

# 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

<b>Domain 1: Resuscitation and initial management of the acutely ill patient</b>
Adopts a structured and timely approach to the recognition, assessment and stabilisation of the acutely ill patient with disordered physiology
<b>Domain 2: Diagnosis, Assessment, Investigation, Monitoring and Data Interpretation</b>
Obtains a history and performs an accurate clinical examination
Undertakes timely and appropriate investigations & Monitors and responds to trends in physiological variables
<b>Domain 3: Disease Management</b>
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Identifies the implications of chronic and co-morbid disease in the acutely ill patient
Recognises and manages the patient with circulatory failure
Recognises and manages the patient with, or at risk of, acute renal failure
Recognises and manages the patient with acute lung injury syndromes [ALI /ARDS]
Recognises and manages the septic patient
<b>Domain 4: Therapeutic interventions / Organ system support in single or multiple organ failure</b>
Manages antimicrobial drug therapy
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<b>Domain 5: Practical procedures</b>
Administers oxygen using a variety of administration devices
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<b>Domain 7: Comfort and recovery</b>
Identifies/attempts to minimise the physical and psychosocial consequences of critical illness for patients/families
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<b>Domain 10: Transport</b>
Undertakes transport of the mechanically ventilated critically ill patient outside the ICU
<b>Domain 11: Patient safety and health systems management</b>
Complies with local infection control measures
Identifies environmental hazards and promotes safety for patients and staff
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Critically appraises and applies guidelines, protocols and care bundles
<b>Domain 12: Professionalism</b>
Communicates effectively with patients and relatives
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Collaborates and consults; promotes team-working
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Takes responsibility for safe patient care

## 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

**'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**

<b>RADIOMETER ABL 9000 SERIES</b>				
ABL900 ED			00:00:00	08-1-2013
PATIENT REPORT	Syringe	S195uL	Sample#	90.....
<b>Patient ID</b>				
Patient First Name				
Patient Last Name				
Date of Birth	62 years old			
Sample type	Arterial			
Fi O <sub>2</sub>	1.0			
Department	ED			
Operator				
<b>Blood Gas Values</b>				
pH	7.19		[7.340 - 7.450]	
pCO <sub>2</sub>	3.1	kPa	[4.70 - 6.00]	
pO <sub>2</sub>	5	kPa	[10.0 - 13.3]	
pO <sub>2</sub> (A-a)e		kPa		
<b>Oximetry Values</b>				
ctHb	11	g/dL	[12.0 - 16.0]	
sO <sub>2</sub>	79	%	[95.0 - 98.0]	
/O <sub>2</sub> Hb		%	[94.0 - 99.0]	
/COHb			[ - ]	
/HHb		%	[ - ]	
/metHb		%	[0.02 - 0.06]	
Hctc	0.34	%		
<b>Electrolyte Values</b>				
cK+	3.2	mmol/L	[ 3.0 - 5.0 ]	
cNa+	126	mmol/L	[ 136 - 146 ]	
cCa <sup>2+</sup>	1.06	mmeq/L	[1.15 - 1.29]	
cCl-	110	mmol/L	[ 98 - 106 ]	
<b>Metabolite Values</b>				
cGlu	4.8	mmol/L	[ 3.5 - 10.0 ]	
cLac	4.0	mmol/L	[ 0.5 - 1.6 ]	
<b>Acid Base Status</b>				
cBase(Ecf)c	-8.5	mmol/L		
cHCO <sub>3</sub> <sup>-</sup> (P,st)c	15	mmol/L		
<b>Notes</b>				
↑	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 <sup>9</sup> /L	4.00 - 10.50
: Platelets	112	x10 <sup>9</sup> /L	145 - 400
: MCV	92	fl	80.0 - 98.0
: HCT	0.34		0.36 - 0.46
: RBC		x10 <sup>12</sup> /L	4.00 - 5.20
: MCH		pg	25.0 - 35.0
: MCHC		g/dL	31.0 - 36.0
: Neut	30.2	x10 <sup>9</sup> /L	1.80 - 7.50
: Lymph	3.1	x10 <sup>9</sup> /L	1.30 - 4.00
: Mono		x10 <sup>9</sup> /L	0.20 - 0.80
: Eosin		x10 <sup>9</sup> /L	0.2 - 0.40
: Baso		x10 <sup>9</sup> /L	0.00 - 0.20

