Sepsis NEONATAL FIRST DOSE Empirical Parenteral Antibiotic Guideline

The Clinical Excellence Commission (CEC) Sepsis Neonatal Empirical Parenteral Antibiotic Guideline aims to guide the prescription and timely administration of the FIRST DOSE of antibiotics for neonatal patients

(less than one month of age)

who re-present after going home and have a diagnosis of sepsis.
When peripheral intravenous access is not available antibiotics can be administered via umbilical or intraosseous access.
Prior to gaining intraosseous access in the neonate, consideration must be given as to whether the umbilical vein is still accessible. If in doubt please refer to local paediatrician.
Intramuscular antibiotics should only be used FOR SHORT TERM if unable to obtain IV, umbilical or IO access.
The guideline is based on MIMS, 2011 and the Therapeutic Guidelines: Antibiotic version 14, 2010. Some doses may vary from Therapeutic Guidelines as they are under review. The CEC guideline incorporates best available evidence and expert opinion and is intended to provide an accessible resource which can be adapted to suit individual facility preferences as required.
Prompt administration of antibiotics and resuscitation fluids is vital in the management of the neonate at risk of, or with, sepsis. The goal is to commence antibiotic therapy within the first hour of the recognition of the risk of sepsis.
Neonates at risk of sepsis may develop irretrievable septic syndromes if antibiotics are delayed.

This is a guideline for the FIRST DOSE of antibiotics after which clinicians should seek local assistance and examine results of tests to inform ongoing directed therapy.

Important notes

- **Sepsis in neonates** is often described as early-onset or late-onset. Sepsis in the neonate often presents with subtle signs which may include dusky episodes, pallor, temperature instability (fever or hypothermia), poor feeding, sleepiness, low blood glucose, milky or bilious vomits or early onset respiratory distress before becoming a fulminant, systemic illness. A low threshold for instituting treatment should be maintained where **two or more** of the above risk factors or signs are present.
- Neonates with **early-onset sepsis** may have antenatal risk factors of
  - positive group B streptococcus colonisation of the maternal vagina,
  - premature or prolonged rupture of membranes,
  - unexplained premature labour
  - peri-partum maternal fever.
- **Late-onset sepsis** usually occurs in neonates > 48 hours of age. Term infants with late-onset sepsis may have a history of obstetric complications but this is less characteristic.

If renal failure is present, dosages and intervals of antibiotics may need to be adjusted especially for vancomycin, gentamicin and penicillin drugs.
All antibiotic dosing in neonates relates to birth weight. Where scales are available the baby should be bare weighed. If no scales available the weight can be estimated. When in doubt discuss with local paediatrician or call QLD QCC 1300 79 9127 or NSW NETS 1300 36 2500 for adequate dosing and management.
Obtain 1mL of blood for blood culture (aerobic bottle) before administering antibiotics if possible
Obtain other clinical specimens as appropriate but do not delay administration of antibiotics or wait for results of investigations.
All neonates with presumed or suspected sepsis should be discussed with the local Paediatrician and for neonates who have to be transferred contact QLD QCC 1300 79 9127 or NSW NETS 1300 36 2500.
Always obtain expert advice about further investigation and treatment if blood culture or CSF cultures become positive.

References
1. ACI/CEC 2011 Sepsis Kills: Recognise—Resuscitate—Refer

Note: see Sepsis Paediatric Empirical Parenteral Antibiotic Guideline for patients 1 month to 16 years of age.

