

Chronic childhood illness



Giacomo Pirozzi/Panos Pictures

Health workers can encourage parents and carers to keep a record of their child's illness.

Many children in developing countries have chronic illness. These children have problems that last for many years, or come back repeatedly, and result in long-term ill health. These conditions cause great suffering for the children and their families. We have devoted this issue of *CHD* to looking at some of the important causes of chronic illness in young children – asthma, epilepsy, sickle cell disease and rheumatic heart disease. These conditions cannot be cured with currently available treatment. However, in all of these conditions health workers can make a major improvement in the quality of life of the child by correct assessment, treatment, follow-up and

advice to parents. By controlling the disease properly, future episodes of illness can be reduced. This benefits the child and the family, and also reduces the burden on already stretched health services.

It is important to be positive when managing these children – there is much that can be done to improve their health. Health services should encourage parents or carers to keep records which note the diagnosis and response to treatment so that there is good continuity of care over the long period of follow-up.

Asthma is an increasing problem in urban centres in developing countries, probably due to increasing exposure to a number of environmental factors.

On pages 4-5 environmental risk factors, diagnosis, differential diagnosis and management of asthma are discussed.

In contrast, sickle cell disease is due to genetic inheritance. It is a cause of chronic illness in many children in Africa and the Americas. Its diagnosis and management are discussed on pages 6-7.

Streptococcal sore throat is a common condition in children aged 5 to 15. It is important to treat because it can develop into rheumatic fever, which may lead to a long-standing debilitating heart disease. The article on pages 8-9 explains how to tell the difference between 'strep' and non-'strep' sore throat, and how to prevent rheumatic heart disease.

Epilepsy is another important chronic childhood illness. Most children with epilepsy respond well to anti-epileptic drugs. These can greatly improve quality of life and prevent serious injuries in these children. Details of management are given on pages 10-11.

Professor Lulu Muhe and Harry Campbell

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The management of fever continues to cause debate among CHD readers:



Don't give up

The article in *CHD*3/4 (page 7) and the response to a reader's letter in *CHD*13 both imply that tepid sponging is no longer recommended. However, it is still not universally accepted that antipyretics alone are the best way to tackle fever in tropical countries. A number of studies show that tepid sponging and paracetamol is more effective at reducing fever than paracetamol alone and is rarely associated with shivering and discomfort. Paracetamol has also been shown to prolong the presence of parasites in fever due to *Falciparum* malaria.

Tepid sponging is an old practice in caring for a febrile child. Mothers want to do something to help and comfort their children and sponging comes naturally to them. It is cheap, affordable and available. Antipyretics commonly used in Africa include salicylates (such as aspirin) which are contraindicated in children because of the potentially harmful side effects.

To encourage antipyretics alone may increase cost and limit caring, efficient management of fever. Let's not give up on tepid sponging until we've assessed all the evidence with cool heads.

Dr David Newsom, Lecturer in Paediatrics, Mbarara University, Uganda



Paracetamol and fever

Dr Pio (*CHD*13 page 2) is right that anti-pyretics such as paracetamol are an effective way to treat fever. But fever helps a child to fight off infection. Paracetamol should **not** be used routinely to treat fever in acute infections because it makes infections last longer and it reduces the amount of antibodies made by a child. Paracetamol can damage the liver and it

does not prevent febrile convulsions.

Giving paracetamol makes treatment more complicated: thermometers and paracetamol have to be supplied, staff have to be trained in their use and time is wasted in taking temperatures and prescribing paracetamol. All this distracts from treatment that is actually helpful.

Tepid sponging is cheap, can be done by the parent and although it is not very effective, it does no harm. Paracetamol is more expensive, prolongs illness, reduces the antibody response and probably increases mortality.

Professor Frank Shann, Royal Children's Hospital, Parkville, Victoria 3052, Australia

Editors note: *These letters show that treatment of fever in young children is a controversial issue. Readers should be aware that any effect of tepid sponging is short-term and that the use of paracetamol should be considered with care. While it would be wrong to withhold paracetamol from children in pain or who are very distressed or uncomfortable due to high fever, we probably place too much emphasis on its use and could focus our efforts elsewhere, such as feeding and antibiotics.*



Ear drops for ear infections

In my under-fives clinic, I used to treat children with acute otitis media with oral antibiotics or procaine penicillin and advise the mother to dry wick the ear. In cases of chronic otitis media I also advise dry wicking but do not give antibiotics. However many doctors, including paediatricians, prescribe antibiotic ear drops for both acute and chronic otitis media. Is this correct? **Solomon Bekele, Bale Zonal Health Department, Goba, Ethiopia**

Dr Andrew Smith and Dr Ian Mackenzie reply:

For acute otitis media the current advice from WHO is to give an oral antibiotic, either cotrimoxazole or amoxicillin. There is no evidence that topical antibiotics improve the outcome of the disease and at present there are no topical antibiotics for use in the ear canal listed in the WHO Model List of Essential Drugs.

For chronic ear infection (chronic suppurative otitis media) current

TERMS & DEFINITIONS

This box explains some of the technical terms used in this issue.

Allergen – something that causes a sensitivity reaction (allergy) such as penicillin, pollen and cat fur

Antipyretic – drug that reduces fever

Bronchodilator – a drug that helps to open the air passages of the lungs and so relieves wheezing

Convulsion – a sudden attack (or fit) due to a burst of abnormal activity of brain cells. Recurrent convulsions are usually due to epilepsy

Wheeze – a soft musical sound when the child breathes out. It may be caused by a swelling and narrowing of the small airways of the lungs or by a contraction of the smooth muscles surrounding the airways

recommended treatment is to dry the ear by wicking, and follow-up in five days. The article on this subject in *CHD*7 (page 7) said to give an oral anti-biotic if necessary, but not to give repeated courses of antibiotics.

