

COMMON ILLNESSES IN CHILDREN WITH HIV/AIDS

COMMON ILLNESSES

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Objectives

The purposes of this module are to:

1. Discuss the appropriate assessment of a child with HIV who has fever.
2. Describe common signs and symptoms associated with respiratory infections in children with HIV.
3. Identify the management of respiratory illnesses based on the child's age.
4. Review treatment interventions for a child with HIV who has otitis media or a sore throat.

Key Points

1. Fever may be caused by infection or malignancy but is rarely caused by HIV infection or medications used to treat HIV infection.
2. Respiratory infections may cause one or more of the following signs and symptoms: fever, cough, difficulty breathing, sore throat, runny nose, and ear pain or ear drainage.
3. Children with severe respiratory disease should be transferred to a hospital immediately.
4. Treatment of respiratory illnesses in children is dependent on the age of the child.
5. Children less than 2 months of age with pneumonia should be hospitalized.

Overview

Any sick child, regardless of HIV status, who is brought to a clinic or hospital requires a complete assessment. If the child is assessed only for the major

complaint or symptom, other important signs of diseases such as pneumonia, diarrhea, malaria, measles, or malnutrition may be overlooked. If left untreated, these diseases can be very serious in young children. The first step in assessing a sick child is to ask the mother or caregiver to describe the problem(s) the child is having and to check for general danger signs.¹

Assessment

Assessment for general danger signs should include asking the child's caregiver:

1. Is the child unable to drink or breastfeed?
2. Does the child vomit every meal?
3. Has the child had convulsions?
4. Has the child's urine output decreased?
5. Has the child been less playful or sleeping more than usual?
6. Has the child been less interactive with the caregiver?
7. Has the child lost weight?

A child who has any of these general danger signs needs immediate urgent attention. The assessment and initial treatment, such as administering a dose of the appropriate antibiotic, should be completed as quickly as possible, and a referral should be made for further treatment at a hospital or urgent-care facility. If the child is not responsive, causes such as hypoglycemia and severe dehydration should be considered. If the child appears dehydrated,

intravenous fluids or aggressive oral rehydration should be considered.

This module reviews assessment and treatment of respiratory infections (including pneumonia), fever, otitis media, and sore throat. Other diseases, including diarrhea and neurological manifestations of HIV/AIDS, are reviewed in other modules.

Respiratory Infection

Respiratory infection may involve the upper or lower respiratory tract, including the nose, middle ear, pharynx, trachea, bronchioles, and lungs. Signs and symptoms of respiratory infection include cough, difficulty breathing, sore throat, runny nose, and ear pain or ear drainage. Fever is also common in children with respiratory infections.

Respiratory infections involving both the upper and lower respiratory tracts are common in children. Most respiratory infections are caused by viruses, such as respiratory syncytial virus (RSV). Other common causes of respiratory infection in children are group A beta-hemolytic streptococci, staphylococci, human pneumo metavirus, *Haemophilus influenzae*, *Chlamydia trachomatis*, *Mycoplasma*, *Moraxella catarrhalis*, and pneumococci.² Younger children are more susceptible to more severe infection because of anatomic differences. Young children's airways are narrower and more easily obstructed by edema and secretions. The eustachian tube, the tube between the nasopharynx and middle ear, is shorter in infants and young children, which leads to increased susceptibility to ear infections (otitis media).

In the early stages of HIV infection, before immune suppression develops, a child with a respiratory infection involving both the upper and lower respiratory tracts should be evaluated as an immunocompetent host. It is not until the patient develops severe immunosuppression (CD4+ count of <15 percent) that the child becomes more susceptible to opportunistic infections.

A child with a mild respiratory infection or cold may be treated symptomatically at home. A child with a more severe infection, such as pneumonia, may need to be treated in the hospital. According to the World Health Organization (WHO), upper respiratory infections are responsible for 18 percent of all deaths in developing countries. Many of these deaths occur among children who are less than 2 months of age. Early recognition and appropriate treatment of pneumonia can greatly reduce the number of deaths.³

Most cases of pneumonia can be identified by checking for the two most common signs of pneumonia, fast breathing and retractions. In this module, the student will learn how to differentiate between a cold and pneumonia and how to determine which cases of pneumonia can be treated in an outpatient clinic and which require admission to a hospital.

