

Treating measles in children

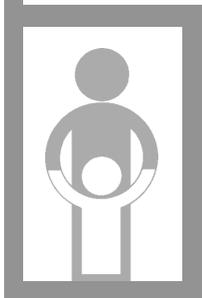


DEPARTMENT OF IMMUNIZATION, VACCINES AND BIOLOGICALS
DEPARTMENT OF CHILD AND ADOLESCENT HEALTH



World Health Organization
Geneva
2004 updated

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The Department of Immunization, Vaccines and Biologicals thanks the donors whose unspecified/undesigned financial support has made the reproduction of this document possible.



The production of this CD-ROM teaching aid was made possible a grant from the Micronutrient Initiative, Ottawa, Canada.

Ordering code: WHO/EPI/TRAM/97.02

Printed: October 1997 (updated 2004)

This document and updates of the information contained therein will be regularly posted on the Internet at:

<http://www.who.int/vaccines-documents/>

Copies may be requested from:

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TREATING MEASLES IN CHILDREN

Acknowledgements

In producing this PowerPoint slide set and booklet, the World Health Organization (WHO) wishes to acknowledge the contributions made by Dr Nicholas Cohen, formerly with the WHO Expanded Programme on Immunization; Dr Greg Hussey, University of Cape Town, South Africa; Lisa Lee, IHPO, Centers for Disease Control and Prevention, Atlanta, GA, USA and the many others throughout the world who reviewed the early drafts.

WHO thanks the following for providing the photographs used:
C. J. Clements, N. Cohen, G. Hussey, Teaching Aids at Low Cost (TALC) and the Institute of Child Health Library, University of Cape Town.

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TREATING MEASLES IN CHILDREN

INTRODUCTION

This PowerPoint slide set and booklet contain information for averting deaths from measles and for minimizing the severity of complications of the disease through proper case management.

Measles vaccine is the best public health tool for the prevention of the disease. Despite its extensive use, however, measles cases continue to occur for a variety of reasons. In 2001, the World Health Organization (WHO) estimated that about 30 million cases and over 700 000 deaths from measles occur annually in developing countries. Most deaths follow complications such as pneumonia, croup and diarrhoea, and are also frequently associated with malnutrition. In addition, measles may result in long-term health problems including blindness, deafness, chronic lung disease, poor growth and recurrent infections.

The aim of this PowerPoint slide set and booklet is to train health workers in measles case management, with emphasis on how to:

- identify, assess and classify a case
- prevent, recognize, treat and manage complications.

Through training in effective measles case management, health workers will correctly identify, assess and treat cases and complications, promote recovery from complications and prevent complications and death. Proper case management of measles should not be seen in isolation but should be complementary to and supportive of other aspects of primary health care for child survival such as:

- Integrated Management of Childhood Illness. This is a training package for diagnosis and care of children with pneumonia, diarrhoea, malaria, measles and malnutrition, which are the major causes of illness and death in children in developing countries.
- The Child, Measles and the Eye. This CD-ROM training aid describes the prevention and management of measles-related eye disease (WHO/EPI/TRAM/93.5; WHO/PBL/93.31).

Target audience

The PowerPoint slide set and booklet are aimed at health workers, particularly those involved in primary health care initiatives such as immunization, nutrition, education or maternal and child health, and their corresponding educational institutions. They will also help health workers in treatment centres and hospitals.

Suggestions to teachers/facilitators

It is recommended that these training materials are used during group teaching sessions. It is good to work and learn within a group, so that everyone can profit from the experience of others. Allow sufficient time to look at or read each slide and the accompanying text in the booklet. If desired, the six parts of the slide set can be taught separately. Introduce each part with a general discussion of the health workers' current knowledge of measles, and end with a summary of what has been covered during the session. Examples of specific questions to facilitate the process are listed in Annex A. Six hours would be a suitable time to allocate to cover teaching the entire 40 slides, although individual needs may alter this time considerably.

Evaluation

Evaluation of impact is an essential component of any programme. Health workers at the clinic or outpatient level should be involved in evaluating their own programmes at a local level. Annex B provides examples of questions that could assist health workers to set up an evaluation process for their measles case management programme.

CASE DEFINITION

Slide 1



Measles is an acute childhood infectious disease caused by a virus. The virus is transmitted from person to person through coughing or sneezing. The disease is characterized by:

- a generalized, reddish (erythematous), blotchy (maculopapular) rash;
- a history of fever usually above 38°C (if not measured, then "hot" to touch); and
- at least one of the following - cough, runny nose (coryza), or red eyes (conjunctivitis).

In addition, children with measles frequently exhibit a dislike of bright light (photophobia), and often have a sore red mouth (stomatitis).

There are many other childhood infectious diseases that also present with a measles-like rash, such as rubella (German measles) and scarlet fever. However in these diseases cough, coryza or conjunctivitis are usually NOT present.

This slide shows a child with the typical measles rash and conjunctivitis.

EXTENT OF THE PROBLEM 1**Disease and death**

Slide 2

**30 million measles cases and
over 700 000 measles
deaths annually (2001)**

Measles is a common disease in children. Recent estimates (2001) from WHO indicate that about 30 million cases and 700 000 deaths occur annually in developing countries. In these countries, measles is one of the leading causes of childhood deaths, most of which follow complications such as pneumonia, diarrhoea and malnutrition. Actual numbers of children affected by measles may be much higher - health workers often identify a childhood illness as simply "pneumonia" or "diarrhoea" and may not realize that the illness is, in fact, a complication of measles.

Find out how many cases and death from measles occur in your community.

EXTENT OF THE PROBLEM 2
Long-term illness

Slide 3



Measles is associated with long-term health problems. These include blindness (measles causes about half of the cases of childhood blindness in Africa), chronic lung disease, malnutrition (marasmus or kwashiorkor) and failure to thrive, and recurrent infections. Furthermore, the risk of contracting other infections or dying remains high for several months after recovery from acute measles infection.

