

PN-AAT-050

KSU-40590

DISEASES OF
INFANTS AND CHILDREN
MODULE

STUDENT TEXT

1980
Rural Health Development Project
Ministry of Health and Social Welfare
Maseru, Lesotho

ACKNOWLEDGEMENTS

Nurse Clinician training materials are Lesotho adaptations based upon the MEDEX prototype curriculum for training mid-level health workers.

The prototype MEDEX materials were developed by the Health Manpower Development Staff of the John A. Burns School of Medicine, University of Hawaii. The original prototypes were based on training experience in over a dozen third-world countries. These were revised on the basis of HMDS experience in Micronesia, Thailand, Pakistan, and Guyana before being made available to Lesotho under a U.S.A.I.D. funded contract.

Major adaptation in Lesotho began at the National Nurse Clinician Training Programme Curriculum Adaptation Workshop held at Mazenod in January 1980. The nearly fifty participants represented all major health and health related activities in Lesotho, both Government and private. These participants and others working as individuals and then as review committees have adapted the Nurse Clinician training materials to meet the conditions and needs of Lesotho.

The Government of Lesotho and particularly the staff of the Nurse Clinician training Programme are grateful to HMDS for supplying the prototype materials and to all those individuals who have helped in the Lesotho adaptation process.

TABLE OF CONTENTS

LIST OF REFERENCES	1
SCHEDULE	2
MAINUTRITION	3
Malnutrition	7
DEHYDRATION AND DIARRHOEA	17
Diarrhoea and Dehydration	18
Practice in Estimating Fluid Replacement for Dehydrated Children	36
NEWBORN PROBLEMS	38
Low Birth Weight Infant	40
Septicaemia in the Young Infant	43
Jaundice of the Newborn	46
Expressed Breast Milk	48
COMMON INFECTIONS OF CHILDREN	53
Thrush	54
Whooping Cough	56
Measles	59
High Fever	62
Croup	63
Mumps	65
Chickenpox	66
Polio (Poliomyelitis, Infantile Paralysis)	68
OTHER PROBLEMS OF INFANTS AND CHILDREN	71
Rheumatic Fever	72
MANAGEMENT PROTOCOLS	
Early Malnutrition	75
Severe Malnutrition	76
Prevention of Malnutrition	77
Diarrhoea/Dehydration (some/mild)	78
Diarrhoea/Dehydration (severe)	79
Low Birth Weight Infant	80
Septicaemia in Young Infant	81
Jaundice of the Newborn	82
Thrush	83
Whooping Cough	84
Measles	85
High Fever	86
Mumps	87
Chickenpox	88
Polio	89
Croup	90
Rheumatic Fever	91

REFERENCES USED IN THE DEVELOPMENT OF THE
DISEASES OF INFANTS AND CHILDREN PROTOTYPE MODULE

General References:

- Baldwin, B., *Child Health, A Manual for Medical Assistants and Other Rural Health Workers*, African Medical Research Foundation, 1975.
- Ebrahim, G.J., *Care of the Newborn in Developing Countries*, MacMillan Press Ltd., 1979.
- Essex, B.J., *Diagnostic Pathways in Clinical Medicine*, African Medical and Research Foundation, 1975.
- Jelliffe, D.B., *Diseases of Children in the Subtropics and Tropics*, second edition, Arnold, 1972.
- Kempe, C.H., Siver, H.K., O'Brien, D., *Current Pediatric Diagnosis and Treatment*, third edition, Lang, 1974.
- King, M., et.al., (1978), *Primary Child Care: A Manual for Health Workers*, Oxford, London.
- King, Maurice, et.al., *Nutrition for Developing Countries*, Oxford University Press, 1972.
- Morley, D., *Pediatric Priorities in the Developing World*, Butterworth, 1973.
- Watt, G.B., Watt, J.L., Halestrap, D.J., *Medical Assistant's Manual, A Guide to Diagnosis and Treatment*, McGraw-Hill, 1973.
- W.H.O., *Treatment and Prevention of Dehydration in Diarrhoeal Diseases: A Guide for use at the Primary Level*, 1976.
- The Child in the Health Centre*, Lembaga Kesehatan Nasional, Jalan Indrapura, Surabaya, Indonesia, 1974.

SCHEDULE

DAY	DAY	DAY	DAY 1	DAY 2
			History and Physical examination of child	Clinical practice of physical examination
				Testing

SCHEDULE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5

This DISEASES OF INFANTS AND CHILDREN contains the two most important conditions of children:

Diarrhoea and Malnutrition

plus others including common childhood infections and conditions of the newborn.

However, some common diseases of children are discussed in other modules:

1. Pneumonia - Disease of Heart and Lung
2. Otitis Media - Diseases of EENT
3. Pharyngitis and URI - Diseases of EENT
4. Meningitis - Infectious Disease
5. Worms - Disease of G.I.
6. Tuberculosis - Infectious Disease

STUDENT GUIDE

MALNUTRITION

I. Entry Level Knowledge and Skill

Before starting this unit you should be able to:

1. Perform and record the results of the physical exam of an infant or child following the guidelines provided by the instructor.
2. Use the diagnostic protocols.
3. Use the growth chart to identify the malnourished child.

II. Objectives

Using the information and experiences provided by the instructor and the module text, you will be able to:

1. Identify the physical signs associated with protein and calorie malnutrition.
2. Use superporridge flip chart to teach mothers.
3. Describe the usual course and common complications of kwashiorkor and marasmus.
4. Use the diagnostic and management protocols as a guide to identification and management of malnutrition.
5. Describe the management procedure for malnourished children.

III. Evaluation

Upon completion of this module you will be rated on your attainment of the above objectives.

Knowledge: Written test based upon the module content.
Acceptable performance, 80%.

Skill: See rating sheet for acceptable performance level.

- a. Teaching mothers to prepare superporridge.

IV. Activities you will be participating in to accomplish the objectives:

1. Practice taking a history of a child in a clinic.
2. Practice physical exam of child in clinic.
3. Read the module text on identification causes and management of malnutrition and answer the review questions.
4. View and discuss slide presentation on signs of Protein-calorie malnutrition.
5. Participate in demonstration and discussion of parent education using superporridge flip chart.
6. Practice parent education.
7. Review of growth charting procedures and practice growth charting.

MALNUTRITION

General Considerations

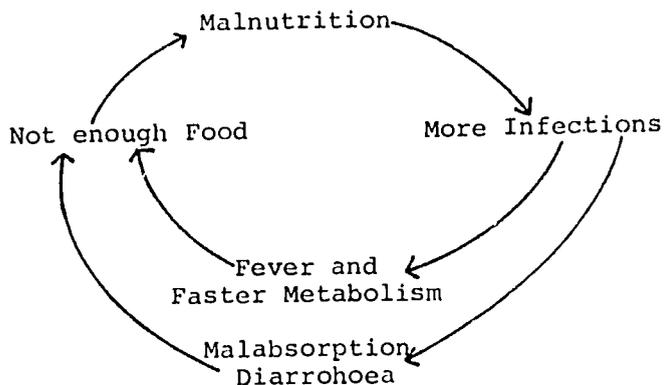
Malnutrition is the term used to describe a condition that occurs if a person has had an inadequate food intake over a period of time. This occurs if the person does not eat enough food, or if the diet is imbalanced (not enough of the right foods), or if the person eats too much food.

- a. If they eat too little food, they lose weight and come into a starved condition (for example, marasmus).
- b. If they eat an imbalanced diet (not enough of the right foods) they acquire a variety of specific symptoms (for example, oedema in protein deficiency and night blindness in Vitamin A deficiency).
- c. If people eat too much, they become overweight (obese).

For children malnutrition is usually due to eating too little food or not enough of the right foods. Obesity is caused by eating more food than the body can use.

The absence of enough food and the right foods in children retards their growth, makes them susceptible to infections and becomes a great risk to their life. Children need good food because they grow so quickly. They are in the vulnerable time of their life. A new-born baby should double his size in months and then double it again in years, etc. His body and brain is growing and it is the right foods that allow them to grow adequately.

The absence of enough food retards their growth. It also makes children more susceptible to infections. The fever associated with infections literally burns up (metabolizes) more food which in turn requires more food. Diarrhoea causes malabsorption of the food being taken in and a dangerous cycle begins.



This, of course, increases the risk of death.

Why don't children get enough food?

Some children are born to very poor families who do not have enough food to give them. But . . . more commonly, it is related to incorrect traditional and incorrect new practices of feeding children.

1. Not starting supplementary foods at an early enough age. Some families wait to start cereals and legumes until the child is a year old or older. That is too long. Children should begin cereals and legumes at 4 to 6 months.
2. The practice of using the bottle instead of breast milk lends to over diluted formulas and inadequate food intake. Dirty water and dirty bottles cause diarrhoea and poor absorption of the food.
3. Not giving a variety of foods so that one nutrient group is absent, such as protein, which results in kwashiorkor.

When is malnutrition commonly found?

Malnutrition is most common among children between the ages of 6 months and 3 years. This is when children are being weaned from the breast, often because the mother is pregnant with another child.

In areas where bottle feeding is practiced, malnutrition is also common among those infants younger than 6 months. Infants without breast milk are very susceptible to malnutrition and infection.

Malnutrition is often more common among people who have left their traditional diets such as people who have left the rural areas to live in peri-urban areas when they must buy their food. The foods available for purchase are often different and more expensive than those available in the village. This often results in imbalanced and inadequate diets for children.

Clinical Picture

Early Malnutrition:

The earliest picture of malnutrition is an irritable whining child who is not growing as fast as he should.

The parent may notice the child's crying and irritation. In some areas mild-moderate malnutrition is so common that these symptoms are thought to be normal

The child has often been recently removed from the breast because the mother is pregnant again. The child has been taking only milk for 8 to 10 months and no other foods have been encouraged or the child has been started on bottle feedings. Often the child is sent to another family member, like a grandmother, when the mother becomes pregnant. The child is usually started on imbalanced solids immediately . . . like mealie porridge without vegetables or a source of protein.

The child is often brought to the clinic for another problem such as diarrhoea, a cold, measles or pneumonia. Although the child is undernourished the parents may not be concerned about this condition. The best way to determine whether early malnutrition is present is by frequent periodic weighings. Once a month the child's weight is compared to the curves on the Growth Chart.

Severe Malnutrition:

If not treated correctly, early malnutrition progresses to severe malnutrition.

The most common form of severe malnutrition is called marasmus. This occurs when the total intake of food is inadequate. A marasmic child is very thin, has prominent bones - ribs and facial bones, has little muscle or fat, his hair is coarse and falls out easily. The child looks miserable and ill.

The second most common form of severe malnutrition is kwashiorkor. This occurs when total intake of food is low but protein is especially low. This child becomes oedematous. The upper arms are usually thin but the face is round and puffy, oedema is present over the feet and front part of the legs, ascites may be present. The hair becomes reddish and lighter in colour and skin lesions may be present.

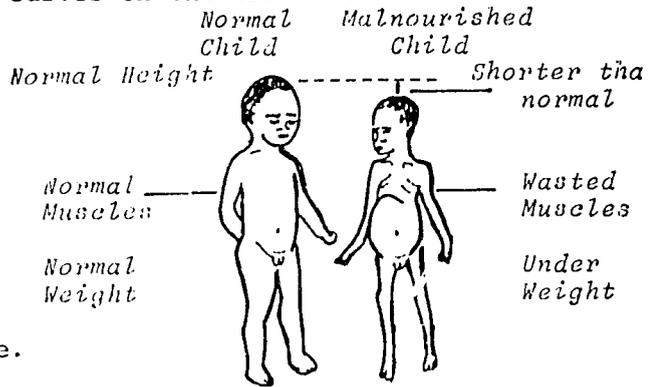


Fig. IC 1 - Growth failure can be seen easily when the child is compared with a normal child.

MARASMUS KWASHIORKOR

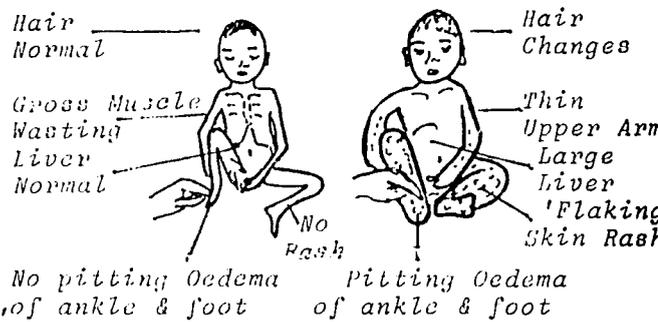


Fig. IC 2 - Marasmus and Kwashiorkor.

