The management and prevention of diarrhoea

Practical guidelines

Third edition

World Health Organization
Geneva
1993
Contents

Foreword v

1. Understanding the problem 1
   What is diarrhoea? 1
   Acute and persistent diarrhoea 1
   Why is diarrhoea dangerous? 1
   How does diarrhoea cause dehydration? 2
   Treating a child who has diarrhoea 2
   ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 1 4

2. Home treatment of a child who has diarrhoea 5
   Educating family members about home treatment of a child who has diarrhoea 5
   Three rules for home treatment of a child who has diarrhoea 6
   ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 2 8

3. Assessment by a health worker for dehydration, and selection of a treatment plan 9
   Identifying a case of diarrhoea 9
   Assessing the child for signs of dehydration 9
   Deciding which treatment plan to use 10
   ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 3 11
   Example of assessment 12

4. Checking for other problems 13
   ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 4 13
   Example of assessment 15

5. Treatment by a health worker of a child who is dehydrated 16
   Ingredients of oral rehydration salts 16
   Preparing ORS solution 16
   Using the appropriate treatment plan 17
   Recording data on the child 22
   ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 5 22

6. Treatment of other problems 23
   Dysentery 23
   Cholera 24
   ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 6 24

7. Prevention of diarrhoea 25
   Breast-feeding 25
8. Things to remember about the management and prevention of diarrhoea

Annexes
1. Diarrhoea management chart
2. How to treat diarrhoea at home (mother’s card)
3. How to determine whether a child is malnourished by using arm circumference
4. What a health worker should do when packets of oral rehydration salts are not available
5. Intravenous therapy for severe dehydration
6. Appropriate use of drugs for cholera, dysentery, and parasitic diarrhoea
7. Check-list of essential skills and knowledge
Foreword

This book is intended for health workers who are concerned with the management and prevention of diarrhoea, and for their supervisors and trainers. It is a revised and updated version of The treatment and prevention of acute diarrhoea. Practical guidelines (second edition, Geneva, World Health Organization, 1989). The guidelines are based on the chart Management of the patient with diarrhoea (segments of which are reproduced in Annex 1), and form the technical basis of the module entitled Management of the patient with diarrhoea (1992) in the Supervisory skills training course of the WHO Programme for Control of Diarrhoeal Diseases.

The book is divided into eight sections. Each of the first seven sections is followed by a list of points of essential skills and knowledge required by health workers for the management and prevention of acute diarrhoea. All 17 points of essential skills and knowledge are summarized in Annex 7. The segments of the chart Management of the patient with diarrhoea given in Annex 1 summarize the approach to management of diarrhoea explained in this book (and are referred to collectively as the “diarrhoea management chart” throughout the remainder of the book). The chart may be adapted to local conditions and should be available to health workers for reference at all times.

Although this book refers mainly to diarrhoea in children, its recommendations apply equally to adults.

1 Both the Supervisory skills training course and the separate module Management of the patient with diarrhoea are available on request from the Programme for Control of Diarrhoeal Diseases, World Health Organization, 1211 Geneva 27, Switzerland.
SECTION 1

Understanding the problem

What is diarrhoea?
The number of stools normally passed in a day varies with an individual's diet and age. When there is diarrhoea, stools contain more water than usual—they are often called loose or watery stools. They may also contain visible blood, in which case the illness is called dysentery.

Mothers usually know when their children have diarrhoea. When diarrhoea occurs, mothers may say that the stools smell strong or pass noisily, as well as being loose and watery. Talking to mothers often reveals one or more useful local definitions of diarrhoea. For practical purposes, diarrhoea is defined as three or more loose or watery stools in a day (24 hours).

Diarrhoea is most common in children, especially those between 6 months and 2 years of age. It is also common in babies under the age of 6 months who are drinking cow's milk or infant feeding formulas.

Frequent passing of normal stools is not diarrhoea.

Babies who are taking only breast milk commonly have frequent soft stools; this is not diarrhoea.

Acute and persistent diarrhoea
Diarrhoea is classified as acute or persistent according to its duration. An episode of diarrhoea that lasts less than 2 weeks is acute diarrhoea; diarrhoea that lasts 2 weeks or longer is persistent.

Why is diarrhoea dangerous?
The two main dangers of diarrhoea are death and malnutrition.

Death from acute diarrhoea is most often caused by loss of a large amount of water and salt from the body. This loss is called dehydration. Another important cause of death is dysentery. Death from dysentery is caused by damage to the intestine, systemic infection, and malnutrition.

Severe diarrhoea with complications is most common in people with malnutrition. Diarrhoea can also cause malnutrition and make existing malnutrition worse because:

- nutrients are lost from the body
- nutrients are used to repair damaged tissue rather than for growth
• a person with diarrhoea may not be hungry
• mothers may not feed children normally while they have diarrhoea, or even for some days after the diarrhoea is better.

To prevent malnutrition, children with diarrhoea should be given food as soon as they will eat, and should be given extra food after diarrhoea stops.

**How does diarrhoea cause dehydration?**

The body normally takes in the water and salt it needs (input) through drinks and food. It normally loses water and salt (output) through stools, urine, sweat, and breathing.

When the bowel is healthy, water and salt pass from the bowel into the blood. When there is diarrhoea, the bowel does not work normally. Less water and salt pass into the blood, and more pass from the blood into the bowel. Thus, the amounts of water and salt passed in the stools are greater than normal.

This larger than normal loss of water and salt from the body can result in dehydration. Dehydration occurs when the output of water and salt is greater than the input. The more diarrhoeal stools a person passes, the more water and salt he or she loses. Repeated vomiting, which often accompanies diarrhoea, can also contribute to dehydration.

Dehydration occurs faster in infants and young children, in hot, dry climates, and when there is fever.

**Treating a child who has diarrhoea**

The most important parts of treatment of diarrhoea are:

• to prevent dehydration from occurring, if possible
• to treat dehydration quickly if it does occur
• to feed the child.

**Prevention of dehydration**

Dehydration can usually be prevented in the home if the child drinks extra fluids as soon as the diarrhoea starts. A child should be given one of the fluids recommended...
locally for home treatment of diarrhoea. These include: oral rehydration salts (ORS) solution, food-based fluids (such as soup, rice water, and yoghurt drinks), and plain water. If possible, food-based fluids should contain a small amount of salt. ORS solution can be used for both prevention and treatment of dehydration, and should also be given in the circumstances described in Treatment Plan A (see Annex 1, Diarrhoea management chart). If the child is under 6 months old and is not yet taking solid food, ORS solution or water should be given rather than a food-based fluid.

**Treatment of dehydration**

If dehydration occurs, the child should be taken to a community health worker or health centre for treatment. The best treatment for dehydration is oral therapy with a solution made with ORS. ORS solution can be used alone to rehydrate 95% or more of patients with dehydration. Patients with severe dehydration require rehydration with intravenous (IV) fluids at first, but should be given ORS solution in addition to IV fluids as soon as they can drink. ORS solution should be used alone when the signs of severe dehydration are gone.

**Feeding**

Feeding during diarrhoea provides nutrients the child needs to grow and be strong, and prevents weight loss. Fluids given to prevent or treat dehydration, such as the recommended home fluid or ORS solution, do not provide the required nutrients; frequent feeding with adequate amounts of nutritious food is essential.

Breast-fed children should be offered the breast frequently. Other children should receive their usual milk. Children of 6 months or older (or infants who are already taking solid food) should frequently be offered small amounts of nutritious, easily digestible food. After the diarrhoea has stopped, an extra meal should be given each day for 2 weeks to help children regain weight lost during the illness.

**Other treatments**

There are no drugs available at present that will safely and effectively help to stop diarrhoea.

Antibiotics are not effective against most organisms that cause diarrhoea. They rarely help and can make some people sicker in the long term. Their indiscriminate use increases the resistance to antibiotics of many disease-causing organisms. In addition, antibiotics are costly, so money is wasted. Antibiotics should therefore not be used routinely. Their appropriate use for dysentery and cholera is described in Section 6 and in Annex 6.

Antidiarrhoeal drugs and antiemetics should never be given to children and infants. These include adsorbents (such as kaolin, attapulgite, and activated charcoal), antimotility drugs (such as codeine, tincture of opium, diphenoxylate, and loperamide), and drugs to treat vomiting (such as chlorpromazine and promethazine). None has proven value in treating diarrhoea and some can be dangerous. Some of these drugs
can cause paralysis of the gut or make children abnormally sleepy, and some can be fatal, especially in infants, if used improperly.

**ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 1**

The health worker should be able to:

- define diarrhoea and dysentery in a way that is appropriate to his or her work setting
- distinguish between acute and persistent diarrhoea
- explain why diarrhoea and dysentery are dangerous
- explain how diarrhoea causes dehydration
- describe the most important parts of the treatment of diarrhoea and dysentery.
SECTION 2
Home treatment of a child who has diarrhoea

Educating family members about home treatment of a child who has diarrhoea

Mothers and other family members can often treat children who have diarrhoea with fluids and foods that they have at home. Health workers can help by showing mothers how to do this.

There are three rules for treating diarrhoea in the home. Whenever a child gets diarrhoea, the mother (or any other family members who care for the child) should follow these rules. Briefly, the rules are:

- increase fluids
- give the child plenty of food
- take the child to a health worker if he or she is not getting better.

These rules are explained below. They are also given in Treatment Plan A (see Annex 1) and in Annex 2.

Mothers whose children are sick with diarrhoea will be particularly interested in learning about home treatment. When teaching them about home treatment of diarrhoea:

- Select an appropriate time. For example, the mother of a child who has diarrhoea should be taught how to treat diarrhoea at home; information about prevention can be given at another time, when the child is healthy.
- Remember the community's beliefs about diarrhoea and ways of treating it. Relate your advice to current practices, and use words the mother will understand.
- Show the mother what to do (for example, show her how much fluid to give the child after each stool).
- Use teaching aids that are familiar (for example, use common containers to demonstrate how to mix ORS).
- Let the mother practise what she is learning while you watch. (For example, let her give the fluid with a spoon while you watch.) This will help the mother to remember what she has learned. It will also let you see whether she has learned correctly, so that you can provide extra help if necessary.
- Ask the mother to tell you, in her own words, things that she has learned but not practised, to be sure that she remembers. (For example, she can tell you what food she will give and how often.)
- Ask the mother whether she has any questions, and try to answer them.
- Ask her whether she has any problems in following your instructions. Listen to what she says and try to help her find a solution to the problems.
- Tell the mother what to expect (for example, how long it will take for her child to get well).
Three rules for home treatment of a child who has diarrhoea

RULE 1: GIVE THE CHILD MORE FLUIDS THAN USUAL

What fluids?

Give recommended home fluids, which may be ORS solution, food-based fluids (such as soup, rice water, and yoghurt drinks) and plain water. If the child is under 6 months old and is not yet taking solid food, give ORS solution or water, rather than a food-based fluid.

