1.0 ACTION FOR CONSULTEES

Consultees are asked to consider and comment upon the *All Wales Prescribing Guidelines for Asthma and COPD*.

2.0 PURPOSE

This project aims to reduce variation in inhaler prescribing. Several audits in different health boards have demonstrated large variations in inhaler prescribing in different practices despite similar prevalence of chronic obstructive pulmonary disease (COPD) and asthma. Many health boards have produced local guidelines for COPD and asthma management, and it was discussed and agreed at Respiratory Health implementation group meetings that an All Wales guideline would be more effective than local plans.

Implementation will require education at a practice level across Wales. There are monies available to create laminated posters for each practice and secondary care outpatient area, and the guidelines will be disseminated electronically as well.

The guidelines are pertinent to the following recommendation made in the *AWMSG Five-year Strategy 2013–2018*:

**Improving health – Prescribing guidance**
AWMSG will work with health boards and other stakeholders to promote the safe, effective and cost-effective use of medicines in Wales.

2.1 Process

- AWPAG meeting 9 March 2016
- Consultation May 2016

3.0 SUMMARY

This project is a key aim of the National Respiratory Delivery plan, with a focus on reducing prescribing variation. Several audits in different health boards have demonstrated large variations in inhaler prescribing in different practices despite similar prevalence of COPD and asthma. Many health boards have produced local guidelines for COPD and asthma management, and it was discussed and agreed at Respiratory Health implementation group meetings that an All Wales guideline would be more effective than local plans.

The COPD and asthma guidelines have been disseminated widely amongst the respiratory community in Wales, and have been modified to the current format. They therefore represent a broad consensus view. They follow national guidelines for asthma and COPD management.
The broad spirit of the Respiratory Delivery plan has been to support prudent healthcare and these guidelines certainly fulfil that remit. Implementation requires close cooperation with primary care and that will be undertaken through the respiratory delivery plan, coordinated by the clinical lead and project manager.

Audit of implementation will be via health board pharmacy leads to monitor the usage of different inhaler combinations and the change in overall costs. In addition we will monitor outcomes such as admissions to hospital with COPD/asthma.

It is envisaged that these guidelines may result in significant cost savings which can be reinvested in respiratory care such as developing community pulmonary rehabilitation and strengthening smoking cessation.
**ALL WALES ASTHMA MANAGEMENT AND PRESCRIBING GUIDE FOR PATIENTS AGE 18 YEARS AND OVER.**

### ALL ASTHMA PATIENTS

Underuse of inhaled steroids and overuse of reliever medication are associated with increased asthma mortality at all treatment steps including ‘mild’ asthma. It is strongly recommended that all symptomatic patients be prescribed a regular inhaled corticosteroid. Urgent review is indicated in patients that:

- Have had an emergency healthcare contact
- Have used more than 12 reliever medications in 12 months

### Treatment options include:

- Clenil Modulite® MDI 100 mcg 2 puffs BD + spacer
- Qvar® Easi-Breathe® 50 mcg 2 puffs BD
- Also prescribe a reliever medication for as required
- Salbutamol 100 mcg MDI + spacer 1–2 puffs PRN
- Salamol Easi-Breathe® 100 mcg 1–2 puffs PRN

**Combination inhalers must be prescribed by brand**

### Treatment options include:

- DuoResp Spiromax® 160/4.5 1–2 doses BD or Maintenance and Reliever Treatment (MART)
- Fostair® MDI 100/6 1–2 puffs BD + spacer\(^\dagger\) or MART
- Fostair NEXThaler® 100/6 1–2 puffs BD

**OR**

- Add to existing treatment 12-week trial one of:
  - Spiriva® Respimat\(^\dagger\) 2.5 micrograms 2 puffs OD
  - Montelukast 10 mg noce
  - Theophylline or aminophylline (prescribe by brand)

**Consult respiratory team to discuss:** Diagnostic uncertainty; co-existing complex pathology; continuous oral corticosteroids; immune-modifying agents; laminar airflow; bronchial thermoplasty; clinical trials

### Inhaler selection:

The choice of device must be based on inhaler technique and patient preference.

