



THE TELEFLEX  
**ACADEMY**

# Find Your Rhythm: Where is the optimal tip position for CVCs

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- Jim Lacy is an employee of Teleflex

## *Lets see who does what ?*

Press which applies.....

- 1: If you insert CVCs & / or PICCs
- 2: If you care for and manage CVCs & PICCs
- 3: I don't know what a CVC is.....

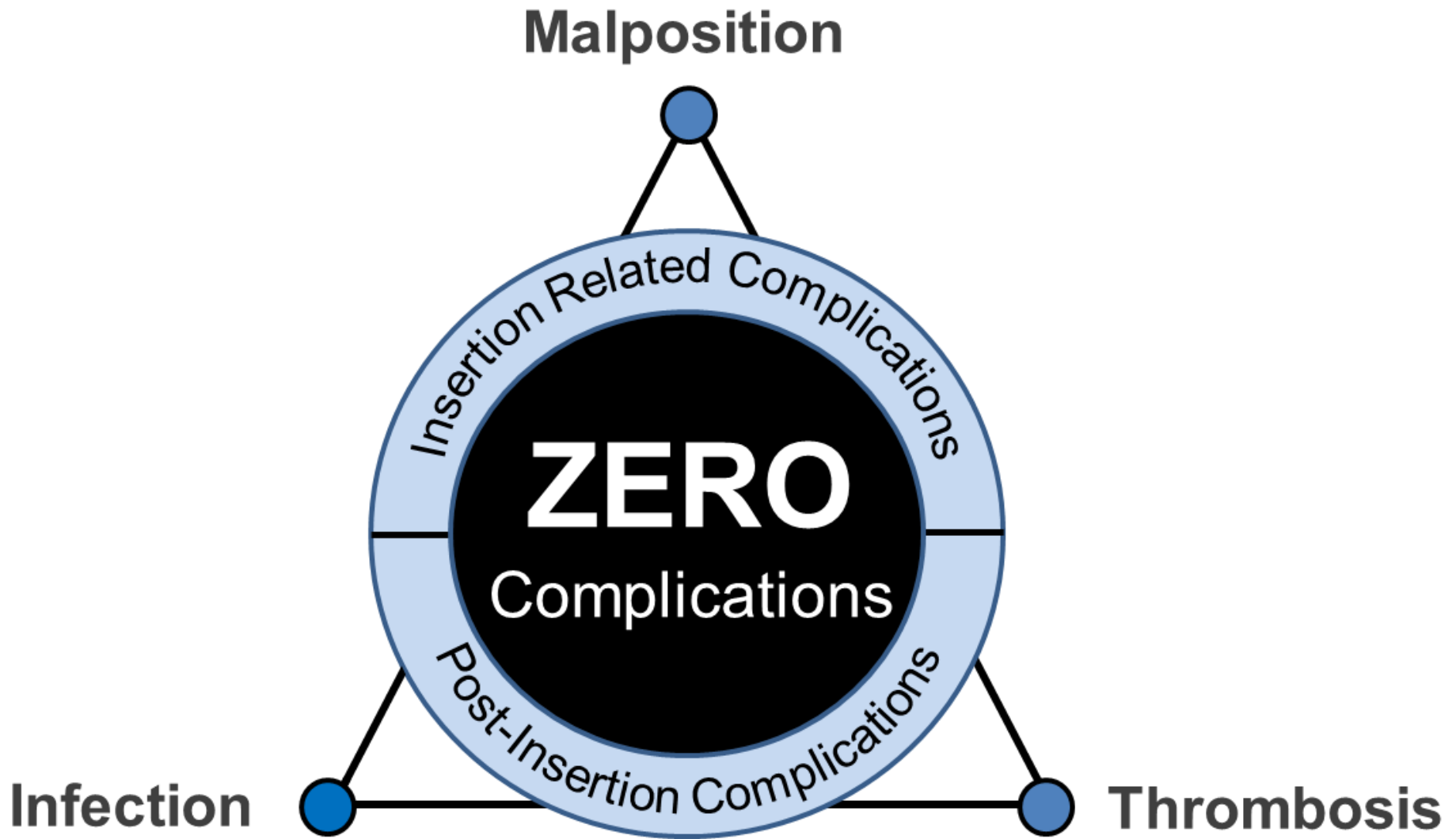
## ***Question***

**Do you or the person you assist use ultrasound for central line insertion?**

1. Yes
2. No
3. Depends on inserter

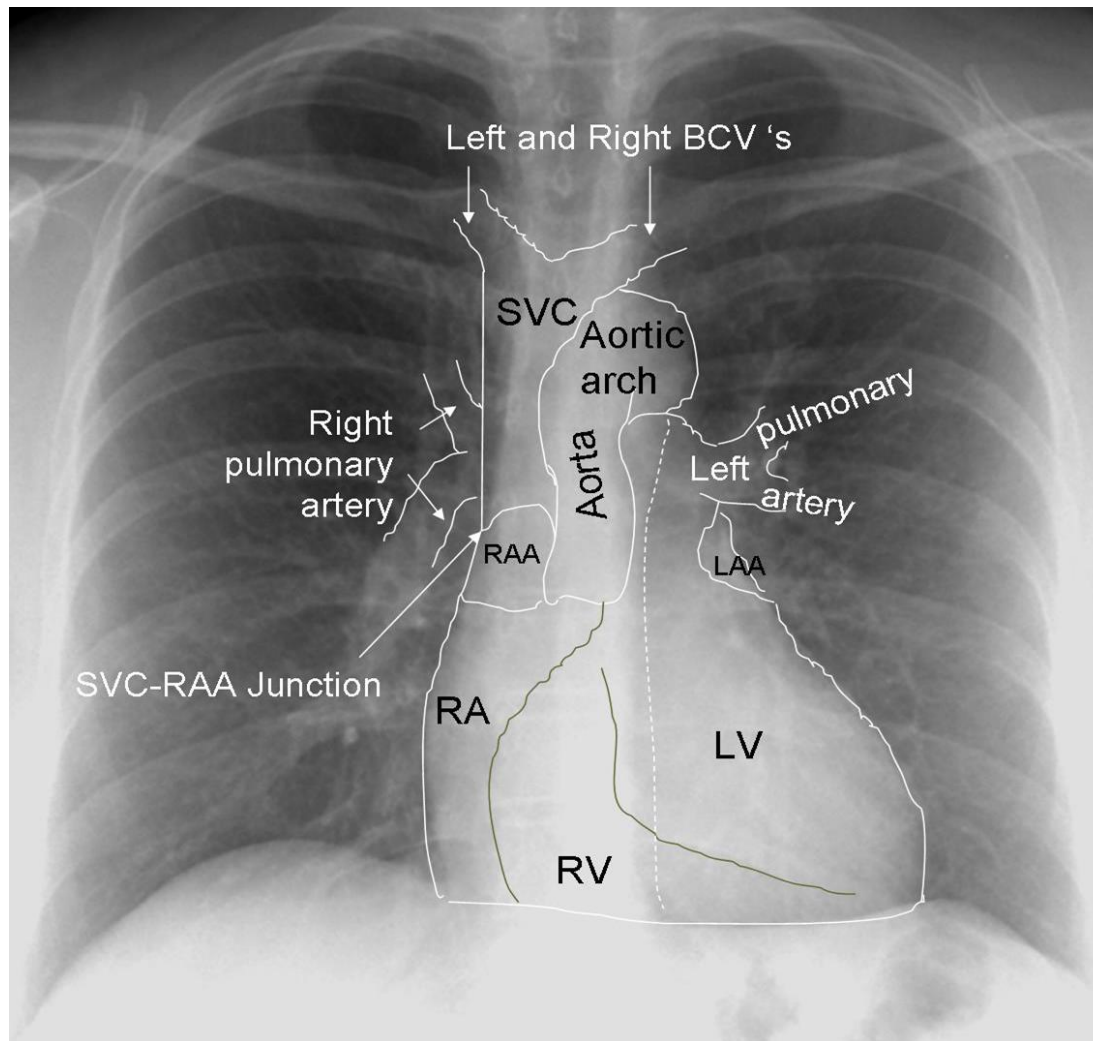
# *CVC Insertion*

## **RaCeVA** **Rapid Central Vein Assessment**



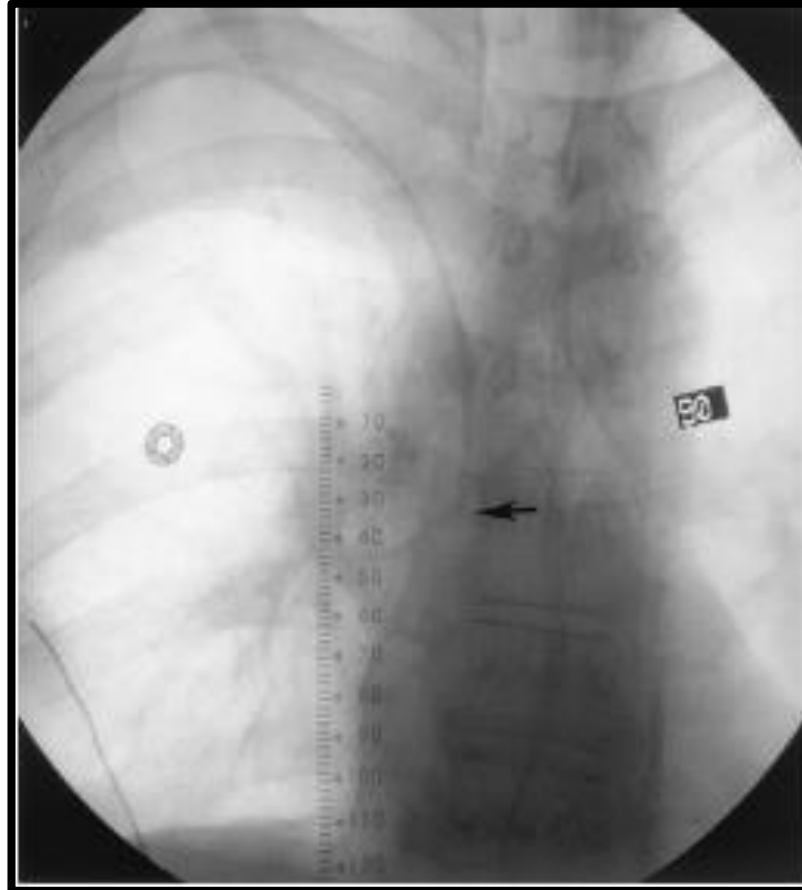
Group	Guideline	Method of Confirmation
NSW Health Policy (2011) (Review September 2016)	It is reasonable to expect that a CVC tip should be: 1. in the superior vena cava 2. above the cephalic limit of the pericardial reflection 3. at a level corresponding to the carina on a chest radiograph	Chest X-Ray
INS (2016) (Infusion Nurses Society)	Lower segment of SVC at or near CAJ	1.ECG 2. Chest X-ray
SIR (2000) Society for Interventional Radiology	SVC / RA Junction	1. Fluoroscopy 2. Chest X-ray
AAGBI (2016) (Association of Anaesthetists of Great Britain & Ireland)	Lower SVC or upper RA	1.Fluoroscopy 2.ECG 3.Chest X-ray
ASA (2012) (American Society of Anaesthetists)	No recommendation	-Acknowledge ECG as a effective method of confirmation -Chest X-ray & fluoroscopy are useful
WoCoVa Consensus Statement (2013)	At or near the CAJ	<ul style="list-style-type: none"> <li>• Fluoroscopy</li> <li>• ECG</li> <li>• Chest X-Ray</li> </ul>

