



# **CASE PRESENTATION**

## **MRS T**

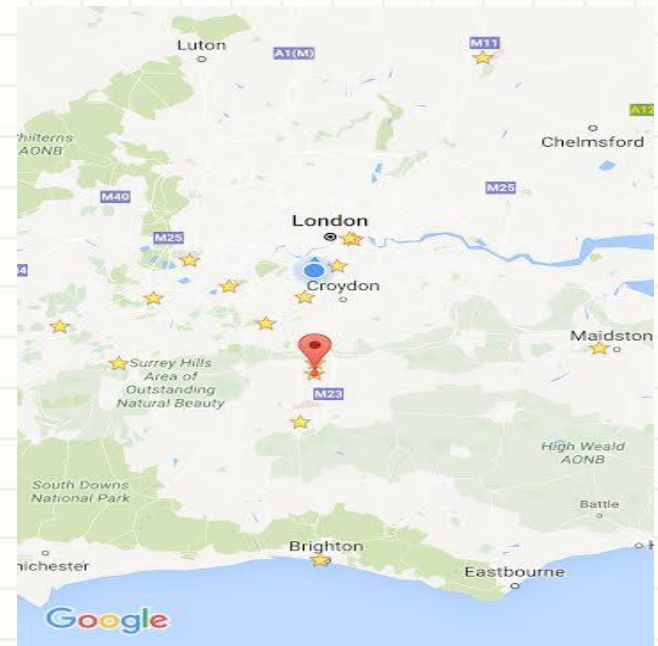
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# East Surrey Hospital

- Acute services for a large catchment area of approximately half million people
- Acute Medical Unit
  - 33 beds and 7 assessment bays
  - 7 Consultants
  - 3 AIM trainees



# Mrs T

- **03:00**
- 77 year old Japanese lady
- **PMH:** Hypertension
- **DH:** Amlodipine 5mg
- **SH:** Non Smoker, Nil ETOH, No recent travel

# Mrs T

- A: Intact
- B: RR **30** Sats **92%** on **15L** Decreased AE bases
- C: Cool peripheries HR **120** BP 120/80 **JVP elevated**
- D: GCS 15/15 °C 37.5
- E: Abdomen SNT, Calves soft

What Investigations would you like to do?



# Investigations

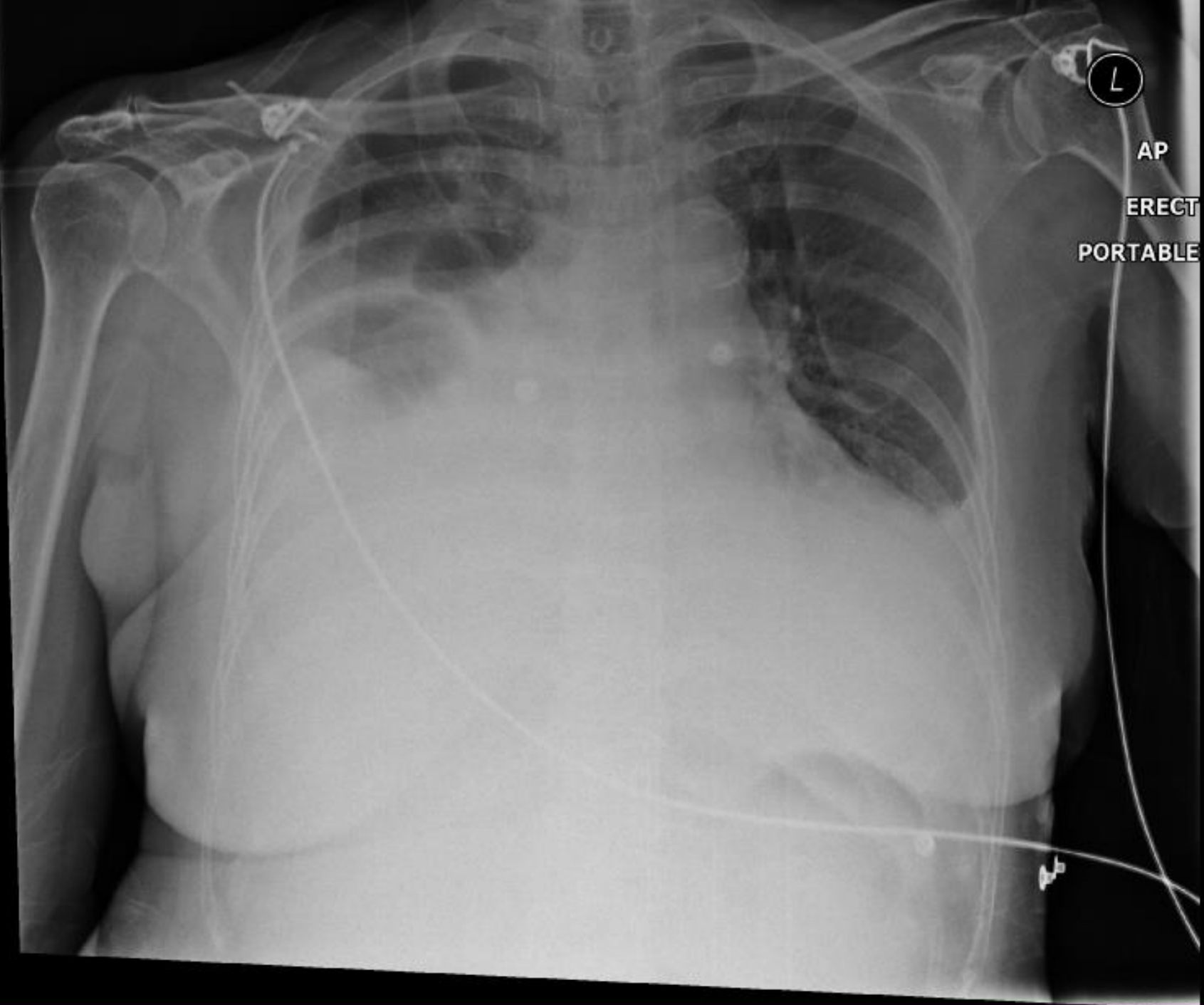
- ABG on 15L
  - pH 7.13, pCO<sub>2</sub> 4.1, pO<sub>2</sub> 10.1, Na 109, K 5.3, glc 8.3, lactate 8.8, BE -17, HCO<sub>3</sub> 10.9
- Haematology
  - Hb 126, plt 291, neut 12.2, INR 1.8
- Biochemistry
  - Na 110, K5.3, Ur 12.2, Crt 132, eGFR 34, Ca 2.24, phos 2.31, albumin 43, Normal LFT, CRP 71, WCC 14.9, Troponin 66 (normal <14)

