

The management of acute respiratory infections in children

**Practical guidelines
for outpatient care**



**World Health Organization
Geneva**

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WHO Library Cataloguing in Publication Data

The management of acute respiratory infections in children :
practical guidelines for outpatient care.

1.Respiratory tract infections — in infancy & childhood 2.Patient care planning 3.Child care
4.Guidelines

ISBN 92 4 154477 5

(NLM Classification: WS 280)

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CHAPTER 1

Introduction

Understanding the problem

Most children have about 4–6 acute respiratory infections each year. Children with respiratory infections account for a large proportion of patients seen by health workers in health centres. These infections tend to be even more frequent in urban communities than in rural areas.

Respiratory infections are infections in any area of the respiratory tract, including the nose, middle ear, throat (pharynx), voice box (larynx), windpipe (trachea), air passages (bronchi or bronchioles), and lungs (see Fig. 1).

Many areas of the respiratory tract can be involved, and there can be a wide variety of signs and symptoms of infection. These include:

- cough;
- difficult breathing;
- sore throat;
- runny nose;
- ear problems.

Fever is also common in acute respiratory infections. Fortunately, most children with these respiratory symptoms have only a mild infection, such as a cold or bronchitis. They may cough because nasal discharge from a cold drips down the back of the throat, or because they have a viral infection of the bronchi (bronchitis). They are not seriously ill and can be treated at home by their families without antibiotics.

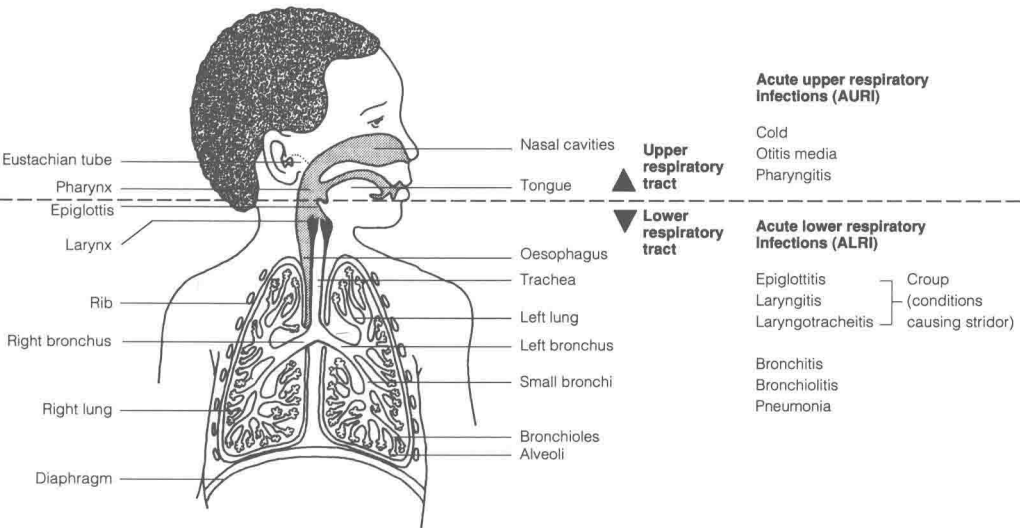


Fig. 1. Acute respiratory syndromes: clinical syndromes

However, a few children have an acute infection of the lungs (pneumonia). If they are not treated with an antibiotic, these children may die, either from a lack of oxygen, or from a bacterial infection of the bloodstream (called sepsis or septicaemia). About one-quarter of all children less than 5 years of age who die in developing countries do so because of pneumonia. Pneumonia and diarrhoea are the two most common causes of death in children. Many of the deaths from pneumonia occur in young infants less than 2 months of age.¹

Therefore, treating children who have pneumonia can greatly reduce deaths in children. In order to treat these children, the health worker must be able to carry out the difficult task of identifying the few, very sick children among the many children with respiratory infections that are not serious.

