

Algorithm for Treatment of profuse acute watery diarrhea/Cholera in children with Severe Acute Malnutrition

Somali Region, Ethiopia

Key messages:

- Acute watery diarrhea (AWD) results in extensive loss of fluid and electrolytes.
- AWD can kill rapidly, so need to act quickly to refer any suspected case, as children with SAM are even more vulnerable.
- Children with severe acute malnutrition must be treated differently because their physiology is seriously abnormal.
- Patient with SAM must be slowly rehydrated compare to well-nourished children because they quickly get over hydrated and have heart failure.
- The diagnosis of dehydration is difficult in children with SAM as the usual signs of dehydration (sunken eyes, lethargy, loss of skin turgor) may be present in these children all of the time, whether or not they are dehydrated.
- The diagnosis of SAM in dehydrated children can also be difficult, as MUAC and weight for height can be affected by rehydration. Reassessment of nutritional status is recommended following rehydration, with diagnosis and management adjusted as needed.

Key Principles

- Consider a diagnosis of AWD if:
 - There is evidence of high output diarrhoea (one stool an hour)
 - Diarrhea appears pale and straw colored in colour
 - Diarrhea may be accompanied by vomiting and nausea
 - A child's family members have been diagnosed or have suspected Profuse AWD/cholera
- ❖ Diagnose if child has severe acute malnutrition (SAM) based on mid-upper arm circumference, weight for height z score or presence of bilateral pitting oedema
- ❖ Do not keep children with SAM and AWD in outpatient treatment programme or the stabilization centre.
 - Because there is a high risk of cross infection with other children
 - Correct rehydration of the child with AWD using the right protocols is lifesaving and the priority; management of SAM will follow once the child is rehydrated
- Manage AWD appropriately at CTC/facility according to the protocol before re-admitting to stabilization centre
- ❖ Severely malnourished children should be referred to stabilization centres for a specialized CARE as soon as they are free of AWD at the CTC/CTU
 - Oral rehydration with standard WHO low osmolarity ORS is preferred method
 - IV hydration should be avoided unless severe dehydration or shock is present because of a high risk of fluid overload

- ❖ Breast fed children should continue to breastfeed.

¹Recommendation

1. For a patient with SAM and Diarrhoea, do Rapid diagnostic tests (Crystal VC Dipstick), a screening test for AWD, if available. Collect stool samples for confirmatory diagnostic testing
2. ReSoMal SHOULD NOT been given if children are suspected of having AWD or have profuse watery diarrhea. Such children should be given standard WHO low osmolarity oral rehydration solution that is normally made, i.e. not further diluted. ReSoMal is not adapted to provide the amount of sodium needed to correct losses in AWD.
3. Children with severe acute malnutrition and AWD, who present with some dehydration but are NOT IN SHOCK should be rehydrated slowly, either orally or by nasogastric tube using low osmolarity rehydration solution (5ml/kg every 30 minutes for the first 2 hours then 5-10ml/kg/h alternating with F-75 for up to a maximum of 10 h).
4. Therapeutic foods already contain adequate zinc, therefore children with severe acute malnutrition And profuse AWD/cholera receiving F-75, F-100 or ready-to-use therapeutic food SHOULD NOT receive zinc supplement.

¹ http://www.who.int/elona/titles/full_recommendations/sam_management/en/index5.html
Algorithm for Treatment of profuse AWD/cholera in children with SAM

