MODULE-7

INTEGRATED MANAGEMENT OF NEONATAL AND CHILDHOOD ILLNESS

Treat the Child

CONTENTS

INTRODUCTION

In the previous module you learnt to identify treatment for the sick child age 2 months up to 5 years. Sick children often begin treatment at a clinic and need to continue treatment at home. The chart *TREAT THE CHILD* describes the treatments.

In this module you will learn to identify the appropriate treatments and use the *TREAT THE CHILD* chart to learn ***how to give*** each treatment. You will also learn ***how to teach the mother*** to continue giving treatment at home.

LEARNING OBJECTIVES

This module will describe and allow you to practice the following skills:

* Treating a sick child with oral drugs at home
* Treating local infections at home
* Giving drugs administered in the clinic only (intramuscular injections of chloramphenicol and quinine)
* Treating different classifications of dehydration, and teaching the mother about extra fluid to give at home
* Immunizing children
* Treating a sick child with a severe classification where referral is not possible.

1.0 TREAT A SICK CHILD WITH ORAL DRUGS AT HOME

In the previous module *IDENTIFY TREATMENT FOR THE SICK CHILD 2 MONTHS UP TO 5 YEARS,* you learnt the classifications for which an appropriate oral antibiotic, paracetamol, zinc, vitamin A, iron and folic acid therapy and an oral antimalarial should be given. Use the *TREAT THE CHILD* chart or your chart booklet (pages 18 and 19) to select the appropriate drug, and to determine the dose and schedule. Read these instructions for giving oral drugs at home on page 18 and 19 of the chart booklet now.

Give an oral drug only if the child is able to drink. There are some points to remember about some oral drugs:

1.1 GIVE AN ORAL ANTIBIOTIC

Give the "first-line" oral antibiotic if it is available. You should give the "second-line" antibiotic only if the first-line antibiotic is not available, or if the child's illness does not respond to the first-line antibiotic.

Some children have more than one illness that requires antibiotic treatment. Whenever possible, select one antibiotic that can treat all of the child's illnesses.

* ***Sometimes one antibiotic can be given to treat the illness(es).***

  For example, a child with PNEUMONIA and ACUTE EAR INFECTION can be treated with a single antibiotic. When treating a child with more than one illness requiring the same antibiotic, do ***not*** double the size of each dose or give the antibiotic for a longer period of time.

* ***Sometimes more than one antibiotic must be given to treat the illness(es).***

  For example, the antibiotics used to treat PNEUMONIA may not be effective against CHOLERA. In this situation, a child who needs treatment for CHOLERA ***and*** PNEUMONIA must be treated with two antibiotics.

1.2 GIVE ORAL ZINC SUPPLEMENTS

Zinc is an important micronutrient for a child's overall health and development. Zinc is lost in greater quantities during diarrhoea. Replacing the lost zinc is important to help the child recover and to keep the child healthy in the coming months.
Zinc supplement is a part of treatment of a child with diarrhoea. Give zinc supplements to the child with diarrhoea for 14 days. A child upto 6 months of age needs ½ tablet (20 mg

tablet) per day for 14 days while children 6 months or more need 1 tablet per day for 14 days. Explain and teach the mother how to give the zinc supplements to the child.

PREPARATION OF ZINC

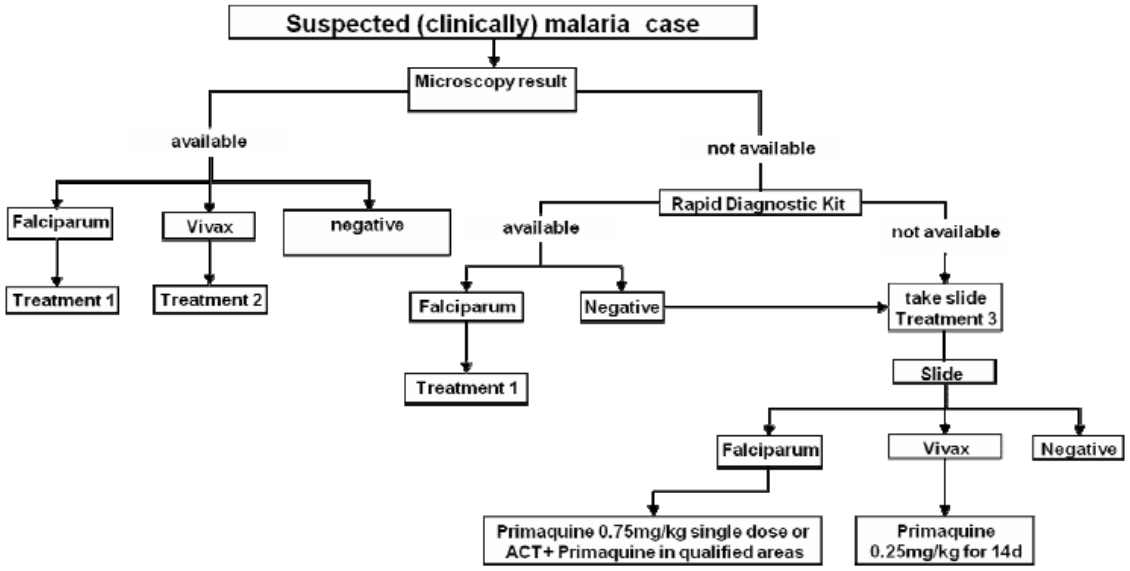
- Take a clean spoon, place 1 tablet (child ≥6 months) on the spoon.
- Pour water carefully on the tablet taking care that the water does not reach the brim. Never dip the spoon with tablet into the water container.
- If the child is <6 months and breastfed, tell mother to express milk first in the spoon and then add ½ tablet, discard the other ½. Be careful, while breaking the tablet into half, put pressure with your thumb on the groove in the tablet. If two halves are not equal, break off the extra bit from the larger half. Discard the remaining half.
- Shake the spoon slowly till the tablet dissolves completely. Take care that the solution does not overflow. Do not use fingertip or any other material to dissolve the tablet. Tell the mother to hold the child comfortably and ask her to feed the solution to the child.
- If there is any powder remaining in the spoon, let the child lick it or add little more water or breast milk to dissolve it and then ask the mother to give it again.

1.3 GIVE AN ORAL ANTIMALARIAL

- Treatment of malaria is guided by the malaria.risk area. Smear should be made in all cases presenting with fever in high risk area.Rapid Diagnostic Test (RDT) for *P . falciparum* is also available in high risk areas which should be done to get quick report .
- **Treatment of P. falciparum (Pf) cases**
  a) in high risk areas: ACT (Artesunate + Sulpha Pyrimethamine) combination is recommended as first line of treatment.
  b) in low risk areas chloroquine in therapeutic dose of 25 mg/kg body weight divided over three days. Also give single dose of Primaquine 0.75 mg/kg to children above one year of age on first day.
- **Treatment of P. vivax (Pv) cases**

  Microscopically positive P. vivax (Pv) cases should be treated with chloriquine in therapeutic dose of 25 mg/kg body weight divided over three days. Primaquine should be given in dose of 0.25 mg/kg body weight daily for 14 days. Primaquine is contraindicated in children <1 year and in children with severe anemia.
- If both microscopy and RDT are negative, or not available, cases having fever without any other obvious cause should be considered as 'clinical malaria' and treated with chloroquine in dose of 25 mg/kg body weight over three days

Flow chart for the treatment of an uncomplicated malaria case (2008)



Treatment 1 **Chloroquine + Primaquine** (25mg/kg over 3 days + 0.75mg/kg single dose)
or
Artesunate + Sulpha Pyrimethamine + Primaquine (in areas qualified for ACT)
4 mg/kg for 3 days + 25/1.25mg/kg single dose + 0.75mg/kg single dose

Treatment 2 **Chloroquine + Primaquine** (25mg/kg over 3 days + 0.25mg/kg for 14 days)

Treatment 3 **Chloroquine** (25mg/kg over 3 days)

Note: Primaquine is contraindicated in pregnant women, G6PD deficiency, and infants, ACT is contraindicated in pregnant women

*** For clinically suspected malaria cases, signs and symptoms may be reffered**

1.4 GIVE PARACETAMOL FOR HIGH FEVER (≥38.5°C) OR EAR PAIN

Paracetamol lowers a fever and reduces pain. If a child has high fever, give one dose of paracetamol in clinic. If the child has ear pain, give the mother enough paracetamol for 1 day, that is, 4 doses. Tell her to give one dose every 6 hours or until the ear pain is gone.

1.5 GIVE VITAMIN A

Vitamin A is a part of treatment of a child with PERSISTENT DIARRHOEA, MEASLES or SEVERE MALNUTRITION. Give Vitamin A to the child in the clinic. In children with MEASLES give 2 doses. Give the second dose to the mother to give her child the next day at home. Check if the child has received vitamin A in the last 30 days. Do not give vitamin A if the child has received it in the last 30 days.

Record the date each time you give vitamin A to a child. This is important. If you give repeated doses of vitamin A in a short period of time, there is danger of an overdose.

1.6 GIVE IRON & FOLIC ACID THERAPY

Give syrup to the child under 12 months of age. If the child is 12 months or older, give iron tablets. Give the mother enough iron for 14 days and ask her to return in 14 days. Also tell her that the iron may make the child's stools black.

Tell the mother to keep the iron out of reach of the child. An overdose of iron can be fatal or make the child very ill.

If a child with some pallor has another infection do ***not*** give iron-folate till the child has improved. If a child with some pallor is receiving the antimalarial sulfadoxine-pyrimethamine, do ***not*** give iron-folate tablets until a follow-up visit in 2 weeks. The folate in the IFA formulation may interfere with the action of the sulfadoxine-pyrimethamine, which contains anti-folate drugs.

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EXERCISE A

Part I

In this exercise you will practice using the *TREAT THE CHILD* chart to determine the appropriate oral drug, and the correct dose and schedule. Refer to your *TREAT THE CHILD* chart. Assume that this is the first time each child is being treated for the illness, unless otherwise indicated. Record your answer in the space provided.

1. A 2-year-old (11 kg) child needs an antibiotic for PNEUMONIA and ACUTE EAR INFECTION.

2. A 4-month-old needs an antibiotic for an ACUTE EAR INFECTION and an oral antimalarial for MALARIA. The malaria risk the area is high. Smear and RDT is negative

3. A 2 ½ year old 12-kg-child needs an oral antimalarial for MALARIA and paracetamol for high fever. The malaria risk the area is high. RDT and smear is positive for *plasmodium falciparum.*

4. A 9-month-old needs vitamin A for MEASLES.

5. A 2-year-old child (11 kg) has ANAEMIA and needs iron.

6. A one year old (7 kg) child needs zinc for persistent diarrhoea.

Part II. ROLE PLAY

You have learnt how to teach the mother to give oral drugs at home in the *TREAT THE YOUNG INFANT AND COUNSEL THE MOTHER* module. Now you will participate in a role play that teaches mothers to give oral drugs at home.

THE SITUATION -- What has happened so far:

Dasar, an 8-month-old (5 kg) boy, lives in a region where the risk of malaria is high. His mother brought him to the clinic because he has fever. The fever has been present for 4 days.

A doctor finds that Dasar has no general danger signs, no cough, no diarrhoea and no ear problem. He has a fever of 38^{o}C, with no stiff neck, no runny nose or measles. He is very low weight for age and has some palmar pallor. The doctor classifies Dasar as MALARIA and VERY LOW WEIGHT and ANAEMIA. RDT is negative for pf and smear is positive for *plasmodium vivax.*

To treat the MALARIA, the doctor decides to give chloroquine syrup.
He notes that Dasar should be given 7.5 ml on the first two days, and 5.0 ml on the third day.

To treat the ANAEMIA, the doctor notes that Dasar needs ¼ tsp of iron syrup.

(NOTE: The doctor should advise Dasar's mother about feeding, but that is not included in this role play. You will learn how to give feeding advice in the next module *Counsel the Mother*.)

DOCTOR:
To start the role play, tell the mother that Dasar needs chloroquine. Teach the mother how to give the oral drugs at home. Give the mother all necessary information, show her how to give the drugs, and observe her giving the first dose of the drugs to her child. Then advise the mother when to return to the clinic immediately and when to return for follow-up care. Check the mother's understanding.

MOTHER:
Listen carefully to the instructions that the doctor gives you. Ask questions if you do not understand the instructions. Answer any questions you are asked by the doctor.

OBSERVERS:
Watch the role play. Do not interfere. Read the following questions and answer them as you watch.

a. Does the doctor ***give information*** to the mother about why the oral drugs are important, and how/when to give them?

b. Does the doctor ***show*** the mother ***examples*** of how to measure a dose of each drug?

c. Does the doctor observe the mother:
practice measuring a dose of each drug, and
practice giving the drug to her child?

d. Does the doctor correctly label and package the drugs?

e. Does the doctor tell the mother when to return immediately?
Does the doctor tell her when to return for follow-up care?

f. Does the doctor check the mother's understanding?
What checking questions does the doctor ask? What other checking questions would you ask?

After the role play, discuss the above questions and your answers with the other participants and facilitator.

2.0 TEACH THE MOTHER TO TREAT LOCAL INFECTIONS AT HOME

Local infections include eye and ear infections, mouth ulcers and cough and cold. You have already learnt how to treat ear infections and mouth ulcers in the *TREAT THE YOUNG INFANT AND COUNSEL THE MOTHER MODULE*.

2.1 SOOTHE THE THROAT, RELIEVE THE COUGH WITH A SAFE REMEDY (Refer to page 20 of your chart booklet)

To soothe the throat or relieve a cough, use a safe remedy. Such remedies can be home made, given at the clinic, or bought at a pharmacy. It is important that they are ***safe***. Home made remedies are as effective as those bought in a store.

Your *TREAT THE CHILD* chart recommends safe, soothing remedies for children with a sore throat or cough. If the child is exclusively breastfed, do ***not*** give other drinks or remedies. Breastmilk is the best soothing remedy for an exclusively breastfed child.

Harmful remedies may be used in your area. Never use remedies that contain harmful ingredients, such as atropine, codeine or codeine derivatives, or alcohol. These items may sedate the child. They may interfere with the child's feeding. They may also interfere with the child's ability to cough up secretions from the lungs. Medicated nose drops (that is, nose drops that contain anything other than salt) should also not be used.

When explaining how to give the safe remedy, it is not necessary to watch the mother practice giving the remedy to the child. Exact dosing is not important with this treatment.

2.2 TREAT EYE INFECTION WITH TETRACYCLINE EYE OINTMENT (Refer to page 20 of your chart booklet)

If the child will be referred, clean the eye gently. Pull down the lower lid. Squirt the first dose of tetracycline eye ointment onto the lower eyelid. The dose is about the size of a grain of rice.

If the child is not being referred, teach the mother to apply the tetracycline eye ointment. Give the mother the following **information**. Tell her that she should treat both eyes to prevent damage to the eyes. Tell her also that the ointment will slightly sting the child's eye.

