart rate 90; blood pressure 140/90; respiratory rate normal; pulse ox 95%*

Heart: *regular rate and rhythm, no murmur/rub/gallop*

Lungs: *clear to auscultation*

Neuro: *pt sounds anxious in conversation*

3. Unstable Angina with Cardiac Arrest -- ACLS

(Panel One)

Scenario States

1. **Baseline**

   (automatic advance)

2. **Mild hypertension**

   (automatic advance)

3. **Mild hypoxia**

   (automatic advance)

STABLE-SICK LEVEL

4. **Ischemia**

   (auto advance after 200 sec)

5. **Ventricular tachycardia**

   (auto advance after 30 sec)

6. **Cardiac arrest**
   (auto advance to "late shock/arrest" if no defib at 200J in under 180 sec—to "resolution" if 200J under 180 sec)

7. **Late shock/arrest**

8. **Resolution**

(Panel two)

Case advances automatically to "stable-sick" level, where patient continues to get worse, but there is some time for reflection and instruction (instructor may manually make worse or better at anytime to fit custom objectives). After 200 seconds of "ischemia" the patient automatically progresses to symptomatic ventricular tachycardia (with pulse), regardless of student intervention. After 30 seconds of arrhythmia (regardless of intervention), patient will experience cardiac arrest and become unconscious. Resolution automatically proceeds if defibrillation at 200 J occurs in under 180 seconds, otherwise no recovery is programmed (ends at "late shock/arrest," although instructor can manually override).

(Panel three)

Equipment / Supplies Needed

NIBP—yes
Art Line—desired*
ECG monitor—yes
Temp—optional
SpO2—yes
EtCO2—desired
PA line—optional
CVP—optional
Anest Machine-optional
Pumps—optional

Other
Pacer—optional
Defibrillator—yes
IV Pole/line—yes
Ambu-bag—yes
O2 mask/tank/line—yes
Nebulizer—optional
Intubation equip—yes
CXR/viewer—desired
EKG w/ischemia—yes

**Pre-existing ECG monitor hookup and "arterial line" tracing for continuous blood pressure monitoring is often helpful for instructional purposes—if more realism is desired, the student must ask for/hook up monitor on own and use NIBP cuff.*

(Panel four)

Instructor Support Notes

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The transmitted "voice" of the patient –simulator is critical to the exercise. Facilitators should reference the "chief complaint" & "scenario scene" to guide the patient's verbalization and response to student interview (should mimic an actual patient encounter). When the patient becomes unconscious in a scenario (i.e. eyes close) remember that patient will stop "speaking."

Students should elicit as much history as possible by interview with the "patient," otherwise the information is not provided. Student should perform an appropriate physical exam and the facilitator (or "patient") should verbalize physical findings that the student is seeking but are not enabled by the simulator (i.e. pain on palpation).

Ancillary studies (i.e. EKG, CXR, labs) and equipment (i.e. IV/O2) are not initially provided until the student asks for them. They may be simulated (i.e. verbalized) or actual.

Debriefing and instruction after the scenario (or during "stable-sick" state of algorithm) are critical (see "learning objectives"). Students/instructors may wish to view a videotape of the scenario afterward for instructional/debriefing purposes.

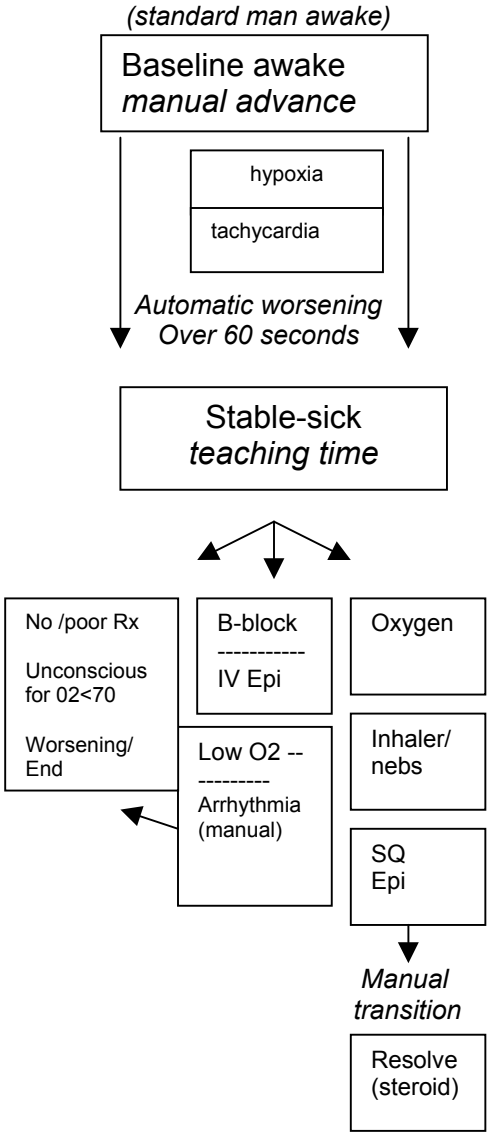
Case author: James A. Gordon, MD, MPA

*Presentation template adapted from Medical Education Technologies, Inc.

