

CHILD RECEIVING PRESCRIBED FLUIDS AT RISK OF



The Department Of Health, Social Services And Public Safety: Guidance is also available on the Departmental website.

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- Any child on IV fluids or oral rehydration is potentially at risk of hyponatraemia.
- Hyponatraemia is potentially extremely serious, a rapid fall in sodium leading to cerebral oedema, seizures and death. Warning signs of hyponatraemia may be non-specific and include nausea, malaise and headache.
- Hyponatraemia most often reflects failure to excrete water. Stress, pain and nausea are all potent stimulators of anti-diuretic hormone (ADH), which inhibits water excretion.
- Complications of hyponatraemia most often occur due to the administration of excess or inappropriate fluid to a sick child, usually intravenously.
- Hyponatraemia may also occur if a child is receiving excess or inappropriate oral rehydration fluids.
- Hyponatraemia can occur in a variety of clinical situations, even in a child who is not overtly "sick". Particular risks include:

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Before starting IV fluids, the following must be measured and recorded:

- **Weight:** accurately in kg. [In a bed-bound child, use best estimate.] Plot on centile chart or refer to normal range.
- **U&Es:** take serum sodium into consideration.

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Fluid needs should be assessed by a doctor competent in determining a child's fluid requirement. Accurate calculation is essential and includes:

Maintenance Fluid

- 100mls/kg for first 10kg body wt, plus
 - 50mls/kg for the next 10kg, plus
 - 20mls/kg for each kg thereafter, up to max of 70kg.
- [This provides the total 24 hr calculation, divide by 24 to get the mls/hr].

Replacement Fluid

- Must always be considered and prescribed separately.
- Must reflect fluid loss in both volume and composition (lab analysis of the sodium content of fluid loss may be helpful).

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- **Maintenance fluids** must in all instances be dictated by the anticipated sodium and potassium requirements. The glucose requirements, particularly of very young children, must also be met.
- **Replacement fluids** must reflect fluid lost. In most situations this implies a minimum sodium content of 130mmol/l.
- **When resuscitating** a child with clinical signs of shock, if a decision is made to administer a crystalloid, normal (0.9%) saline is an appropriate choice, while awaiting the serum sodium.
- The composition of oral rehydration fluids should also be carefully considered in light of the U&E analysis.

Hyponatraemia may occur in any child receiving any IV fluids or oral rehydration. Vigilance is needed for all children receiving fluids.

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- **Clinical state:** including hydration status and general well-being should be documented
 - **Fluid balance:** must be assessed at least once a day by an experienced member of clinical staff
 - **Intake:** All oral fluids (including medicines) must be recorded and IV intake reduced by equivalent amount
 - **Output:** Measure and record all losses (urine, stool, vomit, diarrhoea, etc.) as accurately as possible
- If a child still needs prescribed fluids after 12 hours of starting, their requirements should be reassessed by a senior member of medical staff.
- **Biochemistry:** Blood sampling for U&E is essential at least once a day - more often if there are significant fluid losses or if clinical course is not as expected

The rate at which sodium falls is as important as the plasma level. A sodium that falls quickly may be accompanied by rapid fluid shifts with major clinical consequences.

Consider using an indwelling heparinized catheter to facilitate repeat J&Es.

Do not take samples from the same limb as the IV infusion.

Capillary samples are adequate if venous sampling is not practical.

Urine osmolality/sodium: Very useful in hyponatraemia. Compare to plasma osmolality and consult a senior Paediatrician or a Chemical Pathologist in interpreting results.

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Advice and clinical input should be obtained from a senior member of medical staff, for example a Consultant Paediatrician, Consultant Anaesthetist or Consultant Chemical Pathologist

- In the event of problems that cannot be resolved locally, help should be sought from Consultant Paediatric Anaesthetists at the PICU, RBLHC.