NHS Borders NHS Fife NHS Lothian

East Region Formulary

Respiratory Chapter (Adult)

16/02/2022

/1 /2 etc.	First line, second line, etc. choice(s) within the pathway
i	Key information to note for these recommendations
SI	Specialist Initiation: may be continued in a primary care setting
SUO	Specialist Use Only: must only be prescribed by a specialist
UM	Unlicensed Medicine: a medicine with no UK marketing authorisation
UI	Unlicensed Indication: licensed medicine being used outside the terms of its licence

Healthier Scotland
Scottish Government

Table of Contents

Group	**Respiratory disorders**
Condition	**Allergy**

Pathway 1	**Treatment with antihistamines (non-sedating)**

/1	**Cetirizine**	Cetirizine 10mg tablets Cetirizine 1mg/ml oral solution sugar free	10mg once daily.
/2	**Loratadine**	Loratadine 10mg tablets Loratadine 5mg/5ml oral solution	10mg once daily.
/3	**Fexofenadine**	Fexofenadine 120mg tablets	120mg once daily.

Prescribing notes	• Antihistamines may be of value in the treatment of nasal allergies, especially hay fever, and vasomotor rhinitis. They reduce rhinorrhoea and sneezing but are usually less effective for nasal congestion. • Cetirizine and loratadine cause less sedation than chlorphenamine; they are all available over-the-counter. Drowsiness rarely occurs but patients should be advised that it is a possible side-effect and may affect performance of skilled tasks (e.g. driving); excess alcohol should be avoided. • Loratadine may be a suitable alternative for those who develop sedation with cetirizine. • For nasal spray preparations see the Ear, nose and oropharynx chapter of the formulary. • Oral antihistamines are of value in preventing urticaria and are used to treat urticarial rashes, pruritus, and insect bites and stings; they are also used in drug allergies. For guidance on Urticaria please see recommendations in the Skin chapter of the formulary.

Pathway 2	Treatment with antihistamines (sedating)

/1

Chlorphenamine is more liable to cause drowsiness in older patients.

Chlorphenamine	Chlorphenamine 4mg tablets Chlorphenamine 2mg/5ml oral solution sugar free	4mg every 4-6 hours, max 24mg daily.
	Chlorphenamine 10mg/1ml solution for injection ampoules	Intramuscular or slow intravenous injection: 10mg repeated if required, max 40mg in 24 hours.

Prescribing notes	• Antihistamines may be of value in the treatment of nasal allergies, especially hay fever, and vasomotor rhinitis. They reduce rhinorrhoea and sneezing but are usually less effective for nasal congestion. • Oral antihistamines are of value in preventing urticaria and are used to treat urticarial rashes, pruritus, and insect bites and stings; they are also used in drug allergies. • For nasal spray preparations see the Ear, nose and oropharynx chapter of the formulary. • For guidance on Urticaria please see recommendations in the Skin chapter of the formulary.

Pathway 3 Allergic emergencies

/1

There are current supply issues with adrenaline auto-injectors. Jext and Epipen devices are added as alternatives to Emerade. If an alternative to the usual brand needs to be prescribed – ensure training is provided for the new pen issued.

	Adrenaline	Adrenaline (base) 1mg/1ml (1 in 1,000) solution for injection ampoules	Intramuscularly, 0.5ml repeated if necessary at 5-minute intervals according to blood pressure, pulse and respiratory function.
		Emerade 300micrograms/0.3ml (1 in 1,000) solution for injection auto-injectors EpiPen 300micrograms/0.3ml (1 in 1,000) solution for injection auto-injectors Jext 300micrograms/0.3ml (1 in 1,000) solution for injection auto-injectors	For self-administration by intramuscular injection; repeated after 5-15 minutes as necessary.
		Emerade 500micrograms/0.5ml (1 in 1,000) solution for injection auto-injectors	The recommended dose is 300micrograms for individuals under 60kg bodyweight. The recommended dose is 300 to 500micrograms for individuals over 60kg bodyweight, depending on clinical judgement.
WITH / WITHOUT	**Chlorphenamine**	Chlorphenamine 4mg tablets Chlorphenamine 2mg/5ml oral solution sugar free	4mg every 4-6 hours, max 24mg daily.
		Chlorphenamine 10mg/1ml solution for injection ampoules	Intramuscular or slow intravenous injection: 10mg repeated if required, max 40mg in 24 hours.
WITH / WITHOUT	**Hydrocortisone**	Hydrocortisone sodium succinate 100mg powder and solvent for solution for injection vials Hydrocortisone sodium succinate 100mg powder for solution for injection vials	100-300mg intravenously.

Prescribing notes	• Adrenaline should be given immediately for an acute anaphylactic reaction (laryngeal oedema, bronchospasm and hypotension). • Chlorphenamine injection is a useful adjunctive treatment given after adrenaline injection and continued for 24-48 hours to prevent relapse. • Hydrocortisone injection is of secondary value in the initial management of anaphylactic shock because the onset of action is delayed for several hours, but should be given to prevent further deterioration in severely affected patients. • Atopic individuals are particularly at risk of anaphylactic reactions; patients with known severe allergy should carry, and receive instruction for the use of, prefilled syringes for self-administration. Patients should usually be prescribed two adrenaline prefilled syringes and advised to always carry these. • Adrenaline for self-administration should be prescribed by brand name to ensure that the patient gets the device that they have been taught to use. • The MHRA provides specific advice for healthcare professionals on the safe and effective use of adrenaline auto-injectors. • Please see guidance from the Resuscitation Council UK on emergency treatment of anaphylactic reactions.

Pathway 4 Acute attacks of hereditary angioedema

/1

For use in the symptomatic treatment of acute attacks of hereditary angioedema.

C1-esterase inhibitor SUO	Berinert 500unit powder and solvent for solution for injection vials Berinert 1,500unit powder and solvent for solution for injection vials	20 units/kg by slow intravenous injection or intravenous infusion.

Prescribing notes	• Berinert is approved for the symptomatic treatment of acute attacks of hereditary angiodema under expert supervision.

Group	**Respiratory disorders**
Condition	**Asthma**

Opening text	As part of NHS Scotland's commitment to greener health care, the environmental impact of inhalers has been examined. The majority of carbon emissions from inhalers come from the propellants in pressurised metered-dose inhalers (pMDIs), which currently account for 66.6% of all inhaler device types prescribed in NHS Scotland. The East Region Formulary encourages prescribers to have a full discussion of inhaler choices with patients, taking into account environmental impact, inhaler technique and patient factors and when clinically appropriate to prescribe a dry powder inhaler (DPI) as first choice. Further information can be found through PrescQIPP and the NICE Patient decision aid: Inhalers for asthma.
Guidance links	SIGN 158: Management of Asthma Quality Prescribing for Respiratory 2018-21

Pathway 1	Intermittent reliever therapy

/1

Short-acting beta2-agonist bronchodilators. Dry powder inhaler choice – Easyhaler, or Salbutamol Metered-Dose Inhaler.