# Proper Tip Position



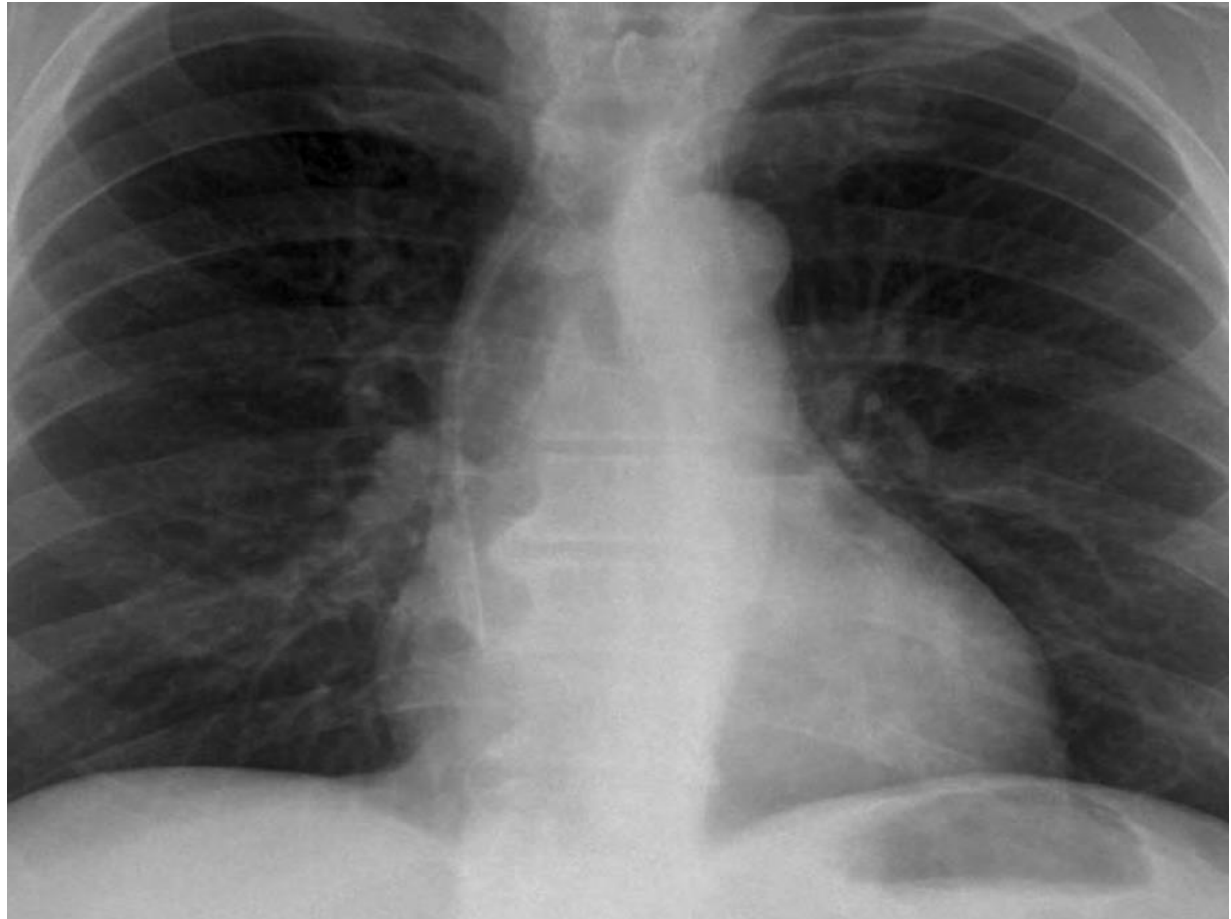


## *Where is the Tip?*



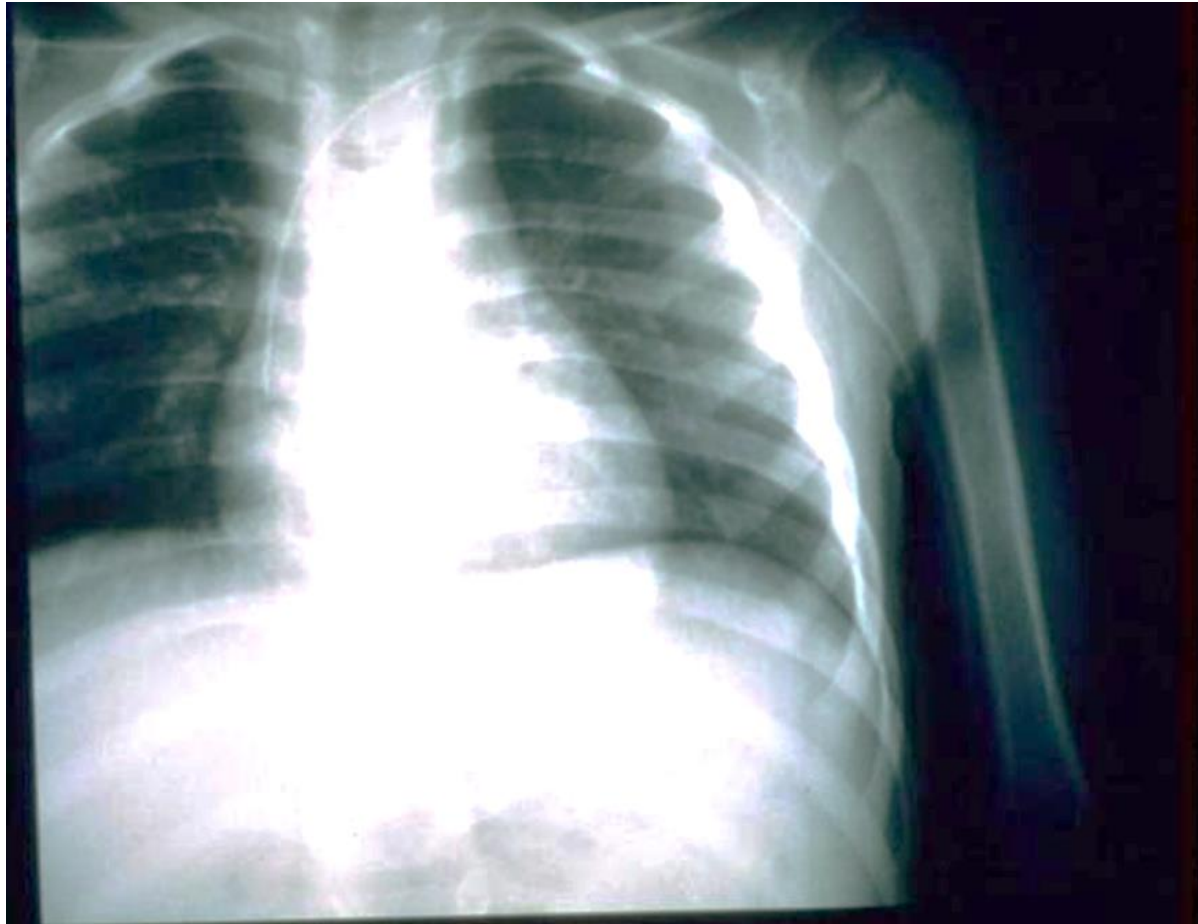
1. Mid SVC
2. Lower 1/3 SVC
3. Right Atrium