This slide shows a child with measles-related blindness. Blindness during measles illness may be due to the measles infection itself, to another complicating infection, or to vitamin A deficiency precipitated by measles.

WHO GETS MEASLES?

Slide 4

In countries where immunization rates are low, virtually all unimmunized children will have been infected with measles by the age of 5 years. About half the cases occur in children below one year, the age group in which most deaths occur. In more developed and industrialized countries measles is now a disease of older children and young adults, who are unimmunized or in whom primary immunization has failed. At particularly high risk of measles are the urban poor, who live in areas where immunization coverage is low and where overcrowding aids transmission. Special efforts are needed to reach these children with immunization and other health services.

**RISK FACTORS FOR
SEVERE COMPLICATED MEASLES**

Slide 5

**RISK FACTORS FOR SEVERE
COMPLICATED MEASLES**

- **Young age**
- **Malnutrition**
- **Overcrowding**
- **Immune deficiency**
- **Vitamin A deficiency**

Some children infected with measles virus may have only a mild illness, with few signs or symptoms. This is fortunate for the child but makes the clinical diagnosis harder. Other children may have severe complicated measles with more obvious signs and symptoms and are generally much sicker. Children at greatest risk of developing severe complicated measles include:

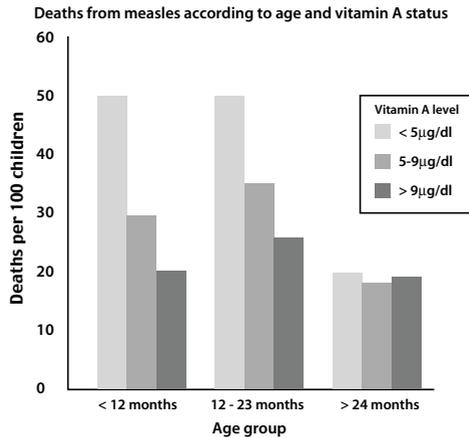
- the young, particularly those who are under one year of age
- the malnourished (children with marasmus or kwashiorkor)
- those living in overcrowded situations (e.g. the urban poor, refugee camps) where they may be exposed to a high load of virus
- those whose immunity (the body's defense mechanism against infections) is affected, such as children with HIV infection, malnutrition or malignancy
- those who are vitamin A-deficient (see slide 6)

The lack of adequate health care for children with measles also increases the risk that untreated complications will progress to severe complications and ultimately to death. Even when a health centre is nearby, parents may not understand the need to bring sick children early enough, and often seek help when complications are well advanced.

Find out which children are at greatest risk in your community.

VITAMIN A DEFICIENCY AND SEVERE COMPLICATED MEASLES

Slide 6



Vitamin A deficiency affects the body's immune system and the cells which protect the lining of the lungs and gut. The damage it causes results in an inability to control and prevent infections. Vitamin A deficiency is linked with a higher rate of measles complications and a higher death rate.

The association between vitamin A deficiency levels and death from measles is shown in this slide from the former Zaïre (current DRC). Children under two years of age with measles infection who also had a very low vitamin A level had double the risk of dying compared to children with higher levels.

In the USA, where clinical vitamin A deficiency is very rare, measles cases in children with low vitamin A levels have been associated with an increased risk of admission to hospital and severe disease. Vitamin A therapy reduces the rate and severity of complications, particularly croup, pneumonia and diarrhoea. The duration of hospital stay is reduced in children given supplements of vitamin A.

Vitamin A therapy as part of the case management of measles is discussed in slides 33-34.

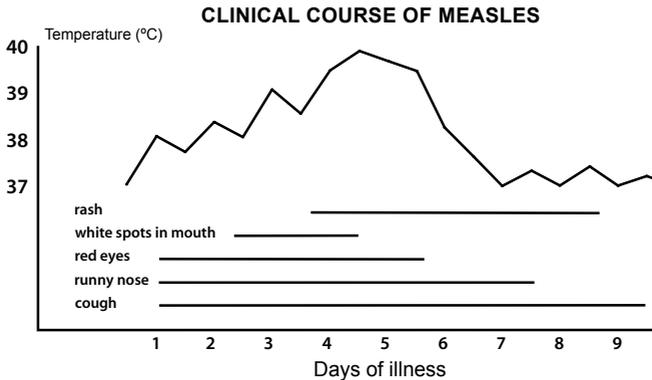
SUMMARY OF PART 1

You should now be familiar with:

- the case definition of measles
- the impact on child health caused by measles in general and in your community
- the long-term effects of measles
- Who gets measles generally, and particularly in your community
- the importance of vitamin A deficiency in making measles more dangerous.

CLINICAL COURSE

Slide 7



The incubation period of measles¹ is usually 8-12 days. The illness before the rash (prodromal illness²) is characterized by high fever, runny nose, cough, conjunctivitis and Koplik spots (tiny whitish-blue spots on the lining of the inside of the cheeks, opposite the molar teeth). These symptoms are followed by the typical red rash, starting behind the ears and on the hairline and then spreading to the rest of the body, arms and legs. The spots often run into each other in blotchy patches. The temperature subsides after 3-4 days and the rash fades after 5-6 days, leaving skin discoloration (post-measles staining). The skin often peels off and may continue to peel for weeks.

¹ The incubation period is the time between being exposed to infection from another person with measles, and developing the first signs or symptoms.

² The prodromal illness is the set of signs and symptoms which occur before the development of the skin rash. It lasts for 3-4 days.

EARLY RASH

Slide 8



This slide shows a child with early measles, showing the erythematous (reddish) maculopapular (blotchy) rash, and the associated conjunctivitis. The skin rash appears as individual spots, but these run together in some places after 2-3 days.

