NATIONAL GUIDELINE

Management of Asthma in Adults at Primary Level

DEPARTMENT OF HEALTH
DIRECTORATE:
CHRONIC DISEASES,
DISABILITIES AND
GERIATRICS

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DEPARTMENT OF HEALTH

FOREWORD

I hereby present the National Guideline on Management of Asthma in Adults at Primary Level. This is our way of saying to the South African people that we, as the Department of Health, care about your health.

I would like to express my appreciation to all the role players who have given many hours of their valuable time to the development of this Guideline.

Asthma prevalence is increasing worldwide. This guideline targets the education of the health professionals in correctly diagnosing asthma and developing a partnership with the patient on how to manage the disease. Patients are encouraged to take responsibility for their own health and to prevent asthma attacks, to the best of their ability, by controlling their environment, avoiding triggers and precipitating factors and using their inhaled anti-inflammatory medication as prescribed. Asthma cannot be cured but can be controlled with a management plan that is practical, acceptable and effective.

Let us be pro-active and provide effective asthma management that will improve the quality of life of those with asthma.

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1. INTRODUCTION

Asthma prevalence is increasing worldwide. It is under-diagnosed and under-treated. It is also over-diagnosed. According to the Demographic and Health Survey (1998), the self reported prevalence of asthma is 7% of men and 9% of women in South Africa.

- Asthma is a chronic inflammatory condition of the airways which is usually allergic in origin. Chronically inflamed airways are hyper-responsive and when exposed to various stimuli or triggers they become obstructed by increased inflammation, broncho-constriction and mucus plugs, resulting in limited airflow.
- Asthma attacks are episodic, but airway inflammation is chronically present. Asthma is a chronic condition that requires long-term management. For many patients, this means taking preventive medication on a daily basis.
- Asthma causes recurring episodes of coughing, wheezing, chest tightness and difficulty in breathing (dyspnoea). Whilst asthma attacks can be life threatening, they can be prevented.
- Asthma cannot be cured. However, it can be treated and controlled.
- Asthma must be distinguished from chronic obstructive pulmonary disease (COPD) (refer page 4 (5.1.3)) and other causes of airway narrowing.

2. MANAGEMENT OBJECTIVES

a) To relieve symptoms.
b) To reduce morbidity and mortality through the restoration of normal airway function, or achievement of the best possible, long-term airway function.
c) To promote education and self-management. A personal peak flow monitor is recommended for all persons with Category III or IV asthma. Peak expiratory flow (PEF) variability should be less than 20%.
d) To promote regular clinic attendance for follow-up and re-evaluation.
e) To improve quality of life and participation in physical and social

activities and work.

f) To reduce the risk of severe attacks and hospitalisation.
g) To reduce the economic burden to the individual, family and community.
h) To manage acute asthma as a crisis.
i) To optimise treatment and minimise side effects of medication.

3. TARGETS AT PRIMARY HEALTH CARE LEVEL

The targets at this health care level should include the following:

a) Correct recognition and diagnosis of asthma and exacerbation of asthma.
b) Education of health care professionals, their patients and families.
c) Prevention, detection and management of complications in a comprehensive way.
   - Availability and accessibility of services as close as possible to the patient's home or work place, and at the lowest level facility that can provide the services safely and effectively.
   - Availability of all essential drugs, supplies and equipment e.g. flow meters.
   - Continuity of care and follow up.
   - Staffing of service centres by technically competent health care providers who utilise approved guidelines/protocols for management.
   - Respectful and non-judgmental care that is responsive to patients' needs.
   - Continued asthma education of PHC staff on the management of acute and chronic asthma.
d) Maintenance of good patient records.
e) Self-monitoring of response to treatment.
f) Awareness of trigger factors and the control of certain trigger factors.
g) Advising a patient to identify him/herself to fellow workers and co-members of the community as an asthmatic patient.
h) Education of each patient on the use of devices, steps to be taken during an attack and when to consult a health professional.
i) Promoting the use of Medic Alert identification.