Selecting the appropriate case management chart

The two fold-out case management charts included at the back of this book summarize the management steps for different illnesses. Therefore, one of the first steps in managing a child with an acute respiratory infection is to determine which of the two charts to use. To do this:

1. Welcome the mother and ask her to sit with the child.
2. Ask her why she has come.
3. If the mother's response does not include cough or difficult breathing, ask her if the child has a cough or has difficult breathing.
 - It is important to ask the mother this question because mothers will often simply say that their child has a cold or a runny nose, and not specify that the child also has a cough or difficult breathing.
 - "Difficult breathing" refers to any unusual pattern of breathing in a child. Mothers may describe it in different ways. For example, they might use the terms "noisy", "fast", or "interrupted".
 - A young infant may have pneumonia or another severe disease without coughing, so health workers should be particularly careful when listening to mothers describe symptoms of a young infant to determine whether there is a history of difficult breathing.
4. If the mother's response still does not include cough or difficult breathing, look to see if the child is coughing or has difficult breathing.
5. Then, select the appropriate case management chart:
 - If the mother's response or your observation includes cough or difficult breathing, use the chart, "Management of the child with cough or difficult breathing".
 - If the child has an ear problem or a sore throat (without a cough or difficult breathing), use the chart, "Management of the child with an ear problem or sore throat".

¹ Throughout this book, the term "young infant" is used to refer to an infant less than 2 months of age.

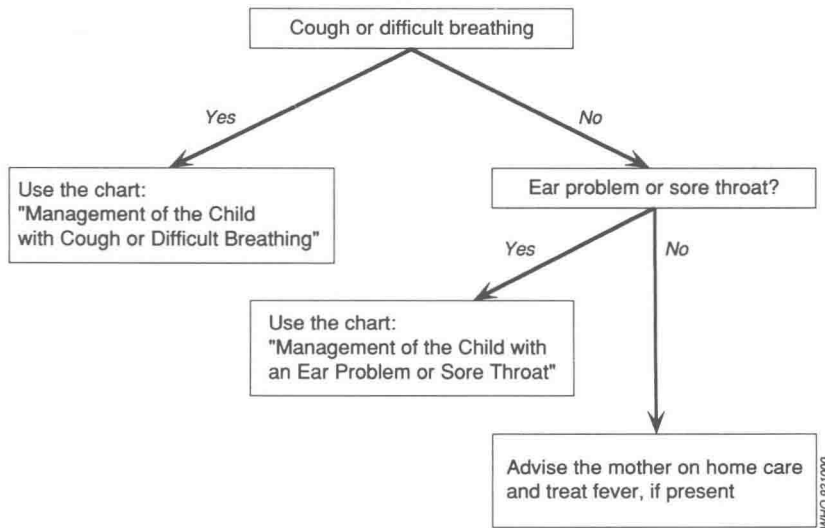


Fig. 2. **Decision tree for selecting the appropriate case management chart**

- If the child has a cough or difficult breathing, and an ear problem or sore throat, first use the chart, "Management of the child with cough or difficult breathing".
- If the child has a runny nose or cold (without a cough, difficult breathing, an ear problem or a sore throat), the child needs home care only. Advise the mother how to give home care and treat any fever, if present.

Fig. 2 summarizes how to select the appropriate case management chart for assessing, classifying and treating acute respiratory infections.

Essential skills and knowledge

By the end of this chapter, you should be able to select the appropriate case management chart for assessing, classifying and treating acute respiratory infections:

- For a child with a cough or difficult breathing, use the chart, "Management of the Child with Cough or Difficult Breathing".
- For a child with only an ear problem or sore throat, use the chart, "Management of the Child with an Ear Problem or Sore Throat".

PART 1

Management of the child with
cough or difficult breathing

CHAPTER 2

Assessing a child who has cough or difficult breathing

"Assessing" a child means obtaining information about the child's illness by asking the mother questions, and looking at and listening to the child. This chapter describes what information to obtain about the child, and how to obtain it.

A child with a cough or difficult breathing could have pneumonia, which is a serious disease that can result in death. However, a cough or difficult breathing can also be caused by a common cold, a blocked nose, a dusty environment, whooping cough (pertussis), tuberculosis, measles, croup or wheezing disorders. (Annex 2 describes how to recognize and manage acute respiratory infections caused by the vaccine-preventable diseases, measles, pertussis and diphtheria.) Careful assessment of a child can help to prevent deaths from pneumonia and other severe diseases.

