NHS
Health Education Thames Valley

PNEUMONIA AND SEPTIC SHOCK

MODULE: Intensive Care Medicine / Trauma

TARGET: ALL ACCS, CORE MEDICAL, ANAESTHETIC, ICM, EM & FOUNDATION TRAINEES

BACKGROUND:

This scenario deals with one of the commonest presentations faced by trainees in ICM. Pneumonia remains a leading cause of admission to the ICU. Severe sepsis and septic shock are significant worldwide healthcare problems and a major cause of mortality and morbidity. Management of sepsis has several time-critical steps which can have a significant impact on outcome.

RELEVANT AREAS OF THE INTENSIVE CARE MEDICINE CURRICULUM

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Domain 12: Professionalism
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Collaborates and consults; promotes team-working
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Takes responsibility for safe patient care

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INFORMATION FOR FACULTY

LEARNING OBJECTIVES:

- Assessment and stabilisation of the critically ill patient – local protocols for sepsis
- Rapid sequence induction in the unfamiliar ward environment
- Safe preparation for and conduct of transfer

SCENE INFORMATION:

- Location: Clinical Decisions Unit

EQUIPMENT & CONSUMABLES

- Mannequin: On CDU Bed.
  O2 via Non-rebreath facemask
  SpO2 monitor on
- Transfer equipment
- Airway equipment
  Laryngoscopes
  ETTs & Bougies
  LMAs
- Portable Monitor

PERSONS REQUIRED

Junior Trainee
Outreach nurse
Ward nurse (optional)
Senior Trainee

PARTICIPANT BRIEFING: (TO BE READ ALOUD TO PARTICIPANT)

You have been bleeped to go and assess a patient on CDU who the medical registrar feels may require admission to ICU.

FACULTY BRIEFING:

62 yr old man with severe community-acquired pneumonia was admitted last night. Participant is the ICU duty doctor called to assess the patient because he has deteriorated overnight and is now hypoxic with septic shock. The patient requires resuscitation and mechanical ventilation.

'VOICE OF MANIKIN' BRIEFING:

Coughing and having difficulty breathing. Only able to give a history in short broken sentences.

PMHx:
Polymyalgia Rheumatica & Hypertension

Drug History: NKDA
Prednisolone 5mg od
Ramipril 10mg od
Co-codamol % Diclofenac prn
(Commenced co-amoxiclav and enoxaparin yesterday).

Social History: Smoker: 20 cigarettes a day, Alcohol: bottles of wine per week

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'IN-SCENARIO PERSONNEL' BRIEFING:

CDU NURSE:
Busy but helpful.

The patient was admitted last night on treatment for pneumonia. He was breathless but stable. Overnight he has required increasing oxygen requirements and this morning is really struggling for breath on maximal oxygen therapy. The medical registrar has just seen the patient, but has been called away to another sick patient.

Suggests calling outreach if candidate does not do so after a few minutes.

OUTREACH NURSE:
Offer suggestions if participant appears to need guidance:
- Local sepsis bundle
- CXR/ABG
- Fluid resuscitation – but patient will likely need vasopressor support.

ADDITIONAL INFORMATION

RADIOMETER ABL 9000 SERIES

ABL900 ED			00:00:00	08-1-2013
PATIENT REPORT	Syringe	S195uL	Sample#	90.....

Patient ID			
Patient First Name			
Patient Last Name			
Date of Birth	62 years old		
Sample type	Arterial		
Fi O_2	1.0		
Department	ED		
Operator			

Blood Gas Values

pH	7.19		[7.340 - 7.450]
pCO2	3.1	kPa	[4.70 - 6.00]
pO2	5	kPa	[10.0 - 13.3]
pO2(A-a)e		kPa	

Oximetry Values

ctHb	11	g/dL	[12.0 - 16.0]
sO_2	79	%	[95.0 - 98.0]
fO_2Hb		%	[94.0 - 99.0]
fCOHb			[-]
fHHb		%	[-]
fmetHb		%	[0.02 - 0.06]
Hctc	0.34	%	

Electrolyte Values

cK+	3.2	mmol/L	[3.0 - 5.0]
cNa+	126	mmol/L	[136 - 146]
cCa^{2+}	1.06	mmeq/L	[1.15 - 1.29]
cCl-	110	mmol/L	[98 - 106]

Metabolite Values

cGlu	4.8	mmol/L	[3.5 - 10.0]
cLac	4.0	mmol/L	[0.5 - 1.6]

Acid Base Status

cBase(Ecf)c	-8.5	mmol/L
$cHCO^{3-}$(P,st)c	15	mmol/L

Notes
↑ Value (s) above reference range
↓ Value (s) below reference range
c Calculated Value (s)
e Estimated Value (s)

