Dexamethasone
Newborn use only

2019

Alert	Dexamethasone is available as Dexamethasone phosphate or dexamethasone sodium phosphate. The conversion factor for dexamethasone: 1.2 mg dexamethasone phosphate = 1 mg dexamethasone. 1.3 mg dexamethasone sodium phosphate = 1 mg dexamethasone
Indication	To facilitate weaning from assisted ventilation and improve lung function in infants at risk of chronic lung disease. To facilitate extubation.
Action	Long acting glucocorticoid with potent anti-inflammatory action. No significant mineralocorticoid activity.
Drug Type	Adrenal steroid hormone.
Trade Name	IV: Dexamethasone sodium phosphate DBL, dexamethasone phosphate DBL, dexamethasone phosphate Alphapharm, dexamethasone phosphate Mylan. Oral: Compounded by pharmacy in-house.
Presentation	IV: 4 mg/mL of dexamethasone **phosphate.** Oral: 0.05mg/mL, 0.1mg/mL, 0.5 mg/mL or 1 mg/mL solution or suspension – Prepared by pharmacy in-house.
Dosage/Interval	**Low dose (DART) protocol** 0.075 mg/kg/dose 12 hourly for 3 days then, 0.05 mg/kg/dose 12 hourly for 3 days then, 0.025 mg/kg/dose 12 hourly for 2 days then, 0.01 mg/kg/dose 12 hourly for 2 days then cease. **High dose protocol – e.g., for term neonates with chronic lung disease** 0.25 mg/kg/dose 12 hourly for 3 days then, 0.15 mg/kg/dose 12 hourly for 3 days then, 0.1 mg/kg/dose 12 hourly for 3 days then, 0.05 mg/kg/dose 12 hourly for 3 days then, 0.025 mg/kg/dose 12 hourly for 6 days then cease. **Extubation protocol** 0.25 mg/kg 8 hourly for up to 3 doses. Commence 4 hours before extubation.
Maximum daily dose	0.75 mg/kg
Total cumulative dose	Low dose (DART) protocol: 0.89 mg/kg High dose protocol: 3.6 mg/kg Extubation protocol: 0.75 mg/kg
Route	IV, oral.
Preparation/Dilution	**IV:** Draw up 0.6 mL (equivalent to 2 mg dexamethasone) and add 9.4 mL of sodium chloride 0.9% to make a final volume of 10 mL with a concentration of 0.2 mg/mL. If volume is too small, further dilute: Draw up 1 mL of solution (0.2mg of dexamethasone) and add 9 mL of sodium chloride 0.9% to make a final volume of 10mL with a concentration of 0.02 mg/mL. **Oral:** Prepared by pharmacy in-house (check which strength is stocked with Pharmacy Department). Strengths available: 0.05mg/mL oral solution or suspension 0.1mg/mL oral solution or suspension 0.5mg/mL oral solution or suspension (if volume is too small, further dilute: Draw up 1mL of solution or suspension (0.5mg dexamethasone) and add 9mL WFI to make a final volume of 10mL with a concentration of 0.05mg/mL). 1mg/mL oral solution or suspension (if volume is too small, further dilute: Draw up 1mL of solution or suspension (1mg dexamethasone) and add 9mL WFI to make a final volume of 10mL with a concentration of 0.1mg/mL).

	Dexamethasone 1mg = Dexamethasone phosphate 1.2mg = Dexamethasone sodium phosphate 1.3mg approx. Molecular mass (Dexamethasone phosphate) = 472.4 Molecular mass (Dexamethasone) = 392.5[12]
Administration	IV: Administer over 3−5 minutes. Oral: Administer with feeds to minimise gastric irritation. Oral Suspension: Shake the bottle well before drawing up required dose.
Monitoring	Blood glucose levels (BGLs) at least daily. When on oral feeds measure BGL only if there is glucose in urine. Blood pressure at least daily. Electrolytes.
Contraindications	Untreated systemic infections.
Precautions	Use preservative free drug where possible. Avoid early (<8 days) treatment, higher dose and longer courses where possible to reduce side effects. Avoid concurrent use with NSAIDs for PDA treatment. Corticosteroids may increase susceptibility to or mask the symptoms of infection.
Drug Interactions	Barbiturates, phenytoin and rifampicin may increase the metabolism of dexamethasone. Antithyroid agents may decrease the metabolism of dexamethasone.
Adverse Reactions	Early (< 8 days) postnatal corticosteroids cause short-term adverse effects including gastrointestinal bleeding, intestinal perforation, hyperglycaemia, hypertension, hypertrophic cardiomyopathy and growth failure. Late (after seven days) postnatal corticosteroids in high doses in particular are associated with short-term side effects including gastrointestinal bleeding, higher blood pressure, glucose intolerance, severe retinopathy of prematurity and hypertrophic cardiomyopathy. Other effects include: Hypertriglyceridemia in association with hyperinsulinism and raised free fatty acids. Increase in total and immature neutrophil counts; increase in platelet count. Adrenal insufficiency is associated with higher doses (initial >0.2 mg/kg/day) longer courses (>14 days) of dexamethasone. Myocardial hypertrophy and outflow obstruction may occur with higher doses and prolonged courses of dexamethasone. May increase risk of infection.
Compatibility	Fluids: Glucose 5%, sodium chloride 0.9% Y-site : Amino acid solutions, aciclovir, amifostine, amikacin, anidulafungin, aztreonam, bivalirudin, cisatracurium, dexmedetomidine, fentanyl, filgrastim, fluconazole, foscarnet, granisetron, heparin sodium, hydrocortisone sodium succinate, hydromorphone, linezolid, methadone, morphine sulfate, pethidine, piperacillin-tazobactam, potassium chloride, remifentanil, zidovudine.
Incompatibility	Fluids: No information. Y-site: Calcium chloride, calcium gluconate, caspofungin, chlorpromazine, ciprofloxacin, dobutamine, erythromycin, esmolol, gentamicin, glycopyrrolate, haloperidol lactate, labetalol, levomepromazine, magnesium sulfate, midazolam, mycophenolate mofetil, pentamidine, phentolamine, promethazine, protamine, rocuronium, tobramycin.
Stability	IV: Diluted solution is stable for 24 hours at 2−8°C Oral: As per Pharmacy Department.
Storage	Ampoule: Store below 25°C. Protect from light. Oral: As per Pharmacy Department – Some formulations are stored at room temperature (below 25°C) while others are stored refrigerated (2−8°C). Protect from light.
Special Comments	

