Paediatric Directorate

Dehydration Guidelines

Primary cause of dehydration diarrhoea +/- vomiting.

Approximately 10% Children < 5yrs present with gastroenteritis each year

**Diagnosis**

**History** - sudden change in stool consistency to loose or watery stools and/or sudden onset of vomiting

- History of contact
- Exposure to known source of infection (contaminated food or water)
- Recent travel abroad

Consider alternative diagnoses if following are present

- Fever (38° or more in children less than 3 months/ 39° c or more in children > 3 months)
- Shortness of breath / tachypnoea
- Altered consciousness state
- Neck stiffness
- Bulging fontanelle in infants
- Non blanching rash
- Blood and/or mucus in stool
- Severe or localized abdominal pain
- Abdominal distension or rebound tenderness.
- Bilious vomit

**Assessment of Dehydration (Fig 1)**

Suspect hypernatraemic dehydration if child has

- Jittery movements
- Increased muscle tone
- Hyperreflexia
- Convulsions
- Drowsiness or coma.
## Figure 1

### Severity of dehydration

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>No dehydration</th>
<th>Clinical dehydration</th>
<th>Clinical Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appears Well</td>
<td>Appears Well</td>
<td>Unwell or deteriorating *</td>
<td>-</td>
</tr>
<tr>
<td>Alert &amp; Responsive</td>
<td>Alert &amp; Responsive</td>
<td>Altered responsiveness (irritable, lethargic) *</td>
<td>↓ consciousness</td>
</tr>
<tr>
<td>Normal urine output</td>
<td>Normal urine output</td>
<td>Urine output</td>
<td>-</td>
</tr>
<tr>
<td>Skin colour unchanged</td>
<td>Skin colour unchanged</td>
<td>Pale/mottled skin</td>
<td></td>
</tr>
<tr>
<td>Warm extremities</td>
<td>Warm extremities</td>
<td>Cold extremities</td>
<td></td>
</tr>
<tr>
<td>Alert &amp; responsive</td>
<td>Alert &amp; responsive</td>
<td>Altered responsiveness *</td>
<td>↓ Consciousness</td>
</tr>
<tr>
<td>Skin colour unchanged</td>
<td>Skin colour unchanged</td>
<td>Pale/mottled skin</td>
<td></td>
</tr>
<tr>
<td>Warm extremities</td>
<td>Warm extremities</td>
<td>Cold extremities</td>
<td></td>
</tr>
<tr>
<td>Moist mucus membrane</td>
<td>Moist mucus membrane</td>
<td>Dry mucus membranes</td>
<td>-</td>
</tr>
<tr>
<td>Eyes not sunken</td>
<td>Eyes not sunken</td>
<td>Sunken eyes *</td>
<td>-</td>
</tr>
<tr>
<td>Normal Heart rate</td>
<td>Normal Heart rate</td>
<td>Tachycardia *</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Normal breathing pattern</td>
<td>Normal breathing pattern</td>
<td>Tachypnoea *</td>
<td>Tachypnoea</td>
</tr>
<tr>
<td>Normal peripheral pulses</td>
<td>Normal peripheral pulses</td>
<td>Weak peripheral pulses</td>
<td></td>
</tr>
<tr>
<td>Normal CRT</td>
<td>Normal CRT</td>
<td>↑ CRT</td>
<td></td>
</tr>
<tr>
<td>Normal Skin turgor</td>
<td>Normal Skin turgor</td>
<td>↓ Skin turgor *</td>
<td></td>
</tr>
<tr>
<td>Normal B.P</td>
<td>Normal B.P</td>
<td>Hypotension</td>
<td></td>
</tr>
</tbody>
</table>

* Warning symptoms/signs for increased risk of progression to shock
**Laboratory investigations**

