Asthma in adults

Asthma is a common, chronic, inflammatory condition which affects all age groups. This article focuses on asthma in adults and examines the recently updated Global Initiative for Asthma guidelines from 2011 (GINA, 2011).

RUTH MORROW, ANP (PRIMARY CARE), PRIMARY CARE CENTRE, CARRIGALLEN, CO LEITRIM

Asthma affects an estimated 300 million individuals worldwide. 7.1% of Irish adults have asthma (www.asthmasociety.ie accessed 18 April 2012). Unfortunately, even in 2012, there is still an average of one death from asthma in Ireland every week despite advances in the knowledge of the mechanisms of asthma and pharmacology. Asthma is a condition that can be treated effectively and most patients can obtain good control through optimal use of their medication and appropriate management plans. Optimally controlled asthma includes:

• Little or no use of reliever inhaler
• Have no nighttime or daytime symptoms
• Have productive physically active lives
• Have near normal lung function
• Avoidance of serious attacks (GINA, 2011)

Symptoms

The symptoms of asthma include wheezing, coughing, shortness of breath and chest tightness. These symptoms are variable and usually troublesome at night or early morning. Patients may present with one, two, three or all four symptoms.

Diagnosis

The diagnosis of asthma is made by the patient’s symptoms and medical history with the measurement of lung function using spirometry. (GINA, 2011)

If the patient has a history of any of the following then asthma should be suspected:

• Cough which is worse at night
• Recurrent wheeze
• Recurrent difficulty breathing
• Recurrent chest tightness
Inhaled medications are the preferred method as the drugs are delivered directly to the lungs where they are needed. This results in an optimum therapeutic effect with reduced risk of systemic side effects.

Symptoms are variable and may occur or worsen in a seasonal pattern. The patient may also have eczema and hayfever. A positive family history of asthma or other atopic conditions may also be present. The patient may describe their symptoms becoming worse when exposed to certain trigger factors. These may include animal dander, aerosol chemicals, changes in temperature, dust mite, exercise, pollen, respiratory infections (viral), smoke and emotion. The list of possible trigger factors can be lengthy and it may take the patient some time before they can identify their trigger factors.

Spirometry is the preferred method for measuring airflow obstruction with reversibility to establish a diagnosis of asthma. An increase in FEV1 of 12% or 200mls fifteen minutes after inhaling a bronchodilator demonstrated airflow limitation consistent with asthma (GINA, 2011). However, not all patients with asthma will have reversibility and repeated tests are advised.

Peak flow measurements can be used if the patient is unable to perform spirometry and are very useful as a monitoring and educational tool for patients. An improvement of 60l/min or greater than 20% post bronchodilator or a greater than 20% in diurnal variation (with twice daily readings, more than 10%) suggests a diagnosis of asthma (GINA, 2011).

Methacholine and histamine challenges may be carried out in patients who have a normal lung function. Indirect challenges such as inhaled mannitol or an exercise challenge may also assist with the diagnosis of asthma. Allergy testing such as the skin prick test or measurement of IgE may help identify trigger factors and assist the patient in controlling their symptoms.

Challenges to the diagnosis of asthma include:

- Cough variant asthma – some patients have chronic cough which occurs at night. Evidence of lung function variability and airway hyperresponsiveness are important to determine the presence or absence of asthma
- Exercise induced bronchoconstriction – for some patients, physical activity may be the only trigger for asthma. An 8 minute running challenge can confirm an asthma diagnosis
- Asthma in the elderly can be difficult to determine as there are several complicating factors such as poor perception of symptoms, reduced expectations of mobility and activity and the possibility of other conditions such as COPD, heart failure, lung cancer, and TB to mention but a few.
- Occupational asthma requires a defined history of occupational exposure to sensitizing agents, an absence of asthma symptoms prior to employment and a documented relationship between symptoms and the workplace. The patient should be asked to maintain a peak flow diary while at work and while away from work to help determine the diagnosis. The opinion of an occupational respiratory physician should be sought.