### At each step assess:

- Inhaler technique
- Medication concordance
- Asthma control
- Smoking status
- Update asthma action plan

### Step Down:

If well controlled, step down and reassess at 3–6 months. Reduce ICS dose by no more than 50% each time. See Asthma Prescribing Notes.

### PRIMARY CARE

### SECONDARY CARE

**Referral:**

All patients at step SPECIALIST THERAPY
Selected patients at HIGH DOSE/ADD ON THERAPY according to expertise and patient

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**Spacer Devices:** *Voluntary Spacer Device; \(^\dagger\)Aerochamber (licensed) and Volumatic (unlicensed)

\(^\dagger\)Tiotropium (Spiriva® Respimat\(^\dagger\)) is not recommended for use within NHS Wales as an add-on maintenance bronchodilator treatment in adult patients with asthma. The full recommendation can be found [here](#).

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### Chart

**Device**

- Clenil Modulite® Beclometasone dipropionate
- Qvar® Easi-Breathe® Beclometasone dipropionate
- Fostair® Beclometasone dipropionate/formoterol fumarate
- Fostair NEXThaler® Beclometasone dipropionate/formoterol fumarate
- DuoResp Spiromax® Budesonide/formoterol fumarate
- Spiriva® Respimat® Tiotropium\(^\dagger\)

**Class**

- ICS
- LABA/ICS
- LABA/ICS
- LABA/ICS
- LABA/ICS
- LAMA

**Technique**

- Soft and gentle
- Soft and gentle via spacer
- Soft and fast via spacer
- Hard and fast
- Hard and fast
- Soft and gentle
1.0 GENERAL PRINCIPLES

It is important to accurately record the dose at each step in order to gauge control.

The treatment recommendations at each step of the guideline need to be considered in the context of the individual patient’s circumstances and clinical presentation. The choice to use an alternative medication to those suggested lies with the clinician and patient. The recommendations represent consensus view on reasonable first choice medications that will be suitable for the majority of patients with asthma, but are not a substitute for individual clinical assessment. When choosing a medication for patients with asthma it is important to involve the patient in the decision, and take into account individual preference, ease with which the device can be used and prior success or failure with different asthma preparations. Where possible it is advisable to ensure continuity of device for individual patients, so that only one inhaler technique is required. The guidelines facilitate this and the visual aid at the bottom should enable clinicians and patients to choose an inhaler that allows up and down titration of treatment without having to change the device used in the majority of cases. This guidance is not intended to be restrictive, and a number of alternative treatments are available particularly as regards combination long-acting beta2 agonist (LABA)/inhaled corticosteroid (ICS) inhalers.

As indicated on the guideline at each opportunity it is important to check and address factors that are known to be associated with poor asthma control and increased morbidity/mortality, particularly those factors which can be corrected or modified:

- Check and correct inhaler technique. If you are unsure how to do this then ask for training.
- Check concordance with asthma medication. The prescription ‘fill rate’ (i.e. the actual number of preventative inhalers collected in a 12-month period compared with the total that should have been collected) is a surrogate measure of concordance. If the fill rate is less than 75% this should prompt a conversation with the patient to explore why this is the case.
- Ensure an appropriate asthma plan is in place.
- Check the patient’s smoking status and refer to smoking cessation services as needed.

2.0 ASSESSMENT OF ASTHMA CONTROL

An objective measurement of asthma control should be recorded during each consultation. This would usually include:

- A validated symptom score such as the Royal College of Physicians (RCP) ‘three questions’
- A measurement of airflow (peak expiratory flow [PEF] or spirometry)
- An assessment of exacerbation risk and symptoms based on reliever use

This information can be used to either increase or decrease the current therapy. See supplementary step-up and step-down information (Appendix 1).
3.0 INITIAL THERAPY

The initial recommended treatment for all asthmatics which are symptomatic must include an inhaled corticosteroid. This is at variance with the published British Thoracic Society guidelines, which recommend a short acting reliever medication be used as monotherapy in some patients. The rationale for use of inhaled steroids in all asthmatics is as follows:

