



The OMFS Survival Guide

Sepsis Screening

Aims & Objectives

- Participants to understand and apply the sepsis screening pathway to real- life cases in the context of an OMFS DCT
- To understand common causes of sepsis in OMFS inpatients
- To be able to recall the Sepsis 6
- To understand when and who to call for help
- To be aware of important initial investigations and interventions as part of the assessment

Components of a Good Medical and Social History

- Full past medical history
- Current prescribed medications and any over- the- counter medications
- Past surgical history
- Family history of conditions
- Smoking- current and past usage
- Alcohol- current and past usage
- Recreational drugs- current and past usage
- Occupation
- Living circumstances
- Systems review
- **If unable to gain a good history, can look at previous admissions, GP records, contact family with consent**

When you are called about an unwell patient:

- Get a full set of observations over the phone
- Get some details such as the background of admission, PMH, any events leading up to this

- Ask for certain things whilst you are on your way- e.g. if the patient has low O₂ sats- nurse can put the patient on oxygen, if there is chest pain ask for a 12-lead ECG

What is Sepsis?

- Sepsis is life-threatening organ dysfunction due to a dysregulated host response to infection: Sources include chest, abdomen, urinary tract, skin and soft tissue.
- The clinical course is variable: some patients will not deteriorate beyond a systemic inflammatory response (SIRS), whereas others will rapidly deteriorate to organ failure (severe sepsis)

SIRS: (Systemic Inflammatory Response Syndrome)

Mildest form. Criteria:

- o Temp >38°C or <36°C
- o RR >20
- o HR >90
- o WBC >12 or <4

Sepsis

Two of the criteria above, plus a suspected or confirmed infection.

Severe Sepsis

Sepsis criteria plus signs of end-organ damage (e.g. kidney failure, AKI), hypotension or lactate >4mmol

Septic Shock

Severe sepsis with persistent end organ damage, hypotension and lactate >4.

Mortality rate of 50%

Pathophysiology of Sepsis

- Patients with sepsis become hypotensive as the cytokines released to fight the infection cause vasodilation
- The lack of peripheral resistance causes the blood pressure to drop. If you have a local infection this is a useful response as the vasodilation increases blood flow to the area and so the delivery of immune cells, but in sepsis it is a systemic response so the vasodilation occurs everywhere.
- These same cytokines also cause some inflammatory damage to the alveoli in the lungs, making air exchange less efficient and causing the raised respiratory rate.
- The combination of the reduced oxygen and increased inflammatory and bacterial degradation products crossing the blood- brain barrier contributes to the confusion.

The Sepsis 6- BUFALO

- Remember you give the patient 3 things and take 3 things

- **Bloods and blood cultures (take)**- ideally take blood cultures before giving abx as if taken afterwards you might not get accurate growth due to the IV abx killing everything initially, however giving abx should not be delayed to take blood cultures
- **Urine dip and monitor output (take)**
- **Fluids (give)**
- **Antibiotics (give)**- broad- spectrum until you know the source of infection, give within an hour.
- **Lactate (take)**- you can see this on a venous blood gas (VBG)
- **Oxygen (give)** if sats low, 15L 100% through a non- rebreath mask

The A-E Assessment

- Airway:** Check airway is patent; can the patient speak and finish sentences?
 Check oxygen saturations
 Listen for additional noises (stridor/ stertor)
 Consider airway adjuncts if pt not maintaining airway (oropharyngeal and nasopharyngeal airways)
 CALL FOR HELP EARLY
- Breathing:** Check respiratory rate
 Check work of breathing
 Consider taking an ABG (if sats low, RR high) and chest X- ray
- Circulation:** Check heart rate and pulse- if high or low, or irregular pulse get an ECG
 Check BP- if low can give a fluid bolus. 500mls Hartmanns IV over less than 10 minutes (250mls if pt has cardiac/ renal failure or is elderly)
 Check Capillary Refill Time (CRT)
 Take bloods as appropriate +/- blood cultures
 Monitor urine output (consider catheterisation)
- Disability:** NAVPU- is the pt alert, confused, only responsive to pain?
 Glucose via finger- prick (can also see this on an ABG/VBG if you have one).
 Check the pupils- if unequal, not responsive get help.
- Exposure:** Everything else!
 Check the calves for any swelling/ tenderness/ erythema.
 Abdomen for pain/distension/bruising.
 Systematically expose the pt and look for any rashes/swellings/skin changes/bleeding signs.

The Venous and Arterial Blood Gas (VBG/ABG)

- The main difference is an ABG has an accurate O₂ and CO₂ reading and so we always need this in patients with low O₂ saturations, or who have a high respiratory rate to assess their oxygenation.
- A VBG has everything else- can take one for any sick patient who is saturating fine.
- Both give a result within minutes, so are good to check the Hb or potassium quickly when you cannot wait for the FBC or U&Es (as these take at least an hour).
- For full interpretation see: <https://geekymedics.com/abg-interpretation/>

Urine Dip Interpretation

- o Taken as part of the Sepsis 6 bundle, if patient is complaining of urinary symptoms (pain on passing urine, strong- smelling urine, urinary incontinence, blood in urine).
- o A very simple test done at the bedside- dip the stick in the urine, the boxes may change colour depending on what's in the urine (the interpretation is on the side of the box).
- o For simplicity, we are only covering the most common considerations.