Tell the mother to:

* Wash her hands before and after treating the eye.

* Clean the child's eyes immediately before applying the tetracycline eye ointment. Use a clean cloth to wipe the eye.

* Repeat the process (cleaning the eye and applying ointment) 3 times per day, in the morning, at mid-day and in the evening.

Then **show the mother** how to treat the eye. Be sure to wash your hands.

* Hold down the lower lid of your eye. Point to the lower lid. Tell the mother that this is where she should apply the ointment. Tell her to be careful that the tube does not touch the eye or lid.

* Have someone hold the child still.

* Wipe one of the child's eyes with the cloth. Squirt the ointment onto the lower lid. Make sure the mother sees where to apply the ointment and the amount (the size of a grain of rice).

Ask the mother to **practice** cleaning and applying the eye ointment into the child's other eye. Observe and give feedback as she practices. When she has finished, give her the following additional information.

* **Treat both eyes until the redness is gone from the infected eye.** The infected eye is improving if there is less pus in the eye or the eyes are not stuck shut in the morning.

* Do ***not*** put any other eye ointments, drops or alternative treatments in the child's eyes. They may be harmful and damage the child's eyes. Putting harmful substances in the eye may cause blindness.

* After 2 days, if there is still pus in the eye, bring the child back to the clinic.

Then give the mother the tube of ointment to take home. Give her the same tube you used to treat the child in the clinic.

Before the mother leaves, ask **checking questions**. Check that she understands how to treat the eye. For example, ask:

"Will you treat one or both eyes?"

"How much ointment you will put in the eyes? Show me."

"How often will you treat the eyes?"

"When will you wash your hands?"

DETERMINE PRIORITY OF ADVICE

When a child has only one problem to be treated, give all of the relevant treatment instructions and advice listed on the charts. When a child has several problems, the instructions to mothers can be quite complex. In this case, you will have to limit the instructions to what is most important. You will have to determine:

- How much can **this** mother understand and remember?
- Is she likely to come back for follow-up treatment? If so, some advice can wait until then.
- What advice is most important to get the child well?

If a mother seems confused or you think that she will not be able to learn or remember all the treatment instructions, select only those instructions that are most essential for the child's survival. Essential treatments include giving antibiotic or antimalarial drugs ***and*** giving fluids to a child with diarrhoea. Teach the few treatments well and check that the mother remembers them.

If necessary, omit or delay the following:

- Feeding assessment and feeding counselling
- Soothing remedy for cough or cold
- Paracetamol*
- Second dose of vitamin A*
- Iron treatment
- Zinc treatment
- Wicking an ear

You can give the other treatment instructions when the mother returns for the follow-up visit.

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*Give the first dose of paracetamol or vitamin A. Do ***not*** dispense the other doses. Do ***not*** overwhelm the mother with instruction for later doses.

EXERCISE B

In this exercise you will answer questions about how to teach a mother to treat local infections at home. You will also practice determining priority of advice.

PART 1: Teaching a mother to treat local infections at home.

1. Treat An Eye Infection

   a. What would you tell a mother about why it is important to treat an eye infection?

   b. What major step of how to teach a mother to treat an eye infection is missing from the list below?

      * Explain how and why to treat the eye.
      * Demonstrate how to clean the eye and apply tetracycline eye ointment.
      * Tell her how often and for how many days to treat the eye and tell her to not put anything else in the child's eye.
      * Give her one tube of eye ointment.
      * Ask checking questions to make sure she understands the instructions.

   c. Change these questions into checking questions.

      1. Do you know how to treat your child's eye?

      2. Can you hold your child still while you apply the ointment?

2. Soothe the Throat, Relieve the Cough with a Safe Remedy

   a. What is meant by a "safe" remedy? Give an example.

   b. Give at least 2 examples of remedies that are not safe.

   c. When should a child classified as NO PNEUMONIA: COUGH OR COLD return immediately for treatment?

When you have finished Part 1, discuss your answers with a facilitator.

PART 2: Practice determining priority of advice.

The facilitator will read aloud a case description for a child named Mela.

1. Listen to the case description of Mela. Write the findings of Mela's assessment and classification on the recording form on the next page.

2. Identify all of Mela's treatments. List the treatments on the recording form.

3. The facilitator will continue reading the case description.

4. Review your list of treatments, instructions and advice that Mela needs. Which ones are the most important for the doctor to teach the grandmother?

5. Which treatments, instructions or advice could be omitted or delayed if the grandmother is clearly overwhelmed?

3.0 GIVE THESE TREATMENTS IN THE CLINIC ONLY

You have already learnt how to treat an infant to prevent low blood sugar in the *TREAT THE YOUNG INFANT AND COUNSEL THE MOTHER MODULE*. Use the same instructions to treat a child to prevent low blood sugar.

3.1 GIVE AN INTRAMUSCULAR ANTIBIOTIC (Refer to page 17 of your chart booklet)

A child may need an antibiotic before he leaves for the hospital. If a child has:
a general danger sign, SEVERE PNEUMONIA OR VERY SEVERE DISEASE, VERY SEVERE FEBRILE DISEASE and MASTOIDITIS. Give this child a single dose of chloramphenicol by intramuscular injection. Then refer the child urgently to the hospital.

3.2 GIVE INTRAMUSCULAR QUININE FOR SEVERE MALARIA (Refer to page 17 of your chart booklet)

A child with VERY SEVERE FEBRILE DISEASE may have severe malaria. To kill malaria parasites as quickly as possible, give a quinine injection before referral. Quinine is the preferred antimalarial because it is effective in most areas of the world and it acts rapidly. Intramuscular quinine is also safer than intramuscular chloroquine.

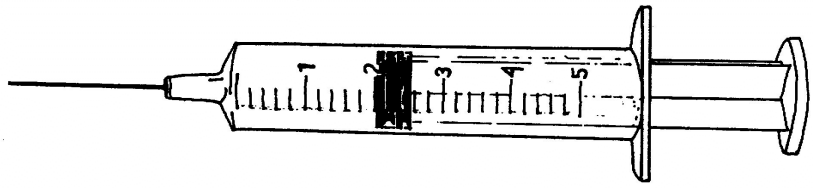
Possible side effects of a quinine injection are a sudden drop in blood pressure, dizziness, ringing of the ears, and a sterile abscess. If a child's blood pressure drops suddenly, the effect stops after 15-20 minutes. Dizziness, ringing of the ears and abscess are of minor importance in the treatment of a very severe disease.

PROCEDURES FOR GIVING CHLORAMPHENICOL AND QUININE INJECTIONS

Follow these steps when giving a quinine or chloramphenicol injection if *you are skilled* to give an intramuscular injection. If not, *ask someone who is skilled* to give the injection. (Later someone can teach you how to give the injections.)

1. Use the *TREAT THE CHILD* chart to determine the appropriate dose. Check which concentration is available in your clinic. Make sure you read the chart correctly for the concentration you are using.
2. CHLORAMPHENICOL: Mix the chloramphenicol. Chloramphenicol is usually packaged as a powder in a 1000 mg rubber-topped vial. Add 5 ml of sterile water to the vial of chloramphenicol. Shake the vial until the mixture is clear.
   QUININE: No mixing is needed.

3. Use a sterile needle and syringe to give the injection. For *Chloramphenicol injections* use the common type of syringe. Measure the dose accurately.



For *Quinine injections, u*se a syringe with fine gradations such as a tuberculin syringe. Measure the dose accurately.

4. Make sure the child is lying down, especially if you are giving a quinine injection. Quinine may cause a sudden drop in blood pressure.
5. Give the drug as a deep intramuscular injection in the front of the child's thigh, ***not*** in the buttock. NEVER give quinine as a rapid intravenous injection. This is extremely dangerous. In some hospitals, quinine may be given in a slow IV infusion over 4-8 hours with special monitoring. Intramuscular quinine is more appropriate and safer than intravenous infusion in clinics and in many hospitals.
6. Refer the child urgently. The child should be carried. Keep the child lying down for one hour after a quinine injection.

EXERCISE C

In this exercise you will determine correct doses of drugs.

Practice determining correct doses

1. What dose would you give the following children?

Child's Weight	If Chloramphenicol is needed (180 mg/ml)	If Quinine is needed (150 mg/ml)
5 kg	_____	_____
7 kg	_____	_____
13 kg	_____	_____
18 kg	_____	_____

2. What are the possible side effects of a quinine injection?

3. Sunil, a 12-month-old (10 kg) boy, was brought to the clinic this morning because he has had fever for 2 days and has been sleeping since yesterday.

   A doctor assessed Sunil and found that he is unconscious. He classified Sunil as VERY SEVERE FEBRILE DISEASE, NOT VERY LOW WEIGHT and NO ANAEMIA.

   The doctor will give Sunil an intramuscular antibiotic and quinine. He will also give him sugar water by nasogastric tube to prevent low blood sugar. Then the doctor will refer Sunil urgently to the nearest hospital.

   Specify the dose of each treatment that Sunil will receive.

   Chloramphenicol: _____

   Quinine: _____

   Sugar water by NG tube: _____

When you have finished, discuss your answers with the other members of your

group.

4.0 GIVE EXTRA FLUID, ZINC SUPPLEMENTS FOR DIARRHOEA AND CONTINUE FEEDING

You have learned to assess a child with diarrhoea, classify dehydration and select one of the following treatment plans:

Plan A - Treat Diarrhoea at Home
Plan B - Treat Some Dehydration with ORS
Plan C - Treat Severe Dehydration Quickly

All three plans provide fluid to replace water and salts lost in diarrhoea. An excellent way to both rehydrate and prevent dehydration in a child is to give him a solution made with oral rehydration salts (ORS). IV fluid should be used only in cases of SEVERE DEHYDRATION.

The only types of diarrhoea that should be treated with antibiotics are diarrhoea with SEVERE DEHYDRATION with cholera in the area and DYSENTERY. You will now learn how to do Plans A, B and C.

4.1 PLAN A: TREAT DIARRHOEA AT HOME

This section describes PLAN A, treatment of a child who has diarrhoea with NO DEHYDRATION. Plan A is an important treatment plan. Children with diarrhoea who come to a doctor with NO DEHYDRATION will be put on Plan A. Children with dehydration need to be rehydrated on Plan B or C, then on Plan A. Eventually, all children with diarrhoea will be on Plan A.

Plan A involves counselling the child's mother about the 4 Rules of Home Treatment. :

1. GIVE EXTRA FLUID (as much as the child will take)
2. GIVE ZINC SUPPLEMENT
3. CONTINUE FEEDING
4. WHEN TO RETURN

Now study Plan A from your chart booklet (Page 22).

GIVE EXTRA FLUID

This section describes how to counsel the mother on the first rule of home treatment, give extra fluid. You will teach the mother to prevent dehydration by giving the child extra fluid. Extra fluid means more fluid than usual. Information about how to continue

feeding the child will be discussed in the module *Counsel The Mother*. You learned when a mother should return to a doctor in the previous module, *Identify Treatment*.

➢ **TELL THE MOTHER:**

Give as much fluid as the child will take. The purpose of giving extra fluid is to replace the fluid lost in diarrhoea and thus to prevent dehydration. The critical action is to give more fluid than usual, as soon as the diarrhoea starts.

Tell the mother to breastfeed frequently and for longer at each feed. Also explain that she should give other fluids. ORS solution is one of several fluids recommended for home use to prevent dehydration.

If the child is exclusively breastfed, it is important for this child to be breastfed more frequently than usual. Also give ORS solution or clean water. Breastfed children under 6 months should first be offered a breastfeed then given ORS.

If a child is not exclusively breastfed, give one or more of the following:

* ORS solution
* Food-based fluids
* Clean water

In most cases a child who is not dehydrated does not really need ORS solution. Give him extra food-based fluids such as soups, rice water and yoghurt drinks, and clean water (preferably given along with food).

Plan A lists 2 situations in which the mother should give ORS solution at home.

1. <u>The child has been treated on Plan B or C during this visit.</u> In other words, the child has just been rehydrated. For this child, drinking ORS solution will help keep the dehydration from coming back.

2. <u>The child cannot return to a clinic if the diarrhoea gets worse.</u> For example, the family lives far away or the mother has a job that she cannot leave.

➢ **TEACH THE MOTHER HOW TO MIX AND GIVE ORS. GIVE THE MOTHER 2 PACKETS OF ORS TO USE AT HOME.**

When you give the mother ORS, show her how to mix the ORS solution and give it to her child. Ask the mother to practice doing it herself while you observe her.

The steps for making ORS solution are:

* Wash your hands with soap and water.

* Pour all the powder from one packet into a clean container. Use any available container, such as a jar, bowl or bottle.

* Measure 1 litre of clean water (or correct amount for packet used). It is best to boil and cool the water, but if this is not possible, use the cleanest drinking water available.

* Pour the water into the container. Mix well until the powder is completely dissolved.

* Taste the solution so you know how it tastes.

Explain to the mother that she should mix fresh ORS solution each day in a clean container, keep the container covered, and throw away any solution remaining from the day before.

Give the mother 2 packets of ORS to use at home. (Give 2 one-litre packets or the equivalent.)

➢ **SHOW THE MOTHER HOW MUCH FLUID TO GIVE IN ADDITION TO THE USUAL FLUID INTAKE:**

Explain to the mother that her child should drink the usual fluids that the child drinks each day ***and*** extra fluid. Show the mother how much extra fluid to give after each loose stool:

Up to 2 years	**50 to 100 ml after each loose stool**
2 years or more	**100 to 200 ml after each loose stool**

Explain to the mother that the diarrhoea should stop soon. ORS solution will not stop diarrhoea. The benefit of ORS solution is that it replaces the fluid and salts that the child loses in the diarrhoea and prevents the child from getting sicker.

Tell the mother to:

* Give frequent small sips from a cup or spoon. Use a spoon to give fluid to a young child.
* If the child vomits, wait 10 minutes before giving more fluid. Then resume giving the fluid, but more slowly.
* Continue giving extra fluid until the diarrhoea stops.

Use a Mother's Card and Check the Mother's Understanding

Some doctors have Mother's Cards to give mothers to take home. A Mother's Card helps the mother remember important information, including what kind of fluids and food to give her child.

To indicate the type of fluids a mother should give her child, tick the appropriate box or boxes in the card's "Fluid" section. (Use a pencil to mark the card so that the instructions can be changed, if needed, at a later visit.)

* Tick the box for ORS if you give the child ORS.
* Tick the other two boxes for water and for other fluids ***unless the child is exclusively breastfed***. Exclusively breastfed children should be breastfed more frequently and can drink clean water or ORS solution. Exclusively breastfed children should not be given food-based fluids such as soup, rice water or yoghurt drinks.