Salbutamol	Easyhaler Salbutamol sulfate 100micrograms/dose dry powder inhaler	Initially 100-200micrograms, increased if necessary to 400micrograms; maximum 800micrograms per day.
	Salbutamol 100micrograms/dose inhaler CFC free	100-200micrograms, up to 4 times a day for persistent symptoms.

/2

Dry Powder inhaler – Bricanyl Turbohaler.

Terbutaline	Bricanyl 500micrograms/dose Turbohaler	1 inhalation (500micrograms) up to 4 times daily, for persistent symptoms.

Prescribing notes	• Dry powder inhalers (DPIs) have lower estimated carbon footprints than pressurised metered-dose inhalers (pMDIs). Where clinically appropriate, prescribers should discuss with patients the potential environmental impact of inhaler choices and the carbon footprint associated with device choices. Inhaler device choice should consider patient factors, training, inhaler technique and environmental impact, please see the NICE Patient decision aid: Inhalers for asthma for further information. • There is virtually no difference in efficacy between salbutamol and terbutaline; currently salbutamol is less expensive and available in a wider range of devices. The preferred dry powder device is the Easyhaler Salbutamol. • Inhalation is preferred to oral administration because it provides more rapid relief and causes fewer side effects. • Inhalation of a short-acting beta2-agonist bronchodilator using a pressurised metered-dose inhaler (pMDI) with a spacer is more effective in emergency use. • Patients with asthma using a short-acting beta2-agonist bronchodilator, three times or more per week, should have their asthma control re-assessed. • Salbutamol can be used as prophylaxis in exercise induced bronchospasm at a dose of 200micrograms. • Caution in patients who may be overusing short-acting beta2-agonist inhalers – patients prescribed more than 12 SABAs in a 12-month period should be reviewed to assess asthma symptoms and control.

Pathway 2	Regular preventer therapy

/1

Inhaled corticosteroids. Dry Powder Inhaler choice – Easyhaler, or Soprobec Metered-Dose Inhaler.

Beclometasone	Easyhaler Beclometasone 200micrograms/dose dry powder inhaler	200-400micrograms twice daily increased up to 800micrograms twice daily, dose to be adjusted as necessary.
	Soprobec 100micrograms/dose inhaler Soprobec 200micrograms/dose inhaler Soprobec 250micrograms/dose inhaler	200micrograms twice daily, adjusted according to response; increased if necessary up to 2mg daily in 2-4 divided doses.

/2

Dry Powder inhaler – Easyhaler Budesonide.

Budesonide	Easyhaler Budesonide 100micrograms/dose dry powder inhaler Easyhaler Budesonide 200micrograms/dose dry powder inhaler	100-800micrograms twice daily, dose to be adjusted as necessary.

Prescribing notes	• Beclometasone is first choice because it is as effective but less expensive than alternative steroid inhalers at standard equivalent doses. • Soprobec should be prescribed by brand name to avoid inadvertent switching to a different metered dose inhaler (MDI) device with a different potency. • Soprobec has a slightly different colour range to Clenil Modulite, another beclometasone dipropionate MDI. Patients should be reassured it is equivalent to their previous device. • A spacer device should also be used with beclometasone MDI. • Patients receiving more than 800micrograms daily of beclometasone or equivalent may have some systemic effects, should be given a steroid card and monitored for adrenal suppression. • Patients on high doses of inhaled steroids (more than 800micrograms daily of beclometasone dipropionate or equivalent) who receive more than three to four courses of oral steroids per year should be considered for bone protection. See osteoporosis recommendations in the Endocrine chapter of the formulary.

	• Prescribers should be aware that higher doses of inhaled steroids may be needed in patients who are smokers. • Asthma guidelines suggest patients may do better with moderate doses of steroid (400micrograms beclometasone dipropionate) plus a long-acting beta2-adrenoceptor stimulant rather than increasing the steroid dose.

Pathway 3 | Initial add on therapy

/1

There is a risk of inadvertent monotherapy with long acting beta2-agonist bronchodilators in patients with asthma. It is recommended that a combination (steroid and long acting beta2-agonist) inhaler is considered in all patients.
ICS+LABA Dry Powder Inhaler – Relvar Ellipta.

Fluticasone + Vilanterol	Relvar Ellipta 92micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily.

OR

ICS+LABA Metered-dose Inhaler – Fostair.

Beclometasone + Formoterol	Fostair 100micrograms/dose / 6micrograms/dose inhaler	One inhalation twice daily. MART: 1 inhalation twice daily; 1 inhalation as required, for relief of symptoms; maximum 8 inhalations per day.

/2

ICS+LABA Dry Powder Inhaler – Fobumix Easyhaler.

Budesonide + Formoterol	Fobumix Easyhaler 80micrograms/dose / 4.5micrograms/dose dry powder inhaler Fobumix Easyhaler 160micrograms/dose / 4.5micrograms/dose dry powder inhaler	80micrograms – two puffs twice a day. 160micrograms – one puff twice a day. MART: 2 inhalations daily in 1-2 divided doses. 1 inhalation as required for relief of symptoms, increased if necessary up to 6 inhalations as required, max. 8 inhalations per day; up to 12 inhalations daily can be used for a limited time but medical assessment is recommended.

OR

ICS+LABA Metered-dose Inhaler – Combisal.

Fluticasone + Salmeterol	Combisal 25micrograms/dose /50micrograms/dose inhaler	2 inhalations twice daily; reduced to 2 inhalations once daily, use reduced dose only if control maintained.

/3

ICS+LABA Dry Powder Inhaler – Fostair NEXThaler.

Beclometasone + Formoterol	Fostair NEXThaler 100micrograms/dose / 6micrograms/dose dry powder inhaler	One inhalation twice daily. MART: 1 inhalation twice daily; 1 inhalation as required, for relief of symptoms; maximum 8 inhalations per day.

