



Identifying Sepsis Early

Debriefing & Instructors Guide

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ISE Instructors Guide

Introduction

The course aims to Identify Sepsis Early based on generic skills. In addition this may be used to explore advanced theory of managing specific sepsis presentations/ patients depending on level of expertise of learners.

Following completion of this course the learner will be able to apply prior and acquired knowledge to carry out the initial assessment and illness severity scoring of a patient with any condition requiring early treatment. In addition the learner will gain the ability to utilise their skills to provide supportive symptom management until a definitive diagnosis has been made and specific treatment is started.

Unlike other courses, which are predominately knowledge based, the ISE course uses scenario based teaching to allow participants to put their knowledge into practice.

The scenarios in this guide have been designed to address the important learning principles of identifying and managing sepsis with a variety of clinical presentations.

Running scenarios

Prior to running simulation scenarios there are a few important tasks to complete to ensure you are prepared and aid the smooth running of your course:

1. Programming your simulator

Pre-programming your simulator with the appropriate physiological parameters will assist the operator with ease of running the computer during the scenarios. However, instructors may have to adapt scenarios during the running therefore it is clear that instructors must have a working knowledge of the simulator.

2. Setting up

Setting an appropriate learning environment is key to the smooth running of your course.

Specific to running scenario based training using the simulator is the use of props e.g. oxygen masks, blood tubes, ECG leads etc. These will have to be available along with appropriate paperwork (hospital/trust specific).

3. Briefing

Explain to participants that reviewing performance is intended to be a positive learning experience: it is not an assessment of performance. This idea may help to put candidates at ease. The experience is intended to be non-threatening and

to facilitate the exchange of ideas, experiences and opinions, rather than provide didactic teaching.

4. Orientation

Orientate the participants to the staff, training environment, equipment and the manikin and its functions. If possible allow time for the participants to explore the surroundings and examine the manikin and its normal physiology e.g. listen to breath sounds; feel for pulses etc. This helps to facilitate the realistic running of scenarios.

5. State the aims clearly

Explain that the overall goal is for candidates to give an analysis and evaluation of their own performance. Discuss any aims specific to course i.e. identifying and treating sepsis early.

Clarify the roles of learners and teachers. The Faculty member's role is to facilitate discussion and tease out learning points.

6. Set the scene

Give a brief description of scenario including clinical setting and the patient's presenting condition. Allocate appropriate clinical roles to participants. Ensure all participants are happy with their allocated roles. It's usually best where possible to try and keep people in own role.

Visit the Scottish Clinical Simulation Centre for further advice or to observe scenarios in action (www.scsc.scot.nhs.uk tel:01786 434480).

Scenarios

- i) Generic scenarios
 - A&E: Cellulitis
 - Medical: Cellulitis
 - Surgical: Cellulitis
- ii) A&E: Meningitis
- iii) Medical: Community Acquired Pneumonia
- iv) Surgical: Crohns disease
- v) High Dependency Unit: Crohns disease

Sepsis Scenario Generic - A&E: Cellulitis

Venue

A&E triage

History

25yr old female. Scratched right index finger whilst gardening.

C/o Pain & tenderness with signs of erythema and reduced movement in right hand and pain in right axilla.

PMH: Fit and well

Drugs: Nil

Allergies: Nil

Presentation

A - Talking

B - RR 20, SpO₂ 93% on air, bilateral clear air entry

C - HR 134, BP 103/60, temp 38.2, CRT - 3 sec, cool peripheries except right forearm

D - GCS 15

E - Infected area swollen with signs of oedema. Pain on movement. Reduced movement. Erythema to mid forearm.

Monitoring

None

Investigations & results

FBC - WCC 14.2, Hb 11.5, Plt 322

U&E's - Na 137, K⁺ 4.1, U 3.4, Cr 70

Clotting - normal

ABG's - H⁺ 45, PCO₂ 3.9, PO₂ 8.7, HCO₃ 21, BE -3

Clinical Course

Shortly after arrival becomes combative. Demands to see a senior member of staff. Feels faint and light-headed. Taken to resus area. Monitoring instituted. Responds rapidly to oxygen and i.v. fluid bolus.

Examination 1

A - Patent

B - RR 25, SpO₂ 91% on 60%, bilateral clear air entry

C - HR 150, BP 93/57, Temp 38.2, CRT - 2 sec, cool peripheries

D - GCS 14 (E4, V4, M6)

Treatment

Oxygen

Fluids

Appropriate referral - ICU vs Surgical

Antibiotics

Examination 2

A - Patent

B - RR 22, SpO₂ 93% on 60%, bilateral clear air entry

C - HR 110, BP 104/62, Temp 38.2, CRT - 2 sec, cool peripheries

D - GCS 13 (E3, V4, M6)

Differential diagnosis / ISS - ? cellulitis

*Penicillin allergies

Usually hypersensitive not true allergy.