Below are examples of how to tick the "Fluid" section of the Mother's Card for a child who will receive ORS on Plan A:

Ø ***Advise the Mother to Increase Fluid During Illness***

FOR ANY SICK CHILD:

Ø Breastfeed more frequently and for longer at each feed.
Ø Increase fluid. For example, give soup, rice water, yoghurt drinks or clean water.

FOR CHILD WITH DIARRHOEA:

Ø Giving extra fluid can be lifesaving. Give fluid according to Plan A or Plan B on *TREAT THE CHILD chart.*

Before the mother leaves, check her understanding of how to give extra fluid according to Plan A. Use questions such as:

* What kinds of fluid will you give?
* How much fluid will you give your child?
* How often will you give the ORS solution to your child?
* Show me how much water you will use to mix ORS.
* How will you give ORS to your child?
* What will you do if the child vomits?

Ask the mother what difficulties she expects when she gives fluid to her child. For example, if she says that she does not have time, help her plan how to teach someone else to give the fluid. If she says that she does not have a one-litre container for mixing ORS, show her how to measure one litre using a smaller container. Or, show her how to measure one litre in a larger container and mark it with an appropriate tool.

The ***second rule of home treatment*** is **GIVE ZINC SUPPLEMENT.**

The ***third rule of home treatment*** is **CONTINUE FEEDING.**

In the module, *Counsel the Mother*, you will learn to counsel on feeding. If a child is classified as PERSISTENT DIARRHOEA, you will teach the mother some special feeding recommendations.

The ***fourth rule of home treatment*** is **WHEN TO RETURN**.

You have learned the signs when a mother should return immediately to a doctor. Tell the mother of any sick child that the signs to return are:

* Not able to drink or breastfeed
* Becomes sicker
* Develops a fever

If the child has diarrhoea, also tell the mother to return if the child has:

* Blood in stool
* Drinking poorly

"Drinking poorly" includes "not able to drink or breastfeed." These signs are listed separately, but it may be easier to combine them. You could simply tell the mother to return if the child is "drinking or breastfeeding poorly."

EXERCISE D

1. Somi is a 4-year-old boy who has diarrhoea. He has no general danger signs. He was classified as having diarrhoea with NO DEHYDRATION, NOT VERY LOW WEIGHT and NO ANAEMIA. He will be treated according to Plan A.

   a. What are the four rules of home treatment of diarrhoea?

   --
   --
   --
   --

   b. What fluids should the doctor tell his mother to give?

2. Kasit is a 3-month-old boy who has diarrhoea. He has no general danger signs. He was classified as NO DEHYDRATION, NOT VERY LOW WEIGHT and NO ANAEMIA. He is exclusively breastfed. What should the doctor tell his mother about giving him extra fluids?

3. For which children with NO DEHYDRATION is it especially important to give ORS at home?

   --

   --

4. The following children came to the clinic because of diarrhoea. They were assessed and found to have no general danger signs. They were classified as NO DEHYDRATION, NOT VERY LOW WEIGHT and NO ANAEMIA. Write the amount of extra fluid that the mother should give after each stool.

	Name	**Age**	**Amount of extra fluid to give after each loose stool**
a)	Kala	6 months	
b)	Sam	2 years	
c)	Kara	15 months	

5. A 4-year-old boy has diarrhoea. He has no general danger signs. He was classified with NO DEHYDRATION, NOT VERY LOW WEIGHT and NO ANAEMIA. The doctor has taught his mother Plan A and given her 2 packets of ORS to use at home.

Tick all the fluids that the mother should encourage her son to drink as long as the diarrhoea continues.

____ a. Tea that the child usually drinks with meals
____ b. Fruit juice that the child usually drinks each day
____ c. Water from the water jug. The child can get water from the jug whenever he is thirsty.
____ d. ORS after each loose stool
____ e. Yoghurt drink when the mother makes some for the family

When you have finished this exercise,
discuss your answers with a facilitator.

4.2 PLAN B: TREAT SOME DEHYDRATION WITH ORS

This section describes Plan B, treatment of a child who has diarrhoea with SOME DEHYDRATION. Plan B includes an initial treatment period of 4 hours in the clinic. During the 4 hours, the mother slowly gives a recommended amount of ORS solution. The mother gives it by spoonfuls or sips. It is helpful to have an ORT corner in your clinic. Refer to Annex B if you need to set up an ORT corner.

A child who has a severe classification and SOME DEHYDRATION needs urgent referral to hospital (The exception is a child with the severe classification, SEVERE PERSISTENT DIARRHOEA. This child should be rehydrated then referred). Do ***not*** try to rehydrate the child before he leaves. Quickly give the mother some ORS solution. Show her how to give frequent sips of it to the child on the way to the hospital.

Otherwise, if a child who has SOME DEHYDRATION needs treatment for other problems, you should start treating the dehydration first. Then provide the other treatments.

After 4 hours, reassess and classify the child for dehydration using the *ASSESS AND CLASSIFY* chart. If the signs of dehydration are gone, the child is put on Plan A. If there is still some dehydration, the child repeats Plan B. If the child now has SEVERE DEHYDRATION, the child would be put on Plan C.

Now study Plan B from your chart booklet (Page 20).

Use the chart in Plan B to determine how much ORS to give. A range of amounts is given. Look below the child's weight (or age if the weight is not known) to find the recommended amount of ORS to give. For example, a 5-kg-child will usually need 200-400 ml of ORS solution in the first 4 hours.

The amounts shown in the box are to be used as guides. The age or weight of the child, the degree of dehydration and the number of stools passed during rehydration will all affect the amount of ORS solution needed. The child will usually want to drink as much as he needs. If the child wants more or less than the estimated amount, give him what he wants.

Another way to estimate the amount of ORS solution needed (in ml) is described below the box. Multiply the child's weight (in kilograms) by 75. For example, a child weighing 8 kg would need:

$$8 \text{ kg} \times 75 \text{ ml} = 600 \text{ ml of ORS solution in 4 hours}$$

Notice that this amount fits in the range given in the box. The box will save you this calculation. Giving ORS solution should not interfere with a breastfed baby's normal feeding. The mother should pause to let the baby breastfeed whenever the baby wants to, then resume the ORS solution.

➢ SHOW THE MOTHER HOW TO GIVE ORS SOLUTION.

Find a comfortable place in the clinic for the mother to sit with her child. Tell her how much ORS solution to give over the next 4 hours. Show her the amount in units that are used in your area. If the child is less than 2 years, show her how to give a spoonful frequently. If the child is older, show her how to give frequent sips from a cup. Sit with her while she gives the child the first few sips from a cup or spoon. Ask her if she has any questions.

If the child vomits, the mother should wait about 10 minutes before giving more ORS solution. She should then give it more slowly. Encourage the mother to pause to breastfeed whenever the child wants to. When the child finishes breastfeeding, resume giving the ORS solution again. The mother should not give the child food during the first 4 hours of treatment with ORS.

Show the mother where she can change the child's nappy or where the child can use a toilet or potty. Show her where to wash her hands and the child's hands afterwards.

Check with the mother from time to time to see if she has problems. If the child is not drinking the ORS solution well, try another method of giving the solution. You may try using a dropper or a syringe without the needle.

While the mother gives ORS solution at the clinic during the 4 hours, there is plenty of time to teach her how to care for her child. However, the first concern is to rehydrate the child. When the child is obviously improving, the mother can turn her attention to learning. Teach her about mixing and giving ORS solution and about Plan A. It is a good idea to have printed information that the mother can study while she is sitting with her child. The information can also be reinforced by posters on the wall.

➢ AFTER 4 HOURS:

After 4 hours of treatment on Plan B, reassess the child using the *ASSESS AND CLASSIFY* chart. Classify the dehydration. Choose the appropriate plan to continue treatment.

Note: Reassess the child ***before*** 4 hours if the child is not taking the ORS solution or seems to be getting worse.

If the child has improved and has NO DEHYDRATION, choose Plan A. Teach the mother Plan A if you have not already taught her during the past 4 hours. Before the mother leaves the clinic, ask good checking questions. Help the mother solve any problems she may have giving the child extra fluid at home.

Note: If the child's eyes are puffy, it is a sign of overhydration. It is not a danger sign or a sign of hypernatraemia. It is simply a sign that the child has been rehydrated and does not need any more ORS solution at this time. The child should be given clean water or breastmilk. The mother should give ORS solution according to Plan A when the puffiness is gone.

If the child still has SOME DEHYDRATION, choose Plan B again. Begin feeding the child in clinic. Offer food, milk or juice. After feeding the child, repeat the 4-hour Plan B treatment. Offer food, milk and juice every 3 or 4 hours. Breastfed children should continue to breastfeed frequently. If the clinic is closing before you finish the treatment, tell the mother to continue treatment at home.

If the child is worse and now has SEVERE DEHYDRATION, you will need to begin Plan C (discussed later in this module).

- **IF THE MOTHER MUST LEAVE BEFORE COMPLETING TREATMENT:**

Sometimes a mother must leave the clinic while her child is still on Plan B, that is, before the child is rehydrated. In such situations, you will need to:

* Show the mother how to prepare ORS solution at home. Have her practice this before she leaves.
* Show her how much ORS solution to give to complete the 4-hour treatment at home.
* Give her enough packets to complete rehydration. Also give her 2 more packets as recommended in Plan A.
* Show the mother how to give zinc tablets and give zinc tablets for 14 days.
* Explain the 4 Rules of Home Treatment:
    1. GIVE EXTRA FLUID
    2. GIVE ZINC SUPPLEMENT
    3. CONTINUE FEEDING
    4. WHEN TO RETURN

EXERCISE E

1. The following children came to the clinic because of diarrhoea. They were assessed and found to have SOME DEHYDRATION and NO ANAEMIA AND NOT VERY LOW WEIGHT. Write the range of amounts of ORS solution each child is likely to need in the first 4 hours of treatment:

	Name	Age or Weight	Range of Amounts of ORS Solution
a)	Andras	3 years	
b)	Gul	10 kg	
c)	Nirveli	7.5 kg	
d)	Sami	11 months	

2. Vinita is 5 months old and has diarrhoea. She is classified as SOME DEHYDRATION, NOT VERY LOW WEIGHT and NO ANAEMIA. There is no scale for weighing Vinita at the small clinic. Vinita's mother died during childbirth, so Vinita has been taking infant formula. The grandmother has recently started giving cooked cereal as well.

   a. Vinita should be given _____ ml of _____during the first _____ hours of treatment.

   b. What should the grandmother do if Vinita vomits during the treatment?

c. When should the doctor reassess Vinita?

d. When Vinita is reassessed, she has NO DEHYDRATION. What treatment plan should Vinita be put on?

e. How many one-litre packets of ORS should the doctor give the grandmother?

f. To continue treatment at home, the grandmother should give Vinita_____ ml of _____ after each _____.

3. A mother and her child must leave the clinic before the child is fully rehydrated. What should the doctor do before the mother leaves? Complete the list below:

* Show her how to prepare ORS solution at home.

*

*

* Explain the 4 Rules of Home Treatment:

1.

2.

3.

4.

Ask the facilitator to review your answers when you have finished the exercise.

EXERCISE F

In this role play a doctor will teach a mother how to care for a dehydrated child. In the first part, the child needs Plan B. In the second part, the child is ready for Plan A.

THE SITUATION -- What has happened so far:

A young mother brought 2-year-old Lura to the clinic because she has had diarrhoea for 1½ days. The doctor found no general danger signs. There was no blood in the stool. Lura was irritable. Her eyes looked sunken. When pinched, the skin of Lura's abdomen went back immediately. She drank eagerly. She had no other problems. The doctor classified Lura as SOME DEHYDRATION. She has no other disease classifications and NOT VERY LOW WEIGHT and NO ANAEMIA. The doctor selected Plan B treatment with ORS solution.

DOCTOR:
To start the role play, tell the mother that Lura needs treatment with ORS. Ask the mother to stay at the clinic to give Lura ORS solution. Then follow Plan B to get the mother started giving ORS solution. Show the mother how much ORS to give. Show her how to give it. Answer her questions and help with any problems.

MOTHER:
Listen to the doctor and try to do what he says. Ask questions about anything that is not clear. After you have given ORS solution for a few minutes, tell the doctor that Lura just vomited the solution.

OBSERVERS:
Look at Plan B and observe the role play. Notice what the doctor explains well and what could be done better.

The facilitator will start the role play and then stop it after a few minutes for a discussion of Plan B.

THE SITUATION 4 HOURS LATER:

After 4 hours, the doctor reassessed Lura. She had NO DEHYDRATION. Her diarrhoea continued, but the doctor thought that she was ready to go home on Plan A.

DOCTOR:
Teach the mother Plan A. Give her ORS packets to take home. Ask her checking questions to be sure she remembers and understands the 4 Rules of Home Treatment.

* * *

4.3 PLAN C: TREAT SEVERE DEHYDRATION QUICKLY

Severely dehydrated children need to have water and salts quickly replaced. Intravenous (IV) fluids are usually used for this purpose. Rehydration therapy using IV fluids or using a nasogastric (NG) tube is recommended *only* for children who have SEVERE DEHYDRATION.

The treatment of the severely dehydrated child depends on:

* the type of equipment available at your clinic or at a nearby clinic or hospital,

* the training you have received, and

* whether the child can drink.

To learn how to treat a severely dehydrated child according to Plan C at your clinic, you will read and study an Annex that matches your situation.

1. **Annex C-1** teaches you how to treat according to Plan C if:

    * your clinic has IV equipment and acceptable fluids (See Annex D for acceptable IV fluids), and

    * you have been trained to give IV fluid.

2. **Annex C-2** teaches you how to treat according to Plan C if:
    * you cannot give IV fluid at your clinic, and

    * IV treatment is available at another clinic or hospital that can be reached within 30 minutes.

3. **Annex C-3** teaches you how to treat according to Plan C if:

    * you cannot give IV fluid at your clinic,

    * there is no clinic or hospital offering IV treatment nearby,

    * your clinic has nasogastric equipment, and

    * you are trained to use a nasogastric (NG) tube.

4. **Annex C-4** teaches you how to treat according to Plan C if:

    * you cannot give IV fluid at your clinic,

    * there is no clinic or hospital offering IV treatment nearby,

    * you cannot give NG therapy, and

* the child can drink.

If you cannot give IV or NG fluid and the child cannot drink, refer the child urgently to the nearest clinic or hospital which can give IV or NG treatment.

To determine how you will treat a child who needs Plan C treatment, refer to the flowchart below. Read the questions in order from top to bottom and answer for the situation at your clinic. Note the first time you answer YES. Turn to the appropriate C Annex (as indicated on the flowchart) and continue reading.

4.4 TREAT PERSISTENT DIARRHOEA

The treatment for PERSISTENT DIARRHOEA requires special feeding and giving vitamin A and zinc.

The mother of a child with PERSISTENT DIARRHOEA will be advised on feeding her child. The feeding recommendations for a child with persistent diarrhoea are on the *COUNSEL THE MOTHER* chart. They are explained in the module *Counsel the Mother*.

