

Control of Diarrhoeal diseases (CDD)

Diarrhea: Passage of liquid or watery stool for at least 3 times during 24 hours. Consistency is more important than frequency.

Note that breast fed infants usually pass semi-solid, pasty and yellow stools. Sometimes, they pass stool after each breast feed. This is not diarrhoea. Unfortunately, many doctors misinterpret these stools as diarrhoea and they give the wrong advice to the mothers to stop breast feeding. This is incorrect practice.

Diarrhoea can be *Acute* which lasts for less than 14 days, or *Persistent* which lasts for 14 days or longer. There may be blood in the stool which is called *Dysentery*, which can be amoebic or bacillary.

Children under 5 y of age are the major victims of diarrhoea, which will lead to growth failure & complications. Annually, 3,000,000 children die from diarrhoea all over the world.

Diarrhoea is caused by viruses, bacteria, or protozoa. The contributing factors to diarrhoea are unclean water, dirty hands when preparing meals (mothers) or when feeding their children, or food spoiled by high temperature.

Diarrhoea leads to malnutrition which is manifested by growth retardation & under weight, the degree of which directly correlates to the duration of the diarrhoea (25gm loss of weight for each day of diarrhoea). This growth deficit is multi-factorial.

Factors leading to growth deficit in a baby with diarrhoea:

- 1- Reduced food intake: due to anorexia (loss of appetite) and withholding food from the child by the mother.
- 2- Reduced absorption of nutrients due to rapid gut transit time, and enteropathy leading to such malabsorption.
- 3- Catabolic losses through vomiting (loss of nutrients) and fever leading to energy expenditure.

This malnutrition will lead to reduced immunity leading to further episodes of diarrhoea. Those at particular risk are infants who are artificially fed and those who are at the weaning age (due to inadequate feeding, contaminated feeds and low resistance to infection).

Dehydration

Is a deficit in water and electrolytes (Sodium, Potassium, Chloride and Bicarbonate) resulting from losses in stool, vomiting, urine, fever, sweat and breathing. When these losses are not adequately replaced, this deficit will develop.

Assessment of Diarrhoea cases for dehydration

Sign	Classification		
	A	B	C
General Condition	Well, Alert	Restless, Irritable	Lethargic, Unconscious
Eyes	Normal	Sunken	Sunken
Thirst	Drinks normally	Eager to drink	Unable to drink
Skin Pinch	Goes Back Quickly	Goes Back Slowly (1 sec)	Goes Back Very Slowly (2 or more sec)
Classification	No Dehydration	Some Dehydration	Severe Dehydration
Treatment	(home) Plan A	Plan B (PHC)	Plan C (Hospital)

Treatment plans:

Plan A:

The aim is to prevent dehydration from occurring. The steps are:

1. Give extra fluid: ORS (Oral Rehydration Solution) & home fluids.
2. Continue feeding of children (breast or other).
3. Teach the mother:
 - a. How to prepare and give ORS (1 litre of water) then we add the sachet & give by cup & spoon or by cup directly, to be used within 24 hr of preparation, “she must discard what remains after 24h i.e throw it away”, to give him 50-100 ml every time the child passes stool.
 - b. Signs of dehydration & the danger signs by showing her pictures of the main signs of dehydration & telling her to bring her child immediately to the health centre if such signs occur.

Plan B:

The aim is to correct dehydration. The steps are:

1. Give ORS in the health centre: Child's weight (kg) x 75 ml = volume given over a 4 hr period. Assess every hour.
2. Continue feeding or breast feeding.
3. Give 100-200 ml of clean water.
4. Teach mother to prepare & give ORS correctly (cup and spoon), as in plan A.
5. Assess every hour.
6. If the child vomits the ORS, wait for 10 minutes and then restart giving him the solution slowly.
7. Reassess after four hours, classify according to the hydration status, and use the appropriate plan accordingly.

Note: Puffiness of the face & eyes is a sign of over hydration. In that case, give the fluid slowly.

Plan C:

The aim is to correct dehydration urgently (immediately).