Subjective and Objective Assessment

Assessment of a child with a respiratory infection should include both subjective data (complaints reported by the child or caregiver) and objective data (observations and measurements by the health care provider).

Subjective Data

Subjective data should include the following:

1. Which signs/symptoms are present? Does the child have a cough? Is the child having difficulty breathing? Parents may describe such breathing as "fast," "noisy," or "interrupted." Does the child have a sore throat or runny nose? Is there ear pain or ear drainage? How long have they been present?
2. Does the child have fever? If yes, how high is the temperature, and how long has it been elevated?
3. Is the child complaining of chest pain? Is the pain localized or generalized, dull or sharp, deep or superficial, associated with rapid shallow respirations or grunting?
4. If the child is less than 2 months old, is he or she feeding well (i.e., tolerating at least a normal amount of breast milk or formula)?

5. If the child is older than 2 months, is he or she able to drink and interested in drinking?
6. What is the child's activity level?
7. Has the child had convulsions?
8. Is the child abnormally sleepy or difficult to arouse?
9. When was the child's last urine output?

Objective Data

Correct interpretation of objective findings will depend on the child's age. Younger children normally have higher respiratory rates than older children. The respiratory rate should be counted for an entire minute, especially in infants, for whom variations in rate are normal. Respiration should be counted while the child is quiet.

1. The child's respirations should be observed for rate, depth, ease, and rhythm of breathing.

Age	Rapid Respirations ³
<2 months	>60 breaths per minute
2-12 months	>50 breaths per minute
12 months - 5 years	>40 breaths per minute

Rate – Is the rate normal, rapid, or slow for the child?

Depth – Is the depth of the respiration normal, too shallow, or too deep?

Ease – Are the respirations effortless or labored? Does the child need to be upright to breathe? Are there intercostal or substernal retractions (sinking in of the chest with respiration)?

Does nasal flaring or head bobbing accompany the child's breathing? Is the child grunting or wheezing?

Rhythm of breathing – Is there variation in rate and depth of respiration?²

2. Is the chest movement symmetrical? Asymmetry may indicate pneumonia, pneumothorax (air in the normally closed pleural space between two membranes on the exterior of the lungs), atelectasis (collapse of a lobe of the lung), or foreign-body obstruction.²
3. The lungs should be auscultated (listened to) throughout all lung fields while the child is quiet. The stethoscope should be placed directly on the child's skin. Are any abnormal sounds present? Table 1 describes abnormal lung sounds.
4. Is there other evidence of infection, such as enlarged cervical lymph nodes, inflamed nasal mucous membranes, or discharge from the nose (rhinorrhea) or lungs (sputum)?
5. Does the child have a cough? When is the cough most frequent (e.g. morning or evening)? How frequent is the cough? Is the cough productive or nonproductive? If the cough is productive, note volume, color, viscosity, and odor of sputum. How does the cough sound – moist, dry, or croupy? Is the cough accompanied by wheezing or stridor?
6. Are there changes in skin color, such as mottling, pallor, or cyanosis? What is the distribution of the discoloration (peripheral, circumoral, central)? What is the capillary refill time? Is cyanosis

Table 1: Description of Abnormal Lung Sounds²

Sound	Description	Cause
Absent or diminished	Decrease or absence of air movement over areas of lung	Fluid, air, or solid masses in the lung space
Coarse crackle	Discontinuous, interrupted, large explosive sound, loud, low pitch	Air passing through airways containing fluid
Fine crackle	Discontinuous, interrupted explosive sound, less loud and higher pitch than coarse crackle	Air passing through smaller airways containing fluid
Wheeze	Continuous, high-pitched, hissing sound	Narrowed or partially obstructed airway; may be due to edema, secretions, or foreign body
Rhonchi	Continuous, low-pitched, snoring sound	Large, upper airway partially obstructed by thick secretions

associated with activity or present at rest?

7. Is clubbing present? Clubbing is an abnormal growth of tissue about the terminal phalanges (bones of the fingers and toes). Clubbing is usually associated with chronic hypoxia (decreased oxygen to body tissues).

