Hydrocortisone
Newborn use only

2018

Alert	Oral dose: Hydrocortisone is not soluble in water and the dose is not evenly distributed in the solution. Refer to preparation section for specific instructions on the oral preparation.
Indication	1. Treatment of cortisol deficiency (hypoadrenalism). 2. Treatment of hypotension NOT responding to inotrope. 3. Short term adjunctive therapy for persistent hypoglycaemia. 4. Prevention of bronchopulmonary dysplasia (not routinely recommended)
Action	1. Adrenal corticosteroid with primarily glucocorticoid effects. 2. Enhances vascular reactivity to other vasoactive substances by increasing expression of adrenergic receptors in the vascular wall and increasing calcium concentrations in myocardial cells. 3. Decreases breakdown of catecholamines. 4. Stimulates the liver to produce glucose from amino acids and glycerol, and stimulates the deposition of glucose as glycogen.
Drug Type	Corticosteroid.
Trade Name	IV: Solu-Cortef. Oral: Hysone.
Presentation	100 mg vial, 4 mg tablet, 20mg tablet
Dosage / Interval	**For oral dosing round dose off to the nearest whole milligram (ie round dose off to the nearest half or quarter tablet).** **Hypotension** ≥ 35 weeks CGA/PMA: 1 mg/kg/dose 6–8 hourly (range 1−2 mg/kg/dose). < 35 weeks CGA/PMA: 1 mg/kg/dose 6–12 hourly (range 1−2 mg/kg/dose). **Hypoglycaemia:** 1–2.5 mg/kg/dose every 6 hours. **Physiologic replacement (hypoadrenalism)**: 8-20 mg/m^2/day in 3-4 divided doses. [2] Dosing and dose adjustment should be done in consultation with a Paediatric Endocrinologist. **Stress dose:** 50 mg/m^2/day in 4 divided doses [up to 100 mg/m^2/day]. [If length not available use hypoglycaemia dose]. **Body Surface Area (BSA) calculation:** $BSA\ (m^2) = \sqrt{\frac{height\ (cm) \times weight\ (kg)}{3600}}$ **Low dose for prevention of bronchopulmonary dysplasia (not routinely recommended) [1-3]:** 0.5 mg/kg/dose every 12 hours for 7 days; then 0.5 mg/kg/dose every 24 hours for 3 days.
Route	IV, oral.
Preparation	**IV** Add 2 mL of water for injection to the 100 mg vial (50 mg/mL). Draw up 1 mL (50 mg) of reconstituted solution and add 4 mL sodium chloride 0.9% to make a final volume of 5 mL with a concentration of 10 mg/mL. **Oral** Hydrocortisone is not soluble in water. Underdosing or inaccurate dosing can occur when a whole 4mg tablet is dispersed in water, and a proportion of the final volume administered. Doses of hydrocortisone for oral administration should be rounded off to the nearest whole milligram (ie round dose off to the nearest half or quarter tablet).

