



AN OSF HEALTHCARE  
AND UNIVERSITY OF ILLINOIS  
COLLEGE OF MEDICINE AT PEORIA  
COLLABORATION

## PART TWO – SESSION MATERIALS

Session Title: EM – STEMI with VT

Please indicate the type of session by checking the appropriate box:

- Case Scenario
- Skills (Procedure) Station
- Small Group Discussion
- Computer-Based Learning
- Simulation Enhanced Didactic

Original Session Date:

Version: 1.0

Revision Date:

Curriculum Title: Emergency Medicine Resident  
Simulations

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Dept/Institution: [Click here to enter text.](#)

## 2.1 SESSION SNAPSHOT

### **Intended Learner Group(s):**

EM1 Residents  
EM Nurses

### **Learning Objectives:**

- A. Primary
  - 1. Evaluates patient for life-threatening causes for chest pain
  - 2. Identifies STEMI on EKG
  - 3. Manages STEMI according to current guidelines in the setting of a catheterization hospital
  - 4. Recognizes VT arrhythmia and can differentiate between stable and unstable VT
  - 5. Manages VT and VF arrest according to current ACLS guidelines

- B. Secondary

- 1. Establishes IV access, monitoring
- 2. Identifies patient risk factors for cardiac disease
- 3. Keeps patient informed throughout the case using layperson's language
- 4. Performs CPR according to current guidelines.
- 5. Uses call-out for orders and ensures checkback communications from nursing staff

### **Session Description:**

This is a case scenario of a patient presenting to the ED with STEMI who subsequently progresses through stable and unstable ventricular tachycardia. Pt requires cardioversion, antiarrhythmic therapy and activation of cardiac cath lab to stabilize.

## 2.2 SESSION EQUIPMENT (P.1)

Please indicate all equipment required for this educational session. This includes any medical or educational supplies or equipment.

<b>MANIKIN - Adult</b>	<b>MANIKIN - Peds</b>
<input checked="" type="checkbox"/> Laerdal SimMan	<input type="checkbox"/> MegaCode Kid

<input type="checkbox"/> SimMan Essential	<input type="checkbox"/> SimJunior
<input type="checkbox"/> SimMan 3G	<input type="checkbox"/> SimBaby
<input type="checkbox"/> SimMom	<input type="checkbox"/> SimNewB
<input type="checkbox"/> MegaCode Kelly	

<b>JUMP EQUIPMENT (check all that apply)</b>	
<input type="checkbox"/> Pediatric Crash Cart	<input type="checkbox"/> Adult Patient Bed
<input checked="" type="checkbox"/> Adult Crash Cart	<input type="checkbox"/> Isolette
<input checked="" type="checkbox"/> Lifepack 20	<input type="checkbox"/> Giraffe Bed/Infant Warmer
<input checked="" type="checkbox"/> Gurney/Stretcher	<input type="checkbox"/> Pediatric Crib

**Note:** The above lists include equipment available from Jump.

If any other items are needed for this session, please list them here and note the source.

If you would like Jump to provide disposable supplies, please provide Peoplesoft number and allow two weeks for delivery.

<b>ITEM</b>	<b>SOURCE</b>	<b>PEOPLESOFT NUMBER</b>	<b>QUANTITY</b>
ED RSI box	ED Educators	N/A	1
Amiodarone drip (50mL IV bag with label)	Click here to enter text.	Click here to enter text.	1
Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.

## 2.3 SESSION ENVIRONMENT

<b>SIMULATION VENUES</b>	
<input type="checkbox"/> Anatomical Skills Lab	<input checked="" type="checkbox"/> Virtual ICU
<input type="checkbox"/> Innovation Lab	<input type="checkbox"/> Virtual OR/Trauma Bay
<input type="checkbox"/> Regional Transport Center	<input type="checkbox"/> Virtual Patient Unit
<input type="checkbox"/> Studio Apartment	<input type="checkbox"/> Virtual Reality (Surgical Skills) Lab
<input type="checkbox"/> Skills Lab	<input type="checkbox"/> Workstation & Med Room
<b>DEBRIEFING VENUES</b>	
<input type="checkbox"/> Briefing Theater	<input checked="" type="checkbox"/> Debriefing Room
<b>CONFERENCE CENTER</b>	
<input type="checkbox"/> Auditorium	<input type="checkbox"/> Lecture Hall
<input type="checkbox"/> Board Room	<input type="checkbox"/> Pre-Function Space
<input type="checkbox"/> Conference Room	

**In-Situ (list clinical space):** Click here to enter text.

**Off-Site (please describe):** Click here to enter text.

### **Room and Materials Setup**

Describe in text form or insert diagram or photo here. Please note any resources to be provided from outside of Jump.

Room to be set up as ED room, with 2x2 supply cart at bedside, crash cart in hallway. Pt should be on monitor at the start of the case.

Amiodarone drip should be available if ordered from pharmacy.