How much fluid?

Give more fluids than usual, as soon as the diarrhoea starts.

Give children under 2 years old approximately 50–100 ml (1/4–1/2 large cup) of fluid after each loose stool.

Give children aged between 2 and 10 years 100–200 ml (1/2–1 large cup) after each loose stool. Older children and adults should drink as much as they want.

RULE 2: GIVE THE CHILD PLENTY OF FOOD

What foods?

Breast milk is the best food for young babies. Continue to breast-feed frequently. If the child is not breast-fed, give the usual milk.

If the child is 6 months or older, or is already taking solid food, give cereal or another starchy food mixed, if possible, with pulses, vegetables, and meat or fish. Add 1 or 2 teaspoonfuls of vegetable oil to each serving to make it more energy-rich. Red palm oil is especially good because it contains a large amount of provitamin A. Fresh fruit juices and bananas are helpful because they contain potassium. (Sweetened fruit drinks are not suitable and may make diarrhoea worse.)

Avoid:

- high-fibre or bulky foods, such as coarse fruits and vegetables, fruit and vegetable peels, and whole grain cereals—these are hard to digest
- foods and drinks with a lot of sugar—these foods can make diarrhoea worse.

How much food?

Encourage the child to eat. Offer food every 3 or 4 hours (at least 6 times each day). Small, frequent feeds are best because they are more easily taken and digested by the child.

After the diarrhoea has stopped, continue to give the child one extra meal each day. Most children need this extra meal for about 2 weeks. Children who have had persistent diarrhoea should be given an extra meal each day for at least a month. Malnourished children will continue to need extra food until they reach a normal weight for their height.
How to prepare the food

Prepare foods by cooking well, fermenting, mashing, or grinding. This will make the foods easier to digest.

Give freshly prepared foods to minimize the chance of contamination. If previously prepared foods must be offered, first reheat them until they are thoroughly hot.

Water used for preparing drinks should be boiled.

Why feed the child?

Withholding food from a child who has diarrhoea can cause malnutrition or make existing malnutrition worse. Mothers may withhold food, or be advised to withhold food, in the belief that this will decrease the diarrhoea. However, food does not make diarrhoea worse. It gives the child the nutrients he or she needs to stay strong and to grow. A strong child will resist illness better.

Although absorption of nutrients from food is lessened somewhat during diarrhoea, most of the nutrients will be absorbed. Fluids given to the child for prevention or treatment of dehydration do not contain enough energy to fulfil the need for food.

RULE 3: TAKE THE CHILD TO THE HEALTH WORKER IF HE OR SHE IS NOT GETTING BETTER

Take the child to a health worker if the child does not get better in 3 days or develops any of the following:

- many watery stools
- repeated vomiting
- marked thirst
- eating or drinking poorly
MANAGEMENT AND PREVENTION OF DIARRHOEA

- fever
- blood in the stool.

ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 2

The health worker should be able to explain to family members the three rules for home treatment of diarrhoea. These are: to give more fluids than usual; to give plenty of food; and to take a child to the health worker if he or she is not getting better.
SECTION 3
Assessment by a health worker for dehydration, and selection of a treatment plan

Identifying a case of diarrhoea

When a mother brings a child with diarrhoea to a health worker, she will usually mention the diarrhoea when describing the child’s problems. However, the health worker should always ask whether there is diarrhoea, especially when a child has an illness that is often accompanied by diarrhoea, such as measles, pneumonia, or severe malnutrition.

The health worker should therefore ask both of the following questions:

- Has the child had loose or watery stools?
- Have there been loose stools with blood?

If the answer to either question is YES, the health worker should use the diarrhoea management chart to assess and treat the child. The first step is to assess the child for signs of dehydration.

Assessing the child for signs of dehydration

The signs that the health worker should look and feel for are listed here, in the table Assess your patient for dehydration (page 10), and in Annex 1. Refer to the table as you read this section.

Look for the following

- What is the child’s general condition? Is the child:
  - well and alert?
  - restless or irritable?
  - lethargic (abnormally sleepy), floppy, or unconscious?
- Are the child’s eyes normal, sunken, or very sunken and dry?
- Does the child have tears when he or she cries?
- Are the child’s mouth and tongue wet, dry, or very dry?
- When offered a drink, does the child:
  - drink normally or seem not thirsty?
  - drink eagerly and seem thirsty?
  - drink poorly or seem unable to drink?

Feel for the following

- When the skin of the abdomen is pinched, does it go back quickly, slowly, or very slowly (longer than 2 seconds)?
**FIRST, ASSESS YOUR PATIENT FOR DEHYDRATION**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LOOK AT: CONDITION</td>
<td>Well, alert</td>
<td>Restless, irritable *</td>
<td>Lethargic or unconscious; floppy*</td>
</tr>
<tr>
<td>EYES</td>
<td>Normal</td>
<td>Sunken</td>
<td>Very sunken and dry</td>
</tr>
<tr>
<td>TEARS</td>
<td>Present</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>MOUTH and TONGUE</td>
<td>Moist</td>
<td>Dry</td>
<td>Very dry</td>
</tr>
<tr>
<td>THIRST</td>
<td>Drinks normally, not thirsty</td>
<td>Thirsty, drinks eagerly *</td>
<td>Drinks poorly or not able to drink *</td>
</tr>
<tr>
<td>2. FEEL: SKIN PINCH</td>
<td>Goes back quickly</td>
<td>Goes back slowly *</td>
<td>Goes back very slowly *</td>
</tr>
<tr>
<td>3. DECIDE:</td>
<td>The patient has NO SIGNS OF DEHYDRATION</td>
<td>If the patient has two or more signs including at least one * sign *, there is SOME DEHYDRATION</td>
<td>If the patient has two or more signs, including at least one * sign *, there is SEVERE DEHYDRATION</td>
</tr>
<tr>
<td>4. TREAT:</td>
<td>Use Treatment Plan A</td>
<td>Weigh the patient, if possible, and use Treatment Plan B</td>
<td>Weigh the patient and use Treatment Plan C URGENTLY</td>
</tr>
</tbody>
</table>

**Note:** Pinching the skin may sometimes give misleading information:

- in the severely malnourished patient with marasmus, when the skin may go back slowly even if the patient is not dehydrated
- in the obese patient or the patient with oedema due to kwashiorkor, when the skin may go back quickly even if the patient is dehydrated.

**Deciding which treatment plan to use**

After the examination, decide which treatment plan to use to treat the child.

- Recall your findings while you were examining the child and look at the table Assess your patient for dehydration above. Find the signs that describe the child’s condition.

Notice that there are certain **key signs** which are in bold print and marked with asterisks (*). Experience has shown that dehydrated children usually have these key signs. These are also the signs most reliably detected by health workers. You should therefore give these key signs special attention when you are assessing the child for dehydration.

- Determine the degree of dehydration

Look first at Column C. If two or more of the signs listed in that column are present, including at least one key sign, conclude that the patient has **severe dehydration**.

If the patient does not have severe dehydration, look next at Column B. If two or more of the signs listed in that column are present, including at least one key sign, conclude that the patient has **some dehydration**.

If the patient does not meet the criteria for some dehydration, conclude that he or she has **no signs of dehydration**.
• Select the appropriate treatment plan based on the degree of dehydration. These treatment plans are described on the diarrhoea management chart (Annex 1).

For **severe dehydration**, select Treatment Plan C — *To treat severe dehydration quickly*. Weigh the patient so that you can determine the appropriate amount of intravenous (IV) fluid to give.

For **some dehydration**, select Treatment Plan B — *To treat dehydration*. Weigh the patient, if possible, but do not delay treatment if there are no scales available.

For **no signs of dehydration**, select Treatment Plan A — *To treat diarrhoea at home.*

An example of how a health worker has selected the appropriate treatment plan for a child with diarrhoea is given on page 12.

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**ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 3**

Using the table *Assess your patient for dehydration*, the health worker should be able to:

• look and feel for signs of dehydration
• select the appropriate treatment plan.
Example of assessment

A mother took her 4-month-old son, Tomi, to a health worker because he had diarrhoea for several days and was not getting better. The health worker looked and felt for signs of dehydration. The health worker’s findings are circled on the table *Assess your patient for dehydration* below.

Tomi had no signs in Column C, so he was not severely dehydrated. Two signs are circled in Column B, sunken eyes and thirsty. Since these two signs included one key sign, the health worker concluded that Tomi had *some dehydration* and needed Treatment Plan B.

**FIRST, ASSESS YOUR PATIENT FOR DEHYDRATION**

<table>
<thead>
<tr>
<th>Column</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. LOOK AT CONDITION</strong></td>
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<td><em>Restless, irritable</em></td>
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<td>EYES</td>
<td>Normal</td>
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<td>Present</td>
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<tr>
<td>MOUTH and TONGUE</td>
<td><em>Dry</em></td>
<td><em>Very dry</em></td>
<td>Very dry</td>
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<tr>
<td>THIRST</td>
<td>Drinks normally, not thirsty</td>
<td><em>Thirsty, drinks eagerly</em></td>
<td>Drinks poorly or not able to drink*</td>
</tr>
<tr>
<td><strong>2. FEEL: SKIN PINCH</strong></td>
<td>Goes back quickly</td>
<td><em>Goes back slowly</em></td>
<td><em>Goes back very slowly</em></td>
</tr>
<tr>
<td><strong>3. DECIDE</strong></td>
<td>The patient has NO SIGNS OF DEHYDRATION</td>
<td>If the patient has two or more signs including at least one <em>sign</em>, there is SOME DEHYDRATION</td>
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<td><strong>4. TREAT</strong></td>
<td>Use Treatment Plan A</td>
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<td>Weigh the patient and use Treatment Plan C URGENTLY</td>
</tr>
</tbody>
</table>
SECTION 4
Checking for other problems

In addition to assessing for dehydration, the health worker should ask about and look for signs of other problems, such as dysentery or severe malnutrition. The section of the diarrhoea management chart entitled Then, for other problems, shown on page 14 and in Annex 1, shows what to ask about and look for, and how to treat or refer any problems discovered.

Ask about the following:

**Blood in the stool.** This will tell you whether the patient has dysentery, which requires treatment with an antibiotic as described in Annex 6.

**Duration of diarrhoea.** If the patient’s diarrhoea has lasted for 14 days or more, it is persistent diarrhoea and should be treated as shown on the chart.

Look for the following:

**Signs of severe malnutrition.** If a child appears very wasted, like “skin and bones”, he or she has severe marasmus. If there is generalized swelling of the body and thin, sparse hair, the child has kwashiorkor. Children with either of these types of severe malnutrition should be referred for nutritional management.