Evidence from a recent study shows that antibiotics and dry wicking are more effective in treating chronic ear discharge than no treatment, or dry wicking alone. A recent review of treatment trials also showed that topical treatment with antibiotics or antiseptics was more effective than oral antibiotics.

In view of these findings WHO is currently reviewing guidelines for treatment of chronic otitis media. Effectiveness, safety and cost of topical preparations vary and although they may be recommended in the future, health workers should continue to follow national guidelines at present. **Dr Andrew Smith, Prevention of Deafness and Hearing Impairment Division, WHO, CH-1211, Geneva 27, Switzerland, and Dr Ian Mackenzie, Centre for Audiology, University of Manchester, Manchester M13 9PL, UK**

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now available at <http://www.healthlink.org.uk/pubs.htm>

CORRECTION TO CHD15

Photo credit on page 1 should read 'Heldur Netocny/Panos Pictures'. We apologise for this mistake.

Chronic childhood illness

Professor Linda Richter describes what is meant by chronic childhood illness and how it affects children and their families.



A childhood illness is chronic when it is long-term or permanent or keeps coming back. About one in seven children suffer from chronic conditions such as asthma, epilepsy, sickle cell anaemia, diabetes, and cancer, or conditions associated with HIV infection. Many children, especially those who are under-nourished, suffer repeatedly from illnesses such as pneumonia, malaria and diarrhoea.

Effect on children

The way chronic illnesses affect a child depends partly on how the family views the child's condition. Carers will do whatever they can to reduce risk, protect the child's health, improve the chances of recovery and avoid relapses. Sometimes this may lead to carers protecting the child too much and preventing him or her taking part in normal activities such as playing games.

In some families or societies, stigma is attached to some chronic conditions. People may believe that the child or the family has been bewitched or attracted

bad luck. Both the child and their family may be shunned or cruelly treated. Chronically ill children may be neglected or hidden to protect the family from shame.

Also:

- most chronic illnesses cause discomfort and pain. Some, for example HIV infection, are associated with neurological and psychological problems
- chronically ill children are often separated from their carers and families for long periods while they receive treatment in health facilities, making it harder for them to cope with discomfort and medical treatment
- chronically ill children often lose their appetite which affects their nutrition and growth
- chronically ill children may need to spend long periods in bed, so have to miss school frequently.

For these reasons, chronically ill children are often unable to lead completely normal lives. They spend less time with other children and their illness limits their activities. All these difficulties affect the personal development of these children and may lower their self-esteem.

Health facilities need to be especially well organised in order to manage the repeat visits and long-term follow-up of children with chronic illnesses. If the child is treated as a new patient every time they visit the health facility this leads to excessive waiting in queues, a poor health service and further repeat visits.

Effect on families

The effect on families depends on the families' resources, especially time and

money for treatment, drugs or transport. Worries about the child's future often lead to depression and distress in the family especially for mothers. Brothers and sisters may feel neglected and resentful of all the attention paid to the sick child and family members may feel there is no time for recreation and no household routine.

However, with sufficient resources, access to appropriate care and social support, some families of chronically ill children become closer to one another and more compassionate as a result of living with and caring for a child with a chronic health condition.

The role of health workers

Trained and caring health workers can help chronically ill children and their families adapt to the demands and stresses of the child's condition.

Health workers need to help parents cope rather than try to replace them or undermine their confidence in caring for their child. This means giving accurate, honest, positive and practical information and advice for everyday life. It also involves helping the family to keep a perspective on other aspects of their lives, and not to blame everything on the child's illness.

Health workers can also help communities to understand that the child's condition is not the fault of the child or the family, and that it is easier for the child to learn to live with a chronic illness if he or she is supported by adults and other children.

Professor Linda Richter, Head of Department of Psychology, University of Natal, Private Bag X01, Scottsville 3209, South Africa

Key messages

- Good social support networks through friends, relatives, and especially health workers, can help families to live normal lives when caring for a chronically ill child.
- Stigma can be reduced by helping the community to understand the causes of chronic illness, and to give practical help to meet the needs of the child and the family.



Managing asthma

Penny Enarson and Robert Gie describe how to diagnose and treat asthma at district level.

Asthma is becoming more common in industrialised countries and large urban areas in developing countries. Children living in urban areas are more likely to have asthma than children living in rural areas.

What causes asthma?

Asthma is caused by inflammation of the airways of the lungs. The wheezing is due to narrowing of the airways caused by excessive mucus, swelling, and spasm of airway muscles.

A child is more likely to have asthma if a parent has a history of the disease. Many factors may bring on attacks in individual children:

- **inhalation of cigarette smoke**
- **airborne allergens** such as house-dust mites, cat fur and pollens
- **indoor air pollution** caused by the burning of wood, coal or gas
- **food allergens** and food and drinks containing sulphur dioxide as a preservative. The most common allergens that affect children are dried fruits and vegetables, and soft drinks. Allergy to cow's milk rarely causes asthma. Knowing which things bring on an attack ('trigger factors') helps parents to prevent exposure, which, in turn, reduces the need for treatment.