S&S: nausea, vomiting, pruritis, urticaria, wheezing, laryngeal oedema, cardiovascular collapse.

Cephalosporins have similar structure to penicillin and cross hyper-sensitivity will occur in approx 10%.

Props: Sepsis scenario 1 - A&E Generic

Set the scene	Monitoring	Props
<p>A&E admission sheet</p> <p>25 yr old female - Carol Sharp</p> <p>Scratched right index finger whilst gardening</p> <p>C/o Pain & tenderness with signs of erythema, reduced movement and pain in right axilla</p> <p>PMH: Fit and well</p> <p>Allergies: Nil</p> <p>Drugs: Nil</p>	<ul style="list-style-type: none"> • Cardiac monitor leads • NIBP cuff • SpO₂ probe • Infusion device <p>(dependant on local policy for antibiotic administration)</p>	<ul style="list-style-type: none"> • ABG syringes • Antibiotics • Blood forms and bags • Blood tubes • Blood culture bottles • Cannula • IV fluids - crystalloids • IV giving sets • 0.9% Saline or H₂O ampoules • Needles • O₂ masks - standard adult & Hudson

METI - ECS settings

Sepsis scenario 1 - A&E Generic

Baseline	Parameters	Deterioration	Parameters
Contractility factor: left ventricle	0.65	Contractility factor: left ventricle	0.5
Heart rate factor	1.75	Heart rate factor	1.65
Ischaemic Index sensitivity	0.1	Respiratory rate factor	1.2
O ₂ consumption	250ml/min	Shunt fraction	0.3
Resistance Factor: Systemic vascular	0.5	Volume - loss	1000mls plasma
Shunt fraction	0.25		
Temp arterial & oesophageal	38.2°C		
	<ul style="list-style-type: none"> • RR 19 • SpO₂ 94-95% • HR 140 • NIBP 105/65 • T 38.2°C 		<ul style="list-style-type: none"> • RR 21 • SpO₂ 93% • HR 150 • NIBP 94/57 • T 38.2°C

Treatment	Parameters	Parameters
Contractility factor: left ventricle	0.75	
Heart rate factor	1.5	
O ₂ consumption	200ml/min	
Shunt fraction	0.2	
Volume - infusion	1500mls	
	<ul style="list-style-type: none"> • RR 16 • SpO₂ 96% • HR 114 • NIBP 113/63 • T 38.2°C 	

Sepsis Scenario Generic -

Medical: Cellulitis

Venue

Medical ward

History

74yr old female - Bessie McCallum. Admitted 3 days ago with confusion due to hyponatraemia. Improved significantly with IV 0.9% Sodium Chloride but has become increasingly confused again over the last hour.

PMH: Diabetes, Hypertension

Drugs: Metformin 1g tds, Bendroflumethazide 2.5mg od (withheld at present)

Allergies: Nil

Presentation

A - Talking

B - RR 20, Sp₂ 93% on air, bilateral clear air entry

C - HR 134, BP 103/60, Temp 38.2, CRT - 2 sec, cool peripheries

D - GCS 14 (E4, V4, M6)

E - Cannula in situ looks inflamed. Appears a bit shivery.

Monitoring

None

Investigations & results

FBC - WCC 18.3, Hb 147, Plt 367

U&E's - Na 136, K⁺ 3.8, U 11.2, Cr 132, HCO₃ 19.4, Glucose 15.6

Clinical Course

During assessment becomes increasingly drowsy (E2, V3, M5) GCS 10

Examination 1

A - Snoring

B - RR 25, Sp₂ 91% on 60%, bilateral clear air entry

C - HR 150, BP 93/57, Temp 38.2, CRT - 4 sec, cool peripheries

D - GCS 10 (E2, V3, M5)

Treatment

Open airway & oxygen

New IV line

Fluids

Appropriate referral - senior help

Antibiotics

Clinical course

Improves with oxygen & fluids

Examination 2

A - Patent

B - RR 22, SpO₂ 93% on 60%, bilateral clear air entry

C - HR 110, BP 104/62, Temp 38.2, CRT - 2 sec, cool peripheries

D - GCS 13 (E3, V4, M6)

Props: Sepsis scenario 1 - Medical Generic

Set the scene	Monitoring	Props
<p>Admission sheet</p> <p>74 yr old female - Bessie McCallum</p> <p>Admitted 3 days ago with confusion due to hyponatraemia.</p> <p>Improved significantly with IV 0.9% Sodium Chloride but has become increasingly confused again over the last hour</p> <p>PMH: Diabetes, Hypertension</p> <p>Allergies: Nil</p> <p>Drugs: Metformin 1g tds, Bendroflumethazide 2.5mg OD withheld at present</p>	<ul style="list-style-type: none"> • Cardiac monitor leads • NIBP cuff • SpO₂ probe • Infusion device <p>(dependant on local policy for antibiotic administration)</p>	<ul style="list-style-type: none"> • ABG syringes • Antibiotics • Blood forms and bags • Blood tubes • Blood culture bottles • Cannula - insitu inflammed site • Cannula • Guedal airways • IV fluids - crystalloids • IV giving sets • 0.9% Saline or H₂O ampoules • Needles • O₂ masks - standard adult & Hudson • Syringes

