

I. Title: STEMI with Ventricular Tachycardia

II. Target Audience: EM1 Residents

1. Learning Objectives or Assessment 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. Discuss possible contraindications for recommended ACS therapies.
- C. Critical actions checklist (see attached form for details):
1. IV, O2, monitor
 2. Immediate ECG
 3. Administers ASA 325mg
 4. Identifies STEMI on ECG
 5. Activates cath lab
 6. Identifies VT
 7. Administers antiarrhythmic
 8. Uses electrical cardioversion for pulseless VT
 9. Defibrillates VF

2. Environment

- A. Lab Set Up - ED room
- B. Manikin Set Up - HPS no moulage
- C. Props - none
- D. Distractors - none

3. Actors

- A. Roles -
1. Patient - provides history, opportunity to observe trainee's interpersonal skills

4. Case Narrative

- A. Scenario Background Given to Participants (all freely provided)
 1. CC: Chest Pain
 2. PMH: None (no doc in 20 years)
 3. Meds: None
 4. Allergies: None
 5. Family history: Dad sudden death at 49yoa
 6. Social history: 2ppd x 50 years, occ EtOH

- B. 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

- C. 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.

IV. Instructors Notes

- A. Tips to keep scenario flowing:
 - "I'm lightheaded" when rhythm changes to VT
 - If no ECG - "where's this pain coming from, doc?"
 - If workup inadequate, RN prompt - "Are there any other labs doctor?"

- B. Actors:
 - Patient - provides HPI freely

- C. 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)

- D. 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
3. Program debugging
- a. Use fluid infusions/losses to manipulate BP

1. Debriefing Plan

- A. Method of debriefing -
1. Participant self-assessment
 2. Group debriefing on case management/general principles
- B. Actual debriefing materials
1. Review article - ECG in AMI
- C. Rules for the debriefing
1. Participant gives self-evaluation first
 2. Group feedback
 3. Case is replayed if significant changes in management are needed
- D. 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
 - Predicts 14-day risk of death, reinfarction or revascularization
 - 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

2. Pilot Testing and Revisions

- A. Numbers of participants: 2-3 (1 primary, 2 support)
- B. Evaluation forms - for and by participants

X. Authors and their affiliations

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XI. 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