Classification of asthma by level of control

Table 1 illustrates levels of asthma control. All patients should be assessed and their level of control established. In general, good clinical control of asthma leads to reduced risk of exacerbations (GINA, 2011). There are a number of well validated tools available which can assist the practice nurse in assessing asthma control such as the asthma Control Test (www.asthmacontrol.com)

Table 1: Levels of asthma control

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Controlled (All of the following)</th>
<th>Partly Controlled (Any measure presented)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daytime symptoms</td>
<td>None (twice or less/week)</td>
<td>More than twice/week</td>
</tr>
<tr>
<td>Limitation of activities</td>
<td>None</td>
<td>Any</td>
</tr>
<tr>
<td>Nocturnal symptoms/wakening</td>
<td>None</td>
<td>Any</td>
</tr>
<tr>
<td>Need for reliever/rescuer</td>
<td>None (twice or less/week)</td>
<td>More than twice/week</td>
</tr>
<tr>
<td>Lung function (PEF/FEV1)</td>
<td>Normal</td>
<td>&lt;80% predicted or personal best (if known)</td>
</tr>
</tbody>
</table>

Features that are associated with increased risk of adverse events in the future include: poor clinical control, frequent exacerbations in the past year, ever admission to critical care for asthma, low FEV1, exposure to cigarette smoke, high dose medication.
Proven Asthma Control with Once-Daily Dosing

Easy to Use Inhaler

Once-daily dosing may improve patient adherence

* Some patients may be more adequately controlled on 400 micrograms daily, given in two divided doses (200 micrograms twice daily)

Asmanex is not intended to be used "on demand" as a reliever medication to treat acute symptoms.
**FIVE SMALL STEPS FOR ADMINISTRATION...**

**...ONE LAUNCH FOR PROSTAP DCS**

Great Expectations come as standard

When it comes to the treatment of prostate cancer, look no further than Prostap DCS

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**INDICATIONS:**
- Contains 11.25mg leuprorelin acetate. 
- PROSTAP SR DCS: 3.75mg administered as a single subcutaneous injection in pre-filled syringe (Dual Chamber Syringe); PROSTAP SR DCS Powder (SmPC).
- PROSTAP 3 DCS: 11.25mg leuprorelin acetate. One dual chamber pre-filled syringe containing 3.75mg leuprorelin acetate in the front chamber and 11.25mg leuprorelin acetate in the rear chamber. One 23 gauge needle, one syringe plunger and one injection site swab are included in a single injection pack. PROSTAP 3 DCS, one dual chamber pre-filled syringe containing 11.25mg leuprorelin acetate in the front chamber and 11.25mg leuprorelin acetate in the rear chamber. One 23 gauge needle, one syringe plunger and one injection site swab are included in a single injection pack.

**PREPARATION:**
- PROSTAP DCS: 3.75mg administered as a single subcutaneous or intramuscular injection every month.
- PROSTAP 3 DCS: 11.25mg administered as a single subcutaneous or intramuscular injection every 3 months. One needle shown is not actual size.

**DOSAGE AND ADMINISTRATION:**

**Men:**
- Management of prostatic carcinoma for which suppression of testosterone is indicated.
- Management of oestrogen dependent gynaecological conditions including the treatment of uterine fibroids.
- Endometrial preparation prior to intrauterine surgical procedures including endometrial ablation or resection.

**For:**
- Administration of endometriosis.
- Administration of uterine fibroids.
- Treatment should be initiated during the first 5 days of the menstrual cycle. PROSTAP SR DCS: 3.75mg administered as a single subcutaneous or intramuscular injection every month for a period of 6 months (endometriosis), for a maximum of 24 months (uterine fibroids). Vary the injection site periodically.

**For:**
- Administration of uterine fibroids.
- Treatment should be initiated during the first 5 days of the menstrual cycle. PROSTAP SR DCS: 3.75mg administered as a single subcutaneous or intramuscular injection every month for a period of 6 months (endometriosis), for a maximum of 24 months (uterine fibroids). Vary the injection site periodically.

**Women:**
- Use in women who are in menopause (postmenopausal women), women on hormone therapy, and women with abnormal uterine bleeding who have been reported.
- Use in women who are undergoing hormone therapy (not premenopausal women).

**Special Populations:**
- Elderly: Patients may require more frequent monitoring of blood glucose. Hepatic dysfunction or who have undiagnosed abnormal vaginal bleeding.