Sepsis Scenario Generic - Surgical: Cellulitis

Venue

Surgical ward

History

45yr old male - William Littlejohn. Laparoscopic nephrectomy 5 days ago. Readmitted with abdominal pain, anorexia and general malaise.

C/o pain and has tenderness over abdominal wound.

PMH: Renal carcinoma

Drugs: Ibuprofen 400mg tds, Co-proxamol 2 tabs as required

Allergies: Nil

Presentation

A - Talking

B - RR 20, Sp_o₂ 93% on air, bilateral clear air entry

C - HR 136, BP 103/60, Temp 38.2, CRT - 2 sec, cool peripheries

D - GCS 15

E - Abdominal wound looks inflamed

Monitoring

None

Investigations & results

FBC - WCC 21.7, Hb 96, Plt 482

U&E's - Na 136, K⁺ 3.8, U 7.2, Cr 122, HCO₃ 19.4, Glucose 5.6

Clinical Course

Complains of worsening abdominal pain and vomits. Repeat observations.

Examination 1

A - Patent

B - RR 25, Sp_o₂ 91% on 60%, bilateral clear air entry

C - HR 150, BP 93/57, Temp 38.2, CRT - 4 sec, cool peripheries

D - GCS 15

Treatment

Oxygen

IV line

Fluids

Appropriate referral - surgical review

Antibiotics

Clinical course

Improves with oxygen & fluids

Examination 2

A - Patent

B - RR 22, SpO₂ 93% on 60%, bilateral clear air entry

C - HR 110, BP 104/62, Temp 38.2, CRT - 2 sec, cool peripheries

D - GCS 15

Props: Sepsis scenario 1 - Surgical Generic

Set the scene	Monitoring	Props
<p>Medical notes & A&E admission sheet</p> <p>45 yr old male - William Littlejohn</p> <p>Laparoscopic nephrectomy 5 days ago</p> <p>Readmitted with abdominal pain, anorexia and general malaise.c/o pain & tenderness over abdominal wound</p> <p>PMH: Renal carcinoma</p> <p>Allergies: Nil</p> <p>Drugs: (old chart) Ibuprofen 400mg TDS, Co-proximal 2 tabs prn</p> <p>Fluid balance: (old chart) crystalloids given over previous 3 days</p>	<ul style="list-style-type: none"> • Cardiac monitor leads • NIBP cuff • SpO₂ probe • Infusion device (dependant on local policy for antibiotic administration) 	<ul style="list-style-type: none"> • ABG syringes • Antibiotics • Blood forms and bags • Blood tubes • Blood culture bottles • Cannula • Inflamed abdominal wound • IV fluids - crystalloids • IV giving sets • N/Saline or H₂O ampoules • Needles • O₂ masks - standard adult & Hudson • Syringes

Sepsis Scenario - Meningococcal septicaemia

Venue

A&E / Acute medical admissions

History

23 year old philosophy student. Janis Stewart.

Found this am in bed by flat mate in confused state having been incontinent of urine.

PMH: Nil

Drugs: Nil (flat mate reports that Janis occasionally smokes cannabis)

Allergies: Nil known

Presentation

A - patent

B - RR 32, SpO₂ 94% on air, equal air entry - clear

C - HR 126, BP 95/56, cool peripheries - CRT 3 sec, temp 35.2C

D - GCS 12 (E3, V4, M5) PERL

E - Few spots on back and feet -petechial rash

Monitoring

Cardiac monitor - sinus tachycardia

Sats

NIBP

Investigations & results

FBC - Hb 113, WBC 2.7, Platelets 107

U&E's - U 6.8, Cr 92, Na 138, K⁺ 3.7, Glucose 6.4

Clotting - PT 1.9:1, APTT 1.7:1, Fib 2.3

ABG's - H⁺ 58, PaCO₂ 3.4, PaO₂ 11.8, HCO₃ 13.2, BE -12.7 on 60%

Cultures - venous

Srape (scarify) lesions

LP vs CT?

Clinical course I

Snoring, RR 40, BP continues to fall 80/35, HR 156, CRT 5 sec, mottled
Fall in GCS 9 (E2, V2, M5).

Treatment

Open airway (head tilt, chin lift). Doesn't tolerate Guedel airway.

