

Simulation Interest Group Scenario Template

Stable Wide Complex tachycardia that becomes unstable

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Simulation Interest Group Scenario Template

I. **Title:** Stable Wide Complex tachycardia that becomes unstable

II. **Target Audience:** senior medical students, residents

3. Learning Objectives or Assessment Objectives

A. Primary

1. Demonstrate rapid primary survey assessment to detect patient's arrhythmia and initiate emergency interventions including antidysrhythmics.
2. Demonstrate focused history and physical exam to assess and recognize the initial stability of the patient.
3. Recognize clinical deterioration through patient reassessment and monitoring of vital signs in a high risk patient.
4. React in a timely and appropriate fashion in the management of an unstable tachycardia, including cardioversion and use of antidysrhythmics.
5. Demonstrate clinical judgment in attaining appropriate disposition of a patient with an arrhythmia.

B. Secondary

1. Demonstrate the ability to read a cardiac monitor and electrocardiogram, distinguishing a wide-complex tachycardia.
2. Know the appropriate antidysrhythmic agents in the treatment of wide-complex tachycardias.
3. Understand the difference between synchronized cardioversion and defibrillation.
4. Understand the need for pretreatment of an awake patient with appropriate sedation or pain medication prior to cardioversion.
5. Demonstrate ability to give a concise and accurate report to a consultant.
6. Know the standard ACLS algorithms for tachycardias and cardiopulmonary arrest.
7. Understand the need for close monitoring and ongoing therapeutics in a high risk patient.

C. Critical actions checklist

1. Recognize patient's initial tachycardia and order an IV, oxygen and cardiac monitor.
2. Obtain electrocardiogram and accurately interpret rhythm.
3. Initiate appropriate antidysrhythmic treatment for rhythm.
4. Early detection of patient destabilization.
5. Rapid procession to electrical, synchronized cardioversion in an unstable patient.
6. Complete a focused reassessment following treatment of the unstable patient.

7. Initiation of a maintenance antidysrhythmics following patient restabilization.
8. Frequent reassessment of vital signs particularly after interventions.

4. Environment

- A. Lab Set Up – ED (in lab or in real ED)
- B. Manikin Set
 1. Laerdal SimMan
 2. Life-Pak or equivalent resuscitation device
 3. Standard “crash cart” or ACLS drugs
 - a. Amiodarone
 - i. IV bolus
 - ii. IV drip
 - b. Lidocaine
 - i. IV bolus
 - ii. IV drip
 - c. Procainamide, IV
 - d. Epinephrine, IV
 - e. Atropine, IV
 - f. Vasopressin, IV
 - g. Sodium bicarbonate, IV
- C. Props (basic airway and code blue cart is assumed)
 1. ECGs
 - a. Wide complex tachycardia
 - b. Sinus tachycardia with unifocal PVCs
 - c. Normal sinus rhythm (old ECG)
 2. X-rays
 - a. Portable chest x-ray, mild cardiomegaly
- D. Distracters
 - a. Monitor alarms

5. Actors

- A. Roles – nurse, nurse’s aide, consultant
 1. Nurse – played by another trainee or faculty member.
He/she will perform ordered nursing tasks correctly
 2. Nurse’s aide – played by another trainee or faculty member.
He/she will perform ordered nurse’s aide tasks correctly
 3. Consultant -- played by a faculty member.
He/she will be available by phone only once patient stabilized
Will make suggestions regarding patient care

VI. Case Narrative

- A. Scenario Background Given to Participants (triage report provided)
 1. 44y/o mildly obese WM cc lightheadedness and palpitations
 - a. Initial vitals

- i. BP: 110/75
- ii. HR: 150
- iii. RR: 14
- iv. SaO2: 98%
- v. AAO, speaking full sentences
- b. No other history obtained, pt transported to treatment area

