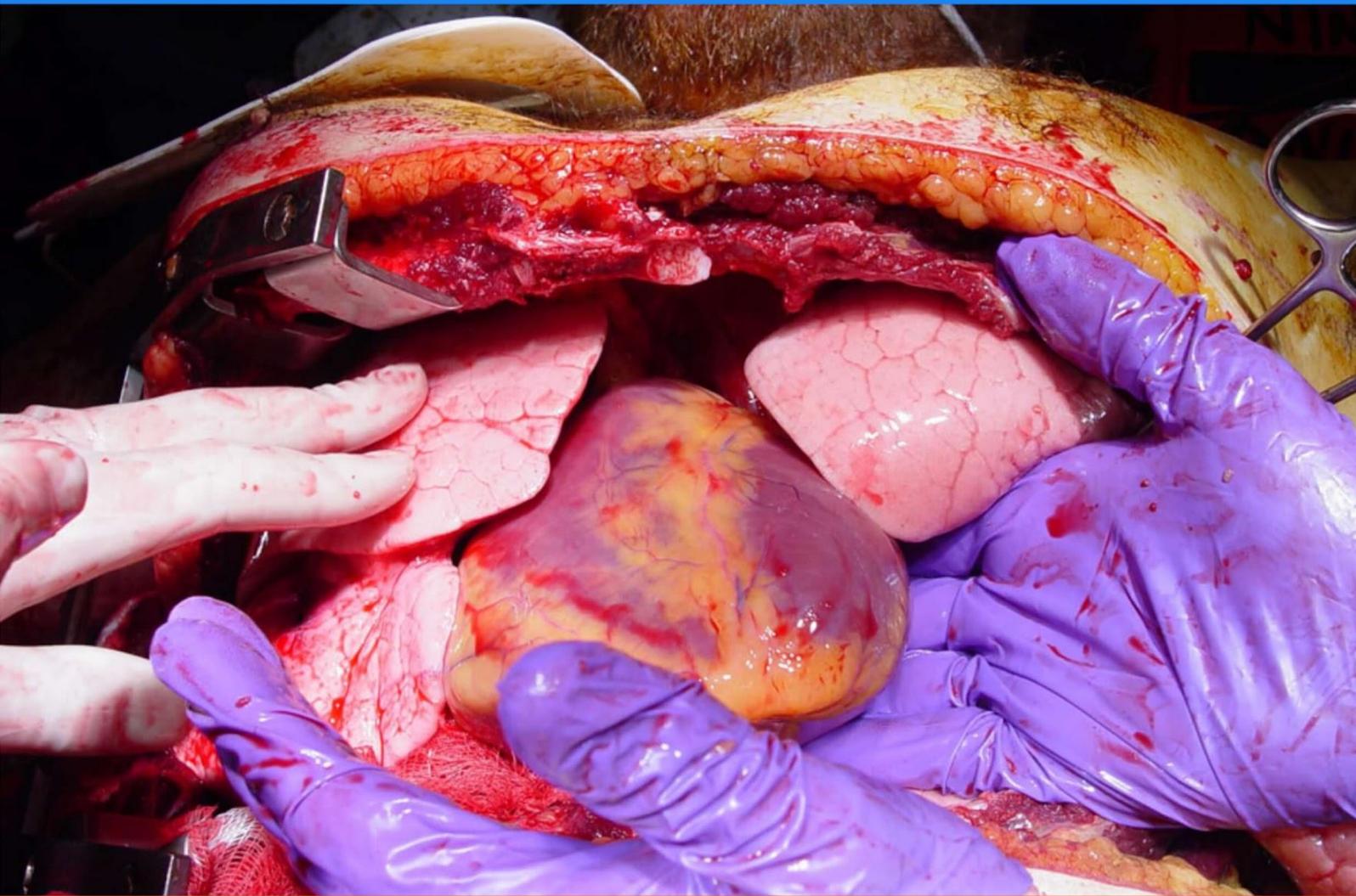


# RESUS DRILLS



**THORACOTOMY  
FOR TRAUMA**

**#2**

## Drill pre-brief (instructor to read out)

*“Welcome to this Resus Drill. Drills are for situations which happen quickly, are not common, and need a time-critical response.*

*They need practice, so when the time comes, you’ve already had the dress rehearsal. This is not a Simulation. Drills are for practising teamwork and speed.*

*We will run a scenario for 5 minutes, chat and reflect on it, then run the same scenario again for another 5 minutes.”*



## Assurances

**Learning, NOT assessment:** The drill is for practice and for learning. We’re concentrating on how fast you can think, and how well you work as a team.