STEPS: MANAGEMENT OF PROFUSE AWD/CHOLERA WITH SEVERE ACUTE MALNUTRITION

STEP 1: Determine nutritional status

Check if

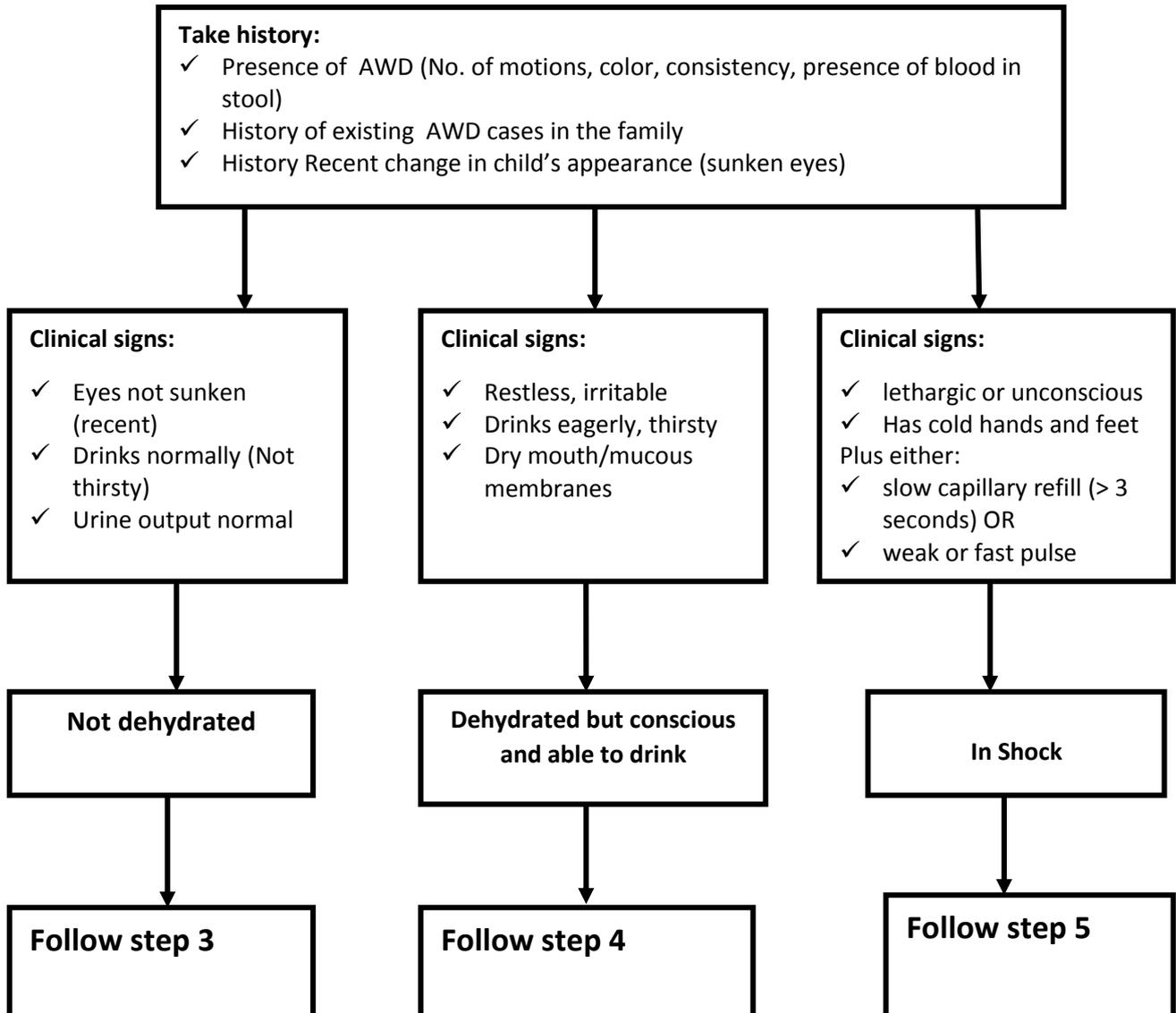
Is the child malnourished?
<input type="checkbox"/> Is mid-upper arm circumference <11.5 cm?
<input type="checkbox"/> Is weight for height z score < -3
<input type="checkbox"/> Is there bilateral pitting edema of both legs/feet?

→ If the answer is **NO** then use the **Standard Rehydration Procedures for AWD** and refer to the **AWD Clinical Guidelines Brochure**

STEP 2: Assessment for Dehydration and Shock among Severely Malnourished Children

- Diagnosis of dehydration in children with severe acute malnutrition is difficult because some of the classical signs of dehydration are unreliable. Thus:

Assessment and decision-tree



STEP 3:

Treatment for non-dehydrated children	
* Continue breastfeeding & age-appropriate food * Administer ORS to replace ongoing losses	
<2 years old	>2 years old
50-100 ml per loose stool	100-200 ml per loose stool

→ And

Refer to specialized center for further management of malnutrition as soon as stable

STEP 4:

If the child with SAM is **dehydrated**, check if the child is **conscious**

→ If the child is conscious and the **child can drink adequately**, then provide **ORS and feed the child**

Treatment for children dehydrated, CONSCIOUS and able to drink

- 5ml/kg every 30 minutes for the first 2 hours of ORS
- 5 – 10 ml/kg/h of ORS alternating with F-75 for 10h maximum or until the fluid deficit is corrected
 - Adjust ORS intake during the rehydration phase to compensate for on-going fluid loss in high-output stooling
- After rehydration, give 50-100ml of ORS for children <2 years and 100-200ml for those >2 years orally after each loose stool for marasmus pts & 30 ml per loose stool for edematous children.
- Only use the nasogastric tube if the child is unable to drink because of tiredness or vomiting

