

come to allopathic medicine.<sup>4</sup> Furthermore, living in the same community as their patients, traditional healers know about the disease pattern of that community. If well trained, they can identify diseases that can be prevented or modified, and they are sometimes able to cure some diseases.

Traditional healers are respected in African villages. They are community leaders and members who can encourage community participation. If consulted they can encourage their fellow community members to help prevent and cure many ailments. Health workers should therefore encourage rapport between themselves and traditional healers. Unfortunately, however, many modern health workers scorn traditional healing.

## Conclusion

In a black African setting, traditional healing is the first and nearest contact with a health care system. It is therefore by definition the African's primary health care. Further incorporating traditional healers into modern health care systems would help identify diseases before they reach an advanced stage and the patient becomes disabled or dies because valuable time has been wasted. Traditional healers should also be encouraged to refer patients they are incapable of curing or treating.

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## CLINICAL GUIDELINES

# Management of childhood and adolescent asthma

## 1994 Consensus

### South African Childhood Asthma Working Group

**Objective.** To make recommendations regarding the treatment of chronic asthma to achieve effective control; to emphasise that asthma is a clinical diagnosis; to stress the central role of inflammation in asthma; to recommend alternative agents for practice where certain drugs are not available; and to address new agents that have been introduced for the treatment of asthma.

**Options.** A new severity grading of mild, moderate and severe asthma is proposed to aid in the selection of medication. This severity assessment uses four features; attack frequency, nocturnal symptom frequency, hospital admissions and peak flow. Since asthma can vary with time, regular reassessment with a view to reassignment of individual grading is necessary.

**Outcomes.** Goals of effective control strive to ensure that the asthmatic leads a normal life free from symptoms with regular school attendance, restful sleep, normal growth and development, minimal acute attacks and avoidance of hospital admissions.

**Evidence.** Previous local and international consensus statements.

**Benefits, harms, costs.** Early diagnosis, accurate grading and effective control reduce morbidity and mortality and will be cost-saving. Pharmaco-economic evaluations of the cost of asthma show that medications *per se* represent a small percentage of the overall cost of asthma.

**Recommendations.** Inhaled therapy is preferred, even in young children, as aerosol devices for all ages are available. Mild asthma is treated with intermittent short-acting  $\beta$ -agonists, moderate asthma with regular cromoglycate and severe asthma with regular inhaled steroids. Environmental control, specialist referral and hazardous and unnecessary therapy are also addressed.

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The South African Childhood Asthma Working Group (SACAWG) convened on 5 February 1994 to review its previous guidelines for the management of chronic childhood and adolescent asthma.<sup>1</sup> The previous guidelines needed changing because:

1. The scoring system presented proved impractical.
2. The central role of inflammation in asthma needed to be stressed.
3. Limited availability of certain drugs in rural areas required alternative agents to be suggested.
4. New inhaled long-acting  $\beta_2$ -agonists and inhaled steroids have been introduced.

The consensus group found that it is extremely difficult to assign an assessment of severity or a scoring system to chronic asthma, because children with asthma present and behave in very variable ways. In order to balance the overtreatment and undertreatment of asthma we draw attention to the two broad categories of chronic asthma presentation: namely intermittent and/or mild symptoms, and continuous/recurrent and/or moderate to severe symptoms. In an attempt to achieve the goals of management this first categorisation step aims to avoid the situation of the treatment being worse than the disease. The figure (p. 864) recommends intermittent  $\beta_2$ -agonists for the former group and continuous anti-inflammatory therapy for the latter. As has been shown, there are two groups of anti-inflammatory agents, cromoglycate and inhaled steroids. In cases where didactic categorisation is difficult, individual practice habits will determine the initial anti-inflammatory of choice. However, whichever drug is chosen for maintenance therapy, the goals of therapy must be achieved (the patient must be well controlled). This applies to step-up as well as step-down therapy.

The dominant pathophysiological process underlying asthma in children is airway inflammation. Asthma is the commonest chronic disease in children and treatment may be expensive. Resources in our country are limited and alternative cheaper drugs will be recommended in this statement. However, health practitioners should strive to achieve the best possible therapy for each of their patients through motivation and education of parents, manufacturers and health administrators in order to ensure that appropriate drugs are accessible to all patients.

## Paediatric v. adult asthma

The differences between paediatric and adult asthma need to be fully appreciated. In childhood and adolescence, asthma is often triggered by environmental factors and allergens. The diagnosis, assessment of severity and monitoring of the effects of therapy are more difficult in young children because it may not be possible to obtain reliable objective measurement of airway obstruction. Acute episodes of severe asthma often develop more rapidly in young children.

## Diagnosis

Asthma is a clinical diagnosis. Asthma must be diagnosed in a child with chronic persistent or recurrent cough and/or

wheeze that responds to a bronchodilator. Features supporting the diagnosis are a family and personal history of atopy, night cough, exercise-induced cough and/or wheeze and a seasonal variation in symptoms. Furthermore, additional support for the diagnosis in older children (> 5 years) is objective evidence of reversible airways obstruction. This can be obtained by measuring the peak expiratory flow rate (PEFR) or forced expiratory volume in 1 second (FEV<sub>1</sub>) before and after  $\beta_2$ -agonist administration. An improvement of more than 10% after 10 minutes indicates reversible airways obstruction.