Generally, you will be able to tell whether a child is severely malnourished just by looking for the above signs. However, if you are unsure, you can also measure the circumference of the child’s upper arm to determine the degree of malnutrition, as described in Annex 3.

**Ask about fever and take temperature:**

Ask the mother whether the child has had a fever (felt abnormally hot) at any time in the past 5 days. If fever is present, it is important to know the age of the child. If the child is under 2 months of age, the treatment of fever is different from that for a child of 2 months or more (see the diarrhoea management chart).

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**ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 4**

The health worker should be able to check for problems other than dehydration (for example, dysentery, persistent diarrhoea, severe malnutrition).
## MANAGEMENT AND PREVENTION OF DIARRHOEA

### THEN, FOR OTHER PROBLEMS

<table>
<thead>
<tr>
<th>ASK ABOUT BLOOD IN THE STOOL</th>
<th>IF BLOOD IS PRESENT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Treat for 5 days with an oral antibiotic recommended for Shigella in your area.</td>
<td></td>
</tr>
<tr>
<td>* Teach the mother to feed the child as described in Plan A.</td>
<td></td>
</tr>
<tr>
<td>* See the child again after 2 days if:</td>
<td></td>
</tr>
<tr>
<td>* under 1 year of age</td>
<td></td>
</tr>
<tr>
<td>* initially dehydrated</td>
<td></td>
</tr>
<tr>
<td>* there is still blood in the stool</td>
<td></td>
</tr>
<tr>
<td>* not getting better</td>
<td></td>
</tr>
<tr>
<td>* If the stool is still bloody after 2 days, change to a second oral antibiotic recommended for Shigella in your area. Give it for 5 days.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASK WHEN THIS EPISODE OF DIARRHOEA BEGAN</th>
<th>IF DIARRHOEA HAS LASTED AT LEAST 14 DAYS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Refer to hospital if:</td>
<td></td>
</tr>
<tr>
<td>* the child is under 6 months old</td>
<td></td>
</tr>
<tr>
<td>* dehydration is present. (Refer the child after treatment of dehydration.)</td>
<td></td>
</tr>
<tr>
<td>* Otherwise, teach the mother to feed her child as in Plan A, except:</td>
<td></td>
</tr>
<tr>
<td>* give only half the usual amount of milk, or replace milk with a fermented milk product, such as yoghurt.</td>
<td></td>
</tr>
<tr>
<td>* assure full energy intake by giving 6 meals a day of thick cereal and added oil, mixed with vegetables, pulses, meat, or fish.</td>
<td></td>
</tr>
<tr>
<td>* Tell the mother to bring the child back after 5 days:</td>
<td></td>
</tr>
<tr>
<td>* if diarrhoea has not stopped, refer to hospital.</td>
<td></td>
</tr>
<tr>
<td>* if diarrhoea has stopped, tell the mother to:</td>
<td></td>
</tr>
<tr>
<td>* use the same foods for the child's regular diet.</td>
<td></td>
</tr>
<tr>
<td>* after 1 more week, gradually resume the usual animal milk.</td>
<td></td>
</tr>
<tr>
<td>* give an extra meal each day for at least 1 month.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOOK FOR SEVERE MALNUTRITION</th>
<th>IF THE CHILD HAS SEVERE MALNUTRITION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Do not attempt rehydration; refer to hospital for management.</td>
<td></td>
</tr>
<tr>
<td>* Provide the mother with ORS solution and show her how to give 5 ml/kg/hr during the trip.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASK ABOUT FEVER AND TAKE TEMPERATURE</th>
<th>IF THE CHILD IS UNDER 2 MONTHS OF AGE:</th>
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<tbody>
<tr>
<td>* Rehydrate as necessary. If there is fever (38°C or above) after rehydration, refer to hospital. Do not give paracetamol or an antimalarial.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IF THE CHILD IS 2 MONTHS OF AGE OR OLDER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>* If temperature is 39°C or above, give paracetamol.</td>
</tr>
<tr>
<td>* If there is falciparum malaria in the area, and the child has any fever (38°C or above) or history of fever in the past 5 days, give an antimalarial (or manage according to your malaria programme recommendation).</td>
</tr>
</tbody>
</table>
Example of assessment

A mother took her 3-year-old daughter, Rania, to a clinic because she had diarrhoea. The clinic worker looked and felt for signs of dehydration. The clinic worker’s findings are circled on the table Assess your patient for dehydration below.

Since Rania had no signs from Column C and only one sign from Column B, the clinic worker decided that she had **no signs of dehydration**. He selected Treatment Plan A to prevent Rania from becoming dehydrated.

The clinic worker also asked about and looked for symptoms and signs of other problems. He found that Rania had blood in her stool and that the diarrhoea had started about 5 days earlier. Rania appeared to be well nourished. She had a slight fever (38°C).

Because Rania had blood in her stool, the clinic worker diagnosed dysentery and gave the mother an appropriate antibiotic for the child. (This was trimethoprim–sulfa-methoxazole, to which most shigellae in the area were known to be sensitive.) Since there was no known malaria in the area, Rania was not given an antimalarial for her fever. The clinic worker assumed that the fever was caused by the dysentery since no other cause was apparent.

### FIRST, ASSESS YOUR PATIENT FOR DEHYDRATION

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LOOK AT CONDITION</td>
<td>Well, alert</td>
<td>+ Restless, irritable +</td>
<td>+ Lethargic or unconscious; Nappy +</td>
</tr>
<tr>
<td></td>
<td>EYES</td>
<td>Normal</td>
<td>Sunken</td>
</tr>
<tr>
<td></td>
<td>TEARS</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td></td>
<td>MOUTH AND TONGUE</td>
<td>Most</td>
<td>Dry</td>
</tr>
<tr>
<td></td>
<td>THIRST</td>
<td>Drinks normally not thirsty</td>
<td>+ Thirsty, drinks eagerly +</td>
</tr>
<tr>
<td>2. FEEL SKIN PINCH</td>
<td>Goes back quickly</td>
<td>+ Goes back slowly +</td>
<td>+ Goes back very slowly +</td>
</tr>
<tr>
<td>3. DECIDE</td>
<td>The patient has NO SIGNS OF DEHYDRATION</td>
<td>If the patient has two or more signs including at least one * sign †, there is SOME DEHYDRATION</td>
<td>If the patient has two or more signs, including at least one * sign †, there is SEVERE DEHYDRATION</td>
</tr>
<tr>
<td>4. TREAT.</td>
<td>Use Treatment Plan A</td>
<td>Weigh the patient, if possible, and use Treatment Plan B</td>
<td>Weigh the patient and use Treatment Plan C URGENTLY</td>
</tr>
</tbody>
</table>
SECTION 5
Treatment by a health worker of a child who is dehydrated

Dehydration is treated with a solution of oral rehydration salts (ORS). All health workers should know how to prepare ORS solution from water and ORS.

Ingredients of oral rehydration salts
Oral rehydration salts often come in packets containing the following ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount (in grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose (a form of sugar)</td>
<td>20</td>
</tr>
<tr>
<td>Sodium chloride (common salt)</td>
<td>3.5</td>
</tr>
<tr>
<td>Trisodium citrate dihydrate</td>
<td>2.9</td>
</tr>
<tr>
<td>or sodium bicarbonate (baking soda)</td>
<td>2.5</td>
</tr>
<tr>
<td>Potassium chloride</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Packets generally contain these ingredients in the correct amounts for mixing with 1 litre of drinking-water.

Note: Some packets of ORS are made for smaller volumes of water; they contain smaller amounts of the same ingredients. It is critical that the correct amount of water is used to mix with any packet. If too little water is used, the solution will be too strong and may be dangerous. If too much water is used, the solution will be too dilute and may not be as effective.

When ORS packets are not available, an oral rehydration fluid can be made by following the instructions given in Annex 4.

Preparing ORS solution
Wash your hands with soap and water.

Pour all the powder from one packet of ORS into a clean container. Use whatever container is available such as a jar, bowl or bottle.
Measure 1 litre of clean water (or the correct amount for the packet used). It is best to boil and cool the water before use, but if this is not possible, use the cleanest drinking-water available.

Pour the water into the container. Mix well with a clean spoon until the powder is completely dissolved.

Taste the solution so that you know what it tastes like.

Mix fresh ORS solution each day in a clean container. Keep the container covered. The solution can be kept and used for one day (24 hours). Throw away any solution remaining from the day before.

**Using the appropriate treatment plan**

Having assessed the degree of dehydration of the child, the health worker should have selected one of the following treatment plans:

- **Treatment Plan C** — *To treat severe dehydration quickly*  
  (see also Annex 5)
- **Treatment Plan B** — *To treat dehydration*
- **Treatment Plan A** — *To treat diarrhoea at home*

Some health workers may not have the skills or the necessary supplies to perform all the steps listed in Treatment Plans B and C. A supervisor or trainer must determine which procedures can be performed by a health worker in a community setting, and which can only be performed by a health worker in a health facility. The supervisor or trainer must then give each type of health worker the training and supplies needed to carry out the treatment correctly.

The health worker will then follow the treatment plan selected. He or she may also need to treat any other problems that have been identified. In all cases, the health worker should first compliment the mother on bringing her child for care.

Many mothers will expect to be given a medicine to stop the diarrhoea. However, it is dehydration that is the main cause of death. It is necessary to take time to explain to the mother that it is most important to replace the lost fluids, and to continue feeding the child. Explain that antidiarrhoeal drugs do not stop the diarrhoea and are useless;
some are dangerous. Explain that ORS will not stop the diarrhoea, but that it will help keep the child strong until the diarrhoea goes away in a few days.

In cases of dysentery, and suspected cholera with severe dehydration, treatment with antibiotics is necessary (see Annex 6). In all other cases of diarrhoea, however, antibiotics will not help: diarrhoea will stop without special treatment.

Before going home, all mothers should be taught the three rules for home treatment of diarrhoea (given on pages 6–8 and in Treatment Plan A). Even children who are treated at a health facility according to Treatment Plan B or C will require home treatment according to Plan A when their condition has improved.

**Remember**

All children with diarrhoea will be treated with Plan A, including both:

- children who have not developed signs of dehydration, and
- children who have already been treated for dehydration, and have improved.

Remember that it is important to give ORS solution in small amounts at a steady pace (a teaspoonful every 1–2 minutes), and that, after receiving ORS solution for 4 hours (on Plan B), most children will improve sufficiently to be treated according to Plan A.

If a child begins to vomit while being given ORS solution, wait 10 minutes then continue giving the solution, but more slowly, a teaspoon every 2–3 minutes. Some children may want to drink too quickly. This may make them vomit.
TREATMENT PLAN A
TO TREAT DIARRHOEA AT HOME

USE THIS PLAN TO TEACH THE MOTHER TO:
- Continue to treat at home her child's current episode of diarrhoea.
- Give early treatment for future episodes of diarrhoea.

