Primary care management of adults and adolescents with chronic asthma and chronic obstructive pulmonary disease for doctors and pharmacists
### DIAGNOSIS

#### ASTHMA
Consider if:
- Symptoms started during childhood or early adulthood (usually before the age of 20yrs)
- History of hayfever, eczema and/or allergies
- Family history of asthma or other allergic conditions
- Symptoms are intermittent with periods of normal breathing in between
- Symptoms are usually worse at night or in the early hours of the morning or during an upper respiratory tract infection
- It may be precipitated by seasonal changes, airborne allergens, or pollutants, emotional factors or occupational hazards (consider occupational asthma)
- Symptoms improve or disappear after using inhaler or oral steroids

#### COPD*
Consider if:
- Symptoms start later in life (usually after the age of 40yrs)
- Symptoms slowly worsen over a long period of time
- Long history of daily or frequent cough and sputum production (usually starts long before the onset of shortness of breath)
- Symptoms are persistent rather than only at night or during the early hours of the morning
- History of heavy smoking (more than 20 cigarettes/day for 15yrs or more), previous tuberculosis, heavy cannabis use or prolonged exposure to the burning of biofuels

#### OTHER/DIFFERENTIAL DIAGNOSIS
- **Cardiac Disease**
  - Presents with shortness of breath and/or wheeze due to pulmonary congestion/oedema
  - Usually associated with leg swelling and/or orthopnoea
  - Can be associated with valvular heart disease, hypertension, ischaemic heart disease and/or diabetes mellitus

- **Other Respiratory Diseases**
  - A variety of less common diseases, such as tumours, may compress the trachea, larynx or bronchi and cause obstruction with localized wheezing or stridor.

### CONFIRM THE DIAGNOSIS
- The medical history (see features above) makes the most important contribution
- A previous diagnosis of asthma or COPD may help, but is not always reliable
- A chest radiograph is usually normal in asthma and COPD, but may be useful to exclude other pathology e.g. TB, carcinoma
- Reversibility of the airway obstruction (see tests below) is helpful when demonstrated and supports the diagnosis of asthma. A lack of reversibility does not exclude asthma.

The following tests can be used:
- Increase in PEF (> 20%) 15-30 minutes following inhalation of 200-400 µg beta agonist (salbutamol) via a spacer
- Increase in PEF (> 20%) after a 2-week trial of prednisone 40mg daily
- Decrease in PEF (> 20%) immediately after running for 5 minutes
- Variability of PEF (> 20%) over a 1-2 week period. A PEF meter is taken home and the PEF recorded morning and night. The daily variation (%) is calculated as (Maximum PEF-Minimum PEF) ÷ (Maximum PEF + Minimum PEF)/2 x 100
- In COPD there is little or no reversibility (no symptomatic improvement or <20% increase in PEF) to inhaled beta agonists and/or a 2-week trial of oral corticosteroids

### CLASSIFICATION OF SEVERITY IN COPD

<table>
<thead>
<tr>
<th>Dyspnoea / additional features</th>
<th>FEV₁ (% predicted)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mild</strong></td>
<td></td>
</tr>
<tr>
<td>Limits strenuous activity e.g. running, climbing stairs</td>
<td>60-79%</td>
</tr>
<tr>
<td><strong>Moderate</strong></td>
<td></td>
</tr>
<tr>
<td>Limits activities performed at normal pace e.g. walking</td>
<td>40-59%</td>
</tr>
<tr>
<td><strong>Severe</strong></td>
<td></td>
</tr>
<tr>
<td>Impairs activities of daily living e.g. washing, dressing Cannot walk more than 200m Repeated hospitalization for exacerbations, right heart failure</td>
<td>&lt;40%</td>
</tr>
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</table>

*COPD: Chronic obstructive pulmonary disease.*
EXPLANATION AND PLANNING FOR ASTHMA

GOALS OF ASTHMA EDUCATION

It is the responsibility of the facility as a whole to organise comprehensive asthma education on:

• The nature of asthma and its inflammatory/allergic basis
• The different classes of drugs and their purpose in treatment (i.e. as-needed “relievers” and regular “controllers”)
• Advice on preventive measures
• The correct choice and use of inhalers and the opportunity to practice under supervision
• The importance of regular follow-up and when to request earlier review
• How to recognize worsening asthma
• Potential side-effects of drugs

PREVENTATIVE MEASURES

Avoidance of triggers wherever possible helps to minimize asthma severity and reduce exacerbations. Practical measures include:

1. Avoid exposure to personal and second hand tobacco smoke
2. Avoid contact with furry animals
3. Reduce pollen exposure
4. Reduce exposure to burning of biofuels
5. Use appropriate mattress and pillow covers
6. Avoid dust and fume exposure which aggravate or cause asthma, especially in the workplace
7. Avoid food and beverages containing preservative
8. Avoid drugs that aggravate asthma (Beta blockers (including eye drops), Aspirin and NSAIDs)
9. Explore psychosocial and emotional factors

Key messages:

Reliever —
Use only when needed to relieve acute attacks.