**Safe zone:** Learning and mistakes are shared here, not any further.

**5-min reflection rules:** Please be constructive in the debrief. We’re all here to learn. These are deliberately tough scenarios. That’s the whole point of a drill.

**Pretend it’s real:** we’ll try to make the drill realistic, but this is not meant to be a high fidelity Simulation. Although it’s not real, we need you to help us by acting as you’d do in real life, in your normal role, and we’ll try to run it in real time.

**Take-away pack:** there is some information that you can take away for further learning. We recommend “spaced repetition” for the best learning:

- make some reflective notes while it’s fresh in your mind
- make yourself read them again in a couple of weeks

## How does it work?

These ER drill packs will be laminated and left in the Simulation Bay (Bay 5) for teaching purposes, as well as “take-home” cards for those who want to brush up on their learning. The team can then choose a scenario or roll the dice to decide!

**Each Resus drill pack contains:** location of equipment, “Red call” sheet (optional), decision algorithm, scenario script, debrief questions, procedure and additional learning resources.



## S.E.T.U.P. (before patient arrives)

**SELF...** physical readiness (*stay calm*) & cognitive readiness (*accept the challenge*)

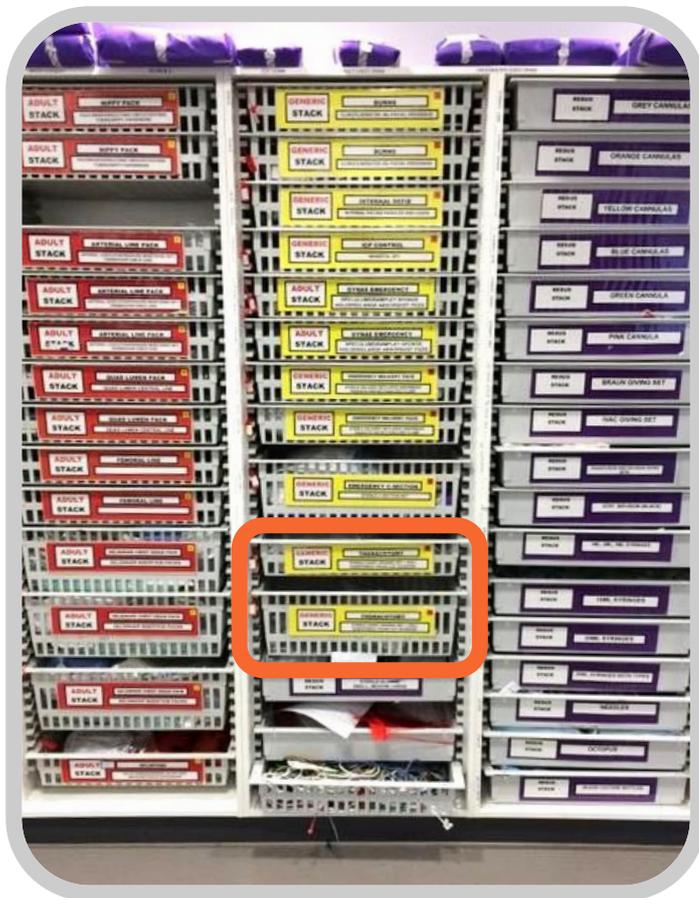
**ENVIRONMENT...** dangers, space, lighting, crowd control, appropriate equipment?

**TEAM...** initial briefing, identify Team Leader, allocate team roles

**UPDATE...** if possible, recap for the team (*and yourself*) before patient's arrival

**PATIENT...** the patient has now arrived

## Location of Equipment



The **thoracotomy kit** can be located inside (*and on top*) of the Resus/ER equipment stacks next to Bay 9 and opposite Bay 10.