Oxygen

Fluids

ICU referral

Early antibiotics - 2g IV cefotaxime or ceftriaxone

Clinical course II

Interventions, maintain own airway, RR 25, SpO₂ 93%, HR 110, increase BP 115/65.

ICU arrive, handover, transfer.

Discuss differential diagnosis - Drug OD, Meningitis, SAH, Meningococcal septicaemia

Tools:

Meningitis Research Foundation / British Infection Society Algorithm

'Early management of suspected Bacterial Meningitis and Meningococcal Septicaemia in Adults'

Props: Sepsis scenario 2 - A&E Meningitis

Set the scene	Monitoring	Props
<p>A&E admission sheet</p> <p>23 yr old philosophy student - Janis Stewart</p> <p>Found this am in bed by flat mate in confused state having been incontinent of urine</p> <p>PMH: Nil</p> <p>Allergies: Nil Known</p> <p>Drugs: Nil (flat mate reports that Janice occasionally smokes cannabis)</p>	<ul style="list-style-type: none"> • Cardiac monitor leads • NIBP cuff • SpO₂ probe • Infusion device <p>(dependant on local policy for antibiotic administration)</p>	<ul style="list-style-type: none"> • ABG syringes • Additive labels • Antibiotics - cefotaxime or ceftriaxone • Bag-valve-mask O₂ delivery device • Blood forms and bags • Blood tubes • Cannula • Geudal airways • IV fluids - crystalloids • IV giving sets • 0.9% Saline or H₂O ampoules • Needles • O₂ masks - standard adult & Hudson

Tools

Meningitis Research Foundation/British Infection Society Algorithm - "Early management of suspected Bacterial Meningitis and Meningococcal Septicaemia In Adults" www.meningitis.org

METI - ECS settings

Sepsis scenario 2 - A&E Meningitis

Baseline	Parameters	Deterioration	Parameters
Contractility factor: left ventricle	0.65	Blink mode	RR 35
Heart rate factor	1.6	Contractility factor: left ventricle	SpO ₂ 91% HR 158
Ischaemic Index sensitivity	0.1	Respiratory rate factor	NIBP 93/55
O ₂ consumption	300ml/min	Shunt fraction	T 35.2°C
Resistance Factor:	0.75	Volume - loss	
Systemic vascular	1.5		
Respiratory rate factor	0.25		
Shunt fraction	35.2°C		
Temp arterial & oesophageal			
Treatment	Parameters	Parameters	Parameters
Blink mode	Eyes open	Blink mode	RR 19
Contractility factor: left ventricle	0.65	Contractility factor: left ventricle	SpO ₂ 96% HR 120
Heart rate factor	1.5	Respiratory rate factor	NIBP 115/65
O ₂ consumption	250ml/min	Shunt fraction	T 35.2°C
Shunt fraction	1.2	Volume - infusion	
Volume - infusion	0.25		
	2000mls		

Sepsis Scenario - Community Acquired Pneumonia

Venue

Medical ward / admissions unit

History

68 year old, Jim Cooper, retired lorry driver

3 day history productive cough, SOB and chest pain

PMH: Hypertension, Angina, NIDDM

Drugs: Atenolol 50mg daily, aspirin 75mg daily, simvastatin 20mg daily, GTN spray prn, glipizide 5mg daily

Allergies: Nil

CXR - left lower lobe consolidation

ECG - Sinus, old inferior MI

Admitted 48hrs previously treated with oxygen, fluids, IV antibiotics and physiotherapy.

Clinical Course I

Called to see as now increased signs of confusion, SOB and chest pain/tightness

Presentation

A - patent, talking

B - RR 29, SpO₂ 91% on 4L, widespread crackles with reduced air entry L base

C - HR 128 AF, BP 100/60 (normal 170/90), warm peripheries, temp 38, reduced u/o

D - GCS 13 (E3, V4, M6) PERL

E - Pale, dry mucous membranes

Monitoring

Cardiac monitor - AF 125bpm

Sats

NIBP

Investigations & results

FBC - Hb 142, WBC 13.8, Platelets 364

U&E's - U 11.3, Cr 75, Na 132, K⁺ 3.3, Glucose 12.7

ABG - H^+ 49, $PaCO_2$ 4.2, PaO_2 8.7, HCO_3 17.4, BE -7.3
ECG - mild ischaemia, AF 125
CXR - widespread consolidation, L lower lobe collapse
Cultures - BC, sputum, urine, atypical screen, pneumococcal antigen

Clinical Course II

A - patent,
B - RR 40, SpO_2 91% on 60%, wheezy
C - HR 138 AF, BP 93/60 (normal 170/90), warm peripheries, temp 38, reduced u/o
D - GCS 13 (E3, V4, M6) PERL