Pathology & Radiology Reports

Name :
DoB :
PID/Ref :

Lab Number : : please quote if consulting Lab
COLLECTED
REPORTED

Requested for :
Patient seen at :
********* TEST RESULTS *********

: Hb	11	g/dl	11.5 - 16.00
: WBC	35.4	x10^9/L	4.00 - 10.50
: Platelets	112	x10^9/L	145 - 400
: MCV	92	fl	80.0 - 98.0
: HCT	0.34		0.36 - 0.46
: RBC		x10^12/L	4.00 - 5.20
: MCH		pg	25.0 - 35.0
: MCHC		g/dL	31.0 - 36.0
: Neut	30.2	x10^9/L	1.80 - 7.50
: Lymph	3.1	x10^9/L	1.30 - 4.00
: Mono		x10^9/L	0.20 - 0.80
: Eosin		x10^9/L	0..2 - 0.40
: Baso		x10^9/L	0.00 - 0.20

Authorised:

Pathology & Radiology Reports

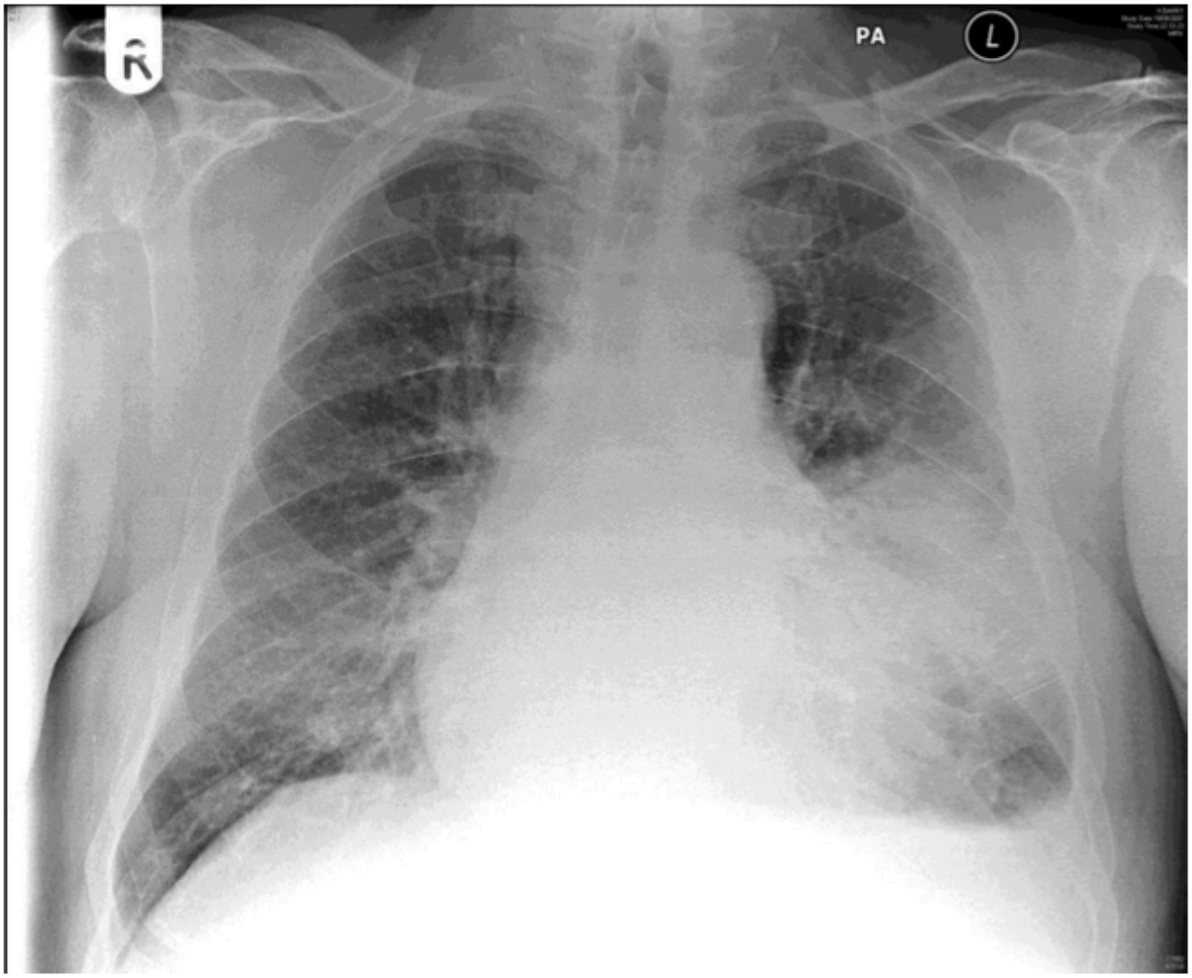
Name :
DoB :
PID/Ref :