MARASMUS

KWASHIORKOR

General Appearance:	"Skin and bones", miserable	Miserable and crying. Poor appetite
Muscle:	Very thin	Thin upper arms; fore-arms and legs swollen with oedema.
Skin:	Very thin and wrinkled with "tenting"	"Flaking paint" rash, pitting oedema of feet and ankles.
Weight:	Extremely underweight	Moderately underweight.
Face:	"Looks like a little old man"	Round "puffy" face
Hair	Relatively normal but can be coarse and falls out easily	Lighter in colour, reddish

Course of the Disease and Complications

Early malnutrition may be present for long periods of time. If it continues to be present, stunted height is the long-term result. However, commonly mild/early malnutrition links up with infections such as diarrhoea or measles and progresses to the severe forms of malnutrition (marasmus and kwashiorkor). When severe malnutrition is present, superimposing infections often result in death.

Vitamin A deficiency (night-blindness and/or Bitot spots) may be present with generalized malnutrition. Bitot spots are shiny gray triangular spots on the conjunctiva associated with Vitamin A deficiency. This can lead to blindness which cannot be cured.

Management

Early Malnutrition:

The treatment for malnutrition is sufficient food. It is also very important that the mother receive proper instruction on how to give sufficient, well prepared food.

Less than 6 months -

If the child is less than 6 months of age and is under-nourished, this child is not getting enough breast milk or is getting contaminated milk or diluted milk from a bottle.

1. Treatment for this child is breast milk at least 6 times a day and cereal/legume porridge three times a day. If breast milk is not available, more frequent small meals are indicated.
2. If the child is being given the bottle, it should be stopped. All foods including boiled milk should be given with a cup and spoon which is washed before and after each feeding; NOT a bottle. It is not possible to keep a bottle sterile in the village setting.
3. Monthly weights.
4. Continue to feed during periods of illness in frequent small amounts.

Older than 6 months of age to 2 years -

1. Treatment for this child includes continuing breast milk or cow's milk and at least six servings of cereal/legume porridge a day.
2. Other foods such as vegetables, fruits, eggs and meat should be encouraged. Food should be cooked without adding salt, sugar or spices.
3. Stop all feedings with a bottle and use cup and spoon which is washed before and after each feeding instead.
4. Continue to feed the child when he is ill (diarrhoea, fever, cold or whatever) with small frequent feedings, because a child requires more food when ill. He also requires more fluids to prevent dehydration.
5. Monthly weights and check-ups.

2 to 5 Years -

1. This child should be receiving a mixed diet of adult foods 3 to 4 times a day.
2. All bottles should be discontinued.
3. Feedings should continue when the child is ill in small, frequent feedings. Increased fluids should also be given.
4. Monthly weights and check-ups.

Severe Malnutrition:

1. Not able to take feedings by mouth. If the child is so ill that he is unconscious or too weak to even swallow, this child should be referred to a hospital for treatment.
2. Able to take feedings by mouth. If the child is severely malnourished with marasmus or kwashiorkor but is able to take oral feedings, you should begin treatment at the health centre/home.

The most important treatment is food. These children may have lost their appetite so they may have to be coaxed to eat. They must eat many times a day - 10 - 12 times a day.

- a. If their mother is still able to breast feed, this should be continued but in addition to breast milk they need other food.
 - b. Give at least 6 feedings a day for one week of a mixed cereal legume porridge such as super porridge. This should be made from locally available cereal and legumes. Then add extra feedings of vegetables, fruit, eggs and milk.
 - c. Weigh the child two times a week. A marasmic child should gradually gain weight. A kwashiorkor child when improving will first lose the oedema resulting in initial weight loss and then begin to gain weight.
 - d. If the child continues to lose weight or gets a respiratory infection, he should be referred to a hospital. Marasmus and kwashiorkor are serious diseases with a high mortality rate.
 - e. If Bitot spots are present, treat with multi vitamin capsules containing 5,000 Units of Vitamin A daily for three weeks.
3. Management after the 1st. Week.
 1. Make sure the parents understand that it is the lack of food that causes this disease.
 2. Keep giving the mixed cereal/legume porridge.
 3. Have mother start child on a variety of soft foods including fruits and vegetables, beans, fish, eggs, and meat if possible.

4. Teach the parents the Six Basic Health Messages for avoiding malnutrition in their children.
5. See weekly in the regular child care clinic, or, even better at a special nutrition clinic. If you have several malnourished children you are following, you can start a special "*nutrition education*" clinic. (See Child Care Module). This will give you the opportunity to teach several families at the same time about better foods.
6. Maintain Growth Chart: Extra effort should be made to follow these "High Risk" children as closely as possible. Special attention will be required to assure they are well immunized and that their nutritional status is improving. (See Child Care Module).

Complications

Children who are malnourished are likely to have some infection in addition to their malnutrition. You should examine them carefully. The following diseases or symptoms are frequently associated with malnutrition.

1. Diarrhoea/dehydration
2. T.B.
3. Pneumonia
4. Otitis media
5. Anaemia
6. Worms
7. Urinary infection
8. Measles

Look for these diseases or symptoms and treat them according to the respective management protocols.

Prevention

1. Child Care Clinic

The prevention of malnutrition is one of the primary functions of the Child Care Clinic. The Growth Chart helps to identify children with mild (or early) malnutrition. These children are then considered at high risk of becoming severely malnourished and/or severely ill with an infection. These children and their parents should be given extra attention and advice about feeding.

2. Six Basic Health Messages

All parents should be taught the six basic health messages for avoiding malnutrition in their children.

1. Breastfeed until child is 2 years old.
NO BOTTLES.
2. Start supplementary feeds such as super porridge made with cereals and legumes at 4 to 6 months.
3. Give a variety of fruits, vegetables, eggs and meat to children over 4 to 6 months old.
4. Feed child at least 4 meals a day. Children need to eat more often than adults because their stomachs are small.
5. Continue to feed sick children.
6. Give pregnant and lactating women more vegetables and protein-rich foods.

See Nutrition and Child Care Modules for further information and preventing malnutrition.

Preparation of Super Porridge

Super porridge is a nutritious food that mothers can easily make at home. It should be given in addition to the regular diet of the child. Super porridge will help to keep a baby healthy and happy. You should teach mothers of poorly nourished children how to make super porridge. (See Flip Chart)

Directions for making super porridge:

1. Ingredients:

Maize } Rice, millet or any grain can be substituted
Wheat } for either corn or wheat

Beans - Any type of bean can be used

2. Procedure:

Take one part wheat flour, one part corn flour and mix them together. Keep in a covered container to keep out insects and rodents. Cover beans with water and let them stand overnight. Cook the beans.

To make the porridge, boil $\frac{1}{2}$ - 1 cup of water in a cooking pot. Add 1 to 2 handfuls of the flour mixture, add 2 handfuls of the beans to the water. Let it boil a little.

Cool porridge before feeding.

OR

Prepare Mabele porridge with milk or eggs.

MALNUTRITION

REVIEW QUESTIONS

1. What is the best way of identifying a child who is suffering from the effect of mild malnutrition? (Check the one correct answer.)
 - a. Observe general appearance
 - b. Periodic, frequent weighings
 - c. Obtain history of poor appetite

2. Often, a malnourished child will be brought to see you because of a problem such as diarrhoea, measles, or pneumonia. Explain why you will find many children who are suffering from acute disease problems in addition to being malnourished.

3. Marasmus and Kwashiorkor are the names for two types of malnutrition. They are the result of low food intake. Which of these two forms of malnutrition results when the intake of protein is especially low?

4. What are some of the factors other than availability of food which effect the nutritional condition of a child. (name 3)
 - a)
 - b)
 - c)

5. The treatment for malnutrition is sufficient food. Describe your management of the following child:
Problem: This child is suffering from mild malnutrition. She is 4 months old and has been receiving diluted bottle milk from a bottle, and no other food.

6. Describe your management of this child:

Problem: This 2 year old child is suffering from severe malnutrition but is conscious and able to take food by mouth.

Describe your feeding programme, instructions to the child's mother, and your follow-up schedule.

7. In order to help prevent malnutrition, you conduct MCH and ANC clinics. During these clinics, you counsel parents on the six basic rules for avoiding malnutrition.

Rule 1: Breastfeed until child is 2 years old.
NO BOTTLES.

Explain the importance of this rule.

8. Malnourished children need highly nutritious food to get better. What food can you teach a mother to make at home, which will help her baby get better?

STUDENT GUIDE

DEHYDRATION AND DIARRHOEA

I. Entry Level Knowledge and Skill

Before starting this unit you should be able to:

1. Perform a physical examination on an infant or child.
2. Start an I.V. on an adult.

II. Objectives

Using the information and experiences provided by the instructor and the module text, you will be able to:

1. Identify the physical signs associated with dehydration.
2. Describe the management for dehydration.
3. Estimate the P.O. fluid replacement for a dehydrated child.
4. Use diagnostic and management protocols as a guide to identification and treatment of diarrhoea.
5. Determine the appropriate management for all degrees of dehydration.
6. Educate parents about the preparation and administration of oral rehydration solution.
7. Calculate I.V. fluid needs for a dehydrated child.
8. Recognize the physical exam discriminations associated with dehydration: tenting skin, sunken fontanelles, changes in pulse, respiration and mucous membranes.

III. Evaluation

Upon completion of this module you will be rated on your attainment of the above objectives.

Knowledge: Written test based upon module content.
Acceptable performance, 80%.

Skill: See rating sheet for acceptable performance level.

1. Calculation of P.O. and I.V. fluid replacement.
2. Parent education oral rehydration solution.
3. Start I.V. on a child.
4. Use of diagnostic protocols for identification of dehydration.

IV. Activities you will be participating in to accomplish the objectives:

1. Read the module text and answer review questions on some mild and severe dehydration.
2. Presentation of slides on clinical picture of diarrhoea and dehydration and discussion.
3. Practice calculation of fluid replacement.
4. Discussion of management of diarrhoea and dehydration.
5. Review of case studies.
6. Practice use of oral rehydration flip chart for parent education.
7. Clinical experience identification and management of dehydration.

DIARRHOEA AND DEHYDRATION

General Considerations

Diarrhoea and dehydration are considered together because they can occur together. When a child has diarrhoea it means that he is 1) passing more stool than usual, 2) these stools are more watery than usual, and 3) with the watery stools, he loses electrolytes. Because the body is losing water, the child soon has *too little water* and electrolytes. When this occurs he is said to be *dehydrated*. The more water and electrolytes he loses, the more dehydrated he becomes. It is the dehydration that causes the child to be so sick. Diarrhoea and dehydration are *very common* in young children.

Three of the most important life saving functions of a nurse clinician are :

1. Recognizing the 3 levels of dehydration.
2. Managing dehydration and associated problems.
3. Preventing dehydration by instructing mothers about giving oral rehydration solution to their children at home.

There are many interrelated causes for diarrhoea. These causes are *very important* to know and understand in order to help mothers *prevent* diarrhoea. They are *less important* to the actual *treatment* of diarrhoea and dehydration. Some of the most important factors related to diarrhoea are:

1. Poor nutritional status. The body's defenses are down. The child is more likely to get diarrhoea as well as other diseases.
2. Weaning. Many children between 6 months and 2 years of age develop diarrhoea as they are being weaned from the breast to an adult diet. This is especially true if weaning is done too early. Breast milk is clean but other forms of milk, water and foods often are contaminated and cause diarrhoea in young children.
3. Bottle feeding. **BOTTLES KILL BABIES**. It is now very clear that infants who are bottle fed have many more episodes of diarrhoea than do breast fed infants. This is especially true where refrigeration and water piped into the house are absent. **BREAST MILK IS THE BEST FOOD FOR INFANTS AND IT IS STERILE**.
4. Intestinal infections. There are some specific intestinal infections which can cause diarrhoea. Examples are: gastro-enteritis and typhoid.

5. Other Infections. Several other infections are also seen with diarrhoea: measles, otitis media, tonsillitis, UTI, pneumonia, urinary infection.

Children use about 5 times as much liquid/kg/day as adults. Dehydration is caused by the increased loss of water and electrolytes in the diarrhoea stools. Children are consequently much more likely to get dehydration than adults.

Epidemiology

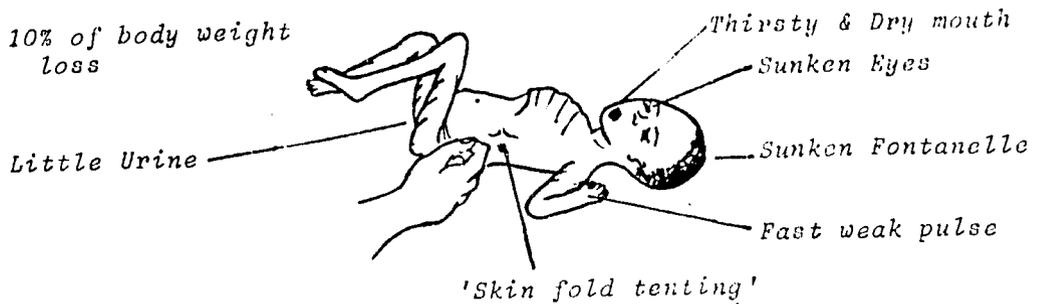
Diarrhoea and dehydration, in the more *severe* form, is often associated with poor nutritional and sanitary conditions. These two factors are further complicated by the fact that many mothers withhold food and liquids (including breast milk) from infants and children with diarrhoea. This is because they believe that it will help the baby by slowing the diarrhoea. It may in some cases slow the diarrhoea but more importantly it causes the baby to become more dehydrated and weaker by not replacing the lost fluids. Sometimes, mothers give enemas believing that the enemas will clean out the intestinal tract. The enemas increase the irritation, increase the diarrhoea and thus increase the dehydration.