The steps for assessing a child are presented here and given on the fold-out chart "Management of the Child with Cough or Difficult Breathing" under the title "Assess". You should first ask the mother certain questions about the child's health. You should then look at and listen to the child for signs of difficult breathing and general signs of the child's condition.¹

Below is the section of the chart that lists the points to cover during the assessment.

ASK:

- How old is the child?
- Is the child coughing? For how long?
- Age 2 months up to 5 years: Is the child able to drink?
Age less than 2 months: Has the young infant stopped feeding well?
- Has the child had fever? For how long?
- Has the child had convulsions?

LOOK, LISTEN:

(Child must be calm)

- | | |
|--|---|
| • Count the breaths in one minute. | • See if the child is abnormally sleepy, or difficult to wake. |
| • Look for chest indrawing. | • Feel for fever, or low body temperature (or measure temperature). |
| • Look and listen for stridor. | • Look for severe malnutrition. |
| • Look and listen for wheeze. Is it recurrent? | |

¹ If a child is obviously very sick and in need of care that you cannot provide, the child should be referred to a hospital immediately without assessment. The assessment process described in this book considers only the steps to follow to identify respiratory infections or other related illnesses.

In many clinics, screening for immunization status is routinely done for all young children. For additional information on immunization screening, see the training module entitled "Plan to provide immunization services" in "EPI training for mid-level managers", available through your national immunization programme.

It is important to keep the child as calm as possible because a child who is crying and upset may exhibit signs that can be confused with signs of illness. Before beginning the assessment, ask the mother:

- *Not* to wake up the child, if the child is asleep.
- *Not* to undress or disturb the child.

Then start the assessment. As you cover each point, record your findings on a piece of paper so that you can remember them.

What to ask the mother

Ask the mother (or caregiver) the following questions:

- **How old is the child?**
- **Is the child coughing? For how long?**
- **Age 2 months up to 5 years: is the child able to drink?**

The child should only be regarded as "not able to drink" if he or she is not able to drink *at all*. This includes the child who is too weak to drink when offered fluids, is not able to suck or swallow, or who repeatedly vomits and keeps nothing down.

Children who are breast-fed may have difficulty sucking when their noses are blocked. However, if they are not severely ill, they can still breast-feed if their noses are cleared.

- **Age less than 2 months: has the young infant stopped feeding well?**

This question is similar to the one listed above. The difference between the two questions, however, is that the sign in the older child is "not able to drink *at all*". In the young infant, the sign is taking *less than half* of the usual amount of breast milk or formula. Mothers can estimate changes in the amount of milk taken from the length of time the child sucks.

- **Has the child had fever? For how long?**
- **Has the child had convulsions?**

Ask the mother if the child has had convulsions during the current illness.

What to look at and listen for

This section describes how to look at and listen to a child to find out whether the child has signs of difficult breathing such as chest indrawing, fast breathing, stridor or wheeze.

It is especially important to look at and listen to the child's breathing only when the child is quiet and calm. It is not possible to count the breathing rate accurately or assess other signs of difficult breathing in a child who is frightened, crying or angry. To calm the child, give the child something to play with, ask the mother to breast-feed the child, or suggest they wait in another room until the child calms down.

• **Count the breaths in one minute.**

Look for breathing movement anywhere on the child's chest or abdomen. If you are not able to see this movement easily, ask the mother to lift the child's shirt. If the child starts to cry or becomes upset, ask the mother to calm the child again before counting.

As children get older, their breathing rate slows down. Therefore, the cut-off you will use to determine if a child has fast breathing will depend on the age of the child (see below).

If the child is:	Then he or she has fast breathing if you count:
Aged less than 2 months	60 breaths per minute or more
Aged 2 months up to 12 months ^a	50 breaths per minute or more
Aged 12 months up to 5 years ^b	40 breaths per minute or more

^a "Up to 12 months" means up to and including the day before the child's first birthday.

^b "Up to 5 years" means including the day before the child's fifth birthday. Therefore, a child who is exactly 12 months old would have fast breathing if he or she breathed 40 or more times per minute.

Three useful methods for counting a child's breaths are:¹

1. Use a sounding timer that sounds after one minute (60 seconds). Count the child's breaths for one minute.
2. Use a watch with a second hand or a digital watch. Ask another person to tell you when 60 seconds have passed so that you can watch the child's chest. If you cannot find anyone to help you, put the watch where you can glance at the second hand while looking at the child's chest to count the breaths.
3. Use a watch with a second hand or a digital watch. Count to the breathing rate cut-off (60, 50 or 40, according to the age of the child), then look back at the watch to see if this took more than one minute.

