

# Putting it all together:

1. The arrested patient
2. The shocked patient
3. The breathless patient

# The Arrested Patient

Adapted from Lichtenstein's SESAME  
protocol, with permission

## Summary

1. (Ongoing resus) Clinical assessment: formulate the question
2. Rapid arrest screen
3. Form a working diagnosis
4. Continue resuscitation
5. Re-scan / monitor progress / further investigations

### First, formulate the question

Whenever using any test to assist diagnosis and treatment, remember you are a clinician first. Think: why do I need to use US? In the case of the arrested patient, US can assist with the following two questions:

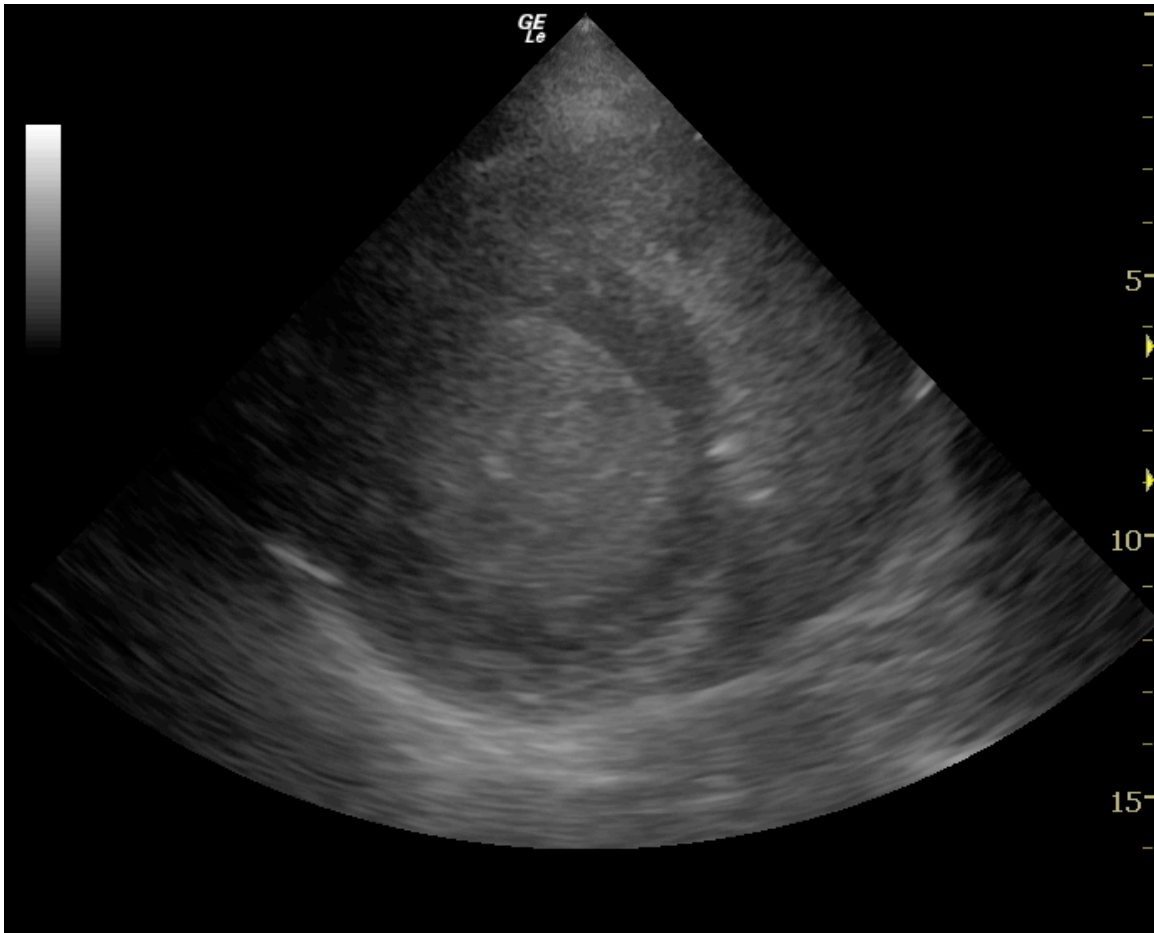
#### a. **Why is the patient arrested: is there a reversible cause?**