Diagnosing asthma

Asthma should be diagnosed in any child who has recurrent or persistent wheeze or cough that improves with a bronchodilator such as salbutamol. In older children asthma can be diagnosed by showing a 15% increase in the peak expiratory flow rate (PEFR) ten minutes after giving a rapid-acting bronchodilator.

Differential diagnosis

Not all children who wheeze have asthma. Wheezing is common. Half of children under three years will have wheezed at some stage in their lives, but in most of these cases the wheez-

ing will not recur. Other causes of wheeze include:

- **Acute bronchiolitis** – this frequently occurs after a viral infection, in infants aged three to six months. Bronchiolitis wheezing responds poorly to bronchodilators.
- **Pneumonia** – children often wheeze during the acute infection. It usually goes away when the infection is finished.
- **Foreign body aspiration** – can

cause wheezing from one or both sides of the lungs. A history of acute onset of wheezing in a previously well child, that does not improve with a bronchodilator, helps diagnosis.

- **Tuberculosis** – swollen glands may cause obstruction of the airways in young children with tuberculosis.
- **Inhalation pneumonia** – pneumonia caused by the child inhaling fluids, vomit or a foreign body. In children under one year of age other causes of wheezing include cardiac failure and congenital lung disease, but these are very rare. After the age of two years asthma becomes the most common cause of wheezing. Only look for an alternative diagnosis in those children not responding to asthma therapy.

Classifying asthma

To manage asthma, health workers must assess the severity of the disease. There are three main categories: mild, moderate and severe asthma (see table). When making the diagnosis, place the child in the most severe group that is indicated by the symptoms.

Category	Per cent of all cases	Frequency of symptoms	Level of PEFR (per cent)
Mild	80	Every few months. The symptoms are relieved by a bronchodilator.	> 80
Moderate	15	Every few weeks. Regularly uses a bronchodilator.	60 – 80
Severe*	5	Daily or continuous wheezing. Child will be woken regularly by a tight chest or coughing.	< 60

*Includes children who have been admitted to hospital or have had life-threatening

Managing asthma

Asthma requires regular treatment, often for life. This raises the issue of cost, compliance and organisation of regular supplies. Asthma is said to be 'under control' when:

- symptoms are reduced or disappear so there is no further need for emergency hospital visits, the child can play sports and does not miss school
- normal or nearly normal PEFR levels
- bronchodilator medication is needed less than twice daily (usually only occasionally). This does not include the need to use a bronchodilator for preventing asthma induced by exercise.

Category	Treatment
Mild	Inhaled bronchodilators to relieve symptoms.*
Moderate	Regular inhaled corticosteroid (e.g. beclomethasone) (dose 200-400 mcg/day) and intermittent inhaled bronchodilators to relieve symptoms.*
Severe**	Regular inhaled corticosteroid (e.g. beclomethasone) (dose 400-800 mcg/day) and intermittent inhaled bronchodilators to relieve symptoms.*

*Inhaled bronchodilators should only be used when the child has symptoms of airway limitation.
 **These children often benefit from a 5-7 day course of oral steroids at the start of their treatment. For example: prednisone 1-2 mg/kg/day, the maximum dose per day is 40mg.

Robert Gie



Always use a spacer with a bronchodilator with children under eight years of age.

USING A SPACER

Inhaled asthma drugs work best and are efficiently delivered via a metered dose inhaler. Children younger than eight years of age have difficulty in coordinating their breathing efforts with activation of the metered dose inhaler. For this reason, and because it reduces the risk of side effects, a spacer becomes essential. Simple but effective spacers can be made from 500 ml plastic bottles. A hole to fit the mouth piece of the metered dose inhaler is cut in the bottle bottom. One puff at a time is released into the bottle and the child takes five breaths from the bottle following each puff. Wash the spacer with soap at least once a week and leave to drip dry.

Choosing the medication

Two types of medication are essential: a bronchodilator to relieve reduced airflow (reliever) and an anti-inflammatory medication to control the disease (preventer).

Type of medication	Generic name	Dosage (mcg=microgram)
Bronchodilator Beta 2 agonist	Salbutamol	Aerosol: 100mcg/puff
Anti-inflammatory Corticosteroid	Beclomethasone Prednisone	Aerosol: 100mcg/puff Oral: 1mg/kg/day

Children with asthma often cough and wheeze during exercise (exercise induced asthma). This can be prevented by taking a bronchodilator before exercise.

Inhaled corticosteroids and safety

Some people worry about the use of inhaled corticosteroids in children, especially that it may slow down their growth. However, it is widely accepted that doses lower than 400 mcg/day are safe. When doses higher than 400 mcg/day are used, the dose should be decreased as soon as the asthma has been under control for three months or more. To decrease the local side effects of inhaled corticosteroids (oral thrush and hoarseness) a spacer should **always** be used (see photo).

Other drugs

Many other drugs are available for the treatment of asthma, but inhaled corticosteroids are the most successful in controlling symptoms and decreasing hospital admissions. Oral theophylline should only be used if other drugs are not available as it can be dangerous. Only long-acting theophylline preparations should be used. Oral salbutamol can be used in young children with mild asthma.

Follow-up care

Children with asthma should have regular fixed appointments to assess improvement. Ideally this includes measuring the child's PEF. If the child's asthma has been 'under control' for three months or more, reduce the dose of the inhaled steroids. This is important as the lowest possible dose of inhaled corticosteroids must be used.

Routine visits also provide the opportunity to give the psychological support necessary to all families caring for a child with chronic illnesses. Ideally carers should have a written action plan of what to do if their child's asthma worsens.

