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Title: **Cefotaxime for NICU**			Effective date: **14 Dec 2016**	
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1. Purpose and scope

To facilitate the safe administration of cefotaxime within the Neonatal Intensive Care Unit (NICU).

2. Drug

Drug	**Cefotaxime, cefotaxime sodium**
Drug action	Cefotaxime is a third generation bactericidal cephalosporin that causes bacterial cell wall disruption. It is distributed into most body tissues and fluids, including CSF, bile, bronchial secretions, lung tissue, ascetic fluid, aqueous humour, prostatic fluids, bone and the middle ear. [1,2] It penetrates the CSF best when the meninges are inflamed.[2] The half-life of cefotaxime in premature infants is approximately 3-6 hours.[3] Excreted mostly unchanged in the urine (60%), therefore if renal impairment exists reduce the total daily dose.[2] Partially metabolised in the liver to form an active compound desacetylcefotaxime,[1] which has a half-life of 1.3-1.9 hours.[2,3] Protein binding is 31-50%.[2]
Indications	• Neonatal meningitis • Bacterial sepsis caused by susceptible organisms
Presentation	Cefotaxime sodium equivalent to 1g of cefotaxime, vial • White to pale yellow powder • Reconstituted solutions are pale yellow • Contains ~48mg of sodium per 1g of cefotaxime • pH ranges from 4.5-6.5[4]
Route	• IV, bolus over 3-5 minutes • IM[1,2,3,4]
Dose	50mg/kg/dose[1,2,3,5] Maximum dose: 300mg/kg/day in neonatal meningitis[8] **Frequency of administration:**[5] Neonate under 7 days: administer every **12 hours** Neonate 7-21 days: administer every **8-12 hours** Neonate 21-28 days: administer every **6-8 hours**
Contraindications	• Known hypersensitivity to cephalosporins[2,3,5] or severe reaction to penicillins[6]
Precautions	• May cause false positive urinary glucose and false positive Coombs' test[5] • Caution in patients with history of colitis. • Caution in patients with impaired renal function.[2,3] Dose reductions recommended .[1] This is particularly important for lower birth weight infants. • Drug-resistant bacteria may develop if used in the absence of bacterial infection[1]

Compatibilities & Incompatibilities	• Compatible with water for injection as a diluent for direct IV injection[4] • Avoid sodium bicarbonate or other alkaline solutions (pH>7.5)[4] • Cefotaxime is incompatible with aminoglycosides, dobutamine, erythromycin, midazolam, phenytoin, vancomycin and doxapram.[7] • Limited data is available regarding medication compatibilities – consult a Pharmacist for more information on individual medications • Do not mix with blood products[6]
Adverse effects	• Hypersensitivity reactions, anaphylaxis. • Pain at injection site and extravasation may occur, causing tissue damage and requiring surgical intervention. • Clostridium difficile diarrhoea ranging from mild to fatal colitis (rare) • Leukopenia, eosinophilia, neutropenia or granulocytopenia and rarely bone marrow failure, pancytopenia or agranulocytosis. • Rapid bolus injection (over <1 min) via a central venous catheter has resulted in life threatening arrhythmias • Skin rash, pruritus, Stevens-Johnson syndrome, toxic epidermal necrolysis • Extremely low birth weight infants (<1000g) are at significantly increased risk of candidiasis than with other antibiotics[1] • Transient disturbance of hepatic enzymes • Encephalopathy and seizures especially with high doses in renal insufficiency.[6,8] • Reversible interstitial nephritis. • CNS effects: hyperactivity, dizziness, nervousness, sleep disturbances, hallucinations, confusion, hypertonia.[5] • May inhibit vitamin K dependent clotting factors and may also suppress the gut flora that normally synthesize them.[8]

3. Administration

Competency for administration	This procedure is carried out by, or under, the direct supervision of a registered nurse / registered midwife who holds generic IV certification **and** Neonatal specific certifications NCV/NAC if administering via CVAD, as well as Guardrails competency.
Preparation & Administration	• Dilute vial to 50-200mg/ml with water for injection.[1,6] Note: 1g of cefotaxime displaces 0.4ml of diluent.[6,9] The following table shows some example dilutions.

Route	Vial Strength	Water to add	Total volume	Concentration
IV	1g	9.6ml	10ml	100mg/ml
IM	1g	4.6ml	5ml	200mg/ml

• Shake vial vigorously to dissolve powder and check for absence of particulate matter before drawing up final dose.
• **For IV bolus, administer over 3-5 minutes. Do not inject over less than 3 minutes as a rapid injection**.

Note: Flush before and after with sodium chloride 0.9%.

• For IM injection, inject deep into large muscle (e.g. gluteal muscle or lateral thigh)..
• **Intramuscular injection with lignocaine hydrochloride should not be used in infants under 30 months of age**.[9,10]

Observations and management	• Monitor haematological function, liver and renal function periodically if treating for longer than 7 days.[4] • Monitor for early signs and symptoms of hypersensitivity or anaphylaxis. • Consider if specimen for culture and sensitivity is required before the first dose.[4] • Observe closely for extravasation during administration. • Monitor for adverse effects and signs of superinfection.[6]
Storage	• Store vials at room temperature (below 25°C) • Protect from light. • Prepare immediately before use • Reconstituted solutions are stable at room temperature for up to 8 hours and refrigerated (2-8°C) for up to 24 hours.[4]
Special considerations	• Increased risk of skin rashes when administered concomitantly with phenobarbitone • Can potentiate the nephrotoxic effect of aminoglycosides[6]
Rescue medication	For management of anaphylactoid reactions: • Discontinue cefotaxime • Administer adrenaline, steroids, oxygen, antihistamines as required • Supportive therapy (i.e. ventilation) as required

4. References

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