L

AP

ERECT

PORTABLE



# Thoughts?





# Impression

1. Severe sepsis

?chest

T1RF ?atypical pneumonia

2. Dehydration

3. Severe metabolic acidosis

4. Element of cardiac failure

# Plan

- Fluid resuscitate
- Cultures
- Broad spectrum antibiotics
- Inform Intensive Care: NIV, need for intubation
- **03:30** NIV initiated: CPAP. PEEP 6, 15L O<sub>2</sub>, TV 460
- Within 30mins sats from 89 → 98%



# Mrs T

4:15 am

- Fast bleeped. More tachypnoeic. BP 80/40.
- Lactate not improving with antibiotics and fluids



**What would you do next..?**

# Focussed Echocardiography



# Focussed Echocardiography



**Why yes, I am a bit stressed.**



**Why do you ask?**

# Mrs T

## 04:30

### Cardiac Arrest

- PEA - 5 cycles ROSC
- VT/VF – 4 further cycles
- 4x adrenaline given
- Severe Acidosis
- (PH 6.8, Lac 9)
- ROSC only after
  - 500ml bloody aspirate from pericardium
- Intubated and Ventilated
- R chest drain Inserted
- Transferred to ITU



# Diagnosis

Mrs T 77 year old Japanese lady

1. Cardiac Tamponade with right ventricular collapse
2. Sepsis
3. Large Pleural Effusion



# Progress

- Discharged from hospital 3 weeks after admission
- Readmitted Worsening SOB
  - Increasing pericardial and pleural effusion
  - Urgently transferred for a **pericardial window**
- CT TAP: Pericardial effusion now much smaller volume. Bilateral pleural effusions of moderate to large volume. These appear not to have changed significantly in volume since the previous scan. RUL lung mass.

# Cytology

- Pleural fluid
  - LDH 1600, protein 16, scanty wcc
- Pericardial fluid
  - Atypical Cells
  - Immunohistochemistry shows that these cells are positive for TTF1, CAM 5.2, CK7, EMA, E-cadherin and BerEP4; are focally positive for CEA; and are negative for calretinin, WT1, CK5,CK20, CD68 and CD45.
  - The features are consistent with adenocarcinoma, consistent with a lung origin
- Pericardial Fluid
  - EGFR Result: Mutation Detected

# Diagnosis

- Lung Adenocarcinoma (eGFR positive)
  - Pleural and Pericardial Effusion
  - RV Collapse and Cardiac Tamponade

# Cardiac Tamponade

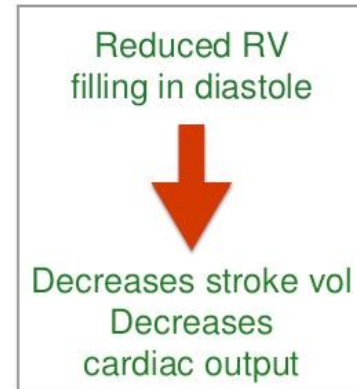
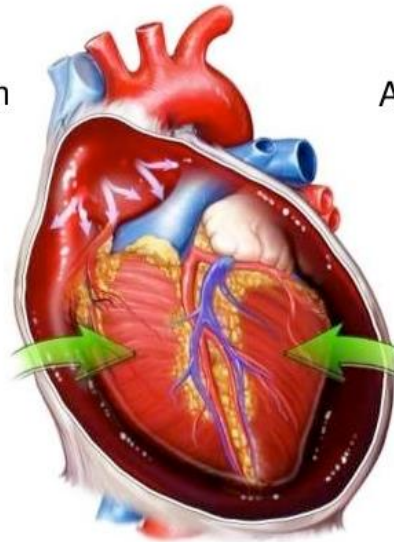
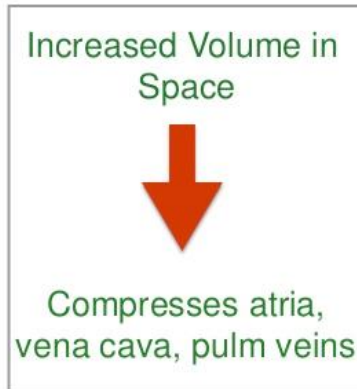
## Cardiac Tamponade