The child's respiratory rate needs to be adequately assessed to determine whether the child is in respiratory distress or faces impending respiratory failure. Cardinal signs of respiratory failure are restlessness, tachypnea (rapid respiration), tachycardia (rapid heart rate), and diaphoresis (profuse sweating). Early signs of respiratory failure include altered depth and pattern of respirations, shortness of breath, nasal flaring, chest-wall retractions, expiratory grunt, and wheezing and/or prolonged expiration.

Management

Most respiratory infections are mild and can be treated symptomatically. Warm or cool mist is helpful in relieving discomfort caused by inflammation of mucous membranes. Instillation of saline drops into the nares and nasal suctioning with a bulb syringe can help remove nasal secretions. This will help infants who primarily breathe through the nose to drink from the bottle or nurse without compromising the respiratory effort. Parents should be instructed to clear the infant's nares by suctioning with the bulb syringe

before feeding and before sleep. Parents should be encouraged to provide the child with plenty of rest. Good handwashing should be observed to reduce the spread of the infection to other household members. Adequate fluids should be offered to the child to prevent dehydration, especially if the child is febrile. If the child has fever, paracetamol given by mouth at a dose of 15 mg/kg/dose every 4-6 hours may be used to decrease fever. Parents should be instructed not to exceed five doses per day of paracetamol, since an overdose can cause liver failure. The child's temperature should be rechecked 30-60 minutes after the dose to confirm the effectiveness of the medication.

Children with respiratory illnesses are treated differently depending on their age and the cause of the illness. The following discussion is based on the 2000 WHO guidelines for managing respiratory illnesses in children.

Children Less Than 2 Months of Age

For a child less than 2 months of age, there are three classifications of respiratory illness: severe disease, severe pneumonia, and no pneumonia (cough or cold).¹

Severe Disease

An infant is classified as having severe disease if any of the following danger signs are present: lethargy, decreased intake, wheezing, fever (>37.5 degrees C) or low body temperature (<35 degrees C), or severe

Table 2: Antibiotic Management

Illnesses Treated	Medications	Dosing Methods	Side Effects
Severe respiratory disease Severe pneumonia Mastoiditis	Aminoglycosides (gentamicin sulfate)	Intravenous and intramuscular antibiotics	Nephrotoxicity (urinalysis, BUN, creatinine) and/or ototoxicity (serum peak and trough levels should be monitored, if available); tinnitus, vertigo
Severe respiratory disease Severe pneumonia Mastoiditis	Penicillin	Intravenous and intramuscular antibiotics	Hypersensitivity reaction
Severe respiratory disease Severe pneumonia Mastoiditis	3rd generation cephalosporins (ceftriaxone sodium, ceftazidime, cefotaxime sodium)	Intravenous and intramuscular antibiotics	Hypersensitivity reaction
Pneumonia Otitis media	Chloramphenicol	Oral and intramuscular antibiotics	Aplastic anemia; renal and liver toxicity
Any of the above illnesses	Penicillin Amoxicillin	Oral antibiotics	Hypersensitivity reaction

malnutrition. A young infant with severe disease should be transferred immediately to a hospital. If possible, give one dose of antibiotics before the transfer.

Severe Pneumonia

In this age group, all pneumonia is considered severe. A child is diagnosed as having pneumonia if the respiration rate is greater than 60 breaths per minute or the infant is having chest-wall retractions. A young infant with pneumonia should be treated with intravenous antibiotics and referred to a hospital for inpatient management. The first dose of antibiotics should be given prior to the transfer of the infant.

No Pneumonia (Cough or Cold)

A young infant without any danger signs (lethargy, decreased intake, wheezing, fever or low body temperature, severe malnutrition) and without fast breathing, retractions, or wheezing is determined to have a cold. The infant can be cared for at home. The caregiver should be encouraged to offer frequent fluids and to clear the infant's nose prior to feeding. The caregiver should be instructed to watch for signs of respiratory distress (e.g. nasal flaring, retractions, cyanosis, grunting) and to take the infant to the hospital immediately if any of the signs occur.