4 TARGET POPULATION

Primary target:

- Adults with asthma

- Health professionals
- Families / friends of patients

Secondary target:

- Employers of persons with asthma

5. DIAGNOSIS OF ASTHMA

Asthma needs to be considered as a diagnosis in an adult with a chronic persistent or recurrent cough and a tight chest or wheeze. The **latter two** are worse at night and usually respond rapidly (within 10 - 30 minutes) to an inhaled bronchodilator. NOTE: This would not be the case in acute severe asthma where prolonged repeated bronchodilator plus anti-inflammatory (steroid) therapy is required.
(A wheeze is the characteristic whistling, breathy sound of asthma. It is best heard during expiration (breathing out). Wheezing is not a reliable indicator of the severity of asthma.)

5.1 SUPPORTIVE FEATURES FOR DIAGNOSIS OF CHRONIC ASTHMA:

5.1.1 CLINICAL: (see Annexure A - Initial Assessment Form Example)

INITIAL VISIT		
HISTORY	**PHYSICAL EXAM**	**SPECIAL TESTS**
– Onset, duration and frequency of symptoms (e.g. cough, wheeze etc.) – Trigger factors for asthma – Relevant family history of asthma and allergy to certain antigens – Relevant medical history – Occupational history – Activities of daily living: • attend work every day • exercise/participate in sports • sleep pattern during the night – Drug history and/or previous treatment – Associated atopic features: • rhinitis • eczema • conjunctivitis – Acute exacerbations	– Weight and height – Respiratory rate – Respiratory signs: • wheezing / other audible sounds. • prolonged expiration phase. • hyperinflation and/or deformity of chest • respiratory distress – Associated allergic status: • allergic rhinitis • allergic conjunctivitis • eczema	– peak flow measurement

5.1.2 LUNG FUNCTION:

- Measure the peak expiratory flow (PEF) rate before and after the administration of the ß2-agonist. An improvement of more than 15% in the PEF after 15 - 30 minutes indicates reversible airway obstruction.
- In patients using a bronchodilator, the PEF varies more than 20% from a measurement taken on rising in the morning to a measurement taken 12 hours later.
- PEF decreases more than 15% after 6 minutes of running. The patient should do free running, as fast as possible, for 6 minutes (e.g. around the clinic). The patient must then sit quietly for 5 minutes and thereafter, peak expiratory flow should be measured again.

5.1.3 DIFFERENTIATING FEATURES BETWEEN ASTHMA AND COPD

Features suggesting asthma	Features suggesting COPD
• Onset at young age • Presence of atopy and/or allergic rhinitis • Diurnal and/or day-to-day and seasonal variation in symptoms and lung function • Often normal examination and normal/near-normal spirometry while in a stable state • Marked improvement after use of bronchodilator (*) and/or 2-week trial of systemic corticosteroids (**)	• Long history of smoking • Usually non-atopic • Insidious onset, slow progression of symptoms and persistent dyspnoea • Hyperinflation and abnormal spirometry • While in a stable state, progressive deterioration in lung function over time • Poor response to use of bronchodilator (*) and/or 2-week trial of systemic corticosteroids (**)

(*) Revised criteria for significant improvement/reversibility:
12% and 200ml improvement in forced expiratory volume in 1 second (FEV_1)
(previously 15% and 200ml improvement in FEV_1).
or
15% improvement in PEF
(**) Prednisone 30 - 40mg/day for 14 days

Asthmatics who smoke may have co-existing COPD in varying degrees. In such cases, the emphasis should be on treating the asthmatic component.

6. ASSESSMENT OF SEVERITY AT PRESENTATION

SEVERITY	Clinical features before treatment		
	Daytime symptoms: cough and/or tight chest and/or wheeze	**Night time symptoms: cough and/or tight chest and/or wheeze**	**PEF**
Category I Intermittent	≤ twice a week Asymptomatic and normal PEF between attacks.	≤ once a month	≥ 80% predicted
Category II Mild Persistent	2 - 4 times a week	2 - 4 times a month	≥ 80% predicted
Category III Moderate Persistent	> 4 times a week Use $ß_2$ - agonist daily. Attacks affect activity.	> 4 times a month	> 60% - < 80% predicted
Category IV Severe Persistent	Continuous. Limited physical activity.	Frequent	≤ 60% predicted

- The presence of **one** of the features of severity is sufficient to place a patient in that category.
- Patients at any level of severity, even intermittent asthma, can have severe attacks.
- If occupational asthma is suspected, immediately refer the patient for specialist diagnosis.

