

# Simulation Scenario Template

## Section 1: Case Summary

<b>Scenario Title:</b>	<b>Traumatic Cardiac Arrest</b>
Keywords:	Trauma, Thoracotomy, Cardiac Arrest
Brief Description of Case:	21 year old M presents VSA with single stab wound to chest

Goals and Objectives	
Educational Goal:	To practice team leading and resuscitative procedures in traumatic cardiac arrest
Objectives: (Medical and CRM)	<ol style="list-style-type: none"> <li>1. Practice effective communication and leadership</li> <li>2. Prioritize reversible causes of traumatic cardiac arrest, with emphasis on massive transfusion protocol and hemorrhage control</li> <li>3. Consider all resuscitative procedures available in traumatic cardiac arrest</li> <li>4. Apply indications for ED thoracotomy</li> </ol>
EPAs Assessed:	

Learners, Setting and Personnel			
Target Learners:	<input type="checkbox"/> Junior Learners	<input checked="" type="checkbox"/> Senior Learners	<input checked="" type="checkbox"/> Staff
	<input checked="" type="checkbox"/> Physicians	<input checked="" type="checkbox"/> Nurses	<input type="checkbox"/> RTs
	<input type="checkbox"/> Other Learners:		
Location:	<input checked="" type="checkbox"/> Sim Lab	<input checked="" type="checkbox"/> In Situ	<input type="checkbox"/> Other:
Recommended Number of Facilitators:	Instructors: 1		
	Sim Actors: 1		
	Sim Techs: 1		

Scenario Development	
Date of Development:	March 21, 2023
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Last Revision Date:	
Revised By:	
Version Number:	



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## Section 2A: Initial Patient Information

A. Patient Chart					
Patient Name: Robert Johnson		Age: 21	Gender: M	Weight: 90kg	
Presenting complaint: stab wound to chest					
Temp: 37.2	HR: 150	BP: 75/40	RR: 20	O <sub>2</sub> Sat: 94	FiO <sub>2</sub> : 100%
Cap glucose: 8			GCS: 7		
<p>Triage note:            You're working at a tertiary care hospital with full surgical capabilities. You get a pre-notification call at 20.23 of a 21-year-old M with a single stab wound to the chest. They are 3 minutes away from your hospital.</p>					
Allergies: None					
Past Medical History: None			Current Medications: None		

## Section 2B: Extra Patient Information

A. Further History	
<p><i>Include any relevant history not included in triage note above. What information will only be given to learners if they ask? Who will provide this information (mannequin's voice, sim actors, SP, etc.)?</i></p> <p>Paramedics are not sure of the exact time of injury, however a 911 call was placed 10 minutes ago and they arrived on scene shortly after. The patient is otherwise healthy with no comorbidities or home medications. There were no signs of drug or alcohol use on scene. They were able to place 1 IV in the L antecubital fossa. No medications have been given.</p>	
B. Physical Exam	
<p><i>List any pertinent positive and negative findings</i></p>	
Cardio: 3 cm stab wound anterior chest, L side in the 5 <sup>th</sup> intercostal space. Active bleeding is noted.	Neuro: Pt opens eyes to pain, pupils equal and reactive
Resp: good air entry bilaterally, no crackles/wheeze	Head & Neck: normal
Abdo: normal	MSK/skin: normal
Other: Responds only to pain, mumbling incoherently.	



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## Section 3: Technical Requirements/Room Vision

A. Patient
<input checked="" type="checkbox"/> Mannequin <b>Adult</b>
<input type="checkbox"/> Standardized Patient
<input type="checkbox"/> Task Trainer
<input type="checkbox"/> Hybrid
B. Special Equipment Required
Chest tube tray Thoracotomy tray
C. Required Medications
TXA IV fluids MTP
D. Moulage
IV in place Street clothes, bloody
E. Monitors at Case Onset
<input type="checkbox"/> Patient on monitor with vitals displayed <input checked="" type="checkbox"/> Patient not yet on monitor
F. Patient Reactions and Exam
<i>Include any relevant physical exam findings that require mannequin programming or cues from patient (e.g. – abnormal breath sounds, moaning when RUQ palpated, etc.) May be helpful to frame in ABCDE format.</i>
A – nil B – nil C – unable to appreciate normal heart sounds, stab wound on anterior chest D – Moaning, will become unresponsive during simulation E – nil
POCUS: pericardial effusion and L pleural effusion



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## Section 4: Sim Actor and Standardized Patients

<b>Sim Actor and Standardized Patient Roles and Scripts</b>	
<i>Role</i>	<i>Description of role, expected behavior, and key moments to intervene/prompt learners. Include any script required (including conveying patient information if patient is unable)</i>



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## Section 5: Scenario Progression