- Asthma is an inflammatory condition of the airways; using an anti-inflammatory agent makes therapeutic sense.
- Airway inflammation is correlated with risk of asthma exacerbations including fatal and near-fatal asthma attacks, but airway inflammation is poorly correlated with symptoms or airflow limitation in many patients. There are no readily available widespread methods to measure airway inflammation and as such it is extremely difficult to identify some patients at risk of adverse asthma outcomes in clinical practice. Use of inhaled corticosteroids substantially reduces the risk of asthma exacerbations.
- There is compelling evidence from the National Review of Asthma deaths that underuse of corticosteroids and overuse of beta-agonists was a contributory factor in a significant number of asthma deaths. This included patients thought to have only 'mild' or 'moderate' asthma.
- There is additional evidence from other healthcare systems that more judicious use of inhaled corticosteroids (along with other interventions) may significantly reduce asthma morbidity and mortality.

Patients should be encouraged to use inhaled corticosteroids as the mainstay of their treatment regardless of severity. Many patients will require only low dose inhaled corticosteroids to completely control their symptoms and as such the risk–benefit relationship of adopting this strategy is favourable.

A good analogy is with cardiovascular disease in which patients with angina would not be prescribed vasodilators (e.g. glyceryl trinitrate [GTN]) for their symptoms, without modification of the underlying risk associated with the pathological disease process by also prescribing anti-hypertensive and lipid lowering medication.

4.0 COMBINED THERAPY

Patients poorly controlled on low-dose inhaled corticosteroids will most likely derive an improvement in symptoms and exacerbation risk if an ICS/LABA is used. The choice of DuoResp Spiromax® and Fostair® as recommended treatments is for the following reasons and with the following caveats:

- It provides continuity with the initial treatment step by giving the choice of either a breath actuated device or a traditional pressurised metered dose inhaler (pMDI) (combined with a spacer) with which patients will probably be familiar.
- Both preparations can be flexibly dosed in a Maintenance and Reliever Treatment (MART) regime.
- Both preparations have higher dose equivalent inhalers that could allow step up in treatment without a change in device or medication.
- The constituent medications in these combined products (budesonide, beclometasone and formoterol) have many years of clinical and safety data to support their use.
- Inhaled corticosteroids and long acting beta-agonists must be prescribed as a combination product to obviate the risk of the patient inadvertently taking the LABA as mono-therapy which has been associated with increased risk of mortality.
• ICS/LABA treatments should also be prescribed by brand to prevent the wrong inhaler device being inadvertently issued by the pharmacy.

4.1 MART dosing
Preparations containing low dose beclometasone and formoterol (Fostair® 100/6 and DuoResp Spiromax® 160/4 in this guideline) can be used in a variable dosing regimen termed MART. This is an acronym for Maintenance and Reliever Treatment. The patient should take twice daily maintenance treatment and then also use the same product and device as a reliever medication as required up to a maximum of eight puffs per day. This enables the amount of inhaled steroid to be titrated against symptoms in an accurate manner, and in some patients can achieve good control without the need for high dose inhaled corticosteroid therapy.

This regimen is good for well motivated patients with a good understanding of their disease, who only wish to use one inhaler.

When using this regimen it may be required to supply more than one inhaler per month, as it is being used as a reliever medication as well as a maintenance treatment. Alternative inhaler products, including different strengths of Fostair® and DuoResp Spiromax®, cannot and should not be prescribed in this manner.

5.0 HIGH DOSE/ADD-ON THERAPY

It is recommended that the initial option for patients that remain poorly controlled despite combined therapy is to increase the strength of the inhaler as indicated. This strategy is recommended as it allows treatment to be increased without the addition of a fourth asthma medication to the regime, and treatment can be increased while using the same inhaler device that the patient is already familiar with.

If this strategy fails to lead to improvement then a fourth asthma medication can be introduced as shown in the treatment algorithm. It is suggested 12 weeks of treatment be given before a decision is made whether a treatment has been effective or not, as this allows some measurement or estimate of the effect on exacerbation frequency. At this stage it is critically important to review and correct where possible the factors outlined under the heading ‘general principles’ and to make objective measurements of asthma control as detailed above. This facilitates treatment modification and revision in a structured manner.