7. MANAGEMENT

Self-management and self-monitoring are essential.
Patients who are assessed as "moderate persistent" or "severe persistent" should have their own peak flow monitoring devices.

7.1 TRIGGERS AND PRECIPITATING FACTORS

1. **Allergens:**
   House dust, house dust mites, cockroaches, grass and pollen, and household pets.
2. **Irritants:**
   Cigarette smoke, exercise, environmental temperature changes, viruses, insecticide, deodorant sprays and fire smoke.

3. **Industrial:**
   Disocyanates (spray paint), platinum salts, detergent enzymes, formaldehyde, penicillins and dyes.
4. **Drugs:**
   Aspirin.
   Non-steroidal anti-inflammatory drugs.(NSAIDs)
   Beta-blockers (including ß-blocker eye drops)
5. **Infection:**
   Viruses (predominantly), bacteria.
6. **Environment:**
   Temperature, humidity and pollution.

7.2 PREVENTION OF ASTHMA ATTACKS AND ENVIRONMENTAL CONTROL

1. Education of the patient and family must include:
   (i) stressing the diagnosis and explaining the nature of the condition; patient should be empowered to manage the disease
   (ii) supplying a written plan of management, after discussion with the patient and agreement thereto by the patient, which should include prevention;
   (iii) reassuring patients of the safety of continuous and regular therapy;
   (iv) providing advise on the optimal use of medication;
   (v) identifying the early warning signs of an acute attack and the appropriate action that should be taken;
   (vi) avoidance of unnecessary therapy (e.g. cough syrups, mucolytics and breathing exercises. **These should play no role whatsoever in asthma therapy.)**
   (vii) lifestyle modification (e.g. cease/avoid smoking and promote exercise);
   (viii) avoidance of known modifiable trigger factors (refer to 7.1).

2. Tobacco smoke and indoor pollution (open fires) are harmful to asthmatic patients. Household members should be informed accordingly. Smoking should not be allowed in a room or vehicle in the presence of an asthmatic patient. Active steps should be taken to avoid open fires in homes. Encourage and support smokers to quit.

3. In individual cases where house dust mites have been identified as a problem, appropriate control measures should be considered. (These include the use of plastic mattress covers, and pillows and duvets filled with synthetic materials, the removal of bedroom carpets and avoidance of fabric-covered furniture. Bedding should be washed in hot water (temperature above 70°C) on a regular basis. Regularly air all bedding in sunshine, damp dust and if possible, vacuum.)

4. Keep pets outside the house. Cats should be discouraged as pets in families with asthmatic members.

5. Certain preservatives (e.g. benzoates and sulphites), allergens and other factors are potentially potent triggers and should be avoided.

6. Exercise-induced asthma should be controlled by the prophylactic use of two (2) puffs of an inhaled ß2-agonist five (5) minutes before the exercise.

7. Effectively treat sinusitis and allergic rhinitis as these conditions may aggravate asthma.

7.3 TREATMENT

7.3.1 INITIATION OF TREATMENT AT PRIMARY LEVEL

SEVERITY	TREATMENT: ADULTS Patient education is essential at every step	
	LONG-TERM PREVENTIVE INHALED STEROID - 1ST LINE TREATMENT	**QUICK RELIEF**
Category I Intermittent	• None needed	• Short-acting inhaled $ß_2$ - agonist e.g. salbutamol 200mcg, as needed for symptoms, but less than once a week.
Category II Mild Persistent	Daily medication: • Inhaled corticosteroid e.g. beclomethasone 200 - 400mcg	• Short-acting inhaled $ß_2$ - agonist e.g. salbutamol 200mcg, as needed for symptoms. Not to exceed 4 times in one day.