Children suffering from an acute asthma attack should be seen as an emergency. Treat with oxygen, inhaled bronchodilator and oral steroids. If a child fails to respond to a bronchodilator, give oral prednisone (2mg/kg) and refer to hospital immediately.

Education of carers

Carers need to understand that asthma is a chronic disease. It is not possible to know at the onset what will be required for treatment in the long term. The carer will be able to help with care of their child's disease, and reduce trigger factors, **only** if they are given the right information.

Health education must be regular, consistent, relevant to the carer's situation and resources, and use simple, non-technical language. It should include information about the illness, the importance of regular treatment and the role of each drug in treatment, the correct way to give the drug (including correct inhalation techniques) and the signs of worsening of the asthma.

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Editor's note: *ARI News 27 has information about doses and administration of oral salbutamol. Please contact Healthlink Worldwide if you would like a copy.*

Key messages

- Remove or reduce exposure to factors that trigger asthma.
- Follow up children with asthma regularly and reduce medication once the illness is under control.



A health worker shows a mother how to check for an enlarged spleen.

Sickle Cell Disease

Dr Klaas Wierenga provides an outline of sickle cell disease and its management.

Sickle cell disease (SCD) has a major impact on families and health care systems. It affects millions of people worldwide and is the underlying cause of many deaths, particularly in young children. Approximately 80,000 children are born with a form of SCD every year in Nigeria alone.

SCD is a chronic lifelong condition, with many unpredictable features. Acute complications, often leading to serious illness, can be followed by periods of relative well-being. Environmental factors play an important part in the prognosis of a child with SCD. In Africa, few survive to adulthood. The often harsh environment (complicated by malaria, measles, diarrhoeal and

respiratory infections, malnutrition) and lack of access to health care for a child with SCD in many developing countries, contributes to this high death rate. An effective approach, based on local research, presents an enormous challenge to all involved.

What is sickle cell disease?

SCD is a group of inherited blood disorders caused by the presence of abnormal haemoglobin (red pigment) in red blood cells (RBCs). The abnormal haemoglobin causes the blood cells to change their shape and look like a sickle. These abnormal cells tend to block blood vessels, causing damage to tissues and organs downstream of the obstruction. These cells also live for a shorter time as they are more easily destroyed than normal RBCs. This causes the clinical features of SCD (see below) which can affect every organ of the body. We will focus on the most common serious form of SCD, homozygous sickle cell disease (SCD:SS).

How is it inherited?

Normal adult haemoglobin is called

haemoglobin A (HbA). Children with SCD are born with an abnormal kind of haemoglobin called haemoglobin S (HbS). If a child gets HbS from both parents all of his or her haemoglobin is abnormal and this causes sickle cell disease.

If a child gets HbS from only one parent he or she will have a mixture of HbA and HbS (AS); this is called sickle cell trait. People with sickle cell trait are not ill but they are 'carriers', meaning they can pass on the gene to their children. If both parents are carriers (a 'couple at risk') there is a one in four chance for each pregnancy that their child will have SCD:SS.

Most people do not realise that they are carriers unless they get tested or their child is diagnosed with SCD:SS. Genetic counselling (including pre-natal diagnosis where available) is a vital part of care and prevention (see box on preventing complications).

Diagnosis and clinical features

Symptoms of SCD are rare in infants under six months. After six months of age SCD is often first suspected when an infant develops symptoms of common complications of the disease (see box on page 7). SCD should also be suspected if the child has jaundice, anaemia, an enlarged spleen and/or liver. Dactylitis (hand-foot syndrome) is a common non-serious complication, with swelling of hands, fingers and/or feet, requiring supportive care. Dactylitis facilitates the diagnosis of young children with SCD where newborn screening is unavailable, and

Sickle Cell Club in Nigeria

The club was set up in Lagos in 1984 for the care and control of sickle cell disorders. Its activities include:

- organising public lectures to raise awareness of sickle cell disorders
- setting up sickle cell clinics
- running the first ever Genetic Counselling Training Course – organised in collaboration with WHO
- fundraising activities such as Annual Sickle Cell Week, Gala Award Nite, Fun-Fair etc.

The activities are mostly carried out through six Area Clubs that meet once a month.

Ayo Otaigbe, Sickle Cell Club, Lagos, Nigeria



Dactylitis (hand-foot syndrome) is a common complication of SCD.

Common serious complications of SCD

Complication	Signs and symptoms	Treatment	Comment
Acute enlargement of the spleen	Lethargic, pale, ill-looking child with low-grade fever, sudden severe anaemia	Urgent blood transfusion	Most common between four months and five years, can reoccur, if so: splenectomy
Aplastic crisis	Pale, febrile child	Urgent blood transfusion	Caused by human parvovirus infection. Most common between six months to ten years. Does not reoccur
Sepsis/ meningitis/ malaria	Ill child with high fever coma and/or convulsions	Urgent intravenous antibiotics, anti-malarials where malaria is common	Most common under six years. Preventable with penicillin and malaria prophylaxis, pneumococcal vaccine
Acute chest syndrome	Ill child with fever, cough, shortness of breath	Urgent intravenous antibiotics, oxygen, physiotherapy, blood transfusion if severe	Common from the age of six months, not presently preventable
Painful crisis	Pain in back, limbs and/or abdomen, tenderness of affected areas	Analgesics after ruling out infection	Exposure to cold might bring on an attack

its features should be well known to all health workers (see photo).