Authorised:

**Pathology & Radiology Reports**

Name :  
DoB :  
PID/Ref :

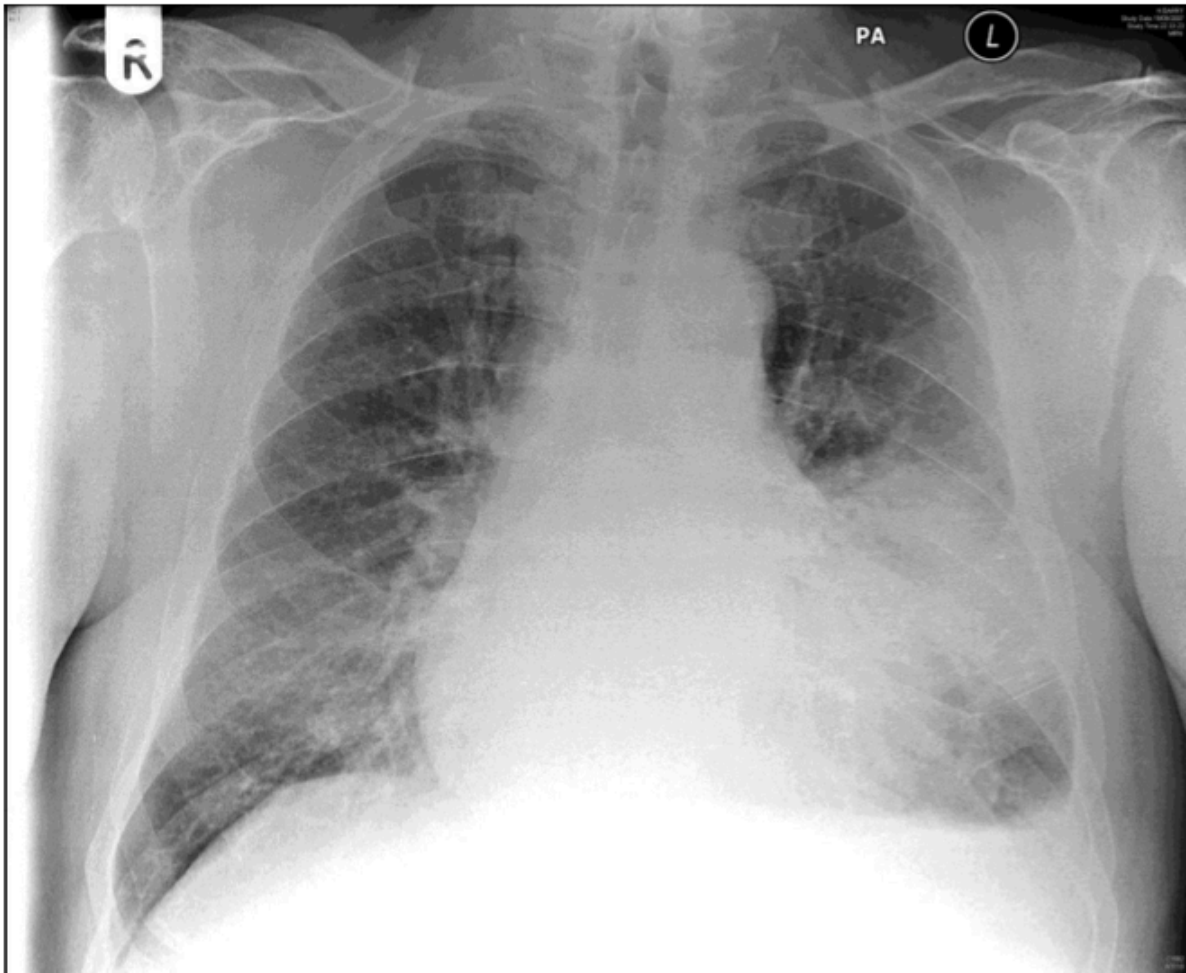
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COLLECTED  
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Requested for :  
Patient seen at :