RASH - DAY 3



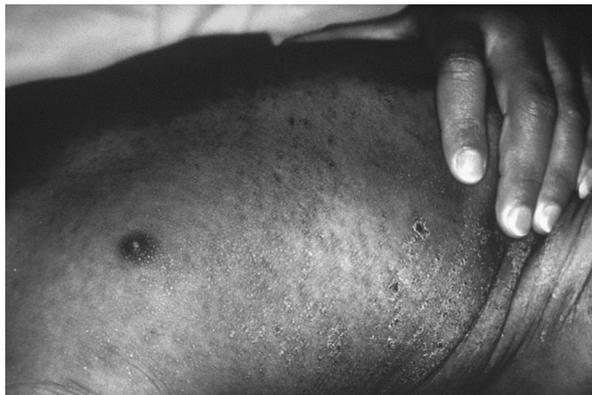
Slide 9

This slide shows a child with measles on about the third day of the rash showing how the spots run together forming large blotchy areas. In dark-skinned children it may be difficult to see the redness of the rash. The measles rash is also best seen in natural daylight and may not be so obvious under artificial lighting or in dark rooms.

The measles rash does not have vesicles (blisters) or pustules, and does not itch. It should not be confused with other common childhood rashes such as chickenpox (generalised rash with vesicles), scabies (occurs on the hands, feet and buttocks and itches), or heat rash (generalised rash with small bumps and vesicles which itch).

RASH - POST-MEASLES STAINING

Slide 10



This slide shows the typical brownish or blackish skin discoloration or "staining" that follows when the rash fades on days 5-6 after onset. The staining is more obvious if the skin is gently pulled tight as shown on the slide.

RASH - POST-MEASLES PEELING



Slide 11

This slide shows the arms of a child with classical post-measles staining and peeling of the skin. This peeling starts after about day 5 following onset of the rash, and may continue for weeks.

COMPLICATIONS

Slide 12

| COMPLICATIONS OF MEASLES | |
|---|--|
| Common Pneumonia Diarrhoea Croup Malnutrition Otitis media Mouth ulcers Eye complications | Uncommon Encephalitis Myocarditis Pneumothorax Pneumomediastinum Appendicitis Subacute sclerosing panencephalitis (SSPE) |

The complications of measles are listed on this slide. Only the common complications are discussed below. The uncommon complications are usually more serious and require specialist care with referral to hospital.

Pneumonia, diarrhoea and croup may be caused by the measles virus itself, especially if they occur within the first week of the illness after the appearance of the rash. When complications occur later, they are usually due to secondary viral and bacterial infections, are frequently more severe, and may cause death more often than when they occur earlier.

Malnutrition may be due to poor appetite or mouth ulcers. Also, parents may not realize the importance of feeding the child during the illness. All these factors increase the risk that the child will develop some type of infection as a complication.

Eye complications are common in poorer communities and are a consequence of the measles infection, secondary herpes or bacterial infection, or a chemical conjunctivitis resulting from incorrect and inappropriate topical therapy or vitamin A deficiency.

LONG-TERM COMPLICATIONS



Slide 13

Recovery following acute measles may be delayed for many weeks and even months, with failure to gain weight (as illustrated on this slide), recurrent infections, and persistent pneumonia and diarrhoea. Because the death rate of children during this phase is also significantly increased, they should attend a clinic at least once a month, for a minimum of six months, for growth monitoring and early detection and treatment of any problems. See slide 35 for more details.

SUMMARY OF PART 2

You should now be familiar with:

- the clinical course of measles
- the rash on different days during the illness
- the early and long-term complications of measles.

ASSESSMENT 1
Assessing severity

Slide 14

ASSESSING SEVERITY

Classify patient as having:

- **Severe complicated measles**
- **Complicated measles**
- **Uncomplicated measles**

Having established a diagnosis of measles either by confirming that the signs and symptoms match the clinical case definition (slide 1), and/or by a positive laboratory¹ test, the next task of a health worker is to assess the child for the severity of the disease.

From the following slides, you will learn what questions to ASK the mother, and what to LOOK/LISTEN/FEEL for in the child. As a result, you will be able to classify cases of measles in children into one of three categories:

- SEVERE COMPLICATED MEASLES
- COMPLICATED MEASLES
- UNCOMPLICATED MEASLES.

The management and treatment for each category is different.

¹ An ELISA test carried out on a finger-prick blood test at the nearest measles laboratory.

ASSESSMENT 2

Assessing individual cases

Slide 15

| Ask about | Look/listen/feel for |
|---|---|
| Ability to take feeds or fluids | Nutritional status |
| Rapid, difficult or noisy breathing (stridor) | Breathing rate, chest indrawing, stridor |
| Diarrhoea, vomiting or blood in stools | Dehydration |
| Sore mouth, eyes or ears | Mouth ulcers, sore and discharging ears and eyes, white spots on eyes |
| Convulsions, sleepiness | Level of consciousness |

Start the assessment of the child by taking a history from the mother - ASK about specific symptoms the child has or has had, and examine the child - LOOK/LISTEN/FEEL for signs of illness.

This slide shows you all the important indicators of measles complications to ask about (SYMPTOMS) and to look, listen or feel for (SIGNS).

Now look at slides 16 and 17 to see if the signs and symptoms you find in the child show that the case can be classified as SEVERE COMPLICATED MEASLES or COMPLICATED MEASLES. A child with measles who is not classified in either of these two categories is classified as having UNCOMPLICATED measles.

CLASSIFICATION 1
Severe complicated measles

Slide 16

Signs and symptoms of severe complicated measles

- Not able to drink or breastfeed*
 - Convulsions*
 - Lethargic or unconscious*
 - Deep or extensive mouth ulcers
 - Chest indrawing and rapid breathing
 - Stridor in a calm child
 - Corneal clouding or ulcers, or vision affected
 - Mastoiditis - pain and swelling of the bone behind the ear
 - Severe malnutrition
 - Severe dehydration
- Key: * DANGER SIGNS

ASK about "symptoms" and LOOK/LISTEN/FEEL for "signs" (slide 15). If the child has even one of the signs and symptoms listed on slide 16, classify as SEVERE COMPLICATED MEASLES and refer to hospital.

Next check for DANGER SIGNS (marked by * on the slide). If one or more is present, the child needs immediate life-saving attention. Complete the assessment and any preliminary treatment (e.g. the first dose of antibiotic, vitamin A, start of rehydration) followed by rapid referral to hospital.