Treatment

Oxygen, sit up
Fluids
Salbutamol nebuliser
ICU referral
Chase microbiology - change antibiotics (strep.pneumoniae)

Examination

A - patent,
B - RR 26, SpO_2 94% on 60%, wheezy
C - HR 114 AF, BP 100/63 (normal 170/90), warm peripheries, temp 38, reduced u/o
D - GCS 13 (E3, V4, M6) PERL

Differential diagnosis - discuss

Tools:

Severity assessment of CAP - 'CURB-65' (BTS Guidelines)

Confusion

Urea > 7mmols

Resp > 30

BP SBP < 90, DBP < 60

Age > 65

3 or more = severe pneumonia

3-4 = ICU referral

4-5 = CURB-65

Props: Sepsis scenario 4 - Medical Community Acquired Pneumonia

Set the scene	Monitoring	Props
<p>Medical notes & A&E admission sheet</p> <p>68 yr old male - Jim Cooper (retired lorry driver)</p> <p>3 day history of productive cough, SOB and chest pain</p> <p>Admitted 48 hrs previous treated with oxygen, fluids, IV antibiotics and physiotherapy</p> <p>PMH: Hypertension, Angina, NIDDM</p> <p>Allergies: Nil Known</p> <p>Drug Chart: Atenolol 50mg daily (withheld as BP low), aspirin 75mg daily, simvastatin 20mg daily, GTN spray, glipizide 5 mg daily, ceftriaxone 1g daily, clarithromycin 500mg IV BD</p> <p>Fluid Chart: Crystalloids given over previous 3 days</p>	<ul style="list-style-type: none"> • Cardiac monitor leads • NIBP cuff • SpO₂ probe • Infusion device <p>(dependant on local policy for antibiotic administration)</p>	<ul style="list-style-type: none"> • ABG syringes • Additive labels • Antibiotics • Bag-valve-mask O₂ delivery device • Blood culture bottles • Blood forms and bags • Blood tubes • Cannula • CXR - lower lobe consolidation • ECG - sinus, old inferior MI • Guedal airways • IV fluids - crystalloids • IV giving sets • Nebuliser • 0.9% Saline or H₂O ampoules • Needles • O₂ masks - standard adult & Hudson

Tools

British Thoracic Society Guidelines 'CURB-65' www.brit-thoracic.org.uk

METI - ECS settings

Sepsis scenario 4 - Medical Community Acquired Pneumonia

Baseline	Parameters	Deterioration	Parameters
Cardiac rhythm override	AF	Blink mode	• RR 35
Heart rate factor	1.5	Breath sounds	• SpO ₂ 91%
Ischaemic Index sensitivity	0.1	Heart rate factor	• HR 140
O ₂ consumption	350ml/min	Respiratory rate factor	• NIBP 93/60
Resistance Factor	1.2	Volume - loss	• T 38°C
Shunt fraction	0.25		
Temp arterial & oesophageal	38°C		

Treatment	Parameters	Parameters
O ₂ consumption	250ml/min	
Respiratory rate factor	1.5	• RR 24
Shunt fraction	0.2	• SpO ₂ 94%
Volume - infusion	2000mls	• HR 115
		• NIBP 108/66
		• T 38°C

Sepsis Scenario 3 - Crohns Disease: post op

Venue

Surgical ward

History

22 year old, female, Vivienne Murray

Total colectomy 3 days ago. Primary anastomotic closure. Uneventful post op period. 3 doses antibiotics post op (Ceftriaxone & Metronidazole). Moved to general surgical ward from HDU this morning. Shortly after transfer complains of severe abdominal pain, nausea & vomiting, shivery. Still remains NBM.