All ages can be affected by diarrhoea and dehydration, however, most of the serious cases occur in children below the age of 3 years.

Clinical Picture

The important clinical findings are those related to the levels of dehydration. As the child loses more fluid and electrolytes with the diarrhoea (and vomiting), the child becomes more dehydrated.

An infant with severe dehydration will have sunken eyes, loss of skin elasticity (tenting) (Fig.IC 3), and sunken fontanelles (Fig.IC 4).



'Skin fold tenting'
Figure IC 3 - Child with Severe Dehydration

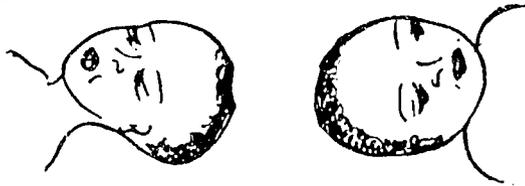


Figure IC 4 - A child on the left with sunken fontanelle is shown next to a child with a normal fontanelle.

Diagnosis. Other diseases including measles, tonsillitis, pneumonia and otitis media should be looked for and treated if possible.

Management

The management of diarrhoea and dehydration is carried out in four steps:

1. Evaluate the level of dehydration
2. Rehydrate as quickly as possible
3. Maintain hydration by replacing fluid and electrolytes as they are lost
4. Nutritional rehabilitation

1. EVALUATE THE LEVEL OF DEHYDRATION

Any child with diarrhoea needs to be evaluated for his level of dehydration. The table below lists the symptoms for determining the level of dehydration and the approximate amount of fluids that have been lost from the body at that level of dehydration.

LEVELS OF DEHYDRATION

SIGNS AND SYMPTOMS	SOME DEHYDRATION	MILD DEHYDRATION	SEVERE DEHYDRATION
	-Diarrhoea &/or vomiting	-Diarrhoea &/or vomiting	-Diarrhoea &/or vomiting
	-Thirst	-Thirst	-Thirst (if conscious)
	-Child appears "well" (unless sick from some other problem)	-Child appears "sick" and is irritable and restless	-Child appears "very sick" and may be semi-comatose or in shock
	-Respiration normal 20-40 per minute	-Respiration normal 20-40 per minute	-Respiration increased 40-60 per minute
	-Pulse normal 100-120 per minute	-Pulse normal 100-120 per minute	-Pulse increase & weak Above 140 per minute
		-Dry lips	-Dry lips
		-Dry mouth	-Dry mouth
		-Dry skin	-Dry skin
			-Dry eyes
		-Sunken eyes may be noticeable	-Sunken eyes obvious
		-Sunken fontanelles (infants) may be noticeable	-Sunken fontanelles (infants) obvious
		- "Tenting" of skin may be noticeable	- "Tenting" of skin obvious
		-Cyanosis	
	-Urine output decreased	-Urine output decreased or absent	
	SOME FLUID LACKING ALREADY	50 ML FLUID LACKING FOR EACH KG OF BODY WEIGHT	100 ML OR MORE FLUID LACKING FOR EACH KG OF BODY WEIGHT

2. REHYDRATE AS QUICKLY AS POSSIBLE (THIS STEP TAKES SIX HOURS)

Some Dehydration

Most children with a little dehydration can remain at home. For these children, giving water and electrolytes by mouth at home is the advised treatment. If a child presents with a little dehydration, the fluid needed is calculated. Because the child will be at home, the mother needs to know the amount of fluid the child will need for maintenance.

Before mother and the child go home, we have to be sure of the following:-

1. The child is weighed (naked) and the weight is recorded.
2. Breast feeding is continued.
3. Child drinks 100-200 ml of the oral rehydration solution and urinates.
4. Mother demonstrates how to make oral rehydration solution.
5. Mother is able to explain how much fluid she is to give to her child.
6. Mother is told to RETURN TO THE CLINIC THE NEXT DAY.

Mild Dehydration

A child with mild dehydration can be rehydrated by mouth unless he is vomiting severely. Some vomiting (once in 2 hours) does not interfere with drinking of the fluid, if it is given in small amounts and frequently. (30-50 ml every 10-15 minutes). Weigh the child (naked) and record. The fluids needed for rehydration are calculated according to the GUIDE FOR REHYDRATION. Oral rehydration in children with mild dehydration has to be given at the clinic for the following reasons.

1. Close supervision is needed to stimulate the giving of oral rehydration fluid by the mother in sufficient amounts.
2. In case of severe vomiting, oral rehydration by NG tube may be needed.
3. If vomiting persists even with the NG tube, rehydration with IV fluids is indicated. (See severe dehydration).
4. The general condition needs assessment after the six hours of rehydration.

If a child with mild dehydration is presented late during the day, or at night, an admission to the clinic might be indicated to supervise the fluid intake.

Severe Dehydration

Severe dehydration is an EMERGENCY condition. The child is at a grave risk. Treatment has to be started before referring to the hospital. The following is advised:

- IF THE CHILD IS ABLE TO DRINK:
1. Weigh the child (naked) and record.
 2. Give oral rehydration solution.
 3. Start IV $\frac{1}{2}$ strength Darrows in 5% Dextrose: 150 ml/kg run $\frac{1}{2}$ of the amount in within 1 hour.
 4. Refer to hospital:
 - Continue oral feeding
 - Slow down I.V.
 - Tape I.V. for transfer
 - Send record of treatment and weight
 5. IF NOT ABLE TO REFER TO HOSPITAL:
 - give second half of the IV within the next 5 hours
 - observe for overhydration (swollen eyelids) and slow the I.V. if this is noted
 - continue oral solution
 - refer to GUIDE FOR MAINTENANCE when I.V. is close to completion

IF THE CHILD IS NOT ABLE TO DRINK:

1. Weigh child naked and record.
2. Insert NG tube, with $\frac{1}{2}$ strength Darrows 5% Dextrose; 120 ml/kg within 6 hours.
3. I.V. $\frac{1}{2}$ strength Darrows 5% Dextrose, 150 ml/kg, run $\frac{1}{2}$ of the amount in within 1 hour.
4. If unable to start IV, continue with NG tube.
5. After starting IV, remove NG tube.

- 6. Refer to hospital:
 slow down I.V.
 tape IV for for transfer
 send record of treatment and
 weights
- 7. IF NOT ABLE TO REFER TO HOSPITAL:
 -give second half of I.V.within
 next 5 hours
 -observe for overhydration
 (swollen eyelids)
 -refer to GUIDE FOR MAINTENANCE
 when I.V. is close to completion

CLOSE SUPERVISION IS ESSENTIAL WHILE THE CHILD IS UNDER YOUR CARE.

IF overhydration occurs (first sign: swollen eyelids) the I.V. should be removed.

GUIDE FOR REHYDRATION

AMOUNT OF DEHYDRATION	TYPE OF SOLUTION TO BE GIVEN	HOW TO BE GIVEN	WHAT LOCATION SOLUTION IS TO BE GIVEN	HOW MUCH TO BE GIVEN	HOW FAST
Some	Oral Rehydration solution	By mouth	At home	100 ml/kg	Within 6 hours
Mild Dehydration (with little vomiting)	Oral Rehydration Solution	By mouth	In clinic	100 ml/kg	Within 6 hours
Mild dehydration (with severe vomiting)	Oral Rehydration Solution	By N.G.tube	In clinic	120 ml/kg	Within 6 hours
Severe Dehydration OR Mild dehydration with persistent vomiting	Oral Rehydration Solution	by mouth or N.G. tube if unable to drink	In clinic	120 ml/kg	Within 6 hours. Discontinue when I.V.in place
	Darrows $\frac{1}{2}$ strength in 5% Dextrose	I.V.	In clinic while awaiting transfer to hospital	150 ml/kg	$\frac{1}{2}$ of total amount in the first half hour. The next half in the next 5 hours

3. MAINTAIN HYDRATION BY REPLACING FLUID AND ELECTROLYTES AS THEY ARE LOST

Usually diarrhoea lasts for one or two days. If we do not fully replace the loss of fluids during the maintenance step the child will continue to be dehydrated. Vomiting is rarely a problem during the maintenance step. When the child is on IV fluids, we begin slowly to give him oral rehydration solution. (Refer to the GUIDE FOR MAINTENANCE.)

Before taking step 3, the child's weight needs to be taken (naked) again and recorded.

GUIDE FOR MAINTENANCE

DIARRHOEA	WHERE & HOW TO GIVE FLUID	HOW MUCH FLUID TO GIVE	HOW LONG
IF CHILD HAS LESS THAN ONE STOOL EVERY <u>FOUR</u> HOURS	AT HOME BY MOUTH	200 ml/kg Oral Rehydration Fluid	IN ONE DAY (24 hours)
IF CHILD HAS ONE STOOL EVERY <u>TWO</u> to <u>FOUR</u> HOURS	IN CLINIC BY MOUTH OR NG TUBE	15 ml/kg Oral Rehydration Fluid	<u>EVERY HOUR</u>
IF CHILD HAS ONE STOOL OR MORE EVERY TWO HOURS (OR two stools or more every four hours)	In CLINIC OR HOSPITAL BY IV	Darrows $\frac{1}{2}$ str. Dextrose 5% 20 ml/kg	-IV 20 ml/kg per hour -give oral rehydration solution 10 ml every 10 minutes for 2 hours -if <u>NO</u> vomiting, give oral rehydration solution 20 ml/kg every hour for 4 hours, then slow down IV -if <u>NO</u> vomiting, and diarrhoea less, remove IV and refer to this guide for treatment

4. RESTART REGULAR FEEDING (NUTRITIONAL REHABILITATION)
AS SOON AS TOLERATED

Regular feedings, including breast feeding, may begin during step 3 if the diarrhoea is not severe and there is no vomiting.

If the child is on formula feeding, restart using a cup and spoon. Dilute the feeding with water or oral rehydration fluid to half strength for the first 24 hours.

If the child is on cow's milk, give soft foods and oral rehydration solution first for 24 hours. Soft foods like cereals (lesheleshele), pumpkin, potato, and nonfibrous fruits like banana or boiled, mashed apple. Then begin to give diluted cow's milk according to the following schedule:

$\frac{1}{4}$ strength for 24 hours

$\frac{1}{2}$ strength for 24 hours

Full strength

MAKING ORAL REHYDRATION FLUID

There are two methods for making oral rehydration fluid:

1. AT HOME:

- ADD: a. Two (2) "Thumb and 2 finger pinch" of DRY SALT
 b. One (1) "Thumb and 2 finger pinch" of DRY KOEKSODA
 c. Two (2) "Four finger scoop" of DRY SUGAR
 d. Three (3) "Soft drink (beer) tins" of COOLED, BOILED WATER.
 (1 tin = 340 ml.)



2 Two-finger/thumb pinches of Dry Kitchen Salt,
gives an average of 2.6 gram.

1 two-finger/thumb pinch of dry Koeksoda,
gives an average of 1.9 gram.

2. AT THE CLINIC:

ADD: a. One (1) packet of readymade GLUCOSE-
ELECTROLYTE POWDER

b. One (1) litre of COOLED, BOILED WATER
(= three (3) "soft drink (beer)
tins").

From the sugar in the fluid made at home, the bowel makes
glucose. In the fluid made in the clinic, the glucose
is already present. Glucose aids the absorption of
water and electrolytes through the diseased bowel.

Prevention of Dehydration in Diarrhoeal Disease

The treatment of a child with diarrhoea gives an excellent opportunity to teach the mother how dehydration may be prevented. Apart from situation that a child receives IV rehydration or rehydration by NG tube, the mother has to be involved in the treatment of her child from the start. She has to learn that if her child develops diarrhoea:

- (1) She should give him as much fluid as he will drink even when the child is vomiting. The minimum amount of fluid is one cup for every loose stool in a small child, two cups in a bigger child.

THUSO EA PELE HA NGOANA NOESA NGOANA KOPI
 A HLATSA KAPA A TŠOLLA: EA MOTSOAKO ONA NAKO
 LE NAKO HA A QETA
 HO TŠOLLA.

- (2) She can prepare oral rehydration solution simply at home.
- (3) She should continue breastfeeding.

HAPE - TSOELAPELE HO NYANTS'A NGOANA
 LE HA A TŠOLLA.

You can use the flip-chart on how to make oral rehydration solution to teach mothers how to make this very important solution for diarrhoea and dehydration.

Drugs (For diarrhoea) No other drugs are needed for diarrhoea unless a *specific disease* such as typhoid is being treated.