4.5 TREAT DYSENTERY

Give oral Ciprofloxacin for *Shigella* to treat DYSENTERY. Tell the mother to return in 2 days for follow-up care to be sure the child is improving.

The box "Give an Appropriate Oral Antibiotic" on the *TREAT THE CHILD* chart tells the recommended antibiotics. Also give zinc tablets for 14 days.

5.0 IMMUNIZE EVERY SICK CHILD, AS NEEDED

This module assumes that you have already been trained to give immunizations. If you immunize children with the appropriate vaccine at the appropriate time, you prevent measles, polio, diphtheria, pertussis, tetanus and tuberculosis. Check the immunization status of every child you treat at your clinic. Immunize, as needed.

Review the following points about preparing and giving immunizations:

* If a child is well enough to go home, give him any immunizations he needs before he leaves the clinic.

* Use a sterile needle and a sterile syringe for each injection. This prevents transmission of HIV and the Hepatitis B virus.

* If only one child at the clinic needs an immunization, open a vial of the vaccine and give him the needed immunization.

* Discard opened vials of vaccines at the end of each immunization session.

* Do ***not*** give OPV 0 to an infant who is more than 14 days old.

* Record all immunizations on the child's immunization card. Record the date you give each dose. Also keep a record of the child's immunizations in the immunization register or the child's chart, depending on what you use at your clinic.

Tell the mother which immunizations her child will receive today. Tell her about the possible side effects. Below is a brief description of side effects from each vaccine.

* **BCG**: A small red tender swelling then an ulcer appears at the place of the immunization after about 2 weeks. The ulcer heals by itself and leaves a small scar.

  Tell the mother a small ulcer will occur and to leave the ulcer uncovered. If necessary, cover it with a dry dressing only.

* **OPV**: No side effects.

* **DPT and DT**: Fever, irritability and soreness are possible side effects of DPT. They are usually not serious and need no special treatment.

  Tell the mother that if the child feels very hot or is in pain, she should give paracetamol. She should ***not*** wrap the child up in more clothes than usual.

* **Measles**: Fever and a mild measles rash are possible side effects of the measles vaccine. A week after you give the vaccine, a child may have a fever for 1 - 3 days.

  Tell the mother to give paracetamol if the fever is high

EXERCISE G

In this exercise you will review checking the immunization status of several children. Answer the questions in the space provided.

1. Malambu is 6 months old. She is brought to the clinic by her grandmother. The doctor classifies her as PNEUMONIA, MALARIA, NOT VERY LOW WEIGHT and NO ANAEMIA. Her immunization card shows that it is time to give Malambu a dose of DPT 1 and OPV 1.
   Should Malambu be given the immunizations today?

2. A mother brings her 5-month-old daughter, Joli, to the clinic because she has diarrhoea with blood in the stool. The doctor classifies Joli as NO DEHYDRATION, DYSENTERY, NOT VERY LOW WEIGHT and NO ANAEMIA. Joli's immunization card shows she had OPV 2 and DPT 2 five weeks ago.
   .

   a. Should the doctor give Joli OPV 3 and DPT 3 today?

   The mother says that she does not want Joli to be immunized again. She tells the doctor that Joli had a fever and was irritable after the last time.

   b. What should the doctor tell the mother about possible side effects of OPV and DPT vaccines?

The mother agrees to let Joli be immunized. The doctor gives Joli the immunizations.

3. Doctor Ramesh wants to immunize a 1-year-old child for measles. The child has been classified as PNEUMONIA, NOT VERY LOW WEIGHT and NO ANAEMIA. The child's mother does not want her child to be immunized. She says that she will return for immunization when the child is better.

   Describe what you would say to a child's mother to try to convince her to have her child immunized for measles today.

When you finish this exercise, discuss your answers with a facilitator.

6.0 WHERE REFERAL IS NOT POSSIBLE

The best possible treatment for a child with a very severe illness is usually at a hospital.

Sometimes referral is not possible or not advisable. Distances to a hospital might be too far; the hospital might not have adequate equipment or staff to care for the child; transportation might not be available. Sometimes parents refuse to take a child to a hospital, in spite of the doctor's effort to explain the need for it.

If referral is not possible, you should do whatever you can to help the family care for the child. To help reduce deaths in severely ill children who cannot be referred, you may need to arrange to have the child stay in or near the clinic where he may be seen several times a day. If not possible, arrange for visits at home.

This section describes treatment to be given for specific severe disease classifications when the very sick child cannot be referred. It is divided into 2 parts: "Essential Care" and "Treatment Instructions: Recommendations on How to Give Specific Treatment for Severely Ill Children Who Cannot Be Referred".

To use this section, first find the child's classifications and note the essential care required. Then refer to the boxes on the *TREAT THE CHILD* chart ***and*** the instructions in second part of this section.

Remember that you must also give treatment for the non-severe classifications that you identified. These treatments should be marked on the Sick Child Recording Form. For example, if the child has SEVERE PNEUMONIA and MALARIA, you must treat the MALARIA ***and*** follow the guidelines below to treat the SEVERE PNEUMONIA.

Although only a well-equipped hospital with trained staff can provide optimal care for a child with a very severe illness, following these guidelines may reduce mortality in high risk children where referral is not possible.

6.1 ESSENTIAL CARE FOR SICK CHILD AGE 2 MONTHS UP TO 5 YEARS

6.1.1 SEVERE PNEUMONIA OR VERY SEVERE DISEASE

Give Antibiotic Treatment

- If the child has a **general danger sign or severe chest indrawing but does not have the classification VERY SEVERE FEBRILE DISEASE:**

    - Give injectable chloramphenicol (If not possible, give oral amoxycillin). If the child vomits oral amoxycillin, repeat the dose.

- Treat with IM chloramphenicol until the child has improved. Then continue with oral chloramphenicol. Treat the child with chloramphenicol/ amoxycillin for 10 days total.

➢ If the child also has the classification **VERY SEVERE FEBRILE DISEASE**, follow the essential care instructions for this classification below:

- Give benzylpenicillin ***and*** chloramphenicol (for 10 days) ***and*** if the patient comes from a high malaria risk area, give **quinine** (for 7 days)**.**

Give a Bronchodilator

If the child is wheezing and you have a bronchodilator, give it.[1]

Treat Fever

If the child has an axillary temperature of 38.5°C or above, give paracetamol every 6 hours. This is especially important for children with pneumonia because fever increases consumption of oxygen.

Manage Fluids Carefully

Encourage the mother to continue breastfeeding if the child is not in respiratory distress. If the child is too ill to breastfeed but can swallow, have the mother express milk into a cup and slowly feed the child the breastmilk with a spoon.

Encourage the child to drink. If the child is not able to drink, either use a dropper to give the child fluid very slowly or drip fluid from a cup or a syringe without a needle. Avoid using a NG tube if the child is in respiratory distress. Wait until the next day if there is no other option.

Avoid giving fluids intravenously **unless** the child is in shock. A child in shock has cold extremities, a weak and rapid pulse, and is lethargic.

Manage the Airway

Clear a blocked nose. A blocked nose can interfere with feeding. Use a plastic syringe (without needle) to gently suck any secretions from the nose. Dry or thick, sticky mucous can be loosened by wiping with a soft cloth moistened with salt water. Help the child to cough up secretions.

[1] Instructions are provided in *Acute Respiratory Infection in Children: Case Management in Small Hospitals in Developing Countries, A manual for doctors and other senior doctors* (1990) WHO/ARI/90.5.

Keep the Infant Warm

Refer to page 6 of your chart booklet.

6.1.2 ESSENTIAL CARE FOR SEVERE PERSISTENT DIARRHOEA

Treat Dehydration Using the Appropriate Fluid Plan

Refer to pages 17, 20 and 22 for plans C, B and A respectively.

Advise Mother How to Feed Child with Persistent Diarrhoea

See the box on the *COUNSEL THE MOTHER* chart. For infants less than 6 months, exclusive breastfeeding is very important. If the mother has stopped breastfeeding, help her relactate (or get help from someone who knows how to counsel on relactation).

Give Vitamin A and Zinc

Refer to page18 of your chart booklet.

Identify and Treat Infection

Some children with PERSISTENT DIARRHOEA have infections such as pneumonia, sepsis, urinary tract infection, ear infection, dysentery, and amoebiasis. These require specific antibiotic treatment. If **no** specific infection is identified, do ***not*** give antibiotic treatment because routine treatment with antibiotics is not effective.

Monitor the Child

See the mother and the child each day. Monitor the child's feeding and treatments and the child's response. Ask what food the child eats and how much. Ask about the number of diarrhoeal stools. Check for signs of dehydration and fever.

Once the child is feeding well and has no signs of dehydration, see the child again in 2 to 3 days. If there are any signs of dehydration or problems with the changes in feeding, continue to see the child every day. Help the mother as much as possible.

6.1.3 ESSENTIAL CARE FOR VERY SEVERE FEBRILE DISEASE

Give Antibiotic and Antimalarial Treatment

A child with VERY SEVERE FEBRILE DISEASE needs treatment for both meningitis and severe malaria (in low or high risk malaria areas). Do ***not*** try to decide whether the child has meningitis or severe malaria. Treat for both possibilities.

- ***For meningitis***, give both IM chloramphenicol ***and*** benzylpenicillin. It is preferable to give an injection every 6 hours. If this is not possible, use the 8-hour or the 12-hour dosing schedule (see Treatment Instructions).

  Give both antibiotics by injection for at least 3-5 days. If the child has improved by this time, switch to oral chloramphenicol. The total treatment duration should be 10 days.

- ***For SEVERE MALARIA***, give quinine or artemesinins.
  If you do not have quinine or artemesinins , give an oral antimalarial . In low risk malaria areas, do ***not*** give quinine to infants less than 4 months of age. It is very unlikely that they have malaria.

Manage Fluids Carefully

The fluid plan depends on the child's signs.

- If the child also has **diarrhoea with SEVERE DEHYDRATION, but has no stiff neck and no SEVERE MALNUTRITION OR SEVERE ANAEMIA**, give fluids according to Plan C.

  The general danger sign which resulted in the classification VERY SEVERE FEBRILE DISEASE may have been due only to dehydration. Rehydrate, and then completely reassess and reclassify the child. The reassessment and reclassification of the child after rehydration may lead to a change in treatment plan if the child no longer is classified as VERY SEVERE FEBRILE DISEASE. If the child rapidly loses his danger signs with rehydration, do ***not*** continue treatment with quinine, benzylpenicillin and chloramphenicol.

- If the child has **VERY SEVERE FEBRILE DISEASE with a stiff neck or bulging fontanelle:** There is no good evidence to support fluid restriction in children with bacterial meningitis. Give the daily fluid requirement, but not more because of the risk of cerebral oedema.

Avoid giving intravenous fluids. If the child is vomiting everything or not able to drink or breastfeed, give fluid by NG tube. If you do not know how to use an NG tube and the child is able to swallow, use a dropper to give the child fluid very slowly, or drip fluid from a cup or a syringe (without needle).

- If the child has **SEVERE MALNUTRITION**, give fluids as described under Essential Care for SEVERE MALNUTRITION.

Treat the Child to Prevent Low Blood Sugar

See Treatment Instructions on page 6 of your chart booklet.

6.1.4 ESSENTIAL CARE FOR SEVERE COMPLICATED MEASLES

Manage Measles Complications

Management depends on which complications are present.

- If the child has **mouth ulcers**, apply half-strength (0.25%) gentian violet. Help the mother feed her child. If the child cannot swallow, feed the child by NG tube. Treat with IM chloramphenicol.
- If the child has **corneal clouding**, be very gentle in examining the child's eye. Treat the eye with tetracycline eye ointment carefully. Only pull down on the lower lid and do not apply pressure to the globe of the eye. Keep the eye patched gently with clean gauze.
- Also treat **other complications of measles, such as pneumonia, diarrhoea, ear infection**.

Give two doses of Vitamin A

Refer to page 18 of your chart booklet

Feed the Child to Prevent Malnutrition

6.1.5 ESSENTIAL CARE FOR MASTOIDITIS

Give IM benzylpenicillin and IM chloramphenicol. Treat for 10 days total. Switch to oral chloramphenicol after 3-5 days.

6.1.6 ESSENTIAL CARE FOR SEVERE MALNUTRITION

Children with SEVERE MALNUTRITION need specially prepared food with mineral supplements that are usually only available at a hospital or nutrition rehabilitation centre. Try to refer the child to one of these locations.

While you are waiting to refer the child:

Give Antibiotic Treatment

Give antibiotics even if the child does not have signs of infection. In SEVERE MALNUTRITION, the usual signs of infection are often absent. For example, fever may not be present. The severely malnourished child with PNEUMONIA may not breathe as fast as a well-nourished child and may not show lower chest wall indrawing. Therefore, it is important to treat all severely malnourished children with antibiotics when you first start to give special feeding.

- If the child has **no specific signs of infection**, give oral amoxicillin ~~cotrimoxazole~~ for 5 days.
- If the child has **a low temperature (less than 35.5°C) or an elevated temperature (more than 37.5°C), ear or skin infection, general danger signs, PNEUMONIA, SEVERE PNEUMONIA OR VERY SEVERE DISEASE, or VERY SEVERE FEBRILE DISEASE**, give IM ampicillin and IM gentamicin. Also treat for malaria in high risk malaria areas. If the child does not improve within 48 hours, add IM chloramphenicol.

Continue Breastfeeding Frequently, Day and Night

Feed the Child

This child must be fed frequently, if necessary by NG tube. The choices of food depend on what is available.

First choice: Give a modified milk diet made of dried skim milk (DSM), sugar and oil. Start with a modified milk containing 25 grams (g) dried skim milk, 100 g sugar, 30 g vegetable oil and enough water to make up to 1000 ml. Mix the milk, sugar and oil to a paste. Slowly add warm boiled water to make a total volume of 1000 ml.[2]

These modified milk feeds have reduced lactose. They can be given to a child with SEVERE MALNUTRITION who also has PERSISTENT DIARRHOEA.

[2] Other alternative modified milk diets are unsweetened evaporated full-fat milk (120 ml and 100 g of sugar and 20 ml oil), fresh cow's milk (300 ml and 100 g sugar and 20 ml oil) or skimmed, unsweetened evaporated milk (120 ml and 100 g sugar and 30 ml oil). For all recipes, add warm, boiled water to make 1000 ml.

The severely malnourished child is very fragile and needs small frequent feeds. Gradually increase the volume of the feed and gradually decrease the feeding frequency. Help the mother feed the child as often as possible. It is important that the child continue to receive as many feeds as possible at night (at least twice during the night). Many severely malnourished children die during the night when they are not fed and kept warm.

The ideal feeding schedule is as follows:

DAYS	FREQUENCY	VOLUME/KG/FEED	VOLUME/KG/DAY
1 - 2	every 2 hours	11 ml	130 ml
3 - 5	every 3 hours	16 ml	130 ml
6 - 7+	every 4 hours	22 ml	130 ml

If the child has a good appetite and no oedema, you may only need to feed him for one day at each level.

