

Respiratory disease

Respiratory diseases account for one in seven of all deaths in Wales – the third largest cause of mortality for both men and women.^{1,2} In an attempt to address some of the issues surrounding these diseases, in May 2014 the Welsh Government published *Together for Health – A Respiratory Health Delivery Plan*, which sets out priorities in the areas of:²

- ◆ prevention
- ◆ early diagnosis
- ◆ fast and effective treatment
- ◆ support for people with respiratory disease
- ◆ improved information
- ◆ targeted research.

To further the aim of achieving better patient outcomes and to promote the best use of resources, the Bevan Commission has set out a framework for the delivery of prudent healthcare, based upon four key outcomes:

- ◆ prevention and early intervention
- ◆ efficiency
- ◆ substitution
- ◆ elimination of waste.³

*"In a system with limited resources, health professionals have a duty to establish not only that they are doing good, but that they are doing more good than anything else that could be done with the same resources."*³

This bulletin focuses on early diagnosis and appropriate treatment for people with asthma and chronic obstructive pulmonary disease (COPD) in the context of these health improvement strategies.

Prevention

Reducing the levels of **smoking** would be likely to have the greatest impact on preventing respiratory disease. The aim in Wales is to reduce the proportion of adults who smoke from the current level of 23%, to 20% by 2016, and 16% by 2020.² The National Institute for Health and Care Excellence (NICE) has issued guidance on smoking cessation and tobacco harm-reduction strategies.^{4,5}

Summary

- ◆ Smoking may negate benefits of treatment for respiratory disease, increasing waste – reducing smoking should be a priority.
- ◆ Appropriate immunisation should be maximised to reduce exacerbations and complications.
- ◆ Early and accurate diagnosis is essential to improve outcomes.
- ◆ At all stages of disease, guidelines should be consulted before prescribing.
- ◆ Health professionals should be able to educate patients about using their inhalers correctly. Benefits are reduced and waste increased unless inhaler use is optimal.
- ◆ High-dose corticosteroids have a limited role and should only be used where specifically indicated.

Appropriate **vaccination** programmes for people with respiratory disease have the potential to decrease morbidity. Asthmatic patients who receive continuous or repeated corticosteroids (inhaled or systemic), or who have been previously hospitalised should be vaccinated against influenza, as should asthmatic children who have been admitted with lower respiratory tract infections.⁶ The frequency of exacerbations in COPD can be reduced by offering pneumococcal and annual influenza vaccination to all patients.⁷

Diagnosis of asthma and COPD

Early and accurate diagnosis is one of the keys to a successful outcome. The identification of **asthma** can be difficult. There is no gold-standard diagnostic test, although variability of peak flow and FEV₁ are characteristic.⁸ The Quality and Outcomes Framework requires measurements of variability or reversibility to be recorded.⁹ Recognising the characteristic signs and symptoms, and careful consideration of an alternative explanation is vital. Diagnosis and treatment is directed by the stratification of patients to having a low, intermediate, or high probability of asthma.⁸

The diagnosis of **COPD** depends on recognising the disease as a cause of breathlessness and cough in patients over the age of 35, who are generally current or ex-smokers, with at least one of;

- ◆ exertional breathlessness
- ◆ chronic cough
- ◆ regular sputum production
- ◆ frequent winter ‘bronchitis’
- ◆ wheeze.⁷

Spirometry is the gold-standard diagnostic test for COPD and should be carried out at the time of diagnosis, or when reconsidering the diagnosis if the response to treatment is exceptionally good, for example >400ml improvement in FEV₁. Post-bronchodilator spirometry (reversibility testing) may be unhelpful and misleading, and is not routinely recommended, except to confirm the diagnosis where there is doubt. It should not be used to predict the response to treatment.⁷

Asthma and COPD are usually distinguishable on the basis of history and examination; the features in Table 1 should be used to differentiate where possible. Longitudinal observations using spirometry, peak flow, or symptoms may be used.⁷

Table 1. Clinically differentiating features

Feature	COPD	Asthma
Smoker/ex-smoker	Nearly all	Possibly
Age <35 years	Rare	Often
Chronic productive cough	Common	Uncommon
Breathlessness	Persistent/ progressive	Variable
Night-time waking with breathlessness/wheeze	Uncommon	Common
Significant day-to-day/ diurnal variability	Uncommon	Common

Education and information

It has recently been estimated that up to two-thirds of deaths from asthma in the UK are preventable, many by implementing changes to care such as the use of appropriate medicines (see Pages 3 and 4), timely review, and the use of a personal action plan.¹⁰ Written **personal action plans** incorporated into self-management education have been shown to improve health outcomes.⁸ The British asthma guideline suggests use of the template available at www.asthma.org.uk/advice-personal-action-plan.