4. Severe Young Asthmatic -- ALS

(Panel One)

Scenario Algorithm



(Panel two – may continue algorithm if necessary)

Learning Objectives

Level One:

1. Recognize the symptoms of an acute asthma attack
2. The role of subcutaneous epinephrine as a rescue medication in the young asthmatic
3. Recognize/understand respiratory failure

Level Two:

1. The importance of immediate oxygen and bronchodilatory therapy in the acute asthmatic.
2. The role of other medical therapies in the failing asthmatic
3. The role of intubation in the failing asthmatic
4. The contraindication of beta-blockade in the acute asthmatic

Critical Actions:

1. Interview and exam
2. Vitals/monitor
3. Oxygen/inhalers-nebs, IV access (CXR/steroid)
4. Subcutaneous epinephrine (NOT IV) as initial rescue medication.

Suggested Patients:
25 year-old male

(Panel three)

Scenario Background

Chief complaint:
"short of breath""

Past medical history:

- *Asthma*

Drug allergies:

- *Penicillin*

Medications:

- *Occasional inhaler*

*Social/Family History & Review of Systems

- *Smoker*

(Panel four)

Scenario Scene

(History of Present illness)

Patient with sudden severe asthma attack

(Simulator-enabled findings):

Vital signs: *heart rate 126; blood pressure 145/90; respiratory rate 36; pulse ox 89%*

Heart: *tachycardic rate and regular rhythm, no murmur/rub/gallop*

Lungs: *diffuse bilateral wheezing, intercostal retraction*

Neuro: *very anxious, hard to speak in complete sentences, looks exhausted*

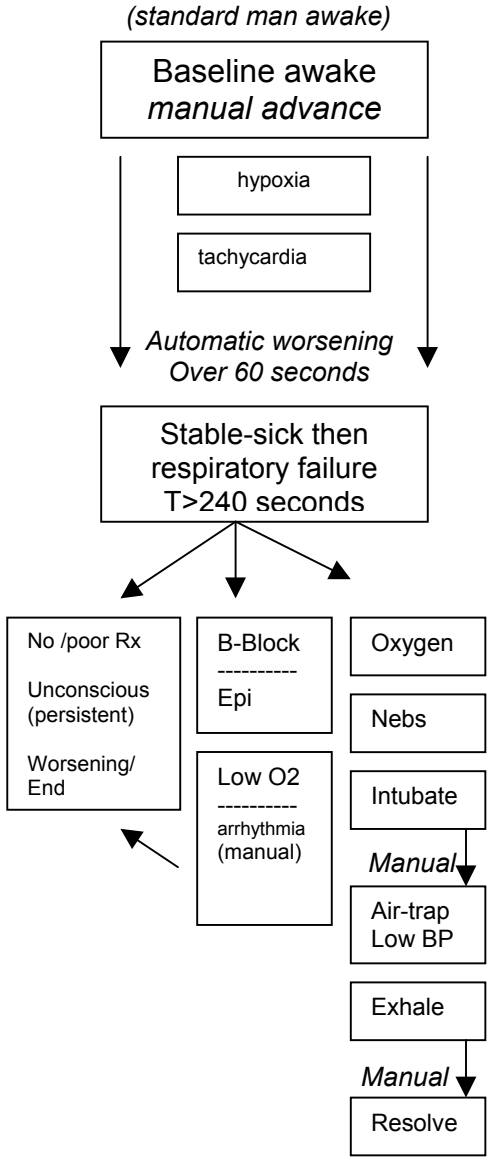
4. Severe Young Asthmatic -- ALS	*(Panel One)* **Scenario States** **1. Baseline** *(automatic advance)* **2. Hypoxia** *(automatic advance)* **3. Tachycardia** ***STABLE-SICK LEVEL*** *(auto advance to unconscious for pOx<70)* **4. Unconscious** *(manual advance to resolution if SQ epinephrine)* **5. Resolution**	*(Panel two)* *Case advances automatically to "stable-sick" level, where patient continues to get worse, but there is some time for reflection and instruction (instructor may manually make worse or better at anytime to fit custom objectives). At this point intervention may be guided by the instructor, or initiated by the student. Student interventions may or may not "work" depending on the instructor's preference and/or the state of the model. If severe hypoxia progresses, patient automatically becomes unconscious. Manual progression to resolution (after subcutaneous epinephrine) improves patient state.*	*(Panel three)* **Equipment / Supplies Needed** NIBP—yes Art Line—optional* ECG monitor—yes Temp—optional SpO2—yes EtCO2—optional PA line—no CVP—no Anest Machine-optional Pumps—no <u>Other</u> Pacer—no Defibrillator—no IV Pole/line—yes Ambu-bag—yes O2 mask/tank/line—yes Nebulizer—yes Intubation equip—yes CXR/viewer--desired EKG—optional TB syringe/subQ inj—yes **Pre-existing ECG monitor hookup and "arterial line" tracing for continuous blood pressure monitoring is often helpful for instructional purposes—if more realism is desired, the student must ask for/hook up monitor on own and use NIBP cuff.*	(Panel four) **Instructor Support Notes** **Note: this case represents a template/example for instructional purposes only. It is not an authoritative pathway or set of expert guidelines. Actual use of any case/scenario with trainees in the simulator should be supervised by an on-site medical expert to ensure accuracy and up-to-date conformance to applicable standards of care. Instructor will have to decide whether student-driven progression of the case produces the desired response, and may need to manually alter case programming/progression to provide the most appropriate instruction.* The transmitted "voice" of the patient – simulator is critical to the exercise. Facilitators should reference the "chief complaint" & "scenario scene" to guide the patient's verbalization and response to student interview (should mimic an actual patient encounter). When the patient becomes unconscious in a scenario (i.e. eyes close) remember that patient will stop "speaking." Students should elicit as much history as possible by interview with the "patient," otherwise the information is not provided. Student should perform an appropriate physical exam and the facilitator (or "patient") should verbalize physical findings that the student is seeking but are not enabled by the simulator (i.e. pain on palpation). Ancillary studies (i.e. EKG, CXR, labs) and equipment (i.e. IV/O2) are not initially provided until the student asks for them. They may be simulated (i.e. verbalized) or actual. Debriefing and instruction after the scenario (or during "stable-sick" state of algorithm) are critical (see "learning objectives"). Students/instructors may wish to view a videotape of the scenario afterward for instructional/debriefing purposes. ***Case author: James A. Gordon, MD, MPA***