## *Where is the tip?*



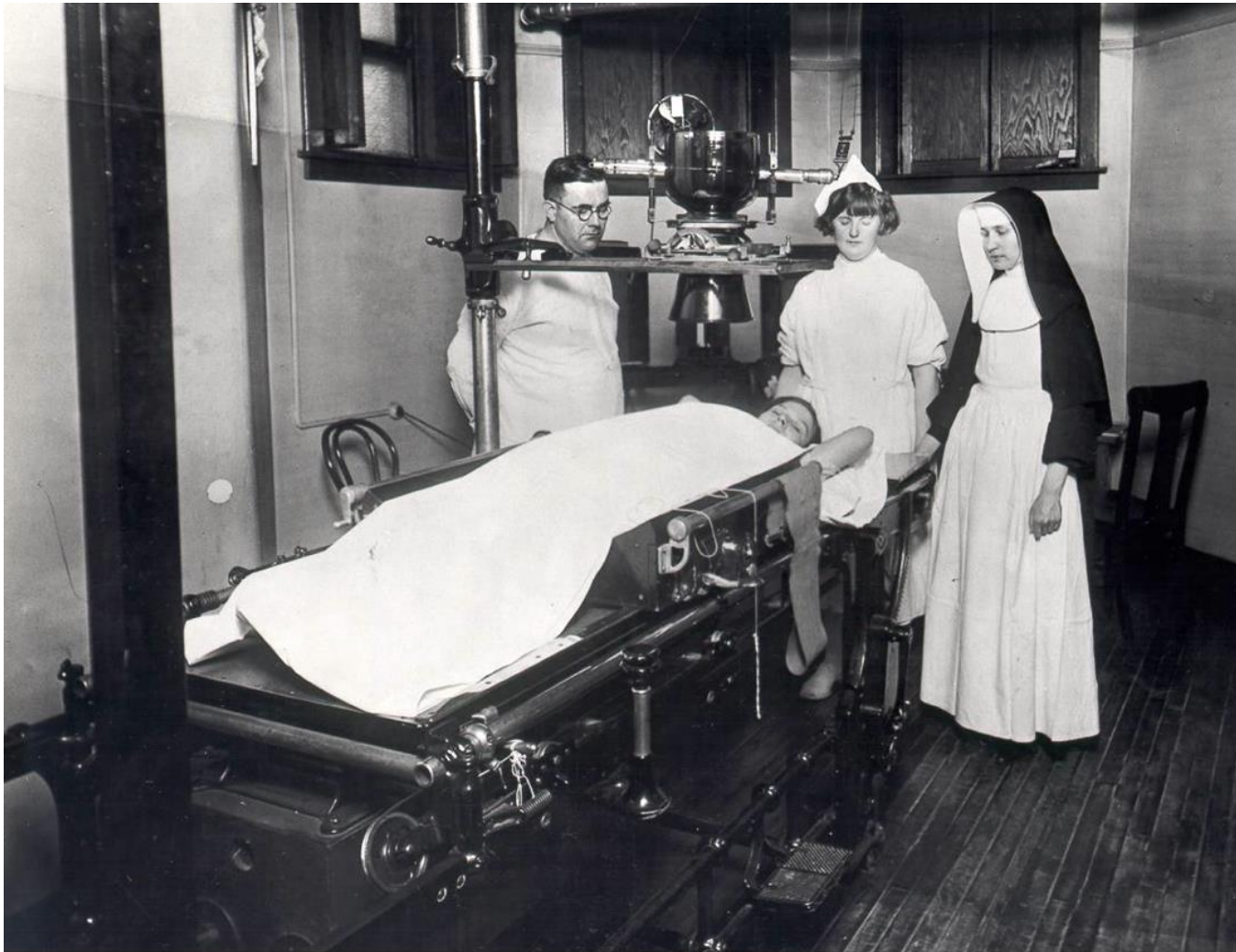
1. Proximal SVC
2. Distal SVC at Cavoatrial Junction
3. Right Ventricle