PMH: Crohns since early teenage years

Drugs: OCP, prednisolone 10mg daily

Allergies: Nil

Presentation

A - patent

B - RR 26, SpO₂ 94% on air, equal air entry - clear

C - HR 113, BP 100/53, cool peripheries, temp 37.7, CRT 3 secs

D - GCS 15, PERL

E - Localised tenderness R lower abdomen, guarding

Monitoring

Cardiac monitor - sinus tachycardia

Sats

NIBP

Investigations & results

FBC - Hb 67, WBC 18.4, Platelets 276

U&E's - U 5.4, Cr 78, Na 141, HCO₃ 14, K 4.2, Glucose 5.1

CXR - normal

ABG - H⁺40, PaCO₂ 2.1, PaO₂ 10, HCO₃ 14, BE -16.2

Clinical course

A - patent

B - RR 29, SpO₂ 93% on 60%, equal air entry - clear

C - HR 146, BP 92/57, cool peripheries, temp 37.7, CRT 4 secs

D - GCS 15, PERL

E - Increasing abdo pain

Treatment

Oxygen

Fluids

Surgical / critical care referral

+/- antibiotics, steroid replacement

Examination

A - patent

B - RR 26, SpO₂ 94% on 60%, equal air entry - clear

C - HR 123, BP 97/59, cool peripheries, temp 37.7, CRT 3 secs

D - GCS 15, PERL

Discuss differential diagnosis - peritonitis, bleed, Addisonian crisis

Props: Sepsis scenario 3 - Surgical Crohns post-op

Set the scene	Monitoring	Props
<p>Medical notes</p> <p>22 yr old female - Vivienne Murray</p> <p>Total colectomy 3 days ago. Primary anastomotic closure. Uneventful post op period. 3 doses antibiotics post op (Ceftriaxone & Metronidazole). Moved to general surgical ward from HDU this am. Shortly after transfer complains of severe abdominal pain, shivering, nausea & vomiting. Still remains NBM.</p> <p>PMH: Crohns since early teenage years</p> <p>Allergies: Nil Known</p> <p>Drug Chart: OCP, prednisolone 10mg daily, 3 doses antibiotics (Cef & Met), post op analgesia (local policy)</p>	<ul style="list-style-type: none"> • Cardiac monitor leads • NIBP cuff • SpO₂ probe • Infusion device <p>(dependant on local policy for antibiotic administration)</p>	<ul style="list-style-type: none"> • A&B syringes • Additive labels • Antibiotics • Bag-valve-mask O₂ delivery device • Blood culture bottles • Blood forms and bags • Blood tubes • Cannula • Guedal airways • IV fluids - crystalloids • IV giving sets • 0.9% saline or H₂O ampoules • Needles • O₂ masks - standard adult & Hudson

METI - ECS settings

Sepsis scenario 3 - Surgical Crohns post-op

Baseline	Parameters	Deterioration	Parameters
Contractility factor: left ventricle	0.45	Heart rate factor	1.65
Heart rate factor	1.25	O ₂ consumption	250ml/min
Ischaemic Index sensitivity	0.1	Respiratory rate factor	1.5
O ₂ consumption	200ml/min	Shunt fraction	0.25
Resistance Factor:	0.5	Volume - loss	1000mls plasma
Systemic vascular	0.25		
Respiratory rate factor	0.3		
Shunt fraction	37.7°C		
Temp arterial & oesophageal			

Treatment	Parameters
Heart rate factor	RR 18
O ₂ consumption	SpO ₂ 95%
Respiratory rate factor	HR 124
Shunt fraction	NIBP 106/61
Volume - infusion	T 37.7°C

Sepsis Scenario - Crohns Disease:

post op - HDU

Venue

Surgical HDU

History

22 year old, female, Vivienne Murray

Total colectomy 2 days ago. Primary anastomotic closure. Uneventful post op period. 3 doses antibiotics post op (Ceftriaxone & Metronidazole). Chart demonstrates oliguria overnight but despite this arterial line removed, CVP line capped off. Epidural removed this morning but since then has complained of increasing abdominal pain, nausea & vomiting, shivery. Still remains NBM.

PMH: Crohns since early teenage years

Drugs: OCP, prednisolone 10mg daily

Allergies: Nil

Presentation

A - patent

B - RR 24, SpO₂ 96% on 40%, equal air entry - clear

C - HR 126, BP 98/53, cool peripheries, temp 37.7, CRT 3 secs

D - GCS 15, PERL

E - Localised tenderness R lower abdomen, guarding

Monitoring

Cardiac monitor - sinus tachycardia

Sats

NIBP

Reconnect CVP

Investigations & results

FBC - Hb 67, WBC 18.4, Platelets 276

U&E's - U 5.4, Cr 78, Na 141, HCO₃ 14, K⁺ 4.2, Glucose 5.1

CXR - normal

ABG - H⁺40, PaCO₂ 2.1, PaO₂ 10, HCO₃ 14, BE -16.2

Clinical course I

A - patent

B - RR 35, SpO₂ 95% on 40%, equal air entry - clear

C - HR 146, BP 92/53, CVP 8 (if CVP gas done - S_{cv}O₂ 62%), cool peripheries, temp 37.7, CRT 4 secs

D - GCS 15, PERL

E - Increasing abdo pain

Clinical course II

Tiring and drowsy

A - patent

B - RR 46, SpO₂ 87% on 40%, equal air entry - clear

C - HR 130, BP 80/45, CVP 8 (no increase with first fluid bolus), (if CVP gas done - S_{cv}O₂ 62%), cool peripheries, temp 37.7

D - GCS 7, (E1, V4, M2) PERL

ABG - H⁺85, PaCO₂ 5.7, PaO₂ 11.0 (On O₂), HCO₃ 14, BE -18.1, Lactate 5.2

Further deterioration if no more fluid given

Treatment

Oxygen

Fluids

Reinstitute invasive monitoring

Surgical / critical care referral (RSI / ventilation)

