PARENTERAL FLUID THERAPY FOR CHILDREN & YOUNG PEOPLE (AGED OVER 4 WEEKS & UNDER 16 YEARS)

**Essential Monitoring, Observations & Reassessment**

INITIALLY
- Admission Weight. U&E (unless child is well & for elective surgery)

Each shift
- Handover and review fluid management plan.

12 Hourly -
- Clinical assessment, fluid balance, glucose

24 Hourly -
- Clinical reassessment.

U&E (more often if abnormal; 4-6hourly if Na⁺ < 130 mmol/L).

Weight

**ILL CHILDREN**

Hourly - HR, RR, BP, GCS. Fluid balance (urine osmolality if volume cannot be assessed). 2-4 hourly – glucose, U&E, +/- blood gas.

**Oral Intake and Medications:**
- Assess and record the volume and type of oral fluids and IV medications.

If plasma Na⁺ < 130mmol/L or > 160mmol/L or plasma Na⁺ changes > 5mmol/L in 24 hours get senior help

**Routine Maintenance**

**CALCULATION OF 100% RATE**

(a) for first 10 kg: 4ml/kg/hr
(b) for second 10 kg: 2ml/kg/hr
(c) for each kg over 20 kg: 1ml/kg/hr

For 100% daily maintenance add together (a) + (b) + (c)

MAXIMUM: females 80 mls per hour; males 100mls per hour.

If risk of hyponatraemia is high consider initially reducing maintenance volume to two thirds of maintenance.

**Hyponatraemia (< 135 mmol/L):**
- Check for initial deficit. Maintenance fluid with pre-added potassium required. For concentration > 40mmol/L, get senior help.
- Patients particularly at risk from hyponatraemia:
  - peri-operative patients
  - head injuries
  - gastric losses
  - CNS infection
  - severe sepsis
  - hypotension
  - intravascular volume depletion
  - bronchiolitis
  - gastroenteritis with dehydration
  - abnormal plasma sodium and also if less than 138 mmol/L
  - salt-wasting syndromes

**Symptomatic Hyponatraemia - potential symptoms:**
- Nausea, vomiting, headache, irritability, altered level of consciousness, seizures or apnoea.

**Routine Maintenance**

**PRESCRIBE INITIAL IV MAINTENANCE FLUID**

(fluid sodium content 131 - 154 mmol/L)

**Fluid choices:**
- glucose containing fluid required in infants and young children. May also be required by older children
- sodium chloride 0.9% (with/without pre-added glucose, pre-added potassium)
- Hartmann’s solution (with/without pre-added glucose)

**Fluid Rate:**
- Alter fluid rate according to clinical reassessment (including changes in oral intake). Adjust fluid type according to investigations.

**COMMENCE ORAL FLUIDS & DISCONTINUE IV FLUIDS AS SOON AS CLINICALLY APPROPRIATE**

**Acute Symptomatic Hyponatraemia:** raise Na⁺ by 5 - 6mmol/L in 1-2 hours using sodium chloride 2.7% IV bolus(es). Aim for maximum 10mmol/L rise in 5 hours

<table>
<thead>
<tr>
<th>Bolus</th>
<th>Volume</th>
<th>Speed</th>
<th>Max</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.1</td>
<td>2ml/kg</td>
<td>10 mins</td>
<td>100ml</td>
<td>Give bolus No.2 if still symptomatic</td>
</tr>
<tr>
<td>No.2</td>
<td>2ml/kg</td>
<td>10 mins</td>
<td>100ml</td>
<td>Check U&amp;E; Give No.3 if symptomatic</td>
</tr>
<tr>
<td>No.3</td>
<td>2ml/kg</td>
<td>10 mins</td>
<td>100ml</td>
<td>If symptomatic reconsider diagnosis</td>
</tr>
</tbody>
</table>

First 48 hours: 2 hourly U&E, max Na⁺ 135 mmol/L, max rise 20mmol/L

**Hypokalaemia (< 3 mmol/L):** Check for initial deficit. Maintenance fluid with pre-added potassium required. For concentration > 40mmol/L, get senior help.

**Hypoglycaemia (< 3 mmol/L):** Medical Emergency: give 2 ml/kg bolus of glucose 10%. Review maintenance fluid, consult senior and recheck level after 15-30 mins. INTRA-OPERATIVE PATIENTS: consider monitoring glucose.