EXPLAIN THE THREE RULES FOR TREATING DIARRHOEA AT HOME:

1. GIVE THE CHILD MORE FLUIDS THAN USUAL TO PREVENT DEHYDRATION:
   - Use recommended home fluids. These include: ORS solution, food-based fluids (such as soup, rice water, and yoghurt drinks) and plain water. Use ORS solution for children described in the box below. (Note: If the child is under 6 months old and is not yet taking solid food, give ORS solution or water rather than a food-based fluid).
   - Give as much of these fluids as the child will take. Use the amounts shown below for ORS as a guide.
   - Continue giving these fluids until the diarrhoea stops.

2. GIVE THE CHILD PLENTY OF FOOD TO PREVENT MALNUTRITION:
   - Continue to breast-feed frequently.
   - If the child is not breast-fed, give the usual milk.
   - If the child is 6 months or older, or already taking solid food:
     - Also give cereal or another starchy food mixed, if possible, with pulses, vegetables, and meat or fish. Add 1 or 2 teaspoonsfuls of vegetable oil to each serving.
     - Give fresh fruit juice or mashed banana to provide potassium.
     - Give freshly prepared foods. Cook and mash or grind food well.
     - Encourage the child to eat: offer food at least 6 times a day.
     - Give the same foods after diarrhoea stops, and give an extra meal each day for two weeks.

3. TAKE THE CHILD TO THE HEALTH WORKER IF THE CHILD DOES NOT GET BETTER IN 3 DAYS OR DEVELOPS ANY OF THE FOLLOWING:
   - Many watery stools
   - Repeated vomiting
   - Marked thirst
   - Eating or drinking poorly
   - Fever
   - Blood in the stool

CHILDREN SHOULD BE GIVEN ORS SOLUTION AT HOME, IF:
- They have been on Treatment Plan B or C.
- They cannot return to the health worker if the diarrhoea gets worse.
- It is national policy to give ORS to all children who see a health worker for diarrhoea.

IF THE CHILD WILL BE GIVEN ORS SOLUTION AT HOME, SHOW THE MOTHER HOW MUCH ORS TO GIVE AFTER EACH LOOSE STOOL AND GIVE HER ENOUGH PACKETS FOR 2 DAYS:

<table>
<thead>
<tr>
<th>Age</th>
<th>Amount of ORS to give after each loose stool</th>
<th>Amount of ORS to provide for use at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 24 months</td>
<td>50-100 ml</td>
<td>500 ml/day</td>
</tr>
<tr>
<td>2 up to 10 years</td>
<td>100-200 ml</td>
<td>1000 ml/day</td>
</tr>
<tr>
<td>10 years or more</td>
<td>As much as wanted</td>
<td>2000 ml/day</td>
</tr>
</tbody>
</table>

- Describe and show the amount to be given after each stool using a local measure.

SHOW THE MOTHER HOW TO MIX ORS.

SHOW HER HOW TO GIVE ORS:
- Give a teaspoonful every 1-2 minutes for a child under 2 years.
- Give frequent sips from a cup for an older child.
- If the child vomits, wait 10 minutes. Then give the solution more slowly (for example, a spoonful every 2-3 minutes).
- If diarrhoea continues after the ORS packets are used up, tell the mother to give other fluids as described in the first rule above or return for more ORS.
TREATMENT PLAN B
TO TREAT DEHYDRATION

APPROXIMATE AMOUNT OF ORS SOLUTION TO GIVE IN THE FIRST 4 HOURS:

<table>
<thead>
<tr>
<th>Age: *</th>
<th>Less than 4 months</th>
<th>4 - 11 months</th>
<th>12 - 23 months</th>
<th>2 - 4 years</th>
<th>5 - 14 years</th>
<th>15 years or older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight: Less than 5 kg</td>
<td>5 - 7.9 kg</td>
<td>8 - 10.9 kg</td>
<td>11 - 15.9 kg</td>
<td>16 - 29.9 kg</td>
<td>30 kg or more</td>
<td></td>
</tr>
<tr>
<td>in ml</td>
<td>200-400</td>
<td>400-600</td>
<td>600-800</td>
<td>800-1200</td>
<td>1200-2200</td>
<td>2200-4000</td>
</tr>
<tr>
<td>in local measure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Use the patient's age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by multiplying the patient's weight (in kg) times 75.

- If the child wants more ORS than shown, give more.
- Encourage the mother to continue breast-feeding.
- For infants under 6 months who are not breast-fed, also give 100-200 ml clean water during this period.

**OBSERVE THE CHILD CAREFULLY AND HELP THE MOTHER GIVE ORS SOLUTION:**

- Show her how much solution to give her child.
- Show her how to give it - a teaspoonful every 1-2 minutes for a child under 2 years, frequent sips from a cup for an older child.
- Check from time to time to see if there are problems.
- If the child vomits, wait 10 minutes and then continue giving ORS, but more slowly, for example, a spoonful every 2-3 minutes.
- If the child's eyelids become puffy, stop ORS and give plain water or breast milk.

Give ORS according to Plan A when the puffiness is gone.

**AFTE74 HOURS, REASSESS THE CHILD USING THE ASSESSMENT CHART. THEN SELECT PLAN A, B, OR C TO CONTINUE TREATMENT.**

- If there are no signs of dehydration, shift to Plan A. When dehydration has been corrected, the child usually passes urine and may also be tired and fall asleep.
- If signs indicating some dehydration are still present, repeat Plan B, but start to offer food, milk and juice as described in Plan A.
- If signs indicating severe dehydration have appeared, shift to Plan C.

**IF THE MOTHER MUST LEAVE BEFORE COMPLETING TREATMENT PLAN B:**

- Show her how much ORS to give to finish the 4-hour treatment at home.
- Give her enough ORS packets to complete rehydration, and for 2 more days as shown in Plan A.
- Show her how to prepare ORS solution.
- Explain to her the three rules in Plan A for treating her child at home:
  - to give ORS or other fluids until diarrhoea stops
  - to feed the child
  - to bring the child back to the health worker, if necessary.
TREATMENT PLAN C
TO TREAT
SEVERE DEHYDRATION QUICKLY

FOLLOW THE ARROWS. IF ANSWER IS "YES", GO ACROSS. IF "NO", GO DOWN

**START HERE**

**Can you give intravenous (IV) fluids immediately?**

- **YES**
  - **Start IV fluids immediately.** If the patient can drink, give ORS by mouth while the drip is set up. Give 100 ml/kg Ringer’s Lactate Solution (or, if not available, normal saline), divided as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>First give 30 ml/kg in</th>
<th>Then give 70 ml/kg in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants (under 12 months)</td>
<td>1 hour *</td>
<td>5 hours</td>
</tr>
<tr>
<td>Older</td>
<td>30 minutes *</td>
<td>2 1/2 hours</td>
</tr>
</tbody>
</table>

* Repeat once if radial pulse is still very weak or not detectable.

- **Send the patient immediately for IV treatment.**
- **If the patient can drink, provide the mother with ORS solution and show her how to give it during the trip.**

- **NO**
  - **Start rehydration by tube with ORS solution: Give 20 ml/kg/hour for 6 hours (total of 120 ml/kg).**
  - **Reassess the patient every 1-2 hours:**
    - If there is repeated vomiting or increasing abdominal distension, give the fluid more slowly.
    - If hydration is not improving after 3 hours, send the patient for IV therapy.
  - **After 6 hours, reassess the patient and choose the appropriate Treatment Plan.**

**Is IV treatment available nearby, (within 30 minutes)?**

- **YES**
  - **Send the patient immediately for IV treatment.**
  - **If the patient can drink, provide the mother with ORS solution and show her how to give it during the trip.**

- **NO**
  - **Are you trained to use a naso-gastric (NG) tube for rehydration?**
    - **YES**
      - **Start rehydration by tube with ORS solution: Give 20 ml/kg/hour for 6 hours (total of 120 ml/kg).**
      - **Reassess the patient every 1-2 hours:**
        - If there is repeated vomiting or increasing abdominal distension, give the fluid more slowly.
        - If hydration is not improving after 3 hours, send the patient for IV therapy.
      - **After 6 hours, reassess the patient and choose the appropriate Treatment Plan.**
    - **NO**
      - **Can the patient drink?**
        - **YES**
          - **Start rehydration by mouth with ORS solution, giving 20 ml/kg/hour for 6 hours (total of 120 ml/kg).**
          - **Reassess the patient every 1-2 hours:**
            - If there is repeated vomiting, give the fluid more slowly.
            - If hydration is not improving after 3 hours, send the patient for IV therapy.
          - **After 6 hours, reassess the patient and choose the appropriate Treatment Plan.**
        - **NO**
          - **UGENT: Send the patient for IV or NG treatment.**

**NOTES:**

- If possible, observe the patient at least 6 hours after rehydration to be sure the mother can maintain hydration giving ORS solution by mouth.
- If the patient is above 2 years and there is cholera in your area, give an appropriate oral antibiotic after the patient is alert.
Recording data on the child

Health workers in the community and in the health facility should keep a record on each child who comes for treatment or to use a service.

Each child must be identified in the records by at least the following information:

- name
- age (or date of birth)
- date of visit
- reason for visit
- diagnosis
- type of treatment or service provided.

From this information a health worker can count the number of episodes of diarrhoea treated each month in children less than 5 years of age, and the number of children given other services.

Additional valuable data that may be recorded include sex, address (the health worker may want to know the distance the child has travelled to receive treatment), information from the physical examination, and whether the child has watery diarrhoea or dysentery.

These records should be kept for periodic review by the supervisor in order to monitor the use of various services and to help plan future use.

The forms used for patient records may differ from one health facility or area to another. The form should include at least the minimum data and be easy to understand and fill out. If existing record-keeping systems in a health area do not include the minimum information, the supervisor should modify them to include that information, or design new forms. If all health workers in an area use the same form, it will be easier to collect and combine the data for analysis.

ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 5

The health worker should be able to:

- demonstrate how to prepare ORS solution correctly
- give oral rehydration therapy to dehydrated children
- give intravenous rehydration therapy to children with severe dehydration or refer them for this treatment
- teach mothers how to continue treatment at home
- keep appropriate records of treatment given.
SECTION 6
Treatment of other problems

The section of the diarrhoea management chart entitled Then, for other problems, shown on page 14 and in Annex 1, describes

- dysentery (that is, diarrhoea with blood in the stools)
- persistent diarrhoea (that is, diarrhoea lasting for 14 days or more)
- severe malnutrition
- fever.

There is also a section of the chart entitled Use of drugs for children with diarrhoea. This is shown on page 24 and in Annex 1. Drugs are very rarely needed in the treatment of diarrhoea. However, antibiotics should be used for dysentery and for suspected cholera with severe dehydration. A list of suitable antibiotics is given in Annex 6.