7.3.2 INITIATION OF TREATMENT AT SPECIALIST / HOSPITAL LEVEL, FOR CONTINUATION AT PRIMARY LEVEL

SEVERITY	TREATMENT: ADULTS Patient education is essential at every step LONG-TERM PREVENTIVE INHALED STEROID - 1ST LINE TREATMENT	QUICK RELIEF
Category III Moderate Persistent	Daily medication: • Inhaled corticosteroids e.g. beclomethasone 500 - 1 000mcg **and** • Long-acting inhaled $ß_2$ - agonist **and/or** • Sustained-release theophylline	• Short-acting inhaled $ß_2$ - agonist e.g. salbutamol 200mcg, as needed for symptoms. Not to exceed 4 times in one day.
Category IV Severe Persistent	Daily medication: • Inhaled corticosteroid e.g. beclomethasone > 1 000mcg **add (or reduce)** • Oral corticosteroids **and** • Long-acting inhaled $ß_2$-agonist **and/or** • Sustained-release theophylline	• Short-acting inhaled $ß_2$ - agonist e.g. salbutamol 200mcg as needed for symptoms, 4 - 6 times a day.

If a specialist/medical doctor is not available or a patient cannot be referred, then the above steps should be initiated at primary level under indirect supervision of specialist/medical doctor.

IDEALLY, PATIENTS IN CATEGORIES III OR IV SHOULD BE REFERRED TO SPECIALIST LEVEL

Step down
Review treatment every three (3) months.
If control is sustained for at least three (3) months, a gradual step-wise reduction in treatment may be possible

Step up
If control is not achieved, consider step up. **But first:** review patient medication technique, compliance and environmental control (avoidance of allergens or other trigger factors) and diagnosis.
To gain rapid control at any time:
Prednisone 30 - 40mg/day for 7 - 14 days)

WARNING:
DO NOT STOP REGULAR INHALED ANTI-INFLAMMATORY THERAPY.
ADULTS VERY RARELY GO INTO REMISSION.

7.3.3 INHALER TECHNIQUE

Inhaled corticosteroids (ICSs) are the preferred route of administration because direct delivery to the lungs permits the use of lower doses.

ICSs reduce airway inflammation and improve asthma control.

Inhaler technique without a spacer should be strictly in accordance with manufacturer's instructions.

Correct inhaler technique is absolutely vital to successful inhaler therapy. The education of the patient on the correct inhaler technique requires time, patience and commitment from the health professional and should be monitored regularly.

The use of a spacer is recommended for those patients who experience difficulty with coordination. Polystyrene cups should not be used as spacers. Polystyrene absorbs the medication and therefore the correct dosage is not inhaled. The actual inhaled dosage cannot be determined. A plastic cooldrink bottle can be converted to a spacer and used.

The spacer should be at least 500ml volume for adults. The spacer should be washed weekly in ordinary household detergent, rinsed in water and left to drip-dry.

Ensure that the delivery device fits the spacer.

Steps.

1 Remove the caps from both the inhaler and the spacer.
2 Shake the inhaler well.
3 Insert the mouthpiece of the metered dose inhaler into the back of the spacer.
4 Insert the mouthpiece of the spacer into the mouth and close the lips around the mouthpiece. Avoid covering any small exhalation holes.
5 Press down on the vial of the metered dose inhaler to spray the drug into the spacer.
6 Immediately take a slow deep breath for 5-10 seconds. Do not breathe in too hard.
7 Repeat steps 4 to 6 for each puff prescribed, waiting at least 30 seconds between puffs.

Note:

Patients regularly using inhaled steroids should be informed about the risk of developing oro-pharyngeal candidiasis.

Methods of prevention are:

- rinsing the mouth after inhalation of the aerosol
- brushing teeth after inhalation
- using a spacer.

7.3.4 FOLLOW-UP VISITS

All follow-up visits should:

- Evaluate coping with asthma, adherence and self-care
- Review management plan
- Deal with pertinent problems, e.g. signs, symptoms, complications and non-adherence
- Include a physical examination as for initial visit and peak flow measurement
- **ENSURE CORRECT INHALER TECHNIQUE.** (This is vital to successful inhaler therapy.)