Route: Intra-Venous or Naso-Gastric tube (because we have to act quickly).

In IV: give Ringer's lactate solution. If it is not available, use normal saline. Calculate the amount of fluid using the following formula:

Weight (kg) x 100ml over a period of 3 hours for children over the age of one year, and over 6 hours for infants, according to the following table:

Intravenous Rehydration by age and time

Age (months)	Amount of IV fluid/unit time	
	30ml/Kg body weight	70ml/Kg body weight
<12	First hour	Following 5 hours
12+	First 30 minutes	Following 2.5 hours

The steps are:

1. Reassess every hour, if no improvement, give fluid more rapidly.
2. If the patient can drink, give ORS in 5ml/kg body weight/hr
3. Reassess after completion, classify according to the hydration status & choose the appropriate plan accordingly.

Oral Rehydration Solution

Composition:

Na: 3.5 gm, NaHCO₃: 2.5 gm, KCl: 1.5 gm, Glucose: 20 gm, In 1000ml (1litre) of water.

Some replace NaHCO₃ by 2 gm Tri-sodium Citrate Di-hydrate which lessens vomiting, is tastier and more stable in humid and hot areas.

Advantages of ORS: Cheap, effective and easy to give at home by the mother. This is why 95% of the cases are treated by ORS, as children will not develop dehydration, when they get diarrhoea.

Preparation of ORS: The water should be boiled and cooled before the powder is added to avoid the loss of bicarbonate, and changes of concentration. In winter, warm the solution to 40°C to increase acceptability, increase the rate of absorption, decrease vomiting & decrease the risk of a drop in the body temperature when large volumes are consumed.

If no ORS is available we use home prepared fluids or household food solutions, rice water, soups, fruit juices salt and sugar solution (one teaspoon of salt + one table spoon of sugar).

Zinc supplements: zinc supplements reduce the duration of a diarrhoea episode by 25% and are associated with a 30% reduction in stool volume.

Management of Chronic (Persistent) Diarrhoea

If the child is under 6 months or is also dehydrated, refer to the hospital, where dehydration is corrected and the case is fully assessed.

If the child is over 6 months and not dehydrated, then the management is mainly dietary. Teach the mother to:

1. Dilute any animal milk given to the child with an equal volume of water or replace with fermented milk products such as yogurt.
2. Increase energy intake: 6 meals per day of thick cereals, added oils or fat, vegetables, pulses and fish or meat.

3. Reassess in 5 days. If diarrhoea persists refer to hospital. If diarrhoea has stopped, teach the mother to use the regular diet, resume the usual animal milk & give an extra meal every day for one month, use growth charts.

Management of Blood in Stool

If bacillary dysentery (*Shigella*) is prevalent in the area, the clinical picture is severe, and there are no amoebic trophozoites in the general stool examination, give Co-trimoxazol which is the antibacterial of choice.

If amoebic dysentery is prevalent in the area, symptoms are less severe, and amoebic trophozoites are seen in the general stool examination, give metronidazole (Flagyl) .

Drugs not to be used for diarrhoea:

1. Anti-bacterials: Most cases are viral. Antibacterials are only used when there is lab evidence of bacterial infections (mainly cholera and amoebic dysentery). They will eventually lead to secondary infection due to the inhibition of the growth of the normal flora.
2. Anti-protozoal: Used only when there is lab evidence of amoebic dysentery or giardiasis.
3. Mycostatin: *Monilia* is a normal inhabitant of the GIT. Mycostatin is only given when there is oral thrush or anal moniliasis.
4. Anti-motility agents and anti-spasmodics: As they may cause paralytic ileus in children.
5. Pectocaolines: Will coat the GIT, allow colonization of the GIT bacteria with bacteria and lead to persistent diarrhoea.
6. Anti-emetics: May cause CNS symptoms.

Key measures to prevent diarrhoea include:

- access to safe drinking-water;
- use of improved sanitation;
- hand washing with soap;
- exclusive breastfeeding for the first six months of life;
- good personal and food hygiene;
- health education about how infections spread; and
- rotavirus vaccination.