Dysentery

Presence of blood in the stools is an indication of infection with microbes that invade the walls of the intestine; Shigella is the most common of those that cause dysentery in children. Other microbes rarely cause dysentery; antibiotic treatment is not required and illness usually subsides without serious complications.

If a patient has blood in the stools, it should be treated as suspected shigellosis. Practical empirical therapy for dysentery involves the following antibiotic therapy.

First, an antibiotic to which most shigellae in the area are sensitive is given for 2 days. If the patient improves, the drug is continued for 5 days. If there is no improvement in the patient’s condition, a second antibiotic known to be effective against shigellae is given for 2 days. If the patient improves, treatment is continued for 5 days. If there is no improvement—or if at any time trophozoites of Entamoeba histolytica containing red blood cells are seen in the faeces—the patient should be treated empirically for amoebiasis.

E. histolytica is a very rare cause of dysentery in children. The clinical presentation of amoebiasis is slow onset of diarrhoea, which is in marked contrast to the abrupt or acute onset of shigella dysentery. Early treatment of shigellosis with appropriate antibiotics is important to decrease the severity, duration, and complications of the infection. Routine treatment (metronidazole) for E. histolytica should never be given: it is ineffective against shigellae, has adverse side-effects, and increases the cost of treatment. Treatment for amoebiasis should be given only if the patient with dysentery fails to improve after consecutive treatment with two antibiotics, each given for 2 days, or when trophozoites of E. histolytica containing red blood cells are seen in fresh stools.
Giardiasis should only be treated with an antiparasitic drug (metronidazole) when diarrhoea has lasted at least 14 days and cysts or trophozoites of *Giardia* are seen in faeces or small bowel fluid.

**Cholera**

Cholera is an important cause of acute diarrhoea in which, as for acute diarrhoea of other origin, rehydration is the cornerstone of effective case management. However, dehydration may be more severe in cholera than in other types of diarrhoea. An adult with cholera may lose 15 litres of fluid in a 24-hour period, and a child with severe cholera may die from dehydration within a few hours of the onset of diarrhoea. Rehydration with ORS solution for patients with some dehydration and with intravenous fluids for patients with severe dehydration is therefore life-saving.

Whereas acute diarrhoea is normally more prevalent in young children, cholera outbreaks affect adults as well. The use of suitable antibiotics in severe cases of cholera will shorten the duration of disease and thus reduce the period during which patients may spread cholera to others.

**ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 6**

The health worker should be able to give appropriate treatment or refer for dysentery, persistent diarrhoea, severe malnutrition, and fever.

**USE OF DRUGS FOR CHILDREN WITH DIARRHOEA**

- **ANTIBIOTICS** should ONLY be used for dysentery and for suspected cholera cases with severe dehydration. Otherwise, they are ineffective and should NOT be given.

- **ANTIPARASITIC** drugs should ONLY be used for:

  - Amoebiasis, after antibiotic treatment of bloody diarrhoea for *Shigella* has failed or trophozoites of *E. histolytica* containing red blood cells are seen in the faeces.
  
  - Giardiasis, when diarrhoea has lasted at least 14 days and cysts or trophozoites of *Giardia* are seen in faeces or small bowel fluid.

- **ANTIDIARRHOEAL DRUGS** and **ANTIEMETICS** should NEVER be used. None has proven practical value. Some are dangerous.
SECTION 7
Prevention of diarrhoea

An important part of the health worker's job is to help prevent diarrhoea by convincing and helping community members to adopt and maintain certain preventive practices. These preventive practices are:

- breast-feeding
- improved weaning
- use of plenty of water for hygiene and clean water for drinking
- hand-washing
- use of latrines
- proper disposal of the stools of young children
- immunization against measles.

The health worker can teach, encourage, and set a good example to influence community members to adopt these preventive practices.

Some simple facts that people in the community should know about each preventive practice are presented on the following pages.

**Breast-feeding**

- Mothers should give only breast milk to their babies for the first 4–6 months and then continue breast-feeding up to 2 years of age or beyond, while giving other foods.
- A new mother should be taught how to hold the baby for breast-feeding and how to place the breast in the baby's mouth. This is best done by a female health worker or another woman who has successfully breast-fed her own children.
- To breast-feed most effectively, mothers should:
  - start breast-feeding as soon as possible after the baby is born
  - breast-feed on demand (increased sucking increases milk supply)
  - express milk manually to avoid engorgement of the breasts during periods of separation from the baby
  - not give their babies other fluids, such as water, sugar water, or milk formula, during the first 4–6 months of life; however, if the baby develops diarrhoea, extra fluids should be given as described on page 6.
- If the mother works outside the home and it is not possible for her to take the baby with her, she should breast-feed before leaving home, on returning at night, and at any other time when she is with the baby.
- A mother should continue breast-feeding when her baby is ill, and after the illness. This is especially important if the baby has diarrhoea.
Improved weaning practices

- Clean, nutritious weaning foods should be introduced when a child is about 4–6 months old. Initially, soft mashed foods are best.
- A child’s diet should become increasingly varied and should include: the staple food of the community (usually a cereal or root); beans or peas; some food from animals, for example, milk products, eggs, or meat; and green leafy vegetables or orange vegetables.
- A child should also be given some fruit or fruit juice, and some vegetable oil or fat should be added to the weaning food.
- Drinks are better given with a cup or spoon than with a bottle.
- Family members should wash their hands before preparing weaning food, and before feeding a baby.
- Food should be prepared in a clean place, using clean pots and utensils.
- Uncooked food should be washed in clean water before it is eaten.
- Cooked food should be eaten while it is still hot; previously prepared food should be thoroughly reheated before being eaten.
- Foods that are being kept should be covered and, if possible, refrigerated.

Use of plenty of water for hygiene and clean water for drinking

- Use the most readily available water for personal and domestic hygiene.
- Water for drinking should be collected from the cleanest available source.
- Water sources should be protected by: keeping animals away; locating latrines more than 10 metres away from the source, and downhill; and digging drainage ditches uphill from the source to channel storm-water away.
PREVENTION OF DIARRHOEA

- Water should be collected and stored in clean, covered containers. It should be taken from the storage container with a clean, long-handled dipper.
- Water used for making food or drinks for young children should be boiled.

**Hand-washing**

- All family members should wash their hands well:
  - after cleaning a child who has defecated, and after disposing of a child's stool
  - after defecation
  - before preparing food
  - before eating
  - before feeding a child.
- An adult or older sibling should wash the hands of young children.

**Use of latrines**

- All families should have a clean and functioning latrine. The latrine should be used by all family members who are old enough to use it.
- The latrine should be kept clean by regular washing of dirty surfaces.
- If there is no latrine, family members should:
  - defecate at a distance from the house, paths, or areas where children play, and at least 10 metres from the water supply
  - avoid going barefoot to defecate
  - not allow a child to visit the defecation area alone.

**Proper disposal of the stools of young children**

- The stool of a young child or baby should be collected quickly, wrapped in a leaf or newspaper, and buried or put into the latrine.
A young child should be helped to defecate into an easily cleaned container. The stool should then be put into a latrine and the container washed out. Alternatively, the child can defecate onto a surface such as a newspaper or large leaf, and this can be put into a latrine.

A child who has defecated should be cleaned promptly, and the child's hands should be washed. The person who has cleaned the child should also wash his or her hands thoroughly.

Immunization against measles

- Children should be immunized against measles as soon after 9 months of age as possible.

What health workers can do to support preventive practices

1. Use good educational techniques

Whenever health workers have an opportunity, they should educate family members about prevention of diarrhoea. Opportunities may occur when mothers come for prenatal care or to have their children immunized. Health workers should create other opportunities, such as group educational sessions or home visits to mothers.

Health workers should be careful not to teach too much about prevention at one time. They should choose the messages that are most relevant for a mother or group of mothers. For example, mothers receiving prenatal care could be taught about breastfeeding, which is an important way to prevent diarrhoea in young infants. Mothers of babies of 4–6 months will need to know about safe weaning practices. If health workers use good educational techniques, they will be more effective in helping community members understand the benefits of the preventive practices.
The rules for home treatment of diarrhoea given on pages 6–8 are also useful when teaching about prevention.

2. **Set a good example**

   Health workers should always "practise what they preach" about prevention. What a person does always sends a more powerful message than what he or she says.

3. **Participate in community projects to improve preventive practices**

   In cooperation with existing community groups, health workers can use their knowledge of ways to prevent diarrhoea to help plan useful projects. Some examples of projects that could be carried out with limited community resources, and that would significantly benefit many community members, include:

   * buying soap in bulk for the community
   * improving water sources
   * designating and supporting someone to build family latrines
   * gardening to produce better and cheaper ingredients for weaning food.

4. **Support breast-feeding**

   A health worker who attends the birth of a baby can help the mother begin breast-feeding by doing the things listed below. Health workers can also encourage traditional birth attendants or family members attending a birth to do these things.

   * Give the infant to the mother to begin breast-feeding immediately, or as soon as possible, after delivery.
   * Let the mother and infant stay in the same room or bring the infant to breast-feed when hungry.
   * Do not give feeds other than breast milk to a newborn baby.
   * Show the mother the best way to breast-feed, and how to avoid problems with breast-feeding.

   Health workers can encourage breast-feeding mothers to form a breast-feeding support group who meet together to discuss any problems they may be having.

5. **Build and maintain a latrine at the health facility**

   A clean, functioning latrine at the health facility will be an example to people coming for health services. It should be properly maintained and kept clean, so that community members see how a latrine should be used and looked after.

6. **Tell community members where the clean water sources are and how to improve water sources**

   Some of the sources of water in a community can probably be improved by taking simple measures such as those listed below. Community members may want to make
improvements to water sources if health workers can tell them exactly what should be done.

- Build a fence or wall around the water source to keep animals away.
- Dig drainage ditches uphill from an open well to prevent storm-water from flowing into it.
- Do not allow washing in the water source.
- Do not allow children to play in or around the water source.
- Do not locate latrines uphill from, or within 10 metres of, the water source.
- Install a simple pulley device and bucket to make it easier to raise water from a well.

ESSENTIAL SKILLS AND KNOWLEDGE: SECTION 7

The health worker should be able to describe and support what families can do to prevent diarrhoea, including:

- breast-feeding
- improved weaning practices
- the use of plenty of water for hygiene and clean water for drinking
- hand-washing
- the use of latrines
- proper disposal of the stools of young children
- immunization against measles.
SECTION 8
Things to remember about the management and prevention of diarrhoea

- The most important aspects of managing a patient with diarrhoea are preventing or treating dehydration and maintaining good nutrition.
- Antidiarrhoeal drugs should never be used; antibiotics should be given only for dysentery and for suspected cholera with severe dehydration in children over 2 years of age.
- Health workers should teach family members how to treat diarrhoea. The three rules for home treatment of diarrhoea are as follows:
  1. Give the child more fluids than usual to prevent dehydration.
  2. Give the child plenty of food to prevent malnutrition.
  3. Take the child to the health worker if he or she is not getting better.

