

Slide 1



## Please read notes under the slides

For use with APLS ANZ 5e manual, March 2013 & pre-course online learning modules

**There are 4 clinical cases to support discussion in this workshop.**

### Case No. Case Aims

- Bacterial vs viral meningitis & use of lumbar puncture
- Management of shock associated with septicaemia
- Possibility of meningococcal /NAI
- Other conditions mimicking sepsis: duct dependent CHD

**If time is limited, please choose either case 3 or 4 depending on candidate's experience**

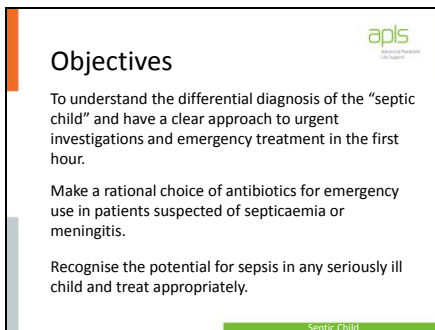
### Materials Required

#### Equipment

Overhead projector  
Screen

Be aware that this session is to discuss principles and initial management. Be prepared to discuss additional therapies often required for the septic child, including special blood factors, inotropes, IVIG, etc. **Use the expertise and experience withing the group.**

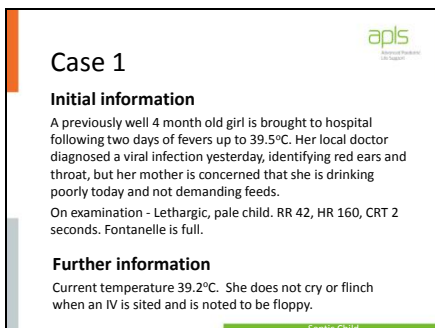
Slide 2



### Supporting material slides

- Bacterial pathogens in meningitis (slide 4)
- Bacterial meningitis treatment (slide 5)
- Bacterial pathogens in septic shock: 3 months to 5 years/over 5 years (slide 7)
- Bacterial pathogens in septic shock: neonates (slide 10)

Slide 3



### Initial Information

Comment on the examination findings- cause of tachycardia due to fever or early shock? Importance of maternal concern. Non-specific findings common in febrile illnesses.

### Further Information

Meningitis a likely diagnosis. The depressed conscious level is a contraindication to lumbar puncture. How should treatment proceed? Discuss likely organisms and the importance of the immunisation state of the child (partial in this child as she is under 6 months) in determining the likelihood of bacterial vs viral cause of fever.

### Instructor Information

Diagnosis:

Bacterial meningitis.

Slide 4

Bacterial meningitis	
<b>Newborns/Neonates</b>	
Group B streptococci	<b>Rx</b> ampicillin/amoxycillin & cefotaxime/ceftriaxone
Escherichia Coli	
Listeria monocytogenes	
<b>Infant &amp; Child</b>	
Neisseria meningitidis	<b>Rx</b> cefotaxime / ceftriaxone
Streptococcus pneumoniae	

Remember potential resistance issues, particularly with pneumococcus (many would add vancomycin until sensitivities known)

Steroids and antivirals discussed next slide

If time allows consider asking what tests should be done on CSF (if safe to collect): discuss modern non-culture methods

Slide 5

Bacterial meningitis	
<b>Lumbar puncture</b>	
Avoid if signs of raised intracranial pressure eg localised neurological signs, GCS < 13	
<b>Steroids</b>	
Give dexamethasone (0.15mg/kg/dose 6 hourly for 4 days) at onset of treatment.	
<b>Antiherpetic treatment</b>	
Give aciclovir if herpes meningo-encephalitis cannot be excluded	

Unlikely, but if time allows, discuss signs of raised intracranial pressure and its management

Slide 6

Case 2	
<b>Initial information</b>	
A nine year old boy with a history of congenital cardiac disease and asplenia presents with fever, vomiting and lethargy of 24 hours duration. On examination he is restless and poorly co-operative, which mum reports is out of keeping with his usual behaviour.	
On examination – RR 30, HR 140 with bounding pulses & he has warm, dry extremities. CRT is 1 second.	
<b>Further information</b>	
Temperature is 40°C. The child becomes more drowsy and mum reports that she can't recall him passing urine all that day.	

### Initial information

The child is in shock. Discuss initial treatment of shock. Sepsis is likely: discuss antibiotics to be given after blood culture.

