



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

## PART TWO – SESSION MATERIALS

Session Title: Wide Complex Tachycardia

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: 1.2

Revision Date:

Curriculum Title: Emergency Medicine Resident  
Simulations

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Dept/Institution: Emergency Services/OSFMC

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

## 2.1 SESSION SNAPSHOT

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

EM1 Residents  
ED staff nurses/student nurses

### **Learning Objectives:**

#### Patient Care:

1. Performs focused H&P that identifies risk factors for CAD, dysrhythmias, metabolic derangements, history of UA/MI/CHF and assesses for hemodynamic stability [PC2.1 - 2.2]
2. Obtains 12-lead ECG [PC3.2] as first diagnostic study [PC3.3]
3. Orders anti-arrhythmic therapy [PC4.2] - bolus and continuous infusion
4. Recognizes when patient becomes hypotensive (unstable) [PC1.1]
5. Performs electrical cardioversion when patient becomes hemodynamically unstable [PC1.2]
6. Reassesses vital signs after anti-arrhythmic therapies [PC1.3]

#### Medical Knowledge:

1. Identify wide-complex tachycardia within 2 minutes of patient evaluation
2. Describe ECG findings that may differentiate between VT and SVT with aberrancy

#### Interpersonal Communication Skills

1. Ensures shared mental model for the team by utilizing 'Call-Out' for rhythm identification and changes in patient's status. [ICS2.2]

### **Session Description:**

Case scenario in which patient presents with lightheadedness due to ventricular tachycardia. He is initially hemodynamically stable then deteriorates requiring electrical cardioversion. He will have recurrent VT unless antiarrhythmic medications are initiated.

## 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 type="checkbox"/> Laerdal SimMan	<input type="checkbox"/> MegaCode Kid
<input type="checkbox"/> SimMan Essential	<input type="checkbox"/> SimJunior
<input checked="" 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 checked="" 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 type="checkbox"/> Gurney/Stretchers	<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	Jump (Moulage)	N/A	1

## 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

### **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.

Set up as ED room in Milestone

2x2 supply cart

Crash Cart outside of room

## 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: WCT

MANIKIN: 3G

EST DURATION: 8-10 min

**Patient Information:** 44 year-old male **CC:** Palpitations

**PMHx:** HTN?

**Weight:** 90kg

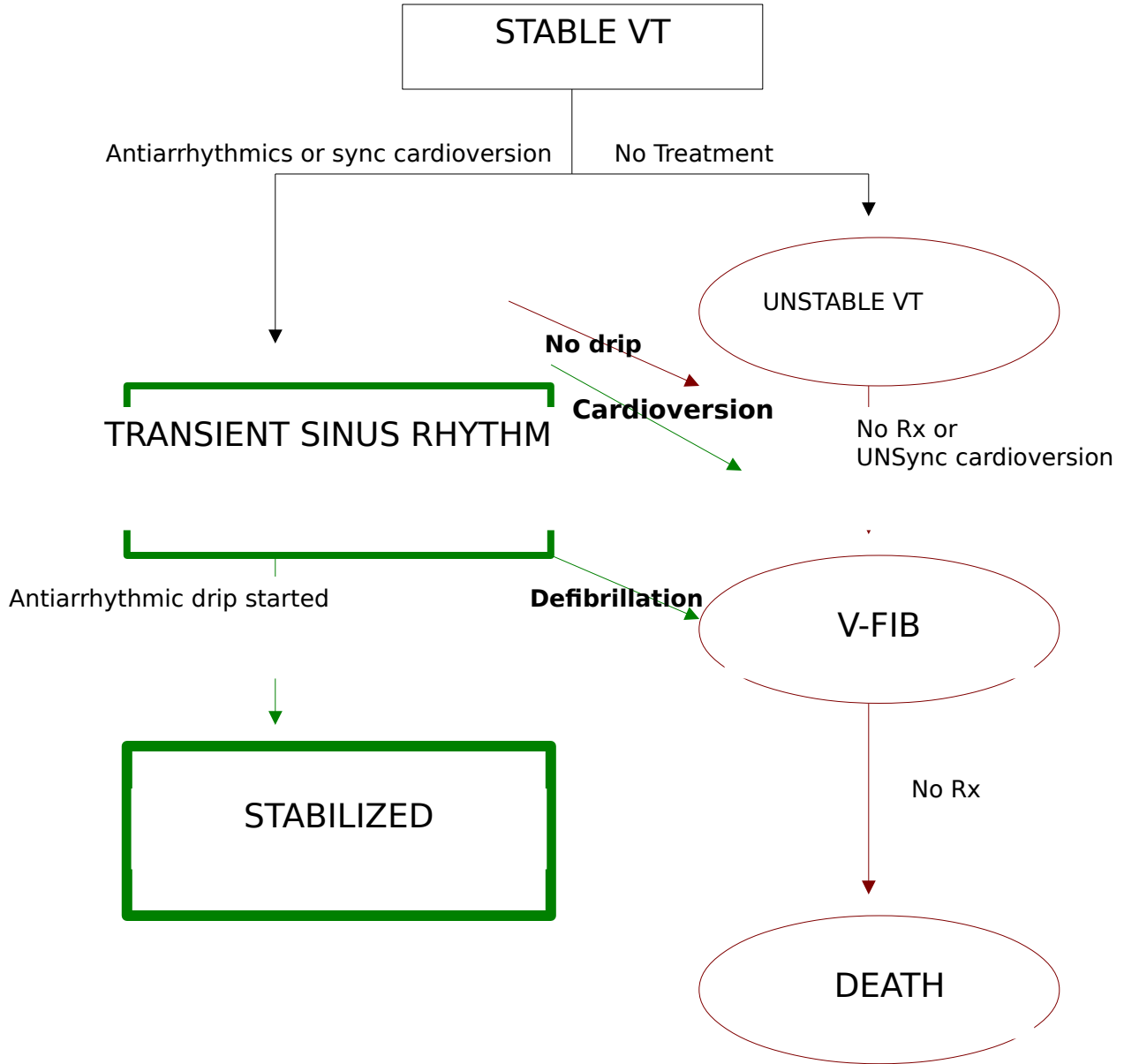
**Allergies:** NKDA **Clinical Setting:** Community ED

