



The management of Chronic Asthma

Dr Do-a-lot noticed that one of her students appeared weary. She asked her about her night on call in the hospital. The student looked upset and said that she would rather not discuss it.

On further probing, it was discovered that a family had brought their five year old asthmatic daughter to the emergency unit at 5 am. The child was lying limply in her father's arms in the resuscitation room, her damp, curly hair falling about her pale face. There were tears at the corners of her closed eyes, but she was not crying. Her lips were dry and faintly blue. Her respiration was irregular, slow and laboured, and she sometimes coughed listlessly. There was very little chest movement.

Her father held her anxiously whilst her mother, proffering a blue asthma pump, explained to the sister in charge that Leila had asthma and that she had developed a cold during the past few days. Her chest had become tight and she had been coughing a lot. Her mother had given her the asthma pump but it did not seem to help much. The previous night the child kept waking and coughing and even though she had used the pump 6 times, there had been no improvement. When she started wheezing, crying, sitting up and looking fearful, her mother had woken the neighbours to borrow their nebuliser. They had administered the nebuliser twice over an hour but Leila had not improved.

They decided to call the ambulance. It took over an hour before help arrived. During this time, they could see that she was getting tired but they didn't know what to do.

The mother looked distraught as she gave the history whilst the night staff got to work. Experienced and efficient, they gave oxygen, adrenaline, bronchodilators and steroids.

Leila however, was in a critical condition and despite intubation and a full and protracted resuscitation attempt, Leila's condition deteriorated.

She died at dawn.

The student left the emergency room knowing that it would be she who would have to break the news to Leila's parents, who were anxiously waiting in the corridor.



References:

1. Guidelines for the management of chronic asthma in adolescents and adults. Laloo, Ainslie, Wong, Abdool-Gaffar, Irusen, Mash, Feldman, O'Brien and Jack. Working group of the South African Thoracic Society. SA Fam Prac 2007;49(5):19-31
2. ALLSA Handbook of Practical Allergy, Third Edition.
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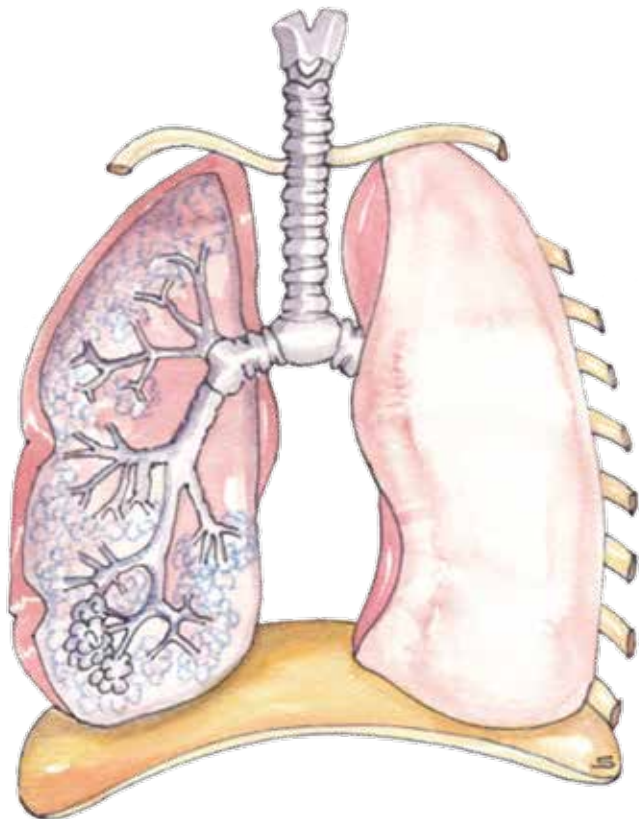
Dr Do-a-lot commented that South Africa has one of the highest asthma-related mortality rates in the world, and that one of the reasons that so many patients with asthma die of their condition, is that they seek help too late in an acute exacerbation.

She thanked her student for discussing the tragic case and emphasised the importance of educating patients so that they are better able to manage their asthma and recognise the signs of a severe exacerbation.