Children 2 Months to 5 Years of Age

There are three classifications of respiratory illness for children 2 months to 5 years of age: severe pneumonia or very severe disease, pneumonia, and no pneumonia (cough or cold).¹

Severe Pneumonia or Very Severe Disease

A child is classified with severe pneumonia or very severe disease if any danger signs are present (lethargy, inability to drink or tolerate fluids, stridor when calm, or severe malnutrition) or if he or she has chest retractions with or without rapid respiration. A child with severe pneumonia also may have other signs, such as nasal flaring, grunting, or cyanosis. Wheezing may be present in a child with severe pneumonia. However, isolated episodes of wheezing not associated with fever, nasal flaring, or rapid respirations are more

likely caused by asthma rather than severe pneumonia. A child classified as having severe pneumonia should be transferred immediately to a hospital. If possible, give one dose of antibiotics before sending the child to the hospital.

Pneumonia

A majority of pneumonia cases in this age group will be characterized by rapid respiration without retractions. A child with pneumonia can be treated at home with oral antibiotics. Pneumonia can be bacterial or viral in origin. Without means to differentiate the cause, all children with pneumonia should be treated with antibiotics. The child's caregiver should be instructed on how to administer the antibiotics; if feasible, the first dose should be given in the clinic to demonstrate proper administration. A child treated at home should return to the clinic in two days to be reassessed. The caregiver should be instructed to return to the clinic sooner if the child continues to have rapid respirations, develops retractions, continues to have fever, or does not improve on oral antibiotics. If this occurs, the child should be referred to a hospital. If the child improves on oral antibiotics, the antibiotics should be continued to complete five days or longer of treatment. If the child's signs and symptoms have not improved and the caregiver has been giving the antibiotics correctly, a different antibiotic should be given for five to 10 days.

No Pneumonia (Cough or Cold)

A child without any general danger signs is determined to have a cold. This child does not require treatment with antibiotics. The child can be cared for at home. The caregiver should be instructed to watch for signs of respiratory distress (e.g. nasal flaring, abdominal or intercostal retractions, cyanosis, grunting) and to bring the child back immediately if any of these signs occur. If coughing has persisted for more than 30 days, the child should be referred to a hospital for assessment.

Caregivers should be instructed on the importance of giving antibiotics as prescribed. They should not stop

the antibiotics before instructed, even if the child appears to be better. Stopping antibiotics early facilitates the development of antibiotic resistance and relapse of the illness.

Fever

Fever is one of the most common parental concerns for a child with HIV. Caregivers often view fever as an illness rather than a sign or symptom. Fever is defined by the WHO as a temperature greater than 37.5 degrees Celsius (measured under the arm) continuously for more than 24 hours or intermittently for more than 24 hours in a 72-hour period.⁴

Fever may be caused by infection (bacterial, viral, fungal, or protozoal) or malignancy but is rarely caused by medications to treat HIV infection or by HIV infection itself. The hypothalamus causes fever in response to endogenous pyrogens (fever-producing chemicals) that are released by phagocytic leukocytes (white cells that surround and engulf foreign particles) when infection, inflammation, hypersensitivity, or trauma occurs. Fever is thought to be a protective mechanism, because many viral and bacterial organisms cannot reproduce as effectively at higher temperatures. Fever also increases leukocyte phagocytic activity, thereby fighting infection.⁵

In the early stages of HIV infection, before immune suppression develops, a child with fever should be evaluated as an immunocompetent host. It is not until the patient develops severe immunosuppression (CD4+ count of <15 percent) that the child becomes more susceptible to opportunistic infections. Bacterial infections, including bacteremia, pneumonia, and sinusitis, account for a majority of infectious complications in advanced HIV disease.⁶

Non-Hodgkin's lymphoma, which can occur during the early stages of HIV infection, can also cause fever. Central nervous system (CNS) lymphomas, occurring more commonly in the late stages of HIV infection, are infrequently associated with fever.⁷

Patients in late stages of HIV infection are more susceptible to adverse drug reactions, which may manifest as fever. Adverse reactions to trimethoprim-sulfamethoxazole (TMP-SMZ) are reported at a rate of 25 percent to 50 percent, most commonly as a pruritic rash with or without fever.⁷

Subjective and Objective Assessment

Assessment of a child with fever should include both subjective and objective data.

