QUIZ 25th October 2017 (answers below)

1. **What is the RUSH exam?**

2. **What does the ultrasound related acronym HIMAP represent?**

3. **What is the deep sulcus sign on chest Xray?**

4. **What is the triangle of safety for chest tube insertion?**

5. **Describe and interpret the following ECG.**

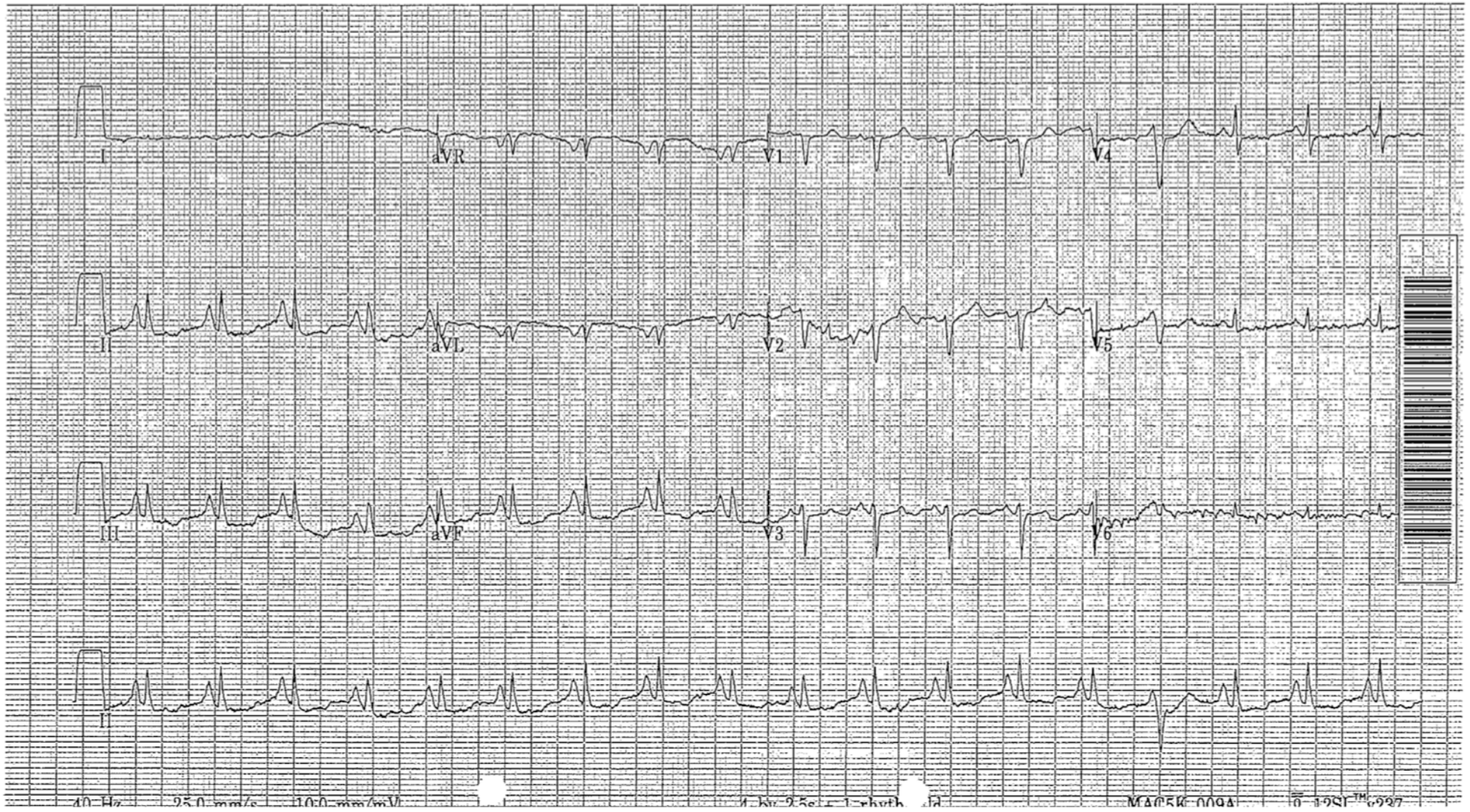
Female

Vent. rate	109	bpm
PR interval	112	ms
QRS duration	66	ms
QT/QTc	372/500	ms
P-R-T axes	85 86	-67