Second choice: Give good complementary foods such as thick porridge with added oil. Avoid foods that contain too much lactose (that is, more than 40 ml whole milk/kg/day) or added salt. Do ***not*** add salt to the food.

Use the same feeding schedule as above.

Replace Essential Minerals

Add 0.5 ml/kg of potassium chloride solution to each feed.[3] Give 2 ml of 50% magnesium sulfate solution[4] once by IM injection.

Give Iron When Child's Appetite Returns

If the child has anaemia, do ***not*** start iron treatment until the child's appetite returns. Before this, iron can make an infection worse.

Manage Diarrhoea with Dehydration Carefully

Children with SEVERE MALNUTRITION and diarrhoea with SOME or SEVERE DEHYDRATION may not be as dehydrated as the signs indicate. The slow skin pinch, sunken eyes, lethargy or irritability may be due to SEVERE MALNUTRITION. Intravenous fluids for SEVERE DEHYDRATION should be given to such children only when signs of shock are present.

[3] From stock solution containing 100 g KCl per litre.

[4] 50% magnesium sulfate solution has 4 mEq Mg^{++} per ml.

ORS solution contains too much salt and too little potassium for children with SEVERE MALNUTRITION. Mix an ORS packet with **2** litres of water (instead of 1 litre of water). Then add 50 g of sugar (or 10 level teaspoons) and 45 ml of potassium chloride solution.[3] Mix carefully.

Rehydrate more slowly than normal. Monitor the child carefully. If the child's breathing rate and heart rate increase when he is being rehydrated, this may mean that too much fluid has been given too quickly. Stop giving the fluid. Resume giving fluid when the rates have slowed.

Monitor the Child's Temperature

Keep the child warm. Make sure the child is covered at all times, especially at night.

If the rectal temperature is below 35.5°C, place the infant on the mother's bare abdomen. Cover a child with a blanket or place a heater nearby. Make sure the child is clothed and wearing a hat or bonnet. It is especially important to feed this child every 2 hours until he is stable. Give IM antibiotics for possible sepsis.

6.1.7 ESSENTIAL CARE FOR SEVERE ANAEMIA

A child with severe anaemia is in danger of heart failure.

Give Iron By Mouth

Feed The Child

Give good complementary foods.

Give Paracetamol If Fever Is Present

Give paracetamol every 6 hours.

Give Fluids Carefully

Let the child drink according to his thirst. Do ***not*** give IV or NG fluids.

6.1.8 ESSENTIAL CARE FOR COUGH MORE THAN 30 DAYS

Give First-line Antibiotic for PNEUMONIA

If the child has not been treated recently with an effective antibiotic for PNEUMONIA, give an antibiotic for 5 days.

Give Salbutamol

If the child is wheezing or coughing at night, or there is a family history of asthma, give salbutamol for 14 days.

Weigh the Child and Inquire about Tuberculosis (TB) in the Family

See the Child in Follow-up in 2 Weeks

If there is no response to the antibiotic (with or without salbutamol) or if the child is losing weight, try again to refer to hospital. If referral is still not possible, begin TB treatment. Refer to the national TB guidelines.

6.1.9 ESSENTIAL CARE FOR CONVULSIONS (CURRENT CONVULSIONS, NOT BY HISTORY DURING THIS ILLNESS)

Manage the Airway

Turn the child on his side to reduce the risk of aspiration. Do ***not*** try to insert an oral airway or keep the mouth open with a spoon or spatula. Make sure that the child is able to breathe. If secretions are interfering with breathing, insert a catheter through the nose into the pharynx and clear the secretions with suction.

Give Diazepam Followed by Paraldehyde

See Treatment Instructions.

If High Fever Present, Lower the Fever

Give paracetamol and sponge the child with tepid water.

Treat the Child to Prevent Low Blood Sugar

See Treatment Instructions.

***

6.2 TREATMENT INSTRUCTIONS

Recommendations on How to Give Specific Treatments for Severely Ill Children Who Cannot Be Referred

Three dosing schedules for drugs are provided in this annexure. The schedules are for every 6 hours (or four times per day), every 8 hours (or three times per day), and every 12 hours (or twice per day). **Choose the most frequent schedule that you are able to provide**.

Ideally, the treatment doses should be evenly spaced. Often this is not possible due to difficulty giving a dose during the night. Compromise as needed, spreading the doses as widely as possible. Some treatments described below are impractical for a mother to give her child at home without frequent assistance from a doctor, for example, giving injections or giving frequent feedings as needed by a severely malnourished child. In some cases, a doctor may be willing to care for the child at or near his home or in the clinic to permit the frequent care necessary. In other cases, it is simply not practical to give the child the treatments that he needs.

Chloramphenicol -

Give IM chloramphenicol for 5 days. Then switch to an oral antibiotic to complete 10 days of antibiotic treatment.

If you are not able to give IM antibiotic treatment, but oral chloramphenicol is available, give oral chloramphenicol by mouth or NG tube. Give every 6 hours, if possible.

Quinine **-**

Give first dose of quinine. Repeat the IM quinine injection at 4 and 8 hours later. These 3 injections are the loading dose.

Then either give quinine (the same dose as above) every 12 hours or give quinine every 8 hours (using the 8-hour dosing schedule). Stop the IM quinine when the child is able to take an oral antimalarial.

The injections of quinine should not continue for more than 1 week. Too high a dosage can cause deafness and blindness, as well as irregular heartbeat (which may cause cardiac arrest).

The child should remain lying down for one hour after each injection as the child's blood pressure may drop. The effect stops after 15 - 20 minutes.

When the child can take an oral antimalarial, give a full dose according to national guidelines for completing the treatment of severe malaria. In most countries, the oral antimalarial recommended is sulfadoxine-pyrimethamine.

If the malaria risk is low, do ***not*** give quinine to a child less than 4 months of age.

DOSING SCHEDULE - INTRAMUSCULAR AND ORAL DRUGS: EVERY 6 HOURS (or 4 times per day)

AGE or WEIGHT	**IM CHLORAMPHENICOL** Dose: 20 mg/kg To vial containing 1000 mg, add 5.0 ml sterile water = 5.6 ml at 180 mg/ml	**BENZYLPENICILLIN** Dose: 50 000 units/kg To vial containing 600 mg (or 1 000 000 units), add 2.1 ml sterile water = 2.5 ml at 400 000 units/ml	add 3.6 ml sterile water = 4.0 ml at 250 000 units/ml	**ORAL CHLORAMPHENICOL** Dose: 20 mg/kg **SYRUP** - 125 mg/5 ml suspension (palmitate)	**CAPSULE** 250 mg
4 kg	0.4 ml	0.5 ml	0.8 ml	3.0 ml (½ tsp)	¼
5 kg	0.5 ml	0.6 ml	1.0 ml	4.0 ml (¾ tsp)	½
4 months up to 9 months (6 - <8 kg)	0.8 ml	0.8 ml	1.5 ml	5.0 ml (1 tsp)	½
9 months up to 12 months (8 - <10 kg)	1.0 ml	1.2 ml	2.0 ml	7.5 ml (1½ tsp)	¾
12 months up to 3 years (10 - <14 kg)	1.2 ml	1.5 ml	2.5 ml	10.0 ml (2 tsp)	1
3 years up to 5 years (14 - 19 kg)	1.8 ml	2.0 ml	3.5 ml	12.5 ml (2½ tsp)	1

DOSING SCHEDULE - INTRAMUSCULAR DRUGS: EVERY 8 HOURS (or 3 times per day)

AGE or WEIGHT	**CHLORAMPHENICOL** Dose: 30 mg/kg To vial containing 1000 mg, add 5.0 ml sterile water = 5.6 ml at 180 mg/ml	**BENZYLPENICILLIN** Dose: 70 000 units/kg To vial containing 600 mg (or 1 000 000 units), add 2.1 ml sterile water = 2.5 ml at 400 000 units/ml	add 3.6 ml sterile water = 4.0 ml at 250 000 units/ml	**GENTAMICIN** (10 mg/ml solution) Dose: 2.5 mg/kg	**QUININE** Dose: 10 mg/kg 150 mg/ml	300 mg/ml
4 kg	0.7 ml	0.7 ml	1.1 ml	1.0 ml	0.3 ml	0.13 ml
5 kg	0.8 ml	0.9 ml	1.4 ml	1.25 ml	0.3 ml	0.17 ml
4 months up to 9 months (6 - <8 kg)	1.2 ml	1.2 ml	2.0 ml	1.8 ml	0.4 ml	0.2 ml
9 months up to 12 months (8 - <10 kg)	1.5 ml	1.6 ml	2.5 ml	2.2 ml	0.6 ml	0.3 ml
12 months up to 3 years (10 - <14 kg)	2.0 ml	2.0 ml	3.5 ml	3.0 ml	0.8 ml	0.4 ml
3 years up to 5 years (14 - 19 kg)	2.5 ml	3.0 ml	4.5 ml	4.0 ml	1.2 ml	0.6 ml

NOTE:

GENTAMICIN CAN BE SAFELY AND EFFECTIVELY GIVEN AS A SINGLE DAILY DOSE OF 7.5 MG/KG.

IF NOT POSSIBLE TO GIVE 8 HOURLY CHLORAMPHENICOL INJECTIONS, GIVE TWO INJECTIONS IN THE DOSES ABOVE AND GIVE A THIRD 30 MG/KG DOSE OF ORAL CHLORAMPHENICOL

DOSING SCHEDULE - INTRAMUSCULAR and ORAL DRUGS: EVERY 12 HOURS
(or 2 times per day)

AGE or WEIGHT	**BENZYLPENICILLIN** Dose: 100 000 units/kg To vial containing 600 mg (or 1 000 000 units),		**GENTAMICIN** (10 mg/ml solution) Dose: 3.0 mg/kg
	add 2.1 ml sterile water = 2.5 ml at 400 000 units/ml	add 3.6 ml sterile water = 4.0 ml at 250 000 units/ml	
4 kg	1.0 ml	1.6 ml	1.2 ml
5 kg	1.2 ml	2.0 ml	1.5 ml
4 months up to 9 months (6 - <8 kg)	1.8 ml	3.0 ml	2.0 ml
9 months up to 12 months (8 - <10 kg)	2.5 ml	4.0 ml	2.8 ml
12 months up to 3 years (10 - <14 kg)	3.0 ml	5.0 ml	3.5 ml
3 years up to 5 years (14 - 19 kg)	4.0 ml	6.0 ml	5.0 ml

NOTE:

SEE THE QUININE BOX FOR THE QUININE DOSE TO GIVE EVERY 12 HOURS.

GENTAMICIN CAN BE SAFELY AND EFFECTIVELY GIVEN AS A SINGLE DAILY DOSE OF 7.5 MG/KG.

Treat the Child to Prevent Low Blood Sugar -

If the child is conscious, follow the instructions on the *TREAT* chart. Feed the child frequently, every 2 hours, if possible.

If the child is unconscious and you have dextrose solution and facilities for an intravenous (IV) infusion, start the IV infusion. Once you are sure that the IV is running well, give 5 ml/kg of 10 % dextrose solution (D10) over a few minutes, or give 1 ml/kg of 50% dextrose solution (D50) by very slow push. Then insert an NG tube and begin feeding every 2 hours.

Potassium Chloride Solution (100 grams KCl per litre) -

Give 0.5 ml (or 10 drops from a dropper) per kilogram of body weight with each feed. Mix well into the feed.

Diazepam and Paraldehyde (anticonvulsants) -

Give by rectum.

Use a plastic syringe (the smallest available) without a needle. Put the diazepam or paraldehyde in the syringe. Gently insert the syringe into the rectum. Squirt the diazepam or paraldehyde. Keep the buttocks squeezed tight to prevent loss of the drug.

If both diazepam and paraldehyde are available, use the following schedule:

1. Give **diazepam**.
2. In 10 minutes, if convulsions continue, give **diazepam** again.
3. In 10 more minutes (that is, 20 minutes after the first dose), if convulsions continue, give **paraldehyde**.
4. In 10 more minutes (that is, 30 minutes after the first dose), if convulsions continue, give **paraldehyde** again.

This is the preferred treatment. It is safer than giving 3 doses of diazepam in a row due to the danger of respiratory depression.

If only diazepam is available, use the following schedule:

1. Give **diazepam**.
2. In 10 minutes, if convulsions continue, give **diazepam** again.
3. In 10 more minutes (that is, 20 minutes after the first dose), if convulsions continue and the child is breathing well, give **diazepam** again. Watch closely for respiratory depression.

If only paraldehyde is available, use the following schedule:

1. Give **paraldehyde**.
2. In 10 minutes, if convulsions continue, give **paraldehyde** again.
3. In 10 more minutes (that is, 20 minutes after the first dose), if convulsions continue, give **paraldehyde** again.

DOSAGE TABLE - DIAZEPAM and PARALDEHYDE

AGE or WEIGHT	**DIAZEPAM** (10 mg/2 ml solution) Dose: 0.2 - 0.4 mg/kg Give rectally.	**PARALDEHYDE** (1 g/ml solution) Dose: 0.15 - 0.3 ml/kg Give rectally.
1 month up to 4 months (3 - <6 kg)	0.5 ml (2.5 mg)	1.0 ml
4 months up to 12 months (6 - 10 kg)	1.0 ml (5 mg)	1.5 ml
12 months up to 3 years (10 - <14 kg)	1.25 ml (6.25 mg)	2.0 ml
3 years up to 5 years (14 - 19 kg)	1.5 ml (7.5 mg)	3.0 ml

EXAMPLE

Margaret is 18 months old. She became sick a week ago. She developed fever, lost her appetite and began to cough. This is the rainy season, and the risk of malaria is high.

Margaret's mother bought some chloroquine 3 days ago and has given Margaret a whole tablet each day. Still Margaret has a fever and now is very sleepy. When her mother makes her eat, Margaret cries weakly. For the last few days, the mother has been afraid to feed Margaret because she is so sleepy and seems to have trouble swallowing. The mother is afraid the child will choke on the food. Margaret stopped breastfeeding 4 months ago when her mother became pregnant.

Margaret's assessment shows the following:

Her axillary temperature is 39°C. She weighs 8 kg. She is very lethargic, waking only for a few seconds before falling asleep again. She has not had convulsions. She is not able to drink now because she is so lethargic. Her breathing rate is 52 beats per minute. She has intercostal indrawing but no lower chest wall indrawing and no stridor. She does not have diarrhoea.

The doctor does not think Margaret's neck is stiff. She has no runny nose and no rash. Margaret does not have an ear problem.

Margaret is thin but does not have visible wasting. She has some palmar pallor. When you press on her feet, there is no oedema. Margaret is up to date on her immunizations.