B. Scenario conditions initially

1. History patient gives: if asked
Glenn Brown 44y/o male sudden onset of “feeling weird” 2hrs prior to arrival just after coming home from work. Tried to go to sleep but couldn’t. Not dizzy, just weak feeling. Heart racing. No other personal history.
ROS: +lightheadedness, palpitations, mild nausea, otherwise –
PMH: possible HTN, “I don’t go to the doctor”
SH: ½ ppd smoker, weekend EtOH, marijuana in college, and works 3rd shift as an air traffic controller
FH: dad with “heart problems,” older brother with HTN, high cholesterol
2. Patients initial exam
 - a. Vitals unchanged, uncomfortable
 - b. Regular tachycardia
 - c. Thready pulses
 - d. Light diaphoresis
 - e. Otherwise normal exam
3. Patients physiology
 - a. Monitor
 - i. Wide complex tachycardia (ventricular tachycardia)
 - b. ECG
 - i. Confirms ventricular tachycardia
 - c. Laboratories
 - i. CBC, BMP, BNP, Cardiacs, Coags, Accucheck all normal
 - ii. All others not relevant

C. Scenario branch points

1. Appropriate diagnosis and initiation of treatment of stable rhythm
 - a. No response to antidysrhythmic initially
 - i. Unstable rhythm, pt deterioration triggered
 - b. Elective cardioversion
 - i. Ablates initially, then rhythm returns
 - ii. Patient deteriorates into unstable rhythm
 - c. Failure to synchronize cardioversion
 - i. Triggers ventricular fibrillation
 - ii. Ventricular fibrillation defibrillates to unstable rhythm, ventricular tachycardia with pulse
 - iii. Failure to treat timely triggers refractory asystole
 - d. Inappropriate antidysrhythmic

- i. Triggers ventricular fibrillation
 - ii. Ventricular fibrillation defibrillates to unstable rhythm, ventricular tachycardia with pulse
 - iii. Failure to treat timely triggers refractory asystole
 - 2. Failure to diagnose and treat stable rhythm
 - a. Unstable rhythm, pt deterioration triggered
 - 3. Appropriate diagnosis and initiation of treatment of unstable rhythm
 - a. Cardioversion
 - i. Failure to synchronize triggers ventricular fibrillation
 - ii. Ventricular fibrillation defibrillates to unstable rhythm, ventricular tachycardia with pulse
 - iii. Failure to treat timely triggers refractory asystole
 - b. Stabilization
 - i. Sinus tachycardia with PVCs
 - ii. Vitals and condition stable
 - c. Begin maintenance antidysrhythmics
 - 4. Failure to treat unstable arrhythmia
 - a. Triggers ventricular fibrillation
 - i. Failure to treat timely triggers refractory asystole
 - 5. Failure to maintain pt on antidysrhythmics
 - a. Unstable rhythm triggered
 - b. Consultant questions on use of antidysrhythmic drip
 - 6. Disposition
 - a. Contact appropriate consultant
 - i. Report to consultant
 - ii. Indirect teaching via consultant questioning
 - b. Request monitored ICU placement
 - i. Pt on drip medication
 - ii. Pt taken to EP lab, focus ablated
 - iii. AICD placed

VII. Instructors Notes

- A. All actors will perform tasks within their skill sets if asked. They will not make suggestions unless asked by the trainee.
- B. Simulator limitation
The simulator only recognizes electricity but cannot differentiate a synchronized cardioversion versus defibrillation. With “shock,” brief asystole will be triggered and the operator will indicate if “shock” was synchronized or not, triggering different pathways.
- C. Scenario programming (attachment 1)
 - 1. Wrong dose means that student treats rhythm as SVT with aberrancy (e.g. Adenosine, Calcium Channel Blocker or Beta Blocker)
- D. Optimal management path
IV/02/ monitor and quick assessment of patient condition. Ordering ECG, laboratories, and x-ray. Recognition of stable patient and wide rhythm on

ECG. Initiation of chemical cardioversion with antidysrhythmic. Rhythm initially improves then patient destabilizes. Electric cardioversion of unstable patient. Initiation of antidysrhythmic drip and appropriate consultation. Disposition of the stabilized patient of drip medication to monitored ICU setting.