## Surgical full thoracotomy kit



## Indications

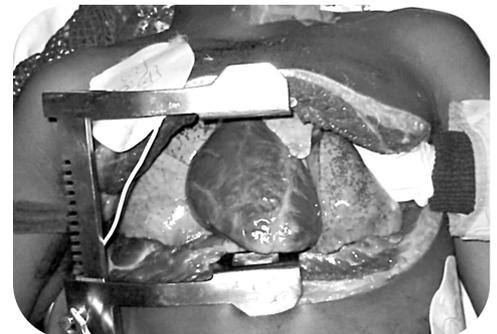
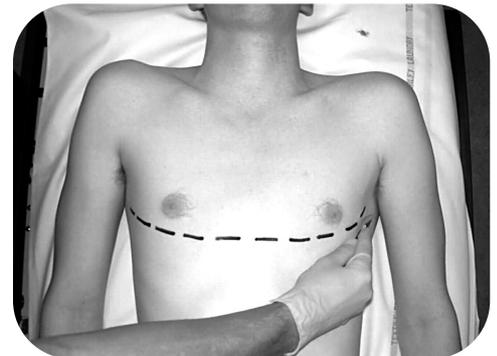
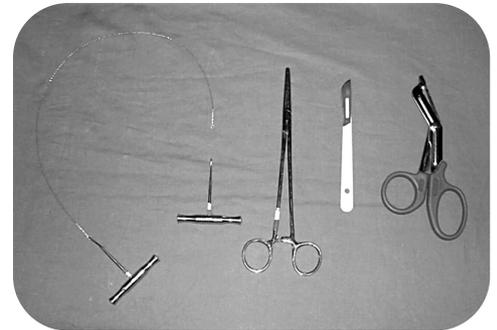
Cardiac arrest after a penetrating thoracic injury **AND** downtime of <15 minutes

## Equipment Required

- ✓ Chloraprep applicator
- ✓ Scalpel (size 22)
- ✓ Spencer wells forceps
- ✓ Suture
- ✓ Sterile gloves
- ✓ Safety glasses
- ✓ Suction
- ✓ Tough-cut shears

## Landmarks and Techniques

1. Concurrent intubation and IV access
2. Thoracostomy incisions are made on both sides but extending to the posterior axillary line – confirm thoracostomies haven't achieved ROSC
3. A skin incision (*down to muscles*) is made across the anterior chest wall joining the 2 thoracostomy incisions, passing over the sternum
4. Intercostal muscles are divided using tough-cut shears +/- scalpel
5. The sternum should be divided using the tough-cut shears
6. The chest wall, if incised correctly, will open upwards exposing the internal organs
7. The pericardium is identified and an incision made vertically in the centre of the pericardium
8. Any clot of blood needs to be evacuated manually from the pericardial space
9. If there is no spontaneous cardiac activity, internal compressions should be commenced
10. Bleeding from wounds to the heart are usually stopped using thumb/finger pressure
11. Bleeding points from the chest wall may need to be tied by the second team member using the vicryl suture
12. Pre-alert the cardiothoracic team for immediate transfer



## Traumatic Cardiac Arrest Decision Algorithm

- ✓ Stab wounds to the chest or upper abdomen (*for penetrating injury*)
- ✓ Loss of vital signs

### In parallel:

- Intubate
- Activate major haemorrhage protocol
- Rapidly transfuse 4U of O negative

**Perform clamshell thoracotomy**

**Tamponade?**

**Evacuate clot & put finger in hole**

**Any cardiac activity?**

**ROSC?**

**Is the heart filling?**

**DEAD**

**Focus on transfusion, start platelets, FFP**

**Get urgent specialist help**

**Ensure anaesthesia is going into patient *or they will wake up!***

**Stop if no ROSC within 20 mins of original loss of output**

**If someone with surgical skills present:**

- Consider suture in RV
- Consider aortic clamp
- Clamp internal mammaries if spurting

# Thoracotomy for Trauma

# #2

## Emergency Department: Pre-Hospital Pre-Alert Report Form

CALL SIGN OF THE VEHICLE / TEAM

1234

<b>A</b> ge (and sex)		AGE 19	SEX M		
<b>T</b> ime (of incident / onset of symptoms)		<30 mins			
<b>M</b> echanism of Incident (injury / illness)		Stabbing to abdomen			
<b>I</b> njuries / Symptoms (suspected or present)		Single wound			
<b>S</b> igns (Observations, Clinical Stability)		HR	140	GCS	15
		RR	20	BM	-
		BP	80/40	TEMP	-
		SPO <sub>2</sub>	96% air	PEAK FLOW	-
		NEWS score total		<b>EMAS TRAUMA TRIAGE TOOL POSITIVE?</b> YES / NO	
<b>Red Flag Sepsis</b>		CLINICAL CONDITION	STABLE / UNSTABLE		
<b>T</b> reatment (Given so far – In brief!)		None			
<b>E</b> TA (Time of arrival in ED)		3 mins			
<b>R</b> equirements (Circle – specify where required)		<b>TRAUMA</b>			
		MASSIVE BLOOD LOSS PROTOCOL TRAUMA TEAM ACTIVATION	MEDICAL STROKE THROMBOLYSIS CARDIAC SPECIALIST NURSE SEPSIS PATHWAY		
Call taken by;	T. Doctor	Date;	Time;	:	HRS
Information passed to;	PRINT NAME	Date;	Time;	:	HRS