	<u>Instructions to prepare an oral dose</u>: Using a tablet cutter, cut a 4mg tablet in halves or quarters (depending on the dose required). Crush the portion of tablet required for the dose and disperse it in 1-2mL of sterile water or milk for administration to patient. Discard remaining portion of tablet. Refer to Appendix 1 for instruction sheet for staff and parents.
Administration	IV: Slow IV injection over at least 1 minute. Oral: With feeds.
Monitoring	Measure blood pressure and blood glucose frequently during acute illness. In infants with primary adrenal insufficiency, monitor glucocorticoid replacement by clinical assessment, including growth velocity, body weight, blood pressure and energy levels.
Contraindications	Hydrocortisone is contraindicated in systemic fungal infections and patients with known hypersensitivity to the product and its constituents.
Precautions	Use of hydrocortisone in preterm infants in the first week is associated with intestinal perforation, particularly when treating concurrently with indomethacin. Untreated systemic bacterial infections. Use with caution in patients with renal impairment, hypothyroidism or cardiac disease. Prolonged use of corticosteroids (> 14 days) may cause prolonged adrenal suppression requiring a tapering dose of hydrocortisone.[4-6] Caution should be used when using hydrocortisone for treatment of hyperinsulinaemic hypoglycaemia given the lack of evidence, potential for adrenal suppression and side effects.
Drug Interactions	Drugs that induce hepatic enzymes such as phenobarbitone, phenytoin may increase the clearance of corticosteroids and may require increases in corticosteroid dose to achieve the desired response. Ketoconazole may inhibit the metabolism of corticosteroids and thus decrease their clearance. Therefore, the dose of corticosteroid should be titrated to avoid steroid toxicity. Increased GI toxicity with concurrent use of indomethacin.
Adverse effects	Hyperglycaemia, glycosuria. Hypertension after 24–48 hours. Vomiting, diarrhoea, gastric irritation, gastrointestinal ulceration and bleeding. Use of hydrocortisone in preterm infants in the first week is associated with intestinal perforation, particularly when treating concurrently with indomethacin. Salt and water retention. Hypokalaemia. Hypocalcaemia and long-term exposure increases the risk of osteopenia. Inhibits immune function and decreases resistance to infection. May mask symptoms of infection. Neutrophilia, thrombocytopenia. Irritability. Acute withdrawal after use > 14 days can lead to acute adrenal insufficiency with fever, hypotension, hypoglycaemia and shock. Long-term use can adversely affect somatic growth.
Compatibility	Fluids: Glucose 5%, glucose 10%, Hartmann's, sodium chloride 0.9% Y-site: Amino acid solutions. Aciclovir, amifostine, aminophylline, anidulafungin, atracurium, atropine, aztreonam, bivalirudin, calcium gluconate, caspofungin, chlorpromazine, cisatracurium, dexamethasone, digoxin, dopamine, doripenem, droperidol, fentanyl, filgrastim, foscarnet, frusemide, granisetron, hyoscine hydrobromide, lignocaine, linezolid, magnesium sulfate, morphine sulfate, neostigmine, noradrenaline, oxytocin, pancuronium, pethidine, piperacillin-tazobactam (EDTA-free), remifentanil, sodium bicarbonate, suxamethonium, vecuronium.
Incompatibility	Fluids: No information.

	Y-site: Adrenaline hydrochloride, azathioprine, calcium chloride, ciprofloxacin, colistin, dobutamine, dolasetron, ephedrine, ganciclovir, haloperidol lactate, labetalol, midazolam, mycophenolate mofetil, pentamidine, phenobarbitone, promethazine, protamine, rocuronium.
Stability	IV: Reconstituted solution: Stable for 24 hours at 2−8 °C. Protect from light. Diluted solution: Stable for 4 hours below 25 °C or 24 hours at 2−8°C. Oral: Discard remaining pieces of tablet after dose administration.
Storage	Ampoules and tablets: Store below 25°C. Protect from light.
Special Comments	Serum cortisol is recommended prior to commencing treatment with hydrocortisone. Caution – Increased risk of GI perforation particularly with simultaneous treatment with indomethacin. If hydrocortisone is required, delay treatment with indomethacin for at least 72 hours if possible. For management of cortisol deficiency, change to oral preparation when possible.
Evidence summary	Refer to full version.
References	Refer to full version.

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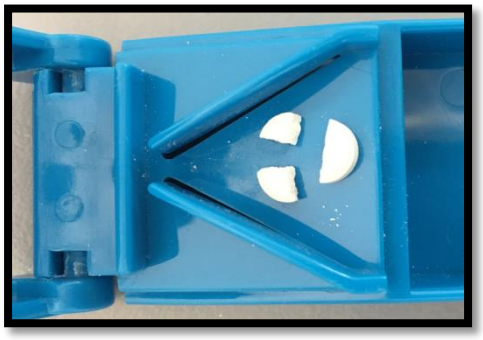
Appendix 1– Guide to Parents on preparation of Hydrocortisone tablets – See next page

Appendix 1
Guide to parents on preparation of Hydrocortisone dose

Hydrocortisone is available as a 4 mg tablet. Always check the tablet's expiry date before administering. The tablet is not soluble in water or milk.

1. Using a tablet cutter, cut a 4mg tablet in halves or quarters (depending on the dose required).



2. Crush the required piece/s of tablet and mix with 1-2 mL of freshly boiled and cooled water, or milk on a spoon.

3. Administer down the side of the mouth while the baby is sucking a dummy or administer through sucking dummy.

   Please NOTE: DO NOT ADD THIS TO THE BOTTLE OF FEED

4. If tablet is cut, discard the remaining pieces of tablet, do not keep and use later.

5. If vomiting occurs within 15 minutes after giving the medication the dose should be repeated. This does not include "possits".

6. If persistent vomiting occurs you need to contact your doctor or go to the Emergency department.

NOTE: If giving only ½ or ¼ tablets, do not dissolve the whole tablet in water and give a proportion of the solution. First cut the tablet in halves or quarters, then disperse the required dose in water/milk as above.