*Presentation template adapted from Medical Education Technologies, Inc.

5. COPD Exacerbation with Respiratory Failure – ALS

(Panel One)

Scenario Algorithm



(Panel two – may continue algorithm if necessary)

Learning Objectives

Level One:

1. Recognize the symptoms of a COPD flare
2. Recognize/understand respiratory failure and the need for respiratory assistance/ intubation in the failing COPD patient
3. The complications of intubation/positive pressure ventilation in the failed COPD/asthma patient

Level Two:

1. The role of oxygen and bronchodilatory therapy in the acutely decompensated COPD patient
2. The role of other medical therapies in the management of COPD
3. The contraindication of beta-blockade in the acute asthmatic/COPD patient
4. The relative contraindication of epinephrine in an older asthma/COPD patient, especially with a history of coronary artery disease
5. The role of air trapping in the intubated asthmatic/COPD patient (i.e. increased intrathoracic pressure leading to decreased venous return to the heart and hypotension—need for increased expiratory time, decreased respiratory rate)

Critical Actions:

1. Interview and exam
2. Vitals/monitor (?baseline hypoxia)
3. Oxygen/nebulizer, IV access (steroid)
4. Defer epinephrine (age/heart disease)
5. Intubate failed patient, check chest xray
6. Adequate expiratory time to avoid/reverse hypotension/air trapping.

Suggested Patients:

75 year-old female

(Panel three)

Scenario Background

Chief complaint:

"short of breath""

Past medical history:

- *Emphysema*
- *Prior heart attack*

Drug allergies:

- *Penicillin*

Medications:

- *Home oxygen*

*Social/Family History & Review of Systems

- *Smoker*

(Panel four)

Scenario Scene

(History of Present illness)

Patient with worse breathing over past few days

(Simulator-enabled findings):

Vital signs: *heart rate 130; blood pressure 145/90; respiratory rate 36; Pulse ox 89%*

Heart: *tachycardic rate and regular rhythm, no murmur/rub/gallop*

Lungs: *diffuse bilateral wheezing, intercostal retraction*

Neuro: *very anxious, hard to speak in complete sentences, looks exhausted*

5. COPD Exacerbation with Respiratory Failure -- ALS

(Panel One)