Controller —
Use regularly, every day, even if you feel well. They work slowly to control the underlying disease. Do not use to relieve acute attacks!

KEY COMPONENTS OF A SELF-MANAGEMENT PLAN

A written self-management plan is useful, particularly in those requiring stabilization or who have had a recent exacerbation. The plan should include:

• Realistic goals of treatment in terms of symptoms relief and/or PEF
• Advice on how to recognize changes in the asthma (via symptoms and/or peak flow rates) and when to make adjustment to treatment according to a predetermined schedule
• Instructions on the class, name, strength, dose and frequency of each of the asthma medications prescribed
• Instruction on when and how to initiate short courses of oral prednisone
• Details on when and how to obtain access to medical care in emergencies
• Arrangements for a Medic-Alert badge for patients with severe asthma, known drug hypersensitivities (like aspirin and penicillin) and brittle asthma
MANAGEMENT OF ASTHMA

The aim of asthma management is to obtain complete control of all features of asthma:

- No daytime or night time asthma symptoms (cough, short of breath, tight chest or wheezing)
- No need for reliever medication
- No limitation of daily activities
- No exacerbations
- Normal PEF

TREATMENT OF NEWLY DIAGNOSED PATIENTS

Start most patients at treatment Step 2 when daytime symptoms > 2/week or night-time symptoms > 1/month
In the few patients with symptoms less frequent than this, start at treatment Step 1.

ASSESSMENT OF CONTROL

Determine level of control at each visit according to asthma symptoms during the last 4 weeks

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Well-controlled</th>
<th>Partly controlled</th>
<th>Uncontrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime symptoms</td>
<td>≤ twice per week</td>
<td>&gt; twice per week</td>
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<tr>
<td>Night time symptoms/early morning</td>
<td>none</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Limitation of daily activities</td>
<td>none</td>
<td>any</td>
<td></td>
</tr>
<tr>
<td>Need for reliever treatment</td>
<td>≤ twice per week</td>
<td>&gt; twice per week</td>
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<tr>
<td>Exacerbations that required attention</td>
<td>none</td>
<td>&gt; one in the last year</td>
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<tr>
<td>PEF (% of predicted or personal best)</td>
<td>≥ 80%</td>
<td>&lt; 80%</td>
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MANAGEMENT PLAN

<table>
<thead>
<tr>
<th>Well-controlled</th>
<th>Partly controlled/Uncontrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Continue current medication</td>
<td>• Check inhaler technique (see page 7)</td>
</tr>
<tr>
<td>• Reassess in 3 months</td>
<td>• Check adherence and understanding of medication</td>
</tr>
<tr>
<td>• If complete control at next visit, consider stepping down treatment: reduce oral steroids first and inhaled corticosteroids last</td>
<td>• Consider aggravation by:</td>
</tr>
<tr>
<td></td>
<td>• Exposure to triggers or allergens at home or work (see page 2)</td>
</tr>
<tr>
<td></td>
<td>• Co-morbid conditions: Gastro-oesophageal reflux disease, rhinitis, sinusitis or cardiac disease</td>
</tr>
<tr>
<td></td>
<td>• Other medication: Beta blockers, NSAID’s, Aspirin</td>
</tr>
<tr>
<td></td>
<td>• Consider stepping up treatment</td>
</tr>
<tr>
<td></td>
<td>• Consider need for a short course of oral prednisolone</td>
</tr>
<tr>
<td></td>
<td>• Review self-management plan (see page 2)</td>
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</table>
### TREATMENT STEPS FOR ASTHMA IN THE PUBLIC SECTOR

<table>
<thead>
<tr>
<th>Reliever Medication</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Refer to specialist as no further treatment options available in primary care</td>
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<tr>
<td>Controller Medication in Primary Care</td>
<td>ICS* 200µg-400µg/day</td>
<td>ICS 800µg/day</td>
<td>ICS 800µg/day plus SR theophylline</td>
<td>ICS 800µg/day plus SR theophylline plus Long-term oral corticosteroids AND Refer to specialist</td>
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<tr>
<td>Controller Medication in Specialist Care</td>
<td>ICS 200µg-400µg/day</td>
<td>ICS 800µg/day</td>
<td>ICS 800µg/day plus SR theophylline</td>
<td>ICS &gt;800µg-1200µg/day plus Salmeterol +/- SR theophylline</td>
<td>ICS &gt;800µg-1200µg/day plus Salmeterol +/- SR theophylline +/- Long-term oral corticosteroids</td>
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</table>