- When a child with diarrhoea is brought to a health worker, the health worker should:
  - use the diarrhoea management chart (Annex 1) for assessing and treating the child
  - look and feel for signs of dehydration
  - check for problems other than dehydration (for example dysentery, persistent diarrhoea, severe malnutrition)
  - select a treatment plan
  - give oral rehydration therapy to children with some dehydration
  - give intravenous rehydration therapy to children with severe dehydration, or refer them for this treatment
  - give appropriate treatment or refer for any other problems found.

- The health worker should be able to describe what families can do to prevent diarrhoea, including breast-feeding, improved weaning practices, use of plenty of clean water for hygiene and clean water for drinking, use of latrines, proper disposal of the stools of young children, and immunization against measles.

- Some things that health workers can do to support preventive practices include:
  - use good educational techniques
  - set a good example
  - participate in community projects to improve preventive practices
  - support breast-feeding
  - build and maintain a latrine at the health facility
  - tell community members where the clean water sources are and how to improve water sources.
The next six pages contain segments of the WHO chart, *Management of the patient with diarrhoea* (1992). This is a poster-sized chart for hanging on the wall. It is available on request from the Programme for Control of Diarrhoeal Diseases, World Health Organization, 1211 Geneva 27, Switzerland, and from WHO Regional Offices.

**FIRST, ASSESS YOUR PATIENT FOR DEHYDRATION**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LOOK AT CONDITION</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EYES</td>
<td>Restless, irritable</td>
<td>Lethargic or unconscious; floppy.</td>
</tr>
<tr>
<td></td>
<td>TEARS</td>
<td>Sunken</td>
<td>Very sunken and dry</td>
</tr>
<tr>
<td></td>
<td>MOUTH and TONGUE</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td></td>
<td>THIRST</td>
<td>Moist</td>
<td>Very dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drinks normally, not thirsty</td>
<td>Drinks poorly or not able to drink.</td>
</tr>
<tr>
<td>2</td>
<td>FEEL: SKIN PINCH</td>
<td>Goes back slowly</td>
<td>Goes back very slowly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The patient has NO SIGNS OF DEHYDRATION</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>DECIDE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the patient has two or more signs including at least one <em>sign</em>, there is SOME DEHYDRATION</td>
<td>If the patient has two or more signs, including at least one <em>sign</em>, there is SEVERE DEHYDRATION</td>
</tr>
<tr>
<td>4</td>
<td>TREAT:</td>
<td>Use Treatment Plan A</td>
<td>Weigh the patient, if possible, and use Treatment Plan B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weigh the patient and use Treatment Plan C URGENTLY</td>
</tr>
</tbody>
</table>
## THEN, FOR OTHER PROBLEMS

### IF BLOOD IS PRESENT:

- Treat for 5 days with an oral antibiotic recommended for *Shigella* in your area.
- Teach the mother to feed the child as described in Plan A.
- See the child again after 2 days if:
  - under 1 year of age
  - initially dehydrated
  - there is still blood in the stool
  - not getting better
- If the stool is still bloody after 2 days, change to a second oral antibiotic recommended for *Shigella* in your area. Give it for 5 days.

### IF DIARRHOEA HAS LASTED AT LEAST 14 DAYS:

- Refer to hospital if:
  - the child is under 6 months old
  - dehydration is present. (Refer the child after treatment of dehydration.)
- Otherwise, teach the mother to feed her child as in Plan A, except:
  - give only half the usual amount of milk, or replace milk with a fermented milk product, such as yoghurt.
  - assure full energy intake by giving 6 meals a day of thick cereal and added oil, mixed with vegetables, pulses, meat, or fish.
- Tell the mother to bring the child back after 5 days:
  - if diarrhoea has not stopped, refer to hospital.
  - if diarrhoea has stopped, tell the mother to:
    - use the same foods for the child’s regular diet.
    - after 1 more week, gradually resume the usual animal milk.
    - give an extra meal each day for at least 1 month.

### IF THE CHILD HAS SEVERE MALNUTRITION:

- Do not attempt rehydration; refer to hospital for management.
- Provide the mother with ORS solution and show her how to give 5 ml/kg/hr during the trip.

### IF THE CHILD IS UNDER 2 MONTHS OF AGE:

- Rehydrate as necessary. If there is fever (38°C or above) after rehydration, refer to hospital. Do not give paracetamol or an antimalarial.

### IF THE CHILD IS 2 MONTHS OF AGE OR OLDER:

- If temperature is 39°C or above, give paracetamol.
- If there is falciparum malaria in the area, and the child has any fever (38°C or above) or history of fever in the past 5 days, give an antimalarial (or manage according to your malaria programme recommendation).
TREATMENT PLAN A
TO TREAT DIARRHEA AT HOME

USE THIS PLAN TO TEACH THE MOTHER TO:

- Continue to treat at home her child's current episode of diarrhoea.
- Give early treatment for future episodes of diarrhoea.

EXPLAIN THE THREE RULES FOR TREATING DIARRHEA AT HOME:

1. GIVE THE CHILD MORE FLUIDS THAN USUAL TO PREVENT DEHYDRATION:
   - Use recommended home fluids. These include: ORS solution, food-based fluids (such as soup, rice water, and yoghurt drinks) and plain water. Use ORS solution for children described in the box below. (Note: If the child is under 6 months old and is not yet taking solid food, give ORS solution or water rather than a food-based fluid).
   - Give as much of these fluids as the child will take. Use the amounts shown below for ORS as a guide.
   - Continue giving these fluids until the diarrhoea stops.

2. GIVE THE CHILD PLENTY OF FOOD TO PREVENT MALNUTRITION:
   - Continue to breast-feed frequently.
   - If the child is 6 months or older, or already taking solid food:
     - Also give cereal or another starchy food mixed, if possible, with pulses, vegetables, and meat or fish. Add 1 or 2 teaspoonfuls of vegetable oil to each serving.
     - Give fresh fruit juice or mashed banana to provide potassium.
     - Give freshly prepared foods. Cook and mash or grind food well.
     - Encourage the child to eat; offer food at least 6 times a day.
     - Give the same foods after diarrhoea stops, and give an extra meal each day for two weeks.

3. TAKE THE CHILD TO THE HEALTH WORKER IF THE CHILD DOES NOT GET BETTER IN 3 DAYS OR DEVELOPS ANY OF THE FOLLOWING:
   - Many watery stools
   - Eating or drinking poorly
   - Repeated vomiting
   - Fever
   - Marked thirst
   - Blood in the stool
   - They have been on Treatment Plan B or C.
   - They cannot return to the health worker if the diarrhoea gets worse.
   - It is national policy to give ORS to all children who see a health worker for diarrhoea.

CHILDREN SHOULD BE GIVEN ORS SOLUTION AT HOME, IF:

- They have been on Treatment Plan B or C.
- They cannot return to the health worker if the diarrhoea gets worse.
- It is national policy to give ORS to all children who see a health worker for diarrhoea.

IF THE CHILD WILL BE GIVEN ORS SOLUTION AT HOME, SHOW THE MOTHER HOW MUCH ORS TO GIVE AFTER EACH LOOSE STOOL AND GIVE HER ENOUGH PACKETS FOR 2 DAYS:

<table>
<thead>
<tr>
<th>Age</th>
<th>Amount of ORS to give after each loose stool</th>
<th>Amount of ORS to provide for use at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 24 months</td>
<td>50-100 ml</td>
<td>500 ml/day</td>
</tr>
<tr>
<td>2 up to 10 years</td>
<td>100-200 ml</td>
<td>1000 ml/day</td>
</tr>
<tr>
<td>10 years or more</td>
<td>As much as wanted</td>
<td>2000 ml/day</td>
</tr>
</tbody>
</table>

- Describe and show the amount to be given after each stool using a local measure.

SHOW THE MOTHER HOW TO MIX ORS.
SHOW HER HOW TO GIVE ORS:

- Give a teaspoonful every 1-2 minutes for a child under 2 years.
- Give frequent sips from a cup for an older child.
- If the child vomits, wait 10 minutes. Then give the solution more slowly (for example, a spoonful every 2-3 minutes).
- If diarrhoea continues after the ORS packets are used up, tell the mother to give other fluids as described in the first rule above or return for more ORS.
TREATMENT PLAN B
TO TREAT DEHYDRATION

APPROXIMATE AMOUNT OF ORS SOLUTION TO GIVE IN THE FIRST 4 HOURS:

<table>
<thead>
<tr>
<th>Age: *</th>
<th>Less than 4 months</th>
<th>4 - 11 months</th>
<th>12 - 23 months</th>
<th>2 - 4 years</th>
<th>5 - 14 years</th>
<th>15 years or older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight:</td>
<td>Less than 5 kg</td>
<td>5 - 7.9 kg</td>
<td>8 - 10.9 kg</td>
<td>11 - 15.9 kg</td>
<td>16 - 29.9 kg</td>
<td>30 kg or more</td>
</tr>
<tr>
<td>In ml</td>
<td>200-400</td>
<td>400-600</td>
<td>600-800</td>
<td>800-1200</td>
<td>1200-2200</td>
<td>2200-4000</td>
</tr>
</tbody>
</table>

* Use the patient's age only when you do not know the weight. The approximate amount of ORS required (in ml) can also be calculated by multiplying the patient's weight (in kg) times 75.

- If the child wants more ORS than shown, give more.
- Encourage the mother to continue breast-feeding.
- For infants under 6 months who are not breast-fed, also give 100-200 ml clean water during this period.

OBSERVE THE CHILD CAREFULLY AND HELP THE MOTHER GIVE ORS SOLUTION:

- Show her how much solution to give her child.
- Show her how to give it - a teaspoonful every 1-2 minutes for a child under 2 years, frequent sips from a cup for an older child.
- Check from time to time to see if there are problems.
- If the child vomits, wait 10 minutes and then continue giving ORS, but more slowly, for example, a spoonful every 2-3 minutes.
- If the child's eyelids become puffy, stop ORS and give plain water or breast milk. Give ORS according to Plan A when the puffiness is gone.

AFTER 4 HOURS, REASSESS THE CHILD USING THE ASSESSMENT CHART. THEN SELECT PLAN A, B, OR C TO CONTINUE TREATMENT.

- If there are no signs of dehydration, shift to Plan A. When dehydration has been corrected, the child usually passes urine and may also be tired and fall asleep.
- If signs indicating some dehydration are still present, repeat Plan B, but start to offer food, milk and juice as described in Plan A.
- If signs indicating severe dehydration have appeared, shift to Plan C.