Prescribing notes	• Fostair (beclometasone dipropionate 100micrograms and formoterol fumarate 6micrograms) is an extrafine particle and therefore is more potent. • The fluticasone salt in Relvar Ellipta is not the same as that contained in single drug fluticasone inhalers. They are not interchangeable. • Combination products can be a cost effective alternative to the individual products and are more convenient to use. In asthma they minimise the risk of inadvertent monotherapy with long-acting beta2-agonist bronchodilators. Choice will depend on the selected inhaled steroid and inhaler technique. • Patients receiving more than 800micrograms daily of beclometasone or equivalent may have some systemic effects, should be given a steroid card and monitored for adrenal suppression. • Patients on high doses of inhaled steroids (more than 800micrograms daily of beclometasone dipropionate or equivalent) who receive more than three to four courses of oral steroids per year should be considered for bone protection. See osteoporosis recommendations in the Endocrine chapter of the formulary. • Fobumix Easyhaler, Fostair MDI and Fostair NEXThaler can be used as part of maintenance and reliever therapy (MART) in asthmatic patients. Patients should be counselled on when to step up inhalations and when to seek further medical advice as part of their asthma management plan.

Pathway 4 Additional add on therapies

/1

If asthma control remains suboptimal after the addition of an inhaled long-acting beta2-agonist, then increase the dose of inhaled corticosteroid from low dose to medium dose in adults if not already on this dose, or consider adding a leukotriene receptor antagonist. If asthma control remains inadequate, consider increasing the inhaled corticosteroid to high dose or add a leukotriene receptor antagonist if not already trialled, or add tiotropium or add theophylline.
ICS+LABA Dry Powder Inhaler – Relvar Ellipta.

Fluticasone + Vilanterol	Relvar Ellipta 92micrograms/dose / 22micrograms/dose dry powder inhaler Relvar Ellipta 184micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily.

OR

ICS+LABA Dry Powder Inhaler – Fostair NEXThaler, or Fostair Metered-Dose Inaler

Beclometasone + Formoterol	Fostair NEXThaler 100micrograms/dose / 6micrograms/dose dry powder inhaler Fostair NEXThaler 200micrograms/dose / 6micrograms/dose dry powder inhaler	1-2 inhalations twice daily; maximum 4 inhalations per day.
	Fostair 100micrograms/dose / 6micrograms/dose inhaler Fostair 200micrograms/dose /6micrograms/dose inhaler	1-2 inhalations twice daily; maximum 4 inhalations per day.

OR

ICS+LABA Dry Powder Inhaler – Fobumix Easyhaler.

Budesonide + Formoterol	Fobumix Easyhaler 160micrograms/dose / 4.5micrograms/dose dry powder inhaler	Two puffs twice a day.
	Fobumix Easyhaler 320micrograms/dose / 9micrograms/dose dry powder inhaler	One to two puffs twice daily.

OR

ICS+LABA Metered-dose Inhaler – Combisal.

Fluticasone + Salmeterol	Combisal 25micrograms/dose /250micrograms/dose inhaler	2 inhalations twice daily; reduced to 2 inhalations once daily, use reduced dose only if control maintained.

/2

Montelukast	Montelukast 10mg tablets	10mg once daily, dose to be taken in the evening.

/3

LAMA soft-mist inhaler – Spiriva Respimat.

Tiotropium	Spiriva Respimat 2.5micrograms/dose inhalation solution cartridge with device Spiriva Respimat 2.5micrograms/dose inhalation solution refill cartridge	2 inhalations once daily.

/4

Older patients – theophylline preparations are best avoided due to increased potential for drug interactions and risk of arrhythmia.

Theophylline	Uniphyllin Continus 200mg tablets Uniphyllin Continus 300mg tablets Uniphyllin Continus 400mg tablets	200mg every 12 hours increased according to response to 400mg every 12 hours. May be appropriate to give larger evening or morning dose to achieve optimum therapeutic effect when symptoms most severe; in patients whose night or daytime symptoms persist despite other therapy, who are not currently receiving theophylline, total daily requirement may be added as single evening or morning dose.

Prescribing notes	• Fostair (beclometasone dipropionate 200micrograms and formoterol fumarate 6micrograms) is an extrafine particle and therefore is more potent. • The fluticasone salt in Relvar Ellipta is not the same as that contained in single drug fluticasone inhalers. They are not interchangeable. • Combination products can be a cost effective alternative to the individual products and are more convenient to use. In asthma they minimise the risk of inadvertent monotherapy with long-acting beta2-agonist bronchodilators. Choice will depend on the selected inhaled steroid and inhaler technique. • Patients receiving more than 800micrograms daily of beclometasone or equivalent may have some systemic effects, should be given a steroid card and monitored for adrenal suppression. • Patients on high doses of inhaled steroids (more than 800micrograms daily of beclometasone dipropionate or equivalent) who receive more than three to four courses of oral steroids per year should be considered for bone protection. See osteoporosis recommendations in the Endocrine chapter of the formulary. • Montelukast should be taken at bedtime; those patients that experience sleep disturbance will still get a clinical benefit by switching the dose to the morning. • Montelukast has been associated with a risk of neuropsychiatric reactions and prescribers should be alert for reactions: please see MHRA Drug Safety Update. Review after 4 weeks for ongoing benefit. • Theophylline is a bronchodilator used for reversible airways obstruction, which may have an additive effect when used with small doses of beta2-adrenoceptor stimulants; this combination may increase the risk of side-effects including hypokalaemia. • Theophylline has a narrow margin between therapeutic and toxic effects; therapy should be monitored. Theophylline and aminophylline interact with many drugs; see BNF for details. • Smoking cessation may increase theophylline levels, this is independent of any nicotine replacement therapies that may be prescribed.

Pathway 5	Acute asthma

/1

Short-acting beta2-agonist bronchodilator choices, with or without oxygen (see prescribing notes).

Salbutamol	Salbutamol 2.5mg/2.5ml nebuliser liquid unit dose vials Salbutamol 5mg/2.5ml nebuliser liquid unit dose vials Salbutamol 5mg/ml nebuliser liquid	2.5–5mg up to 4 times daily or more frequently. In severe cases 5mg, repeat every 20–30 minutes or when required, give via oxygen-driven nebuliser if available.
	Salbutamol 500micrograms/1ml solution for injection ampoules SI	Subcutaneous or intramuscular injection, 500micrograms, repeated every 4 hours if necessary. Slow intravenous injection, 250micrograms repeated if necessary. Intravenous infusion, initially 5micrograms/minute, adjusted according to response and heart rate usually in range 3-20micrograms/minute, or more if necessary.

/2

Corticosteroid choices, see prescribing notes regarding use of a Steroid Emergency Card.

Prednisolone	Prednisolone 5mg tablets Prednisolone 5mg soluble tablets Prednisolone 5mg/5ml oral solution unit dose Prednisolone 10mg/ml oral solution sugar free	30-40mg daily reducing once the attack has been controlled.
OR **Hydrocortisone**	Hydrocortisone sodium succinate 100mg powder and solvent for solution for injection vials	By slow intravenous injection or infusion, 100mg every 6 hours until conversion to oral prednisolone is possible.