If the child with measles has severe malnutrition, either marasmus or kwashiorkor, then the case should always be classified as severe complicated measles.

Treatment of severe complicated measles is discussed in slides 20-22.

CLASSIFICATION 2
Complicated measles

Slide 17

Signs and symptoms of complicated measles

- Rapid breathing, but NO chest indrawing
 - 40 or more breaths per minute if aged more than 1 year
 - 50 or more breaths per minute if aged less than 1 year
- Some dehydration
- Stridor only when the child is upset or crying
- Mouth ulcers not affecting intake of food or fluids
- Pus draining from the eyes
- Acute otitis media - pain in or discharge from the ear, duration less than 14 days

ASK about "symptoms" and LOOK/LISTEN/FEEL for "signs" (slide 15). If the child has even one of the signs and symptoms listed on slide 17, classify as COMPLICATED MEASLES.

Treatment of complicated measles is discussed in slides 23-28.

If a child with measles has no signs or symptoms suggesting severe complicated or complicated measles, classify as UNCOMPLICATED MEASLES. The management of these children is described in slides 18-19 and 29-36.

SUMMARY OF PART 3

You should now be familiar with:

- signs and symptoms of the three types of measles cases
- how to classify measles cases as
 - severe complicated measles
 - complicated measles
 - uncomplicated measles
- what signs to look, listen and feel for, and what symptoms to ask about
- danger signs.

WHERE TO MANAGE CASES

Slide18

WHERE TO MANAGE CASES

Severe complicated measles - HOSPITAL

Complicated measles - OUTPATIENT CLINICS

Uncomplicated measles - HOME CARE

The assessment and classification of measles cases into the three categories will help you to decide where to treat the child:

- Severe complicated cases are treated in hospital wherever possible.
- Complicated cases are treated on an outpatient basis.
- Uncomplicated cases are managed at home with basic supportive care.

The management at these three levels is dealt with in more detail in the following slides.

GENERAL MANAGEMENT PRINCIPLES

Slide 19

GENERAL MANAGEMENT PRINCIPLES

Treat the whole child (and family)
Treat multiple complications at the
same time
Anticipate complications
Act fast to treat eye lesions

This slide lists the general management principles that should be applied when caring for all children with measles at all levels of the health care system.

The management and treatment of common complications of measles such as pneumonia, diarrhoea, malnutrition, croup, ear infections, and eye disease associated with vitamin A deficiency (xerophthalmia) are described in slides 20-28. The management and treatment described follow WHO guidelines for the management of these conditions.

Antibiotic dosages are given in Annex C.

Details on informing and advising the mother are given on slide 35.

SEVERE COMPLICATED MEASLES

Hospital care 1 - Reasons for admission

Slide 20

REASONS FOR HOSPITAL ADMISSION

Not able to drink/breastfeed*
Convulsions*
Abnormally sleepy or difficult to wake*
Deep or extensive mouth ulcers
Chest indrawing and rapid breathing
Stridor in calm child
Corneal clouding or ulcers, or vision affected
Mastoiditis
Severe dehydration
Severe malnutrition
Key: * DANGER SIGNS

Slides 20, 21 and 22 deal with the management of SEVERE COMPLICATED MEASLES. Remember that the essential components of management outlined on slides 29-36 must be applied here as well.

Criteria for admission to hospital will vary in different areas and will depend on the availability of hospital beds. Whenever feasible, all children with severe complicated measles (listed on this slide) should be admitted to hospital. Without admission and proper care, these children are in danger of dying. If admission is not possible, provide the best available therapy on an outpatient basis, with regular reassessment until the child is well. For children with danger signs, treatment must begin at once, before transfer to hospital.

SEVERE COMPLICATED MEASLES

Hospital care 2 - Management issues

HOSPITAL CARE OF SEVERE COMPLICATED MEASLES

Safe arrival

General management principles

Pneumonia

Croup

Slide 21

- **Safe arrival.** Children with severe complicated measles (especially those with danger signs) should be treated in hospital. For the peripheral health worker, the most important action is to ensure the child arrives at the hospital as quickly as possible and in the best possible condition. This means starting urgent treatment before sending the mother and child to hospital (e.g. starting rehydration, giving the first dose of vitamin A or the first dose of antibiotic).

- **General management principles** as shown on slide 19 must be applied. In this slide set it is not possible to deal with the hospital treatment of all the severe complications of measles. A few important points are mentioned below.

- **Pneumonia.** Antibiotics should be given by intramuscular or intravenous injection. Give oxygen, if available, to all children who are hospitalized with very severe pneumonia (cyanosis, unable to drink). If wheezing is a problem, give salbutamol.

- **Croup.** Airways intervention (intubation or surgical tracheotomy) may be needed. Nebulized adrenaline may be used as an alternative. If bacterial croup (see slide 24) is suspected, give chloramphenicol.

- **General care.** See Part 5.

SEVERE COMPLICATED MEASLES

Hospital care 3 - isolation of children

Slide 22



Measles is a highly infectious disease and spreads rapidly amongst children who have not had the disease and amongst those who have not been immunized against measles.

- Do not leave in the public waiting area children with fever and rash suspected of having measles. If possible, provide a special isolation room for them.
- Isolate children admitted to hospital with measles for at least 4 days after the rash appears. This will limit the spread of the measles virus. Isolation should be as effective as resources permit. Ideally measles patients should be kept in their own ward away from other patients.
- Isolate malnourished and immuno-compromised children with measles during the whole illness, since they may excrete the virus for a long time.
- Immunize with measles vaccine all children from 6 months of age who are admitted to hospital. For children receiving a dose before 9 months, it is essential that a second dose be given as soon after 9 months of age as possible.

COMPLICATED MEASLES
Outpatient care 1 - pneumonia

Slide 23

MANAGEMENT OF PNEUMONIA**Assessment:**

Rate of respiration

Treatment:

Give an antibiotic

Slides 23-28 deal with the management of COMPLICATED MEASLES on an outpatient basis. Remember that the essential components of management outlined on slides 29-36 must always be applied here as well.