5.1 Spiriva® Respimat® (tiotropium)
Tiotropium is the only long-acting anti-cholinergic treatment licensed for use in asthma and has been shown to reduce exacerbations and improve symptoms in patients who remain poorly controlled on treatment with an ICS/LABA. This treatment may be of particular benefit in patients in whom asthma and COPD are thought to co-exist. When using this medication it is important to show the patient how to use the inhaler device, which will require a different technique.

*Tiotropium (Spiriva® Respimat®) is not recommended for use within NHS Wales as an add-on maintenance bronchodilator treatment in adult patients with asthma. The full recommendation can be found here.
5.2 Montelukast
This once daily medication could be considered preferentially in patients with atopic asthma or co-existing allergic rhinitis.

5.3 Theophylline/aminophylline
This should be considered third line as potential add-on therapy (i.e. after failed trials of Spiriva® Respimat® or montelukast) because of the narrow therapeutic window and potential for drug interactions.

5.4 Onward referral
Clinicians may wish to consider referral to secondary care at this stage, depending on clinical circumstances and expertise particularly if there is any diagnostic uncertainty.

6.0 SPECIALIST THERAPY
Patients who remain uncontrolled at this step of the treatment algorithm should be referred for specialist assessment. This is for the following reasons:

- A proportion (up to 20%) will have an alternative or co-existing condition that is contributing to their symptoms. Objective and structured evaluation can help identify and treat these conditions and determine which asthma treatments are likely to be effective.
- Patients with genuine difficult asthma should be treated by a multidisciplinary team with expertise in the management of that condition.
- There is a Welsh Difficult Asthma network that can guide treatment decisions for this group of patients, but at the present time requires secondary care evaluation to facilitate discussion of cases.
- The risk–benefit for escalation of treatment at this stage requires careful evaluation.
- Treatments such as maintenance steroids, biological treatments (which are likely to become more widely used), immune modulating treatments and bronchial thermoplasty can be of value in selected patients at this stage, all of which require a degree of secondary or tertiary care input.

It is not anticipated that every patient at this step will remain exclusively under the care of a secondary care physician or team. The role of coordinated care delivered close to the patient’s home by health care providers familiar to the patient is extremely important and should be maintained.
APPENDIX 1: SUPPLEMENTARY ASTHMA STEP-UP AND STEP-DOWN INFORMATION

For asthma inhaler therapy in adult patients (≥ 18 years)

### Table 1: LEVELS OF ASThma CONTROL

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Completely controlled</th>
<th>Partially controlled</th>
<th>Uncontrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP 3 Questions</td>
<td>Daytime symptoms</td>
<td>None (twice or less/week)</td>
<td>&gt; Twice/week</td>
</tr>
<tr>
<td>Limitation on activities</td>
<td>None</td>
<td>Any</td>
<td></td>
</tr>
<tr>
<td>Nocturnal symptoms/awakening</td>
<td>None</td>
<td>&gt; Twice/week</td>
<td></td>
</tr>
<tr>
<td>Need for reliever/rescue treatment</td>
<td>None (twice or less/week)</td>
<td>&lt; 80% predicted or personal best (if known)</td>
<td></td>
</tr>
<tr>
<td>Lung function (PEF or FEV₁)</td>
<td>Normal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: VARIATIONS IN BDP EQUIVALENCE

<table>
<thead>
<tr>
<th>Inhaled corticosteroid</th>
<th>Equivalence to 400 mcg beclometasone dipropionate/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclometasone – Clicen</td>
<td>400 mcg</td>
</tr>
<tr>
<td>Beclometasone – Fostair</td>
<td>No 400 mcg equivalent: 200 mcg Fostair ≈ 500 mcg BDP</td>
</tr>
<tr>
<td>Beclometasone – Qvar</td>
<td>200 mcg Qvar = 400–500 mcg BDP (refer to SPC)</td>
</tr>
<tr>
<td>Budesonide – Pulmicort/Symbicort</td>
<td>400 mcg</td>
</tr>
<tr>
<td>Fluticasone – Flutiform/Fluticort/Seretide</td>
<td>200 mcg</td>
</tr>
<tr>
<td>Fluticasone furoate – Relvar Ellipta</td>
<td>92 mcg ≈ 500 BDP</td>
</tr>
<tr>
<td>Ciclesonide – Alvesco</td>
<td>200–300 mcg</td>
</tr>
<tr>
<td>Mometasone – Asmanex</td>
<td>200 mcg</td>
</tr>
</tbody>
</table>