REVIEW QUESTIONS

1. Explain the relationship between diarrhoea and dehydration.

2. A mother brings a child to your clinic with diarrhoea. This child is thirsty but has no other signs of dehydration. How do you manage this problem?

3. An understanding of the causes of diarrhoea is important in the prevention of diarrhoea. Each of the following problems has a specific relationship to diarrhoea. Briefly explain that relationship.
 - a) poor nutritional status:

 - b) weaning:

 - c) bottle feeding:

4. Describe the clinical picture of a four month old child with severe dehydration. Consider all of the areas listed below.
 - a. lips and mouth:
 - b. eyes:
 - c. fontanelles:
 - d. skin elasticity:
 - e. respiration:
 - f. pulse:
 - g. urine output:

5. If a child is brought to you to be treated for diarrhoea and you find the child to be mildly dehydrated, what is the most important management step you can take? (Check the one correct answer.)
 - a. stop oral intake
 - b. rehydrate with oral rehydration solution
 - c. check stool for worms

6. A child is mildly dehydrated. You decide to rehydrate with intravenous fluids because the child is vomiting. The child weighs 15 Kg. Provide the following information:
 - a. Solution used for rehydration:

 - b. Best site for intravenous:

 - c. Amount of I.V.fluid to be given immediately:

7. When you are replacing fluids through an I.V. and you notice oedema of the eyelids, what should you do?

Why?

8. List the four points to teach mothers to help them prevent diarrhoea.
 - 1.
 - 2.
 - 3.
 - 4.

9. What are the Six Basic Health Messages of good nutrition?

1.

2.

3.

4.

5.

6.

10. List the 2 points to teach mothers about preventing dehydration when their child has diarrhoea.

1.

2.

LEVELS OF DEHYDRATION

SIGNS AND SYMPTOMS	SOME DEHYDRATION	MILD DEHYDRATION	SEVERE DEHYDRATION
	-Diarrhoea	-Diarrhoea	-Diarrhoea
	-Thirst	-Thirst	-Thirst
	-Child appears "well" (unless sick from some other problem)	-Child appears _____	-Child appears _____
	-Respiration _____	-Respiration _____	-Respiration _____
	-Pulse _____	-Pulse _____	-Pulse _____
		-Lips _____	-Lips _____
		-Mouth _____	-Mouth _____
		-Skin _____	-Skin _____
			-Eyes _____
		-Eyes _____	
		-Sunken fontanelles (infants) may be noticeable	-Fontanelles _____
		-"Tenting" of skin may be noticeable	
		-Cyanosis	
	-Urine output _____	-Urine output decreased or _____	
Approx. amount of fluid lost	-Fluid lacking already	-ml fluid lacking for each kg of body weight	-ml or more fluid lacking for each kg of body weight

14. Give the possible treatments for the three levels of dehydration.

15. True or False (T or F)

_____ Children with diarrhoea should be encouraged to take food as long as they are able to eat without vomiting.

PRACTICE IN ESTIMATING
FLUID REPLACEMENT
FOR DEHYDRATED CHILDREN

A. Fluids given by mouth OR by N.G. tube.

Below is the GUIDE FOR REHYDRATION using ORAL REHYDRATION SOLUTION to be given in a 6 hour period.

<u>Amount of Dehydration</u>	<u>Amount of Fluid</u>
Some	100/ml/kg
Mild, with little vomiting	100/ml/kg
Mild, with severe vomiting	120/ml/kg

Use the chart to calculate the amount of fluid necessary in 6 hours for children who have the following level of dehydration and weigh the following amounts. Number 1 has been answered as an example.

Weight	Level of Dehydration	Total Amount in 6 hours	Amount to be Given Hourly
3 kg	Some	300 ml	50 ml
10 kg	Some		
17 kg	Mild, with little vomiting		
14.5kg	Mild, with severe vomiting		

B. Fluids given intravenously

1. The amount of fluids to be given intravenously in the first 6 hours "For Rapid Rehydration" is determined by multiplying the child's weight in kg by 150 ml. Half of this amount is to be given in the first hour and the other half in the remaining 5 hours.

Example: For an 8 kg child, multiply $8 \times 150 = 1200$ ml.

In first hour: 1200 ml divided by 2 = 600 ml.

In next 5 hours: 1200 ml total minus the 600 ml = 600 ml.

To calculate the amount to give each hour, divide by 5 : 600 ml divided by 5 = 120 ml/hour.

Using the chart below, practice the calculation of I.V.fluids for children.

Weight	Total fluids for "Rapid Rehydration"	Amount to be given in first hour	Amount to be given in next 5 hours	Amount to be given in each hour of the <u>5</u> hours
a. 3 Kg				
b. 7 Kg				
c. 11 Kg				
d. 14.5 Kg				
e. 16 Kg				

STUDENT GUIDE
NEWBORN PROBLEMS

I. Entry Level Knowledge and Skill

Before starting this unit you should be able to:

1. Perform a physical examination on an infant or child.
2. Pass naso-gastric tube.

II. Objectives

Using the information and experiences provided by the instructor and the module text, you will be able to:

1. Use the diagnostic and management protocols as a guide to identification and treatment of the following newborn problems: low birth weight, septicaemia, jaundice, congenital anomalies, constipation, skin conditions.
2. Describe appropriate management for newborn problems.
3. Educate a parent about the procedures for expressing breast milk.
4. Recognize the physical exam discriminations listed for newborn problems.
5. Insert Naso-gastric tube for feeding.

III. Evaluation

Upon completion of this module you will be rated on your attainment of the above objectives.

Knowledge: Written test based upon module content.
Acceptable performance, 80%.

Skill: See rating sheet for acceptable performance level.

1. Parent education.
2. Use of protocols for identification of newborn problems.
3. Insertion of Naso-gastric tube.

IV. Activities you will be participating in to accomplish the objectives:

1. Read the module text about problems of newborns and answer the review questions.

2. Participate in a discussion of identification and management of the problems of newborns.
3. Practice using the protocols for identification of newborn problems.
4. Practice parent education in expressing breast milk.
5. Clinical experience: Observation (if patients are available) of the following physical examination discriminations:
 - a. jaundice
 - b. purulent umbilical cord
 - c. bulging fontanelles
 - d. congenital anomalies
 - e. skin conditions

Practice: a. Insertion of Naso-gastric tube.

LOW BIRTH WEIGHT INFANT

General Considerations

Some infants are very small at birth. This is often due to a short time in the uterus (less than 9 full months) or due to inadequate growth in the uterus. Twins are often small at birth and these infants require special care in order to survive. Since they do not have as much insulating fatty tissue, temperature regulation is extremely important. Also, since they are smaller and they need more frequent feedings and they tend to tire easily while feeding and fall asleep before completing their feeds.

Clinical Picture

A small infant at birth who weighs less than 2.25 Kg. The infant may look normal but small at birth.

Complications

Small infants have poor temperature control, increased infections, jaundice and respiratory distress problems. If any of these complications occur, the infant should be referred to a hospital.

Management

1. At birth the infant should be immediately wrapped in a clean warm cloth and given to the mother to hold. This will allow the baby to stay warm. DO NOT BATHE THE SMALL INFANT AFTER DELIVERY.
2. Frequent breast feedings should be started 2-6 hours after birth when the child is able to suck and swallow. Tickle the feet if the infant falls asleep while suckling.
3. If the infant tires, complete the feeding with expressed milk (EBM) by dropper (pipette) or cup and spoon.
4. If the child is unable to suck and swallow, feed by N.G.tube in the following quantities every two hours:

Weight	First day each feed	Increase each feed each day	Maximum each feed at 10 days
Less than 1400 g	4 ml	4 ml	40 ml
1400 g to 1800 g	6 ml	6 ml	60 ml
More than 1800 g	8 ml	8 ml	80 ml

5. The room should be kept warm.
6. If the infants are twins, rotate feedings on breasts. Feed one child first one time and the other child the next.
7. To avoid infection, practice STRICT HAND WASHING before handling infant.
8. If the baby is getting enough milk, he should pass urine at least 5-6 times/day, and start to gain weight after the first week of life. If he is not getting enough milk, he will become dehydrated and not gain weight.

REVIEW QUESTIONS

1. Small babies need special care. Mark the following True/False.
 - a. Always bathe the baby in the first 12 hours.
 - b. Fresh air is important but no direct breezes.
 - c. Small babies often fall asleep when suckling, so must be awakened in order to ingest enough milk.
 - d. Always feed twins from the same breast.
 - e. Refer any small infant with jaundice or respiratory distress.

2. What are the indications for referral of small infants to the hospital?
 - a.

 - b.

 - c.

3. List 3 ways in which a baby weighing less than 2,25 Kg may be fed.
 - a.

 - b.

 - c.

4. How can you tell if a breast fed baby is getting enough milk?
 - a.

 - b.

SEPTICAEMIA IN THE YOUNG INFANT

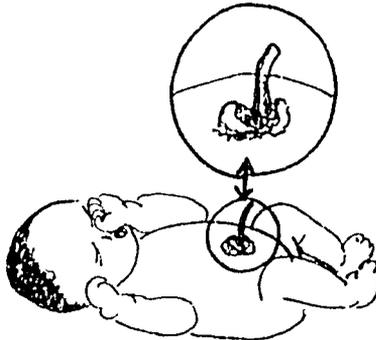
General Considerations

Septicaemia is a generalized infection usually caused by staphylococcus aureus, or E.Coli. If not treated early, and for at least one week, the baby will usually always die. In the foetus, the bacteria enters the amniotic fluid if the membranes rupture too early before the baby is born. In the newborn, the bacteria enters through the umbilical cord after it is cut.

Clinical Picture

Young infants do not react to infections like older infants and children. The signs of septicaemia are many. Examples are: not suckling well, irritability, vomiting, limpness, fever, jaundice, sub-normal temperature, bleeding spots on skin (petechiae) and fits. Jaundice and fitting occur fairly late. If you find any of these signs of septicaemia you should treat for septicaemia. The complications of septicaemia include shock, fits, meningitis, urinary tract infection and pneumonia.

A newborn may present with discharge, foul smell and redness around the cord stump. (See Figure I.C.6.)



*Figure IC 6 -
Discharge and
redness around
the cord stump.*

Management

1. Antibiotics should be started immediately and continued for 5-7 days:

Ampicillin 50-100 mg/kg/day I.M.

- For infants less than one week and prematures, the dose should be divided and given every 12 hours.
- For infants older than one week, the dose should be divided and given every 8 hours.

OR

Crystalline Penicillin (Penicillin G) 50,000-100,000 units/kg/day

AND

Streptomycin 20 mg/kg/day

The dosage of both drugs are given together in divided doses every 12 hours.

2. Refer to the hospital immediately.
3. Feed by naso-gastric tube with expressed breast milk (and 10% glucose solution if needed), 50 ml every 3 hours until baby is able to nurse from the breast. It is important that the mother's milk is expressed, so that there will be sufficient milk when the baby is able to suckle.
4. Keep the baby warm. Use blankets and keep next to mother.

Prevention

1. Hygienic deliveries will prevent some forms of septicaemia. Therefore, education and supervision of traditional birth attendants is very important.
2. Keep cord clean and dry by cleansing with methylated spirits 3 - 4 times/day. DO NOT BIND CORD STUMP because warmth and moisture encourage bacteria to grow. Gentian Violet may also be used on the cord twice a day.

REVIEW QUESTIONS

SEPTICAEMIA IN THE YOUNG INFANT

1. Newborn septicaemia is a generalized infection in the blood caused by bacteria. Name two ways the bacteria that cause septicaemia enters the blood stream:

2. Describe the usual clinical picture of a young infant whom you have diagnosed as having septicaemia. Consider all of the following:
 - a) general appearance:

 - b) feeding pattern:

 - c) condition of cord:

3. Which of the following would be your first management decision for the infant diagnosed as having septicaemia? (Check the correct answer.)
 - a. Start antibiotic therapy
 - b. Refer to hospital
 - c. Feed by naso-gastric tube
 - d. Keep the baby warm

4. What two factors are important in the care of the cord stump?
 - a.

 - b.

JAUNDICE OF THE NEWBORN

General Considerations

About half of all babies get mild jaundice between the second and fifth day of life. This is called normal jaundice and needs no treatment. If jaundice starts during the first 24 hours after birth or after the fifth day and/or continues after the seventh day, it is serious. Blood incompatibility between the mother and baby or septicaemia may be the cause. Serious jaundice can harm the baby's brain (Kernicterus).

Clinical Picture

Mild jaundice is easily seen in the baby's sclera. As jaundice becomes worse, it can be seen further down the body. Jaundice is serious when:

1. It involves the whole body, including the soles of the feet and palms of the hands;
2. It is associated with abnormal behaviour, such as drowsiness, weak sucking, abnormal muscle tone (either increased or decreased), irritability, convulsions.