She asked the students to study the national guidelines for the treatment of asthma in adults and adolescents and to give a presentation to the class under the following headings:

- **Establishing a diagnosis**
- **Assessing severity**
- **Implementing treatment**
- **Achieving and monitoring control**

The students studied the well-written paper and entertained their colleagues with a practical and relevant presentation.



The anatomy of the respiratory system

Definition:

Asthma is a

- Chronic inflammatory condition
- Usually allergic in origin
- Characterised by hyper-responsive airways
- That constrict easily in response to a wide range of stimuli.



Establishing a diagnosis:

The diagnosis of asthma is made on history and examination and may be confirmed by using special investigations.

The symptoms are typically cough, wheeze, dyspnoea and a 'tight chest'.

When taking a history, it is important to elucidate variability of symptoms over time, typical precipitants like respiratory tract infections or irritants, and response to treatment with bronchodilators or corticosteroids.

Additional information suggestive of atopic disease and the allergic march is also helpful.



Cough is a common symptom in asthma

Examination and special investigations:

An expiratory wheeze may be present on chest auscultation, but often the examination is normal, unless the patient exhibits signs of atopic conditions like eczema or allergic rhinitis. The PEFR (Peak Expiratory Flow Rate) and spirometry tests are helpful in diagnosis, but may be normal in a patient who is well. Typically the PEFR and the FEV1 (Forced Expiratory Volume in 1 second) pop in asthma.

Asthma has many phenotypes and the diagnosis is made considering all the available information. A 'working diagnosis' is often made, requiring a trial of treatment, if the full clinical picture is not immediately clear.



Peak Flow Meter

Spirometry machine

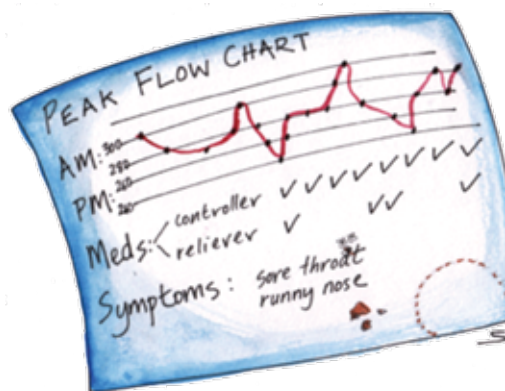
Differential Diagnosis:

It is always important to consider a **differential diagnosis** or a **second diagnosis**, especially when the evidence for asthma is not obvious or typical. It is helpful to consider the anatomy of the cardio-respiratory system when considering a differential diagnosis. Think of conditions that might cause obstructive breathing patterns at each level of the respiratory tract from the larynx, down the trachea, along the bronchi and down to the alveoli.

Conditions like vocal cord dysfunction, tracheomalacia, tumours, enlarged lymph nodes, tuberculosis, chronic obstructive airways disease, bronchiolitis, and pulmonary congestion secondary to cardiac failure may cause obstruction to air flow. Pulmonary hypertension and multiple pulmonary emboli can also mimic asthma.

Assessing severity:

Severity in a newly diagnosed patient is judged by considering day and night time symptoms and measuring the peak expiratory flow rate. A PEFR chart that captures morning and evening readings over a few weeks or months is a helpful method of determining a patient's baseline PEFR. Most patients with asthma have mild or moderate persistent symptoms which vary over time.



Peak Flow Chart

Implementing treatment:

Management includes the avoidance of triggers in order to minimise asthma severity and exacerbations. Exposure to tobacco smoke, furry animals, house dust mite, sensitisers in the workplace like fumes and dust, food and drinks containing preservatives and drugs like non-steroidal anti-inflammatory medications and beta blockers that aggravate asthma should be avoided where possible.