At respiratory **review**, and when considering stepping up therapy, it is essential to properly assess **inhaler technique**. Dose increases and new medication may be unnecessary if a patient can make optimum use of their current medication.

Studies have shown that the ability of health professionals to counsel appropriately varies widely and that substantial numbers of patients use their inhalers incorrectly. This contributes significantly to wastage; in practice audits, inhalers are frequently found to be the most costly and commonly discarded items.

“An inhaler can be neither clinically effective nor provide value in respiratory disease if a patient is unable or unwilling to use it.”

The wide variety of devices on the market probably contributes to confusion as techniques for inhalation are quite different depending on the nature of the inhaler (see Box 1). It is good practice to use a checklist to assess inhaler technique to ensure that a patient:

- ◆ is able to prepare the device for use
- ◆ adopts the correct posture
- ◆ exhales fully (away from the device) before use
- ◆ demonstrates device-appropriate respiratory effort and duration (see below)
- ◆ holds their breath for 10s after inhalation.

Box 1. Classification and use of devices

Patient-inhalation independent devices include pressurised metered-dose inhalers (pMDIs), whether press-and-breathe, breath-actuated, or if used with a spacer. Inhalation from these devices, which produce their own aerosol by forcing propellant and medication under pressure through a small aperture, should be ‘gentle and slow’.

Patient-inhalation dependent devices, such as dry powder inhalers (DPIs), rely on a patient’s inspiratory effort to create an aerosol from the medication and excipients and to break up large particles; a ‘forceful’ inhalation is required from the outset. The degree of inspiratory force needed is dependent on the specific DPI due to their varying internal resistance.

Devices are available to mimic both the effort and technique required to effectively use various inhalers and to measure inspiratory capability. Such devices may be useful to evaluate which inhaler/s might suit which patient. Bear in mind that patients receiving multiple therapies, especially in COPD, may well receive several different types of device – although this should be avoided where possible. If this is necessary, patients should understand and be able to use each device. It should also be remembered that, during acute asthma attacks and exacerbations of COPD, inspiratory capability decreases and patients may be physically unable to use certain inhalers.

Treatment

It is of course important that **severity** of disease is determined at diagnosis to establish initial treatment and to record progression, but the degree of **control** of disease may be a more useful measure to direct ongoing therapy. Inhaler technique and adherence should be considered at each consultation and, to avoid a ‘prescribing cascade’, medicines that are ineffective for a patient should be stopped or changed and not simply added to. Consideration should be given to stepping down therapy when control is good.

Inhaled bronchodilators

As might be expected, bronchodilators account for the highest numbers of prescriptions for respiratory medicines dispensed in Wales.¹¹ They are a mainstay of treatment but should be used according to guidelines whenever possible (see Page 4).

Concern about the potential for long-acting beta₂-agonists (LABAs) to increase **asthma** mortality led to several Medicines and Healthcare products Regulatory Authority (MHRA) reviews of evidence. Current advice is that the benefits of a LABA in combination with an inhaled corticosteroid (ICS) outweigh apparent risk in both adults and children over 5 years.¹² LABAs should not be prescribed in rapidly deteriorating asthma, should be given at the lowest effective dose and stopped if ineffective, and consideration should be given to stepping-down therapy when good long-term control has been achieved.¹² A LABA should not be used in the absence of an ICS in asthma.^{8,12} A combination product may help patients to adhere to ICS therapy when a LABA is prescribed.^{8,13}