Scenario States, Modifiers and Triggers			
Patient State/Vitals	Patient Status	Learner Actions, Modifiers & Triggers to Move to Next State	Facilitator Notes
<b>1. Baseline State</b>	Prehospital notification arrives. Pt vitals are given as: HR: 150 BP: 75/40 RR: 20 Sat: 94% on 100% FiO2 Ambulance is 3 minutes away	<u>Expected Learner Actions</u> <input type="checkbox"/> Establish roles <input type="checkbox"/> Notify blood bank for MTP <input type="checkbox"/> Prepare advanced airway equipment <input type="checkbox"/> Prepare chest tube kit <input type="checkbox"/> Prepare thoracotomy kit <input type="checkbox"/> Pre-notify surgical/trauma service of unstable penetrating stab wound arrival <input type="checkbox"/> Communicate and establish priorities for patient arrival	<u>Modifiers</u> <i>Changes to patient condition based on learner action</i>  <u>Triggers</u> <i>For progression to next state</i> -3 minutes of time elapse, regardless of actions complete -
<b>2. Patient Arrives</b> Rhythm: sinus tachycardia HR: 140 BP: 60/40 RR: 24 O <sub>2</sub> SAT: 98% T: 37.5°C GCS: 7	Patient on the bed, GCS 6-7, opening eyes and moaning to pain.	<u>Expected Learner Actions</u> <input type="checkbox"/> IV access <input type="checkbox"/> Place on all monitors <input type="checkbox"/> CABG approach to trauma, direct pressure to chest wound <input type="checkbox"/> PRBC given through rapid transfuser <input type="checkbox"/> eFAST on ultrasound <input type="checkbox"/> roll patient to ensure no other injury <input type="checkbox"/> Labs sent: VBG, CBC, BMP, extended electrolytes, fibrinogen, group and screen	<u>Modifiers</u> -start to get chest tube, patient loses vital signs -If no blood given, patient lose vital signs - <u>Triggers</u> -eFAST: pericardial effusion and pleural effusion noted -
<b>3. Vital Signs Absent</b>		<u>Expected Learner Actions</u> <input type="checkbox"/> Thoracotomy <input type="checkbox"/> Pericardiotomy <input type="checkbox"/> Cardiac Repair	<u>Modifiers</u>



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		<input type="checkbox"/> Internal Cardiac Massage <input type="checkbox"/> Blood products via MTP and rapid transfuser <input type="checkbox"/> Intubate	<u>Triggers</u> -All actions complete – End the Case	
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## Appendix A: Laboratory Results

<p><u>CBC</u> WBC 3.7 Hgb 54 Plt 127</p> <p><u>Lytes</u> Na 134 K 4.2 Cl 99 HCO<sub>3</sub> 26 Urea 21 Cr 101 Glucose 7.6</p> <p><u>VBG</u> pH 7.27 pCO<sub>2</sub> 37 pO<sub>2</sub> 68 HCO<sub>3</sub> 26 Lactate 2.0</p>	<p><u>Cardiac/Coags</u> INR 1.0 aPTT 24</p> <p><u>Tox</u> EtOH 0 ASA &lt;1 Tylenol &lt;1 Dig level &lt;1</p>
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## Appendix B: ECGs, X-rays, Ultrasounds and Pictures

*Paste in any auxiliary files required for running the session. Don't forget to include their sources so you can find them later!*

<https://www.thepocusatlas.com/echocardiography-2> for Pericardial Effusion

<https://www.thepocusatlas.com/pulmonary> for Spine Sign/Pleural Effusion





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## Appendix C: Facilitator Cheat Sheet & Debriefing Tips

*Include key errors to watch for and common challenges with the case. List issues expected to be part of the debriefing discussion. Supplemental information regarding any relevant pathophysiology, guidelines, or management information that may be reviewed during debriefing should be provided for facilitators to have as a reference.*

This case focuses on the acute management of a penetrating chest wound. The participants should recognize that the patient is unstable, and manage them according to ATLS principles, including resuscitative thoracotomy.

### CRM objectives:

1. Task prioritizing – the participants should focus on the life-threatening nature of this injury, and note that when vital signs are lost the priority is to manage cardiac bleeding rather than ACLS principles.
2. Communication – traumatic thoracotomies are intensive procedures; the team lead should give clear communication with specific task delegation to other participants
3. Situational Awareness – recognize and appreciate the stressful nature of a thoracotomy

### Medical Objectives:

1. Review ATLS approach to an unstable trauma patient with a penetrating chest injury
2. Review the East vs West guidelines for resuscitative thoracotomy
3. Review approach to intracardial resuscitation