Assessment

A child has pneumonia if there is cough and rapid breathing (40 breaths or more per minute if aged more than one year, or 50 breaths or more per minute if aged less than one year).

Treatment

Give an antibiotic, either ampicillin, amoxicillin, cotrimoxazole or, if these are not available, procaine penicillin for 5 days (see Annex C for dose). The child should return for reassessment in 2 days, or sooner if the condition worsens (see slide 36).

COMPLICATED MEASLES

Outpatient care 2 - croup

Slide 24

MANAGEMENT OF CROUP

Assessment:

Stridor only when the child is crying or also when quiet?

Cough and/or fever?

Treatment:

Outpatient for mild croup and no distress

Admit all other croup

Give chloramphenicol for bacterial croup

Assessment

Croup is caused by an infection of the voice box and windpipe, and in children with measles it may be:

Mild croup - noisy in-breathing (stridor) only when the child is crying, a fever, hoarse voice, and a barking or hacking cough.

Severe croup - stridor even when the child is quiet. There is frequently rapid breathing and chest indrawing and the child is distressed by his/her condition.

Bacterial croup which presents as stridor, high fever and thick green sputum. This type of croup is much less common than "mild" and severe" croup.

Treatment

A child with mild croup and no distress may be managed as an outpatient and reassessed in 2 days, or sooner if the condition worsens. Whenever feasible, all other children with measles-associated croup should be admitted to hospital. Give a soothing cough remedy. Children with bacterial croup should be treated with chloramphenicol (see Annex C for dosage).

COMPLICATED MEASLES
Outpatient care 3 - ear problems

Slide 25

MANAGEMENT OF EAR PROBLEMS**Assessment:**

Acute ear infection - fever and earache or ear discharge
Chronic ear infection - ear discharge for 14 days or more
Mastoiditis - fever, acute pain and swelling behind the ear

Treatment:

Give an antibiotic for acute ear infection
Dry wick the ear if there is ear discharge
Admit to hospital if mastoiditis is present

Assessment

There are three complications of measles related to the ear:

- **Acute ear infection** (acute otitis media) - fever, earache, discharge from the ear for less than 14 days or a red bulging drum on examination of the ear.
- **Chronic ear infection** (chronic otitis media) - pus discharging from the ear for 14 days or more.
- **Mastoiditis** - fever and a painful swelling of the bone behind the ear.

Treatment

For acute ear infection give an antibiotic (cotrimoxazole or ampicillin) for 7 days (see Annex C for dosage) and if there is a discharge, clean the affected ear(s) at least twice a day with cotton wool or a wick of clean cloth. For chronic ear infection, only dry the ear(s) with a clean cloth. Children with mastoiditis must be referred to hospital immediately.

COMPLICATED MEASLES

Outpatient care 4 - diarrhoea

Slide 26

CLASSIFICATION OF DEHYDRATION

No dehydration

Some dehydration

Severe dehydration

DEHYDRATION

Assessment and classification

| | |
|--------------------|---|
| No dehydration | Well, alert, drinks normally, tears present, moist mouth and tongue, skin pinch goes back quickly |
| Some dehydration | Two or more of the following signs including: restless or irritable thirsty and drinks eagerly skin pinch goes back slowly sunken eyes |
| Severe dehydration | Two or more of the following signs including: skin pinch goes back very slowly lethargic or unconscious drinks poorly or not at all sunken eyes |

DIARRHOEA

Diarrhoea is a common complication of measles and causes problems through the resulting dehydration and secondary malnutrition. First assess and classify the degree of dehydration as shown on this slide, and then treat accordingly.

Assessment

- Diarrhoea is usually defined as the passing of loose or watery stools on three consecutive occasions. The degree of dehydration is assessed and classified as shown on this slide.
- If there is blood in the stools then the child has dysentery. The commonest cause of dysentery is a bacterial infection (*Shigella*).
- If the diarrhoea lasts for 14 or more days then the child is classified as having persistent diarrhoea. If you see a child with persistent diarrhoea and oral thrush, consider HIV infection as a possible diagnosis.

Treatment

- Children with diarrhoea and dehydration should be treated according to WHO guidelines. Children with some dehydration can be managed with oral rehydration (using oral rehydration salts) and proper feeding, while children with severe dehydration require intravenous fluids. Reassess the child according to the WHO guidelines and adapt the treatment plans accordingly.
- Treat dysentery for 5 days with an oral antibiotic recommended for *Shigella* in your area, usually cotrimoxazole (See Annex C for dosage).
- Persistent diarrhoea is treated by adjusting the diet. If the child is still breastfeeding, increase the intake of breast milk. If breastfeeding has recently been stopped, consider starting it again. If the child is receiving animal milk products, reduce the usual amount or replace with breast milk or a fermented milk product, such as yoghurt, or replace half the animal milk with nutrient-rich semi-solid food.

COMPLICATED MEASLES

Outpatient care 5 - eye problems

Slide 27



VITAMIN A DEFICIENCY AND EYE DAMAGE

Recognition

- Night blindness -the child has difficulty in seeing in reduced light intensity e.g. at night or in twilight
- Bitôt spots - foamy white plaques on the conjunctiva
- Conjunctival and corneal dryness (xerosis)
- Corneal clouding
- Corneal ulceration (as shown in the child pictured on this slide).

Treatment

If there are signs of corneal clouding, refer the child to hospital.

If this is not possible then:

- give the child two doses of vitamin A on successive days (see slide 34)
- give a third dose 2-4 weeks later
- use tetracycline eye ointment, three times a day for 7 days
- apply a protective eye pad; an eye pad over a closed eye promotes healing of the cornea
- advise the mother to return in 2 days; if there is no improvement, refer to a specialist eye worker.