	Hydrocortisone sodium succinate 100mg powder for solution for injection vials	

/3

Magnesium sulfate SUO	Magnesium sulfate 50% (magnesium 2mmol/ml) solution for injection 2ml ampoules Magnesium sulfate 50% (magnesium 2mmol/ml) solution for injection 5ml ampoules Magnesium sulfate 50% (magnesium 2mmol/ml) solution for injection 10ml ampoules Magnesium sulfate 50% (magnesium 2mmol/ml) solution for injection 20ml vials	1.2–2g over 20 minutes.

/4

Note: patients taking oral theophylline should not normally receive a bolus or loading dose but could receive the infusion dose ideally guided by plasma levels.

Aminophylline SUO	Aminophylline 250mg/10ml solution for injection ampoules	Deteriorating acute severe asthma not previously treated with theophylline, by slow intravenous injection over at least 20 minutes, 250-500mg (5mg/kg) then as for acute severe asthma. Acute severe asthma, by intravenous infusion 500-700micrograms/kg/hour, adjusted according to plasma-theophylline concentration.

Prescribing notes	• First choice short-acting beta2-agonist bronchodilator choices may be used with or without oxygen – adjust flow to maintain an oxygen saturation of 94-98%. • Acute attacks of asthma should be treated with short courses of 30-40mg prednisolone daily, reducing once the attack has been controlled. Usually doses of up to 40mg daily taken for less than 3 weeks do not need to be tapered. It may be appropriate for some patients to have a “rescue” course of prednisolone at home, if this is agreed as part of the self-management strategy of their asthma.

- See the Healthcare Improvement Scotland website for details around the use of a Steroid Emergency Card.
- Prednisolone oral solution and soluble tablets are restricted to use in patients who are unable to swallow tablets. These preparations are considerably more expensive than the standard tablets.
- Prednisolone oral solution 5mg/mL, single dose unit presentation should not be prescribed for doses exceeding 30mg daily.
- Normally short courses of steroids can be stopped abruptly but in certain cases they should be tapered - see BNF for more information.
- With regard to gastrointestinal effects, there is no advantage by using enteric coated prednisolone tablets; plain tablets should be used.
- Intravenous hydrocortisone is used in the management of acute severe asthma.
- Hydrocortisone sodium succinate is recommended in preference to hydrocortisone sodium phosphate which has been associated with perineal irritation.

Equivalent doses	
IV hydrocortisone 50mg 3 times daily	Oral prednisolone 40mg daily (approx.)
IV hydrocortisone 50mg 4 times daily	Oral prednisolone 50mg daily
IV hydrocortisone 100mg 3 times daily	Oral prednisolone 75mg daily
IV hydrocortisone 100mg 4 times daily	Oral prednisolone 100mg daily

- Aminophylline has a narrow margin between therapeutic and toxic effects; therapy should be monitored.
- Intravenous aminophylline is not a recommended drug in primary care having been superseded by nebulised beta2-agonists.
- Theophylline and aminophylline interact with many drugs; see BNF for details.
- Smoking cessation may increase aminophylline levels, this is independent of any nicotine replacement therapies that may be prescribed.

Pathway 6	Immunotherapy in asthma

/1	**Benralizumab** SUO	Fasenra 30mg/1ml solution for injection pre-filled pens	Dose as per specialist.
OR	**Mepolizumab** SUO	Nucala 100mg/1ml solution for injection pre-filled pens	Dose as per specialist.
OR	**Omalizumab** SUO	Xolair 150mg/1ml solution for injection pre-filled syringes	Dose as per specialist.

/2	**Dupilumab** SUO	Dupixent 200mg/1.14ml solution for injection pre-filled pens Dupixent 200mg/1.14ml solution for injection pre-filled syringes Dupixent 300mg/2ml solution for injection pre-filled pens Dupixent 300mg/2ml solution for injection pre-filled syringes	Dose as per specialist.

Prescribing notes	• Omalizumab (Xolair) is approved for specialist use only in patients with severe, persistent confirmed allergic IgE-mediated asthma as an add-on to optimised standard therapy (a full trial of and, if tolerated, documented compliance with inhaled high-dose corticosteroids, long-acting beta2 agonists, leukotriene receptor antagonists, theophyllines, oral corticosteroids, and smoking cessation if clinically appropriate) in people aged 6 years and older who need continuous or frequent treatment with oral corticosteroids (defined as 4 or more courses in the previous year). • Mepolizumab (Nucala) is approved for specialist use only in adult patients with severe refractory eosinophilic asthma. It is restricted to patients requiring 4 or more courses of prednisolone for exacerbation in the previous 12 months or are on chronic daily oral steroids despite maintenance with high dose inhaled steroids plus one other controller therapy. • SMC advice restricts mepolizumab use for adult patients as an add-on treatment for severe refractory eosinophilic asthma who have eosinophils of at least 150 cells per microlitre (0.15 x 109/L) at initiation of treatment and have had at least four asthma exacerbations in the preceding year or are receiving maintenance treatment with oral corticosteroids. • Benralizumab (Fasenra) is specialist use only for add-on maintenance treatment in adult patients with severe eosinophilc asthma inadequately controlled by high dose inhaled corticosteroids plus long-acting β-agonists, blood eosinophils ≥150

	cells/microlitre, and either ≥4 prior asthma exacerbations needing systemic corticosteroids in the previous 12 months or treatment with continuous oral corticosteroids over the previous 6 months.

Pathway 7	Prophylaxis of exacerbations of severe asthma

/1

	Azithromycin SI	Azithromycin 250mg capsules	Dose as per specialist.

Prescribing notes	• Prescribing of azithromycin should be on the advice of a respiratory specialist, following sensitivities and investigations in secondary care.