**Step the patient down**

1. Identify which ICS inhaler therapy the patient is using.
2. Identify the patient’s current dose and locate where this is positioned in the Quick Reference Guide.
3. Follow the arrow and prescribe the next recommended inhaler(s) or switch to the alternative at the same step.
4. Check and correct inhaler technique. **Note: If patient is prescribed add on therapies (e.g. montelukast, oral prednisolone) these should be stopped one by one before attempting to reduce the ICS dose.**

**Do not step the patient down**

**Check concordance with therapy and consider any issues which may affect compliance.**

**Suggested action/discussion points with patient:**

1. Check and correct inhaler technique – consider spacer or alternative device.
2. Are there any issues affecting compliance e.g. dexterity?
3. If concordance or inhaler technique corrected on this occasion review again in 3 months.
4. Is the patient exposed to trigger factors e.g. smoking, pets, pollen or stress?
5. Are there any lifestyle points to consider where asthma suitability is crucial e.g. impending exam?
6. How long did it take the patient to achieve complete asthma control last time?
7. What would be the potential consequences of an exacerbation and does the patient know what to do if this occurs?
8. Has the patient got a written self-management plan?
9. What would the patient prefer to do?

**Action:**

Clinicians should use their professional judgement to decide whether to continue trialling the current therapy or step up again. If continuing on the current therapy for longer, the patient should be advised to monitor their symptoms and reliever use, and the patient should be reviewed in 1 month. Patients should be advised to return to the clinic if their symptoms become problematic within this time.

**Review the patient in 3 months**

Has the patient maintained asthma control in the last 3 months (See Quick Reference Guide)?

**Use and Care of Spacers**

- The spacer should be compatible with the pMDI being used.
- The drug should be administered by repeated single actuations of the metered drug inhaler into the spacer, each followed by inhalation.
- There should be minimal delay between pMDI actuation and inhalation.
- Tidal breathing is as effective as single breaths.
- Spacers should be cleaned monthly rather than weekly as per manufacturer’s recommendations or performance is adversely affected. They should be washed in detergent and allowed to dry in air. The mouthpiece should be wiped clean of detergent before use.
- Drug delivery may vary significantly due to static charge.
- Plastic spacers should be replaced at least every 12 months but some may need changing at six months.

**Why step down?**

As with all medicines, the well recognised benefits of ICS need to be balanced against the potential risks.

High dose ICS carry a risk of systemic side-effects e.g. adrenal suppression, growth retardation, decrease in bone mineral density, cataract and glaucoma. Clinicians should ensure patients are aware of the benefits and risks associated with high dose ICS.

**What do the guidelines say about stepping-down?**

The decision to step-down therapy should be jointly made between the clinician and the patient. Reductions should be considered every three months, but only if patients have complete asthma control. When reducing ICS clinicians should remember that patients deteriorate at different rates. If asthma is controlled with a combination of ICS/ LABA, the preferred approach is to reduce the ICS by approximately 50% whilst continuing the LABA at the same dose. Clinicians should note that Fostair® 100/6 is only available as a single strength inhaler so this approach may lead to loss of asthma control. An alternative strategy would be to prescribe the ICS and LABA as two separate devices.

NICE guidance advises that combination devices may increase adherence to therapy. As LABA monotherapy can increase the risk of asthma-related deaths, prescribers should consider each patient on an individual basis taking into account patient preference, therapeutic need and the likelihood of adherence with all asthma therapy. Any decision should be taken after having a full discussion with the patient covering the potential consequences; such as a reappearance of symptoms and what to do if they occur.

If control is maintained after stepping-down, further reductions in the ICS should be attempted until a low dose is reached, when the LABA may be stopped.

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**NOTE:** Dose equivalence not well established. Non-formulary
REFERENCES


**ALL WALES COPD MANAGEMENT AND PRESCRIBING GUIDE**

### STEP 1 Diagnosis
Smoking history (> 20 pack years), breathlessness, cough, sputum, exacerbations AND obstructive spirometry (mandatory for a diagnosis - see notes).