1. Potential complication paths and error paths
 - No antidysrhythmic triggers unstable rhythm
 - Wrong antidysrhythmic triggers ventricular fibrillation
 - Failure to “sync” triggers ventricular fibrillation
 - Failure to defibrillate ventricular fibrillation triggers death
 - Following stabilization, not initiating antidysrhythmic drip triggers unstable rhythm
2. Program debugging

Since trainees may arrive in different frames of the simulation by a means not anticipated, the trends built into the program may not represent the physiologic condition that you are trying to simulate. Limits can be incorporated into the actions to correct this.

8. Debriefing Plan

- A. Method of debriefing
 - Group debriefing is recommended. The support team will likely be made up of other trainees. The teaching points and review of events are best accomplished with all team members present.
 - Video of simulation will be available to review simulation events and trainee performance. Focus areas of interest include team management, communication, multitasking and resource utilization.
- B. Actual debriefing materials
 - PowerPoint slides to be used in formal slide presentation or as a script for an onsite debriefing.
 - Explanation of origin of this patient’s dysrhythmia.
 - Explain possible etiologies of this dysrhythmia.
 - Explain appropriate approach to the stable and unstable patient with tachydysrhythmia.
- C. Rules for the debriefing
 - Feedback will be factual, focused on performance rather than individuals. Issues discussed remain confined to the simulation lab unless the trainees were informed and consented prior to simulation to have results shared with an interested third party.
- D. Questions to facilitate the debriefing
 - Solicit trainee’s perception of how they did, discussing specific performance issues. Review the key teaching points outlined in the slides.

9. Pilot Testing and Revisions

- A. Numbers of participants

- Initial pilot testing was accomplished by running the simulation several times without the manikin. It was then tested using a faculty member and emergency medicine resident, both unfamiliar with the case, in the role as trainee.
- B. Performance expectations, anticipated management mistakes
 - The medical student or resident will be able to recognize tachycardia and interpret the electrocardiogram correctly. They will initiate appropriate medical management of the patient and reassess the patient with detection of instability. They will ensure to synchronize the defibrillator when delivering electrical energy to the patient. They will contact the appropriate consultant and provide accurate and concise information in achieving a disposition for the patient.
- C. Evaluation form for participants
 - Attachment 2.

X. Authors and their affiliations

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Attachment 1

tachycardias case.sce page 1 of 2

Patient:
Monitor:

Initial State
Ventricular Tachycardia (VT):
168 bpm, Muscular

Airway
Trismus: Off
Tongue Edema: Normal
Pharyngeal: Off
Decr. CRM: Off
Laryngospasm: Off
L Pneumothorax: Normal
R Pneumothorax: Normal
L Lung Resistance: Normal
R Lung Resistance: Normal
Stomach Distention: Disabled

Monitor Controls
SpO2 = 98
etCO2 = 34 mmHg
Tblood = 37.2 °C
Respiration Rate: 12 CO2 Exhalation: Off
Blood Pressure: 111/74
Vocal Sound: 'I feel really bad' Rep: 1
Pulse Strength
Radial/Brachial Pulse: Weak
Central Pulses: Normal
Left Pedal Pulse: Weak
Right Pedal Pulse: Weak

Oxygen	IVLine	Order chest x-ray	Amiodarone	1 shocks	FT=5:00	Wrong drug
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Frame1 Frame6 Frame1 Frame2

Frame1
Start Trend: unstable trend (Start: 0 min)
Vocal Sound: 'Moan' Rep: 1
Pulse Strength
Central Pulses: Weak

1 shocks	Pulse check	FT=3:00
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Frame6(2) Frame2

Frame2
Ventricular Fibrillation (VF): 0 bpm
Monitor Controls
SpO2 = 92
Blood Pressure: 0/0
Stop All Trends

1 shocks	FT=1:00	Volume Infusion
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Frame1 Frame4