US can help ID the following causes:

- tension PTX
- tamponade
- thromboembolism (PE)
- hypovolaemia

It can also ID the frankly non-survivable patients eg ID a heart with all four chambers filled with thrombus. (*see fig*)

*Arrested patient, chambers filled with thrombus, cardiac standstill.  
Parasternal short axis view.*



**b. Have I successfully intubated?** Occasionally it can be difficult to confirm ETT placement (eg if unable to obtain an ETCO<sub>2</sub> trace). By demonstrating bilateral pleural sliding, chest US can rapidly demonstrate that the ETT is correctly placed.

## **How to perform a rapid US screen in the arrested patient**

**Caution: don't get in the way of CPR!**

You need to scan during the pulse check

You have ten seconds!

**CPR**

Pulse check & scan heart

**CPR**

Pulse check & scan lungs

**CPR**

Pulse check & consider options

### **Probe & scanner settings**

As this is a rapid screen (not a formal echocardiogram), use the curved (abdominal) probe on abdominal / FAST preset.

### **Step 1: single view of the heart**

- Window: any can be used, but the subcostal is most likely to be successful if you use the curved probe.
- Probe transverse with probe marker to the patient's right and probe angled cephalad



**Possible results:**

1. Big RV squashing the LV
2. Pericardial fluid
3. Small volume chambers, heart beating
4. Cardiac standstill
5. Inadequate view

**1. Big RV squashing the LV**

A distended, high pressure RV squashing LV is most likely a PE in the context of cardiac arrest.

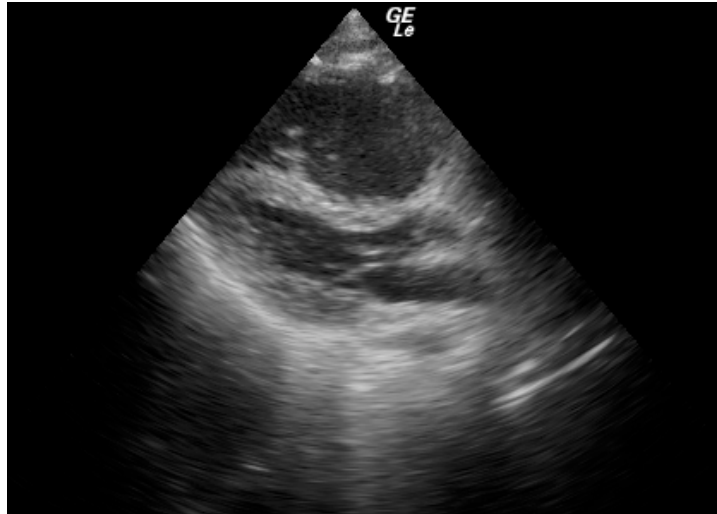
Caveats:

- Is it chronic? Thickened RV wall
- Is it dilated? Intra arrest

Action: consider thrombolysis

If in doubt, consider 3-point DVT scan

*Arrested patient, high pressure RV compressing LV. Massive PE.  
Parasternal long axis view.*