## *Where is the Tip?*



1. Proximal SVC
2. Distal SVC at Cavoatrial Junction
3. Right Atrium

# Is X-Ray “The Gold Standard”



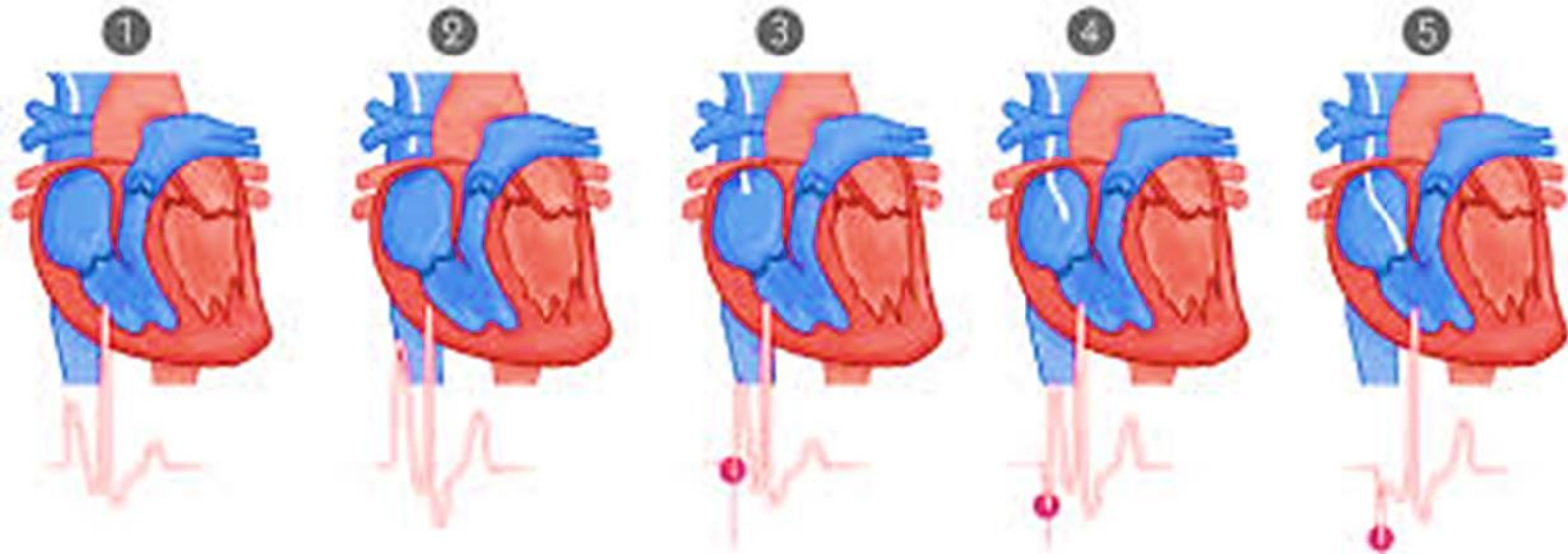
## *Issues with X-Ray*

- Not real-time unless fluoroscopy
- Excessive time requirement (treatment delays, decreased throughput)
- X-ray exposure to patient and staff
- Costly (machine, staffing, interpretation)
- Repeat x-rays often needed (Average > 2/case)
- Interpretation based on grayscale shadows of vascular, airway, bony landmarks

