



KIDS clinical guideline: Fluid and electrolyte therapy

Principles of management:

Fluid therapy comprises 3 main elements:

1. Restoring **deficits** (e.g. volume resuscitation / dehydration correction)
2. **Maintenance** therapy (i.e. routine replacement of physiological losses)
3. Replacement of **non-physiological losses** (e.g. diarrhoea)

1. Restoring deficits:

Volume resuscitation:

- use isotonic fluid e.g of 0.9% Sodium Chloride, Hartmann's, Plasmalyte 148
- Use aliquots of 20 ml/kg of crystalloids (exceptions: trauma, DKA, neurosurgical emergencies - see separate guidance)
- be aware of
 - fluid overload
 - raised intracranial pressure
 - congestive cardiac failure
- Call KIDS if requiring > 40-60ml/kg volume - may need inotropes

Correcting dehydration:

- Replace estimated deficit in addition to maintenance replacement.
- Correct dehydration over 48 hrs.
- Use isotonic fluid as default fluid.

2. Maintenance fluid (excluding neonates):

First 10kg	100ml/kg/day	4ml/kg/hour
Second 10kg	50ml/kg/day	2ml/kg/hour
Every further kg	20ml/kg/day	1ml/kg/hour

Maximum 2400ml/day in males and 2000ml/day in females

Rules of thumb:

- In most cases, maintenance fluid should be **restricted** to 60-80% of calculated requirement.
- Use [0.9% sodium chloride + glucose 5% (potassium chloride 20mmol/1000ml)] as first choice maintenance IV fluid
- Isotonic crystalloids can be used alternatively
- Glucose content: 5% in infants and small children, 10% in neonates
- Monitor glucose and electrolyte levels daily
- Adjust potassium content as needed
- Daily weights should be performed and recorded where possible.

3. Replacement of losses:

- Anticipate, measure (if possible) and replace non-physiological losses such as diarrhoea, vomiting, large diuresis, burns-related fluid loss.
- Use 0.9% Sodium chloride +/- potassium chloride 10mmol/ 500ml depending on nature of losses.
- Keep an accurate fluid balance chart.

Electrolyte emergencies

Hyperkalaemia ($[K^+] > 5.5\text{mmol/l}$):

Monitor ECG (long PR interval or tall T waves).

Ensure external potassium delivery (ie. maintenance) stopped

Emergency Management (Discuss with KIDS team):

- **Salbutamol** nebulised (2.5mg for <10kg, 5 mg for > 10Kg)
- **Calcium Gluconate 10%**, 0.5-1ml/kg over 5-10 min
 - Use 5-fold dilution for peripheral us. [See BCH monograph](#)
- **Sodium Bicarbonate 8.4%** 1-2mmol/kg over 20 min
 - Use 4-fold dilution (i.e. 2.1%) for peripheral use
- **Insulin and Glucose:** Infuse 0.1Units/kg Actrapid with 1g/kg of Glucose (10ml/kg of 10% Glucose) over 10 minutes. Monitor Blood glucose for hypoglycaemia. [See BCH monograph](#)
- **Salbutamol IV** 4 micrograms / kg over 10 min
- Forced Saline diuresis – **Furosemide** 1mg/kg i.v.
- **Calcium resonium** 125-250 mg/kg orally or rectally

Symptomatic hyponatraemia: $[Na^+] < 125\text{ mmol/L}$ with CNS symptoms (seizures, coma or respiratory depression).

Emergency management (discuss with KIDS team):

- Give 3% Sodium chloride: 3 ml/kg over 10-15 minutes
- Measure plasma sodium at end of bolus, repeat bolus if necessary
- If still seizing, consider IV anticonvulsants and intubation and give further 2ml/kg 3% sodium chloride over 10-15 minutes.
- Aim to raise plasma sodium by no more than 0.5 mmol/L/hour, measure sodium at least hourly initially.
- Review therapy when symptoms resolve, or when $[Na^+] > 125\text{ mmol/L}$