**SIDE EFFECTS:**
- Hypersensitivity to any of the ingredients or to synthetic GnRH or GnRH derivatives.
- Use in pregnant women (category X).
- Use in children (not established).
- Use in women on hormone therapy (not premenopausal women).
- May cause an increase in uterine cervical resistance. The induced hypo-oestrogenic state results in a clinically significant loss in bone density over the course of treatment, some of which may not be reversible.
- The generally accepted level of bone loss with GnRH analogs such as PROSTAP 3 DCS, it is necessary for prescriptions to reflect this change of name. A video demonstrating the five steps of administration can be viewed at www.ProstateCancerUpdate.ie

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**Adverse events should be reported to the Pharmacovigilance Unit at the Irish Medicines Board (IMB) on +44 1628 537900.**

**Adverse events information about adverse event reporting can be found on the IMB website (www.imb.ie).**

**Adverse events should also be reported to Takeda UK Ltd. on +44 1628 357900.**

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**QUANTITIES:**
- PROSTAP 3 DCS PA 1547/3/3; PROSTAP SR DCS PA 1547/3/4.

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**PRODUCT AUTHORIZATION HOLDER:**
- Takeda UK Limited, Takeda House, Mercury Park, Wooburn Green, High Wycombe, Bucks. HP10 0HH, UK. Tel: +44 1628 537900.

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**DATA OF PREPARATION:**

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**LEGAL CATEGORY:**
- POM.

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**REFERENCES:**
- Medicines and Healthcare products Regulatory Agency (UK)."
Table 2: Treatment steps (GINA, 2011)

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>As needed rapid-acting B2 agonist</td>
<td>Select one</td>
<td>Select one</td>
<td>Step 3 and select one</td>
<td>Step 4 treatment, add either</td>
</tr>
<tr>
<td>Low dose inhaler ICS</td>
<td>Low dose ICS plus long acting B2 agonist</td>
<td>Medium or high dose ICS plus long acting B2 agonist</td>
<td>Oral glucocorticosteroids (lowest dose)</td>
<td></td>
</tr>
<tr>
<td>Leukotriene modifier</td>
<td>Medium or high dose ICS</td>
<td>Leukotriene modifier</td>
<td>Sustained release theophylline</td>
<td></td>
</tr>
<tr>
<td>Low dose ICS plus sustained release theophylline</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Four components of asthma care

GINA (2011) identifies four interrelated components of asthma care:

- **Component 1:** Develop doctor/patient relationship
- **Component 2:** Identify and reduce exposure to risk factors
- **Component 3:** Assess, treat and monitor asthma
- **Component 4:** Manage asthma exacerbations

This article will focus on component 3 with regard to the management of asthma but it is important that all four components are addressed so that health professionals provide a holistic approach to patient care. All patients should be assessed to establish their treatment regimen and that they are on the appropriate for their level of control. This may mean either increasing or decreasing their treatment. However, before any changes are made to the patient’s regimen, inhaler technique and concordance with medication should be established (GINA, 2011). Each patient is assigned to one of five treatment steps and patients may move up or down the steps depending on symptoms and the amount of reliever therapy being used (see table 2). Inhaled glucocorticosteroids are the cornerstone of asthma treatment and are the most effective controller medications available. However, there are additional medications such as leukotriene receptor antagonists which can be added on and are very useful in patients who have an allergy component to their asthma. These medications are also licensed for use in allergic rhinitis, a condition which a significant number of people with asthma also have. Newly diagnosed patients who are not yet on medication should be commenced on Step 2 or Step 3 depending on severity of symptoms (GINA, 2011). Patients who do not reach an acceptable level of control at Step 4 can be considered to have difficult to treat asthma and should be referred to a respiratory specialist for management.

Inhaled medications are the preferred method as the drugs are delivered directly to the lungs where they are needed. This results in an optimum therapeutic effect with reduced risk of systemic side effects. It is imperative that all patients are trained in the use and maintenance of their device and that inhaler technique is checked at every opportunity.

Ongoing monitoring is essential to maintain control and establish the lowest dose of medication for optimal control. If asthma is not controlled, treatment should be stepped up. If partly controlled, consider stepping up. If asthma is controlled for at least 3 months, consider stepping down treatment. The goal of treatment is to be on the least amount of medication to maintain optimal control.