IF THE MOTHER MUST LEAVE BEFORE COMPLETING TREATMENT PLAN B:

- Show her how much ORS to give to finish the 4-hour treatment at home.
- Give her enough ORS packets to complete rehydration, and for 2 more days as shown in Plan A.
- Show her how to prepare ORS solution.
- Explain to her the three rules in Plan A for treating her child at home:
  - to give ORS or other fluids until diarrhoea stops
  - to feed the child
  - to bring the child back to the health worker, if necessary.
TREATMENT PLAN C
TO TREAT
SEVERE DEHYDRATION QUICKLY

FOLLOW THE ARROWS. IF ANSWER IS "YES", GO ACROSS. IF "NO", GO DOWN

START HERE

Can you give intravenous (IV) fluids immediately?

YES

- Start IV fluids immediately. If the patient can drink, give ORS by mouth while the drip is set up. Give 100 ml/kg Ringer's Lactate Solution (or, if not available, normal saline), divided as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>First give 30 ml/kg in:</th>
<th>Then give 70 ml/kg in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants (under 12 months)</td>
<td>1 hour *</td>
<td>5 hours</td>
</tr>
<tr>
<td>Older</td>
<td>30 minutes *</td>
<td>2 1/2 hours</td>
</tr>
</tbody>
</table>

* Repeat once if radial pulse is still very weak or not detectable.

- Reassess the patient every 1-2 hours. If hydration is not improving, give the IV drip more rapidly.
- Also give ORS (about 5 ml/kg/hour) as soon as the patient can drink: usually after 3-4 hours (infants) or 1-2 hours (older patients).
- After 6 hours (infants) or 3 hours (older patients), evaluate the patient using the assessment chart. Then choose the appropriate Plan (A, B or C) to continue treatment.

NO

Is IV treatment available nearby, (within 30 minutes)?

YES

- Send the patient immediately for IV treatment.
- If the patient can drink, provide the mother with ORS solution and show her how to give it during the trip.

NO

Are you trained to use a naso-gastric (NG) tube for rehydration?

YES

- Start rehydration by tube with ORS solution: Give 20 ml/kg/hour for 6 hours (total of 120 ml/kg).
- Reassess the patient every 1-2 hours:
  - If there is repeated vomiting or increasing abdominal distension, give the fluid more slowly.
  - If hydration is not improving after 3 hours, send the patient for IV therapy.
- After 6 hours, reassess the patient and choose the appropriate Treatment Plan.

NO

Can the patient drink?

YES

- Start rehydration by mouth with ORS solution, giving 20 ml/kg/hour for 6 hours (total of 120 ml/kg).
- Reassess the patient every 1-2 hours:
  - If there is repeated vomiting, give the fluid more slowly.
  - If hydration is not improving after 3 hours, send the patient for IV therapy.
- After 6 hours, reassess the patient and choose the appropriate Treatment Plan.

NO

URGENT: Send the patient for IV or NG treatment.

NOTES:
- If possible, observe the patient at least 6 hours after rehydration to be sure the mother can maintain hydration giving ORS solution by mouth.
- If the patient is above 2 years and there is cholera in your area, give an appropriate oral antibiotic after the patient is alert.
USE OF DRUGS FOR CHILDREN WITH DIARRHOEA

- **ANTIBIOTICS** should ONLY be used for dysentery and for suspected cholera cases with severe dehydration. Otherwise, they are ineffective and should NOT be given.

- **ANTIPARASITIC** drugs should ONLY be used for:
  - Amoebiasis, after antibiotic treatment of bloody diarrhoea for *Shigella* has failed or trophozoites of *E. histolytica* containing red blood cells are seen in the faeces.
  - Giardiasis, when diarrhoea has lasted at least 14 days and cysts or trophozoites of *Giardia* are seen in faeces or small bowel fluid.

- **ANTIDIARRHOEAL DRUGS** and **ANTIEMETICS** should NEVER be used. None has proven practical value. Some are dangerous.
ANNEX 2
How to treat diarrhoea at home
(mother’s card)

1. AS SOON AS DIARRHOEA STARTS, GIVE YOUR CHILD MORE FLUIDS THAN USUAL:
   GIVE:
   • ORS solution
   • Food-based fluids, such as soup, rice water and yoghurt drink
   • Plain water
   • If the child is under 6 months old and taking only breast milk, give only ORS solution or plain water, in addition to breast milk.
   GIVE AS MUCH OF THESE FLUIDS AS YOUR CHILD WANTS.

2. GIVE YOUR CHILD PLENTY OF FOOD
   • Breast-feed frequently.
   • If not breast-feeding, give the usual milk.
   • If your child is 6 months or older, or already taking solid food, also give:
     - cereal or another starchy food mixed with pulses, vegetables, meat or fish, and a little oil
     - fresh fruit juice or mashed banana
     - freshly prepared foods, cooked and mashed or ground well
     - frequent, small meals (at least 6 per day)
     - an extra meal each day for 2 weeks after diarrhoea stops.

3. TAKE YOUR CHILD TO THE HEALTH WORKER IF THE CHILD:
   • Does not get better in 3 days
   • Passes many watery stools
   • Vomits repeatedly
   • Is very thirsty
   • Eats or drinks poorly
   • Has a fever
   • Has blood in the stool.

DO NOT GIVE DRUGS FOR DIARRHOEA UNLESS RECOMMENDED BY A HEALTH WORKER

4. YOU CAN PREVENT DIARRHOEA BY:
   • Giving only breast milk for the first 4-6 months and continuing to breast-feed for at least 2 years
   • Starting foods listed in section 2 of this card at 4-6 months
   • Giving freshly prepared foods and clean drinking water
   • Giving milk and other fluids by cup and spoon instead of feeding bottle
   • Having all family members wash hands after passing stools and before preparing or eating food
   • Having all family members use a latrine
   • Putting a young child’s stools in a latrine or burying them
   • Having your child immunized against measles at the recommended age.
ANNEX 3
How to determine whether a child is malnourished by using arm circumference

The upper arm has a bone, muscles, and fat. When babies are about 1 year old, they have quite a lot of fat under the skin of their arms. When they are 5 years old, there is much less fat and more muscle. The distance around the upper arm remains almost the same between the ages of 1 and 5 years. If a child is malnourished, this distance is reduced, and the arm becomes thin. This is due to reduction in muscle and fat. By placing a special measuring strip around the upper arm you can find out whether a child between the ages of 1 and 5 years is malnourished or not.

This measuring strip is called a tri-coloured arm strip and looks like this:

A tricoloured arm strip

![Image of a tricoloured arm strip]

You can make a measuring strip from a string or strip of material that does not stretch. Take care that the markings are accurate.

To use this strip:

Put the strip around the mid upper arm of the child and see which colour is touched by the 0 cm mark on the strip.

- If the green part is touched, the child is well nourished.
- If the yellow part is touched, the child is moderately malnourished.
- If the red part is touched, the child is severely malnourished.

This method of measuring the arm is useful because the health worker can identify malnutrition in a child without using a scale or knowing the child’s age. However, since it only shows large changes in a child’s nutrition, it is not suitable for determining whether the child is improving or becoming worse.
ANNEX 4

What a health worker should do when packets of oral rehydration salts are not available

The health worker should understand the routine procedures for ordering ORS packets and the procedure for obtaining emergency supplies quickly.

If ORS packets are not available and it is necessary to prepare and dispense large quantities of an oral rehydration fluid, ingredients can be measured in bulk and mixed thoroughly in an appropriate volume of drinking-water. The cleanest available drinking-water should be used. Boiled water, cooled before use, or chlorinated water is best. However, the prepared fluid should not be kept for more than 24 hours and should not be dispensed in quantities exceeding the 24-hour volume requirement.

The following table shows how to make an oral rehydration fluid in large quantities; the example given is 5 litres.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount required for 1 litre of oral rehydration fluid</th>
<th>Amount required for 5 litres of oral rehydration fluid</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>1 litre</td>
<td>1 litre (\times 5 = 5) litres</td>
<td>Use the cleanest available drinking-water. Boiled water, cooled before use, or chlorinated water is best</td>
</tr>
<tr>
<td>Sodium chloride (common salt)</td>
<td>3.5 g</td>
<td>3.5 g (\times 5 = 17.5) g</td>
<td>This must be used to make the solution</td>
</tr>
<tr>
<td>Glucose or sucrose (common sugar)</td>
<td>20 g or 40 g</td>
<td>20 g (\times 5 = 100) g or 40 g (\times 5 = 200) g</td>
<td>This must be used to make the solution</td>
</tr>
<tr>
<td>Trisodium citrate dihydrate, or sodium bicarbonate</td>
<td>2.9 g or 2.5 g</td>
<td>2.9 g (\times 5 = 14.5) g or 2.5 g (\times 5 = 12.5) g</td>
<td>The solution can be made without this, but it is better to have it</td>
</tr>
<tr>
<td>Potassium chloride</td>
<td>1.5 g</td>
<td>1.5 g (\times 5 = 7.5) g</td>
<td>The solution can be made without this, but it is better to have it. Do not add potassium chloride if accurate scales are not available</td>
</tr>
</tbody>
</table>

1If larger volumes of the fluid are prepared, the amount of each ingredient should be increased proportionally.

The ingredients should be measured accurately using scales (which may be available in a local pharmacy). This is especially important in measuring potassium chloride: errors in potassium measurements are dangerous.
If accurate scales are not available, the fluid should be prepared without potassium chloride. In this case, and if the child is already taking solid food, the mother should be advised to give fruit juice or mashed banana to provide potassium.

*Do not mix the salts and sugar in dry form* without adding the appropriate amounts of water when they are measured in bulk. You cannot ensure the uniformity of mixing of dry ingredients, and this could be dangerous.
ANNEX 5
Intravenous therapy for severe dehydration

Administration of intravenous fluids
The technique for administering intravenous fluids can be taught only by practical demonstration and only by someone with experience. Intravenous therapy should be given only by trained persons. Several general points are made here.

The needles, tubing, bottles, and fluid used for intravenous therapy must be sterile.

Intravenous therapy can be given using any convenient vein. The most accessible veins are generally those in front of the elbow, on the back of the hand, or, in infants, on the side of the scalp.

Using a neck vein or making an incision to locate a vein is rarely necessary and should be avoided if possible.

In patients requiring rapid resuscitation, the femoral vein may be used if the health worker is trained in this technique. In this case, the needle must be held firmly in place and removed as soon as possible. In some cases of severe dehydration, particularly in adults, infusion into two veins may be necessary; one infusion line can be removed once rehydration is well in progress.

It is useful to mark intravenous fluid bottles at various levels to show the time it should take for the fluid to fall to each level. This allows easier monitoring of the rate of administration.

Solutions for intravenous infusion
Although a number of intravenous solutions are available, they all lack some of the electrolytes in the concentration needed by severely dehydrated patients. To ensure adequate electrolyte replacement, some ORS solution should be given as soon as the patient is able to drink, even while intravenous therapy is being given. The relative suitability of several intravenous solutions is described briefly below.

