Asthma is a common chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Symptoms include wheezing, coughing, chest tightness, and shortness of breath.

Over the past 25 to 30 years the prevalence of asthma and allergies has increased considerably worldwide. In most cases the condition has its onset in early childhood with 80% to 90% of all cases initially being diagnosed before the age of six years. This was not always the case. For example in the early 1970s the prevalence of asthma and allergies were roughly half of what they are today.

In Ireland, asthma is the most common chronic disease and affects people of all ages, from all socio-economic groups and all geographic regions. Asthma is the most common chronic disease in childhood and the most common respiratory disease in Ireland. The morbidity of the disease varies greatly in patients and can be very mild, with no impact on their daily lives, to a severely debilitating disease with frequent hospitalisation and a huge impact on the patient’s quality of life. Asthma can be under-diagnosed and under controlled, creating a substantial burden to individuals.

CAUSES

The cause of asthma is likely to be attributable to genetic factors. However, there is a substantial amount of evidence which suggests that genetic factors alone cannot account for the increase in prevalence, as they take several generations to manifest.

There is clearly an equatorial disparity between north and south, with western industrialised countries which are furthest away from the equator – New Zealand, Australia and the UK having the highest prevalence worldwide. In the USA the asthma epidemic appears to be worse among the urban poor, particularly among African-Americans and Puerto Ricans and there is also a clear urban/rural gradient among poorer, developing nations.

It is important to note that, not only has asthma and Th2 diseases such as allergic rhinitis, eczema and food allergy increased but so too have a number of Th1 conditions such as type 1 diabetes and Crohn’s disease.

One theory behind the increase in asthma is the hygiene hypothesis, which states that a decrease in childhood infections leads to a “missing immune deviation”; however this does not explain the rise in Th1 conditions or why children who are most at risk of developing asthma are also susceptible to upper respiratory infections.
Not only has asthma and Th2 diseases such as allergic rhinitis, eczema and food allergy increased but so too have a number of Th1 conditions such as type 1 diabetes and Crohn’s disease.

Diet and lifestyle have contributed to the increase in asthma. There are numerous recent papers linking diet to respiratory disease, in both adults, children and during pregnancy. In particular, there are links made between the role of vitamins, choice of food and respiratory health. In addition, the affect of indoor environment, tobacco smoke and obesity on the rise in asthma prevalence deserve further study and consideration.

SYMPTOMS
Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. The chronic inflammation is associated with airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or in the early morning. These episodes are usually associated with widespread, but variable airflow obstruction within the lung that is often reversible, either spontaneously or with treatment.

DIAGNOSIS
A diagnosis of asthma is based on the recognition of a significant pattern of symptoms. Asthma symptoms may be intermittent and non-specific and a correct diagnosis is essential for proper management of the condition. This is particularly true among children where misdiagnosis often identifies various forms of bronchitis or croup. Misdiagnosis in the elderly often takes the form of a diagnosis of COPD or a cardiac condition which in turn leads to mismanagement and inappropriate treatment. The key is to take a careful clinical history and in many cases this will allow a reasonably certain diagnosis of asthma or an alternative diagnosis to be made.

Useful questions to consider when making a diagnosis:
- Are the symptoms worsened by seasonal increases in specific aeroallergens e.g. pollen, birch and ragweed pollens.
- Is there a cough-variant element present? This is particularly common in children.
- Other diagnoses to be considered are cough induced as a result of ACE inhibitors, gastro-oesophageal reflux (GORD), postnasal drip, reflux, chronic sinusitis, vocal cord dysfunction.

The physical examination may show a normal respiratory system because of the variability of asthma symptoms. Wheezing on auscultation is usually found; however, in severe asthma exacerbations wheezing may be absent. Clinical signs maybe present if patients are examined during symptomatic periods. It is important, even in relatively clear-cut cases, to obtain objective support for the diagnosis.