## *Technologies for Tip Location*

1. Transesophageal Echocardiogram (TEE)
2. Fluoroscopy
3. ECG
4. Chest X-Ray
5. Make a guess

## ECG for Tip Location



P-wave increasing as catheter approaches cavoatrial junction

P-wave at maximum amplitude indicating catheter tip in proximity to the top of the cavoatrial junction

P-wave with small negative deflection indicating catheter tip in proximal right atrium

Biphasic P-wave indicating catheter tip in mid-right atrium

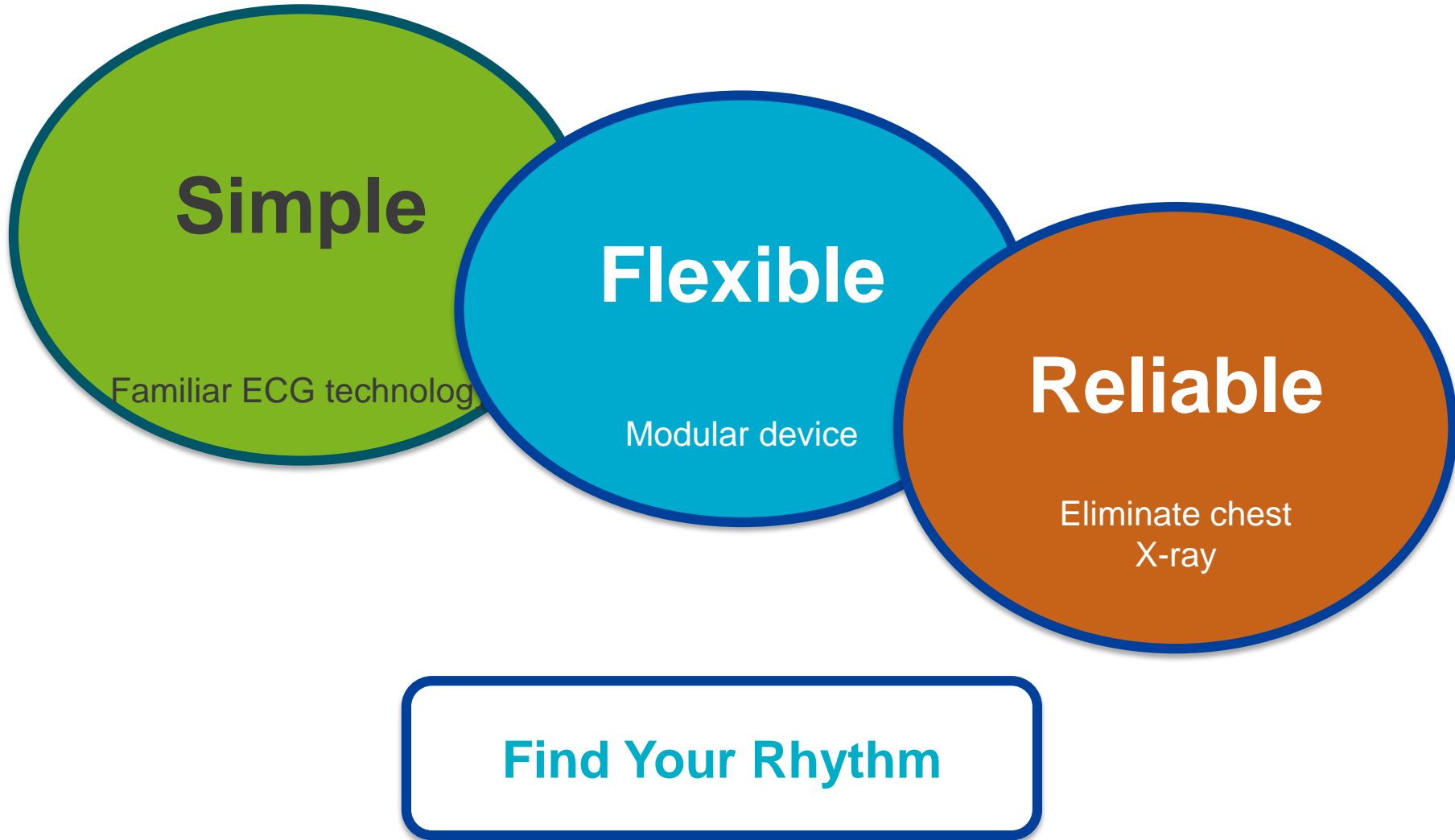
Inverted P-wave indicating catheter tip approaching right ventricle