→ If the child is **conscious** and the child **CANNOT drink adequately**, then administer **ORS by nasogastric tube** (same dosing as above)

STEP 5:

Does the child appear to be in shock?
<input type="checkbox"/> Is the child unresponsive or semi-conscious?
<input type="checkbox"/> Are pulses absent or weak?
<input type="checkbox"/> Are there cold hands and feet?
<input type="checkbox"/> Continuing vomiting after the introduction of the NG Tube OR
<input type="checkbox"/> Presence of severe abdominal distension

→ If the answer is **YES**, then provide the follow treatment

IV Treatment for children in shock
<p>Give IV Ringer lactate with 5% dextrose</p> <ul style="list-style-type: none">• 15ml/kg/h for the first hour then reassess, if there is improvement (respiratory and pulse rates) same amount repeated for another one hour.• After 2hrs of IV fluids, give 10ml/kg/h ORS PO or via NG-tube until the deficit is corrected or until the child is fully rehydrated.• Adjust IV flow rate during the rehydration phase to compensate for on-going fluid loss in high-output stooling

↓

CHECK EVERY 10 minutes for:
<ul style="list-style-type: none">• Heavy or labored breathing• Check PR & RR• check Urine output• Check JVP OR engorged neck veins

→ In case of presence of **one or more signs of FLUID OVERLOAD or CARDIAC FAILURE** (heavy, labored breathing, engorged jugular vein and increased edema) then **STOP the IV and CONSULT to a physician**

STEP 6

Continue to check the child status (reassess after 1 hr)

If the **breathing status worsens**, then **STOP IV infusion**

If you **do not see improvement**, consider septic shock

If you do **see improvement** continue the same amount of IV fluid for the next one hour

Step 7: Rehydration is complete when:

- * Child is no longer thirsty
- * Urine production has normalized
- * Other signs of dehydration have resolved

- **Once hydration reestablished, measure MUAC, if MUAC still less than 11.5 cm, continue with treatment for non-dehydrated children with SAM**
- **Concomitant treatment for medical complication such as hypothermia, or hypoglycemia should be started as well as feeding.**

National Cholera guideline

In severely malnourished patients:

Assessment of hydration status in severely malnourished patients is difficult. Many classical signs of dehydration are unreliable. For example, a child with marasmus has loose, lax skin even when he is not dehydrated. On the other hand, skin pinch may go back quickly in a child with kwashiorkor, even when he is dehydrated.

Monitoring a patient's weight is a good tool to confirm dehydration as it is always associated with weight loss. Weigh the patient and compare to its previous weight. If there is no weight loss, there is no dehydration.

Eyes may be sunken because of loss of subcutaneous fat in the orbit. When the child presents with sunken eyes, it is important to ask the mother/caretaker if it started with the onset of diarrhea.

Dehydration is considered to be severe only if the patient shows signs of shock (rapid and thready pulse often only detected on major arteries or absence of pulse; low blood pressure with narrow pulse pressure or blood pressure undetectable; cold extremities; altered consciousness, etc.).

Rehydration requires great caution as excessive and indiscriminate use of rehydration fluid may rapidly result in over hydration and fatal heart failure.

Give standard WHO low osmolarity **ORS** in some dehydration (those with no signs of shock) cases as follows:

Child and adult:

- Start with 20 ml/kg over the first 2 hours administered at the rate of 5 ml/kg every 30 minutes, followed by 50 ml/kg administered at the rate of 5ml/kg/hour for up 10 hours (up to 10 ml/kg/hour if needed, until dehydration is corrected). Breast-feeding and therapeutic milk shouldn't be interrupted during oral rehydration
- Secure IV line and give IV fluid for severe dehydration and those with signs of shock as follows:
 - o Use Ringer Lactate²: 15 ml/kg/hour over 2 hours, then stop the infusion, and change to oral treatment with ORS: 10 ml/kg/hour until dehydration is corrected (for up to 10 hours if needed). At the same time that ORS treatment begins, re-start feeding.
- If there are signs of fluid overload, temporarily stop all oral intake (food and fluid) and IV fluids, administer furosemide IV (1 mg/kg, maximum 20 mg/24 hrs.), and place the patient in a semi-sitting position with legs lowered.

² Ringers' Lactate solution (RL): also known as sodium lactate solution and Hartmann's solution, is a mixture of sodium chloride, sodium lactate, potassium chloride, and calcium chloride in water. It is used for replacing fluids and electrolytes in those who have low blood volume or low blood pressure