+/- antibiotics, steroid replacement (?random cortisol level)

A - patent

B - RR 22, SpO₂ 95% on 60%, equal air entry - clear

C - HR 122, BP 98/55, CVP 8, temp 37.7, CRT 3 secs

D - GCS 13, (E3, V4, M6) PERL

Discuss differential diagnosis - peritonitis, bleed, Addisonian crisis

Steroid replacement perioperatively

Tools:

Early Goal Directed Therapy - Rivers, E et al

Props: Sepsis scenario 5 - HDU Crohns

Set the scene	Monitoring	Props
<p>Medical notes</p> <p>22 yr old female - Vivienne Murray</p> <p>Total colectomy 3 days ago. Primary anastomotic closure. Uneventful post op period. 3 doses antibiotics post op (Ceftriaxone & Metronidazole). Her chart demonstrates oliguria over-night but despite this arterial line removed, CVP capped off. Epidural removed this am but since then has c/o increasing abdominal pain, shivering, nausea & vomiting. Still remains NBM.</p> <p>PMH: Crohns since early teenage years</p> <p>Allergies: Nil Known</p> <p>Drug Chart: OCP, prednisolone 10mg daily, 3 doses antibiotics (Cef & Met), post op analgesia (epidural)</p> <p>Fluid Chart: Crystalloids given over previous 2 days</p> <p>TPR chart: Oliguria overnight</p>	<ul style="list-style-type: none"> • Cardiac monitor leads • CVP transducer & line • NIBP cuff • SpO₂ probe • Infusion device (dependant on local policy for antibiotic administration) 	<ul style="list-style-type: none"> • ABG syringes • Additive labels • Antibiotics • Bag-valve-mask O₂ delivery device • Blood culture bottles • Blood forms and bags • Blood tubes • Cannula • CXR - lower lobe consolidation • CVP line, transducer & pressure line • ECG - sinus, old inferior MI • Guedal airways • IV fluids - crystalloids • IV giving sets • Nebuliser • 0.9% Saline or H₂O ampoules • Needles • O₂ masks - standard adult & Hudson • Syringes

Tools

Rivers, E et al. "Early Goal Directed Therapy" Algorithm

METI - ECS settings

Sepsis scenario 5 - HDU Crohns

Baseline	Parameters	Deterioration	Parameters
Contractility factor: left ventricle	0.5	Heart rate factor	1.65
Fraction of inspired O ₂ override	40%	Respiratory rate factor	1.5
Heart rate factor	1.25	Shunt fraction	0.25
Ischaemic Index sensitivity	0.1	Volume - loss	500mls plasma
O ₂ consumption	250ml/min		
Resistance factor:	0.5		
Systemic vascular	1.25		
Respiratory rate factor	0.2		
Shunt fraction	38.2°C		
Temp arterial & oesophageal	500 plasma		
Volume Loss			

Further Deterioration	Parameters	Treatment	Parameters
Blink mode	RR 46	Blink mode	RR 22
Contractility factor: left ventricle	SpO ₂ 87%	Contractility factor: left ventricle	SpO ₂ 95%
Heart rate factor	HR 130	Heart rate factor	HR 122
O ₂ consumption	NIBP 80/45	O ₂ consumption	NIBP 98/55
Respiratory rate factor	T 37.7°C	Respiratory rate factor	T 37.7°C
Volume - infusion	Eyes closed	Volume - infusion	Eyes open
	0.3		0.5
	1.0		1.4
	500ml/min		200ml/min
	1.75		0.85
	500 plasma		1000ml crystalloid

Debriefing

Introduction

It is common sense to tell candidates explicitly what will be expected of them during the scenarios. Remember what is said, and how it is said, sets the tone for the entire debriefing.

A clear introduction at the beginning of the debriefing session should emphasise the following points:

1. The importance of the debrief, i.e. the valuable opportunity to learn from reviewing their own and others actions and from group discussion.
2. Set the scene - reviewing performance is intended to be a positive learning experience: it is not an assessment of performance. Although this will have been emphasised at the start of the session, reinforcing this idea may help to put candidates at ease. The experience is intended to be non-threatening and to facilitate the exchange of ideas, experiences and opinions, rather than provide didactic teaching.
3. State the aims clearly - the goal is for candidates to give an analysis and evaluation of their own performance
4. Clarify the roles of learners and teachers. Debriefing is a group discussion in which learning is enhanced by contributions from all, not simply the team leader. The Faculty member's role is to facilitate discussion and tease out learning points.
5. Candidate performance will be improved if the goals and the reasons for the debrief are emphasised.

Debriefing Tool/Structure

Team members and observers may have varying perceptions of what was happening; therefore all learners should have an opportunity to input to the debriefing.