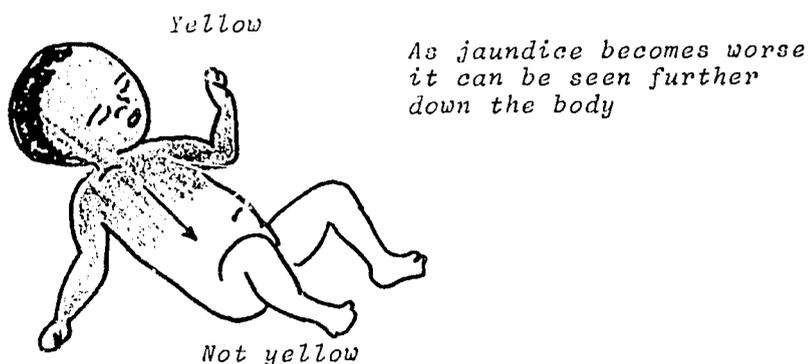


Figure IC 7 - A jaundiced baby.

Management

If he is seriously jaundiced or has signs of septicaemia, referral to a physician in a hospital is recommended.

EXPRESSED BREAST MILK (EBM)

If a baby is too weak to nurse, expressed breast milk is the best food to give him. When a mother expresses the milk from her breasts to feed the baby, her supply of milk will not dry up. When the baby is strong, he can once again be fed from the breast.

You may need to explain to a mother how to express milk from her breasts.

Have the mother wash her hands before she starts and use a clean bowl or cup to collect the milk.

Using her hands and a cup:

1-2. Show her how to hold up her left breast with the front of her left hand and to press it with her right hand from the edge towards the nipple.

3. Show her how to squeeze the part behind her nipple between her thumb and first and second fingers.

4-5. After she has done this two or three times, milk will start to come out into the bowl.

She will need to do this many times and to press on each part of both breasts especially any hard parts. It will take about 10 minutes to get all the milk from one breast.

This milk is then fed to the infant with a cup and spoon, cup and dropper, or N.G.tube. Any milk that is not immediately taken by the infant should be discarded and not saved.

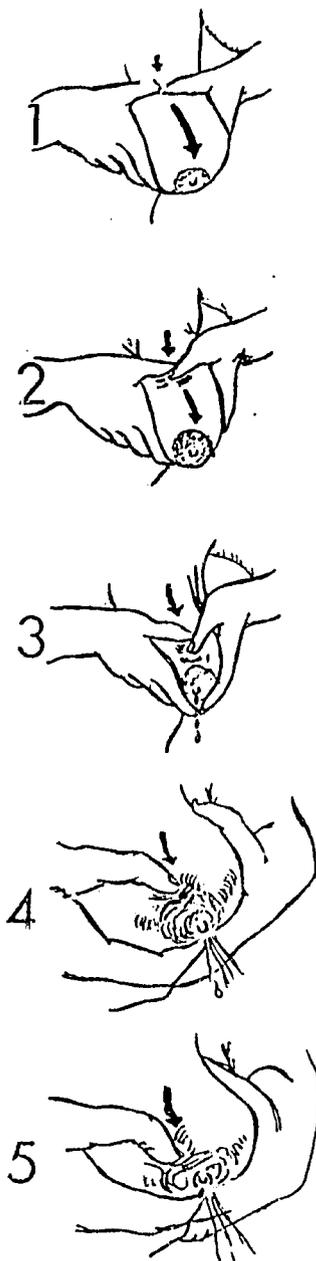


Figure IC 8 - Expressing Breast Milk.

REVIEW QUESTIONS

EXPRESSED BREAST MILK

1. If the baby is too weak to nurse, what is the best food to give him?

2. When a mother expresses the milk from her breasts to feed the baby, does her supply of milk dry up?

3. How long does it take to get all the milk from one breast?

4. How can EBM milk be given to an infant? (Name three ways.)
 - a.
 - b.
 - c.

5. Can leftover breast milk be saved?

THERAPEUTIC SKILL

NASO GASTRIC FEEDING TUBE INSERTION - INFANT
AND
FEEDING THROUGH NASO GASTRIC TUBESupplies

Sterile covered tray with the following sterile equipment:

- Bowl
- Cotton swabs
- Gallipot of sterile warm water
- Naso gastric tube appropriate for age (plastic preferable)

Unsterile:

- 5-10 ml syringe
- Covered mackintosh
- Adhesive tape strips

Purpose of Procedure

Feeding of child unable to take food or fluids by mouth.

Steps in Procedure

1. Explain procedure to mother or assistant who will hold the child.
2. Wash hands thoroughly.
3. Inspect tube for cracks.
4. Clean nostrils using sterile water moistened cotton swab.
5. Take naso gastric tube in hand and measure distance from nose to ear, to the xyphoid sternum. Grasp tube at xyphoid sternum with left hand, as a marker for proper length.
6. Have mother or assistant wrap baby in blanket. Hold the child and put the mackintosh on the baby.
7. Lubricate naso gastric tube with sterile water and using your right hand, pass the tube through one nostril down oesophagus into the stomach to the point that you are marking by holding with your left hand.
8. If the child shows signs of distress, coughs or becomes cyanotic, remove the tube immediately because the tube may be in the trachea.

9. After the child has recovered, repeat the procedure. Check to see that the tube is not in the lungs by feeling for air coming out of the tube during expiration or by putting the end of the tube in a glass of water and looking for bubbles.
10. After successful insertion, attach the syringe and aspirate; gastric fluid should flow into the syringe. Detach the syringe and empty the contents into a bowl. You may check the contents with the litmus paper. Gastric contents change the blue litmus paper to a pink colour.
11. If the tube is in the stomach, reattach the syringe and pour the desired amount of liquid feeding into the barrel of the syringe. Let the fluid go down the tube by itself, don't push it down with the plunger.
12. The tube is then strapped with adhesive tape strips securely to the cheeks.

GENERAL CONDITICNS OF THE NEWBORN

Scaling or Peeling of the Skin

This can be quite normal when it occurs after two to three days. If present at birth, it usually indicates malnutrition or excessive prolongation of labour. Just observe and reassure the mother.

Sebonnhoca or the Scalp

This is also called cradle cap. It occurs in the form of thick crusts cading on the scalp. If the scalp is dry, the crusts should be softened once daily with cotton wool soaked in baby oil or vegetable oil. Wash scalp with warm water and soap twice a week.

Neonatal Breast Engorgement (Gynaecomastia)

This is a harmless condition common in boys and girls. It is due to the effect of the maternal hormones that are still present in the baby's blood stream. Squeezing the engorged breast should not be done - just observe and reassure the mother.

Neonatal Mastitis

This will often lead to abscess formation which needs incision and drainage. Refer the baby to the hospital.

Napkin Rash

The napkin rash is due to irritation of the skin by the ammonia from decomposing urine or chemical irritation from a diarrhoeal stool. It can be quite common. Treatment includes:

1. Change nappies frequently.
2. Leave nappie off during the day as much as possible.
3. Use plastic pants as little as possible.
4. Rinse all the soap out of the nappie.
5. Use zinc oxide paste to prevent further rash.

Constipation

Mothers of newborns and infants often bring the baby into the clinic complaining that the infant has constipation, seldom is there a real constipation. With constipation, the stool is hard, the bowel movements are less frequent than normal, and the infant strains to pass the stool.

The number of stools that as infant will have varies. In a breast fed infant, it is quite normal to have a bowel movement after each breast feeding. In other infants, a bowel movement may occur once in every three or four days.

Management: When the stool is hard and the bowel movements are difficult to pass, give the infant -

one or two teaspoons of fresh squeezed orange juice
or

$\frac{1}{2}$ teaspoon of sugar in 120 ml of boiled and cooled water.

STUDENT GUIDE

COMMON INFECTIONS OF CHILDREN

I. Entry Level Knowledge and Skill

Before starting this unit you should be able to:

1. Perform a physical examination on an infant or child.

II. Objectives

Using the information and experiences provided by the instructor and the module text, you will be able to:

1. Use the diagnostic and management protocols as a guide to the identification and treatment of the following common infections: onchocerciasis, whooping cough, measles, polio, mumps, chickenpox, high fever.
2. Describe the appropriate management for common infections.
3. Recognize the following physical exam discriminations: rash of measles and chickenpox, swelling of parotid, paralysis.
4. Calculate drug dosages for children.

III. Evaluation

Upon completion of this module you will be rated on your attainment of the above objectives.

Knowledge: Written test based upon module content.
Acceptable performance, 80%.

Skill: See rating sheet for acceptable performance level.

1. Calculation of drug dosages for children.
2. Use of protocol for identification of common infections.

IV. Activities you will be participating in to accomplish the objectives.

1. Read the module text on infections of children and answer review questions.
2. View presentation on measles and participate in discussion.
3. Participate in a discussion and case study practice on the identification and management of common infections.
4. Practice using the protocols for identifying problems.
5. Practice calculating drug dosages for children.
6. Review all problems presented in this module to date.

MONILIASIS IN INFANTS

THRUSH (Monilia of the mouth)

General Considerations

Thrush is an infection in the mouth of infants. It is caused by a fungus called candida albicans. This fungus is passed from the mother to the baby. It can also be seen in older children who are malnourished, severely or chronically ill, or on antibiotics for a long time.

Clinical Picture

Thrush is not usually a serious disease, but it worries the mother. The lesions of thrush are white spots or patches with a red inflamed base on the mucous membrane. In more severe infections, a white membrane is formed.

Management

1. Paint 1% or 2% gentian violet on lesions 3 times a day for 10 days. The mother can be shown how to do this.
2. Mothers should continue to feed newborns on the breast.
3. Antibiotics should not be used for thrush - they make it worse. If the child is on antibiotics for another infection, you should consider stopping them if gentian violet is not controlling the thrush.

MONILIA OF THE SKIN

General Considerations

Monilia of the skin is also caused by the fungus, Candida albicans. It can occur almost anywhere on the surface of the body, but in infants it usually occurs in the diaper area. It can be a complication of a napkin rash, or as thrush and can occur with malnutrition, in the severe or chronically ill, or for those who are on long term antibiotics.

Clinical Picture

The infant comes in with a beefy red, superficially denuded areas, usually in the skin folds. Whitish, curd like substance can be present.

Management

1. Paint affected area with 1% or 2% gentian violet 3 times a day for 10 days;
OR, if available -
Apply Nystatin Cream 3 times a day to affected areas.
2. Change nappies as often as possible.
3. Leave nappie off during the day as much as possible.
4. Use plastic pants as little as possible.

REVIEW QUESTIONS

1. Appearance of white spots in the mouth of an infant is clinically diagnostic for what problem?
2. What is the effect of antibiotic administration to an infant who has thrush? (Check the one correct answer.)
 - a. Treatment of choice for thrush.
 - b. Increases the severity of thrush.
 - c. Prevent the development of bacteria infection.
3. What is the purpose of painting the lesions in the mouth or skin with gentian violet?
4. What is the appearance of monilia of the skin?

WHOOPING COUGH

(Pertussis)

General Considerations

Whooping cough is a serious disease of the respiratory system. It causes inflammation of mucous membranes in the nose, throat, trachea and bronchi. A thick mucous is formed. This causes older children to cough in a very characteristic way. Younger infants frequently do not develop the typical "whoop". Instead they often become choked and have great difficulty breathing. Whooping cough is caused by an infection by the pertussis bacteria. The most important thing to remember about whooping cough is that it can be prevented by giving the DPT vaccinations.

Epidemiology

Whooping cough is found worldwide. It usually appears in epidemics every two to four years. There are few cases seen at other times. The bacteria are spread by person to person contact through droplets while coughing. The disease is seen almost exclusively in children below the age of 9 years.

Clinical Picture

The disease begins with a cough, runny nose and mild fever. This stage lasts one to two weeks.

This initial stage is followed by the "whooping" cough stage which may last from 10 to 12 weeks. The cough comes in attacks. The typical cough is very long, lasting until the child is completely out of breath. This is followed immediately by the "whoop" as the child attempts to gain his breath quickly. During these attacks it is common for the child to vomit. Nose bleeds and blood in the thickened sputum are also common. Infants generally do not show this same type of cough. Instead infants often become choked on the heavy thick secretions and become cyanotic. Most of the deaths from whooping cough are related to these choking spells in young infants.

The diagnosis is relatively simple in older children with the characteristic whoop but is much more difficult in infants. This is unfortunate because of the increased risk in infants. Therefore, when whooping cough is present in a community, all infants who present with respiratory symptoms should be treated as though they have whooping cough.

Complications

1. Choking leading to suffocation in infants.
2. Pneumonia (difficulty in breathing, rales).
3. Malnutrition.
4. Susceptibility to tuberculosis.
5. Convulsions.

Management

Uncomplicated whooping cough:

- Infants:
1. Erythromycin liquid: 40 mgm/kg/day in 4 divided doses for 10 days by mouth.
 2. Breastfeed every two hours and give cooled boiled water in between feedings. If the baby vomits, feed again immediately.

- Older Children:
1. Child should be strongly encouraged to eat after vomiting to promote good nutrition state. The food should be soft and easily digestible and given in small frequent feedings.
 2. Antibiotics are not indicated.
 3. Encourage increased fluids by mouth.