Preferred solution
Ringer’s lactate solution. This is also called Hartmann’s solution for injection. It is the best commercially available solution. It supplies an adequate concentration of sodium, and sufficient lactate, which is metabolized to bicarbonate for correction of acidosis (a condition resulting from a relative excess of acid in the blood, primarily due to loss of alkali in the stool). The solution can be used for patients in all age groups to treat
dehydration due to acute diarrhoea of any cause. Early provision of ORS solution and early resumption of feeding will provide the required amounts of potassium and glucose.

**Acceptable solutions**

Use of any of the following solutions should be supplemented by ORS solution given by mouth as soon as the patient can drink. The ORS solution will provide the potassium, bicarbonate, and sodium that may be lacking in the intravenous solutions.

*Normal saline.* This solution is also called *isotonic or physiological saline,* and is often readily available. It will not correct acidosis and will not replace potassium losses. Sodium bicarbonate or sodium lactate and potassium chloride can be added to the solution, but quantities must be carefully calculated and the solutions must be sterile.

*Half-strength Darrow's solution.* This solution is also called *lactated potassic saline.* It contains less sodium chloride than is needed for efficient correction of the sodium deficit in severe dehydration.

*Half-normal saline in 5% dextrose.* Like normal saline, this solution will not correct acidosis or replace potassium losses. It also contains less sodium chloride than is needed for efficient correction of the sodium deficit in severe dehydration.

**Unsuitable solutions**

*Plain glucose or dextrose solution.* These solutions should not be used as they provide only water and sugar. They do not contain electrolytes and thus do not correct the electrolyte deficits or acidosis.

**Intravenous therapy for severe dehydration**

The purpose of intravenous therapy is to give the patient a large quantity of fluid quickly to overcome the serious fluid loss that has caused severe dehydration.

Intravenous therapy should be started quickly, giving the quantities specified on the diarrhoea management chart. If the patient can drink, ORS solution should be given by mouth until the drip is running. The first portion of the intravenous fluid (30 ml/kg) is given very rapidly (within 60 minutes for infants under 12 months, within 30 minutes for older children and adults) to restore the blood volume and prevent death from shock. The rest of the fluid (70 ml/kg) is given more slowly to complete rehydration within 3 hours (6 hours for infants).

During the course of intravenous therapy, the patient’s progress should be assessed every 1–2 hours to determine whether the rate of administration is satisfactory or needs to be increased.
MANAGEMENT AND PREVENTION OF DIARRHOEA

Particular attention should be paid to:

- the number and volume of stools passed
- the extent of vomiting
- the presence of, and changes in, signs of dehydration
- whether the rehydration fluid is being successfully given, and in adequate amounts.

If the signs of dehydration and the diarrhoea and vomiting become worse, or remain unchanged, the rate of administration and the amount of fluid given should be increased.
ANNEX 6

Appropriate use of drugs for cholera, dysentery and parasitic diarrhoea

Antibiotic treatment of cholera and dysentery

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oral antibiotic</th>
<th>Recommended dose</th>
<th>Estimated single dose (in tablets, capsules, or ml of syrup), according to body weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Children</td>
<td>Adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3–5 kg</td>
<td>6–9 kg</td>
</tr>
<tr>
<td>Severe cholera²</td>
<td>Doxycycline³</td>
<td>Tablet or capsule, 300 mg</td>
<td>Not suitable for children under 12 years</td>
</tr>
<tr>
<td></td>
<td>Tetracycline</td>
<td>Tablet or capsule, 250 mg</td>
<td>12.5 mg/kg 4 times a day for 3 days</td>
</tr>
</tbody>
</table>
### Antibiotic treatment of cholera and dysentery (continued)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oral antibiotic</th>
<th>Recommended dose</th>
<th>Estimated single dose (in tablets, capsules, or ml of syrup), according to body weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Children</td>
</tr>
<tr>
<td>Severe cholera²</td>
<td>**Trimethoprim—sulfamethoxazole (TMP–SMX)**¹</td>
<td></td>
<td>3–5 kg</td>
</tr>
<tr>
<td></td>
<td>Adult tablet</td>
<td></td>
<td>TMP 5 mg/kg and SMX 25 mg/kg twice a day for 3 days</td>
</tr>
<tr>
<td></td>
<td>TMP 80 mg and SMX 400 mg</td>
<td></td>
<td>TMP 160 mg and SMX 800 mg twice a day for 3 days</td>
</tr>
<tr>
<td></td>
<td>Paediatric tablet, TMP 20 mg and SMX 100 mg</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Syrup, TMP 40 mg and SMX 200 mg in 5 ml</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>Disease</td>
<td>Oral antibiotic</td>
<td>Recommended dose</td>
<td>Estimated single dose (in tablets, capsules, or ml of syrup), according to body weight in kg</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------</td>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Children</td>
<td>Adults</td>
</tr>
</tbody>
</table>
| Severe cholera²      | **Furazolidone**³,
Tablet, 100 mg | 1.25 mg/kg      | 100 mg                                                   | —       | —       | 1/4 | 1/4 | 1/2 | 1       |
|                      |                 | 4 times a day   | 4 times a day                                           |         |         | tablet | tablet | tablet |
|                      |                 | for 3 days      | for 3 days                                              |         |         |        |        |        |
| Dysentery⁷           | **Trimethoprim–
Sulfamethoxazole**
(TMP–SMX) | Adult tablet, TMP 5 mg/kg and SMX 25 mg/kg twice a day for 5 days | TMP 160 mg and SMX 800 mg twice a day for 5 days | 1/4 tablet | 1/2 tablet | 1 | 1 | 2 | 2 |
|                      |                  | Paediatric tablet, TMP 5 mg/kg and SMX 25 mg/kg twice a day for 5 days | — | 1 | 2 | 3 | 4 | 6 | — |
|                      |                  | Syrup, TMP 5 mg/kg and SMX 25 mg/kg twice a day for 5 days | — | 2.5 | 5 | 7.5 | 10 | 15 | — |
### Antibiotic treatment of cholera and dysentery (continued)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oral antibiotic</th>
<th>Recommended dose</th>
<th>Estimated single dose (in tablets, capsules, or ml of syrup), according to body weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Children</td>
<td>Adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3–5 kg</td>
<td>6–9 kg</td>
</tr>
<tr>
<td>Dysentery</td>
<td>Nalidixic acid</td>
<td>Tablet, 250 mg</td>
<td>15 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 times a day</td>
<td>4 times a day</td>
</tr>
<tr>
<td></td>
<td>Ampicillin</td>
<td>Tablet or capsule, 250 mg</td>
<td>25 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 times a day</td>
<td>4 times a day</td>
</tr>
</tbody>
</table>

1. Selection of an antimicrobial should be based on sensitivity patterns of strains of *Vibrio cholerae* O1 and *Shigella* isolated in the area.
2. Antibiotics are recommended for patients older than 2 years with suspected cholera and severe dehydration.
3. Doxycycline is the antimicrobial of choice for adults because only one dose is required. (See footnote 5 for treatment of pregnant women.)
4. Trimethoprim + sulfamethoxazole (also named co-trimoxazole) is the antimicrobial of choice for children. Tetracycline is equally effective; however, it is not recommended for paediatric use in some countries.
5. Furazolidone is the antimicrobial of choice for pregnant women.
6. Other choices include erythromycin and chloramphenicol.
7. *Shigella* is the most important cause of dysentery in young children. An antimicrobial to which most *Shigella* in the area are sensitive should be selected. If the stool is still bloody after two days, the antimicrobial should be stopped and a different one used. In many areas, trimethoprim–sulfamethoxazole is the drug of choice and nalidixic acid is an alternative. Resistance to ampicillin is frequent.
Antimicrobial treatment of parasitic diarrhoea

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oral antimicrobial</th>
<th>Recommended dose</th>
<th>Estimated single dose (in tablets, capsules, or ml of syrup), according to body weight in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Children</td>
<td>Adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Children</td>
<td>Adults</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3–5 kg</td>
<td>6–9 kg</td>
</tr>
<tr>
<td>Amoebic dysentery¹</td>
<td>Metronidazole</td>
<td>10 mg/kg</td>
<td>750 mg</td>
</tr>
<tr>
<td></td>
<td>Tablet, 250 mg</td>
<td>3 times a day</td>
<td>3 times a day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10 days for severe disease)</td>
<td>(10 days for severe disease)</td>
</tr>
<tr>
<td>Giardiasis²</td>
<td>Metronidazole</td>
<td>5 mg/kg</td>
<td>250 mg</td>
</tr>
<tr>
<td></td>
<td>Tablet, 250 mg</td>
<td>3 times a day</td>
<td>3 times a day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10 days)</td>
<td>(10 days)</td>
</tr>
</tbody>
</table>

¹ Amoebiasis is an unusual cause of dysentery in young children. Metronidazole should be given only when trophozoites of Entamoeba histolytica containing red blood cells are seen in the faeces or when bloody stools persist after consecutive treatment with two antimicrobials (each given for two days) that are usually effective for Shigella in the area.

² Treatment for giardiasis should be given only when diarrhoea is persistent (lasting at least 14 days) and cysts or trophozoites of Giardia are seen in faeces or small bowel fluid. Tinidazole and ornidazole are also effective. Tinidazole is given in a single dose of 50 mg/kg, with a maximum dose of 2 g. Ornidazole should be used according to the manufacturer’s instructions.
In order to prevent and manage acute diarrhoea, a health worker should be able to:

- define diarrhoea in a way that is appropriate to his or her work setting
- distinguish between acute and persistent diarrhoea
- explain why diarrhoea is dangerous
- explain how diarrhoea causes dehydration
- describe the most important parts of the treatment of diarrhoea and dysentery
- explain to family members the three rules for home treatment of diarrhoea; these are—to give the child more fluids than usual, to give plenty of food, and to take the child to the health worker if he or she is not getting better
- look and feel for signs of dehydration
- select the appropriate treatment plan using the chart Assess your patient for dehydration
- check for problems other than dehydration (for example, dysentery, persistent diarrhoea, severe malnutrition)
- demonstrate how to prepare ORS solution correctly
- give oral rehydration therapy to dehydrated children
- give intravenous rehydration therapy to children with severe dehydration or refer them for this treatment
- teach mothers how to continue treatment at home
- keep appropriate records of treatment given
- give appropriate treatment or refer for dysentery, persistent diarrhoea, severe malnutrition, and fever
- describe what families can do to prevent diarrhoea, including breast-feeding, improved weaning practices, the use of plenty of water for hygiene and clean water for drinking, hand-washing, the use of latrines, proper disposal of the stools of young children, and immunization against measles
- list several things that health workers can do to support preventive practices.