### Factors Leading to Tamponade

Rate of accumulation  
Amount of fluid in pericardium  
Compliance of pericardium

### Pathophysiology

Rate of accumulation  
Amount of fluid in pericardium  
Compliance of pericardium



RV  
Collapse



Cardiac Arrest

# Pericardocentesis

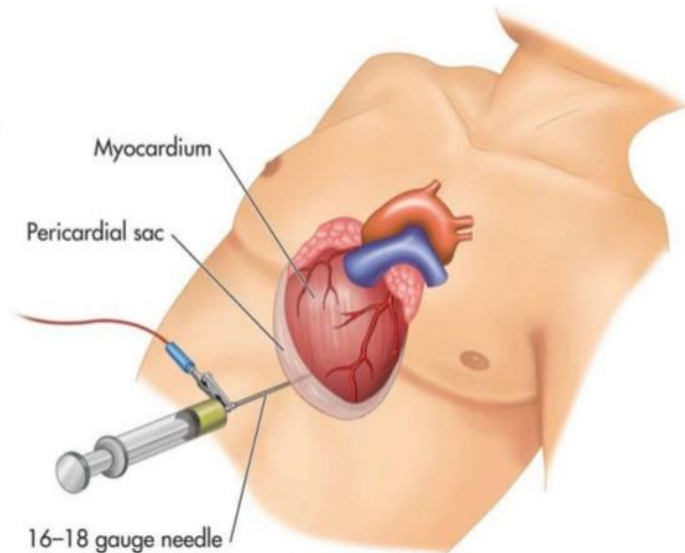
## Pericardiocentesis

### Subxiphoid Approach

Needle inserted btwn the  
xiphoid process and L  
costal margin  
30° to 45° angle

Aim for L mid-clavicle

Directs needle toward  
Anterior wall of R  
ventricle



# Complications of Pericardocentesis

- Myocardial damage
- Vascular injury
- Pneumothorax
- Air embolism
- Arrhythmia

# Benefits of Ultrasound Guided Method

- Can assess depth
- Size of effusion
- Location
- Loculated or not
- Reduce risk of damaging other structures/complications if under direct vision
- Greater chance of successful drainage



# Point of Care Echocardiography

- Point of care ultrasound is becoming an increasing field
- Focussed echo is an alternative to full departmental echocardiography
- A number of standards have been developed
  - FEEL, ELS, FATE, FAME, FICE

# Focussed vs Formal Echo

Focussed echo (FICE)	BSE echo
<i>Relatively</i> quick to learn	Difficult qualification to achieve
Rapid to perform (≈10 minutes)	Approx 40 minutes when experienced
Available 24 hours a day (potentially)	Usually working hours
Limited information obtained	Full assessments including valves, vegetations
Potential to miss pathology	Unlikely to miss visualisable pathology
BSE approved training pathway	BSE approved training pathway

# FICE Proforma

Operator: \_\_\_\_\_

(Any documents leaving clinical area must be anonymised)

Haemodynamics:

Image quality ( )  
 Good  
 Acceptable  
 Poor

	Circle YES	NO	U/A –Unable to assess U/A
Is the LV function significantly impaired? Notes:			
Is the LV dilated? Notes:	<u>YES</u>	NO	U/A
Is the RV dilated or severely impaired? Notes:	YES	NO	U/A
Is there pericardial fluid? Notes:	YES	NO	U/A
Is there evidence of hypovolaemia?? <del>YES</del> Notes:	<u>YES</u>	NO	U/A
Is there pleural fluid? Notes:	YES	NO	U/A

Other comments:

Conclusion and clinical significance:

Is expert referral required? Y N  
 Signed: \_\_\_\_\_ Counter signed: \_\_\_\_\_

*This is a training report only, and should not be used to influence clinical management without expert verification*

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# Summary

- Importance of basic echo skills in assessing the acutely unwell patient
- Importance of training juniors in recognizing tamponade
- FEEL (Focused Echo Evaluation in Life Support)
- FICE (Focussed Intensive Care Echocardiography)
- Realize focussed echo does have limitations

# Acknowledgements

- Society of Acute Medicine / ESIM
- Dr James Sneddon - Cardiologist East Surrey Hospital
- Dr Jo Hulley, Dr Tehmeena Khan – Trainees at ESIM

# References

- <http://www.feel-uk.com/index.php>
- <http://www.ics.ac.uk/ics-homepage/accreditation-modules/focused-intensive-care-echo-fice/>



**QUESTIONS?**