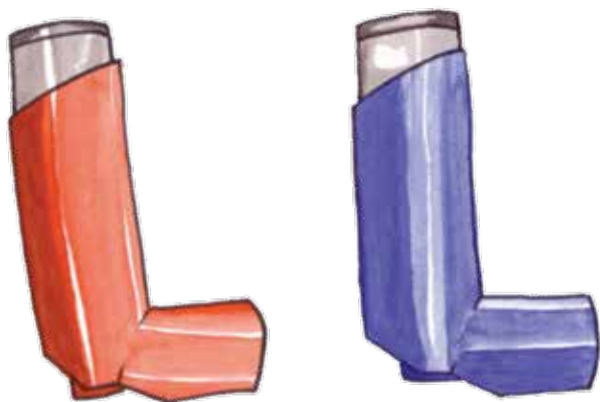


Asthma triggers

Implementing treatment:

Major goals in asthma treatment include the following:

- Achieving and maintaining control of symptoms.
- Maintaining normal activity levels.
- Maintaining pulmonary function as close to normal as possible
- Preventing asthma exacerbations
- Avoiding adverse effects from asthma medications
- Preventing asthma mortality



Pharmacological treatment

Pharmacological treatment involves choosing a controller medication and a reliever medication that best suits the patient.

The main aim of pharmacotherapy is to manage inflammation.

All patients with persistent asthma require daily treatment with inhaled steroids or another anti-inflammatory treatment. The type, dose and device of the controller medication will depend on several factors including patient profile and severity of symptoms.

Patients should never be without a short-acting β_2 -adrenergic agonist (SABA) inhaler device for the treatment of acute bronchospasm.

Medication doses and combinations may be altered during the course of a patient's treatment depending on their level of control.

Asthma medications:

Medications currently recommended in chronic asthma management include: short-acting β_2 -adrenergic agonists (SABA), inhaled corticosteroids, long-acting β_2 -adrenergic agonists (LABA), Leukotriene modifiers, slow-release theophylline and oral corticosteroids. Dosages and combinations depend on the severity of the patient's symptoms.



Spacers are recommended used with metered dose inhalers.

Home nebulisers are not recommended as patients often consider them equivalent to hospital nebulisers which deliver oxygen, and their use may cause a delay in seeking help in a severe exacerbation.



Assessing asthma control:

It is important to be able to assess the level of a patient's asthma **CONTROL**. The following are useful parameters by which to judge control:

- Daytime symptoms
- Limitation of activities
- Nocturnal symptoms
- Need for reliever medication
- Peak flow or Lung function
- Exacerbations

Control of asthma symptoms:

Should a patient's asthma control on treatment be poor, remember to check the following parameters before altering medication or doses: adherence to treatment plan, understanding of treatment plan and which medication is the reliever and which the controller, treatment device technique, ongoing exposure to asthma triggers, unmanaged rhinitis or sinusitis, other medications like non-steroidal anti-inflammatory drugs or beta blockers, untreated gastro-oesophageal reflux disease and other medical conditions like cardiac disease.

Achieving and maintaining control:

Asthma is a chronic condition that is variable over days, seasons and years. Achieving long-term control of symptoms involves consistent and comprehensive patient education with a view to patient self-management in the long term where possible.



A skilled asthma educator should be able to:

- Explain asthma and the allergic basis of the condition
- Explain classes of drugs and the purpose of treatment
- Advise on prevention strategies like allergen and tobacco avoidance
- Teach proper choice and use of inhalers
- Explain how to recognise worsening asthma
- Teach the use of a PEFr meter and chart
- Introduce patients to available education resources

Patients should be frequently reviewed which gives the practitioner time and opportunity to educate patients in a phased approach, covering all aspects of management, including the important point that asthma is a potentially

fatal condition that requires early, informed management in an exacerbation.

All patients should receive a **written asthma management plan** that explains their chronic treatment as well as how to recognise and react to worsening symptoms. It should include their baseline PEFr, how and when to initiate a short course of oral steroids and exactly what to do and where to go in an emergency, with relevant telephone numbers.



Written asthma management plan

Conclusion:

Leila's devastating case reminds us that, even in resource-rich countries, the mortality rate from asthma is unacceptably high.

If patients are educated about asthma, learn to manage their condition, and know when to seek help, unnecessary morbidity and mortality can be avoided.

Trained asthma educators are an invaluable resource in the successful management of asthma as comprehensive education is time-consuming and requires experience.