Pathway 8	General information on inhalers

Prescribing notes	• Best practice is to prescribe all inhalers by brand name (except salbutamol) and device type. • Changing the type of inhaler device may impact the effectiveness of therapy and the incidence of adverse effects. There are new versions of existing combination inhalers coming on to the market. Take care to ensure the intended product is prescribed and dispensed. • Assessment of a patient's inhaler technique is required before an inhaler is prescribed as this will determine the choice of product. Information on assessing inhaler technique and counselling on the correct method can be found at the PrescQIPP website or the My Lungs My Life website. The individual forms can be printed out for patient use. • Older patients may have difficulty using any inhaler device due to reduced hand strength, poor inspiratory effort, or confusion. Individual assessment is required. • All inhalers have different 'in use' expiry, this can lead to unintended wastage. Ensure patients are given adequate advice on effective use of the device. *For example, an inhaler with an in use expiry of 6 weeks: one inhaler lasts 1 month with regular use. If 2 inhalers are prescribed and dispensed and both opened at the same time, they will both expire 6 weeks later, but if opened one at a time they would have lasted 8 weeks.* • Inhaler-induced cough by MDI may be alleviated by use of a spacer or change of device. • It is essential to specify inhaler device, strength and dose. • Not all spacers are compatible with all inhalers; users should seek advice from their local pharmacist regarding the appropriate spacer to be used.

Pathway 9 Oxygen therapy

/1

Oxygen cylinder – adjust flow to maintain an oxygen saturation of 94-98%.

Prescribing notes	• Further information is available in the 'National Guidance and Best Practice for Domiciliary Oxygen Therapy'. • The Department of Health has issued safety advice through the Central Alerting Service regarding electronic cigarettes and oxygen therapy. Patients and carers should be advised not to use an electronic cigarette whilst a patient is receiving oxygen therapy and batteries of electronic cigarettes should not be charged in the vicinity of a patient receiving oxygen therapy or the oxygen source.

Pathway 10 Spacer devices

/1

	AeroChamber Plus Flow-Vu Anti-Static	AeroChamber Plus Flow-Vu Anti-Static AeroChamber Plus Flow-Vu Anti-Static with adult small mask AeroChamber Plus Flow-Vu Anti-Static with adult large mask	For use with pressurised inhalers.
OR	**Volumatic**	Volumatic	For use with pressurised inhalers.

Prescribing notes	• A poster has been developed to provide guidance on selecting the correct *AeroChamber Plus Flow-Vu Anti-Static* valved holding chamber. • Local advice is that patients should inhale from the spacer device using a single breath with 5-10 second breath hold. • Spacers should be cleaned no more than weekly, with water and washing-up liquid, or put in a dishwasher, and allowed to air dry. More frequent cleaning affects their performance due to build-up of static. • AeroChamber Plus Flow-Vu and Volumatic should be replaced every 12 months following regular use.

Pathway 11	Peak flow meters

/1

Peak flow meter standard range	Mini-Wright peak flow meter standard range Vitalograph peak flow meter standard range	For use with pressurised inhalers.

Prescribing notes	• Measurement of peak flow is helpful for patients who are unable to detect deterioration in their asthma, and for those with moderate or severe asthma. Mini-Wright and Vitalograph peak flow meters are the most commonly prescribed.

Group	Respiratory disorders
Condition	Bronchiectasis

Pathway 1	Treatment with mucolytics

/1	**Acetylcysteine** SI	NACSYS 600mg effervescent tablets	One tablet, once daily, dispersed in water.
/2	**Carbocisteine** SI	Carbocisteine 375mg capsules	Two capsules three times a day, can reduce to two capsules twice daily if response satisfactory.

Prescribing notes	• A trial of mucolytics can be considered in patients with bronchiectasis who have difficulty in sputum expectoration. Trial period should be advised by specialist, the patient should be reviewed and treatment discontinued if no clinical benefit observed.

Pathway 2	Treatment with nebulised saline

/1

Nebulised saline is commonly used in hospital for patients with bronchiectasis.

Sodium chloride SUO	Sodium chloride 0.9% nebuliser liquid 2.5ml unit dose ampoules	To be used as directed.

Pathway 3	Prophylaxis of exacerbations of bronchiectasis

/1

Specialist initiation following investigations in secondary care.

Azithromycin SI	Azithromycin 250mg capsules	Dose as per specialist.

Prescribing notes	• Prescribing of azithromycin should be on the advice of a respiratory specialist, following sensitivities and investigations in secondary care.

Group	**Respiratory disorders**
Condition	**Chronic Obstructive Pulmonary Disease (COPD)**

Opening text	The pathways in this section refer to the GOLD Guidelines 2022. This means that initial pathways (GOLD A-D) are not a stepwise progression, but intended as a guide for initiation of the pharmacological management of COPD according to the individual patient assessment of symptoms and exacerbation risk following the ABCD scheme. Following implementation of therapy, there are separate follow up pathways (dyspnoea and exacerbations) for any patient already taking maintenance treatment and are not dependent on the GOLD group at diagnosis. As part of NHS Scotland's commitment to greener health care, the environmental impact of inhalers has been examined. The majority of carbon emissions from inhalers come from the propellants in pressurised metered-dose inhalers (pMDIs), which currently account for 66.6% of all inhaler device types prescribed in NHS Scotland. The East Region Formulary encourages prescribers to have a full discussion of inhaler choices with patients, taking into account environmental impact, inhaler technique and patient factors and when clinically appropriate to prescribe a dry powder inhaler (DPI) as first choice. Further information can be found through PrescQIPP.
Guidance links	GOLD COPD

Pathway 1 Management of stable COPD (GOLD A)

/1

Bronchodilator options for 0 or 1 moderate exacerbations (no hospital admissions) and mMRC 0-1, CAT <10.
Dry Powder Inhaler choice – Easyhaler, or Salbutamol Metered-Dose Inhaler.

Salbutamol	Easyhaler Salbutamol sulfate 100micrograms/dose dry powder inhaler	Initially 100–200micrograms, increased if necessary to 400micrograms; maximum 800micrograms per day.
	Salbutamol 100micrograms/dose inhaler CFC free	100-200micrograms, up to 4 times a day for persistent symptoms.

/2

Dry Powder inhaler – Bricanyl Turbohaler.

Terbutaline	Bricanyl 500micrograms/dose Turbohaler	1 inhalation (500micrograms) up to 4 times daily, for persistent symptoms.

OR

LAMA (Long Acting Muscarinic Antagonist) Dry Powder Inhaler – Incruse Ellipta.

Umeclidinium bromide	Incruse Ellipta 55micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium).

OR

LAMA soft-mist inhaler – Spiriva Respimat.

Tiotropium	Spiriva Respimat 2.5micrograms/dose inhalation solution cartridge with device Spiriva Respimat 2.5micrograms/dose inhalation solution refill cartridge	Two inhalations once daily, at the same time of the day.

OR

LABA (Long Acting Beta2 Agonist) options: Dry Powder Inhaler – Formoterol Easyhaler, or Atimos Modulite Metered-Dose Inhaler.

Formoterol	Formoterol Easyhaler 12micrograms/dose dry powder inhaler	One inhalation twice a day.
	Atimos Modulite 12micrograms/dose inhaler	One inhalation twice a day, for symptom relief additional doses may be taken up to maximum 4 doses a day.