EYE INFECTION - conjunctivitis, keratitis and other corneal damage**Assessment**

• **Conjunctivitis.** Inflammation of the conjunctiva is seen in the early stages of measles. The child has red, watery eyes. If there is secondary bacterial infection, the eyelids will be sticky (to the extent that the child may not be able to open the eyes), or pus will collect at the corners of the eyes.

• **Keratitis.** Measles virus in the cornea causes irritation of the eyes and a dislike for bright light (photophobia).

• **Other corneal damage.** Corneal damage with scarring may result in blindness. The causes of corneal damage include:

- measles virus infection
- vitamin A deficiency
- secondary herpes simplex or bacterial infection
- a chemical conjunctivitis resulting from harmful eye practices such as application of topical herbal remedies.

Treatment

• If there is a clear watery discharge, no specific therapy is needed.

• If there is pus discharge in the eyes, clean the eyes with clean water using cotton wool boiled in water and cooled, or a clean cloth. Apply tetracycline eye ointment three times a day for 7 days. NEVER use steroid ointment to treat eye disease associated with measles.

COMPLICATED MEASLES

Outpatient care 6 - mouth ulcers

Slide 28

**Assessment**

Mouth ulcers are most frequently due to herpes simplex or *Candida* infections. The ulcers caused by herpes start off as little blisters on the lips, tongue and on the inside of the cheeks. They soon develop into ulcers. *Candida* usually presents as whitish plaque-like lesions in the mouth. If mouth hygiene is poor, then additional infections are likely to occur. This may cause difficulty with drinking and feeding and may result in dehydration (from lack of drinking) and make malnutrition worse (from lack of eating). If you see recurrent severe oral thrush, suspect the possibility of HIV infection, whether or not measles is present.

Treatment

- If the child is able to drink and eat, advise the mother to clean the mouth with clean water (add a pinch of salt to the cup of water, if available) at least 4 times a day.
- Apply half-strength (0.25%) gentian violet to the sores in the mouth at least twice a day. Local anaesthetic/antiseptic solutions such as lignocaine and tannic acid, or tannic acid and listerine, if available, are good alternatives.
- If the mouth sores result in decreased intake of food or fluids, then admit the child to hospital and feed via a nasogastric tube if possible.

SUMMARY OF PART 4

You should now be familiar with:

- Where to manage cases of measles
- the reasons for admission to hospital
- the need for isolation of measles patients
- the principles of treatment of severe complicated measles in hospital.
- the treatment of complicated measles, including croup, ear and eye problems, diarrhoea and mouth ulcers, on an outpatient basis

ESSENTIAL COMPONENTS OF MANAGEMENT

Slide 29

ESSENTIAL COMPONENTS OF MANAGEMENT

- Relieve common symptoms
- Provide nutritional support
- Provide vitamin A
- Advise the mother about the illness

Note: The principles of treatment discussed in slides 29-36 apply equally to uncomplicated, complicated and severe complicated measles, whether treatment is at home, on an outpatient basis or in hospital.

There are four major components of the management of all measles cases. They are summarized on this slide:

- Relieve common symptoms such as fever, cough, blocked nose, conjunctivitis and sore mouth.
- Provide nutritional support and promote breastfeeding.
- Provide vitamin A.
- Inform the mother about the illness and what to expect in the next few days.

These four components are explained in more detail on slides 30-36.

RELIEVING COMMON SYMPTOMS
Fever, cough and blocked nose

Slide 30

Fever. Advise the mother to:

- give paracetamol if the child is very uncomfortable or feels very hot (a fever of more than 39°C by thermometer if available)
- take clothes or blankets off the child
- continue breastfeeding; if weaned, continue feeding and ensuring the child drinks plenty
- bring the child back for re-assessment if the fever persists for more than 4 days - this may be an indication of a secondary infection.

Cough. If there is cough but no rapid breathing, advise the mother to give a soothing remedy, such as tea with lemon and honey or a simple cough linctus.

Blocked nose. If the nose is blocked and makes feeding difficult, advise the mother to use a weak solution of salt water (saline) nose drops given using a moistened wick of clean cloth before feeding.

RELIEVING COMMON SYMPTOMS
Eye and mouth care

Slide 31



Conjunctivitis. If the child has a clear watery discharge from the eye, advise the mother she need do nothing special. If the eyes are sticky because of pus, advise regular cleaning with cotton swabs and apply tetracycline eye ointment three times a day. The cotton swab should be boiled in water and allowed to cool before use.

Sore mouth. Rinse the mouth with clean water (preferably with a pinch of salt) as often as possible, but at least four times a day. Advise frequent sips of clean water.

PROVIDING NUTRITIONAL SUPPORT

Slide 32

The nutritional status of children with measles may be affected as a result of the disease itself, associated diarrhoea and vomiting, or refusal to take feeds because of mouth ulcers or poor appetite. Assess the nutritional status by looking at the child, and by weighing the child and plotting the weight on a growth chart. Any dehydration confuses the classification of nutritional status, since it is associated with significant weight loss. If weight indicators are being used for nutritional classification, rehydrate the child before classification.

Encourage breastfeeding. If the child is already weaned, encourage the intake of food and fluids (some mothers incorrectly withhold food and fluids from sick children). It is best to feed sick children with small amounts of food given more frequently than usual. Avoid bulky cereal, porridge or starchy food as they are not easy for a sick child to eat. Instead give milk or gruel. The energy content of food may be increased by adding a teaspoonful of vegetable oil and a teaspoonful of sugar to the milk, cereal or gruel. A child needs 80-120 kcal per kg of body weight per day by whatever means.

GIVING VITAMIN A

Slide 33



Vitamin A is recommended for children with measles in the following situations:

- in areas where measles case fatality is probably more than 1 %
- in areas of known vitamin A deficiency
- in all cases of severe complicated measles.
- Give the first dose of vitamin A to the child immediately on diagnosis.
- Give a second dose the following day. The reason for the second dose is to make sure that the body stores are built up again, even if the child has diarrhoea and is very ill. Inform the mother about the importance of vitamin A, and provide her with the second dose for giving at home. Give her the exact number of capsules to avoid accidental overdosing.