Less common, but serious, complications include: stroke (caused by narrowing of blood vessels to the brain); infection of the bone(s); complications of gallstones causing obstruction of the bile duct.

Once suspected, SCD can be diagnosed by a special test called haemoglobin electrophoresis that identifies the type(s) of haemoglobin a child has. The presence of HbS, combined with the absence of HbA confirms the diagnosis of SCD:SS.

Management of SCD

Once a child has been diagnosed and immediate problems dealt with, take steps to prevent complications occurring in the future. The child should be seen regularly (every eight to twelve weeks), preferably at a specialist clinic.

The importance of attendance for routine visits should be explained to parents or carers. This allows communication between the child, the carers and the health workers. Education of the child's parents or carers is very important as many children die before they receive adequate medical care, or shortly afterwards. However, parental education, prevention and early intervention can only begin once the diagnosis of SCD:SS has been made. In many countries neonatal screening is now an integral part of health care

allowing preventative measures to begin before the first SCD complications occur.

Quality of life

Care of children with SCD often tends to focus on the acute complications of the disease because many of these can be fatal. However, it is important to remember SCD is a chronic illness, affecting not just the child's physical and mental well-being but also his or her relationships with parents, brothers and sisters, and friends (see page 3).

A child's quality of life can be improved by ensuring that his or her carers understand the illness, and the importance of letting the child attend school and take part in everyday activities.

Dr Klaas JJ Wierenga, Research Associate, Medical Research Council Laboratories, Sickle Cell Unit, University of West Indies, Mona Kingston 7, Jamaica. E-mail: wierenga@cwjamaica.com

Key messages

- Screening can identify carriers of SCD and genetic counselling can help to make 'couples at risk' aware of the disease.
- Early diagnosis, education, prevention and early intervention in childhood help reduce the risk of death from complications of SCD.
- Public health measures for SCD need not be expensive.

Preventing complications

Early diagnosis, prevention and intervention measures vary from country to country. However, in general they should include:

- **Newborn screening.**
 - **Education of parents or carers**
 - try to involve the father as early as possible
 - teach the parents to feel for the child's spleen, and if enlarged compared to previous measurements, to take the child immediately to the nearest facility where blood transfusion is available
 - advise parents to seek medical attention whenever their child has fever or increased jaundice, is pale, lethargic, short of breath or otherwise unwell, and inform any attending health worker about the child having SCD. Teach the parents to use a thermometer.
 - **Malaria prophylaxis** – in endemic areas, according to national guidelines.
 - **Nutritional advice** – balanced, high protein, high calorie diet, adequate fluids, proper personal and food hygiene; and where needed folate, iron and other vitamin supplementation.
 - **Routine childhood vaccinations** – and if available *Haemophilus influenzae* type b (Hib) vaccine, and if needed, hepatitis B vaccine.
 - **Penicillin prophylaxis** – to prevent sepsis and meningitis, as follows:
 - benzathine penicillin 0.6 mega units (MU) intramuscularly (IM) every 28 days from three to four months of age (or as soon as possible following diagnosis), until age three years; then 1.2 MU IM every 28 days until one month after administration of pneumococcal vaccine (usually given at age four-five years)
 - OR
 - penicillin V 125 mg orally, twice every day from three to four months of age, until age three years; then 250 mg twice daily every day until one month after administration of pneumococcal vaccine.
- Never discontinue penicillin unless the child receives the pneumococcal vaccine; in the absence of the pneumococcal vaccine, the best option is probably to continue penicillin for an extended period.