The doctor classifies Margaret as SEVERE PNEUMONIA OR VERY SEVERE DISEASE, VERY SEVERE FEBRILE DISEASE and ANAEMIA.

The nearest hospital is a day's journey away and the mother cannot go there. Her husband is away and she must care for her other children. She also does not think that there are drugs at the hospital and she has no money to pay for her food there.

Margaret cannot be referred. She can stay with her mother at the house of an aunt who lives near the clinic. The mother will bring the child for injections. One of the nurses in the clinic is willing to come to the aunt's house to help care for Margaret in the evening.

It is now 9 am and the clinic is open until lunch. The doctor will conduct a special session for follow-up and nutrition counselling from 3 pm to 4 pm today. The clinic is open during the same hours tomorrow.

The doctor decides that it will be possible to give injections approximately every 8 hours. He will give the first injection now (9 am) and the second at 4 pm as the clinic is closing. The third injection will be given to Margaret in the late evening when the nurse visits Margaret at the aunt's house.

The doctor immediately gives the following treatments:

1. **Benzylpenicillin** : 1 000 000 units with 2.1 ml of sterile water added to get 2.5 ml at 400 000 units/ml:

   The doctor gives Margaret 1.6 ml by intramuscular injection, based on the 8-hour dosing schedule. This same dose will be given to Margaret approximately every 8 hours.

2. **Chloramphenicol** : 1000 mg vial with 5 ml of sterile water added to get 5.6 ml at 180 mg/ml:

The doctor gives Margaret 1.5 ml by intramuscular injection, based on the 8-hour dosing schedule. This same dose will be given to Margaret approximately every 8 hours.

3. **Quinine**: The doctor gives Margaret the initial dose of 0.6 ml of 150 mg/ml. The same dose is given 4 and 8 hours later. Then the doctor will continue to give Margaret 0.6 ml every 8 hours until she is able to take oral antimalarials.

4. **Sugar Water**: The doctor gives Margaret 50 ml of sugar water by NG tube.

The doctor sends for whole, undiluted cow's milk. He crushes a ¼ 500 mg paracetamol tablet to mix with the milk. He gives Margaret 30 ml of the milk by NG tube every hour during the rest of clinic. To the first 30 ml, he adds the paracetamol. He repeats the dose in 6 hours.

The doctor asks the mother to hold Margaret to keep her warm. The mother also adjusts Margaret's hat and blanket so she is covered.

When the nurse visits Margaret at her aunt's home in the evening, she slowly gives her 100 ml of the milk by NG tube. The nurse does not give more than 100 ml because she is worried that Margaret may vomit if given more. The same amount is given when the clinic opens the next morning. At that time, Margaret is more alert and able to swallow the fluids that are dripped into her mouth. The doctor gives the mother a 10 ml syringe so that she can feed her child this way. The doctor tells the mother to try to give Margaret 3 syringe-fulls of milk every hour.

After 4 days of treatment, Margaret is alert and her fever is gone. She is able to take sips from a cup. Because she was already treated with chloroquine, the doctor decides to give sulfadoxine-pyrimethamine (½ tablet, crushed) when stopping the quinine injections.

Because the doctor is uncertain whether the VERY SEVERE FEBRILE DISEASE was meningitis or severe malaria, he wants to be sure that all possibilities are adequately treated but needs to stop giving these frequent injections. Therefore, he stops the IM chloramphenicol and benzylpenicillin and gives oral chloramphenicol every 6 hours. He gives this for 6 more days to complete 10 days of treatment.

The doctor continues to see Margaret every day for a few more days. He wants to make sure that she continues to improve and begins eating, and that the mother is able to give the chloramphenicol 4 times per day.

The doctor now reviews with the mother how Margaret was fed before this illness. He advises the mother that the child should receive good complementary foods or family foods at least 5 times per day. Because he does not want to confuse the mother with too many pills, the doctor decides not to start the iron treatment until Margaret finishes the full 10 days of antibiotic treatment.

When Margaret and her mother return, the doctor gives the mother a bottle of iron syrup and shows her how to measure ¼ teaspoon. He also shows her how to give it to Margaret. He tells the mother to give ¼ teaspoon to Margaret every morning. He also tells the mother to make sure the syrup is kept out of reach of Margaret and her siblings. Then he arranges to see Margaret again in 2 weeks when he will check on her pallor and give the mother more iron syrup.

ANNEXES

ANNEX A: Nasogastric Rehydration

ANNEX B: ORT Corner

ANNEX C-1: If You Can Give Intravenous Treatment

ANNEX C-2: If IV Treatment Is Available Nearby

ANNEX C-3: If You Are Trained To Use A Nasogastric (NG) Tube

ANNEX C-4: If You Can Only Give Plan C Treatment by Mouth

ANNEX D: Intravenous Treatment For Severe Dehydration

ANNEX A

NASOGASTRIC REHYDRATION

1. Use a clean rubber or plastic nasogastric (NG) tube. Use a tube that is 2.0mm - 2.7mm in diameter for a child, or 4.0mm - 6.9mm for an adult.

2. Place the patient on his or her back, with the head slightly raised. Older children and adults may prefer to sit up.

3. Measure the length of tube to be swallowed by placing the tip just above the navel. Then stretch the tubing over the back of the ear and forward to the tip of the nose. Mark the tube with a piece of tape where it touches the end of the nose. This mark shows the length of tubing needed to reach from the tip of the nose to the stomach.

4. Moisten the tube with a water-soluble lubricant or plain water; do ***not*** use oil.

5. Pass the tube through the nostril with the largest opening. Gently advance it until the tip is in the back of the throat. Each time the patient swallows, advance the tube another 3.5cm. If the patient is awake, ask him or her to drink a little water.

6. If the patient chokes, coughs repeatedly or has trouble breathing, the tube has probably passed into the trachea. Pull it back 2cm - 4cm until the coughing stops and the patient is comfortable. Wait a minute, and then try to insert the tube again.

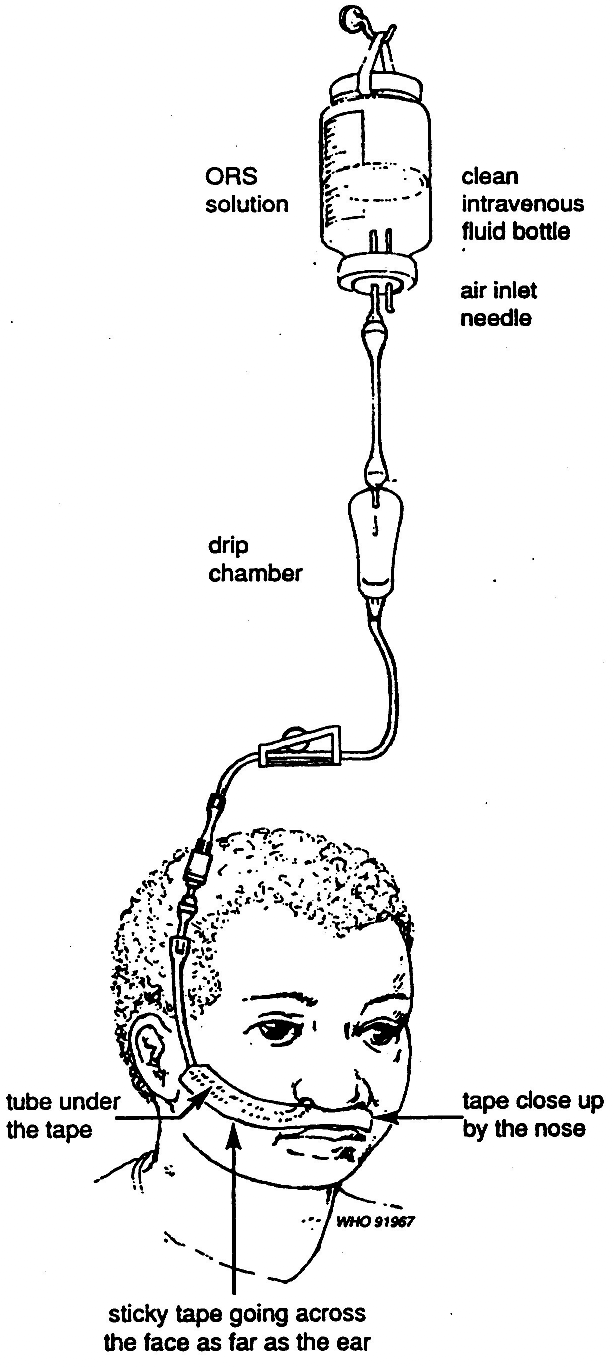
7. Advance the tube each time the patient swallows until the tape marker reaches the nose. If the patient is comfortable and not coughing, the tube should be in the stomach.

8. Look into the patient's mouth to be certain that the tube is not coiled in the back of the throat. Confirm that the tube is in the stomach by attaching a syringe and withdrawing a little stomach fluid. You could also do this by placing a stethoscope just above the navel. Inject air into the tube with an empty syringe. Listen for the air entering the stomach.

9. Fasten the tube to the face with tape and attach IV tubing that is connected to a clean IV bottle containing ORS solution. Regulate the infusion to a rate of 20 ml/kg per hour, or less.

10. If an IV bottle is not available, a syringe (with the barrel removed) can be attached to the tube and used as a funnel. Hold the syringe above the patient's head and pour ORS solution into it at regular intervals.

TECHNIQUE FOR NASOGASTRIC REHYDRATION



Source: King, M.et al. *Primary child care: a manual for health workers.* Book One. Oxford University Press, 1978

ANNEX B

ORT CORNER

An ORT corner is an area in a health facility available for oral rehydration therapy (ORT). This area is needed because mothers and their children who need ORS solution will have to stay at the clinic for several hours.

When there are no diarrhoea patients using the ORT corner, the area can be used for treating other problems. Then the space is not wasted. When there are dehydrated patients, this conveniently located and adequately equipped ORT corner will help the staff to manage the patients easily.

The ORT corner should be:

* Located in an area where staff frequently pass by but not in a passageway. The staff can observe the child's progress and encourage the mother.
* Near a water source
* Near a toilet and washing facilities
* Pleasant and well-ventilated

The ORT corner should have the following furniture.

* Table for mixing ORS solution and holding supplies
* Shelves to hold supplies
* Bench or chairs with a back where the mother can sit comfortably while holding the child
* Small table where the mother can conveniently rest the cup of ORS solution

The ORT corner should have the following supplies. These supplies are for a clinic that receives 25-30 diarrhoea cases in a week.

* ORS packets (a supply of at least 300 packets per month)
* 6 bottles that will hold the correct amount of water for mixing the ORS packet, including some containers like those that mother will have at home
* 6 cups
* 6 spoons
* 2 droppers (may be easier to use than spoons for small infants)
* cards or pamphlets (such as a Mother's Card) that remind mothers how to care for a child with diarrhoea. A card is given to each mother to take home.
* Soap (for handwashing)
* Wastebasket

* Food available (so that children may be offered food or eat at regular meal times)

The ORT corner is a good place to display informative posters. Since mothers sit in the ORT corner for a long time, they will have a good opportunity to learn about health prevention from the posters.

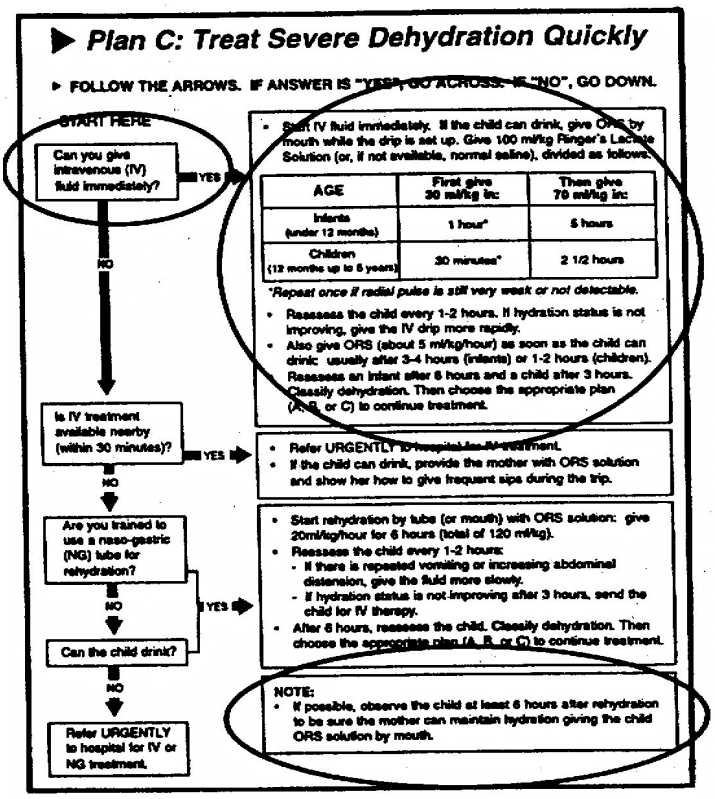
Mothers are interested in posters about the treatment and prevention of diarrhoea and dehydration. The posters should contain information about ORT, use of clean water, breastfeeding, weaning foods, handwashing, the use of latrines, and when to take the child to the clinic. Other health messages should include information on immunizations.

Posters alone are not adequate for informing mothers. Doctors should also counsel mothers in person, using a Mother's Card if there is one available.

ANNEX C-1

IF YOU CAN GIVE INTRAVENOUS (IV) TREATMENT

If you can give IV treatment and you have acceptable solutions such as Ringer's Lactate or Normal Saline at your clinic, give the solution intravenously to the severely dehydrated child.



The sections of Plan C below describe the steps to rehydrate a child intravenously. It includes the amounts of IV fluid that should be given according to the age and weight of the child. Study the sections carefully.

- Start IV fluid immediately. If the child 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:

AGE	First give 30 ml/kg in:	Then give 70 ml/kg in:
Infants (under 12 months)	1 hour*	5 hours
Children (12 months up to 5 years)	30 minutes*	2 1/2 hours

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

- Reassess the child every 1-2 hours. If hydration status is not improving, give the IV drip more rapidly.
- Also give ORS (about 5 ml/kg/hour) as soon as the child can drink: usually after 3-4 hours (infants) or 1-2 hours (children).
- Reassess an infant after 6 hours and a child after 3 hours. Classify dehydration. Then choose the appropriate plan (A, B, or C) to continue treatment.

NOTE:
- If possible, observe the child at least 6 hours after rehydration to be sure the mother can maintain hydration giving the child ORS solution by mouth.

Provide IV Treatment for Severe Dehydration

When you provide IV therapy for SEVERE DEHYDRATION, you give the child a large quantity of fluids quickly. The fluids replace the body's very large fluid loss.

Begin IV treatment quickly in the amount specified in Plan C. If the child can drink, give ORS by mouth until the drip is running. Then give the first portion of the IV fluid (30 ml/kg) very rapidly (within 60 minutes for infants, within 30 minutes for children). This will restore the blood volume and prevent death from shock. Then give 70 ml/kg more slowly to complete rehydration.