### STEP 2 SABA

**SABA options:**
- Salbutamol 100 mcg MDI + spacer PRN
- Easyhaler® Salbutamol 100 mcg PRN
- Salamol Easi-Breathe 100 mcg PRN

### STEP 3 LAMA or LABA

**LAMA options:**
- Spiriva® HandiHaler® 18 mcg 1 puff OD
- Seebri Breezhaler® 1 puff OD
- Eklira Genuair® 1 puff BD

*Use with caution in patients with unstable IHD, recent MI, class III or IV heart failure, arrhythmia or prolonged QT interval

**LABA options:**
- Easyhaler® Formoterol 12 mcg 1 puff BD

### STEP 4 LABA/LAMA combination

**Combination LABA/LAMA options:**
- Duaklir Genuair® 340/121 puff BD
- Ultibro Breezhaler® 50/110 1 puff OD
- Spiolto Respimat® 2.5/2.5 2 puffs OD

### STEP 5 LABA/ICS Combination + LAMA

**Combination LABA and ICS options:**
- DuoResp Spiromax® 320/9 1 puff BD
- Fostair® MDI 100/6 2 puffs BD + spacer

**Mucolytic:**
- Carbocisteine 750 mg BD

### Referral to secondary care if:
- diagnostic uncertainty
- oxygen saturations < 93%
- acute deteriorations
- new CXR changes or haemoptysis (urgent ref).

**Smokers**
Ask about smoking at every opportunity and refer to smoking cessation services.

**Device and technique**
Only prescribe a device the patient has been shown how to use. Patient choice should inform device used. Check technique at every opportunity.

**Clinical review**
Always check response. Stop if no clinical benefit.

**Inhaled corticosteroids. Consider before prescribing:**
- Only use a LABA/ICS in frequent exacerbators (2 or more p.a).
- Consider asthma phenotype if significant response. Reassess in 6-12 months and stop if no benefit
- Be aware risks of pneumonia and diabetes

**Mucolytic**
- only prescribe to those with chronic bronchitic phenotype
- stop if no symptomatic improvement after 4 weeks
- reduce from TDS starting dose to BD maintenance after 2 weeks.

### Device and Technique Table

<table>
<thead>
<tr>
<th>Device</th>
<th>Class</th>
<th>Device</th>
<th>Class</th>
<th>Device</th>
<th>Class</th>
<th>Device</th>
<th>Class</th>
<th>Device</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easyhaler®</td>
<td>LABA</td>
<td>Formoterol</td>
<td>LAMA</td>
<td>Eklira Genuair®</td>
<td>LAMA</td>
<td>Aclidinium</td>
<td>LAMA</td>
<td>Spiriva®</td>
<td>LAMA</td>
</tr>
<tr>
<td>Seebri Breezhaler®</td>
<td>LAMA</td>
<td>Glycopyrronium</td>
<td>LAMA</td>
<td>Spiriva® HandiHaler®</td>
<td>LAMA</td>
<td>Tiotropium</td>
<td>LAMA</td>
<td>Duaklir Genuair®</td>
<td>LAMA</td>
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<td>Ultibro Breezhaler®</td>
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<td>Indacaterol/Glycopyrronium</td>
<td>LAMA</td>
<td>Spiolto Respimat®</td>
<td>LAMA</td>
<td>Olodaterol/Formoterol</td>
<td>LAMA</td>
<td>Fostair® MDI</td>
<td>LABA/ICS</td>
</tr>
<tr>
<td>DuoResp Spiromax®</td>
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<td>Beclometasone/Formoterol</td>
<td>LABA/LAMA</td>
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<td>Indacaterol/Tiotropium</td>
<td>LABA/LAMA</td>
<td>DuoResp Spiromax®</td>
<td>LABA/LAMA</td>
</tr>
</tbody>
</table>

**Technique**
- Hard and fast
- Hard and fast
- Hard and fast
- Soft and gentle
- Hard and fast
- Soft and gentle
- Soft and gentle via spacer
- Hard and fast

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All Wales COPD Management and Prescribing Guide v1.7 May 2016. For review April 2017
DEVELOPED BY THE RESPIRATORY HEALTH IMPLEMENTATION GROUP
1.0 DIAGNOSIS