Repeat the count of a child aged 2 months up to 5 years if you are unsure of the count (e.g. if the child was moving and it was difficult to watch the chest).

However, repeat the count of a young infant *every* time you count 60 breaths per minute or more. This is important because the breathing rate of young infants is often erratic. Young infants will occasionally stop breathing for a few seconds, and then breathe very rapidly for a short period. This is why it is also important to count the young infant's breathing for a full 60 seconds. Determine if a young infant has fast breathing in this way:

- If you count less than 60 breaths per minute, the young infant does not have fast breathing.

¹ These methods can also be used with a half-minute count for children aged 2 months up to 5 years. For children aged 2 months up to 12 months, fast breathing is 25 breaths or more per half minute; for children aged 12 months up to 5 years, fast breathing is 20 breaths or more per half minute. However, for young infants, it is important to count for a full minute because their breathing rate is often irregular.

- If you count a rate of 60 breaths or more, wait for a few minutes and repeat the count:
 - if the second count is also 60 or more breaths per minute, the young infant has fast breathing.
 - if the second count is less than 60 breaths per minute, the young infant does not have fast breathing.

If you have not already done so, ask the mother to lift the child's shirt before you look and listen for chest indrawing, stridor and wheeze. Before looking for these signs, make sure you know when the child is breathing in and when the child is breathing out.

- **Look for chest indrawing.**

Look for chest indrawing when the child breathes in. The child has chest indrawing if *the lower chest wall goes in when the child breathes in*. Chest indrawing occurs when the effort required to breathe in is much greater than normal. In normal breathing, when the child breathes in, the whole chest wall (upper and lower) and the abdomen move out (Fig. 3a). With chest indrawing, when the child breathes in, the lower chest wall moves in, while the upper chest wall and abdomen move out (Fig. 3b). If only the soft tissue between the ribs or above the clavicle goes in when the child breathes in (intercostal retraction), this is not chest indrawing.¹

(a) A child breathing in *without* chest indrawing



(b) A child breathing in *with* chest indrawing



Fig. 3. **Identifying chest indrawing**

¹ Chest indrawing as defined here is the same as "subcostal indrawing" or "subcostal retraction".

Be especially careful when looking for chest indrawing in young infants. Mild chest indrawing is normal in young infants because their chest wall bones are soft. However, severe chest indrawing (very deep and easy to see) is a sign of pneumonia.

If you are not certain whether the child has chest indrawing, reposition the child and look again. If the child's body is bent at the waist, it is hard to judge the movement of the lower chest wall. The child should be lying flat in the mother's lap. If chest indrawing is not visible when the child is in this position, assume that the child does not have this sign.

Chest indrawing is only significant if it is present all the time and clearly visible. If you see it only when the child is upset or trying to feed, but not when the child is resting peacefully, do not count this as chest indrawing.

- **Look and listen for stridor.**

Look to see when the child is breathing in. A child with stridor makes a harsh noise when breathing in. Listen for stridor by holding your ear near the child's mouth, since the noise may be difficult to hear. Stridor occurs when there is a narrowing of the larynx, trachea or epiglottis which interferes with air entering the lungs. These conditions are often called croup.

Sometimes you will hear a wet noise if the child's nose is blocked. Clear the nose and listen again. Often, a child who is not very ill will have stridor only when he or she is crying or upset, so be sure to look and listen for stridor when the child is calm.

- **Look and listen for wheeze. Is it recurrent?**

Look to see when the child is breathing out. A child with wheezing makes a soft whistling noise or shows signs that breathing out is difficult. Listen for wheeze by holding your ear near the child's mouth, since the noise may be difficult to hear. Wheezing is caused by a narrowing of the air passages in the lungs. The breathing-out phase takes longer than normal and requires effort.

Sometimes so little air moves that there is no noise. Look to see if the breathing-out phase requires effort, and is longer than normal.

If the child is wheezing, ask the mother if her child has had a previous episode of wheezing within the past year. If so, the child should be classified as having recurrent wheeze.