Subjective Data

1. What is the child's temperature? What is the highest it has been?
2. How long has the child had fever?
3. What is the child's general appearance?
4. Does the child appear alert and playful or lethargic and quiet?
5. Does the child appear well-hydrated?
6. Does the child have a rash or appear pale or cyanotic (blue around the lips or face)?
7. Is the child's respiration labored? Does the child have retractions or nasal flaring?
8. Is the child experiencing any other signs/symptoms, such as ear pain, runny nose, cough, sore throat, abdominal pain, vomiting, or diarrhea?
9. How is the child's appetite?
10. Has the child been in contact with anyone who is ill?
11. Which treatments or medications have been given?

Objective Data

1. A complete physical examination is needed to locate a source for the fever. Fever in persons with HIV infection should be evaluated based on signs, symptoms, and the stage of HIV disease. The physical examination should pay particular attention to auscultation of the lungs, abdominal exam, skin, lymph nodes, and neurologic examination.⁷
2. If the child is less than 3 months of age and the fever is greater than 38 degrees C with no identifiable source of fever, and there is access to

laboratory tests, then a CBC, blood and urine cultures, a chest radiograph, and a lumbar puncture should be performed.⁸

Management

Treatment should be initiated when a source for the fever is found. The health care provider should instruct the caregiver to give the child any medicine as prescribed and to finish all medications. Fever in children should be managed symptomatically.

Paracetamol can be used judiciously. Caregivers should be instructed to keep the child in a cool environment and to avoid overbundling of the child. A light blanket may be used to avoid chilling, because shivering can increase body temperature. Caregivers should be discouraged from sponging the child with alcohol, because this decreases the body temperature too quickly.

Otitis Media and Sore Throat

Otitis media, or infection of the middle ear, can be classified into four categories to help identify proper treatment: acute ear infection, chronic ear infection, mastoiditis, and no ear infection.

Acute Ear Infection

A child with an ear infection may have ear pain, ear drainage, and/or fever. On physical examination, the child will have an erythematous (abnormally red), bulging, dull, immobile eardrum and/or pus draining from the ear. If the signs and symptoms have been present for less than two weeks, the child is classified as having acute otitis media. Acute otitis media is treated with oral antibiotics at home for five days. If the child has fever for more than 48 hours on antibiotics, consider a change in the antibiotics.

Chronic Ear Infection

A child who has had ear drainage for longer than two weeks is considered to have chronic otitis media. The ear should be dried by a method known as wicking. This should be done for the first time in the clinic to demonstrate the technique to the child's caregiver. To

dry the ear, roll a clean, soft, absorbent cotton cloth into a wick. Place the wick in the child's ear, and remove it when it is wet. Repeat these steps until the wick no longer gets wet; this indicates that the ear is dry. This should be done at home at least three times per day.³ Antibiotics are usually not effective in treating chronic ear infections, which are caused by different bacteria than acute ear infections.

Mastoiditis

Mastoiditis is a complication of otitis media. A child with mastoiditis will have a tender, swollen, erythematous, warm area behind the ear. Mastoiditis requires treatment with antibiotics and possible surgery. A child with mastoiditis should be referred to a hospital. The first dose of antibiotics should be given in the clinic, if feasible. The same antibiotics used to treat pneumonia are used in the treatment of mastoiditis.

Management

If antibiotics are given for an ear infection, the caregiver should be instructed to complete the full course of antibiotics and to return for follow-up as instructed. The caregiver should be instructed not to put oil or any other fluid into the child's ear, and the child should avoid getting water into the ear. Recurrent, chronic ear infections can cause deafness.

Sore Throat

Sore throat is one of the most common symptoms of an upper respiratory infection. Most cases of sore throat are caused by viruses, can be treated symptomatically, and resolve in a few days. Occasionally a child with a sore throat will require antibiotics. Antibiotics are necessary if the sore throat is caused by a throat abscess or streptococcal infection. A child with a throat abscess will not be able to swallow secretions, fluids, or food and should be referred to a hospital for drainage of the abscess. A child with a streptococcal throat infection will have tender, enlarged lymph nodes in the front of the neck and white exudate in the posterior oropharynx and/or on the tonsils.