In **COPD**, a LABA or long-acting muscarinic antagonist (LAMA) is indicated if a short-acting bronchodilator fails to control disease and in most cases should be used prior to an ICS.⁷ Long-acting bronchodilators improve outcomes such as lung function, dyspnoea, exacerbation rate, and quality of life.¹⁴ However, there has been concern over the cardiovascular risks associated with their use. There have been several trials and studies of potential adverse effects, with differing results, but there appears to be little to choose between the established LABAs and LAMA in terms of benefit or risk.¹⁴ Patient preference should be considered.⁷

Over the past few years several trials and meta-analyses have reported conflicting results regarding an excess in mortality when using tiotropium via the Respimat[®] device (a pMDI) compared with the Handihaler[®] (a DPI).¹⁵ As yet, there is no definitive

answer as to whether this is a significant effect. The MHRA advises caution with Respimat[®] in patients with cardiac rhythm disorders and warns against exceeding the recommended dose of tiotropium.¹⁵

One newer LABA (indacaterol) and two newer LAMAs (glycopyrronium[▼] and aclidinium[▼]) are licensed for use in COPD and are recommended as options for treatment by the All Wales Medicines Strategy Group. They seem to confer little additional benefit over more established treatments, but cost may be a consideration.¹⁶⁻¹⁸ It should be noted that long-term data are not yet available.

Inhaled corticosteroids

Inhaled corticosteroids account for the highest proportion of expenditure on respiratory medicines in Wales (more than £54m in 2013) and prescribing does not necessarily correlate with local disease prevalence.¹¹ Work by the All Wales Therapeutics and Toxicology Centre (AWTTC) will soon allow GP clusters to benchmark ICS prescribing with areas demographically similar to their own.

In **asthma**, when a standard-dose ICS does not control the disease, the next step should be to add a LABA and not to escalate the ICS dose.⁸ A recent study has noted that commonly, when adding a LABA into therapy, prescribers also tend to simultaneously increase the steroid dose when prescribing a combination inhaler; particularly the fluticasone/salmeterol combination.¹⁹ The dose of ICS should be titrated to the lowest dose that maintains effective control.⁸ An evaluation of the use of high-dose ICS (see Page 4 for definition of high dose) in practice may be useful.

An ICS should only be prescribed in **COPD** where a patient’s FEV₁ < 50% of predicted, or where the patient experiences persistent exacerbations.⁷ There is convincing evidence that an ICS should not be introduced earlier than guidelines suggest, i.e. in milder disease.²⁰ In studies, the additional benefit of the LABA/ICS combination versus LABA alone is variable and not always clinically relevant, though there is some evidence that combination therapy somewhat reduces the exacerbation rate.²⁰⁻²² This should be balanced against the risks of high-dose ICS, such as an increased risk of pneumonia.²⁰ Patients using ICS who develop pneumonia should have their treatment reconsidered.²³ All preparations of ICS licensed for use in COPD also contain a LABA.

The risks and benefits should be discussed with the patient when a high-dose ICS is considered and a steroid card should be issued with the inhaler.^{7,24}