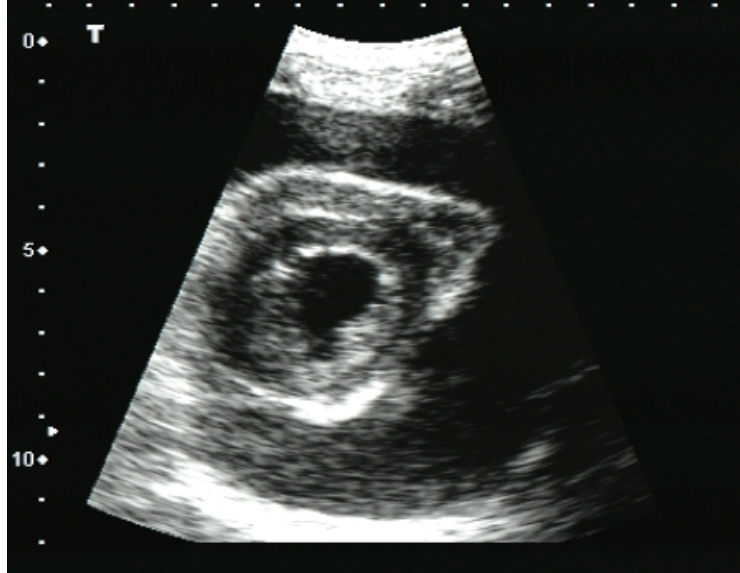
## **2. Pericardial fluid**

In the context of the arrested patient, a substantial pericardial effusion suggests a tamponade, and this calls for immediate pericardiocentesis.

Caveat: it might be an incidental finding, esp likely if small volume.



*Substantial pericardial fluid compressing RV. Pericardial tamponade.  
Subcostal short axis view.*



### **3. Small volume chambers, actively beating heart**

This is pseudo-EMD and mandates ongoing resuscitation with IV fluids while seeking the cause.

### **4. Cardiac standstill**

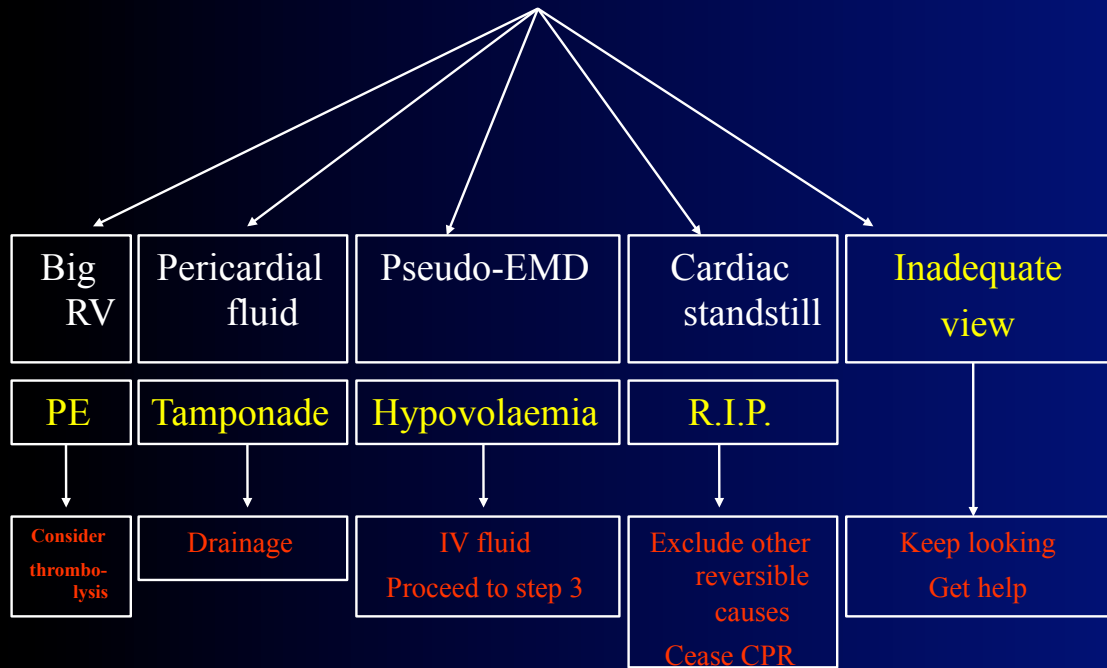
Unless clinical assessment suggests reversibility (eg major hypothermia) cease resuscitation.