VITAMIN A DOSAGE

Slide 34

| Age | Immediately on diagnosis | Next day | 2-4 weeks later (if eye signs) |
|----------------------------------|---------------------------------|-----------------|---------------------------------------|
| Infants less than 6 months old | 50 000 IU | 50 000 IU | 50 000 IU |
| Infants aged 6-11 months | 100 000 IU | 100 000 IU | 100 000 IU |
| Children aged 12 months and over | 200 000 IU | 200 000 IU | 200 000 IU |

The dosage schedule of vitamin A for children with measles is shown on this slide. Note that if the child has any eye signs indicating vitamin A deficiency (refer to slide 27), then a third dose must be given at least 2 weeks after the second dose. This should be given when the child comes for a check-up at the clinic.

Vitamin A supplements are available either as capsules (50 000 IU, 100 000 IU, 200 000 IU) or in liquid form with a pump dispenser. Capsules need to be cut open and the contents squeezed into the mouths of children under the age of 2 years. Capsules have the advantage that they can be given to mothers for use at home.

INFORMING AND ADVISING THE MOTHER

Slide 35

INFORMING AND ADVISING THE MOTHER

Tell her about measles.

Advise her to have any other children immunized immediately.

Advise her to bring the child back if the child's condition worsens or he/she refuses to eat or drink.

Tell the mother about measles and that, even after recovery, the child is at increased risk of developing other infections and malnutrition. Advise the mother that the child should attend a clinic regularly for health checks and growth monitoring. The first follow-up visit should be about 14 days after the measles illness starts and thereafter at least once a month for a minimum period of six months.

Advise the mother to bring any other unimmunized children for immunization at once. Immunizing susceptible children within 72 hours of exposure may prevent the disease from occurring in contacts.

Advise the mother to bring the child back immediately if the child's condition worsens (see slide 36).

**REASONS FOR
IMMEDIATE RETURN TO CLINIC****REASONS FOR IMMEDIATE RETURN TO CLINIC**

Convulsions or drowsiness
Rapid or difficult breathing or chest indrawing
Refusal to eat or drink
Diarrhoea, vomiting or blood in stools
Earache
Painful eyes or blurred vision
Sore mouth
Fever persisting for more than 4 days

Slide 36

For children being cared for at home or as outpatients, advise the mother to bring the child back to the clinic immediately if the child's condition worsens, that is, if any of the signs or symptoms shown on this slide develop. She should return with the child if the child still has a fever after more than 4 days. Whenever a child is brought back to the clinic because of any of the above reasons, start again the whole process of assessment, classification and management (starting at slide 14).

A child who has been diagnosed as having measles but who has no complications should be brought back to the clinic after 14 days for follow-up.

SUMMARY OF PART 5

You should now be familiar with:

- the general principles of managing cases of measles
- treating common symptoms of measles
- providing nutritional support including vitamin A
- informing the mother about measles, including how to tell whether the child needs to be brought back to the clinic/hospital if complications develop.

PREVENTION THROUGH IMMUNIZATION

Slide 37

Measles is preventable by immunization. Following immunization, over 85% of children will be protected against the disease. While this PowerPoint slide set and booklet describe WHO's policy on treating cases of measles, it is stressed that primary prevention of measles by immunization remains the strategy of choice against the disease. As coverage increases, cases (and therefore also complications and death) can be expected to decrease. Children should be immunized according to the current WHO guidelines (See slide 39).

Special situations. In exceptional situations where measles morbidity and mortality in infants below 9 months of age represent a significant problem, give an extra dose of standard measles vaccine as early 6 months of age, in addition to the scheduled dose given as soon as possible after 9 months of age. This schedule is recommended for certain groups that are at high risk of measles death, such as infants in refugee camps, infants admitted to hospitals and infants affected by disasters, as well as during measles outbreaks. The second dose at 9 months of age is important because the serological response is significantly lower before this age, resulting in lower levels of protection.

UTILIZING OPPORTUNITIES FOR
IMMUNIZATION

Slide 38

DO NOT MISS OPPORTUNITIES

Use every available opportunity to
ensure that children
are immunized.

All opportunities for immunization should be taken. For instance, children of immunizable age attending outpatient clinics or admitted to hospital for other conditions should be immunized with all appropriate antigens (including measles vaccine) immediately if there is no documentation of immunization on the immunization card or road-to-health card. The immunization status of all children discharged from hospital should be checked and appropriate vaccines administered. Do not forget to ask whether the mother needs a dose of tetanus toxoid.

IMMUNIZATION SCHEDULE

Slide 39

| RECOMMENDED INFANT IMMUNIZATION SCHEDULE | |
|--|---|
| Age | Vaccine |
| At birth | BCG, OPV-0, Hep*-0 |
| At 6 weeks | DPT1, OPV-1, HepB-1, Hib |
| At 10 weeks | DPT2, OPV-2, HepB-2, Hib |
| At 14 weeks | DPT3, OPV-3, HepB-3, Hib |
| At 9 months | Measles** Yellow fever*** Vitamin A**** |

This slide shows the basic schedule recommended by the WHO for immunization of infants in developing countries.

BCG - Bacillus Calmette-Guérin vaccine against tuberculosis

OPV - Oral poliovaccine against poliomyelitis (+OPV-0 in polio-endemic countries)

DPT - Triple vaccine against diphtheria, pertussis and tetanus

Hepatitis B vaccine - (*) Various options exist for three and four dose schedules for Hepatitis B vaccine depending on the epidemiologic situation and programmatic issues (such as the use of combination vaccines).

Hib - *Haemophilus influenzae* type b against childhood meningitis and bacterial pneumonia

Measles – (**) All children should be provided with a “second opportunity” for measles immunization to assure that those not reached by routine services, and those that were vaccinated but did not develop immunity are protected. This second opportunity can be provided through routine schedule or periodic campaigns.

Yellow fever vaccine - (***) in countries where yellow fever is endemic; give at nine months with measles vaccine.