Management

Most children with a sore throat get better in a few days with symptomatic treatment. Caregivers should be encouraged to offer frequent liquids to keep the mucosal surface of the throat moist. Paracetamol may be given by mouth at a dose of 15 mg/kg/dose every 4-6 hours to relieve discomfort or fever.

Caregivers should be instructed not to exceed five doses per day of paracetamol, since an overdose can cause liver failure. The child's temperature should be

rechecked 30-60 minutes after the dose to confirm the effectiveness of the medication. If the child has a streptococcal infection, the best treatment is a single injection of benzathine penicillin. If this is not available, the child should be treated with oral amoxicillin, ampicillin, or penicillin for 10 days. If oral antibiotics are given, the caregiver must understand the importance of completing the antibiotics to prevent complications such as rheumatic fever or a relapse of the illness.

Review Questions

1. What are the most important questions to ask when assessing a child with HIV who has fever?
2. Name at least three causes of fever in a child with HIV.
3. What is considered a rapid respiratory rate for children less than 2 months of age?
4. Describe the treatment for respiratory illnesses in children less than 2 months of age.
5. Describe the treatment for respiratory illnesses in children 2 months to 5 years of age.
6. What is the appropriate management for children with a sore throat or otitis media?

Exam Questions

1. Which factor places a child with HIV/AIDS at greatest risk for an opportunistic infection?
 - a. Presence of a malignancy
 - b. Immune suppression
 - c. Persistent high fevers
 - d. Drug reaction
2. What is the most important intervention for a child less than 2 months of age with severe pneumonia?
 - a. Begin oral antibiotics
 - b. Hospitalize immediately
 - c. Administer fluids
 - d. Administer oxygen
3. Rubi, a 2-month-old, comes to your clinic with a respiration rate of 32 breaths per minute. She has had congestion for the past few days with no fever. She is drinking well. What is your assessment?
 - a. Rubi has pneumonia, since she is having rapid respirations.
 - b. Rubi has a normal respiratory rate.
 - c. Rubi has severe respiratory disease.
 - d. Rubi should be hospitalized.

Answers: 1b, 2b, 3b

Case Study

A 1-month-old infant comes to clinic with a two-day history of stuffy nose, normal breastfeeding, and no fever. On physical examination, the infant's respiratory rate is 40 breaths per minute without retractions or nasal flaring. Bilateral breath sounds are clear, and the child is afebrile.

Question: According to the 2000 WHO guidelines, the appropriate diagnosis for this infant is:

- a. Severe disease
- b. Severe pneumonia
- c. Pneumonia
- d. No pneumonia (cough or cold)

Answer: d. A young infant without any danger signs (lethargy, decreased intake, wheezing, fever or low body temperature, severe malnutrition), fast breathing, retractions, or wheezing is determined to have a cold.

Question: The most appropriate intervention for the above infant is:

- a. Hospitalization for intravenous antibiotics
- b. Hospitalization to monitor signs and symptoms
- c. Home with oral antibiotics
- d. Home to monitor signs and symptoms

Answer: d. The infant can receive care at home. The caregiver should be encouraged to offer frequent fluids and to clear the infant's nose prior to feeding. She should be instructed to watch for signs of respiratory distress (e.g. nasal flaring, retractions, cyanosis, grunting) and to bring the infant back to the hospital immediately if any of the signs occur.

The mother brings the infant back to clinic two days later. The infant has had fever for the past 24 hours and decreased breastfeeding. On physical examination, the infant's respiratory rate is 70 breaths per minute with retractions and nasal flaring. Bilateral breath sounds are coarse with inspiratory and expiratory wheezes.

Question: According to the 2000 WHO guidelines, the appropriate diagnosis for this infant is:

- a. Severe disease
- b. Severe pneumonia
- c. Pneumonia
- d. No pneumonia (cough or cold)

Answer: a. The infant is classified as having severe disease if any danger signs (lethargy, decreased intake, wheezing, fever or low body temperature, severe malnutrition) are present.

Question: The most appropriate intervention for the infant is:

- a. Hospitalization for intravenous antibiotics
- b. Hospitalization to monitor signs and symptoms
- c. Home with oral antibiotics
- d. Home to monitor signs and symptoms

Answer: a. A young infant with severe disease should be transferred to a hospital immediately. If possible, the first dose of antibiotics should be given before the transfer.

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