*** Poor data quality, interpretation may be adversely affected
Sinus tachycardia with occasional premature ventricular complexes
Right atrial enlargement
ST & T wave abnormality, consider inferior ischemia
Abnormal ECG

Test ind:

Unconfirmed



QUIZ answers 25th October 2017

1. **What is the RUSH exam?**

The RUSH exam is Rapid Ultrasound in Shock where bedside ultrasound is used to determine the cause of a shocked state. The RUSH exam was initially described by Weingart in 2006 and then published by Perera in 2010. Weingart uses a HIMAP approach (see below) whereas Perera uses a Pump, Tank, Pipes approach.*

Table 1
Rapid Ultrasound in SHock (RUSH) protocol: ultrasonographic findings seen with classic shock states

RUSH Evaluation	Hypovolemic Shock	Cardiogenic Shock	Obstructive Shock	Distributive Shock
Pump	Hypercontractile heart Small chamber size	Hypocontractile heart Dilated heart	Hypercontractile heart Pericardial effusion Cardiac tamponade RV strain Cardiac thrombus	Hypercontractile heart (early sepsis) Hypocontractile heart (late sepsis)
Tank	Flat IVC Flat jugular veins Peritoneal fluid (fluid loss) Pleural fluid (fluid loss)	Distended IVC Distended jugular veins Lung rockets (pulmonary edema) Pleural fluid Peritoneal fluid (ascites)	Distended IVC Distended jugular veins Absent lung sliding (pneumothorax)	Normal or small IVC (early sepsis) Peritoneal fluid (sepsis source) Pleural fluid (sepsis source)
Pipes	Abdominal aneurysm Aortic dissection	Normal	DVT	Normal

Abbreviations: DVT, deep venous thrombosis; IVC, inferior vena cava; RV, right ventricle.

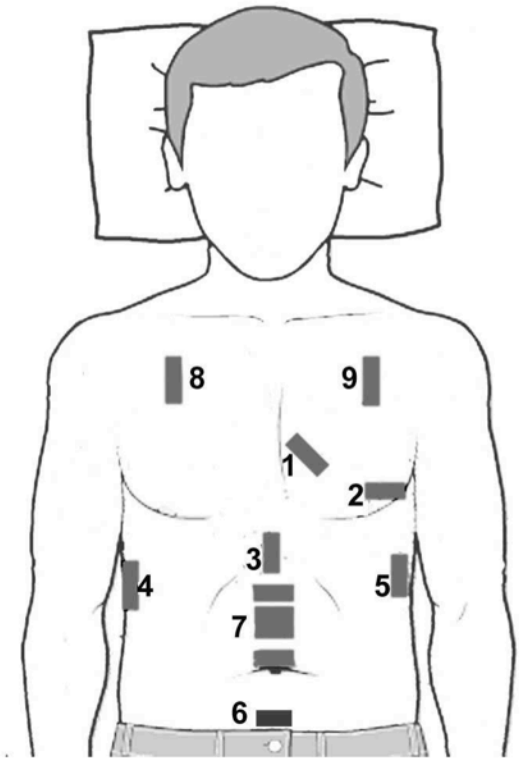
*Perera et al, The RUSH exam: Rapid Ultrasound in Shock in the evaluation of the Critically Ill Emerg Med Clin North Am. 2010 Feb;28(1):29-56