- Do not routinely perform blood tests
- Measure plasma Na, K+, urea, creatinine, blood gas, and glucose if
  - IV fluid therapy is needed
  - Symptoms and/or signs that suggest hypernatraemia.
- Send stool for MCS
  - Suspected septicaemia
  - Blood and/or mucus in stool
  - Child is immunocompromised
- Consider sending stool for MCS
  - History of recent travel abroad
  - Diarrhoea not improved by 7 days
  - Diagnosis in doubt
Fluid Management

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**Assess Dehydration (see fig 1)**

- **No clinical Dehydration**
  - Preventing dehydration
    - Continue breast feeding
    - Encourage fluid intake
    - Discourage fruit juices and carbonated drinks
    - ORS as supplemental fluid if at increased risk of dehydration

- **Clinical dehydration (+Hypernatraemic dehydration)**
  - Oral Rehydration Therapy (ORT)
    - 50 ml/kg ORS over 4 hrs, plus ORS for maintenance, often and in small amounts
    - Continue Breast feeding
    - Consider supplementing with usual fluids if child refuses to take ORS
    - Consider ORS via NG tube/ondansetron

- **Clinical shock suspected or confirmed**
  - IV therapy for Shock
    - 20 ml/kg 0.9% NaCl bolus
    - If still shocked repeat 20ml/kg 0.9 % NaCl
    - No Improvement – consider PICU

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**IVT for rehydration**

- Use isotonic solution for fluid deficit replacement and maintenance
- Add 100ml/kg fluid deficit (if shock present) or 50ml/kg fluid deficit (if no shock present) to normal maintenance fluids
- Monitor clinical response.
- Measure Na, K+, urea, creatinine and glucose and change fluid composition or rate of administration if necessary.
- Continue breast feeding if possible.
- If hypernatraemic dehydration (see hypernatraemia guideline)
  - Use isotonic solution for deficit and maintenance
  - Replace fluid deficit over 48 hrs
  - Aim to ↓ plasma Na at <0.5mmol/l per hour

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**During IVT attempt to introduce ORT early & gradually**
Fluid management after rehydration

- encourage breastfeeding and other milk feeds
- encourage fluid intake
- In children at increased risk of dehydration recurring, consider giving 5 ml/kg of ORS solution after each large watery stool. Restart oral rehydration therapy if dehydration recurs after rehydration.

Nutritional Management

During rehydration therapy:
- continue breastfeeding
- do not give solid foods
- In children use ORS solution; however, consider supplementation with the child’s usual fluids if they consistently refuse ORS solution and are not severely dehydrated.

After rehydration:
- give full-strength milk straight away
- reintroduce the child’s usual solid food
- Avoid giving fruit juices and carbonated drinks until the diarrhoea has stopped.

Maintenance fluids

100ml/kg/24hrs for 1st 10kg body weight
(150ml/kg/24hrs if < 28 days old)
50ml/kg/24hrs for 2nd 10kg body weight
20 ml/kg/24hr for remaining kg of body weight
Consider iv Potassium supplementation when plasma Potassium is known
<1 month old use 10% dextrose with Sodium and Potassium added

Antibiotic therapy

Do not routinely give antibiotics to children with gastroenteritis.

Give antibiotic treatment to all children:
- with suspected or confirmed septicaemia
- with extra-intestinal spread of bacterial infection
- with salmonella gastroenteritis (younger than 6 months, malnourished, immunocompromised)
- with Clostridium difficile-associated pseudomembranous enterocolitis, giardiasis, dysenteric shigellosis, dysenteric amoebiasis or cholera.
**Antiemetics**

Consider giving ondansetron 4 mg PO (age 1-12 yrs)

**Information and advice for parents and carers**

See information leaflet

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*Ref:*

*NICE Clinical guideline – Diarrhoea and Vomiting in children (2009)*

*APLS 2004*

*Archives of Disease in Childhood Aug 2001*

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Ratified by Dr. Peter Reynolds, Children’s Services Clinical Governance Lead (03/03/2010)