Prescribing notes	• There is virtually no difference in efficacy between salbutamol and terbutaline; currently salbutamol is less expensive and available in a wider range of devices. The preferred dry powder device is the Easyhaler salbutamol. • Inhalation is preferred to oral administration because it provides more rapid relief and causes fewer side effects. • Patients with acute exacerbation of COPD rarely require doses higher than 2.5mg salbutamol via nebulisers. Higher doses may be required in asthma where there is a dose related response. • Spirometry should be performed before prescribing antimuscarinic bronchodilator. • Before prescribing a Respimat device please ensure patient is able to load device and activate. • LABA monotherapy in COPD patients may be appropriate. • Combination preparations should be used to support patient compliance. • Ipratropium can be used in patients with COPD however LAMAs must not be given in combination with ipratropium.

Pathway 2 Management of stable COPD (GOLD B)

/1

LAMA (Long Acting Muscarinic Antagonist) options for 0 or 1 moderate exacerbations (no hospital admissions) and mMRC ≥ 2, CAT ≥10. Dry Powder Inhaler – Incruse Ellipta.

Umeclidinium bromide	Incruse Ellipta 55micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium).

OR

LAMA soft-mist inhaler – Spiriva Respimat.

Tiotropium	Spiriva Respimat 2.5micrograms/dose inhalation solution cartridge with device Spiriva Respimat 2.5micrograms/dose inhalation solution refill cartridge	Two inhalations once daily, at the same time of the day.

OR

LABA (Long Acting Beta2 Agonist) options: Dry Powder Inhaler – Formoterol Easyhaler, or Atimos Modulite Metered-Dose Inhaler.

Formoterol	Formoterol Easyhaler 12micrograms/dose dry powder inhaler	One inhalation twice a day.
	Atimos Modulite 12micrograms/dose inhaler	One inhalation twice a day, for symptom relief additional doses may be taken up to maximum 4 doses a day.

/2

For patients with severe breathlessness, initial therapy with two bronchodilators may be considered.
LAMA/LABA (Long Acting Muscarinic Antagonist/Long Acting Beta2 Agonist) options: Dry Powder Inhaler – Anoro Ellipta.

Umeclidinium bromide + Vilanterol	Anoro Ellipta 55micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium and 22micrograms of vilanterol).

OR

LAMA/ LABA soft-mist inhaler – Spiolto Respimat.

Tiotropium + Olodaterol	Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution cartridge with device Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution refill cartridge	Two puffs once daily.

Prescribing notes	• Spirometry should be performed before prescribing antimuscarinic bronchodilator. • Before prescribing a Respimat device please ensure patient is able to load device and activate. • LABA monotherapy in COPD patients may be appropriate. • Combination preparations should be used to support patient compliance. • Ipratropium can be used in patients with COPD however LAMAs must not be given in combination with ipratropium.

Pathway 3	Management of stable COPD (GOLD C)

/1

LAMA (Long Acting Muscarinic Antagonist) options for ≥ 2 moderate exacerbations (or ≥ 1 leading to hospital admission) and mMRC 0-1, CAT <10. Dry Powder Inhaler – Incruse Ellipta.

Umeclidinium bromide	Incruse Ellipta 55micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium).

OR

LAMA soft-mist inhaler – Spiriva Respimat.

Tiotropium	Spiriva Respimat 2.5micrograms/dose inhalation solution cartridge with device Spiriva Respimat 2.5micrograms/dose inhalation solution refill cartridge	Two inhalations once daily, at the same time of the day.

Prescribing notes	• Before prescribing a Respimat device please ensure patient is able to load device and activate. • Combination products can be a cost-effective alternative to the individual products and are more convenient to use. Choice will depend on the selected inhaled steroid and inhaler technique. • Combination preparations should be used to support patient compliance. • LAMAs must not be given in combination with ipratropium.

Pathway 4 | Management of stable COPD (GOLD D)

/1

LAMA (Long Acting Muscarinic Antagonist) options for ≥2 moderate exacerbations (or ≥1 leading to hospital admission) and mMRC ≥ 2, CAT ≥10. Dry Powder Inhaler – Incruse Ellipta.

Umeclidinium bromide	Incruse Ellipta 55micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium).

OR

LAMA soft-mist inhaler – Spiriva Respimat.

Tiotropium	Spiriva Respimat 2.5micrograms/dose inhalation solution cartridge with device Spiriva Respimat 2.5micrograms/dose inhalation solution refill cartridge	Two inhalations once daily, at the same time of the day.

/2

LAMA/LABA (Long Acting Muscarinic Antagonist/Long Acting Beta2 Agonist) options. Dry Powder Inhaler – Anoro Ellipta.

Umeclidinium bromide + Vilanterol	Anoro Ellipta 55micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium and 22micrograms of vilanterol).

OR

LAMA/LABA soft-mist inhaler – Spiolto Respimat.

Tiotropium + Olodaterol	Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution cartridge with device Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution refill cartridge	Two puffs once daily.

/3

LABA/ICS (Long Acting Beta2 Agonist/Inhaled Corticosteroid Combination) options: Dry Powder Inhaler – Fostair NEXThaler, or Fostair Metered-Dose Inhaler.

Beclometasone + Formoterol	Fostair NEXThaler 100micrograms/dose / 6micrograms/dose dry powder inhaler	2 inhalations twice daily; maximum 4 inhalations per day.
	Fostair 100micrograms/dose / 6micrograms/dose inhaler	2 inhalations twice daily; maximum 4 inhalations per day.

OR

LABA/ICS Dry Powder Inhaler – Relvar Ellipta.

Fluticasone + Vilanterol	Relvar Ellipta 92micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily.

Prescribing notes	• Before prescribing a Respimat device please ensure patient is able to load device and activate. • Fostair (beclometasone dipropionate 100micrograms and formoterol fumarate 6micrograms) is an extrafine particle formulation and therefore is more potent. • Fostair NEXThaler dry powder is the same dosing as Fostair MDI. • The fluticasone salt in Relvar Ellipta is not the same as that contained in single drug fluticasone inhalers. They are not interchangeable. • Combination products can be a cost-effective alternative to the individual products and are more convenient to use. Choice will depend on the selected inhaled steroid and inhaler technique. • Inhaled corticosteroids for COPD should only be prescribed for patients with an FEV1 of 50% predicted or less, who have two or more exacerbations needing treatment with antibiotics or oral corticosteroids a year. • Patients receiving more than 800micrograms daily of beclometasone or equivalent may have some systemic effects, should be given a steroid card and monitored for adrenal suppression. • Patients on high doses of inhaled steroids (more than 800micrograms daily of beclometasone dipropionate or equivalent) who receive more than three to four courses of oral steroids per year should be considered for bone protection. See osteoporosis recommendations in the Endocrine chapter of the formulary. • Combination preparations should be used to support patient compliance. • LAMAs must not be given in combination with ipratropium.