During the IV treatment, assess the child every 1 - 2 hours. Determine if the child is receiving an adequate amount of IV fluid.

EXAMPLE

The following example describes how to treat a child with SEVERE DEHYDRATION if you can give IV treatment.

A 6-month-old (9 kg) girl, Ellen, was classified as SEVERE DEHYDRATION and NO ANAEMIA AND NOT VERY LOW WEIGHT. She was not able to drink but had no other disease classifications. IV treatment was available in the clinic. Therefore, the doctor decided to treat the infant with IV fluid according to Plan C.

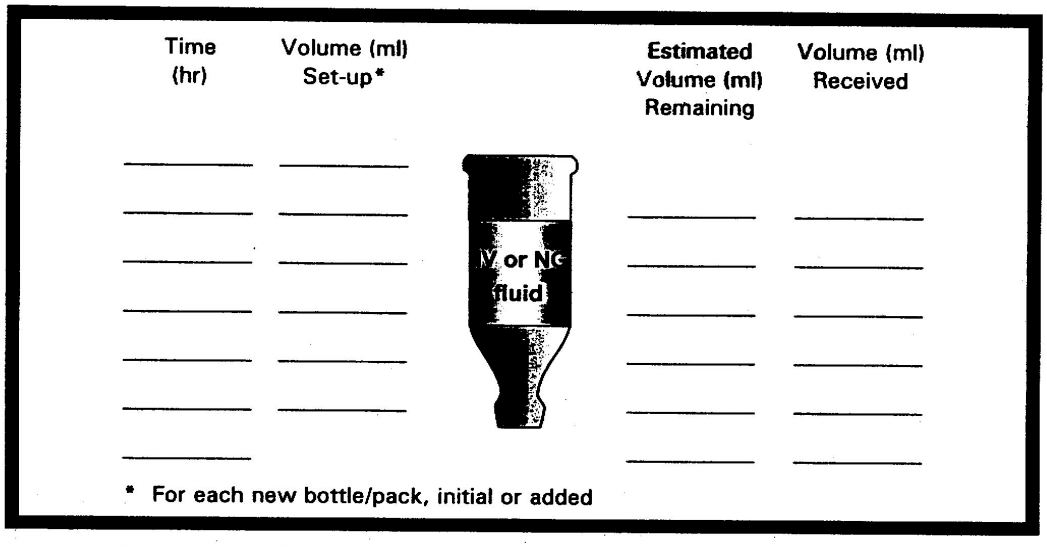
The doctor gave Ellen 270 ml (30 ml x 9 kg) of Ringer's Lactate by IV during the first hour. Over the following five hours, he gave her 630 ml of IV fluid (70 ml x 9 kg), approximately 125 ml per hour. The doctor assessed the infant's hydration status every 1-2 hours (that is, he assessed for dehydration). Her hydration status was improving, so the doctor continued giving Ellen the fluid at a steady rate.

After 4 hours of IV treatment, Ellen was able to drink. The doctor continued giving her IV fluid and began giving her approximately 45 ml of ORS solution to drink per hour.

After Ellen had been on IV fluid for 6 hours, the doctor reassessed her dehydration. She had improved and was reclassified as SOME DEHYDRATION. The doctor chose Plan B to continue treatment. The doctor stopped the IV fluid. He began giving Ellen ORS solution as indicated on Plan B.

Monitor Amount of IV Fluid and the Child's Hydration Status

When rehydrating a child who has SEVERE DEHYDRATION, you have to monitor the amount of IV fluid that you give. You may use a form, similar to the following sample form.



The form has 4 columns to record the amount of fluids given to a patient over a period of time.

1. **Time:** Record the times that you will check the IV fluid.

For an Infant: (under 12 months)	**For a Child:** (12 months up to 5 years)
* After the first hour	* After the first half hour (30 minutes)
* Every hour over the next 5 hours	* Every half hour over next 2½ hours

2. **Volume Set-up:** As you start the IV fluid, record the amount of fluid in the bottle or pack. The amount should be listed on the container. Each time you replace the IV fluid with another container, be sure to record the amount on the appropriate line on the form at the time of replacement.

3. **Estimated Volume Remaining:** Check the IV fluid remaining in the container at the times listed. The remaining volume cannot be read precisely. Estimate it to the nearest 10 ml (for example - 220 ml, 230 ml, 240 ml, etc). Record the estimated amount on the form.

4. **Volume Received:** Calculate the amount of IV fluid received by the child at the times listed. To calculate, subtract the "Volume remaining" amount from the "Volume set-up" amount. The answer is the amount of IV fluid the child has received up to the time you are checking. Record that amount on the form.

It is helpful to mark the IV fluid container with a pen or tape to show the level that should be reached at a certain time. For example, mark the desired level to reach after the first 30 or 60 minutes, each hour, or at the end of 3 or 6 hours. This will help you adjust the rate of the drip correctly. Regulate the number of drops per minute to give the correct amount of fluid per hour.

The sample form below shows the amounts of IV fluid given to a 16-month-old (10 kg) child who is classified as having SEVERE DEHYDRATION. The doctor followed Plan C. He gave the child 300 ml (30 ml ×10 kg) in the first 30 minutes. He gave 700 ml (70 ml × 10 kg) over the next 2.5 hours (about 300 ml per hour).

Sample Fluid Form

Time (hr)	Volume (ml) Set-up*		Estimated Volume (ml) Remaining	Volume Received
12:00 pm	1000 ml			
12:30 pm			700 ml	300 ml
1:30 pm			400 ml	600 ml
2:30 pm			100 ml	900 ml
3:00 pm			0 ml	1000 ml

* For each new bottle/pack, initial or added

Make sure the IV fluid is given correctly and in adequate amounts. To monitor whether the fluid rate is adequate, reassess the child's dehydration every 1-2 hours. If the signs of dehydration and the diarrhoea are worse or not improved, increase both the rate you give the fluid and the amount of fluid that you give. Also increase the fluid rate if the child is vomiting. If the signs are improving, continue giving IV fluid at the same rate.

While giving IV fluid, remember to also give small sips of ORS solution to the child as soon as he can drink. Give the child approximately 5 ml of ORS solution per kilogram of body weight per hour.

Reassess Dehydration and Choose the Appropriate Treatment Plan

Assess the signs of dehydration in an infant after 6 hours and a child after 3 hours. Classify dehydration. Select the appropriate treatment plan (Plan A, B or C) to continue treatment.

After a child has been fully rehydrated and is classified as NO DEHYDRATION, keep the child at the clinic for 6 more hours if possible. During this time, the mother should give extra fluid according to Plan A. Watch to be sure that the mother can give enough fluid to fully replace all fluid lost while the diarrhoea continues. The child should also be fed. Check the child periodically to make sure that signs of dehydration do not return.

EXERCISE: ANNEX C-1

1. Barec is 3 years old and weighs 15 kg. His mother told the doctor that his diarrhoea started yesterday. The doctor assessed Barec and found that he is not able to drink and a skin pinch goes back very slowly. Barec is classified as diarrhoea with SEVERE DEHYDRATION and NOT VERY LOW WEIGHT and NO ANAEMIA. The doctor can give IV treatment.

   a. How should the doctor treat Barec's dehydration?

   b. What amount of fluid should Barec be given?

   c. The doctor monitors the IV fluid each half hour to be sure it is given at the rate he calculated. He also assesses Barec's dehydration each hour. After about 2 hours, Barec is more alert and can drink. What should be done now?

   d. After Barec has completed 3 hours of IV treatment, what should the doctor do?

2. Amaru is 2 years old, weighs 8 kg. He has diarrhoea. A doctor determines that Amaru is lethargic, but able to drink. His eyes are sunken, and a skin pinch goes back very slowly. The doctor classifies Amaru as diarrhoea with SEVERE DEHYDRATION.

   He has a fever of 38.5°C and a runny nose. His risk of malaria is high. The doctor also classifies him as VERY SEVERE FEBRILE DISEASE. He has VERY LOW WEIGHT and NO ANAEMIA.

The doctor can give IV fluid for Plan C. Should Amaru be urgently referred to a hospital? Why or why not?

3. Dano is 8 months old and weighs 6 kg. He is no longer breastfed. His mother brings him to a clinic because he has had diarrhoea for a week. The mother tells the doctor that there has been no blood in Dano's stools. The doctor sees that Dano's eyes are sunken. When encouraged, Dano is able to take a sip of water, but drinks poorly. A skin pinch goes back very slowly. The doctor, who can give IV treatment, finds Dano has diarrhoea with SEVERE DEHYDRATION, NOT VERY LOW WEIGHT and NO ANAEMIA.

   a. How much IV fluid should be given to Dano in the first hour? How much over the next 5 hours?

   b. Should the doctor give Dano ORS solution?
   If so, how much?

   c. Dano started receiving IV treatment at 1:00 pm from a 1000 ml bottle of IV fluid. The doctor checked Dano every hour. She recorded the amounts remaining in the bottle. See the fluid form. Calculate the amounts of IV fluid that Dano received and record them on the form.

Time (hr)	Volume (ml) Set-up*		Estimated Volume (ml) Remaining	Volume Received
1:00 pm	1000 ml			
2:00 pm			820 ml	
3:00 pm			730 ml	
4:00 pm			640 ml	
5:00 pm			550 ml	
6:00 pm			470 ml	
7:00 pm			400 ml	

* For each new bottle/pack, initial or added

   d. At 7:00 pm, the doctor reassesses Dano for dehydration. He had slept some. He is now awake, alert and drinking well though he does not seem thirsty. His eyes are sunken. The doctor pinched his skin and the pinch goes back immediately. How should the doctor classify Dano's dehydration?

What plan should be followed to continue treating Dano?

Is Dano ready to go home? Why or why not?

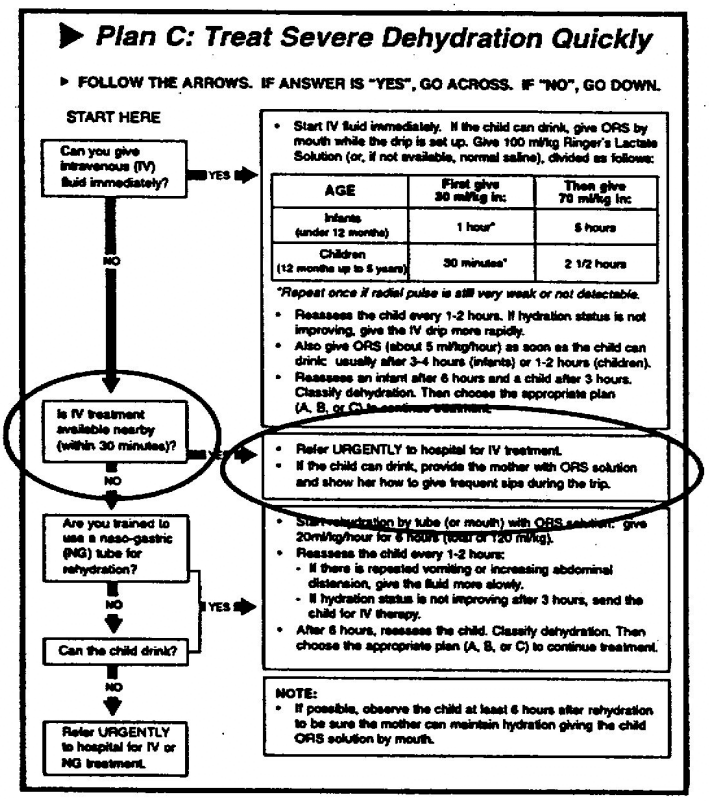
Ask a facilitator to check your answers.

ANNEX C-2

IF IV TREATMENT IS AVAILABLE NEARBY

You are not able to provide IV treatment at your clinic. However, IV treatment is available at a clinic or hospital nearby (within 30 minutes).

Read the Plan C section below that describes this situation.



Refer the severely dehydrated child immediately to the nearby facility. If the child can drink, show the mother how to give sips of ORS solution to the child. She should encourage her child to drink on the way to the facility.

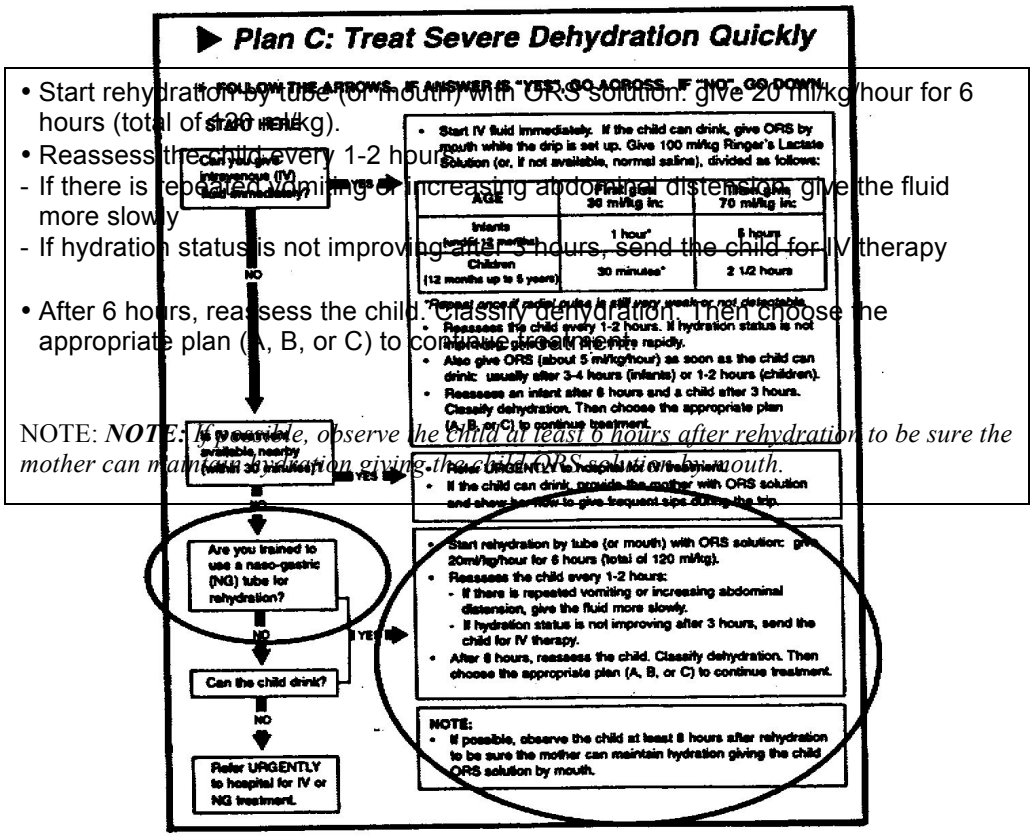
- Refer URGENTLY to hospital for IV treatment.
- If the child can drink, provide the mother with ORS solution and show her how to give frequent sips during the trip.