Neonatal Parenteral Antibiotic Prescribing: FIRST DOSE			
WHEN NO OBVIOUS FOCUS			
	FIRST DOSE empirical IV, umbilical or IO antibiotic regimen **AGE: Less than 7 days**	FIRST DOSE empirical IV, umbilical or IO antibiotic regimen **AGE: 7 to 28 days**	FIRST DOSE empirical IM antibiotic regimen
Severe sepsis with **NO OBVIOUS SOURCE OR INFECTION**	**Cefotaxime** 50mg/kg/dose IV/IO, 12-hourly ***PLUS*** **Gentamicin *5 MINUTE PUSH*** 5 mg/kg/dose IV/IO, 24-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO, 8-hourly ***PLUS*** **Aciclovir** 20mg/kg/dose IV/IO, 8-hourly	**Cefotaxime** 50mg/kg/dose IV/IO, 8-hourly ***PLUS*** **Gentamicin *5 MINUTE PUSH*** 5 mg/kg/dose IV/IO, 24-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO, 6-hourly ***PLUS*** **Aciclovir** 20mg/kg/dose IV/IO, 8-hourly	**Cefotaxime** 50mg/kg/dose IM, 12-hourly (age < 7 days) ***OR*** 8-hourly (age 7-28 days) ***PLUS*** **Gentamicin** 5 mg/kg/dose IM, 24-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IM, 8-hourly (age < 7 days) ***OR*** 6-hourly (age 7-28 days) *Aciclovir **CANNOT** be given IM*
Fever in the neutropenic Oncology patient	See guideline "Management of fever in the neutropenic oncology patient". http://int.ncahs.nsw.gov.au/documents/view.php?documentid=4810&status=&message=&PHPSESSID=9ebd083a70bbe305309912b1f6f8de40		
Meningitis / encephalitis	**Cefotaxime** 50mg/kg/dose IV/IO, 12-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO, 8-hourly ***PLUS*** **Aciclovir** 20mg/kg/dose IV/IO, 8-hourly	**Cefotaxime** 50mg/kg/dose IV/IO, 8-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO, 6-hourly ***PLUS*** **Aciclovir** 20mg/kg/dose IV/IO, 8-hourly	**Cefotaxime** 50mg/kg/dose IM, 8 or 12-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IM, 8-hourly (age < 7 days) ***OR*** 6-hourly (age 7-28 days) *Aciclovir **CANNOT** be given IM*
For administration guideline consult individual antibiotic drug guideline on intranet.			

ANTIMICROBIAL ADMINISTRATION

- Administer the antibiotic in the order provided.
- To avoid drug incompatibility flush the IV line with 0.5mL sterile sodium chloride 0.9% before and after the antibiotic injection/infusion.
- When injecting antibiotics directly into an IV injection port which has resuscitation fluid (0.9% sodium chloride) running: clamp the infusion

Neonatal Parenteral Antibiotic Prescribing: FIRST DOSE

SOURCE OF INFECTION IS SUSPECTED OR KNOWN

1. Consider Aciclovir if severe sepsis, pneumonia, meningitis, seizures, hepatitis or if skin vesicles or ulceration present.
2. Consider adding clindamycin if high risk for community acquired MRSA when the apparent source of sepsis is cellulitis/ omphalitis/osteomyelitis/septic arthritis.
3. Add vancomycin if severe sepsis when the apparent source of sepsis is cellulitis/omphalitis/osteomyelitis/septic arthritis.

APPARENT SOURCE OF INFECTION	FIRST DOSE empirical IV, umbilical or IO antibiotic regimen **AGE: Less than 7 days**	FIRST DOSE empirical IV, umbilical or IO antibiotic regimen **AGE: 7 to 28 days**	FIRST DOSE empirical IM antibiotic regimen
Meningitis / encephalitis	**Cefotaxime** 50mg/kg/dose IV/IO, 12-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO, 8-hourly ***PLUS*** **Aciclovir** 20mg/kg/dose IV/IO, 8-hourly	**Cefotaxime** 50mg/kg/dose IV/IO, 8-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO, 6-hourly ***PLUS*** **Aciclovir** 20mg/kg/dose IV/IO, 8-hourly	**Cefotaxime** 50mg/kg/dose IM, 8 or 12-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IM, 8-hourly (age < 7 days) ***OR*** 6-hourly (age 7-28 days) *Aciclovir **CANNOT** be given IM*
Pneumonia *Refer to note 1 above*	**Benzylpenicillin** 60mg/kg/dose IV/IO, 12-hourly ***PLUS*** **Gentamicin *5 MINUTE PUSH*** 5mg/kg/dose IV/IO, 24-hourly ***PLUS*** **Azithromycin** 10mg/kg/dose IV/IO, 24-hourly (if considering chlamydia or pertussis)	**Benzylpenicillin** 60mg/kg/dose IV/IO, 6-hourly ***PLUS*** **Gentamicin *5 MINUTE PUSH*** 5mg/kg/dose IV/IO, 24-hourly ***PLUS*** **Azithromycin** 10mg/kg/dose IV/IO, 24-hourly (if considering chlamydia or pertussis)	**Benzylpenicillin** 60mg/kg/dose IM, 12-hourly (age ***PLUS*** **Gentamicin *5 MINUTE PUSH*** 5mg/kg/dose IM, 24-hourly *Azithromycin **CANNOT** be given IM. It may be given orally if appropriate. Seek specialist advice.*
Urinary tract infection	**Ampicillin** 50mg/kg/dose IV/IO, 8-hourly ***PLUS*** **Gentamicin *5 MINUTE PUSH*** 5mg/kg/dose IV/IO, 24-hourly	**Ampicillin** 50mg/kg/dose IV/IO, 6-hourly ***PLUS*** **Gentamicin *5 MINUTE PUSH*** 5mg/kg/dose IV/IO, 24-hourly	**Ampicillin** 50mg/kg/dose IM, 8-hourly (age < 7 days) ***OR*** 6-hourly (age 7-28 days) **Gentamicin *5 MINUTE PUSH*** 5mg/kg/dose IM, 24-hourly