Management of Complications

1. Pneumonia - give Erythromycin, dosage as above.
2. Malnutrition - follow child closely in clinic for next few months. Advise mother to feed child especially well during that time. (See Management of Malnutrition.)
3. If child continues to cough for more than 3 months and is losing weight - refer for investigation for P.T.B.
4. If child has convulsions - see Management Protocol on Convulsions.

Prevention

Whooping cough can be prevented by giving the DPT shots (the "P" stands for pertussis, the other name for whooping cough). These shots should be given routinely to all infants before they are 6 months old. Older children not yet vaccinated should be given DPT shots up to age 5 years. (See Child Care Module for Immunization schedule.)

REVIEW QUESTIONS

WHOOPIING COUGH

1. Whooping cough is easy to identify in children because of the type of cough. Explain the pattern of this cough.
2. Infants frequently do not develop this cough. What happens instead of the cough?
3. You begin to have a few children with whooping cough brought to the clinic. You can probably expect the numbers of cases to increase. Explain why this will happen.
4. How is whooping cough spread,
5. Whooping cough has two stages. The second stage is the whooping cough stage that can last for 10 - 12 weeks. Describe the clinical picture of the initial stage.
 - a. Length of time:
 - b. Signs and symptoms:
6. What dietary considerations are important when infants and children have whooping cough.
7. Whooping cough is found worldwide. It is seen in children below 9 years old. Whooping cough can be prevented. How?
8. One of the complications of whooping cough is malnutrition, can you explain why this happens?

Management

1. No antibiotics nor other drugs are needed for uncomplicated cases.
2. The most important treatment for measles is food and fluids. Babies should take the breast as often as possible. Older children should be fed soft foods like milk, eggs, tapioca, and porridge. Avoid spicy and greasy foods.
3. Fluids should be strongly encouraged.
4. Patients with measles should be re-examined after 3, 7 and 10 days. In this way, complications can be noted and treated early.
5. If fever is above 40°C, use a sponge bath for 15 to 20 minutes every 2 to 4 hours. (This is especially important for children less than 5 years old.)
6. Mouth sores - older children can be maintained on fluids and soft foods. Infants may require tube feedings and if so should be referred.

Hospitalization:

Infants and children of all ages should be sent to the hospital if any of the following findings are present:

1. Signs of severe dehydration.
2. Unconsciousness or convulsions.
3. Malnutrition.

In addition to the above, infants only should also be sent to the hospital if they have either of the following:

1. Soreness of the mouth that interferes with sucking.
2. Laboured breathing indicative of pneumonia:

Treat with Procaine Penicillin I.M. one dose only.

0 - 1 year	300,000 u (1 cc)
2 - 4 years	600,000 u (2 cc)
5 - 10 years	900,000 u (3 cc)
11 - adult	1,200,000 u (4 cc)

followed by -

Penicillin V four times a day for 7 days.

0 - 2 years	½ tab (125 mg)
3 - 4 years	1 tab (250 mg)
5 - adult	2 tabs (500 mg)

Expectorant Cough Mixture four times a day.

Children - 1 tsp. (5 ml)

Adults - 2 tsp. (10 ml)

Prevention

Measles can be prevented by one injection of measles vaccine. If available, this should be given routinely to all infants at 9 to 12 months of age. Older children up to 6 years of age not yet vaccinated nor ever infected with measles should also be vaccinated. Both the vaccine and the disease provide permanent immunity to measles in almost all cases.

Suspected cases of measles should be reported to your supervisor.

REVIEW QUESTIONS

MEASLES

1. Fill in the signs and symptoms of measles below as they appear during the illness.

Onset: Day 1:

Day 2-3:

Day 3-4:

Day 7+:

2. Uncomplicated measles does not require drug therapy. What is your responsibility in the care of an otherwise healthy child with measles?
3. Explain how you would care for a child with measles who develops a high fever.
4. What can be done to prevent measles?

HIGH FEVER

General Considerations

Fever is an important clinical SIGN of many infections. IT IS NOT A DISEASE. In all cases of fever, the associated condition must be sought and when determined treated. Common causes of fever include colás, pneumonia, otitis media, and typhoid. Occasionally the cause of the fever is unknown. High fever may be harmful to a child. The high fever could cause dehydration or convulsions. Careful history taking and physical examination must be done to find the cause of the fever.

Clinical Picture

A sick appearing child with a high fever - temperature of 39° - 41° with or without shaking chills. The pulse is usually elevated. The skin may be dry and warm or moist and warm.

Complications

It is important to look for other signs of associated diseases.

- a. Pain in the ear - otitis media.
- b. Rapid breathing and rales - pneumonia.
- c. Stiff neck or convulsions - meningitis. Infants under 6 months may not have neck stiffness even if they have meningitis.

Management

1. Remove most of the child's clothing. Leave only a light loose garment on.
2. Give tepid sponge baths until the temperature lowers to 38°.
3. Instruct the mother to increase the amount of oral fluids the child takes, so that he won't become dehydrated.
4. Instruct the parents in the method of giving tepid baths but also to return the child the next day for continued evaluation.
5. Search for and treat underlying conditions.

CROUP

General Considerations

Infectious croup is a condition resulting from inflammatory and oedematous obstruction of the upper air way. It may involve the area above the vocal cords (epiglottitis) or below the true vocal cords (laryngotracheo bronchitis). It is caused by an infectious organism. It can be a dangerous disease in the young child because it can result in complete obstruction of the airway.

Clinical Picture

Epiglottitis usually presents in a child of 3 to 6 years. Onset may be acute or follow upper respiratory infection. The course is rapidly progressive. From the onset of fever to sore throat, inability to swallow (because of pain), drooling saliva and to increasing respiratory distress and obstruction in less than 24 hours. The child is restless, anxious and prefers to sit with head held up.

Complications

Complete respiratory obstruction resulting in sudden death.

Treatment

Once the diagnosis is suspected, DO NOT ATTEMPT OR DO oropharyngeal examination. Keep child calm, in humid, cool air.

Antibiotics: Ampicillin - 100 mg/kg/day I.V. in four divided doses every 6 hours

OR

Chloramphenicol 100 mg/kg/day I.V. in four divided doses every 6 hours.

Refer to hospital immediately.

Laryngotracheo bronchitis (LTB)

Usually presents in children between 6 months and 3 years and follows symptoms of upper respiratory infection for more than a day. There is runny nose, low grade fever, a high-pitched barking cough and hoarseness. Respiratory distress with inspiratory stridor, retractions, tachypnoea and flaring of the alae nasi progress gradually. Drooling of saliva almost never occurs. This disease may recur.

MUMPS

General Considerations

Mumps is an infection caused by a virus which affects the parotid glands (located at the angle of the jaw). Mumps is a common disease of children and rarely affects adults. (Most are immune because they had mumps in childhood.)

Clinical Picture

Fever, "ear ache" and painful chewing is followed by swelling and tenderness at the angle of the jaw. Usually the angle can no longer be felt. The ear lobe is usually lifted upwards and out. Eating citrus fruit or anything sour, increases the pain. Symptoms are completely gone in 5 - 7 days.

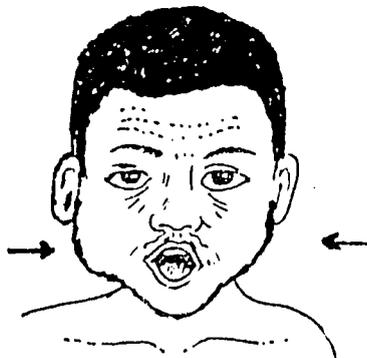


Figure 10 - Child with mumps with swollen parotid glands.

Complications

Adult men with mumps may develop tenderness and swelling of the testicles (orchitis) which may occasionally lead to sterility.

Rarely, a child with mumps develops meningoencephalitis (encephalitis).

Treatment

Rest and increased fluids. Isolation is not helpful

REVIEW QUESTIONS

1. Mumps is a virus infection which affects the parotid glands. What clinical signs result from this?
2. How long do symptoms of mumps remain?
3. What is the treatment of mumps?
4. Name two possible complications of mumps.

CHICKENPOX

General Considerations

Chickenpox is a mild common infection seen in children. It is caused by a virus. It is very contagious. It usually occurs in epidemics.

Clinical Picture

Chickenpox is usually very easy to diagnose. It is characterized by a skin rash. The rash consists of many small lesions which progress from red spots to blisters to ulcers with scabs. Different stages can be seen at the same time, after the first day. Most of the lesions are found on the chest and abdomen. Involvement of the face and extremities is seen to a lesser degree. Lesions are rarely seen on the palm of the hand or sole of the foot. Complete healing takes place in about 10 days.

Complications

Skin lesions may become seriously infected. Pneumonia and meningitis may occur.

Management

1. Increased fluids and adequate diet.
2. Keep the skin lesions clean with soap and water.

Management of Complications

1. Infected lesions around the face should be treated with:

Penicillin V four times a day for 7 days		
0 - 2 years	½ tab	(125 mg)
3 years or above	1 tab	(250 mg)
2. Complications such as pneumonia and meningitis should be vigorously treated.

REVIEW QUESTIONS

CHICKENPOX

1. Explain the rash of chicken pox.
 - a. Type of lesion:
 - b. Location of lesions:
 - c. Duration of lesions:
2. The management of skin lesions is the primary consideration when treating chickenpox. Describe the treatment of:
 - a. Non-infected lesions:
 - b. Infected lesions:

PÓLIO

(Poliomyelitis, Infantile Paralysis)

General Considerations

Polio is due to an infection by the polio virus. It is seen throughout the world but is rare where polio immunization is given routinely to all children. It is usually spread by the faecal-oral route but can be spread by coughing. The most infective state lasts about two weeks following the beginning of symptoms. The disease is most common in children under five years old but may affect older children and adults.

Clinical Course

The most noticeable sign of this disease is paralysis one or two days after febrile illness accompanied by headache and a mild stiff neck. Some children will develop paralysis of one or more extremity (arms and legs). The affected extremities will be tender. The paralysis is flaccid. That means that the extremity is "floppy" when you pick it up. Some children also develop paralysis of the respiratory muscles. All children seen at this phase should be referred to the hospital if possible, especially those with troubled breathing.

After some time all children will show some recovery from the paralysis. This will range from complete recovery to mild weakness or limp to total paralysis of one or more arm or leg.

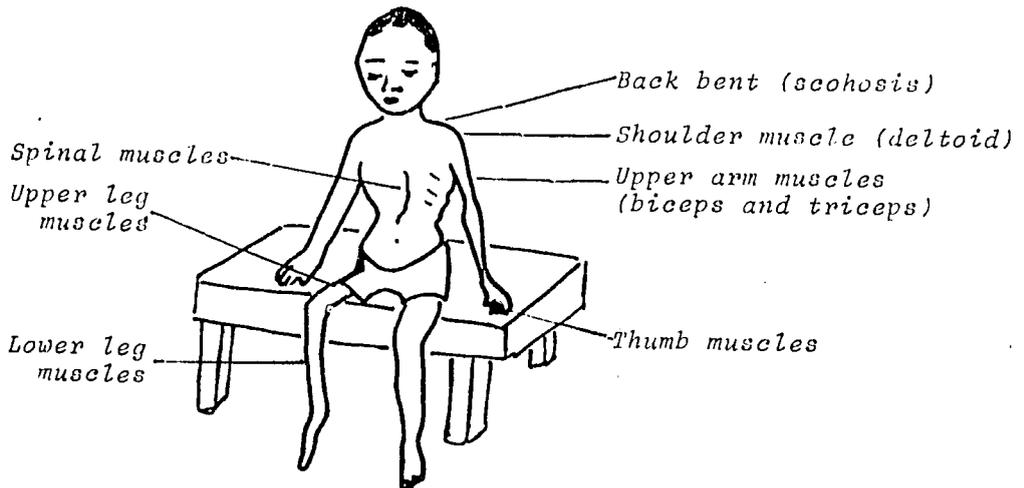


Figure IC 11 - muscles that are commonly paralyzed with polio.

Management

There is no drug which is effective against polio. Do not give any injections if you think the child has polio. This can make the paralysis worse.

The child should be referred to a hospital.

Late Management

When all signs of pain are gone, the child with some paralysis should be encouraged to exercise and to be as active as possible. Handmade crutches or splints can be helpful. Refer all cases 6 months after the acute stage for evaluation.

Prevention

Polio can be prevented by giving immunizations to child.

(See Child Care Module for Immunization Schedule.)

The supervisor should be notified of all cases of polio so that area-wide immunization can be carried out. This will prevent many new cases from occurring.

REVIEW QUESTIONS

POLIO

1. The polio virus is spread by two routes. List the two routes and circle the one that is most common.
 - a.
 - b.
2. What is the recommended drug treatment for polio?
3. Polio can be prevented. How?
4. Polio is common among children who are under _____ years old but may affect older children and adults. The most infective state lasts _____ weeks following the beginning of the symptoms.
5. One or two days after febrile illness with headache and mild stiff neck, some children develop _____ of arms and legs or of the respiratory muscles. Those children should be referred to the hospital.