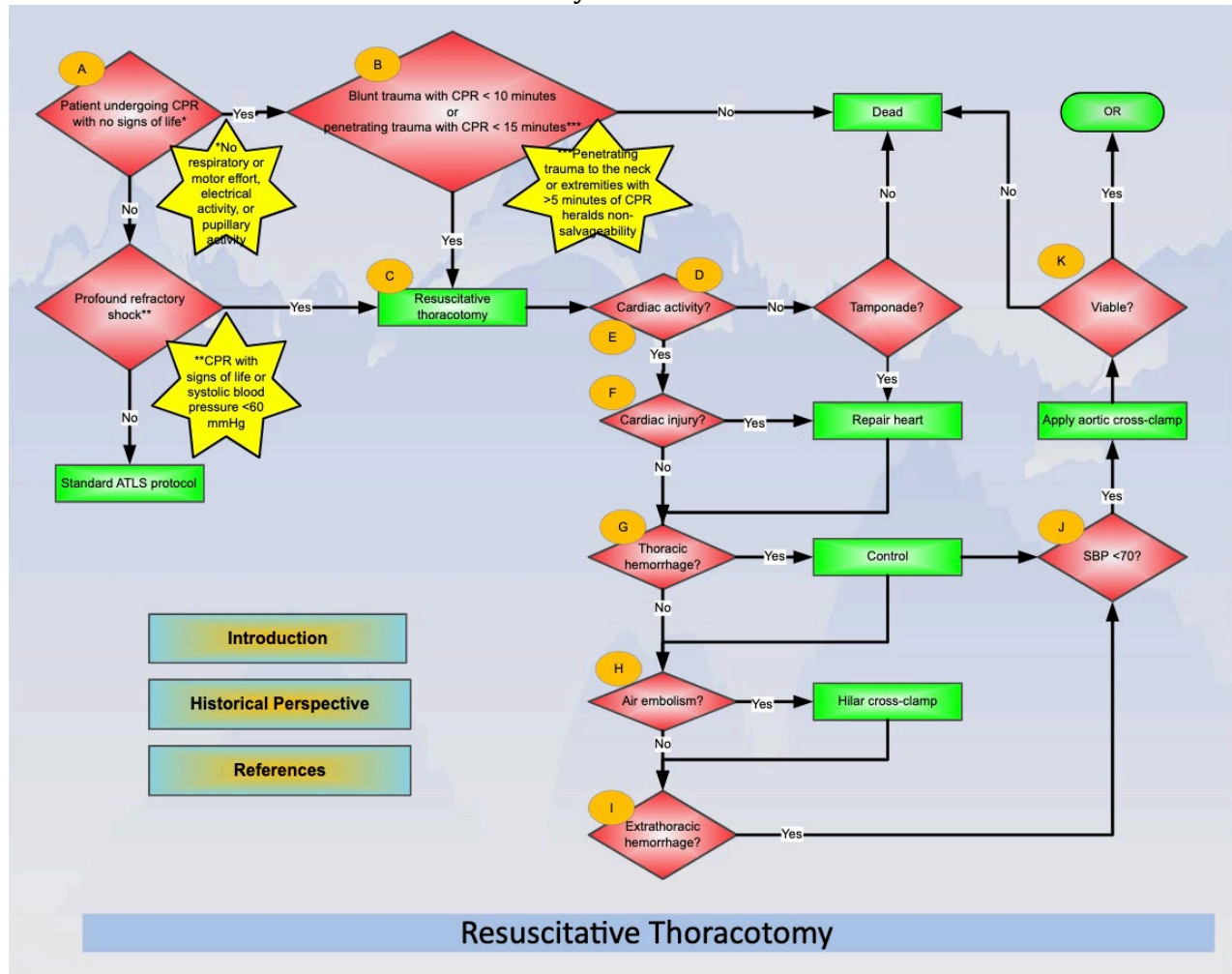
### East Guidelines for Resuscitative Thoracotomy:

1. Pulseless with signs of life after penetrating thoracic injury (strong recommendation)
2. Pulseless without signs of life after penetrating thoracic injury (conditional recommendation)
3. Pulseless with signs of life after penetrating extra-thoracic injury (conditional recommendation)
4. Pulseless without signs of life after penetrating extra-thoracic injury (conditional recommendation)
5. Pulseless with signs of life after blunt injury (conditional recommendation)
6. Pulseless without signs of life after blunt injury (recommend against)