### Further information

Severe septic shock is likely. Causative organisms are more likely to be gram positive encapsulated bacteria such as Streptococcus Pneumoniae, Haemophilus Influenzae type B or Neisseria Meningitidis due to the asplenia. Anticipate severe shock. Consider the lab tests to be requested- include clotting studies.

### Instructor information

Diagnosis:

Warm septic shock due to Streptococcus Pneumoniae septicaemia

Discuss antibiotic choices, which vary amongst units. Often use 3<sup>rd</sup> generation cephalosporin plus additional staphylococcal cover (flucloxacillin). Some units consider vancomycin if concerns re resistance. Use the expertise and experience of the group.

If time allows discuss asplenia.

Slide 7

Bacterial pathogens in non-immunocompromised	
<b>3 months to 5 years</b>	
Streptococcus pneumoniae	
Neisseria meningitidis	<b>Rx</b>
Staphylococcus aureus	cefotaxime / ceftriaxone
Escherichia Coli	flucloxacillin
Group A streptococcus	
<b>Over 5 years</b>	<b>Note</b>
Neisseria meningitidis	Know your local data – issues with resistance? (coliforms, pneumococcus, staph)
Staphylococcus aureus	
Group A streptococcus	

Septic Child

Be prepared to discuss resistance in organisms, which varies widely. May need to introduce idea of using bigger doses or additional antimicrobials such as vancomycin. Emphasise discussion with local ID team

Slide 8

**Case 3**

**Initial information**  
 A 3 month old baby is brought in with a history of a generalised convulsion at home lasting about 10 minutes. RR 45 with no recession, HR 130, CRT 2 sec. She is responsive only to pain, and there is no fever. Purpura are seen on the trunk.

**Further information**  
 The fontanelle is noted to be bulging and she starts to convulse again.

Septic Child

**Initial Information**

ABC are satisfactory – it is the conscious level that attracts concern. Discuss purpura and initial treatment.

**Further Information**

Convulsion control. Treat for possible meningitis. CT scan.

**Instructor Information**

Differential has to include sepsis, so act accordingly. Purpuric rash should open dialogue re meningococcal infection. However differential diagnosis always important. What is unusual for infection here? (age, lack of fever, normal CRT). Final diagnosis = “Shaken baby” syndrome, intracerebral bleeding on CT, multiple old fractures

Slide 9

**Case 4**

**Initial information**  
 A 5 day old baby is brought into hospital. He had had a full-term normal delivery and appeared well until a few hours before admission. Over this time he has refused feeds and his breathing has become rapid. RR 80 with mild recession, HR 190 by auscultation as peripheral pulses are almost impalpable. He responds only to pain. His colour is greyish blue and rectal temperature is 34°C.

**Further information**  
 A gallop rhythm is heard on auscultation and liver is enlarged by 4cm.

Septic Child

**Initial Information**

Seriously ill baby. Needs intubation, ventilation and bolus of fluid into circulation. Sepsis possible: blood culture and antibiotics.

**Further Information**

Duct dependent congenital heart disease likely. Infusion of prostaglandin E1.

**Instructor Information**

Diagnosis:  
 Duct dependent coarctation of aorta.

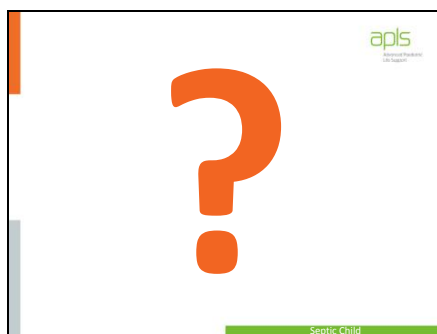
Slide  
10

Bacterial pathogens in non-immunocompromised	
<b>Newborns/Neonates</b>	<b>Rx</b> ampicillin/amoxycillin & cefotaxime/ceftriaxone
Group B streptococci	
Escherichia Coli	
Listeria monocytogenes	

Septic Child

Even though prev case not infective, opportunity here to discuss different approach to neonatal sepsis. Stress importance of group B and Listeria. If using 3<sup>rd</sup> gen cephalosporins (as some units do empirically) emphasise addition of amoxycillin/ampillin to cover Listeria. Some candidates may wish to discuss benzylpenicillin as an alternative (commonly used in UK)

Slide  
11



Slide  
12

### Summary

Recall differential diagnosis of the "septic child" and have a clear approach to urgent investigations and emergency treatment in the first hour.

Make a rational choice of antibiotics for emergency use in patients suspected of septicaemia or meningitis.

Recognise the potential for sepsis in any seriously ill child and treat appropriately.

Septic Child