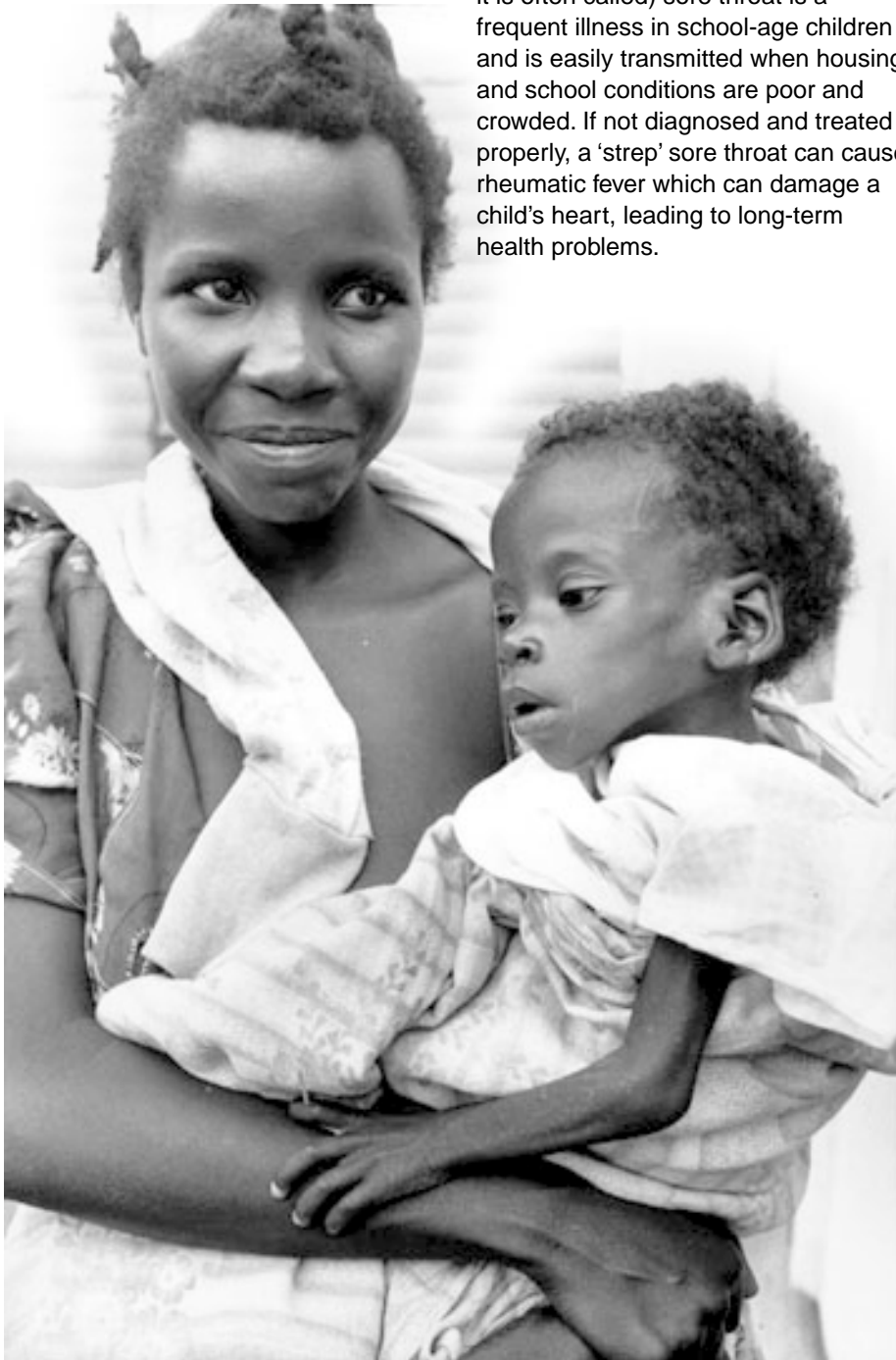
Not just a sore throat

Prompt management of a child with a Streptococcal sore throat prevents rheumatic fever and rheumatic heart disease.

'Strep' sore throat

Children, especially those living in disadvantaged areas, may have as many as six respiratory infections during a year. These respiratory infections may include a runny nose,

cough, cold, flu and sore throat. Most sore throats are caused by viruses and get better without treatment. Sometimes they are caused by bacteria called *Streptococcus Pyogenes*. A streptococcal (or 'strep' as it is often called) sore throat is a frequent illness in school-age children and is easily transmitted when housing and school conditions are poor and crowded. If not diagnosed and treated properly, a 'strep' sore throat can cause rheumatic fever which can damage a child's heart, leading to long-term health problems.



Jenny Matthews

Diagnosis and treatment of 'strep' throat

A child may feel well but suddenly within a few hours gets a very sore throat and high fever (over 38.5°C). The back of the child's mouth and the tonsils become very red and swollen. The lymph nodes on the child's neck are enlarged, tender and painful. There usually is no runny nose or coughing. The child must be taken to a health facility for treatment.

Give a single intramuscular injection (IM) of benzathine penicillin or oral penicillin V tablets (see table on page 9 for dosage). This treatment prevents the child from developing rheumatic fever. It also prevents the child spreading the illness to other children at home and school.

Rheumatic fever

If a child with a 'strep' sore throat is not treated properly, the child may develop rheumatic fever sometime during the next two weeks. The fever returns but this time the child also develops painful and swollen joints at the wrists, elbows, knees and ankles. The swollen joints will feel hot. Some-times the pain will move from one joint to another. For example, one day there may be swelling and pain in the ankles, the next day in the wrist. The child may also be tired, have a poor appetite and difficulty in breathing.

Rheumatic fever is most common in children between five and fifteen years of age. Unlike 'strep' sore throat rheumatic fever is not infectious but treatment must be started immediately. Give benzathine penicillin and aspirin (80-100 mg/kg/day in four doses). It takes a long time for a child to recover from rheumatic fever. The child will need to rest in bed for at least one month. During the recovery period it is important that the child receives nutritious meals (i.e. a balanced mixture of staple, legumes, meat/fish, eggs, milk, fruit, vegetables and fats) which are not too bulky. The child should be fed frequently.

Rheumatic heart disease

Rheumatic fever and rheumatic heart disease are still common in developing countries, particularly among poor people. They are responsible for

Differential Diagnosis

Clinical feature	'Strep' throat	Non-'strep' throat
Age	5-15 years (most common)	All ages
Type of onset	Sudden	More gradual
First symptoms	Sore throat, with pain on swallowing	Mild sore throat
Fever	High (over 38.5°C)	Not so high
Appearance of the throat	<ul style="list-style-type: none"> Redness and swelling of the pharynx and tonsils with pus discharge Redness, swelling and bruising on the soft palate 	Redness of the pharynx
Other signs	Tender lymph nodes in neck, scabs on the nostrils, signs of scarlet fever – red tongue, skin rash	Cough, hoarseness, runny nose

Drug treatment for 'strep' sore throat and prophylaxis for prevention of rheumatic fever and rheumatic heart disease

Drug treatment	Benzathine penicillin Intramuscular injection vial of 2.4 million units		Phenoxymethyl-penicillin (V) Tablet 250 mg	
	'strep' sore throat*	prophylaxis**	'strep' sore throat*	prophylaxis**
Frequency of dosage	single dose	single dose once a month	four times a day for 10 days	twice a day
Dosage				
1- 6 years (<30kg)	600,000 units	600,000 units	½ tablet	½ tablet
7-12 years (>30kg)	1,200 000 units	1,200,000 units	1 tablet	1 tablet
*If the child is allergic to penicillin, give oral erythromycin 40mg/kg/day in 2-4 divided doses. Total daily dose should not exceed 1 gram.		**Alternatively sulfadiazine can be given: children <30kg 0.5gm daily children >30kg 1 gram daily		

significant mortality and morbidity rates.