## 2.4 SCENARIO SETUP

### **Documents Included**

<input checked="" type="checkbox"/> Scenario Setup Form
<input checked="" type="checkbox"/> Embedded Role Guide(s)
<input type="checkbox"/> Other: <a href="#">Click here to enter text.</a>
<input type="checkbox"/> <b>N/A</b> - this session does not include case scenarios

SCENARIO SETUP FORM

TITLE: STEMI with VT Arrest

MANIKIN: SimMan, 3G

EST DURATION: <10 min

**Patient Information:**

55 year-old male. **CC:** Chest Pain. No known prior medical problems. **Weight** 90kg **NKDA**

**Clinical Setting:** ED in tertiary care hospital

STATE NAME	VITAL SIGNS	EXAM/ADDL MANIKIN INFO	ACTIONS DESIRED
Stable Chest Pain	Temp: 37.5 HR: 116 BP: 160/90 RR: 20 SPO2: 98% RA	Provide History per guide	EKG - identify acute MI ASA 325 mg CXR Call 777
<b>TRANSITIONS:</b> After 3 min in this state, go to stable VT			
Stable VT	HR: 130 BP: 140/70 RR: 24 SPO2: 96% RA	Cardiac rhythm: VT w/pulse	Amiodarone 150mg over 5-10min Amiodarone drip 1mg/min
<b>TRANSITIONS:</b> 1. If given amiodarone with drip, go to Stabilized 2. If given amio bolus only, go to Temporary Sinus 3. If in state for 90sec, go to pulseless VT			
Temporary NSR	HR: 110 BP: 110/70 RR: 12 SPO2: 95% RA	Cardiac rhythm: Sinus tach Breath sounds: normal	Amiodarone drip 1mg/min
<b>TRANSITIONS:</b> If in state for 60 sec, go to pulseless VT			
Pulseless VT	HR: 140 BP: unreadable RR: 0 (BVM) SPO2:	Cardiac rhythm: pulseless VT No breath sounds or respirations	Start CPR, BVM Defibrillate 360J (200J biphasic) Amiodarone 300mg IVP
<b>TRANSITIONS:</b> 1. If defibrillated but no amiodarone, go to Temporary Sinus 2. If defib + amio, go to Stabilized			
VF Arrest	HR: 0 BP: 0 RR: 0 SPO2: unable to read	Cardiac rhythm: VF No respiratory effort	Start CPR, BVM Defibrillate 360J (200J biphasic)

SCENARIO SETUP FORM

TITLE: STEMI with VT Arrest

MANIKIN: SimMan, 3G

EST DURATION: <10 min

**TRANSITIONS:** 1. If defib without amio, go to Temporary NSR  
2. If defib + amio, go to Stabilized

Stabilized	<i>HR:</i> 80 <i>BP:</i> 100/60 <i>RR:</i> 20 <i>SPO2:</i> 100%	Cardiac rhythm: NSR	Admit to Cath Lab
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**Moulage:** IV in place    **Multimedia:** ECG1A, CXR1, ECG1B    **Embedded Roles:** Patient

**EMBEDDED ROLE GUIDE -**

SCENARIO TITLE: STEMI with VT

NAME: John Smith

ROLE: Patient

BACKGROUND INFO:

Pt ID: 58 yo male

CC: Indigestion

HPI: Approximately 1 month of epigastric pain occurring after eating (about 30minutes later). Lasts up to an hour, is accompanied by nausea. Pt is sedentary (desk job), lives in a ranch (1 level) so has never noted this pain with exertion. Today he had lunch out with associates (double cheeseburger, fries and a shake). The pain started in the car coming back from the restaurant, and worsened as he was walking back to his office. He tried Maalox and Tums from his desk without relief, and against his wishes, his co-workers brought him in. It's been going on for about 45 minutes.

ROS: Negative except as above

PMHx: None (hasn't seen a doc in over 20 years)

Meds: None

Allergies: NKDA

FHx: None known (although if asked about sudden death, Dad died suddenly at 49, cause unknown)

SHx: EtOH on weekends, 2ppd tobacco x 25years, no illicit

**Physical Exam (Sim findings in bold):**

WDWN 58 male appears uncomfortable

VS: Per **monitor 37.5 160/90 110 20 98%**

Gen: Mild distress.

HEENT: Reactive 4mm bilaterally. MMM.

CV: **Normal rate No M/R. (+) S4 Symmetric pulses.** Laterally displaced PMI. No JVD.

Lungs: **CTAB**

Abd: Normal BS. Soft, NTND.

Skin: Warm, dry. No lesions. Extremities: No edema.

Rectal: Normal tone, nontender, hemoccult neg. Brown stool.

Neuro: Eyes open spontaneously. CN intact. NI motor and sensory. No dysmetria or past-pointing. Normal reflexes

ACTIONS WITHIN THE CASE:

- A. Provide history freely.
- B. Tips to keep scenario flowing:
  - "I'm lightheaded" when rhythm changes to VT



- If no ECG - “where’s this pain coming from, doc?”