Once the patient's condition is under control, schedule clinic visits **every three months.**

8. DIRECT REFERRALS TO A HIGHER LEVEL FOR TREATMENT

- Acutely distressed patients, initiate emergency treatment and make provision for immediate transfer.
- Patients not responding to treatment.
- Recurrent or persistent acute asthma.
- Persistent interference in activities of daily living.
- When oral steroids are required more than 3-4 times per year.
- Any history of a life-threatening episode or hospitalisation in previous 12 months.
- Uncertainty of the diagnosis.
- People with suspected occupational asthma.
- Other co-morbidity (e.g. hypertension, diabetes), pregnant women and older persons (especially women over 60 years of age).

9. ACUTE SEVERE ASTHMA

9.1 CRITERIA FOR DIAGNOSIS

- Peak expiratory flow (PEF) rate less than 60% of predicted normal or best value
- Cannot complete a sentence in one breath, talks in words
- Pulse rate more than 120 beats/minute
- Respiratory rate more than 30/minute.

9.2 MANAGEMENT:

9.2.1 AT HOME OR ANY PLACE OTHER THAN A HEALTH CARE FACILITY:

- ß2 agonist, 5 puffs immediately using spacer. Repeat every 20 minutes if needed (maximum 50 puffs).
- Take patient to nearest health care facility.

9.2.2 AT HEALTH CARE FACILITY

- Administer nasal O_2 at high flow rate of 6 - 8 L/min.
- Nebulise with ß2 agonist and O_2 over 3 minutes. 1 - 2ml of a 0.5% salbutamol solution in 3ml of 0.9% sodium chloride. Repeat every 20 minutes in first hour if there is no relief.
- 2ml of a 0.025% ipratropium bromide solution can be mixed with salbutamol solution. May be repeated 4 hourly.
- If a nebuliser is not available, use a metered dose inhaler with spacer – 5 puffs every 20 minutes.
- Oral prednisone 30 - 60mg stat (once only).
- Hydrocortisone sodium succinate IV, 100 - 200mg given as an immediate dose via IV line if oral prednisone cannot be taken.
- Avoid sedation of any kind.

Patients **must** be re-assessed **after 20-30 minutes initially**, and thereafter every 1-4 hours depending on response.

If there is a **good response** from the patient, continue with ß2-agonist 4 hourly as above, until referred.

If there is a **poor response** from the patient and a **doctor is available** to initiate treatment, use:

- aminophylline 250mg IV infusion in 200ml saline over 6 hours.
  - no loading dose to be given as patients are often unaware of therapy/names of medication
  - avoid in patients already on long-term theophylline therapy

Inhaled mucolytics, sedation, antihistamines and chest physiotherapy are not indicated.

Antibiotics are **only** indicated for patients with fever and purulent sputum.

If there is a **poor response** from the patient, and a **doctor is not available**, transfer the patient to a District Hospital or higher.

9.3 URGENT TRANSFER TO NEAREST HOSPITAL

- PEF rate of less than 33% of the predicted normal or best value 15 - 30 minutes after nebulisation.
- any life-threatening features, e.g. inability to talk, extreme tachycardia, drowsiness, confusion, absent wheeze, cyanosis, collapse.

Date: **Initial asthma assessment form** – EXAMPLE **ANNEXURE A**

Patient's name: _____ Age: _____

Health Facility: _____ File nr: _____

SOCIAL HISTORY: Patients' occupation: _____

Occupation of partner/spouse: _____

Housing: _____ Domestic/work stress: _____

Smoking: _____

POSSIBLE TRIGGERS AND PRECIPITATING FACTORS

Do any of the following cause wheezing, cough or tight chest? _____

Allergens: House dust, house dust mites, cockroaches, grass and pollen, and household pets

Irritants: Cigarette smoke, exercise, environmental temperature changes, viruses, insecticide, deodorant sprays and fire smoke

Infection:

Environment: Temperature changes, humidity and pollution

Preservatives: Benzoates and sulphites as used in specific drinks

Are you exposed to any industrial agents? _____

Disocyanates (spray paint), platinum salts, detergent enzymes, formaldehyde, penicillins and dyes.