STUDENT GUIDE

OTHER PROBLEMS OF INFANTS AND CHILDREN

I. Entry Level Knowledge and Skill

Before starting this unit you should be able to:
Take a history.
Perform a physical examination on an infant or child.

II. Using the information and experiences provided by the instructor and the module text, you will be able to:

1. Use diagnostic and management protocols as a guide to identification and treatment of the following other problems: rheumatic fever.
2. Describe the appropriate management for "other problems".
3. Recognize the physical exam discriminations listed in the module for stridor, heart murmur, intercostal retraction.

III. Evaluation

Upon completion of this module you will be rated on your attainment of the above objectives.

Knowledge: Written test based upon module content.
Acceptable performance, 80%.

Skill: See rating sheet for acceptable performance level.

1. Use of diagnostic protocols for identifying rheumatic fever and croup.

IV. Activities you will be participating in to accomplish the objectives.

1. Read the module text on "other problems of infants and children" and answer the review questions.
2. Discuss the identification and management of "other problems".
3. Participate in case study practice activity for identification and management of "other problems".
4. Practice using the protocols for identification of "other problems".
5. Clinical experience to observe the following physical examination discriminations: joint swelling and pain, heart murmur.

RHEUMATIC FEVER

General Considerations

Rheumatic fever is a disease which sometimes follows streptococcal sore throat or skin infection. It is most common in children between 5 and 15 years of age. The symptoms usually appear 2 to 3 weeks following a sore throat.

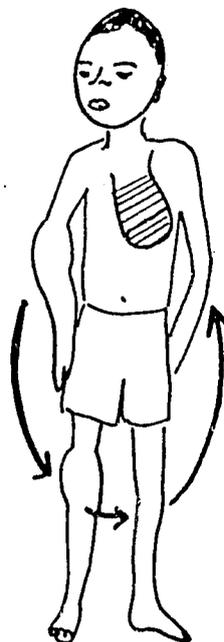
Clinical Picture

Painful swollen joints associated with fever are most commonly seen. The arthritis caused by rheumatic fever moves from one joint to another. The knees, elbows and ankles are usually affected. The joints become tender, painful, red and swollen. This arthritis lasts in one joint from 1 to 3 days then moves to another.

Carditis (inflammation of the heart) is less common but more serious. The patient may become weak. There is fever and a loud heart murmur. The neck veins may be filled, in the more severe cases. These severe cases may be fatal during the illness. Others may develop permanent damage to their hearts after repeated episodes of carditis.

Complications

The serious complication of rheumatic fever is permanent damage to the heart from carditis. This permanent damage results in chronic tiredness and easy fatigue.



Migrating polyarthritis

Carditis

Figure IC 13 - Clinical features of Rheumatic Fever.

Management

1. Refer to hospital. All patients suspected of having rheumatic fever should be referred to the hospital. This diagnosis is difficult to make.
2. If for some reason it is impossible to refer the patient, do the following:
 - a. Benzathine Penicillin 1.2 million units IM.
 - b. Aspirin four times a day for 4 to 6 weeks.

50-100 mg/kg/day in four divided doses.

NOTE: Ask about "ringing" or "buzzing" noise after 2 to 3 days. If present, reduce dosage until it goes away.

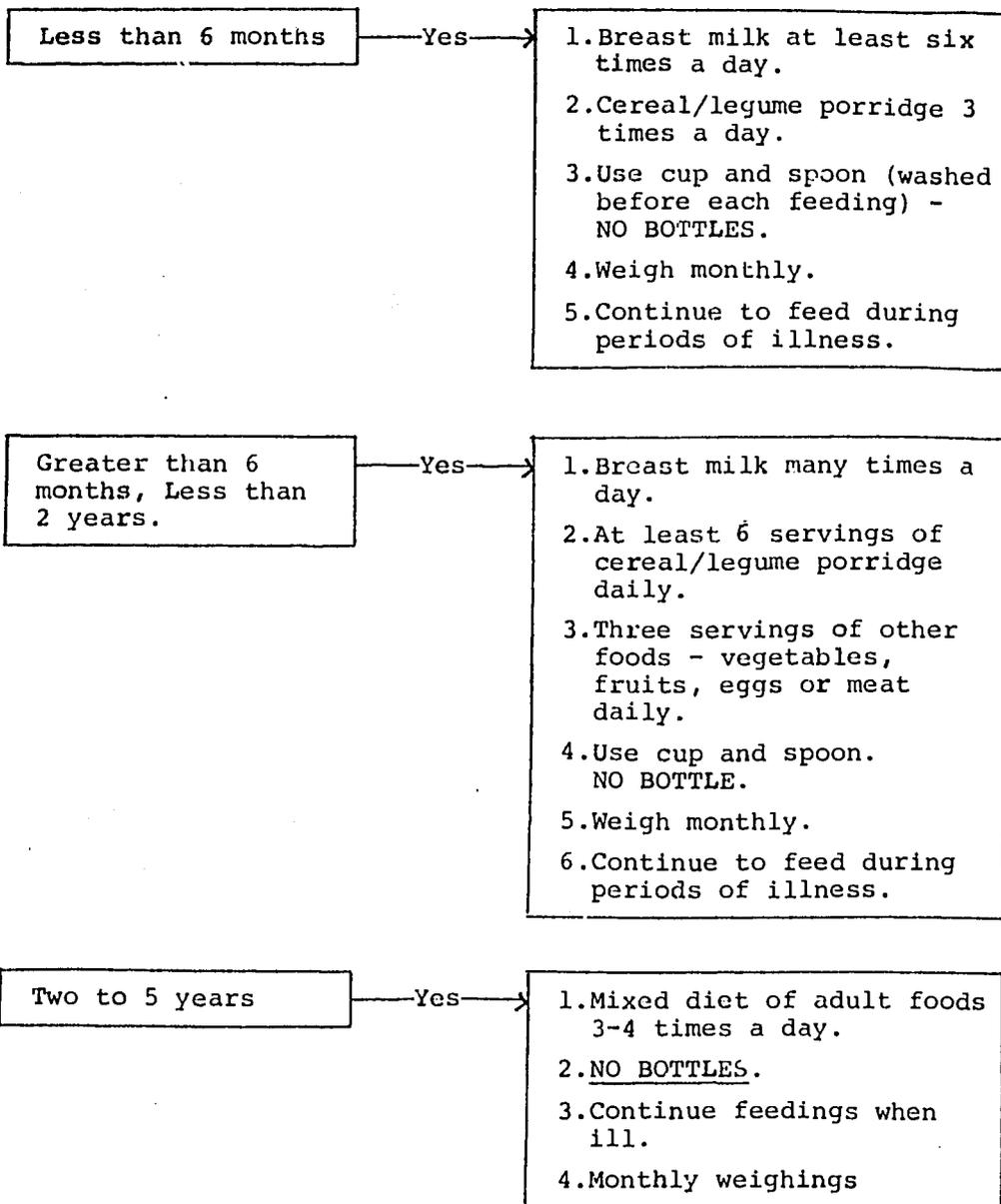
- c. Bedrest for two weeks then gradual increase in activity if able. Patient should continue to rest when feeling tired for several weeks.

Long Term Management

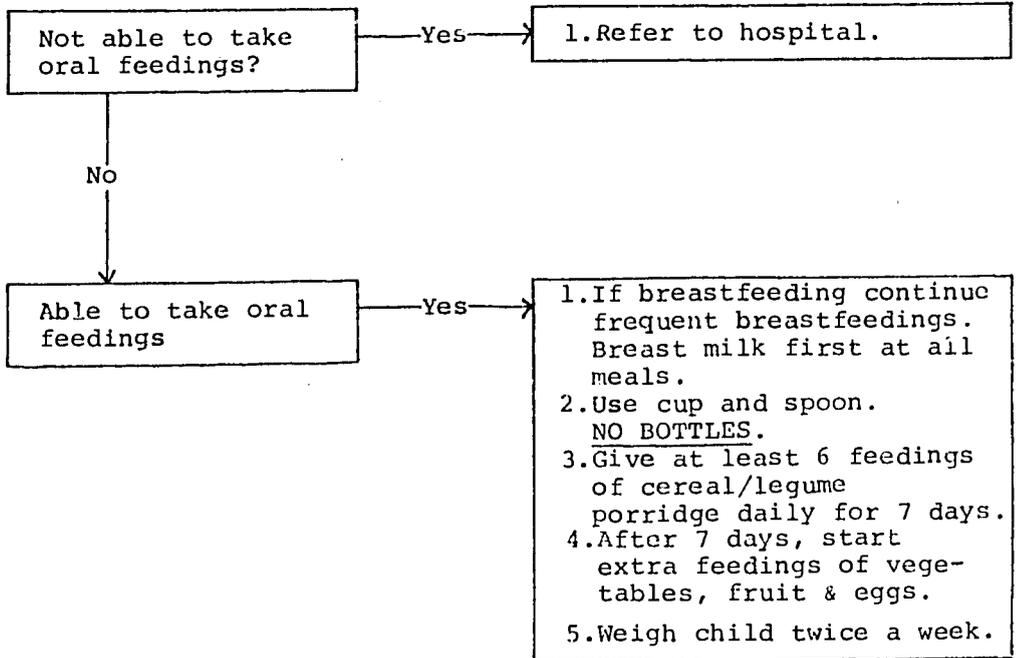
After the diagnosis of rheumatic heart disease has been made by a physician, the child should receive 1.2 million units of benzathine penicillin I.M. every month until 20 years of age. This prevents further damage to the heart.

Prevention

Early treatment of streptococcal sore throat with penicillin, oral or intramuscular. Penicillin should be continued for ten days.

EARLY MALNUTRITION

SEVERE MALNUTRITION



Complications

1. Respiratory infections - refer.
2. Bitot spots - treat with Vitamin A 5000 Units daily for 3 weeks.
3. Others - treat as in protocols.

Maintenance

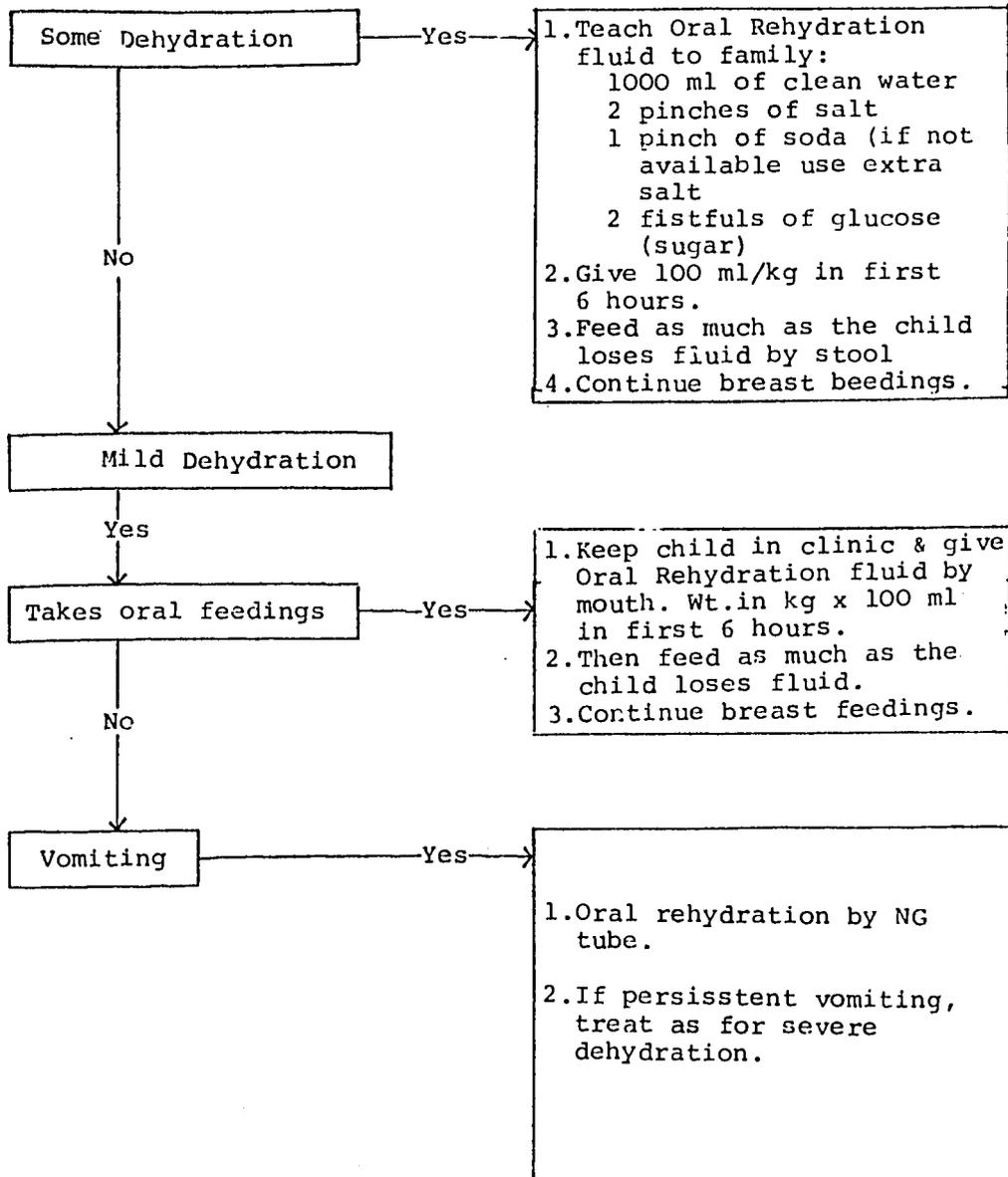
1. Be certain parents know that lack of food caused the illness.
2. Continue mixed grain/legume porridge.
3. Continue variety of foods.
4. See weekly in Child Care Clinic.