There are several tests for diagnosis and monitoring asthma:
- Measurement of spirometry and peak expiratory flow provides an assessment of severity of airflow limitation, its reversibility and its variability, and provides confirmation of the diagnosis of asthma.
- Spirometry is recommended as the ideal method to establish a diagnosis of asthma.
- Reversibility (improvements in FEV1 within minutes after inhalation of rapid-acting bronchodilator or sustained improvement over days/weeks after introduction of effective controller treatment such as inhaled glucocorticosteroids). The degree of reversibility in FEV1 which indicates a diagnosis of asthma is accepted as >12% (or >200ml) from pre-bronchodilator value.
- Variability (improvement or deterioration occurring over time, day to day, month to month or seasonally). Obtaining a history of variability is an essential component of the diagnosis of asthma.
- Measurement of PEF is not interchangeable with FEV1. PEF should be measured first thing in the morning, before treatment is taken when values are at their lowest and last thing at night when values are usually higher.
- A 60 L/min (or >20% of pre-bronchodilator PEF) improvement after inhalation of a bronchodilator or a diurnal variation in PEF >20% suggests a diagnosis of asthma. Other tests of airflow obstruction, airway responsiveness and airway inflammation which may also support the diagnosis of asthma are:
- Measurement of airway responsiveness to methacholine, histamine, mannitol, or exercise challenge may help establish a diagnosis of asthma for patients with symptoms consistent with asthma, but with normal spirometry. These are generally performed in a pulmonary function laboratory.
- Measurement of allergic status (IgE, RAST, skin allergy tests) can help to identify risk factors that cause asthma symptoms in individual patients. The presence of allergies, eczema, and allergic rhinitis in particular, increase the probability of a diagnosis of asthma. Skin tests with allergens represent the primary diagnostic tool in determining allergic status. They are simple and rapid to perform, have a low cost and high sensitivity. When performed incorrectly skin tests can lead to false positive or false negative results. Measurement of specific IgE in serum does not surpass the reliability of results from skin tests and is more expensive. Measurement of total IgE in serum has no diagnostic value as a diagnostic test for atopy.
- Confirmation of asthma hinges on demonstration of airflow obstruction varying over short periods of time. It is also important to point out that the diagnosis in patients with possible asthma differs among age groups and produces a diagnostic challenge.

MANAGEMENT
There is no cure for asthma but through appropriate management patients can achieve a level of control that allows for a good quality of life. There is much more to good asthma management than writing a prescription. Proper diagnosis, patient education, allergen avoidance, medication prescribed...
**Onbrez® Breezhaler®**

- **Superior Bronchodilation versus tiotropium**
- **5 minute rapid onset of action**

A first line once daily maintenance treatment for COPD

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**ABBREVIATED PRESCRIBING INFORMATION**

- **Indications:** For maintenance bronchodilator treatment of airflow obstruction in adult patients with chronic obstructive pulmonary disease (COPD).
- **Dosage and administration:** Recommended dose is the inhalation of the content of one 150mcg capsule once a day, administered at the same time of the day each day, using the Onbrez Breezhaler Inhaler. Cardiovascular disease, hypoglycaemia and hypertensive crisis are contraindications. Hypersensitivity to the active substance, lactose or to any of the other excipients.
- **Warnings/Precautions:** The active substance, lactose or to any of the other excipients. No relevant use in the paediatric population.
- **Dosage and administration:** Recommended dose is the inhalation of the content of one 150mcg capsule once a day, administered at the same time of the day each day, using the Onbrez Breezhaler Inhaler. Cardiovascular disease, hypoglycaemia and hypertensive crisis are contraindications. Hypersensitivity to the active substance, lactose or to any of the other excipients.
- **Contraindications:** Hypersensitivity to the active substance, lactose or to any of the other excipients. No relevant use in the paediatric population.

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**References:**

1. Onbrez Breezhaler SmPC. Available at www.medicines.ie

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**Legal Category:** POM

**Marketing Authorisation Holder:** Novartis Europharm Limited, Wimblehurst Road, Horsham, West Sussex, RH12 5AB, United Kingdom.

**Marketing Authorisation Numbers:** EU/1/09/593/002 & 007. Full prescribing information is available on request from Novartis Ireland Ltd, Beech Hill Office Campus, Clonskeagh, Dublin 4. Tel: 01 2601255 or at www.medicines.ie

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**Abbreviations:**

API: Abbreviated Prescribing Information

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**Contraindications:**

- Hypersensitivity to the active substance, lactose or to any of the other excipients.
- No relevant use in the paediatric population.