Evidence summary	**Efficacy:** **Late (after seven days) postnatal corticosteroids for chronic lung disease in preterm infants:** corticosteroids to infants at least seven days old reduces the need for assisted ventilation and chronic lung disease, and may reduce death in the first 28 days of life. However, high doses in particular are associated with short-term side effects such as bleeding from the stomach or bowel, higher blood pressure, glucose intolerance, severe retinopathy of prematurity and hypertrophic cardiomyopathy [1]. (LOE I, GOR B) A meta-regression of randomised trials of postnatal corticosteroids in preterm infants found a relationship between risk of bronchopulmonary dysplasia and risk of death or CP. With risks for CLD below 35%, corticosteroid treatment significantly increased the chance of death or CP, whereas with risks for CLD exceeding 65%, it reduced this chance. There was no difference overall in risk of death or cerebral palsy. The analysis suggests postnatal corticosteroids should be restricted to ventilated infants predicted to have ≥35% risk of bronchopulmonary dysplasia [2, 3]. (LOE III, GOR C) **Conclusion:** It is recommended reserve the use of late corticosteroids for infants who cannot be weaned from mechanical ventilation and to minimise the dose and duration of any course of treatment [1]. **Dose:** Treatment regimens varied from cumulative dexamethasone doses 0.4 mg/kg up to 8.0 mg/kg [2]. The low dose dexamethasone protocol (DART trial) facilitated extubation and shortened duration of intubation in ventilator-dependent, very preterm/extremely low birth weight infants, without obvious short-term complications. [Twice-daily doses of a 10-day tapering course of dexamethasone sodium phosphate (0.15 mg/kg per day for 3 days, 0.10 mg/kg per day for 3 days, 0.05 mg/kg per day for 2 days, and 0.02 mg/kg per day for 2 days; total of 0.89 mg/kg)] [4]. **Early (< 8 days) postnatal corticosteroids for preventing chronic lung disease in preterm infants:** early corticosteroid treatment facilitates extubation and reduces the risk of chronic lung disease, patent ductus arteriosus and severe retinopathy of prematurity. However, it causes short-term adverse effects including gastrointestinal bleeding, intestinal perforation, hyperglycaemia, hypertension, hypertrophic cardiomyopathy and growth failure. Long-term follow-up studies report an increased risk of abnormal neurological examination and cerebral palsy. There was no difference in infection. The benefits of early postnatal corticosteroid treatment, particularly dexamethasone, may not outweigh the adverse effects of this treatment [5]. (LOE I, GOR B) **Intravenous dexamethasone for extubation of newborn infants:** Dexamethasone reduces the need for endotracheal reintubation of neonates after a period of intermittent positive pressure ventilation. In view of the lack of effect in low risk infants and the documented and potential side effects, restrict use to infants at increased risk for airway oedema and obstruction, such as those who have received repeated or prolonged intubations. Dose regimens used 0.25-0.5 mg/kg from 1-3 doses [6]. [LOE I, GOR C] **Other side effects:** Adrenal suppression and myocardial hypertrophy: Higher doses (starting >0.2mg/kg) and prolonged courses (>14 days) may be associated with myocardial hypertrophy and adrenal suppression [7, 8]. (LOE II, GOR B) Infection: Systematic reviews of trials of early and late postnatal corticosteroids found no difference in infection rate overall [1, 4]. However, a crossover trial of dexamethasone-placebo versus placebo-dexamethasone reported increased nosocomial infection in the initial time period in the dexamethasone group [9]. Neutrophils: Dexamethasone increased total and immature neutrophils and platelet count peaking on day 7 [10]. Hypertriglyceridaemia: Dexamethasone induces hypertriglyceridemia in association with hyperinsulinism and raised free fatty acids [11].
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Original version Date: 29/10/2015	**Author: ANMF Consensus Group**
Current Version number: 3.0	**Current Version Date: 31/10/2019**
Risk Rating: Low	**Due for Review: 31/10/2024**

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