### TREATMENT STEPS FOR ASTHMA IN THE PRIVATE SECTOR

<table>
<thead>
<tr>
<th>Reliever Medication</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Inhaled beta-agonist (salbutamol) 2 puffs when needed</td>
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<tr>
<td>Option 1</td>
<td>ICS 200µg-400µg/day (BDP equivalent)</td>
<td>ICS 200µg-400µg/day plus Long-acting beta-2-agonist</td>
<td>ICS &gt;400µg-800µg/day plus Long-acting beta-2-agonist</td>
<td>ICS &gt;800µg-1200µg/day plus Long-acting beta-2-agonist +/- Leukotriene modifiers</td>
<td>ICS &gt;800µg-1200µg/day plus Long-acting beta-2-agonist plus Leukotriene modifiers +/- SR theophylline +/- Long-term oral corticosteroids</td>
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<tr>
<td>Option 2</td>
<td>ICS &gt;400µg-800µg/day</td>
<td>ICS &gt;400µg-800µg/day plus SR theophylline</td>
<td>ICS &gt;800µg-1200µg/day plus Long-acting beta-2-agonist +/- SR theophylline</td>
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<tr>
<td>Option 3</td>
<td>ICS 200µg-400µg/day plus Leukotriene modifiers</td>
<td>ICS &gt;400µg-800µg/day plus Leukotriene modifiers</td>
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</table>

*ICS: Inhaled cortico-steroids.
1. Smoking cessation

- Ask each patient about their smoking status and advise each smoker to quit
- Provide behaviour change counselling as described on page 8
- Consider use of nicotine replacement or bupropion (not available in public sector)
- Refer to cessation support group if available and acceptable

2. Improvement of breathlessness

- See the recommended treatment steps for different severity of disease on page 6

3. Improvement of quality of life

- Provide verbal and written information on COPD, smoking cessation and management options
- Offer referral to an exercise programme e.g. physiotherapy (if available)
- Advise regarding optimal nutrition and weight
- Consider long term domiciliary oxygen in patients with severe disease, persistent hypoxaemia (saturation <90% at rest) when stable and who are non-smokers. Refer for specialist assessment only if all 3 criteria are met.

4. Prevention and treatment of exacerbations

- An exacerbation presents as increased breathlessness, often accompanied by wheezing, chest tightness and increased cough and sputum (sputum often changes in volume and colour). Exacerbations are usually precipitated by an infection.
- Exacerbations should be distinguished from other causes such as pneumonia, pneumothorax, congestive cardiac failure, arrhythmia and pulmonary embolism.
- Prevention involves annual vaccination for influenza and 5-yearly pneumococcal vaccination
- Outpatient treatment involves 4-6 hourly use of inhaled beta-agonists and/or anticholinergics via nebuliser or MDI/spacer, a 7-day course of 40mg of oral prednisone and antibiotic therapy such as Amoxycillin 500mg tds or Doxycycline 100mg BD for 10-days. Hospitalisation may be required if there is no improvement on treatment.

5. Treatment of complications

- Right heart failure (oedema, raised JVP, ascites, hepatomegaly). Treat any precipitating causes (acute respiratory infection, worsening airflow obstruction) and reduce oedema with a diuretic such as furosemide 40mg. Avoid over-diuresis, which may cause hypotension. Advise salt and water restriction
### TREATMENT STEPS FOR COPD IN THE PUBLIC SECTOR

<table>
<thead>
<tr>
<th>Initiation of treatment according to severity</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication in primary care</td>
<td>Mild</td>
<td>Moderate</td>
<td>Severe</td>
<td>Refer to specialist if frequent exacerbations, rapid deterioration or for a trial of steroids</td>
</tr>
<tr>
<td>Inhaled Salbutamol 2 puffs 6-hrly</td>
<td>Inhaled Salbutamol 2 puffs 6-hrly plus Inhaled Ipratropium bromide 40-80 µg 6-hrly</td>
<td>Inhaled Salbutamol 2 puffs 6-hrly plus Inhaled Ipratropium bromide 40-80 µg 6-hrly plus SR theophylline</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* frequent exacerbations (>2/year) or rapid deterioration or where a 2-week trial of responsiveness to oral corticosteroids and/or bronchodilator shows >15% or 200ml improvement in FEV₁.
**INHALER/SPACER TECHNIQUE**