Base your debrief around the following 4 key elements:

1 Acute assessment & primary treatment with immediate investigations & support	2 Monitoring with frequent re-assessment	3 Illness severity assessment	4 Definitive diagnosis & treatment: targeted secondary exam
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Use a white board or flip chart to list the key points that arise from the discussions.

Questions

1. What was done well?

Start by asking the participating team, one by one, to comment on something that they feel they did well. Include the observers by asking them for a positive critique of the team's performance.

Ensure that learners include a critique of their non-technical skills in these discussions¹ i.e.

- Team work
- Communication skills
- Decision making skills
- Resource management

2. What could be improved on?

Allow participants, and then observers, to give an example of things they would do differently if given the chance to run the scenario again.

Don't allow yourself or the learners to become focused on the negative actions during this aspect of the debriefing.

3. What was your initial assessment of the patient?

Ask the learners to consider their performance using an A – B – C – D – E approach:

- A – e.g. was the airway clear, able to be opened and stabilised or unstable?
- B – e.g. what was the rate, rhythm and character of breathing?
Were the breath sounds normal?
- C – e.g. was the cardiovascular system stable or unstable?
What was the rate, rhythm and volume? What was the BP?
What was the capillary refill time (CRT)?
- D – e.g. what was the conscious level - using AVPU or GCS?
- E – e.g. Examination, Environment, Evidence, Charts, Medical & Nursing Notes
Include ABG, CXR, 12 lead ECG, glucose and Bloods

4. What monitoring and initial treatment and investigations did you institute?

Discuss the usefulness of basic non-invasive monitoring e.g. ECG and SpO₂. Point out that NIBP can be inaccurate. Reiterate the importance of frequent re-assessment of the patient.

Were the fundamental resuscitation treatments e.g. O₂ therapy, IV access and fluid therapy, initiated and when? This will provide an opportunity to discuss the different O₂ delivery devices, and issues surrounding IV access and the type and quantity of intravenous fluids.

What investigations were carried out e.g. cultures and were these appropriate? Discuss the importance of contacting the labs to inform them you have urgent blood samples to be processed.

Discuss the choice and speed of administration of the antibiotic – “time is tissue”!

5. What was your illness severity assessment at this time?

Ask the learners to discuss their concerns for the patient, based on their initial assessment. Ask the group to assess the patient’s illness severity at this point in the scenario.

VIDEO

The introduction of the video at this stage allows candidates to observe what actually happened, which may differ from their perception of how events unfolded. The previous discussions have established the team leader's line of thought and his or her recount of proceedings, any video evidence to the contrary can be addressed. When the learners see the video footage and the accompanying vital signs data, their actions will be evident.

6. What was your differential diagnosis and what lead you to that conclusion?

The differential diagnosis can be considered and any supporting or contradictory factors discussed.

This provides an opportunity to establish the background knowledge of the candidates, with reference to the pathophysiology of the principle diagnosis. In addition disease incidence, mortality risk, precipitating factors, and associated complications can also be explored.

Although this may not be the ideal setting for a review of basic knowledge, it will provide the facilitator with evidence of the candidates' understanding of the condition. It may also alert the candidates to areas in which further learning is required.

The candidates can be encouraged to review their own thought processes, and how they reached their diagnosis.

It may illustrate examples of candidates reaching the correct diagnosis but for the wrong reasons. Expected clinical signs, monitoring and investigation results can be discussed.

7. What is the specific treatment and management of this patient?

Discussions can focus on the specific treatment and management of the septic patient. Different treatment options can be explored and current research can be discussed. The pharmacology of key drugs can be reviewed.

8. What is your illness severity assessment of the patient now?

Ask the group to reconsider the illness severity assessment of the patient now and compare this to their earlier thoughts. Deliberate with them about what level and speed of intervention the patient requires, whether senior help is required and where the patient should be nursed i.e. ward, HDU, ICU etc.

Throughout the viewing, the facilitator should refer to the team leader with regards to regular updates on their perception of events as the scenario develops. **The video can be paused as required to emphasise specific points.** This allows access to candidate's mental model, anticipation, and re-evaluation of events.

Questions such as the following could be used to elicit this.

- What do you think was happening here?
- What is your plan at this point?
- If you didn't intervene how would you expect the patient to be in 5 mins?
- What are your priorities?

Conclusion

9. What would you do differently next time?

Allow participants, and then observers, to give an example of one thing that they would do differently if given the chance to run the scenario again.

Summarise the learning points then end the debriefing on a positive note!

ISE Project Acknowledgements

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Reference

1. Flin R, Glavin R, Maran N, Patey R. Framework for Observing and Rating Anaesthetists' Non-Technical Skills. University of Aberdeen/Version 1.0 2004.

**For further information contact the Scottish Clinical Simulation Centre -
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IDENTIFYING SEPSIS EARLY