## Assessment of severity and control

The assessment presented has been kept as simple as possible but does not constitute a compromise, as it conforms to international assessment criteria. The following points should be noted:

1. The assessment of severity is outlined in tabular form in the figure on p. 864. A severity grading is important to place the child into a *particular treatment category*.
2. The assessment of severity refers to a child with *regular or intermittent symptoms*. The assessment and management of the *acute attack* are dealt with in a previous guideline.<sup>2</sup>
3. Asthma presents as a spectrum of severity rather than in discrete severity groups. Practitioners should attempt to grade each patient accurately but must regard this only as a *starting point*.
4. If *unsure of grading*, place the child on the most likely therapy, provide a diary card (for symptoms and/or PEFR) and *reassess after 4 weeks*.
5. One or more features may be present to assign a grade of severity; a patient must be assigned to the *most severe grade* in which any feature occurs.
6. Asthma can *vary with time*. Regular reassessment (at least every 3 months) with a view to reassignment of individual patients is necessary.
7. PEFR should not be used to classify patients during acute attacks.
8. In practice about 70% of childhood asthmatics will fall into the 'mild', 25% into the 'moderate' and 5% into the 'severe' categories.

Parents and patients should be taught that failure to respond to two doses of inhaled bronchodilator given 30 minutes apart constitutes a severe attack of asthma. This should not be managed at home without medical supervision.

## Management

### Goals

The goal is effective control of asthma, which strives to ensure that the asthmatic is able to lead a normal and physically active life. For a 'normal life' the aim is to:

1. Be completely free from any symptoms, i.e. cough, wheeze and breathlessness.

2. Attend school regularly and participate fully in all school activities, including sports.
3. Have restful sleep free from night-time cough and/or wheeze.
4. Grow and develop normally.
5. Minimise the number of attacks of acute asthma.
6. Avoid hospital admissions.

### Principles

A comprehensive therapeutic approach is required to meet the above objectives. This includes the following:

1. Early diagnosis and objective assessment of severity.
2. Control of the environment to exclude cigarette smoke and reduce exposure to triggers such as viral infection and allergens.
3. Optimal use of medications to limit side-effects and cost.
4. Ensuring that the patient receives the correct therapy by the most appropriate means (see 'Drug delivery systems').
5. Follow-up and regular re-evaluation.
6. Education of the patient and family, which must include: (i) stressing the diagnosis and explaining the nature of the condition; (ii) issuing a *written plan of management*; (iii) informing all care-givers, including teachers; and (iv) reassuring parents and patients of safety of continuous regular therapy.

### Environmental control

Certain aspects, where practical, need to be emphasised:

1. *Cigarette smoking is harmful to asthmatics.* Smoking should not be allowed in the home of any asthmatic and active steps should be taken to inform household members of the problem, encouraging any smokers to quit. The need to help their child can be a powerful incentive to parents to quit smoking.
2. In the individual patient where house-dust mites have been shown to be a problem, appropriate control measures should be considered. These include plastic mattress covers, removal of bedroom carpets, and washing blankets in hot water (> 70°C). Although acaricides such as benzyl benzoate (Acarosan) are able to reduce house-dust mite levels in carpets, they are ineffective when applied to mattresses.
3. Pets should not sleep in children's bedrooms. In addition, cats should be discouraged as pets in families with allergic children.
4. Certain preservatives can be potent triggers (e.g. benzoates and sulphites) and should be avoided.

### Drug delivery systems

The inhaled method is the route of choice, as lower doses can be used than with oral medication. Inhalation spacer devices (Aerochamber, Fisonaire, Volumatic) enable parents to administer aerosol therapy to children of all ages. If these spacer devices are not available, spacers can be made from a variety of cheap alternatives, e.g. polystyrene cups, plastic bottles. If patients are on long-term inhaled therapy they should preferably use a spacer device rather than a home-made device. The ages at which different inhalers are appropriate are: (i) spacer devices (with MDI) — birth to 5

years; (ii) powder devices — over 5 years; (iii) metered dose inhalers (MDI) — over 8 years. These recommended age ranges should serve only as a guide, as overlap often occurs. Certain devices to improve efficacy of inhaler therapy delivery outside these age ranges are now available, e.g. Autohaler, Turbuhaler.

### Lung function testing

PEFR can be measured by cheap hand-held devices (Assess, Mini-Wright, Pocket peak flow, Vitalograph). They give objective evidence of the degree of airway obstruction and improvement on therapy. All children (> 5 years) should have their peak flow measured during the initial evaluation and at follow-up. Moderate and severe asthmatics should receive peak flow meters to assess their condition at home. Forced spirometry should be done periodically at follow-up to confirm home peak flow measurements and assess small-airway disease.