## 2.5 LEARNERS' SESSION HANDOUTS

For relevant supporting documents uploaded to the curriculum library, list filenames with brief descriptions of the content here:

1. STEMI with VT - Stimuli (diagnostic test results, face sheet)

## 2.6 SESSION ASSESSMENT

	C O M P L E T E	P R O M P T E D	N O T  D O N E		<b>CORE COMP</b>
<b>Initial Assessment</b>				Introduces self to patient	IP
				IV, O2, monitor	PC
				Orders ECG	MK, PC
				Elicits AMPLE history	PC
				Asks about CAD risk factors	MK, PC
				<i>CV exam: S4 gallop, displaced PMI</i>	PC
				<i>Lung exam: Auscultation normal</i>	PC
				Identify STEMI	MK, PC
<b>Workup</b>				Bilateral BP	MK
				Portable CXR	PC, SBP
				CIEs, CBC, BMP, coag profile	MK, PC
<b>Initial Treatment</b>				ASA 325mg	PC
				Anti-platelet <i>Dose ordered:</i>	PC
				Heparin bolus	PC
				<i>Nitroglycerin</i>	
				<i>B-blockers</i>	
<b>Arrhythmias</b>				Identifies VT on monitor	PC
				Checks for pulse (stable vs. unstable)	PC
				Administers antiarrhythmic	MK, PC
				If pulseless, uses electrical cardioversion	MK, PC
				If VF, defibrillates with $\geq 200$ J biphasic	MK, PC
				Starts (or orders) CPR if pulse lost	
				Starts antiarrhythmic drip	PC
<b>CPR</b>				Defibrillates immediately upon recognition of VF	MK, PC
				2 min (5 cycles) compressions between shocks	MK, PC
				Compression rate $\geq 100$	MK, PC
				Full chest recoil	MK, PC
				Resumes compressions immediately after shock delivery	MK, PC
				If intubated, ventilated $< 10$ breaths/min	MK, PC

<b>Disposition</b>			Admit to cath lab	SBP
			Cardiology consult	IP,SBP

## 2.7 SESSION SPECIFIC REFERENCES/SOURCES

### I. Instructors Notes

- A. Scenario conditions initially
1. Patient provides history of 1 month of increasing chest pain after eating. Today with exertion and not resolving.
  2. Patient's initial exam:
    - Tachycardia
    - S4 gallop
  3. Patients physiology
    - Undiagnosed long-standing hypertension
    - Undiagnosed CAD, now STEMI
- B. Scenario branch points
1. Pt will present hemodynamically stable with acute anterolateral STEMI
  2. Pt will develop stable VT.
  3. If not VT not treated, will go into VF arrest.
- 1.
- C. Embedded Roles:
  - Patient (sim tech) – provides HPI freely
- D. Stimuli available:
  - HPI/PE
  - ECG #1 (Anterior STEMI with inferior recip changes)
  - ECG #2 (VT)
  - CXR (normal)
  - CBC (Elevated WBC/left shift), CMP (normal)
  - UDS (normal)
  - CIE (elevated MB/troponin)
- E. Scenario programming:
  1. Optimal management path (see evaluation checklist)
  2. Potential errors / path(s)
    - Not ordering ECG to diagnose AMI
    - Not noticing rhythm change on monitor (VT)
    - Not treating VT (goes to VF)
    - Delaying defibrillation to intubate
- A. Questions to facilitate the debriefing
1. What are initial assessment and treatments for AMI?
    - IV, monitor, O2 to keep Sat>90%
    - ECG within 10 minutes of arrival
    - ASA

- Nitrates
  - Contraindicated if pt used phosphodiesterase-5 inhibitors in the last 24 hours
  - Caution with inferior MI due to possible RV involvement
- 2. The 4 ischemic syndromes
  - STEMI
    1. hyperacute T waves
    2. ST elevation
    3. Q waves
    4. T wave inversion
  - NSTEMI
  - Subendocardial ischemia (Angina)
  - Transmural ischemia (Prinzmetal's variant angina)
- 3. TIMI score - risk stratification
  - A. Predicts 14-day risk of death, reinfarction or revascularization
  - B. 7-point criteria (1pt each, >5 = high risk)
    1. age > 65
    2. 3 or more risk factors for CAD
    3. ASA used in the last 7 days
    4. 2 or more anginal events in the last 24 hrs
    5. ST deviation on presenting ECG
    6. Increased CIE
      - a. CK-MB
        - onset 3-12, peak 18-24h, lasts 36-48h
      - b. Troponin
        - onset 3-12, peak 18-24h, lasts up to 10d
    7. Prior CAD > 50% stenosis
- 4. Review the 2005 CPR guidelines:
  - Compression rate > 100
  - Allow full recoil
  - Vent rate 8-10 per minute
  - 1-rescuer 30:2 ratio
  - 2-rescuer 15:2 ratio
  - 2 min of CPR between shocks and drugs (5 cycles)
    - This includes after ROSC
  - Minimize downtime

## Resources and References

Zimetbaum PJ, Josephson ME. *Use of the electrocardiogram in acute myocardial infarction.* NEJM 2003;348:933

Madias JE, Zimetbaum PJ, Josephson ME. *Correspondence: Use of the electrocardiogram in acute myocardial infarction.* NEJM 2003;348:2362

For relevant supporting documents uploaded to the curriculum library list  
filenames with descriptions here: