



MONOGRAPH

SODIUM CHLORIDE 3% AND 23.4% (HYPERTONIC SALINE)

| | |
|----------------|---|
| Scope (Staff): | Medical, Pharmacy, Nursing, Anaesthetic Technicians |
| Scope (Area): | All Clinical Areas |

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [DISCLAIMER](#)

! HIGH RISK MEDICINE !

QUICKLINKS

| | | | |
|---|--------------------------------|-------------------------------|----------------------------|
| Dosage/Dosage Adjustments | Administration | Compatibility | Monitoring |
|---|--------------------------------|-------------------------------|----------------------------|

DRUG CLASS

Electrolyte.

Sodium chloride 3% and 23.4% are [High Risk Medicines](#).

INDICATIONS AND RESTRICTIONS

- Raised intracranial pressure and traumatic brain injury.^{2,6}
- Severe symptomatic (e.g. seizures) hyponatraemia (serum sodium level <120mmol/L).^{2,6}

CONTRAINDICATIONS

- Hypersensitivity to sodium chloride or any component of the formulation.

PRECAUTIONS

Avoid rapid correction of hyponatraemia. Corrections of >8 mmol/L can lead to brain damage.⁶ Seizures usually stop with a correction of only 3-5 mmol/L or once serum sodium is greater than 125 mmol/L.⁷

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- Sodium Chloride 3% Infusion 1000 mL (0.513 mmol of sodium per mL).²

- Sodium Chloride 23.4% Vial 10 mL (4.004 mmol of sodium per mL).²

Imprest location: [Formulary One](#)

DOSAGE & DOSAGE ADJUSTMENTS

Neonates: [Refer to Neonatal Medication Protocols](#)

Intravenous Fluid Therapy (≥ 4 weeks - 18 years)

‘Fast Correction’ using intravenous sodium chloride 3% is indicated for symptomatic hyponatraemia (e.g. seizures, altered mental status) with a serum sodium level <125 mmol/L, or raised intracranial pressure (ICP).^{5,6}

Acute Symptomatic Hyponatraemia

Sodium Chloride 3% – Intravenously 3 mL/kg administered over 20 minutes (maximum 150 mL/dose).⁶

- On average 1 mL/kg of sodium chloride 3% (“fast correction”) raises sodium concentration by 1 mmol/L.⁵
- Once symptoms resolve or the serum sodium is >125 mmol/L, a slow correction (i.e. up to 8 mmol/L over 24 hours) can be considered.⁶

Raised Intracranial Pressure (ICP), Refractory Raised ICP, Traumatic Brain Injury (TBI)

Sodium Chloride 3% – Intravenously

Bolus: 2 - 5 mL/kg over 10-20 minutes **OR**

Continuous IV infusion 0.1 – 1 mL/kg/hour titrated to maintain ICP <20 mmHg.^{6,9}

For Fluid Restricted Patients (with Refractory Raised ICP or TBI)

Sodium Chloride 23.4% - Intravenously (undiluted)

Continuous IV Infusion (**ONLY in PCC with Consultant approval**):

0.01 – 0.1 mL/kg/hour, **ONLY** via Central Venous Access Device (CVAD). Some patients may require higher rates, titrate to target ICP (usually <20 mmHg) or serum sodium limits.

Therapy should not be administered to patients with a serum sodium >160 mmol/L.⁶

Cerebral Oedema, Diabetic Ketoacidosis

Sodium Chloride 3% – Intravenous 5 mL/kg administered over 10 – 15 minutes. Consider mannitol if sodium chloride 3% is unavailable or in patients unresponsive to sodium chloride 3%.⁶

Renal Impairment:

- Use with caution in patients with renal impairment; may cause sodium retention.⁶

RECONSTITUTION & ADMINISTRATION**Reconstitution**

Sodium Chloride 3%

- Comes in a ready to use pre-mixed infusion bag.¹

Sodium Chloride 23.4%

- Given undiluted for refractory increased intracranial pressure in the Intensive Care Unit.²

Administration

Sodium Chloride 3%

- Central line preferable.
- Peripheral line can be used for urgent administration (If peripheral line used, strict observation of the IV site every 30 minutes is mandatory).⁵

Sodium Chloride 23.4%

- Via central line ONLY.²

COMPATIBILITY (LIST IS NOT EXHAUSTIVE)

Compatible fluids: Glucose 5%, Glucose 10%^{7,8}

[Compatibilities of IV drugs](#) must be checked when two or more drugs are given concurrently.

MONITORING

- Measure serum sodium after initial infusion, then 2 to 4 hourly.⁶
- Monitor serum potassium, chloride, bicarbonate, and serum osmolality as well as for signs of fluid overload.^{5,6}
- Monitor infusion site during administration of hypertonic solutions.⁶ If administered peripherally, monitor carefully for potential extravasation and local tissue damage.¹

ADVERSE EFFECTS

Hypernatraemia.³

Rapid infusion can cause pulmonary oedema, respiratory arrest, renal failure, convulsion, coma, central pontine myelinolysis (osmotic demyelination syndrome).⁵

Excessive use of chloride salts may cause a loss of bicarbonate with an acidifying effect.³

STORAGE

Store at room temperature, below 30°C.¹

Use diluted solution within 4 hours.²

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. [Clinical Pharmacology](#)), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Sodium Chloride 3% and 23.4% (Hypertonic Saline)

****Please note: The information contained in this guideline is to assist with the preparation and administration of sodium chloride 3% and 23.4% (hypertonic saline). Any variations to the doses recommended should be clarified with the prescriber prior to administration****

Related CAHS internal policies, procedures and guidelines

[Intravenous Fluid Therapy Guideline](#)

[Sodium Chloride 3% Neonatal Medication Monograph](#)

[High Risk Medicine Policy](#)

[PCH PCC Traumatic Brain Injury: Management in PCC Guideline](#)

[PCH ED Diabetic Ketoacidosis Guideline](#)

References



1. Mims Online 2024 [updated July 2024; cited July 2024]. Available from: <https://www-mimsonline-com-au.pklibresources.health.wa.gov.au/Search/Search.aspx>.
2. Australian Injectable Drugs Handbook, 9th Edition: Health Communication Network; 2024 [updated 24/5/24]. Available from: https://aidh-hcn-com-au.pklibresources.health.wa.gov.au/browse/about_aidh
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6. UpToDate: Wolters Kluwer; 2024. Cited July 2024. Available from: <https://www-uptodate-com.pklibresources.health.wa.gov.au/contents/search>.
7. Sodium Chloride 3% Hypertonic Saline for 'Fast Correction', King Edward Memorial Hospital Neonatal Monograph. Cited July 2024.
8. The Royal Children's Hospital Paediatric Injectable Guideline Online. Cited July 2024. Available from: <https://pig-rch-org-au.pklibresources.health.wa.gov.au>
9. Kochanek PM et al. 2019. Guidelines for the Management of Pediatric Severe Traumatic Brain Injury, Third Edition: Update of the Brain Trauma Foundation Guidelines, Executive Summary. Paediatric Critical Care Medicine 20(3) 280-289

Useful resources (including related forms)

[Paediatric Fluid Calculator](#)

[Diabetic Ketoacidosis Fluid Calculator](#)

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Healthy kids, healthy communities

Compassion

Excellence

Collaboration

Accountability

Equity

Respect

Neonatology | Community Health | Mental Health | Perth Children's Hospital