Prevention of rheumatic heart disease

If a child has had rheumatic fever, he or she can get it again. Each time the child has an attack, his or her heart gets more damaged resulting in rheumatic heart disease. This causes shortness of breath, weakness and an irregular heart beat, especially after physical activity or exercise. These symptoms become worse over time and the child may become physically disabled for life, or may die early.

To prevent repeat attacks of rheumatic fever, the child must see a health worker once a month and be given an IM injection of benzathine penicillin prophylaxis. Alternatively, oral penicillin V can be given daily (see table for dosage). This treatment must continue until the child is 18 years or older. If the child does not receive the preventative monthly treatment he or

she can develop rheumatic heart disease.

If recurrence of rheumatic fever is managed appropriately, there is a 60% chance of reverting the heart lesions to normal within 10 years. If recurrence is allowed to occur, this will result in a permanent disability, and surgery will be needed.

Talking with families

Health education is one of the most effective ways of preventing rheumatic fever. If a child is diagnosed with 'strep' sore throat, take time to explain the dangers of the illness to his or her parents or carers, and the importance of treatment.

Source: *Streptococcal sore throat, rheumatic fever and rheumatic heart disease a reference for physicians and paramedical personnel. Prepared by United Nations Educational, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO) and International Society and Federation of Cardiology (ISFC), 1992.*



Penny Tweedie/Panos Pictures

Chronically ill children can take part in normal activities such as playing games.

Key messages

- Correct diagnosis and treatment of 'strep' sore throat prevents rheumatic fever and rheumatic heart disease.
- Treatment for rheumatic fever must start immediately.

Learning exercise answers from page 12

- 1 mild asthma
- 2 wheeze associated with cough or cold, pneumonia, foreign body aspiration
- 3 avoid anything that she is allergic to. Avoid contact with smokers, avoid indoor air pollution, keep away from smoke. Avoid exposure to cold. Clean the sleeping area as much as possible.
- 4 use inhaled bronchodilators (salbutamol) and inhaled corticosteroids (beclomethasone) initially, as described on pages 4-5.
- 5 regular fixed appointments to check on the child's condition and to monitor improvements.

Children living with epilepsy

Dr Sharon Lim Shu Lee describes how epilepsy affects children and how it can be managed.

Epilepsy is a condition in which the child has a tendency to suffer repeated episodes of convulsions in the absence of an acute illness (such as meningitis or malaria). A child with epilepsy may be completely healthy between convulsions, or may have other problems such as learning difficulties or cerebral palsy.

Not all convulsions are due to epilepsy. It is important to look for and treat any underlying cause for a convulsion. Fever with convulsions might be due to a 'fever fit' which occurs commonly in young children aged six months to six years during a simple infection because of the immaturity of the brain. Fever with convulsions may also be due to a brain infection, such as meningitis, tuberculosis or malaria. Other causes include:

- head injury
- lack of oxygen supply to the brain (as occurs in near-drowning)
- low sugar levels or salt and water imbalance in the body (such as with severe vomiting or diarrhoea)
- irregular heart rhythms (such as in rheumatic heart disease)
- poisons
- overdose with certain medication.

Some harmless conditions may look like convulsions.

These include fainting, toddler breath-holding spells, sleep startles, night terrors and facial 'twitching'. A good eye-witness account, particularly of the events just before and after the convulsion, is crucial to making the right diagnosis of a convulsion.

A child with true epilepsy may have one or more types of convulsions. 'Generalised' convulsions refer to convulsions during which the child loses awareness of his or her surroundings. In 'focal' convulsions, the child is alert despite jerking movements of part of his or her body. The commonest type of convulsions are when the child's body first stiffens up and then starts jerking. At the same time, uprolled or staring eyes, blue coloured lips, clenching of teeth and involuntary passing of urine may be seen. A rarer form of generalised convulsion called 'absence' convulsions involves the child simply staring and becoming unresponsive for a few seconds. This type of convulsion may be misinterpreted as day-dreaming spells.

The management of childhood epilepsy involves: Correct diagnosis

It is always crucial to first obtain a clear description of the events before, during and after the convulsion. Any underlying cause has to be looked for and treated. Blood tests, X-rays and brain wave recordings (EEG) are not always necessary in making the diagnosis of epilepsy.

Drug treatment

Epilepsy is treated with anti-epileptic drugs, which must be taken daily in order to prevent the recurrence of convulsions. When on medication, the child must be reviewed regularly to prevent under- or over-treating his or her convulsions, and to monitor for any side effects. The health worker should try to obtain:

1. an accurate picture of how frequently the convulsions have occurred
2. how long they last each time
3. whether the child's learning or behaviour has been affected since treatment was started.

2. how long they last each time
3. whether the child's learning or behaviour has been affected since treatment was started.

If a child remains convulsion-free for at least one year, it may be possible to slowly reduce and stop the drug to see if he or she she still requires it.

'First Aid'

- Family members should be taught how to turn the child to his or her side to aid breathing during a convulsion (see *CHD15*), to rest his or her head on a soft object and to clear the surrounding area of any dangerous articles (see illustration).
- NEVER force objects into the child's mouth during a convulsion.
- If the child has had prolonged convulsions (of more than 15 minutes) in the past, the family may need to have emergency medication to put in the anus to stop the fit quickly.