### Principles of medication

When selecting medication for an asthmatic patient, the following principles apply:

1. Asthma is an inflammatory disease of the airways.
2. Regular anti-inflammatory medication is indicated for the moderate and severe categories.
3. Where  $\beta_2$ -agonists are used regularly (more than 3 times a week), daily anti-inflammatory therapy should be prescribed.
4. Inhaled therapy is preferable.
5. Syrups and tablets are not necessarily cheaper.

## Anti-asthma drugs

### Bronchodilators

#### 1. Short-acting $\beta_2$ -agonists

Short acting  $\beta_2$ -agonists (rather than theophylline) should be used as first-line bronchodilators in children because of their wide margin of safety and freedom from serious side-effects. Bronchodilators should be used intermittently for the relief of symptoms rather than as regular maintenance therapy. It is cheaper to use an inhaled  $\beta_2$ -agonist with a spacer than most theophylline preparations.

#### 2. Long-acting $\beta_2$ -agonists

Formoterol (Foradil) and salmeterol (Serevent) can be used in resistant nocturnal and exercise-induced asthma. When required, these agents should be considered as an addition to anti-inflammatory therapy in children with severe asthma.

#### 3. Theophyllines

Where  $\beta_2$ -agonists or anti-inflammatory agents (inhaled cromoglycate and steroids) are not available, theophylline tablets and aqueous solution can be used for maintenance therapy.<sup>3</sup> Differing absorption profiles complicate treatment using the long-acting preparations. Controversy as to the correct therapeutic serum levels to advise further complicates theophylline therapy. Practitioners are therefore encouraged to motivate for the availability of anti-inflammatory agents in their institution.

#### 4. Ipratropium bromide (Atrovent)

Ipratropium bromide may be a useful adjunct to regular  $\beta_2$ -agonist therapy in small children (< 1 year) in whom cough and/or wheeze are major symptoms.

### Anti-inflammatories

#### 1. Sodium cromoglycate (Lomudal)

Sodium cromoglycate (Lomudal) is indicated for the prevention of moderate asthma. It must be taken regularly to be effective to reduce bronchial hyper-reactivity. It is also useful in the prevention of exercise-induced asthma when taken 30 minutes beforehand. Sodium cromoglycate is remarkably safe in children.

#### 2. Ketotifen (Zaditen)

Ketotifen (Zaditen) may be a useful adjunct to bronchodilator therapy in young (< 3 years old) highly allergic children who have atopic eczema or hay fever in addition to their asthma.

#### 3. Inhaled steroids

Inhaled steroids should be used for prophylaxis in children with severe asthma. Steroid therapy should be tailored to the response documented by symptoms and, where possible, respiratory function testing. The lowest possible effective dose should be used. For inhaled beclomethasone (Becotide, Clenil, Ventzone, Viarox), budesonide (Inflammid, Pulmicort) and fluticasone (Flixotide), doses under 400  $\mu\text{g}/\text{day}$  are associated with minimal side-effects. Where higher doses are required, use of fluticasone (Flixotide), which to date has demonstrated reduced systemic effects, should be considered. The efficacy and safety of inhaled steroids are increased by the use of spacer devices. Where cromoglycate is not available, low-dose inhaled steroids may be considered.

#### 4. Oral steroids

Short courses ( $\leq 14$  days) of oral steroids (prednisone 1 - 2 mg/kg/d) are generally necessary in the treatment of exacerbations of asthma.<sup>3</sup> Maintenance treatment with daily or alternate-day oral steroids is indicated only in those rare patients not controlled by high-dose inhaled steroids. In children on oral steroids extra care should be taken during episodes of increased stress, e.g. surgery.

### Other drugs — antihistamines

Antihistamines may be used for the treatment of hay fever in asthmatics with hay fever.

## Tapering and terminating therapy

Children on anti-asthma therapy should be reviewed at least every 3 months, and if well controlled should be considered for reduction in treatment. Note that this should not be attempted during the patient's worst season.

## Referral to a specialist

Referral of patients to a specialist is recommended if the goals of management are not achieved, or for the following reasons:

1. Diagnosis in doubt.
2. Unstable asthma.
3. Asthma interferes with normal life despite treatment.
4. Parents or general practitioners need further support.
5. When oral steroids are required regularly.
6. After a life-threatening episode.

## Unnecessary therapy

The following are without benefit in the treatment of childhood asthma: antibiotics, cough syrups, mucolytics, ionisers and breathing exercises. Physiotherapy is indicated in children only where lobar collapse is documented. Frequent visits to the physiotherapist must indicate to the practitioner that the patient's maintenance anti-inflammatory treatment needs revision.

## Hazardous therapy

Rectal aminophylline and immunotherapy are dangerous and contraindicated in childhood asthma.

The SACAWG is an official working group of the Allergy Society of South Africa. This meeting of the SACAWG was sponsored by Roche Products.

These guidelines are endorsed by the Medical Association of South Africa.

### REFERENCES

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