PREVENTION OF MALNUTRITION

1. Be certain parents and communities know the Six Basic Health Messages:
 - a. Breast feed until the child is 2 years old.
NO BOTTLES.
 - b. Start supplementary feeds such as mixed grain/legume porridge at 4-6 months.
 - c. Add a variety of fruits, vegetables, eggs, beans and meat to child over 4-6 months.
 - d. Feed child at least 4 meals a day.
 - e. Continue to feed sick child.
 - f. Give pregnant and lactating women more vegetables and protein rich foods.

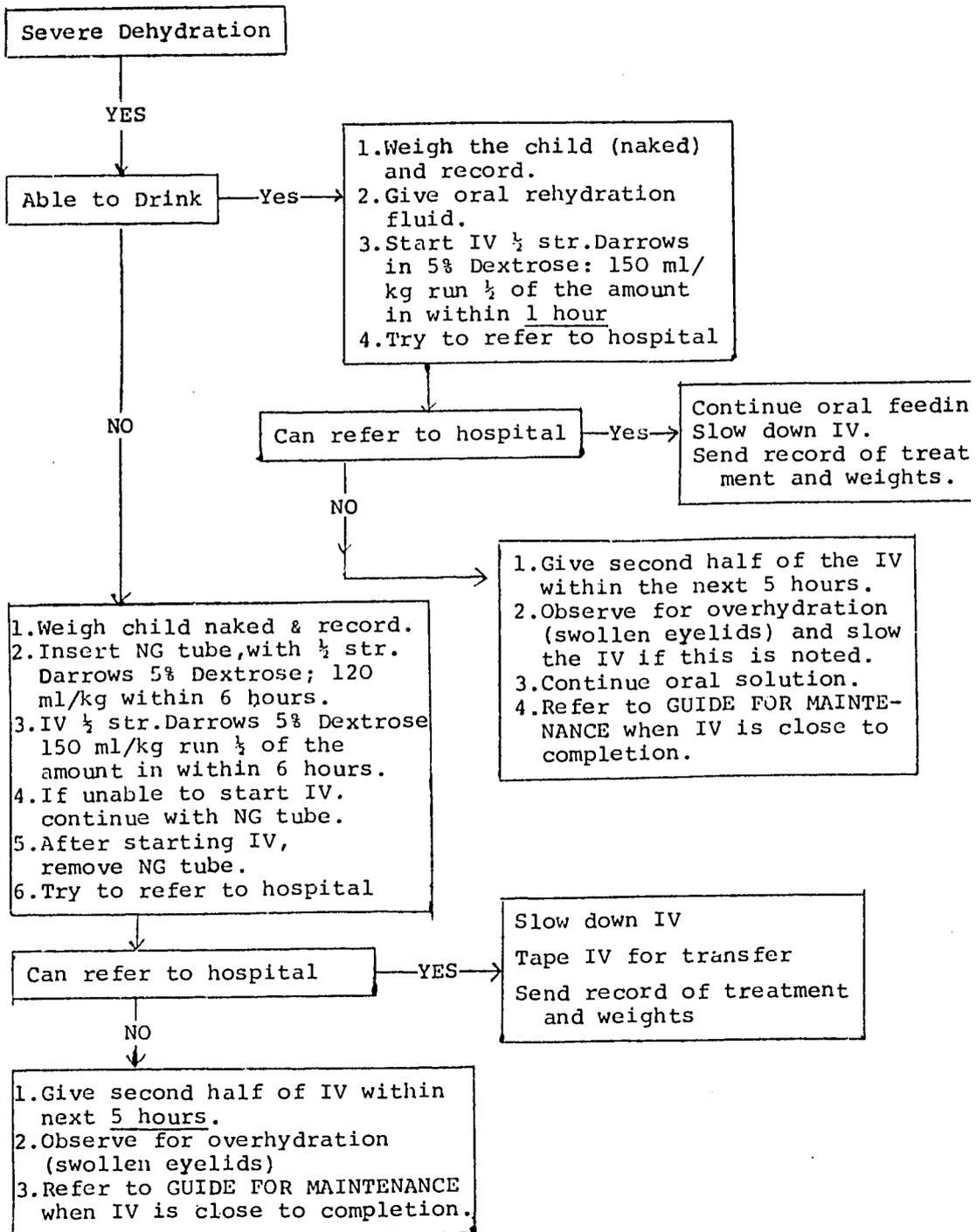
2. Child Care Clinics with Growth Charts and health education for families.

MANAGEMENT OF DIARRHOEA/DEHYDRATION
(SOME/MILD)



MANAGEMENT OF DIARRHOEA/DEHYDRATION

(Severe)



MANAGEMENT OF
LOW BIRTH WEIGHT INFANT

1. At birth the infant should be immediately wrapped in a clean warm cloth and given to the mother to hold. This will allow the baby to stay warm. DO NOT BATHE THE SMALL INFANT AFTER DELIVERY.
2. Frequent breast feedings should be started 2-6 hours after birth when the child is able to suck and swallow. Tickle the feet if the infant falls asleep while suckling.
3. If the infant tires, complete the feeding with expressed milk (EBM) by dropped (pipette) or cup and spoon.
4. If the child is unable to suck and swallow, feed by N.G. tube in the following quantities every two hours:

Weight	First day each feed	Increase each feed each day	Maximum each feed at 10 days
Less than 1400 g	4 ml	4 ml	40 ml
1400 g to 1800 g	6 ml	6 ml	60 ml
More than 1800 g	8 ml	8 ml	80 ml

5. The room should be kept warm.
6. If the infants are twins, rotate feedings on breasts. Feed one child first one time and the other child the next.
7. To avoid infection, practice STRICT HAND WASHING before handling infant.
8. If the baby is getting enough milk, he should pass urine at least 5-6 times/day, and start to gain weight after the first week of life. If he is not getting enough milk, he will become dehydrated and not gain weight.

MANAGEMENT OF
SEPTICAEMIA IN YOUNG INFANT

1. Antibiotics should be started immediately and continued for 5-7 days:

Ampicillin 50-100 mg/kg/day I.M.

- For infants less than one week and prematures, the dose should be divided and given every 12 hours.
- For infants older than one week, the dose should be divided and given every 8 hours.

OR

Crystalline Penicillin (Penicillin G) 50,000-100,000 units/kg/day

AND

Streptomycin 20 mg/kg/day

The dosage of both drugs are given together in divided doses every 12 hours.

2. Refer to the hospital immediately.
3. Feed by naso-gastric tube with expressed breast milk (and 10% glucose solution if needed), 50 ml every 3 hours until baby is able to nurse from the breast. It is important that the mother's milk is expressed, so that there will be sufficient milk when the baby is able to suckle.
4. Keep the baby warm. Use blankets and keep next to mother.

MANAGEMENT OF
JAUNDICE OF THE NEWBORN

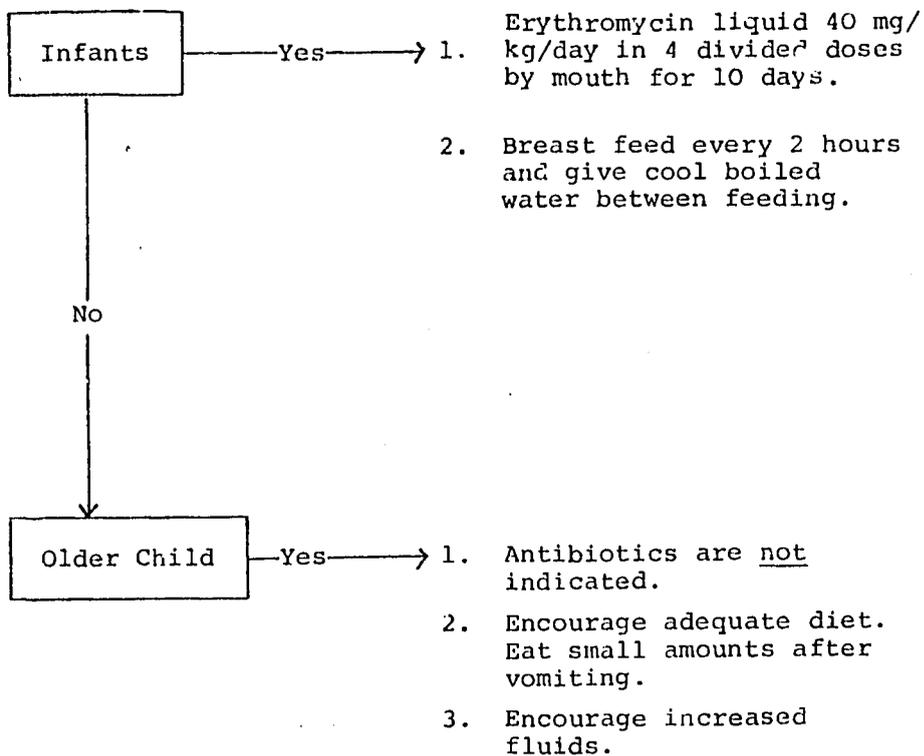
1. Refer to a physician.

MANAGEMENT OF

THRUSH

1. Paint 1% or 2% gentian violet on lesions 3 times a day for 10 days. The mother can be shown how to do this.
2. Mothers should continue to feed newborns on the breast.
3. Antibiotics should not be used for thrush - they make it worse. If the child is on antibiotics for another infection, you should consider stopping them if gentian violet is not controlling the thrush.

MANAGEMENT OF
WHOOPIING COUGH



Prevention

1. DPT immunization.

MANAGEMENT OF
MEASLES

General

1. Encourage an adequate diet.
2. Advise increased fluids
3. No antibiotics are necessary.
4. Spongé bathe for 15 - 20 minutes, if fever is above 40°.
5. For mouth sores, continue feedings of soft foods and fluids.
6. Re-examine after 3, 7 and 10 days.

Complications

1. Pneumonia - treat as indicated.
2. Unconsciousness or convulsions - refer.
3. Weight below 10th percentile - refer.
4. Signs of severe dehydration - refer.

Prevention

1. If available, measles vaccine will prevent measles.

One injection at 9 months to one year of age.

MANAGEMENT OF
HIGH FEVER

1. Remove heavy clothing.
2. Give tepid sponge baths until temperature levels to 38^o.
3. Search for and treat underlying conditions.
4. Encourage increased oral fluids.

MANAGEMENT OF
MUMPS

1. Rest.
2. Encourage increased fluids.
3. Adequate diet.

MANAGEMENT OF
CHICKEN POX

1. Increased fluids and adequate diet.
2. Keep skin lesions clean with soap and water.

Complications

1. Infected lesions about the face.

Penicillin V four times a day for 7 days

0 - 2 years $\frac{1}{2}$ tab (125 mg)

3 years or above 1 tab (250 mg)

2. Pneumonia - as indicated.

MANAGEMENT OF POLIO

Early Management

1. Refer to a hospital.
2. Do not give any injections.

Late Management

1. Encourage exercise and activity.
2. Help with crutches or splints.
3. Refer all cases to the hospital for evaluation 6 months after the acute stage.

Prevention

1. Oral polio immunization, see Child Care Module.
2. Notify the supervisor of all cases.

MANAGEMENT OF CROUP

1. Once the diagnosis is suspected, DO NOT ATTEMPT OR DO oropharyngeal examination. Keep child calm, in humid, cool air.
2. Antibiotics: Ampicillin - 100 mg/kg/day IV in four divided doses every 6 hours

OR

Chloramphenicol 100 mg/kg/day IV in four divided doses every 6 hours.
3. Refer to a hospital if severe.

MANAGEMENT OF RHEUMATIC FEVER

1. Refer to a hospital.
2. If impossible to refer, do the following:
 - a. Penicillin 1.2 million units IM
 - b. Aspirin four times a day for 4-6 weeks.

50 - 100 mg/kg/day in 4 divided doses.

Ask about ear ringing and reduce dose until it disappears.
 - c. Bed rest for 2 weeks.

Long Term Management

1. 1.2 million units of benzathine penicillin IM every month until 20 years of age.

Prevention

1. Early treatment of streptococcal sore throat (see EENT module).