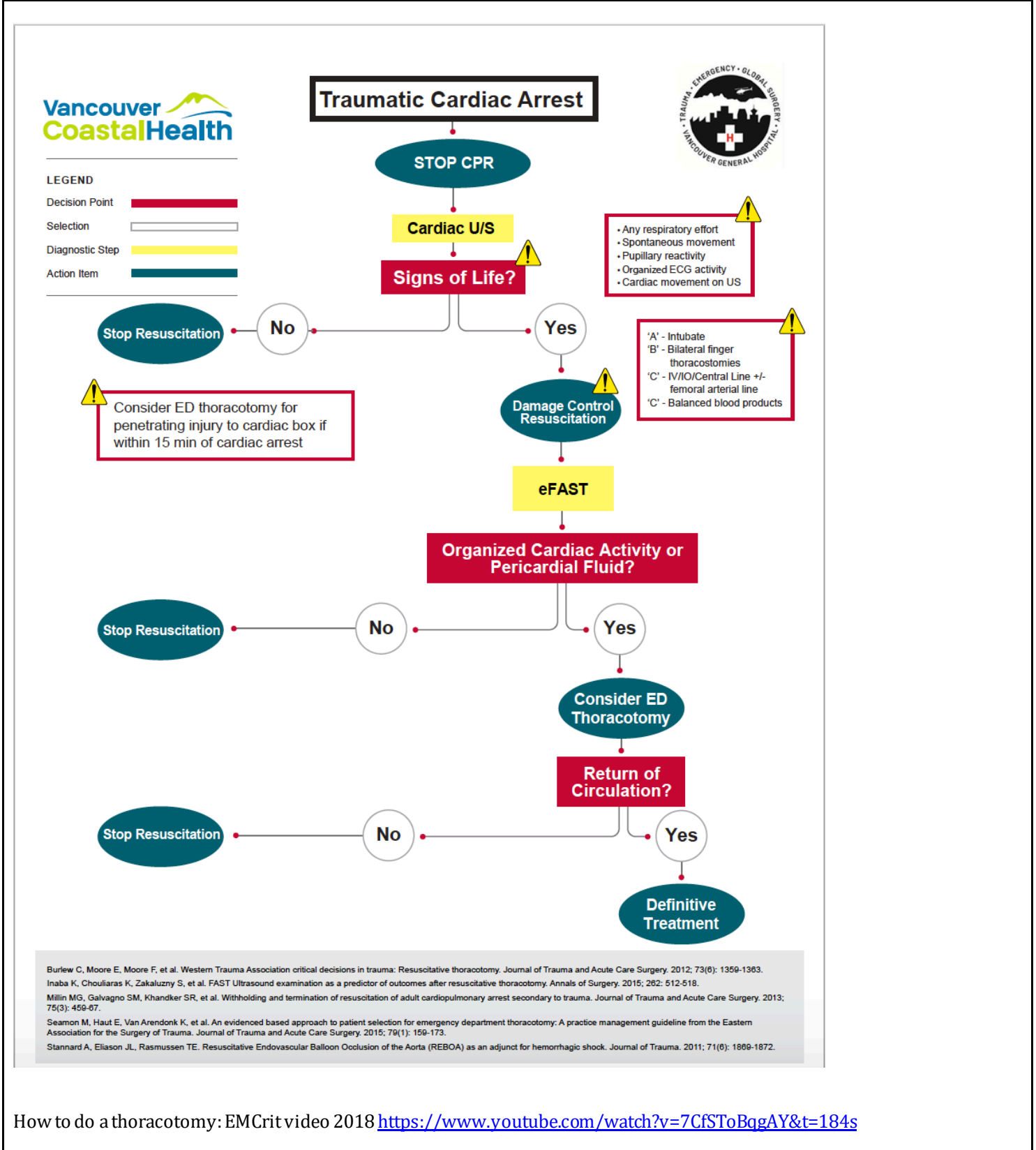
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## West Guidelines for Resuscitative Thoracotomy:



1. Blunt Trauma Patients: less than 10 min of prehospital CPR
2. Penetrating Trauma Patients:
  - a. Less than 15 min of prehospital CPR
  - b. Less than 5 min of prehospital CPR in patients with penetrating trauma to neck or extremity
3. Other: patients in profound refractory shock

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How to do a thoracotomy: EMCrit video 2018 <https://www.youtube.com/watch?v=7CfStoBqgAY&t=184s>



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## References

1. Burlew CC, Moore EE, Moore FA, et al. Western Trauma Association critical decisions in trauma: resuscitative thoracotomy. *J Trauma Acute Care Surg.* 2012;73(6):1359-63.
2. Seamon MJ, Haut ER, Van Arendonk K, et al. An evidence-based approach to patient selection for emergency department thoracotomy: A practice management guideline from the Eastern Association for the Surgery of Trauma. *J Trauma Acute Care Surg.* 2015;79(1):159-73
3. The ATLS Subcommittee, American College of Surgeons' Committee on Trauma, The International ATLS Working group. Advanced trauma life support (ATLS®): the ninth edition. *J Trauma Acute Care Surg,* 2013; 74(5): 1363-1366