For administration guideline consult individual antibiotic drug guideline on intranet.

Neonatal Parenteral Antibiotic Prescribing: FIRST DOSE

SOURCE OF INFECTION IS SUSPECTED OR KNOWN

1. Consider Aciclovir if severe sepsis, pneumonia, meningitis, seizures, hepatitis or if skin vesicles or ulceration present.
2. Consider adding clindamycin if high risk for community acquired MRSA when the apparent source of sepsis is cellulitis/ omphalitis/osteomyelitis/septic arthritis.
3. Add vancomycin if severe sepsis when the apparent source of sepsis is cellulitis/omphalitis/osteomyelitis/septic arthritis.

APPARENT SOURCE OF INFECTION	FIRST DOSE empirical IV, umbilical or IO antibiotic regimen **AGE: Less than 7 days**	FIRST DOSE empirical IV, umbilical or IO antibiotic regimen **AGE: 7 to 28 days**	FIRST DOSE empirical IM antibiotic regimen
Cellulitis or Omphalitis *See points 2, 3 above*	**Flucloxacillin** 50mg/kg/dose IV/ IO, 12-hourly Consider Clindamycin in caMRSA. Add Vancomycin in severe sepsis.	**Flucloxacillin** 50mg/kg/dose IV/IO, 6-hourly Consider Clindamycin in caMRSA. Add Vancomycin in severe sepsis.	**Flucloxacillin** 50mg/kg/dose IM, 12-hourly (age < 7 days) ***OR*** 6-hourly (age 7-28 days) Consider Clindamycin in caMRSA. Vancomycin ***CANNOT*** be given IM.
Osteomyelitis or septic Arthritis *See points 2, 3 above*	**Flucloxacillin** 50mg/kg/dose IV/ IO, 12-hourly Consider Clindamycin in caMRSA. Add Vancomycin in severe sepsis.	**Flucloxacillin** 50mg/kg/dose IV/IO, 6-hourly Consider Clindamycin in caMRSA. Add Vancomycin in severe sepsis	**Flucloxacillin** 50mg/kg/dose IM, 12-hourly (age < 7 days) Consider Clindamycin in caMRSA. Vancomycin ***CANNOT*** be given IM.
Intra-abdominal infection	**Gentamicin** ***5 MINUTE PUSH*** 5mg/kg/dose IV/IO, 24-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO 8-hourly ***PLUS*** **Metronidazole** 15mg/kg/dose IV/IO as a loading dose then 7.5mg/kg/dose IV/IO, 12-hourly This is given 12 hours after the loading dose	**Gentamicin** ***5 MINUTE PUSH*** 5mg/kg/dose IV/IO, 24-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IV/IO 6-hourly ***PLUS*** **Metronidazole** 15mg/kg/dose IV/IO, 12-hourly	**Gentamicin** 5mg/kg/dose IM, 24-hourly ***PLUS*** **Ampicillin** 50mg/kg/dose IM, 8-hourly (age < 7 days) ***OR*** 6-hourly (age 7-28 days) ***PLUS*** **Clindamycin** 5mg/kg/dose IM, 8-hourly (age < 7 days) Metronidazole ***CANNOT*** be given IM. Give orally only if appropriate. Seek specialist advice.

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ANTIMICROBIAL ADMINISTRATION

- Administer the antibiotic in the order provided.
- To avoid drug incompatibility flush the IV line with 0.5mL sterile sodium chloride 0.9% before and after the antibiotic injection/infusion.
- When injecting antibiotics directly into an IV injection port which has resuscitation fluid (0.9% sodium chloride) running: clamp the infusion