**ASSESSMENT OF GOOD INHALER TECHNIQUE**

1. Remove mouthpiece cap
2. Shake
3. Hold pump upright
4. Form a seal with your lips around the mouthpiece
5. Press the inhaler once at the beginning of the breath.*
   Breathe in deeply and slowly.
6. Hold breath for 10 seconds or as long as possible
7. Remove inhaler from mouth and breathe out slowly
8. Wait for 1 minute and then repeat steps 2–7 for second puff

**ASSESSMENT OF GOOD SPACER TECHNIQUE**

1. Assemble the spacer
2. Remove inhaler mouthpiece cap
3. Shake the inhaler
4. Place inhaler firmly into the spacer
5. Remove the spacer’s dust cap and form a seal with your lip around the mouthpiece.
   Press the inhaler with 1 puff into the spacer.
6. Breathe in deeply through the mouth
7. Remove the spacer and hold breath for 10 seconds or as long as possible
8. Breathe out slowly
9. Wait for 1 minute and then repeat steps 3–8 for second puff

**RINSE MOUTH AFTER INHALATION OF CORTICOSTEROIDS**

* Step 5 is the most important and the use of a spacer should always be considered if the patient cannot do this.
COUNSELLING TO SUPPORT ADHERENCE 
AND/OR A CHANGE IN LIFESTYLE

• These tips are designed for a patient who needs help to make a change in lifestyle or to adhere to a treatment plan
• The term ‘adherence’ implies that the patient and health worker negotiate a plan for the patient’s health care. This is preferred to ‘compliance’, which suggests the patient obeying the instructions of the health worker.
• On average worldwide only 50% of people adhere to their prescribed chronic medication
• Reasons for non-adherence include side-effects, inconvenient frequency of dosage, poor health worker-patient relationship, alcohol or drug misuse, mental problems, or that the client has been inadequately informed about their illness, the need for treatment, or on how to take medication.

Establish Rapport
• Be honest, open and warm as this establishes trust
• Be affirming and supportive—acknowledge any achievements or abilities—as this builds confidence and self-esteem
• Be collaborative and work with the patient as someone who is an expert in their own life
• Attempt to listen to and understand the patient’s perspective
• Avoid giving orders to, arguing with, judging, criticizing or blaming the patient
• Try to draw out the reasons for change from the patient rather than trying to convince them of why they must change
• Be respectful and remember that it is the patient’s right to make decisions about their own health

Set the agenda
• Check the patient’s willingness to discuss the topic
• If there are multiple topics discuss which one the patient is most interested in or ready to discuss
• Ask for other issues that the patient would like to discuss

Understand the patient’s perspective
• Explore the patient’s reasons for non-adherence or a particular behaviour—listen to the pros and cons from their viewpoint
• Listen, understand, reflect and summarise how they see things
• Ask for additional reasons

Exchange information
• Ask if the patient is interested in information—offer information that seems relevant to the individual patient
• If yes, provide the desired information neutrally, without interpretations or telling them what to do
• Invite the patient to interpret the information or make sense of it for themselves
• If necessary, exchange further information

Explore and build motivation
• How ready are you to change?—e.g. use the medications in line with the prescriptions, change your smoking—motivation includes importance (is the change necessary) and confidence (how to change or concerns about the medication)
• The patient can rate their readiness on a scale from 0 (not at all ready) to 10 (ready) or place a mark on a line with “not ready” and “ready” at each end or just explain in their own words how ready they are to change.
  • Why did you rate yourself an (x) and not (lower)?
  • What would help your (x) to become a (higher)?

Brainstorm and contract
• If the patient is not ready or willing to change do not try and force them
• One improvement in adherence or change in behaviour that is chosen by the patient is better than multiple changes suggested by the health worker.
• Brainstorm about potential solutions / specific changes—both patient and health worker participate
• Help the patient to select the solutions / changes that seem most useful and achievable
• Together set a reasonable target for the next visit (e.g. 90% of pills taken, half the number of cigarettes)
• Organise a follow-up visit
# Peak Expiratory Flow in Adolescents and Adults

## Child and Adolescent Female

<table>
<thead>
<tr>
<th>Height (cm)</th>
<th>107</th>
<th>117</th>
<th>123</th>
<th>137</th>
<th>145</th>
<th>152</th>
<th>162</th>
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<tbody>
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## Adult Female

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## Child and Adolescent Male

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## Adult Male

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SA Fam Pract 2007; 49(5): 19-31
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Websites:
Further resource materials can be downloaded from the Asthma Guidelines Implementation Project at www.pulmonology.co.za
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