## *Issues with ECG*

- Absent P-Wave
- Select Atrial Arrhythmias
- Patient has a pacer
- It does not discern artery vs. vein

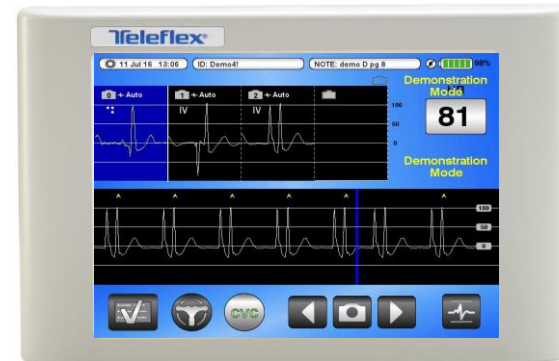


## Arrow VPS Rhythm



## VPS Rhythm<sup>™</sup> Device

- Basic ECG only - simple to use
- Incorporates familiar ECG modality
  - Requires recognition of a normal P-wave
- Tip Confirmation Checklist
  - Aspirate & flush
  - Record baseline
  - Record Maximum P- wave
  - Record biphasic P-wave



**Find  
Your  
Rhythm**

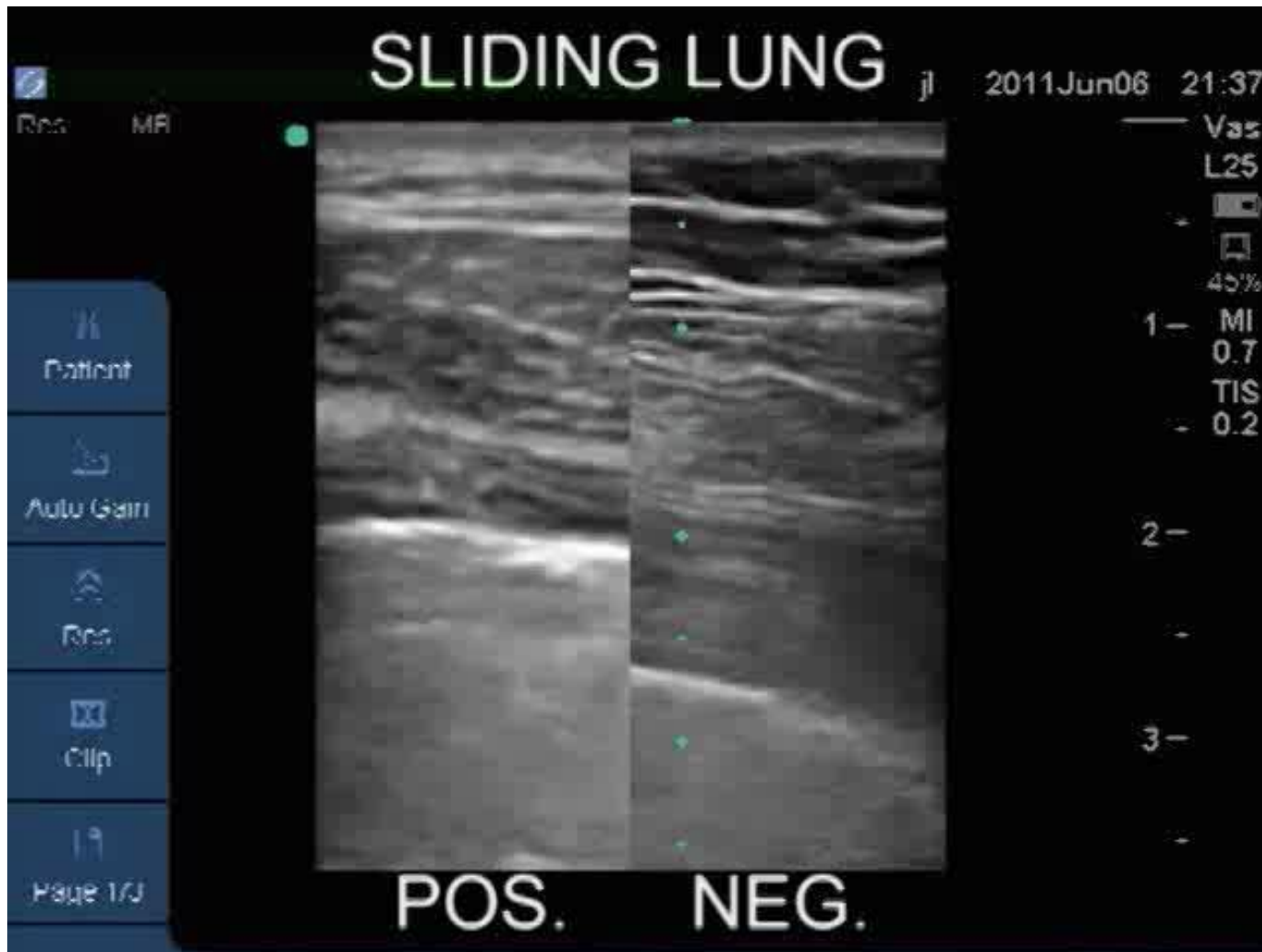


## Questions

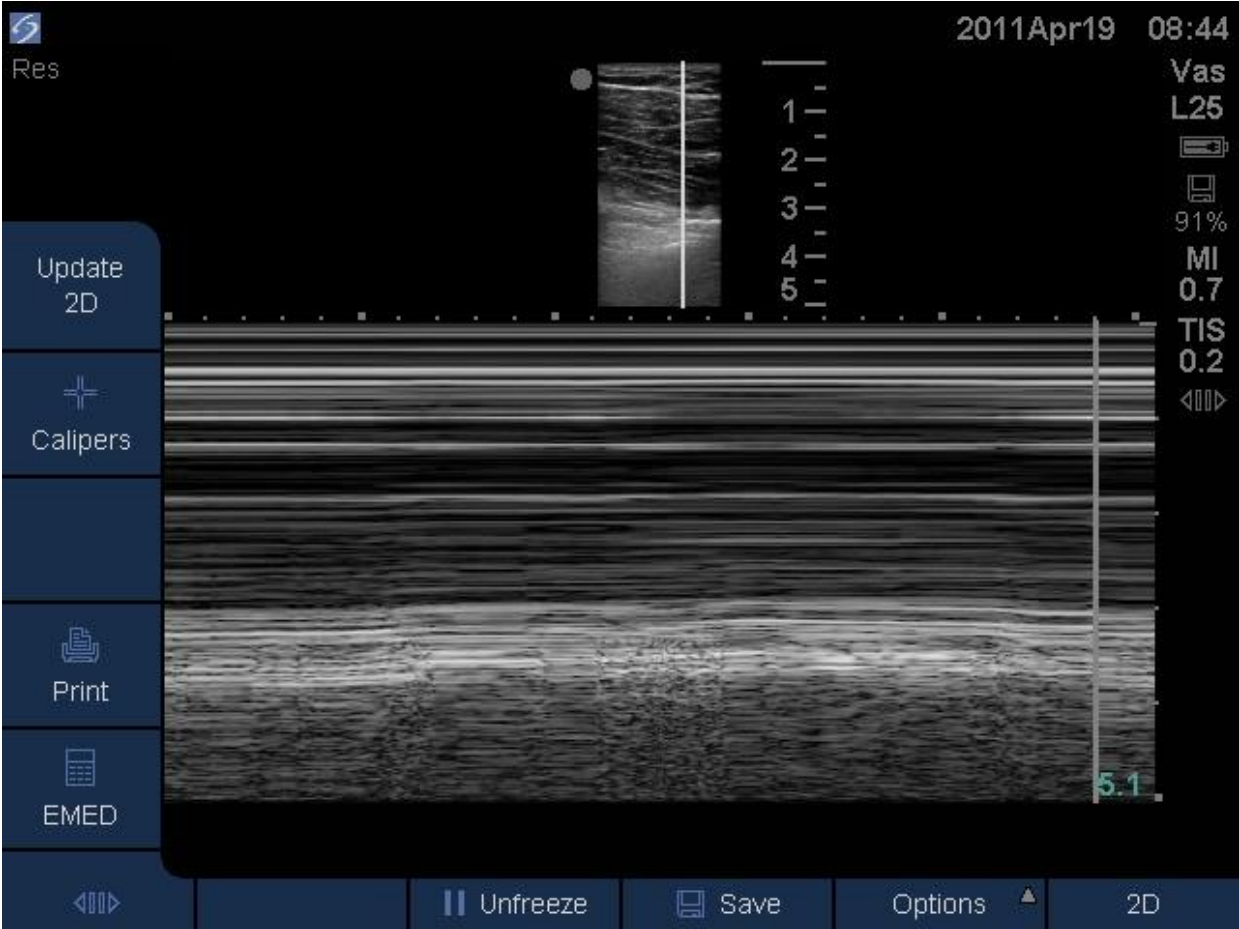
How can I rule out a pneumothorax without chest x-ray?

1. Listen to the patients lungs.
2. No need to rule out a pneumothorax.
3. Use ultrasound.

# Sliding Lung



# Sandy Beach



# Sliding Lung



***Thank You***

*Thank You*