Vitamin A - (****) In countries (or areas) where vitamin A deficiency is a public health problem, the measles immunization contact can provide an opportunity to give vitamin A to children. Immunization contacts (at birth or 6 weeks) are also important opportunities to give vitamin A to post-partum mothers and thereby benefit the infant via increased vitamin A content of breastmilk.

In addition, administration of tetanus toxoid is recommended for women of child-bearing age.

STRATEGY FOR REDUCING
MEASLES MORTALITY

Slide 40

**STRATEGY FOR REDUCING
MEASLES MORTALITY**

- **Immunization**
- **Surveillance**
- **Case management**

In summary, measles remains a common cause of childhood illness and death in developing countries. The challenge facing all health workers is to work towards the control and ultimately sustainable reduction of measles mortality through:

- **Immunization**
- **Surveillance**
- **Other disease control measures including effective case management.**

Death, disease and disability from measles can be reduced dramatically by effective measles case management. This slide set and booklet have outlined the basic principles of measles case management.

QUESTIONS FOR USE BY FACILITATORS

The following is a list of questions that can be used by facilitators to introduce each part of the slide set. The answers should be reviewed once each section has been completed.

Part 1. Epidemiology

- Does anyone keep any kind of records or statistics on measles cases seen in your facilities? Can you tell us how you use the information?
- Can anyone name a factor that increases a child's chances of getting measles? Are there any other factors? (Continue until there are no new responses.)
- What is your case definition of measles?
- How common is measles where you work/live?
- Which children get measles in this area?

Part 2. Natural history of measles

- Can you describe the last case of measles you saw? What was the illness like? How old was the patient?
- How would you describe the development of measles during the first week of the illness?
- Are there other illnesses in your area which can look similar to measles?
- What are the most common complications of measles you see in your clinic?
- Has anyone seen any other types of complications? (Continue until there are no new responses.)
- What happens to children with measles once they are better?
- How many children died from measles in your district last year?

Part 3. Case assessment and classification

- Is measles easy to diagnose? Why? Why not?
- What do you do when you see a child with measles in the clinic?
- How do you know whether the child has complicated or uncomplicated measles?

Part 4. Treating complications

- How do you treat children with complications?
- Which children do you refer to hospital?
- What urgent action must be taken for children with measles who need sending to hospital?

Part 5. General management

- How do you treat common symptoms of measles?

Part 6. Prevention

- What sort of immunization services do you provide in your clinic?
- What is the schedule of immunization for your clinic?
- What is the target for measles immunization in your district? What problems have you encountered in trying to reach that target?
- Who is responsible for immunization in your area?
- Can you immunize a child who is malnourished?
- Can you immunize a child with a cold?
- Does your clinic/hospital miss opportunities to immunize children?

EVALUATION OF MEASLES CASE MANAGEMENT

Evaluation is an essential component of any programme. Its purpose is to measure the impact of what is being done. Specially designated supervisors are usually responsible for coordinating the evaluation procedure. Health workers at the clinic and outpatient level should also be involved in evaluation of their own programmes.

The following are examples of questions that should form the basis of a regular assessment of measles case management:

1. Do staff know the clinical case definition of measles and how to assess and classify a measles case? How many do, how many do not?
2. How many patients with measles were seen last month? What were the complications? How many patients died? What were their ages? What was the immunization status of each?
3. To which health facility are severe complicated measles cases referred? Have there been any problems with the referrals?
4. Have the staff been trained in the use of the WHO "Integrated Management of Childhood Illness" package? What are the training needs of the staff?
5. Are the "Integrated Management of Childhood Illness" wall charts displayed in the clinic?
6. Are measles vaccine and the essential drugs for the treatment of cases available in the clinic? Which are missing?
7. On average, how long do staff spend giving advice to mothers on management, treatment and follow-up when a case of measles has been recognized? (2, 4, 6, 8 or more minutes)?

ANNEX C

DRUG DOSES FOR TREATMENT OF MEASLES

| Drug and formulation | | Age in years | | | Doses per day |
|---------------------------------------|-------------------|---------------|---------|---------|---------------|
| | | < 1 | 1-3 | > 3 | |
| | | Weight in kgs | | | |
| | | 6-9 | 10-14 | >14 | |
| Paracetamol | 100-mg tablets | 1 | 1 | 1½ | 4 |
| | 500-mg tablets | 1/4 | 1/4 | 1/2 | 4 |
| Ampicillin | 250-mg tablets | 1/2 | 1/2 | 1 | 4 |
| | 250 mg/5ml elixir | 2.5 ml | 5 ml | 5 ml | 4 |
| Amoxicillin | 250-mg tablets | 1/2 | 1/2 | 1 | 3 |
| | 125 mg/5ml elixir | 5 ml | 10 ml | 10 ml | 3 |
| *Cotrimoxazole | Adult tabs | 1/2 | 1/2 | 1 | 2 |
| | Paediatric tabs | 2 | 3 | 3 | 2 |
| | Paediatric elixir | 5 ml | 7.5 ml | 7.5 ml | 2 |
| Chloramphenicol | 250-mg capsules | - | 1 | 1 | 4 |
| | 125 mg/5ml elixir | 8 ml | 12 ml | 15 ml | 4 |
| Cloxacillin | 250-mg capsules | - | 1 | 1 | 4 |
| | 125 mg/5ml elixir | 5 ml | 7.5 ml | 10 ml | 4 |
| Nalidixic acid | 125mg/5ml elixir | 5 ml | 7.5 ml | 10 ml | 4 |
| Procaine penicillin injection (in IU) | | 400 000 | 800 000 | 800 000 | 1 |

* **Cotrimoxazole** (a fixed combination (1:5) of trimethoprim and sulfamethoxazole):

- Adult tablet contains 80 mg of trimethoprim
- Paediatric tablet contains 20 mg of trimethoprim
- Paediatric elixir contains 40 mg of trimethoprim per 5 ml

Nebulized adrenaline: Mix 1 ml of adrenaline (1:1000) with 2 ml of sterile water; administer every 2 hours under close observation.