Lab Number : : please quote if consulting Lab
COLLECTED
REPORTED

Requested for :
Patient seen at :
********* TEST RESULTS *********

: SODIUM	126	mmo1/L	(134 -145)
: POTASSIUM	3.2	mmo1/L	(3.6 - 5.3)
: UREA	11.5	mmo1/L	(2.8 - 7)
: CREATININE	166	umo1/L	(44 - 80)
: eGFR	52	mL/min/1	

Lab Comment:
eGFR- If of Afro-Caribbean origin multiply by 1.2
Authorised:



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CONDUCT OF SCENARIO

INITIAL SETTINGS

A: Own.
B: SpO2 78% on 15L O2. RR 30/min, LHS creps.
C: HR 130 (AF**), BP 90/50.**
D: **Eyes half open.** AVPU.

EXPECTED ACTIONS

- Initial ABCDE Assessment
- History and Examination
- Review of relevant results
- Recognition of significant deterioration in condition
- Call for help from Outreach
- Commence fluid resuscitation
- Ensure antibiotics given

ADDITIONAL INFO

Bloods
Hb 11
WCC 35.4
Plt 112
Na 126
K 3.2
Ur 11.5
Cr 166

ABG
pH 7.19
pCO2 3.1
pO2 5
BE -8.5

CXR
LLZ Consolidation

DETERIORATION

A: Own.
B: SpO2 **70%** on 15L O2. **RR 35-40/min.**
C: **HR 140 (AF), BP 75/40. ECG with ST Depression**
D: **Eyes half open.** Pupils equal. AV**P**U

EXPECTED ACTIONS

- Recognise need for ITU admission – liase with ITU consultant and staff.
- Organise transfer process.

FURTHER DETERIORATION

A: Threatened airway loss.
B: SpO2 **65%** on 15L O2. **RR 15/min agonal.**
C: **HR 150 (AF), BP 60/30.**
D: AV**P**U**. Moans to pain only.**

LOW DIFFICULTY

Haemodynamic state improves with correct fluid resuscitation.
Hypoxia persists but stable allowing organisation of transfer.

NORMAL DIFFICULTY

Haemodynamics fail to improve with fluid resuscitation.
Will require intubation prior to intubation

HIGH DIFFICULTY

Haemodynamic instability on induction – BP 40/20.
Fixed neck during intubation

EXPECTED ACTIONS

- Preparation for intubation and ventilation
- Safe technique for RSI
- Appropriate vasopressor treatment to maintain cardiovascular status

RESOLUTION

Scenario ends when patient safely packaged to commence transfer

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DEBRIEFING

POINTS FOR FURTHER DISCUSSION:

Technical:

- Assessment of the critically ill patient
- Management of severe sepsis and septic shock
- Intubation in the ward environment

Non-technical:

- Based on established non-technical skills frameworks e.g. ANTS, NOTECHS etc
- Local factors that may influence success or failure of ward-based airway management

DEBRIEFING RESOURCES

1. Surviving Sepsis Campaign www.survivingsepsis.org

2. Identifying sepsis early http://www.scottishintensivecare.org.uk/education/ise.pdf

3. Rivers E et al. Early Goal Directed Therapy in the Treatment of Severe Sepsis and Septic Shock.
   N Engl J Med 2001; 345:1368-1377
   http://www.nejm.org/doi/full/10.1056/NEJMoa010307

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INFORMATION FOR PARTICIPANTS

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PARTICIPANT REFLECTION:

What have you learnt from this experience? (Please try to list 3 things)

How will your practice now change?

What other actions will you now take to meet any identified learning needs?

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PARTICIPANT FEEDBACK

Date of training session:.....

Profession and grade:.....

What role(s) did you play in the scenario? (Please tick)

Primary/Initial Participant	
Secondary Participant (e.g. 'Call for Help' responder)	
Other health care professional (e.g. nurse/ODP)	
Other role (please specify):	
Observer	

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
I found this scenario useful					
I understand more about the scenario subject					
I have more confidence to deal with this scenario					
The material covered was relevant to me					

Please write down one thing you have learned today, and that you will use in your clinical practice.

How could this scenario be improved for future participants?
(This is especially important if you have ticked anything in the disagree/strongly disagree box)

FACULTY DEBRIEF – TO BE COMPLETED BY FACULTY TEAM

What went particularly well during this scenario?

What did not go well, or as well as planned?

Why didn't it go well?

How could the scenario be improved for future participants?

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