Table 3: Severity of asthma exacerbations (GINA, 2011)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Respiratory arrest imminent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breathless</td>
<td>Walking</td>
<td>Talking</td>
<td>At rest</td>
<td>Hunched forward</td>
</tr>
<tr>
<td></td>
<td>Can lie down</td>
<td>Prefer sitting</td>
<td>Hunched forward</td>
<td></td>
</tr>
<tr>
<td>Talks in</td>
<td>Sentences</td>
<td>Phrases</td>
<td>Words</td>
<td></td>
</tr>
<tr>
<td>Alertness</td>
<td>May be agitated</td>
<td>Usually agitated</td>
<td>Usually agitated</td>
<td>Drowsy or confused</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>Increased</td>
<td>Increased</td>
<td>Often &gt;30/min</td>
<td></td>
</tr>
<tr>
<td>Accessory muscles</td>
<td>Usually not</td>
<td>Usually</td>
<td>Usually</td>
<td>Paradoxical thoraco-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>abdominal movement</td>
</tr>
<tr>
<td>Wheeze</td>
<td>Moderate</td>
<td>Loud</td>
<td>Usually loud</td>
<td>Absence of wheeze</td>
</tr>
<tr>
<td>Pulse/min</td>
<td>&lt;100</td>
<td>100-200</td>
<td>&gt;120</td>
<td>Bradycardia</td>
</tr>
<tr>
<td>PEFR</td>
<td>Over 80%</td>
<td>Approx 60-80%</td>
<td>&lt;60% or response lasts</td>
<td>&lt;2 hours</td>
</tr>
<tr>
<td>SaO2</td>
<td>&gt;95%</td>
<td>91-95%</td>
<td>&lt;90%</td>
<td></td>
</tr>
</tbody>
</table>
Patients should be offered self-management plans with instructions on how to adjust their medications in response to worsening symptoms and/or worsening PEFR. An example of a self-management plan is available on www.asthmasociety.ie

Acute exacerbations
It is important not to underestimate the severity of an asthma attack. A progressive increase in shortness of breath, cough, wheezing, chest tightness or a combination is indicative of an acute exacerbation. Red flags for acute asthma include:
- A history of near fatal asthma requiring intubation and mechanical
- Hospitalisation or ED visit within the last year
- Currently using or have recently stopped using oral glucocorticosteroids
- Over dependence on rapid-acting bronchodilators
- History of psychiatric or psychosocial problems
- History on non-compliance with an asthma medication plan (GINA, 2011)

Table 3 illustrates severity of asthma exacerbations. Mild attacks are defined by a reduction in peak flow of 20%, nocturnal wakening and increased use of rapid-acting bronchodilator. Mild attacks can be treated at home if the patient has a personal asthma management plan. Moderate attacks and severe attacks usually require hospital care. It is important that the severity of the asthma is assessed so that the appropriate treatment is administered (see GINA, 2011). Prompt treatment includes:
- Inhaled rapid-acting beta2 agonists in adequate doses are essential – 2 to 4 puffs every 20 minutes for the first hour, then 2 to 4 puffs every 3 to 4 hours (mild exacerbations), 6 – 10 puffs every 1 – 2 hours (moderate exacerbations)
- Oral glucocorticosteroids 0.5 to 1mg of prednisolone/kg during a 24 hour period
- Oxygen if hypoxic – aim to achieve o2 saturation of 95%.

It is imperative that response to treatment is monitored and that the patient is offered follow-up. The purpose of follow-up is to identify the factors that precipitated the exacerbation so that these can be avoided in the future. It also provides an opportunity to review the patient’s medication plan and to ensure that the patient is on the appropriate medication.

Conclusion
This article has reviewed the updated GINA (2011) guidelines. The diagnosis, management of stable asthma and the management of acute exacerbation of asthma in adults has been discussed from a primary care perspective.

Further reading
Global Initiative for Asthma, 2011, Pocket Guide for Asthma Management and Prevention (For Adults and Children over 5 Years).

References
Global Initiative for Asthma, 2011, Pocket Guide for Asthma Management and Prevention (For Adults and Children over 5 Years).
www.asthmasociety.ie accessed 18 April 2012

Having read the article now test your knowledge of asthma.

Q1. What percentage of adults in Ireland are affected by asthma?
   a) 10%
   b) 5.4%
   c) 7.1%
   d) 7.8%

Q2. The symptoms of asthma are:
   a) Wheeze
   b) Cough and chest tightness
   c) Shortness of breath
   d) All of the above

Q3. Diagnosis of asthma includes
   a) Spirometry
   b) Symptoms, detailed history taking with spirometry assessment with reversibility
   c) Serial peak flow measurement
   d) Response to a trial of treatment

Q4. The cornerstone of asthma treatment is:
   a) Inhaled corticosteroids
   b) Leukotriene receptor antagonists
   c) Short-acting bronchodilators
   d) Theophyllines

Q5. Patients who experience mild exacerbations of asthma should be:
   a) Referred to hospital for treatment
   b) Managed in primary care
   c) Referred to respiratory consultant
   d) Managed in primary care, patient given an action plan and followed up after the exacerbation