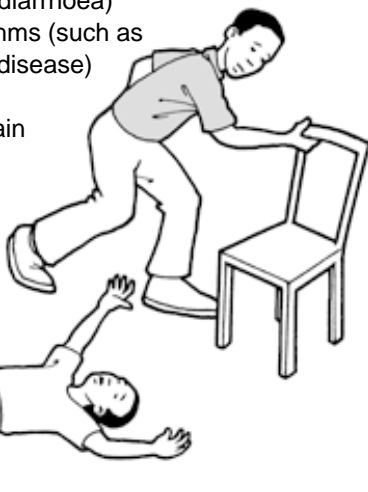
Remember:

- Convulsions can be very frightening for onlookers.
- Convulsions that last longer than 20 minutes can lead to permanent brain damage.

Education

Careful teaching is important as epilepsy is often misunderstood. In many societies it is thought to be caused by a disease of the spirit. Some traditional 'first-aid' measures may be inappropriate or even harmful e.g. putting the child's feet in the fire. The family also needs to understand that anti-epileptic medication will not 'cure' their child, but is needed to prevent convulsions so that the child can continue to lead a normal life as far as possible. Much support is needed so that the child receives adequate safety and supervision yet does not become over-protected or stigmatised in his or her community. Most children with epilepsy can attend school and will learn at the same rate as other children.

Dr Sharon Lim Shu Lee, Department of Paediatrics, KK Women and Children's Hospital, 100 Bukit Timah Road, Singapore 229 899. Thanks also to Dr Paul Eunson, Department of Neurology, Royal Hospital for Sick Children, Edinburgh, UK



Treating epilepsy – anti-convulsants

Children with epilepsy require continued treatment with an anti-convulsant. The aim is to prevent the convulsions and to make sure that he or she does not suffer too much from the side effects of the drugs. Ideally the convulsions should be controlled with only one drug and in most cases of childhood epilepsy this is possible. However, some children will need two drugs and in a few more complicated cases children may need more than two drugs. The two main drugs used in developing countries are Phenobarbital and Phenytoin.

When beginning treatment one drug is given, usually Phenobarbital. The type, frequency, duration and time of occurrence of convulsions are recorded by the child's carer, and initially the child is seen monthly. The daily dose of Phenobarbital is increased by 15mg or 30mg every month, based on the response of the child, until either the convulsions are being controlled or signs of Phenobarbital overdose appear (see below). If the convulsions are not controlled before side effects appear, start Phenytoin and continue to give Phenobarbital at the dose before side effects appeared. Increase the dose of Phenytoin every month until the convulsions are controlled or signs of Phenytoin toxicity occur. Once convulsions are controlled the first drug, Phenobarbital, can then be slowly withdrawn.

Thanks to Dr Ayele Gebremariam, Paediatric Neurology Unit, Addis Ababa University, PO Box 1768, Addis Ababa, Ethiopia and Dr Sharon Lim Shu Lee, Department of Paediatrics, KK Women and Children's Hospital, 100 Bukit Timah Road, Singapore 229 899



Penny Tweedie/Save the Children Fund

Most children with a chronic illness can learn at the same rate as other children.

DRUG	PHENOBARBITAL (PHENOBARBITONE)	PHENYTOIN
BRAND NAME	PHENOBARBITAL	EPANUTIN
WHEN TO USE	Generalised or partial (focal) convulsions	Generalised or partial (focal) convulsions
POSSIBLE RISK/SIDE EFFECTS	Drowsiness, lethargy, aggressive behaviour, learning difficulties (long-term), inattention, sleep disturbance, hyperactivity, skin rashes Overdose can cause coma, shallow/stop breathing, low blood pressure, abnormally low body temperature	Nausea and vomiting, confusion, dizziness, headache, tremor, rashes Rarely may cause anaemia, acne, rickets Signs of overdose: slurred speech, blurred vision and unsteadiness in walking
CONTRAINDICATIONS	Impaired kidney or liver function, hypersensitivity	Liver problems, pregnancy and breastfeeding
PREPARATIONS	Tablets 15mg, 30mg, 60mg	Capsules 25mg, 50mg, 100mg, 300mg Tablets 50mg, 100mg
DOSAGE AND FREQUENCY	Oral – Daily in two doses, 12 hours apart, 5-8mg/kg/day	Oral – Daily in two doses, 12 hours apart, 4-8mg/kg/day (max 300mg)
STORAGE	Store in a closed container in a cool, dry place	Store in a closed container in a cool, dry place

Learning exercise – CASE STUDY

Amina is three years old. Her mother has brought her to your health centre for the third time in six months because of episodes of wheezing. Her mother says that Amina was healthy until three days ago when she started to wheeze again. She also explains that Amina's head feels hot. When asked about the family's history of asthma, Amina's mother says that her sister suffers from asthma. On examination, Amina looks in distress and has an audible wheeze. She breathes 56 times per minute and her body temperature is 36.5°C rectal. She has no lower chest wall indrawing.

Questions

- 1 What is the most likely diagnosis?
- 2 What other diagnosis would you consider?
- 3 What advice would you give to help Amina's mother prevent future attacks of her wheeze?
- 4 How would you treat Amina initially?
- 5 What follow up care would you give to Amina?

Answers on page 9.



Adapted from 'Child alive', Red Cross and Red Crescent Societies

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