STATE NAME	VITAL SIGNS	EXAM/ADDL MANIKIN INFO	ACTIONS DESIRED
Stable VT	Temp: 37.5 HR: 150 BP: 110/75 RR: 14 SpO2: 100% RA	Rhythm: VT	H&P Metabolic, cardiac workup Cardioversion (shock or meds)
<b>TRANSITIONS:</b> 1. Time in state > 180 sec go to Unstable VT 2. If amio 150mg or lido 100mg given, go to Transient Sinus Rhythm over 20 seconds 3. If sync cardioversion go to Brief Asystole			
Unstable VT	HR: 150 BP: 80/30 RR: 20 SPO2: 98%	"I feel lightheaded" "My chest feels heavy"	Synchronized cardioversion Cardiac workup
<b>TRANSITIONS:</b> 1. If amio 150mg or lido 100mg given, go to Transient Sinus Rhythm 2. If time in state > 90 sec go to VF 3. If unsync cardioversion go to VF 4. If sync cardioversion go to Brief Asystole			
Ventricular Fibrillation	HR: fib BP: 0/0 RR: 0 SPO2: 90% over 30 sec		Defibrillation
<b>TRANSITIONS:</b> If defibrillated > 200J go to Transient Sinus			
Brief Asystole	No change	Rhythm: Asystole	
<b>TRANSITIONS:</b> Time in state 4 sec go to Transient Sinus Rhythm			
Transient Sinus Rhythm	HR: 90 BP: 140/80 RR: 14 SPO2: 100%		
<b>TRANSITIONS:</b> 1. If time in state >90 sec and no drip go to Unstable VT 2. If drip started (amio or lido) go to Stabilized over 30 seconds			
Stabilized	HR: 110 BP: 140/70 RR: 20 SPO2: 100%		

**Moulage:** IV in place. Diaphoresis

**Multimedia:** CXR1, ECG1A, ECG 1B

**Embedded Roles:** Patient



## **STANDARDIZED PARTICIPANT ROLE GUIDE**

SCENARIO TITLE: Wide Complex Tachycardia

**NAME:** Steven Johnson

**ROLE:** Patient

### **BACKGROUND INFO:**

**HPI:** You are 44 yo, and came to ED by private car. You had just gotten home from work this morning when you suddenly “felt weird” – about 1 hour ago. You work third shift at local meat processing plant. You tried to eat something, ‘walk it off’ but it wouldn’t go away so you came in to get checked out.

Feel generally weak. No CP, SOB. Have some mild nausea, lightheadedness.

**PMH:** None (you haven’t seen a doctor in 20 years). You were told by work health nurse your blood pressure was elevated once, but you never followed up (“I felt fine”)

**Meds:** None

**ALLERGIES:** NKDA

**SocHx:** 1ppd smoker x 25 years. Weekend EtOH, smoked marijuana in high school – none recently.

**FamHx:** Father has ‘heart problems’ (not sure what) – Brother has high cholesterol and HTN

**ROS:** As per HPI. NO recent illnesses or exposures.

### **Physical Exam (Sim Findings in Bold):**

WDWN 44yo male

VS: Per **monitor: 37.0 110/75 150 14 100% RA**

Gen: Slightly diaphoretic, uncomfortable

HEENT: PERRL. MMM. No thyromegaly.

CV: **Tachycardia. No M/R/G. Symmetric, full pulses**

Lungs: **CTA.**

Abd: Normoactive BS. Soft NTND.