Patient Addressograph Label

(MUST BE ADDED ONCE PATIENT REGISTERED)

**TURN FORM OVER AND COMPLETE CHECKLIST ON REAR**

PLEASE ATTACH TO PATIENT NOTES – INSIDE FRONT SHEET

ADHESIVE STRIP - HERE

## Scenario Script

***“The red phone has just rung with a 3-minute warning of a 19-year-old male stabbed in the epigastrium. HR 140, BP 80/40.”***

### Minutes One & Two

**Team Leader** designates team members and uses **S.E.T.U.P.** (Self, Environment, Team, Update, Patient arrives). Gloves, aprons, badges donned. Mini-thoracotomy kit found. Rapid infuser brought to cubicle. Trauma call put out (*no-one arrives until scenario over*).



### Minute Three

Paramedics arrive stating that he's just lost his output. Decision to do clamshell taken. CPR not initiated – must be verbalised as deliberate decision. 2-minute cycles/adrenaline should be avoided. Arrest time should be noted. Team members allocated for thoracostomies (*x2 HSTs or consultants*), intubation (*x1 + assistant*), IV access (*x1*), activating massive haemorrhage protocol, fetching O negative.

### Minute Four

Nursing staff setting up rapid infuser rapidly. Member of staff stays by phone in cubicle, to liaise with transfusion and others. Thoracostomies performed (*correct position*) – no rush of air, lungs are inflated. Intubated easily. Nursing staff able to locate and pass all requested information quickly.

### Minute Five

Clamshell incision made and sternum cut through. Heart is empty but beating, no pericardial tamponade or RV wound. Decision made to infuse 2L as end-point and stop if no output – this should be verbalised.

### Minute Six

Close scenario with narrator fast-forwarding 5 minutes and saying no output returned. Decision to check with team, stop CPR, and record time.

## Debrief and Feedback

You should aim to cover the following points within 5 minutes, then re-run the scenario:

1. After receiving the red call did **Team Leader** allocate roles and tasks in a way that was clearly understood?
2. Did team members do as allocated?
3. On arrival of patient did **Team Leader** maintain team control?
  - a. Calm and clear speech?
  - b. Closed loop communication when tasking?
  - c. Body language that looks relaxed and inspires confidence?
  - d. Listened to handover and extracted the important information?
4. Was the decision to attempt thoracotomy taken quickly?
5. Key roles executed?
  - a. Mini thoracotomy kit provided?
  - b. Patient intubated?
  - c. 2 people performed thoracostomy then clamshell?
  - d. Rapid fluid infuser?
  - e. Major haemorrhage protocol activated and team member allocated to communicate with lab?
6. Did the **Team Leader** accurately interpret information and decide appropriately to stop resuscitation?
7. How did team members help the team pull together?
8. Were there any instances of:
  - a. Equipment issues?
  - b. Human factors negatively impacting communication or patient care?



## Additional Resources

 **Emergency thoracotomy: "how to do it"** (D. Wise et al.)  
<http://bit.ly/emthoracotomy>

 **Procedural Aide Memoires: PAMs (MAGPAS)**  
<http://bit.ly/magpasthoracost>

 **Crack the chest. Get crucified.** (J. Hinds)  
<http://bit.ly/emcritctgc>

 **Epidemiology and aetiology of traumatic cardiac arrest in England and Wales** (E. Barnard et al.) <http://bit.ly/2FeVHyH>

 **Crack to Cure: ED Thoracotomy (EMCrit)** <http://bit.ly/2Dt27IL>

 **Apply Some Pressure: CPR in cardiac arrest from trauma?** (St.Emlyn's) <http://bit.ly/2D9KcWB>

 **Pre-hospital management of life-threatening chest injuries (RCSED)** <http://bit.ly/2yZWzlo>

 **Pre-hospital physician-performed resuscitation procedure that can yield good results** (G. Davies et al.)  
<http://bit.ly/2QrnlcU>

 **Thoracotomy (PHEMcast)** <http://bit.ly/2zCA2KS>

