DIARRHOEAL DISEASE: INITIAL FLUID MANAGEMENT

This is what you MUST get right

Is the child shocked?

Shock refers to depleted INTRAVASCULAR volume. Shock IS NOT THE SAME AS dehydration.

Signs of shock include: tachycardia, slow capillary refill, cool peripheries, weak pulses, hypotension (this is a LATE sign)

- Give 20ml/kg IV bolus as fast as possible. Use either MODIFIED RINGERS LACTATE (MRL) or NORMAL SALINE
- Review after the bolus
- If still shocked, repeat the bolus of 20ml/kg
- Thereafter, use 5-10ml/kg boluses until there are signs of intravascular volume replenishment (liver becomes palpable), and ask for experienced assistance
- Beware of cardiogenic shock masquerading as hypovolaemic shock. Always listen for a gallop and check for hepatomegaly BEFORE giving fluids

Never give ½ DD as a volume expander. It contains glucose and you will cause an OSMOTIC DIURESIS, and the child will not get better

Is the child dehydrated?

Dehydration refers to depleted EXTRAVASCULAR volume. Even 10% dehydration IS NOT THE SAME AS shock

- For 5% dehydration, give 50ml/kg/24 hours
- For 10% dehydration, give 100ml/kg/24 hours (do not give more than 100 ml/kg/24hours)
- Give this IN ADDITION TO maintenance requirements (see below)

Does the child have ongoing losses?

Ongoing losses refers to excessive water loss in the stool, vomitus or urine (see above). NORMALLY a child loses about 10ml/kg/day of water in the stool. So start by giving more than this.

- A good starting point is to give 30ml/kg/24 hours (or 50-200 ml per stool if on orals, depending on the size of the child)
- Give this IN ADDITION TO maintenance requirements (see below)

What is the child's maintenance requirement?

<table>
<thead>
<tr>
<th>Age</th>
<th>Maintenance Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>120 ml/kg/24 hrs</td>
</tr>
<tr>
<td>1 - 2 years</td>
<td>100 ml/kg/24 hrs</td>
</tr>
<tr>
<td>2 - 3 years</td>
<td>85 ml/kg/24 hrs</td>
</tr>
<tr>
<td>&gt; 3 years</td>
<td>70 ml/kg/24 hrs</td>
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<tr>
<td>1-10 kg</td>
<td>100 ml/kg/24 hrs</td>
</tr>
<tr>
<td>11-20 kg</td>
<td>1000 ml PLUS 50 ml/kg</td>
</tr>
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<td>&gt; 20 kg</td>
<td>1500 ml PLUS 20 ml/kg</td>
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What does this mean practically?

1) Decide on INTAKE (how much):

| Calculate requirements after SHOCK has been corrected |

For example, a 5kg child, 5% dehydrated, having frequent watery stools:

- **Maintenance:** 120 ml/kg/24hrs
- **Rehydration:** 50 ml/kg/24hrs
- **Losses:** 30 ml/kg/24hrs

2) Decide what to give (water vs food)

| IV Resuscitation: | Ringers or normal saline |
| IV Rehydration: | ½ DD |
| IV Losses: | ½ DD |
| IV Maintenance | ½ DD |
| Oral Rehydration: | Oral rehydration solution (home mix, ORS, Soral) |
| Oral Maintenance: | Breast / Formula |

Using the same example above...

If taking orally:

= 120 ml/kg/24hrs: breast ad lib or formula 100 ml 4 hourly

= 50 ml/kg/24hrs

= 30 ml/kg/24hrs

IV ½ DD 17 ml/hr

In the outpatient setting (oral rehydration corner) ORS can be tried.

If NPO:

= 120 ml/kg/24hrs

= 50 ml/kg/24hrs

= 30 ml/kg/24hrs

IV ½ DD 42 ml/hr

Withhold feeds only if there is good reason: excessive vomits, ileus. **Re-introduce feeds as soon as possible.**

Never give ½ DD as an oral rehydration solution. It contains too much glucose and you will cause an **OSMOTIC DIARRHOEA**, and the child will not get better.

When giving a child intravenous fluids, especially when replenishment is required, use an electronic flow controller (like an IVAC pump) **EVEN IN DISTRICT HOSPITALS.** This is an advocacy issue. Use an intake/output chart (Form Paed/21).

After the initial assessment and plan, what is the ongoing fluid management?

- Use the “**Diarrhoeal Disease Continuation Sheet**” (Form Paed/14)
- Children with diarrhoeal disease should ideally be assessed 8 hourly, at least
  - ALWAYS check for shock first
  - At EVERY check, apart from the “fluid balance check”, you must assess the child’s ability to take feeds. Restart or increase feeds if possible
  - Adjust rehydration and ongoing losses as the child improves
- If the child is not improving, then more fluid is going OUT than IN. Reasons include:
  - Drip tissue
  - Fluid not given as prescribed (see notes on infusion pump, and charting above)
  - Osmotic diuresis (check urine dipstix)
  - Osmotic diarrhoea (check what oral fluid the child is getting)
  - The losses are bigger than your initial estimate
- If the child is getting oedematous, think of:
  - Fluid is going in faster than requested
  - Losses are smaller than guessed
  - The child is HYPOALBUMINAEMIC: if this is the case, the child may be **depleted** intravascularly
- After considering and assessing these possibilities, adjust fluids accordingly