Frame3
Sinus Rhythm: 98 bpm, Unifocal PVC:16
Blood Pressure: 116/78
Stop All Trends
Vocal Sound: 'I feel better now' Rep: 1
Pulse Strength
Radial/Brachial Pulse: Normal
Central Pulses: Normal
Left Pedal Pulse: Normal
Right Pedal Pulse: Normal

Amiodarone	Consult Cardiolo	FT=2:00
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Frame5 Frame1

Frame4
Idiovent.: 8 bpm
Monitor Controls
SpO2 = 36
Comment:
Pt deceased. END OF CASE

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Frame5		
Comment: END OF CASE		
admit ICU		

Frame7	
Ventricular Tachycardia (VT): 176 bpm	
Monitor Controls	
SpO2 = 96	
Respiration Rate: 12	
Blood Pressure: 102/68	
Amiodarone	FT=2:00
Frame1	Frame1

Frame6		
Asystole: 0 bpm		
Comment: Simulator does not differentiate synchronize vs not synchronize electrical shock. Once pt. is shock will advance to this frame and the operator will have to indicate manually if electricity delivered was synchronize or not. Time elapse between actual electrical delivery and manual indication of what kind, should be 3-5 seconds.		
Sync cardioversion	Defibrillation	EKG
Frame7	Frame2	

Frame6(2)		
Asystole: 0 bpm		
Comment: Simulator does not differentiate synchronize vs not synchronize electrical shock. Once pt. is shock will advance to this frame and the operator will have to indicate manually if electricity delivered was synchronize or not. Time elapse between actual electrical delivery and manual indication of what kind, should be 3-5 seconds.		
Sync cardioversion	Defibrillation	Monitor
Frame3	Frame2	

Attachment 2

Sim Title: Tachycardia that becomes unstable

Date:

Trainee:

Instructor:

During Simulation	NI	M E	A E	N/ A	Categor y
1. Introduces self and efficiently establishes a respectful and effective communication with patient.					ICS, PR
2. Gathers essential and accurate information from patient					PC, SBP
3. Evaluates the airway and presenting vital signs; listens to the heart and lungs.					PC
4. Recognize patient dysrhythmia, order ECG and initiate early interventions. Including early placement of electrical pads and initiation of medical cardioversion.					MK
5. Competently performs ACLS algorithm for Wide complex tachycardias and CPR if required					MK, PC
6. Communicates clearly/concisely/professionally with staff regarding medications, preparation for electrical cardioversion. Communicate safety steps during execution of electrical cardioversion and indicate if cardioversion is synchronize or not					ICS, PR
7. Anticipates possibility of failure to respond to pharmaceutical cardioversion and prepares for electrical cardioversion					ICS,SBP,PR
8. Clinical charting is timely, legible, and succinct, and reflects ED course and decision-making.					PC, PR
9. Demonstrate competency in the reading of ECGs					SBP
10. Can handles distractions while maintaining patient care priorities					SBP
11. Reevaluates patient after starting O2/IV/Monitor and pharmacologic cardioversion; following electrical cardioversion; or when VS start to deteriorate after initial stabilization					PC
12. Documents reassessment and response to therapeutic intervention.					PC
13. Presents the patient clearly and concisely.					MK, PC
14. Carries out appropriate/admission/transfer plan, including notification of accepting MD as indicated					PC, SBP

PC MK ICS PR

During Debriefing				
15. Makes informed decisions regarding method of cardioversion using patient information and preferences, scientific evidence and clinical judgment				PC
16. Understands indications and contraindications of a therapy or procedure.				MK
17. Explains an appropriate differential, plan, response, and disposition				PC, MK
18. Can explain the pathologic basis for management				MK

Sum	PC	MK	ICS	PR
Average	0	0	0	0
	###	###	###	####

Patient Care Score (Average) = ###
 Medical Knowledge Score (Average) = ###
 Interpersonal Communication Skills Score (Average) = ###
 Professionalism Score (Average) = ###
 System-Based Practice (Average) = ###