### **5. Inadequate view**

If you can't obtain an adequate view, available options:

- try a different window
- try the cardiac probe on the cardiac preset
- get help

## Step 1: single view heart



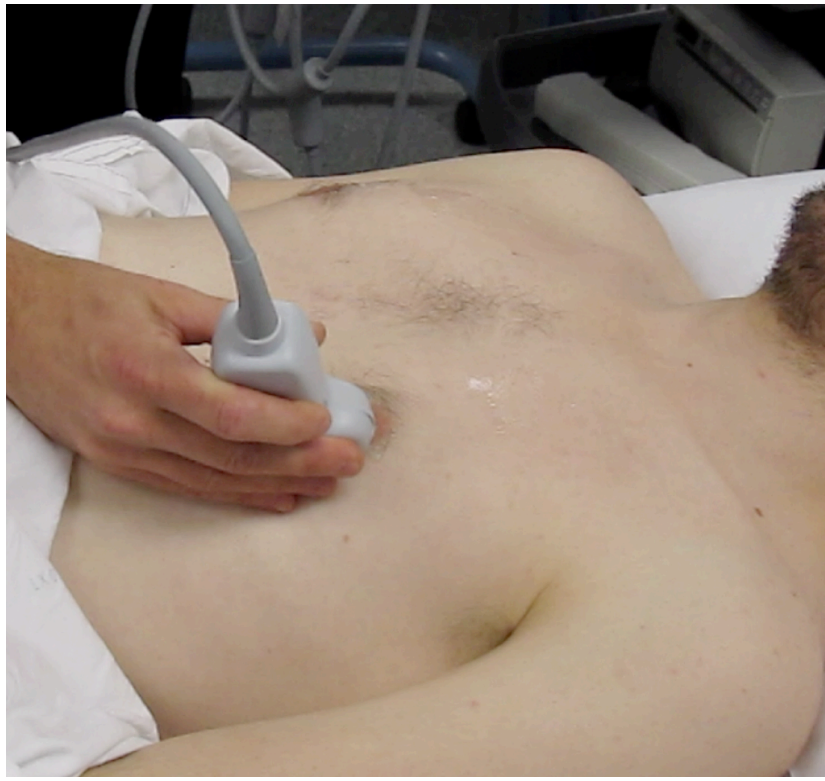
## Step 2 (if required eg if pseudo-EMD): scan the lungs

**What am I looking for?** Lung sliding.

**Why?**

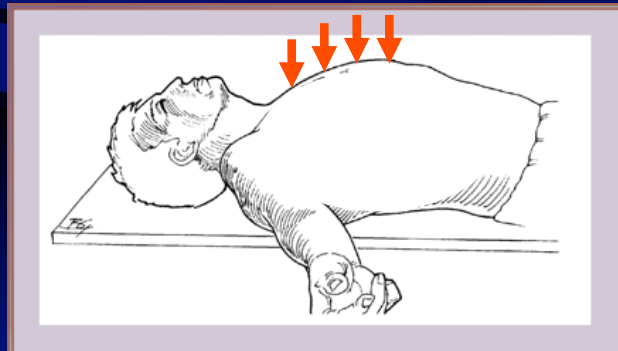
- Tension PTX
- Incorrect ETT placement eg
  - One lung ventilation
  - Oesophageal intubation

**Where shall I look?** The anterior chest.



*TOP TIP: you don't need to be exact*

- If tension PTX, it will fill the hemithorax
- You'll see it anywhere on the anterior chest



14

## Step 2 findings

Neither lung is  
sliding?



Not ventilating!



Check the airway

One lung is not  
sliding?



PTX or  
1 lung ventilation



Check the ETT  
Is there a lung  
Point (PTO)?

Both lungs  
ventilating



No PTX



Go to step 3

### **Step 3 (seldom required)**

**What am I looking for?** Cause of hypovolaemia.

**Why?**

- Patient is in PEA: heart is beating but no output
- Chambers are small volume.

**What am I looking for?** Cause of hypovolaemia.

**Where shall I look?**

- The abdomen: free fluid and AAA.

### **Arrest screen: summary**

- 1 Don't get in the way of CPR
- 2 Ten seconds for each step
- 3 Make a working diagnosis
- 4 Re-scan / monitor progress / further investigations