Management of chronic asthma in adults and children^{8,24}

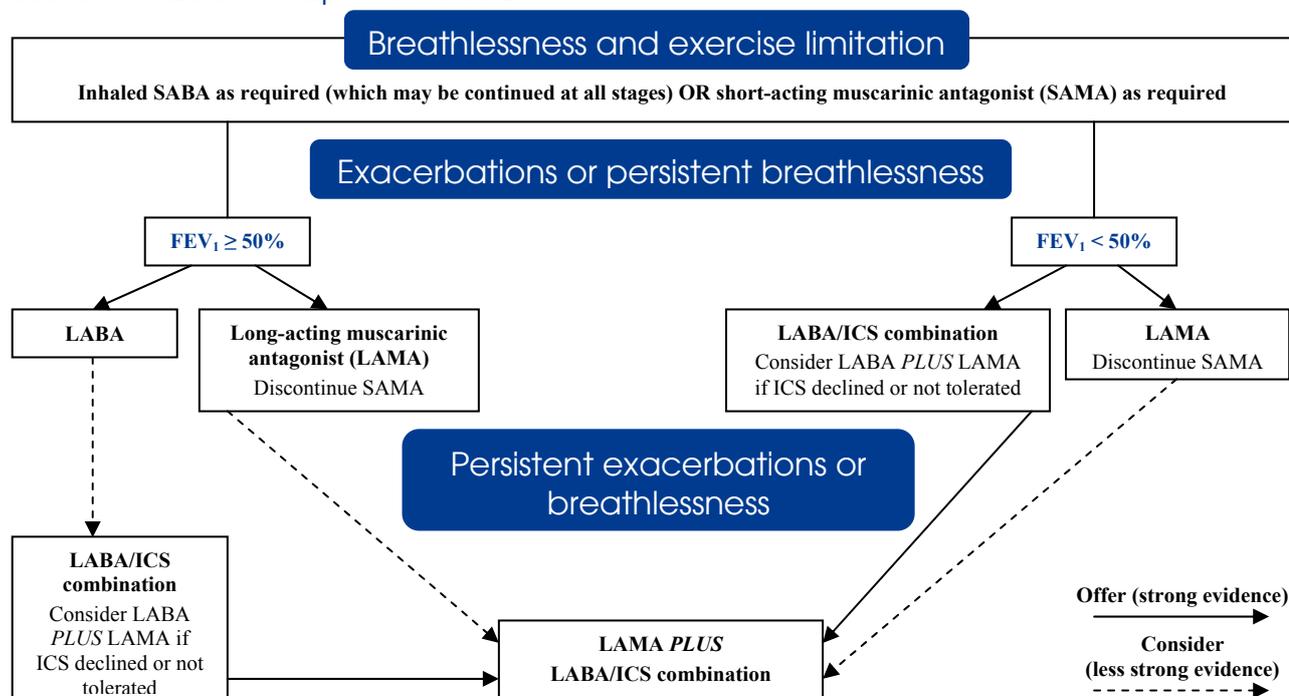
Step 1	<p>Adults and children over 5: Inhaled short-acting beta₂-agonist (SABA) as required, up to once daily Child under 5: preferably inhaled SABA – less effective and more adverse effects if given orally All: step up if needed >2/week, if night symptoms ≥1/week, or if exacerbation in last two years</p>
Step 2	<p>Adults and children over 5: Inhaled SABA as required PLUS regular standard-dose ICS Child under 5: as above, but use leukotriene antagonist if ICS cannot be used</p>
Step 3	<p>Adults and children over 5: Inhaled SABA as required PLUS regular standard-dose ICS PLUS regular inhaled LABA If asthma uncontrolled: Increase ICS dose to upper end of standard dose range AND stop LABA if no benefit If LABA stopped and asthma uncontrolled, add one of: leukotriene antagonist OR m/r theophylline OR m/r oral beta₂-agonist (not for child <12 years) Child 2-5: inhaled SABA as required PLUS regular standard-dose ICS PLUS leukotriene antagonist Child under 2: refer to respiratory paediatrician</p>
Step 4	<p>Adults and children over 5: Inhaled SABA as required PLUS regular high-dose ICS PLUS regular inhaled LABA In adults, consider 6-week sequential trial of: leukotriene antagonist, m/r theophylline, m/r oral beta₂-agonist Child: refer to respiratory paediatrician</p>
Step 5	<p>All: Refer to a respiratory specialist Inhaled SABA as required PLUS regular high-dose ICS PLUS one or more regular long-acting bronchodilators (as Step 4) PLUS regular prednisolone tablets (continue high-dose ICS)</p>

Table 2. Doses of ICS

	Standard-dose	High-dose
Beclometasone dipropionate (BDP)* and budesonide	Adult: 100-400 micrograms bd Child (under 12): 100-200 micrograms bd	Adult: 400-1000 micrograms bd Child (5-12 years): 200-400 micrograms bd
Fluticasone	Adult: 50-200 micrograms bd Child (4-12 years): 50-100 micrograms bd	Adult: 200-500 micrograms bd Child (5-12 years): 100-200 micrograms bd
Mometasone furoate	Adult: 400 micrograms od or 200 micrograms bd Child (under 12): not recommended	Adult: 400 micrograms bd Child (under 12): not recommended

*The potency of BDP in QVAR and Fostair pMDIs is increased and doses should be approximately halved compared to standard BDP pMDIs such as Clenil.^{24,25}

Use of inhaled therapies in COPD^{7,24}



Summaries of Product Characteristics (SPCs) should be consulted for full prescribing information.

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