Pathway 5 Follow up pharmacological treatment – dyspnoea

/1

Follow up pharmacological management should be guided by principles of review and assess, then adjust if needed.
LABA (Long Acting Beta2 Agonist) Dry Powder Inhaler – Formoterol Easyhaler, or Atimos Modulite Metered-Dose Inhaler.

Formoterol	Formoterol Easyhaler 12micrograms/dose dry powder inhaler	One inhalation twice a day.
	Atimos Modulite 12micrograms/dose inhaler	One inhalation twice a day, for symptom relief additional doses may be taken up to maximum 4 doses a day.

OR

LAMA (Long Acting Muscarinic Antagonist) Dry Powder Inhaler – Incruse Ellipta.

Umeclidinium bromide	Incruse Ellipta 55micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium).

OR

LAMA soft-mist inhaler – Spiriva Respimat.

Tiotropium	Spiriva Respimat 2.5micrograms/dose inhalation solution cartridge with device Spiriva Respimat 2.5micrograms/dose inhalation solution refill cartridge	Two inhalations once daily, at the same time of the day.

/2

LAMA/LABA (Long Acting Muscarinic Antagonist/Long Acting Beta2 Agonist) options: Dry Powder Inhaler – Anoro Ellipta.

Umeclidinium bromide + Vilanterol	Anoro Ellipta 55micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium and 22micrograms of vilanterol).

OR

LAMA/LABA soft-mist inhaler – Spiolto Respimat.

Tiotropium + Olodaterol	Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution cartridge with device Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution refill cartridge	Two puffs once daily.

/3

LABA/ICS (Long Acting Beta2 Agonist/Inhaled Corticosteroid Combination) options: Dry Powder Inhaler – Fostair NEXThaler, or Fostair Metered-Dose Inhaler.

Beclometasone + Formoterol	Fostair NEXThaler 100micrograms/dose / 6micrograms/dose dry powder inhaler	2 inhalations twice daily; maximum 4 inhalations per day.
	Fostair 100micrograms/dose / 6micrograms/dose inhaler	2 inhalations twice daily; maximum 4 inhalations per day.

OR

LABA/ICS Dry Powder Inhaler – Relvar Ellipta.

Fluticasone + Vilanterol	Relvar Ellipta 92micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily.

/4

LABA/LAMA/ICS (Long Acting Beta2 Agonist/ Long Acting Muscarinic Antagonist/ Inhaled Corticosteroid Combination) Dry Powder Inhaler – Trelegy Ellipta.

Fluticasone + Umeclidinium bromide + Vilanterol	Trelegy Ellipta 92micrograms/dose / 55micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation daily, dose should be taken at the same time each day.

OR

LABA/LAMA/ICS Metered-Dose Inhaler – Trimbow.

Beclometasone + Formoterol + Glycopyrronium bromide	Trimbow 87micrograms/dose / 5micrograms/dose / 9micrograms/dose inhaler	Two inhalations twice daily.

Prescribing notes	• Before prescribing a Respimat device please ensure patient is able to load device and activate. • Fostair (beclometasone dipropionate 100micrograms and formoterol fumarate 6micrograms) is an extrafine particle formulation and therefore is more potent. • Fostair NEXThaler dry powder is the same dosing as Fostair MDI. • The fluticasone salt in Relvar Ellipta is not the same as that contained in single drug fluticasone inhalers. They are not interchangeable. • Combination products can be a cost effective alternative to the individual products and are more convenient to use. Choice will depend on the selected inhaled steroid and inhaler technique. • Inhaled corticosteroids for COPD should only be prescribed for patients with an FEV1 of 50% predicted or less, who have two or more exacerbations needing treatment with antibiotics or oral corticosteroids a year. • Patients receiving more than 800micrograms daily of beclometasone or equivalent may have some systemic effects, should be given a steroid card and monitored for adrenal suppression. • Patients on high doses of inhaled steroids (more than 800micrograms daily of beclometasone dipropionate or equivalent) who receive more than three to four courses of oral steroids per year should be considered for bone protection. See osteoporosis recommendations in the Endocrine chapter of the formulary. • Combination preparations should be used to support patient compliance. • LAMAs must not be given in combination with ipratropium. • For patients with persistent breathlessness or exercise limitation on LABA/ICS treatment, LAMA can be added to escalate to triple therapy. Alternatively, switching from LABA/ICS to LABA/LAMA should be considered if the original indication for ICS was inappropriate, or if there is a lack of response to ICS treatment or, if ICS side effects require discontinuation. • Use of Trimbow is restricted to use in adult patients with severe COPD who are not adequately treated by a combination of an inhaled corticosteroid and a long acting beta2-agonist, whose FEV1 (% predicted) is less than 50% and who have had 2 or more exacerbations in the last year. • Use of Trelegy is restricted to use in adult patients with severe COPD who are not adequately treated by a combination of an inhaled corticosteroid and a long acting beta2-agonist , whose FEV1 (% predicted) is less than 50% and who have had 2 or more exacerbations in the last year.

Pathway 6 Follow up pharmacological treatment – exacerbations

/1

Follow up pharmacological management should be guided by principles of review and assess, then adjust if needed. LABA (Long Acting Beta2 Agonist) options. Dry Powder Inhaler – Formoterol Easyhaler, or Atimos Modulite Metered-Dose Inhaler.

Formoterol	Formoterol Easyhaler 12micrograms/dose dry powder inhaler	One inhalation twice a day.
	Atimos Modulite 12micrograms/dose inhaler	One inhalation twice a day, for symptom relief additional doses may be taken up to maximum 4 doses a day.

OR

LAMA (Long Acting Muscarinic Antagonist) options. Dry Powder Inhaler – Incruse Ellipta.

Umeclidinium bromide	Incruse Ellipta 55micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium).

OR

LAMA soft-mist inhaler – Spiriva Respimat.

Tiotropium	Spiriva Respimat 2.5micrograms/dose inhalation solution cartridge with device Spiriva Respimat 2.5micrograms/dose inhalation solution refill cartridge	Two inhalations once daily, at the same time of the day.

/2

LAMA/LABA (Long Acting Muscarinic Antagonist/Long Acting Beta2 Agonist) options. Dry Powder Inhaler – Anoro Ellipta.