Skin: **Slightly diaphoretic. No rashes or ecchymoses.**

Extremities: **No edema.**

Rectal: Normal tone, nontender, hemoccult negative.

Neuro: GCS 15. Normal strength, sensation.

### **ACTIONS WITHIN THE CASE:**

Provide history freely. When in unstable VT should complain of lightheadedness and chest heaviness. Become non-verbal when in V-Fib. When converted back to NSR – start speaking again – “what happened”?



## 2.5 LEARNERS' SESSION HANDOUTS

Copy any session-specific information for learners in this section.  
For relevant supporting documents uploaded to the curriculum library, list filenames with brief descriptions of the content here:

## 2.6 SESSION ASSESSMENT

<b>WCT</b>	<b>C O M P L E T E</b>	<b>P R O M P T E D</b>	<b>N O T  D O N E</b>	Learner(s):	
				Date:	
<b>Initial Assessment</b>				Introduces self to patient	
				Places pt on monitor	
				Identifies wide complex on monitor, orders ECG	
				Elicits AMPLE history	
				<i>Lung exam:</i> Clear bilaterally	
				<i>CV exam:</i> S4 gallop, strong peripheral pulses	
				<i>Neuro exam:</i> alert and oriented	
				Identifies patient as hemodynamically stable	
				Places pacer/defib pads due to risk of deterioration	
<b>Treatment</b>				Administers antidysrhythmic Amiodarone 150mg or Lidocaine 1mg/kg	
				Synchronized cardioversion	
				Explains procedure to patient	
				Obtains informed consent	
				Prepares airway equipment before sedating	
				Sedates patient before procedure	
				Synchronizes before delivering shock	
				Orders repeat ECG after cardioversion	
				Re-evaluates patient's vitals	
<b>Work-Up</b>				CBC, CMP, Mg	
				TSH	
				CIEs	
				Interprets initial ECG as VT	
				CXR	
				Interprets post-cardioversion ECG correctly	
				Can list 3 etiologies for ventricular arrhythmias	
<b>Reassessment/Treatment</b>				Re-examines pulses, vitals with change in status	
				Identifies patient as hemodynamically unstable	
				Performs electrical cardioversion	
				Starts infusion of antidysrhythmic agent	
<b>Disposition</b>				Cardiology consultation	
				Admit to CCU	

## 2.7 SESSION SPECIFIC REFERENCES/SOURCES

Supporting documents uploaded to portal:

1.

Questions to facilitate debriefing:

1. What defines WCT in adults?
  - a. QRS > 120ms
  - b. HR > 100
2. What is the differential for a WCT?
  - VT vs. SVT with aberrancy
  - Pre-excitation syndromes (antidromic – e.g. WPW)
  - Pacemaker-mediated
  - WCT due toxic-metabolic derangement
  - Better to assume VT if unsure
    1. WCT is VT in 80% (unselected populations, non-ED studies
      - Only 16% in one ED-based study
    2. WCT is VT in 95% of pts with prior MI
    3. Treatment of VT with SVT meds is potentially dangerous, while the reverse is not true
3. Describe approach to differentiating between WCT and SVT with aberrancy (noting no criteria is 100% sensitive):
  - a. COMPARE TO PRIOR ECG (if available)
  - b. Regular or Irregular?
    - i. Irregular: PMT, AF with either AVC or WPW
    - ii. Regular: Monomorphic VT, SVT with AVC or pre-excitation, pacemaker-mediated
    - iii. Toxic-metabolic can be either regular or irregular
  - c. Griffith criteria
    - i. Eval for RBBB or LBBB (v1/v6)
    - ii. Eval axis
    - iii. AV dissociation (supports VT)
      - a. Irregular notching of QRS (dissociated P-waves)
      - b. Fusion or capture beats
  - d. Supporting SVT with AVC
4. What is the next question to ask?
  - a. STABLE OR UNSTABLE?
  - b. Stable: No evidence of hemodynamic compromise
  - c. Unstable: Awake, with a palpable pulse, but...
    - hypotension
    - angina
    - heart failure
    - altered level of consciousness
  - d. Arrest: pulseless, unresponsive

5. What are the causes of ventricular tachycardia?
  - a. **Ischemic heart disease**
  - b. Electrolyte disturbances
- Hypokalemia
- Hypomagnesemia
- (more likely to cause VT when also taking antiarrhythmic meds)
  - c. QT prolonging drugs
- Antiarrhythmics
- Erythromycin
- fluoroquinolones
6. What medical therapies are available?
  - a. Lidocaine
  - b. Amiodarone
  - c. Procainamide
- 7.

**References:**

1. Subramanian NR, Brady WJ. Wide Complex Tachycardia: Diagnosis and Management in the Emergency Department. *EM Practice* 10(6) June 2008.