2. **What does the ultrasound related acronym HIMAP represent?**

Scott Weingart's approach to the RUSH exam follows the HIMAP mnemonic

H *Heart*
I *IVC*
M *Morrison's Pouch*
A *Aorta*
P *Pneumothorax*

The sequence of views to follow HIMAP



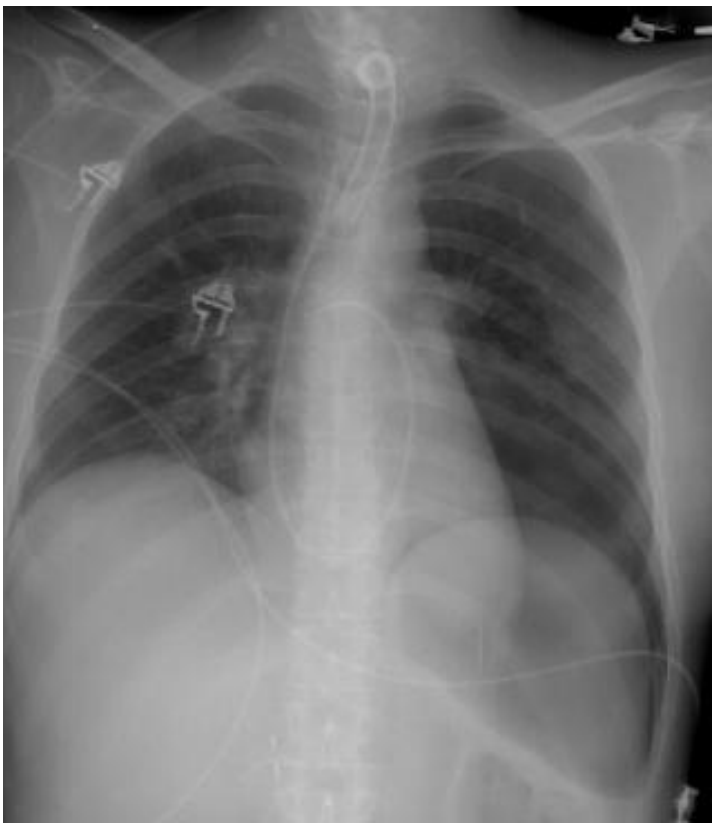
RUSH(ed) Exam Sequencing

1. Parasternal Long Cardiac View
2. Apical Four-Chamber Cardiac View
3. Inferior Vena Cava View
4. Morison's with Hemothorax View
5. Splenorenal with Hemothorax View
6. Bladder View
7. Aortic Slide Views
8. Pulmonary View
9. Pulmonary View

Use Curvilinear Array for all Views
Add in a search for Ectopic Pregnancy and DVT depending on clinical circumstances

Weingart et al www.emcrit.org

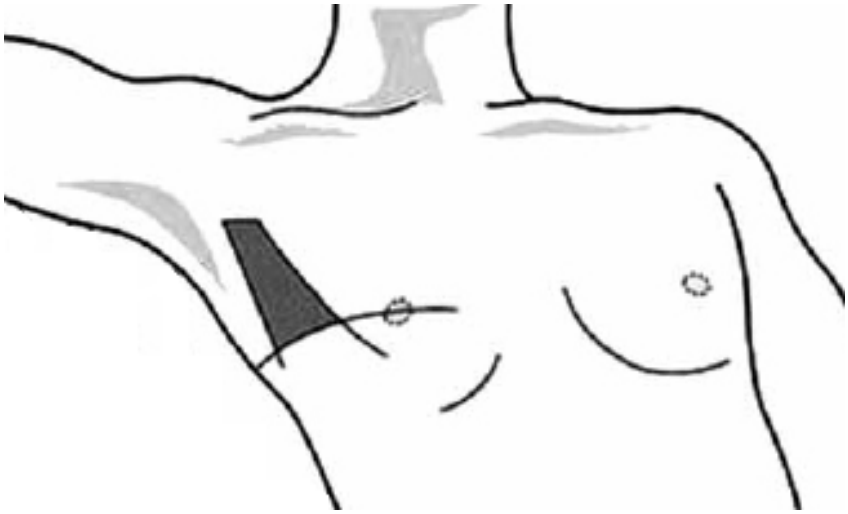
3. What is the deep sulcus sign on chest Xray?



In a supine patient with a pneumothorax, the air collects anteriorly and basally in the pleural space.
On CXR, this can give the appearance of a deep costophrenic angle; a "deep sulcus" as demonstrated on the left hemithorax in this CXR.

4. What is the triangle of safety for chest tube insertion?

Above the nipple level
Anterior to mid axillary line
Posterior to pectoralis major



5. Describe and interpret the following ECG.

Sinus tachycardia 109/min
VEB 4th to last

Tall P waves at 5mm in II
More than 2.5mm is indicative of right atrial enlargement

Lead I is a flat line
A flat line is always suspicious for a limb lead reversal
In the case of flat lead I, there could be bilateral arm/leg lead reversal (ie, the arm leads on the legs, and leg lead on the arms) especially as aVR and aVL are identical and II, III and aVF are identical (flat Einthoven's triangle)

Axis in normal range, but this could be misrepresented by malpositioned leads

QRS is narrow with no signs of RVH
TWI inferior leads (but these 3 are identical)

→ *P pulmonale*
Limb lead misplacement
Possible inferior ischaemia

This patient presented with shortness of breath on background of severe CAL.