Spirometry is mandatory to make a diagnosis as the majority of smokers will not develop clinically significant COPD. National and local guidelines show that only 34% of patients on COPD registers have documented obstructive spirometry¹. There is a concerted emphasis therefore in improving primary care spirometry in Wales through training to Association for Respiratory Technology and Physiology (ARTP) qualification and standardisation of equipment. Current guidelines recommend using a fixed ratio FEV₁/FVC < 0.7 to diagnose obstruction²;³; however, considerable controversy exists surrounding this area. Lung elasticity naturally declines with age so that nearly half of all non-smoking young adults are misclassified as normal because they have an FEV₁/FVC > 0.7 and 20% of healthy non-smoking older adults are classified as abnormal because they have a ratio < 0.7, when in fact they are normal⁴. As a consequence, European and American guidelines suggest using a statistically derived figure from linear regression modelling, the lower limit of normal (LLN) which is the lower 5% of normally distributed FEV₁/FVC values corrected for age, sex and height⁵. In practice, the normal FEV₁/FVC ratio range at different ages is 0.6–0.8 so any value < 0.6 always indicates airways obstruction. Given that Wales aims to have all spirometry providers trained to ARTP standards, we recommend adopting the LLN to diagnose obstruction.

Severity of COPD is based on the percentage predicted FEV₁.

### NICE 2010/GOLD 2014 COPD severity

<table>
<thead>
<tr>
<th>FEV₁</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 30%</td>
<td>Very severe</td>
</tr>
<tr>
<td>30–&lt; 50%</td>
<td>Severe</td>
</tr>
<tr>
<td>50–&lt; 80%</td>
<td>Moderate</td>
</tr>
<tr>
<td>≥ 80%</td>
<td>Mild (requires symptoms to be significant)</td>
</tr>
</tbody>
</table>

2.0 SMOKING

Stopping smoking is the only intervention that alters the progression of COPD. Ask, advise, assess, assist and arrange (referral to stop smoking services) for every patient at every visit.

3.0 EXERCISE

Deconditioning as patients become more breathless with COPD is a frequent outcome and patients should be encouraged to remain active. Pulmonary rehabilitation is a highly effective intervention at improving quality of life and functioning and reducing hospitalisations². All symptomatically breathless patients with COPD should be referred for rehabilitation if available, or National Exercise Referral Scheme (NERS).

4.0 INHALER GENERAL PRINCIPLES

Asymptomatic COPD patients do not require inhalers. Only prescribe an inhaler that the patient has been shown how to use and when the patient has demonstrated that their technique is adequate. Patients should be offered a choice of different devices within a class by someone familiar with the devices and their usage.
Note that the correct inhaler technique for dry powder inhalers (DPI) is ‘hard and fast’, whereas that for metered dose inhalers (MDI) is soft and gentle. MDI (salbutamol, Fostair®) should always be given via a small or large volume spacer.

Assess the impact of the inhaler on symptoms and if there has been no benefit, it should be stopped and an alternative tried.

4.1 Inhaled corticosteroids
Current understanding recognises heterogeneity within the umbrella term COPD. There are some patients who benefit from inhaled corticosteroids (ICS), particularly those with an asthmatic phenotype, but others who do not. In addition, there is increasing recognition of side effects associated with ICS including pneumonia⁶ and diabetes⁷. This signal appears to be higher in fluticasone containing devices⁷,⁸. Therefore, this guideline recommends combination ICS containing beclomethasone and budesonide. The best evidence for ICS is in reducing exacerbations, and therefore these should be reserved for frequent (two or more per year) exacerbators.

5.0 EXACERBATION MANAGEMENT
Exacerbations are defined as worsening symptoms beyond day to day variability prompting a change of medication. They are associated with significant mortality, morbidity and cost. A cause is only identified in 30% of patients, and frequently viruses are implicated.

**Antibiotics** are only indicated if all three Anthonisen criteria are fulfilled, or two if one of these is sputum purulence².

Anthonisen criteria: increased sputum purulence, increased sputum volume, increased dyspnoea

**Oral steroids** reduce risk of relapse, improve oxygenation and length of stay. The dose is 40 mg prednisolone for 5 days².
REFERENCES