Are you using any medication? _____

Aspirin
Non-steroidal anti-inflam matory drugs (NSAIDs)
Beta-blockers, including Beta-blocker eye drops
Herbal remedies

Other _____

Are you receiving treatment for any allergies? _____

Rhinitis
Conjunctivitis
Hayfever/Sinusitis
Eczema

Other _____

FAMILY HISTORY: Asthma: _____

Other allergies: _____

EXAMINATION: Height: _____ Weight: _____

Colour (skin, lips, nails): _____

Chest • Prolonged expiration rate _____ • Deformity: _____

• Expansion/hyperinflation _____ • Auscultation: _____

• Chest X-Ray: Date _____ Changes observed: _____

• Respiratory rate _____ • Pulmonary function _____

Current episode onset Duration or N/A

ASTHMA RELATED SYMPTOMS	WHEEZING		COUGH		TIGHT CHEST	
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
Frequency:						

ACTIVITIES OF DAILY LIVING:

Have you attended work everyday during the last 30 days? _____

Did the symptoms worsen during exercise or participation in sport? _____

Has your sleep pattern during the night changed? _____

ANNEXURE B EXAMPLE

ASTHMA MANAGEMENT FOR EVERY VISIT AT HEALTH FACILITY

Patient's name: Age:

Health Facility: File nr:

Date of first visit: Classification of severity:

Age of onset of asthma:

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Date:												
ASTHMA RELATED SYMPTOMS DURING THE LAST 30 DAYS												
WHEEZING – day												
– night												
COUGH – day												
– night												
TIGHT CHEST – day												
– night												
ASTHMA ATTACKS DURING THE LAST 30 DAYS												
Duration:												
Severity of attack:												
Date of last attack:												
Controlled between attacks:												
Number of asthma-related hospital admissions												
ANY ALLERGIES AT PRESENT:												
Rhinitis												
Conjunctivitis												
Hayfever/Sinusitis												
Eczema												
Drugs												
Preservatives												
Other:												
Drug Therapy												
Inhaled β^2 agonist:												
Dosage:												
Inhaled corticosteroid:												
Dosage:												
Other:												
Compliance factors:												
Do you know why you have to take your medication?												
Do you know what will happen if you do not take your medication?												

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Date:												
Is it difficult for you to get/take your medicines?												
Why?												
Do you have any side effects from the medication?												
Any other factors?												
Is inhaler technique with/ without spacer correct?												
Examination:												
Colour (skin, lips, nails):												
Weight:												
Height:												
Chest												
• Deformity:												
• Expansion:												
• Auscultation:												
• Chest X-Ray: Date Changes Observed												
• Respiratory rate												
• Pulmonary function												
Activities of daily living												
Have you attended work every day in the last 30 days?												
Do you exercise/participate in sports?												
Has your sleep pattern during the night been disturbed in the last 30 days?												
Possible/known triggers and precipitating factors												
Have you been exposed to any of the following:												
Allergens: House dust, house dust mites, cockroaches, grass and pollen, and household pets												
Irritants: Cigarette smoke, exercise, environmental temperature changes, viruses, insecticide, deodorant sprays and fire smoke												

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Date:												
Industrial: Disocyanates (spray paint), platinum salts, detergent enzymes, formaldehyde, penicillins and dyes.												
Infection:												
Environment: Temperature changes/Humidity/Pollution												
Have you used/are you using any of the following medication?												
Aspirin												
Non-steroidal anti-inflammatory drugs (NSAIDs)												
Beta-blocker, including Beta-blocker eye drops												
Herbal remedies												
Other												
Patient education given:												
Is Asthma controlled (Y/N):												

DO ANY OF THE FOLLOWING FACTORS INFLUENCE YOUR NON-ATTENDANCE AT HEALTH FACILITY:

Money ☐ Working hours ☐ Clinic/out-patient hours ☐ Transport ☐
Strikes ☐ Public Holidays ☐ Other _____

Return Date: | | | | | | | | | | | | |