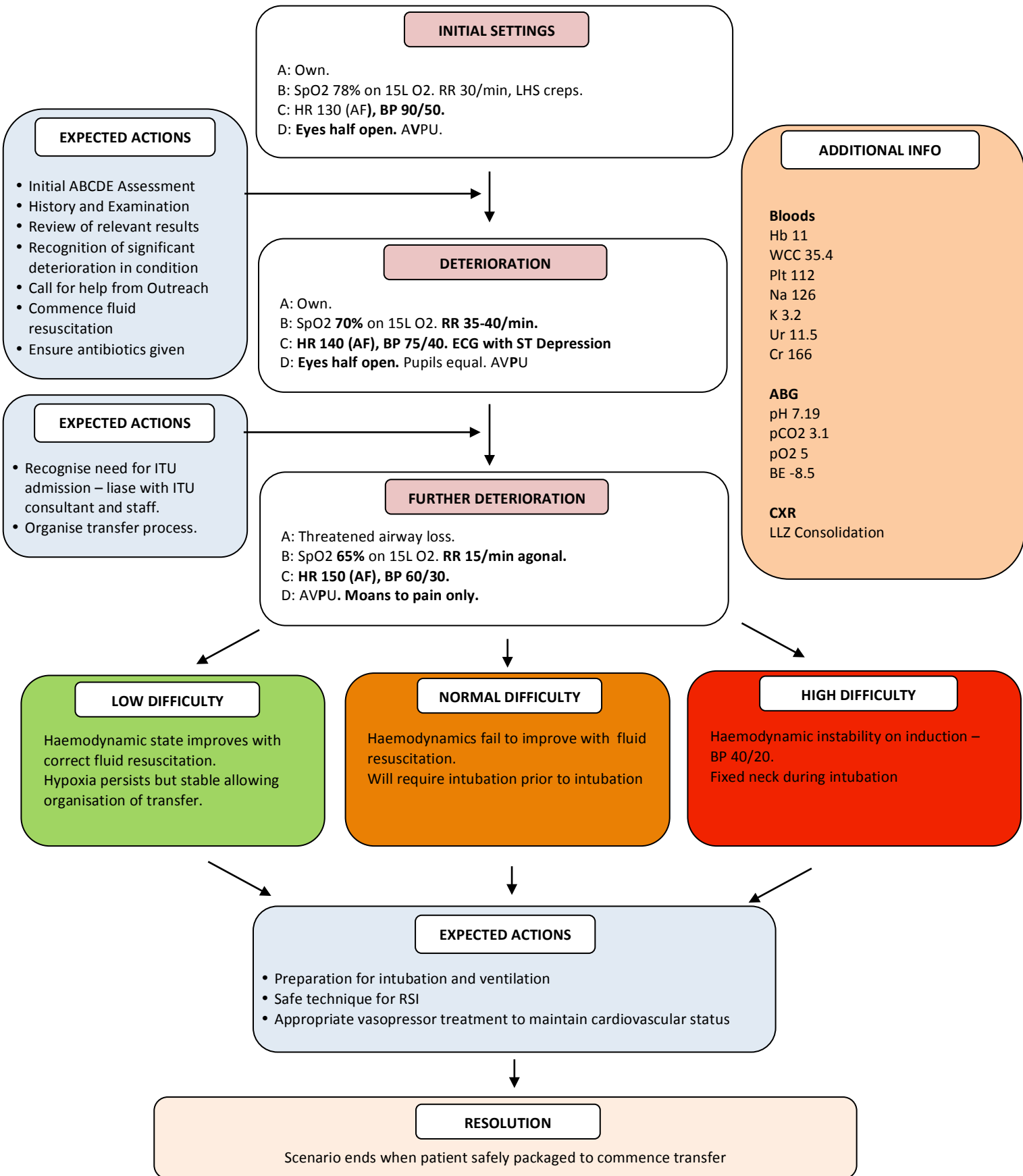
\*\*\*\*\* TEST RESULTS \*\*\*\*\*

: 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:



CONDUCT OF SCENARIO



## 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, NOTECHSetc
- Local factors that may influence success or failure of ward-based airway management

### DEBRIEFING RESOURCES

1. Surviving Sepsis Campaign [www.survivingsepsis.org](http://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>

## INFORMATION FOR PARTICIPANTS

### KEY POINTS:

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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?

**PARTICIPANT FEEDBACK**

Date of training session:.....

Profession and grade:.....

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

Primary/Initial Participant	<input type="checkbox"/>
Secondary Participant (e.g. 'Call for Help' responder)	<input type="checkbox"/>
Other health care professional (e.g. nurse/ODP)	<input type="checkbox"/>
Other role (please specify):	<input type="checkbox"/>
Observer	<input type="checkbox"/>

	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?