Scenario States

1. **Baseline**

   (automatic advance)

2. **Hypoxia**

   (automatic advance)

3. **Tachycardia**

STABLE-SICK LEVEL

(automatic advance for T>240 sec or pox<70 or BP<70)

4. **Failure**

(manual advance if want to demonstrate air – trap/hypotens after intubation if not adequate expiratory time)

5. **Airtrap/Hypotension**

(manual advance for resolution)

6. **Resolution**

(Panel two)

Case advances automatically to "stable-sick" level, where patient continues to get worse, but there is some time for reflection and instruction (instructor may manually make worse or better at anytime to fit custom objectives). After 240 seconds (or sooner if severe hypoxia or hypotension) patient automatically becomes unconscious, regardless of student intervention. Manual advance to "airtrap/hypotension" is designed to demonstrate hypotension that would accompany airtrapping after intubation if not adequate expiratory time on ventilation (but may be skipped based on student performance and/or instructor preference). Manual progression to resolution improves patient state (if airtrapping/hypotension pathway, resolution would occur after patient is allowed sufficient expiratory time).

(Panel three)

Equipment / Supplies Needed

NIBP—yes
Art Line—desired*
ECG monitor—yes
Temp—optional
SpO2—yes
EtCO2—yes
PA line—no
CVP—optional
Anest Machine-optional
Pumps—optional

<u>Other</u>
Pacer—no
Defibrillator—desired
IV Pole/line—yes
Ambu-bag—yes
O2 mask/tank/line—yes
Nebulizer—yes
Intubation equip—yes
CXR/viewer—desired
EKG—desired
TB syringe/subQ inj—optional

**Pre-existing ECG monitor hookup and "arterial line" tracing for continuous blood pressure monitoring is often helpful for instructional purposes—if more realism is desired, the student must ask for/hook up monitor on own and use NIBP cuff.*

(Panel four)

Instructor Support Notes

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The transmitted "voice" of the patient –simulator is critical to the exercise. Facilitators should reference the "chief complaint" & "scenario scene" to guide the patient's verbalization and response to student interview (should mimic an actual patient encounter). When the patient becomes unconscious in a scenario (i.e. eyes close) remember that patient will stop "speaking."

Students should elicit as much history as possible by interview with the "patient," otherwise the information is not provided. Student should perform an appropriate physical exam and the facilitator (or "patient") should verbalize physical findings that the student is seeking but are not enabled by the simulator (i.e. pain on palpation).

Ancillary studies (i.e. EKG, CXR, labs) and equipment (i.e. IV/O2) are not initially provided until the student asks for them. They may be simulated (i.e. verbalized) or actual.

Debriefing and instruction after the scenario (or during "stable-sick" state of algorithm) are critical (see "learning objectives"). Students/instructors may wish to view a videotape of the scenario afterward for instructional/debriefing purposes.

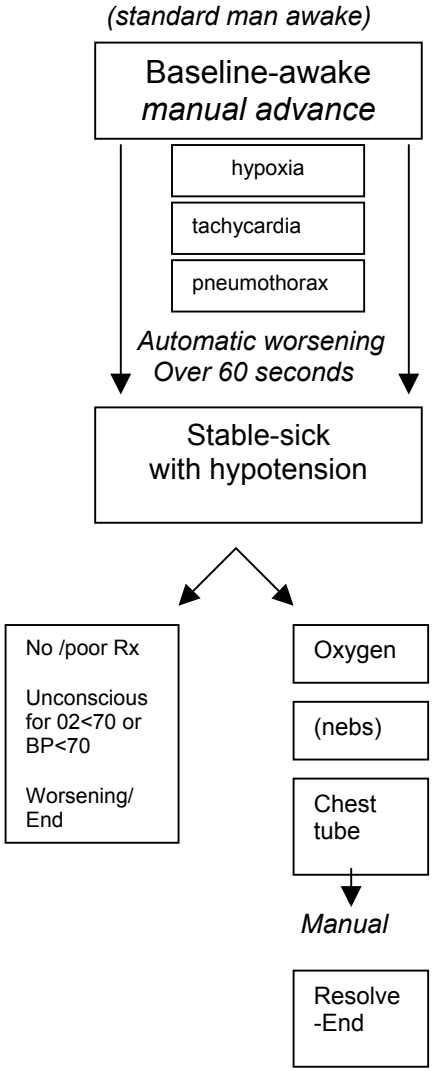
Case author: James A. Gordon, MD, MPA

*Presentation template adapted from Medical Education Technologies, Inc.