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**Adverse reactions:**

- **Common:** Nasopharyngitis, upper respiratory tract infection, sinusitis, diabetes mellitus and hyperglycaemia, headache, musculoskeletal disorders, back pain, arthralgia, and abdominal pain.
- **Uncommon:** Parasthesia, atrial fibrillation and non-cardiac chest pain.

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**Recommended dose:** The inhalation of the content of one 150mcg capsule once a day, administered at the same time of the day each day, using the Onbrez Breezhaler Inhaler.

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**Contraindications:**

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**References:**

1. Onbrez Breezhaler SmPC. Available at www.medicines.ie
For most classes of controller medications, improvement begins within days of initiating treatment, but the full benefit may only be evident after 3 to 4 months.

according to findings from objective tests, medication compliance and inhaler technique are all vital parts of asthma management. Equal or greater attention should be paid to the fact that asthma has a significant impact on individuals, their families and society. Partnership between the healthcare professional and patient is also important in achieving good control, as management plans can be tailored to the individual patient.

The goals of long-term asthma management are to:
- achieve and maintain control of symptoms
- maintain normal activity levels, including exercise
- maintain pulmonary function (FEV1/PEF) as close to normal as possible
- prevent asthma exacerbations
- avoid adverse effects from asthma medications
- prevent asthma mortality

Asthma can be effectively controlled in most patients by intervening to suppress and reverse inflammation as well as treating bronchoconstriction and related symptoms.

A short term reliever therapy of an inhaled short acting B2 agonist should be prescribed for all patients with a diagnosis of asthma. Inhaled corticosteroids are the recommended controller medication for adults and children to achieve good asthma management. It is important that before initiating a new drug therapy or increasing existing medication, inhaler technique, medication compliance and avoidance or exposure to new triggers should be re-checked.

An inhaled long acting B2 agonist is the first choice as an add-on therapy to inhaled steroids in adults and children aged between 5 and 12 years. It should be considered before going above a dose of 400mcg BDP or equivalent per day. The first choice of add-on therapy to inhaled steroids in children under 5 years old is a leukotriene modifiers.

It is imperative to say that once asthma control is achieved ongoing monitoring is essential to maintain control and to establish the lowest step and dose of treatment necessary, which maximises the safety of treatment. Asthma is a variable disease, and treatment has to be altered in response to loss of control as indicated by worsening symptoms or the development of an exacerbation. Asthma control should be monitored by the healthcare professional and also by the patient at regular intervals, depending on the clinical severity and the patient’s involvement.

For most classes of controller medications, improvement begins within days of initiating treatment, but the full benefit may only be evident after 3 to 4 months. The reduced need for medication once control is achieved is not fully understood, but may reflect the reversal of some of the consequences of long-term inflammation. At other times treatment may need to be increased either in response to loss of control or an acute exacerbation (defined as a more acute and severe loss of control that requires urgent treatment).

Some further points of extreme importance in managing asthma:
- The need for repeated doses of rapid on-set, short acting or long acting B2 – agonist bronchodilators over more than one or two days signals the need for review and possible increase of controller therapy.
- Temporarily doubling the dose of ICS has not been shown to be effective, and is no longer recommended. A four-fold or greater increase has been demonstrated to be equivalent to a short course of oral glucocorticosteroids in adult patients with acute deterioration. The higher dose should be maintained for 7 to 14 days, more research is needed in both adults and children to standardise this approach.
- A combination of ICS and rapid and long-acting B2-agonist (e.g. formoterol) in a single inhaler, both as a controller and reliever, is effective in maintaining a high level of asthma control and reduces exacerbations requiring systemic steroids and hospitalisation.

In conclusion, as a result of evidence-based guidelines, our understanding of what causes asthma, what is occurring in the airways and how best to treat the condition has advanced considerably.

For more information on asthma, its causes and treatments contact the Asthma Society of Ireland by calling 01 817 8886, emailing office@asthmasociety.ie or by visiting our website at www.asthmasociety.ie.

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