ANNEX C-3

IF YOU ARE TRAINED TO USE A NASOGASTRIC (NG) TUBE

You cannot give IV treatment at your clinic and there is no nearby clinic or hospital offering IV treatment. If you are trained to use an NG tube, rehydrate the child by giving ORS solution with an NG tube.

Read the sections of Plan C below. They describe the steps to rehydrate a child by NG tube.



- Start rehydration by tube (or mouth) with ORS solution: give 20 ml/kg/hour for 6 hours (total of 120 ml/kg).
- Reassess the child every 1-2 hours:
  - If there is repeated vomiting or increasing abdominal distension, give the fluid more slowly
  - If hydration status is not improving after 3 hours, send the child for IV therapy
- After 6 hours, reassess the child. Classify dehydration. Then choose the appropriate plan (A, B, or C) to continue treatment.

NOTE: ***NOTE:*** *If possible, observe the child at least 6 hours after rehydration to be sure the mother can maintain hydration giving the child ORS solution by mouth.*

To assess a child's hydration status, refer to the signs on the *ASSESS & CLASSIFY* chart.

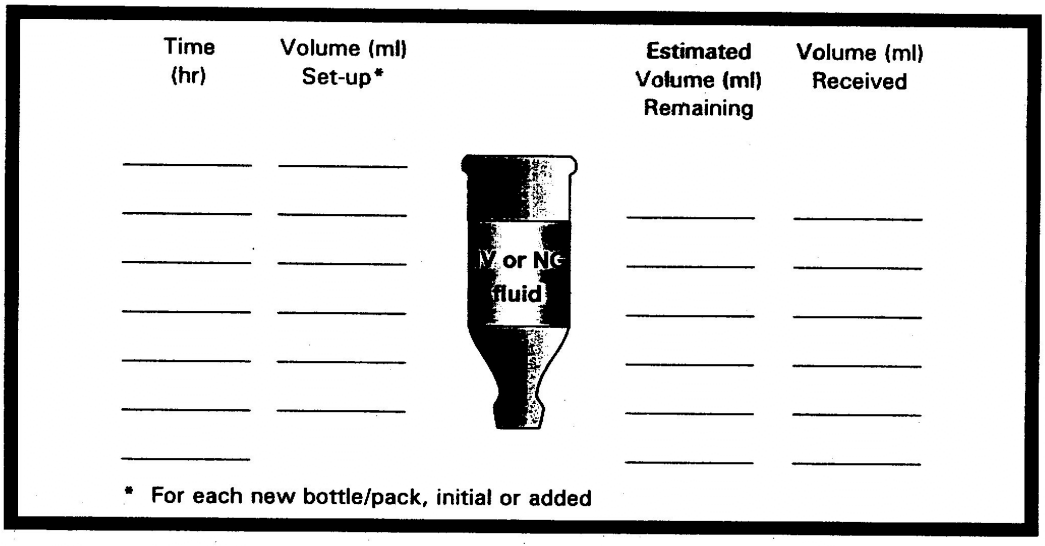
EXAMPLE

The following example describes how to treat a severely dehydrated child if you can give ORS solution by NG tube.

> A 4-year-old (10 kg) boy, Sa, was brought to a clinic with diarrhoea. The clinic did not offer IV treatment and no clinic nearby had IV treatment. NG treatment was available. Sa was not able to drink. He had no other signs of disease. He was classified as diarrhoea with SEVERE DEHYDRATION and NO ANAEMIA AND NOT VERY LOW WEIGHT.
>
> Following Plan C, the doctor decided to give ORS solution to Sa by NG tube. The doctor gave him 200 ml (20 ml × 10 kg) over the next hour. The doctor checked Sa every hour to make sure that he received 200 ml of ORS per hour. She also checked to make sure that the boy was not vomiting and that he did not have abdominal distension.
>
> After 6 hours, Sa had received 1200 ml of ORS solution by NG tube.

Monitor the Amount of NG Fluid and the Child's Hydration Status

When rehydrating a child who has SEVERE DEHYDRATION, you have to monitor the amount of NG fluid that you give over the 6-hour period. You may use a form, similar to the following sample fluid form.



The form has columns to record the amount of NG fluid given.

1. **Time:** Record the times that you will check the NG fluid. You will want to monitor the fluid every hour for 6 hours.

2. **Volume set-up:** When you begin to give NG fluids, record the amount of fluid in the container. Each time you replace the NG fluid container, record the amount on the appropriate line on the form at the time of replacement.

3. **Estimated Volume Remaining:** Check the IV fluid remaining in the container at the times listed. The remaining volume cannot be read precisely. Estimate it to the nearest 10 ml (for example - 220 ml, 230 ml, 240 ml, etc). Record the estimated amount on the form.

4. **Volume received:** Calculate the amount of NG fluid received by the child at the times listed. To calculate, subtract the "Volume remaining" amount from the "Volume set-up" amount. The answer is the amount of NG fluid the child has received up to the time you are checking. Record that amount on the form.

It is helpful to mark the container with a pen or tape to show the level that should be reached at a certain time. For example, mark the desired level to reach after the first 30 or 60 minutes, each hour, or at the end of 3 or 6 hours. This will help you adjust the rate of the drip correctly. Regulate the number of drops per minute to give the correct amount of fluid per hour.

EXAMPLE

The sample form below shows the amounts of NG fluid that Sa received during the 6 hours he was treated at the clinic. The doctor gave him 200 ml of ORS solution by NG tube (that is, 20 ml ×10 kg) beginning at 11:00 am.

Sample Fluid Form

Time (hr)	Volume (ml) Set-up*		Estimated Volume (ml) Remaining	Volume Received
11:00 am	1000 ml			
12:00 pm	---		800 ml	200 ml
1:00 pm	---		600 ml	400 ml
2:00 pm	---		400 ml	600 ml
3:00 pm	---		200 ml	800 ml
4:00 pm	1000 ml		0 ml	1000 ml
5:00 pm			800 ml	1200 ml

* For each new bottle/pack, initial or added

Reassess the child every 1-2 hours:

* If the child is vomiting repeatedly or has increased abdominal distension, give the NG fluid more slowly.

* If the child's dehydration is ***not*** improving after 3 hours, refer the child for IV treatment.

* If the child is improving, continue to give the NG fluid for a total of 6 hours.

Reassess Dehydration and Choose the Appropriate Treatment Plan

After 6 hours of NG fluid, reassess the child for dehydration. Classify dehydration. Select the appropriate treatment plan (Plan A, B or C) to continue treatment.

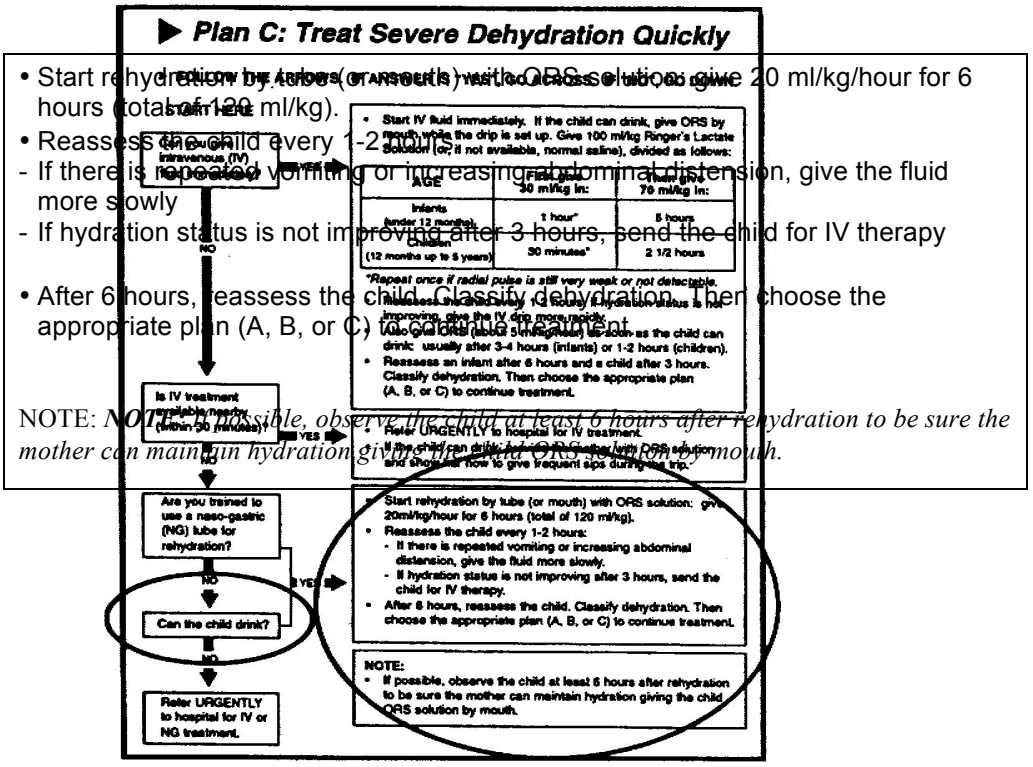
After a child has been fully rehydrated and is classified as NO DEHYDRATION, keep the child at the clinic for 6 more hours if possible. During this time, the mother should give extra fluid according to Plan A. Watch to be sure that the mother can give enough fluid to fully replace all fluid lost while the diarrhoea continues. The child should also be fed. Check the child periodically to make sure that signs of dehydration do not return.

ANNEX C-4

IF YOU CAN
ONLY GIVE PLAN C TREATMENT BY MOUTH

You cannot give IV fluids at your clinic. There is no clinic or hospital nearby that can give IV treatment. You are not able to use an NG tube for rehydration.

To learn how to give Plan C treatment by mouth, read the sections of Plan C below. Study the sections carefully



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

- After 6 hours, reassess the child. Classify dehydration. Then choose the appropriate plan (A, B, or C) to continue treatment.

NOTE: *NOTE: If possible, observe the child at least 6 hours after rehydration to be sure the mother can maintain hydration giving the child ORS solution by mouth.*

If a child with SEVERE DEHYDRATION comes to your clinic and you cannot give IV or NG treatment, find out if the child is able to drink.

- **If he is able to drink, you can try to rehydrate the child orally.**

- **If the child is not able to drink, you must refer him urgently to the nearest clinic or hospital where IV or NG treatment is available. If this child does not receive fluids, he will die.**

To assess a child's hydration status, refer to the signs on the *ASSESS & CLASSIFY* chart.

Monitor the Amount of ORS

If you will rehydrate the child orally, you will have to monitor the amount of ORS solution you give him. Give 20 ml per kilogram of body weight per hour for a 6-hour period. After 6 hours, you will have given the child a total of 120 ml of ORS solution per kilogram of the child's weight.

Reassess the child's hydration status every 1-2 hours.

* If there is repeated vomiting or increasing abdominal distension, give the fluid more slowly.

* If the child's hydration status is ***not*** improving after 3 hours, refer the child for IV treatment.

EXAMPLE

Lulutown Health Clinic does not give IV or NG therapy. The nearest hospital that can give IV or NG treatment is more than 2 hours away.

A 15-month-old (7 kg) girl, Eleli, was brought to Lulutown Clinic by her mother. Eleli appeared to be sleeping but was able to take small sips of a drink when aroused. The doctor found that she had sunken eyes. A skin pinch went back very slowly. She was classified as diarrhoea with SEVERE DEHYDRATION and NO ANAEMIA AND NOT VERY LOW WEIGHT.

The doctor decided to rehydrate Eleli by mouth according to Plan C. Since Eleli weighed 7 kg, the doctor calculated that she needed 140 ml of ORS solution per hour. The doctor showed Eleli's mother how much ORS to give in one hour.

Each hour during the next 6 hours, the doctor checked Eleli to make sure she was not vomiting and that her abdomen was not distended. The doctor also checked her hydration status. As Eleli began to improve, the doctor encouraged the mother to continue rehydrating Eleli.

Reassess Dehydration and Choose the Appropriate Treatment Plan

After 6 hours of taking ORS solution by mouth, reassess the child for dehydration. Classify dehydration. Select the appropriate treatment plan (Plan A, B or C), and continue treatment.

After the child is rehydrated, keep the child at the clinic for 6 more hours if possible. During this time, encourage the mother to give extra fluid according to Plan A. Watch to be sure that the mother can give enough fluid to fully replace all fluid lost while the diarrhoea continues. Check the child periodically to make sure that signs of dehydration do not return.

Remember:

If the child cannot drink, refer the child urgently to the nearest clinic or hospital for IV or NG treatment.

If this child does not receive fluids, he will die.

ANNEX D

INTRAVENOUS TREATMENT FOR SEVERE DEHYDRATION

1. Technique of Administration

The technique of administration of intravenous (IV) fluids can only be taught through practical demonstration by someone with experience. Only trained persons should give IV treatment. Several general points are:

* The needles, tubing, bottles and fluid used for IV treatment must be **sterile**.

* IV treatment can be given into any convenient vein. The most accessible veins are generally those in front of the elbow or on the back of the hand. In infants, the most accessible veins are on the side of the scalp.

  Use of neck veins or incision to locate a vein are usually not necessary and should be avoided if possible.

  In cases requiring rapid resuscitation, a needle may be introduced into the femoral vein 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 can be removed when the patient is becoming rehydrated.

* It is useful to mark IV bottles at various levels to show the times at which the fluid should fall to those levels. Regulate the number of drops per minute to give the correct amount of fluid per hour.

2. Solutions for Intravenous Infusion

Although a number of IV 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 IV treatment is being given. The following is a brief discussion of the relative suitability of several IV solutions.

Preferred Solution

Ringer's Lactate Solution, also called Hartmann's Solution for Injection, is the best commercially available solution. It supplies an adequate concentration of sodium and sufficient lactate, which is metabolised to bicarbonate, for the correction of acidosis.

Ringer's Lactate Solution can be used in all age groups for dehydration due to acute diarrhoea of all causes. Early provision of ORS solution and early resumption of feeding will provide the required amounts of potassium and glucose.

Acceptable Solutions

The following acceptable solutions may not provide adequate potassium, bicarbonate, and sodium to the patient. Therefore, give ORS solution by mouth as soon as the patient can drink.

Normal Saline, also called Isotonic or Physiological Saline, is often readily available. It will not correct the acidosis. It will not replace potassium losses. Sodium bicarbonate or sodium lactate and potassium chloride can be given at the same time. This requires careful calculations of amounts and monitoring is difficult.

Half-strength Darrow's Solution, also called Lactated Potassic Saline, contains less sodium chloride than is needed to efficiently correct the sodium deficit from severe dehydration.

Half Normal Saline in 5% Dextrose contains less sodium chloride than is needed for efficient correction of dehydration. Like Normal Saline, this will not correct acidosis nor replace potassium losses.

Unsuitable Solution

Plain Glucose and **Dextrose Solutions** should not be used. They provide only water and sugar. They do not contain electrolytes. They do not correct the electrolyte losses or the acidosis.