LEU 120 s	—	15 ±	70 +	125 ++	500 +++	Leu/μL	
NIT 60 s	—	+	pink rose rosado	rosada rosa rožový rož	rosa różowy różaszín roz	lyserød růžový 粉红	
URO 60 s	—	+	+	+	+	+	
	0.2(3.5)	1(17)	2(35)	4(70)	8(140)	12(200)	mg/dL(μmol/L)
PRO 60 s	—	15(0.15) ±	30(0.3) +	100(1.0) ++	300(3.0) +++	2000(20) ++++	mg/dL(g/L)
pH 60 s	5.0	6.0	6.5	7.0	7.5	8.0	9.0
BLO 60 s	—	±	+	++	+++	5-10	50 Ery/μL
SG 45 s	1.000	1.005	1.010	1.015	1.020	1.025	1.030
KET 40 s	—	5(0.5) ±	15(1.5) +	40(4.0) ++	80(8.0) +++	160(16) ++++	mg/dL(mmol/L)
BIL 30 s	—	1(17) +	2(35) ++	4(70) +++	mg/dL(μmol/L)		
GLU 30 s	—	100(5) ±	250(15) +	500(30) ++	1000(60) +++	≥2000(110) ++++	mg/dL(mmol/L)

Positive for Leukocytes: Present in any inflammatory process such as infection, post- op for any surgery along urinary tract, cancer, will be present due to local trauma in catheterised pts. If positive alone does not always signal infection.

Positive for Nitrites: This is a breakdown product of gram- negative bacteria and is specific for detecting a urinary tract infection.

Positive for Protein: This is a sign of kidney disease, indicates damage to the tubules which is why they are leaking protein (usually these molecules are too large to pass into the urine).

Positive for RBCs: Red cells may be present due to infection, local trauma (e.g. catheter) and always important to suspect cancer in older patients if infection ruled out. If pre-menstrual female- check they are not on their period, or finishing it.

Positive for Ketones: In a diabetic patients this is a sign of diabetic ketoacidosis, seek help immediately. Can also be a sign of starvation.

Positive for Glucose: Usually diabetes, also indicates kidney disease as damage to the tubules is allowing more glucose to leak out.

Important Medical Issues to Consider

Diabetes

- These patients are immunocompromised and are more susceptible to severe infections. Ensure their regular diabetic medications are prescribed and given, if the pt has badly controlled blood glucose or is to be kept NBM prior to theatre put them on a variable rate insulin infusion to control their blood glucose.
- Severe infections can lead to diabetic ketoacidosis as the increase in stress leads to cortisol production- this is an antagonist of insulin. It is important to be aware of the need for tight monitoring of the blood glucose.

HIV Patients

- Patients with HIV are possibly immunocompromised and can be susceptible to atypical infections. It is important these patients are discussed with their parent team with regards to their therapy and appropriate treatment.

Rheumatology Patients

- These patients are often taking one or more disease- modifying anti- rheumatoid drugs (DMARDs) such as methotrexate, sulfasalazine, leflunomide or possible biologics (e.g. adalimumab)
- All of these medications are strong immunosuppressants and as a result patients with an infection may not mount an appropriate immune response, and their bloods may look normal
- They may also be taking long- term steroids and require steroid cover

Chemotherapy/ Haematological Malignancy Patients

- These patients may have low white cell counts and therefore be unable to fight off infection
- If the counts fall low enough, they will not form pus as there are no neutrophils (neutropenic sepsis)- so patients with dental abscess may not have swellings. It is important these patients have their carious/ infected teeth removed promptly.
- All patients with a known haematological malignancy or undergoing chemo/radiotherapy must be discussed with haematology if they present with an infection as they may require adjunctive treatment.

Malnourished Patients

- An important consideration, especially in our oncology patients who may not have good oral intake due to obstruction via tumour, or the reconstruction
- Malnourishment means your cells do not have the adequate supplies to function properly and so these patients are susceptible to infection

Further reading:

General assessment of OMFS patients: <https://www.amazon.co.uk/Call-Oral-Maxillofacial-Surgery-2nd/dp/1909818585>

Mind the Bleep:

<https://www.mindthebleep.com/sepsis/>

Geeky Medics Guides on Sepsis Screening, ABG Analysis and Urinalysis:

<https://geekymedics.com/acute-management-of-sepsis/>

<https://geekymedics.com/abg-interpretation/>

<https://geekymedics.com/urinalysis-osce-guide/>

E- Face:

<https://www.e-lfh.org.uk/programmes/oral-and-maxillofacial-surgery/>