6. Asthmatic with Pneumothorax -- ALS

(Panel One)

Scenario Algorithm



(Panel two – may continue algorithm if necessary)

Learning Objectives

Level One:

1. Recognize the symptoms of a pneumothorax
2. Understand the hemodynamic effects of a tension pneumothorax
3. Recognize/understand the need for immediate chest decompression in an unstable patient with a tension pneumothorax

Level Two:

1. Learn the correct placement of a needle and/or tube thoracostomy
2. Understand the predisposing factors for pneumothorax in this patient (asthma, recent positive pressure ventilation)

.

Critical Actions:

1. Interview and exam
2. Vitals (monitor)
3. Oxygen (IV access)
4. (Consider inhalers)
5. (Check chest xray if time permits)
6. Place needle or tube thoracostomy

Suggested Patients:

45 year old female

(Panel three)

Scenario Background

Chief complaint:

"short of breath"

Past medical history:

- *Asthma*

Drug allergies:

- *None*

Medications:

- *Ran out of asthma medications*

*Social/Family History & Review of Systems

- *smoker*

(Panel four)

Scenario Scene

(History of Present illness)

Had laporoscopic procedure this morning under general anaesthesia. Reports right chest pain and shortness of breath since returning home from the outpatient surgical clinic.

(Simulator-enabled findings):

Vital signs: *heart rate 120; blood pressure 90/60; respiratory rate 36; pulse ox 89%*

Heart: *tachycardic rate and regular rhythm, no murmur/rub/gallop*

Lungs: *diffuse wheezing, intercostal retraction, decreased breath sounds on the right*

Neuro: *very anxious, hard to speak in complete sentences, looks exhausted*

6. Asthmatic with Pneumothorax -- ALS

(Panel One)

Scenario States

1. **Baseline**

   (automatic advance)

2. **Hypoxia**

   (automatic advance)

3. **Tachycardia**

   (automatic advance)

4. **Pneumothorax**

STABLE-SICK LEVEL

(automatic advance to unconscious if BP<70 or pOx<70)

5. **Unconscious**

   (Manual advance to resolution)

6. **Resolution**

(Panel two)

Case advances automatically to "stable-sick" level, where patient continues to get worse, but there is some time for reflection and instruction (instructor may manually make worse or better at anytime to fit custom objectives). At this point intervention may be guided by the instructor, or initiated by the student. If severe hypoxia progresses, patient automatically becomes unconscious. Manual progression to resolution (after decompression of pneumothorax) improves patient state.

(Panel three)

Equipment / Supplies Needed

NIBP—yes
Art Line—desired*
ECG monitor—yes
Temp—optional
SpO2—yes
EtCO2—optional
PA line—no
CVP—optional
Anest Machine-optional
Pumps—optional

Other
Pacer—no
Defibrillator—yes
IV Pole/line—yes
Ambu-bag—yes
O2 mask/tank/line—yes
Nebulizer—yes
Intubation equip—yes
CXR w/PTX—yes
EKG—desired
TB syringe/SQ inj—yes
Chest tube—yes
Needle for PTX decompress—yes

**Pre-existing ECG monitor hookup and "arterial line" tracing for continuous blood pressure monitoring is often helpful for instructional purposes—if more realism is desired, the student must ask for/hook up monitor on own and use NIBP cuff.*

(Panel four)

Instructor Support Notes

**Note: this case represents a template/example for instructional purposes only. It is not an authoritative pathway or set of expert guidelines. Actual use of any case/scenario with trainees in the simulator should be supervised by an on-site medical expert to ensure accuracy and up-to-date conformance to applicable standards of care. Instructor will have to decide whether student-driven progression of the case produces the desired response, and may need to manually alter case programming/progression to provide the most appropriate instruction.*

The transmitted "voice" of the patient –simulator is critical to the exercise. Facilitators should reference the "chief complaint" & "scenario scene" to guide the patient's verbalization and response to student interview (should mimic an actual patient encounter). When the patient becomes unconscious in a scenario (i.e. eyes close) remember that patient will stop "speaking."

Students should elicit as much history as possible by interview with the "patient," otherwise the information is not provided. Student should perform an appropriate physical exam and the facilitator (or "patient") should verbalize physical findings that the student is seeking but are not enabled by the simulator (i.e. pain on palpation).

Ancillary studies (i.e. EKG, CXR, labs) and equipment (i.e. IV/O2) are not initially provided until the student asks for them. They may be simulated (i.e. verbalized) or actual.

Debriefing and instruction after the scenario (or during "stable-sick" state of algorithm) are critical (see "learning objectives"). Students/instructors may wish to view a videotape of the scenario afterward for instructional/debriefing purposes.

Case author: James A. Gordon, MD, MPA