It is also important to look at and listen to the child for other signs of the child's general condition. These signs are listed below and can be assessed even when the child is not calm.

- **See if the child is abnormally sleepy or difficult to wake.**

An abnormally sleepy child is drowsy most of the time when he or she should be awake and alert, and often will not look at the mother or watch your face when you talk. The child may stare blankly and may not appear to see.

Ask the mother if the child has seemed unusually sleepy or difficult to wake. Look to see if the child awakens when the mother talks or when you clap your hands. A child who is

difficult to wake may continue to sleep even with the mother's voice or a loud clap. Even very young babies, who sleep a lot, should waken naturally with these disturbances, or when their mother begins to undress them.

- **Feel for fever or low body temperature (or measure temperature).**

Measure the child's temperature, if possible. A temperature of 38°C^1 or above is regarded as fever. Below 35.5°C^2 is an abnormally low body temperature, called hypothermia.³

If you do not have a thermometer, feel the child's body to see if it is hot or too cold. Sometimes the hands and feet may feel cold in a child who is not adequately wrapped. However, cold calves and armpits indicate that the child is hypothermic (too cold).

- **Check for severe malnutrition.**

Check for severe malnutrition by looking at the child.⁴ Look for:

- Severe marasmus, which is characterized by severe muscle wasting and a lack of subcutaneous fat, so that the child looks like skin and bones.
- Kwashiorkor, which is characterized by a generalized swelling of the body (oedema), dry, flaking skin, and thin, weak hair (Fig. 4).

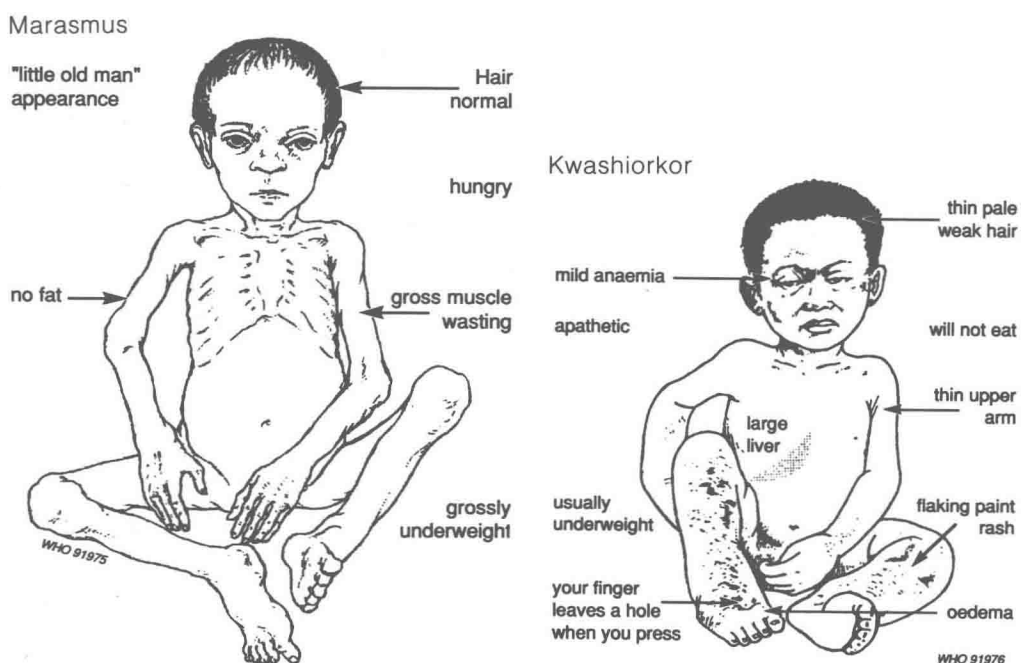


Fig. 4. Clinical features of marasmus and kwashiorkor

¹ The Fahrenheit equivalent for 38°C is 100.4°F .

² The Fahrenheit equivalent for 35.5°C is 96°F . These thresholds are based on rectal temperature. The thresholds for axillary temperature readings are approximately 0.5°C lower.

³ Ensure that the thermometer is capable of reading below 36°C .

⁴ Other methods can be used to determine if a child is severely malnourished, such as measuring weight and height, or the circumference of the arm. Follow the policy of your national maternal and child health programme.