Umeclidinium bromide + Vilanterol	Anoro Ellipta 55micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily (each inhalation is equivalent to 55micrograms umeclidinium and 22micrograms of vilanterol).

OR

LAMA/LABA soft-mist inhaler – Spiolto Respimat.

Tiotropium + Olodaterol	Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution cartridge with device Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution refill cartridge	Two puffs once daily.

OR

LABA/ICS (Long Acting Beta2 Agonist/Inhaled Corticosteroid Combination) options. Dry Powder Inhaler – Fostair NEXThaler, or Fostair Metered-Dose Inhaler.

Beclometasone + Formoterol	Fostair NEXThaler 100micrograms/dose / 6micrograms/dose dry powder inhaler	2 inhalations twice daily; maximum 4 inhalations per day.
	Fostair 100micrograms/dose / 6micrograms/dose inhaler	2 inhalations twice daily; maximum 4 inhalations per day.

OR

LABA/ICS Dry Powder Inhaler – Relvar Ellipta.

Fluticasone + Vilanterol	Relvar Ellipta 92micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation once daily.

/3

Triple therapy (LABA/LAMA/ICS) options. Dry Powder Inhaler – Trelegy Ellipta.

Fluticasone + Umeclidinium bromide + Vilanterol	Trelegy Ellipta 92micrograms/dose / 55micrograms/dose / 22micrograms/dose dry powder inhaler	One inhalation daily, dose should be taken at the same time each day.

OR

LABA/LAMA/ ICS Metered-Dose Inhaler – Trimbow.

Beclometasone + Formoterol + Glycopyrronium bromide	Trimbow 87micrograms/dose / 5micrograms/dose / 9micrograms/dose inhaler	Two inhalations twice daily.

/4

Specialist initiation following investigations in secondary care.

Azithromycin SI	Azithromycin 250mg capsules	Dose as per specialist.

Prescribing notes	• Before prescribing a Respimat device please ensure patient is able to load device and activate. • Fostair (beclometasone dipropionate 100micrograms and formoterol fumarate 6micrograms) is an extrafine particle formulation and therefore is more potent. • Fostair NEXThaler dry powder is the same dosing as Fostair MDI. • The fluticasone salt in Relvar Ellipta is not the same as that contained in single drug fluticasone inhalers. They are not interchangeable. • Combination products can be a cost-effective alternative to the individual products and are more convenient to use. Choice will depend on the selected inhaled steroid and inhaler technique. • Inhaled corticosteroids for COPD should only be prescribed for patients with an FEV1 of 50% predicted or less, who have two or more exacerbations needing treatment with antibiotics or oral corticosteroids a year. • Patients receiving more than 800micrograms daily of beclometasone or equivalent may have some systemic effects, should be given a steroid card and monitored for adrenal suppression. • Patients on high doses of inhaled steroids (more than 800micrograms daily of beclometasone dipropionate or equivalent) who receive more than three to four courses of oral steroids per year should be considered for bone protection. See osteoporosis recommendations in the Endocrine chapter of the formulary. • Combination preparations should be used to support patient compliance. • LAMAs must not be given in combination with ipratropium. • Use of Trimbow is restricted to use in adult patients with severe COPD who are not adequately treated by a combination of an inhaled corticosteroid and a long acting beta2-agonist, whose FEV1 (% predicted) is less than 50% and who have had 2 or more exacerbations in the last year.

	• Use of Trelegy is restricted to use in adult patients with severe COPD who are not adequately treated by a combination of an inhaled corticosteroid and a long acting beta2-agonist, whose FEV1 (% predicted) is less than 50% and who have had 2 or more exacerbations in the last year. • Prescribing of azithromycin should be on the advice of a respiratory specialist, following sensitivities and investigations in secondary care.

Pathway 7	Treatment with mucolytics

/1	**Acetylcysteine**	NACSYS 600mg effervescent tablets	One tablet, once daily, dispersed in water.
/2	**Carbocisteine**	Carbocisteine 375mg capsule	Two capsules three times a day, can reduce to two capsules twice daily if response satisfactory.

Prescribing notes	• A 4-week trial of a mucolytic agent should be considered in COPD patients chronically troubled by sputum production. Only continue if symptoms improve.

Pathway 8	Acute exacerbation of COPD

/1

	Amoxicillin	Amoxicillin 500mg capsules Amoxicillin 250mg/5ml oral suspension sugar free	500mg every 8 hours for 5 days.
OR	**Doxycycline**	Doxycycline 100mg capsules	200mg on day 1, then 100mg daily for 5 days treatment in total.

/2

Consider an alternative antibiotic (amoxicillin or doxycycline) that wasn't used as first choice.

Prescribing notes	• The vast majority of respiratory tract illness is self-limiting and it is recommended that the term "infection" is avoided. Purulent sputum alone is not a marker for antibiotic treatment. • Oral cephalosporins are not a suitable choice as they do not penetrate lung tissue. • Antibiotics are only indicated in acute exacerbations of COPD when purulent sputum **and** increased breathlessness **and/or** increased sputum volume are present. • Risk factors for antibiotic resistant organisms include co-morbid disease, severe COPD, frequent exacerbations, antibiotics in the last three months. Consider sending a sputum sample +/- chest X-ray to assess if consolidation present. • Co-trimoxazole may be considered for use, particularly in individuals who have received multiple courses of antibiotics, the elderly and those at risk of Clostridium difficile infection, and have persistent symptoms of infection despite first line antibiotics. Send sputum for culture and consider a CXR. • For an exacerbation of COPD, prednisolone 30mg should be prescribed for 5 days; there is no advantage in prolonged therapy and no evidence to support the weaning of prednisolone over a longer period following a 5 day course.

Pathway 9	General information on inhalers

Prescribing notes	• Best practice is to prescribe all inhalers by brand name (except salbutamol) and device type. • Changing the type of inhaler device may impact the effectiveness of therapy and the incidence of adverse effects. There are new versions of existing combination inhalers coming on to the market. Take care to ensure the intended product is prescribed and dispensed. • Assessment of a patient's inhaler technique is required before an inhaler is prescribed as this will determine the choice of product. Information on assessing inhaler technique and counselling on the correct method can be found at the PrescQIPP website or the My Lungs My Life website. The individual forms can be printed out for patient use. • Older patients may have difficulty using any inhaler device due to reduced hand strength, poor inspiratory effort, or confusion. Individual assessment is required. • All inhalers have different 'in use' expiry, this can lead to unintended wastage. Ensure patients are given adequate advice on effective use of the device. *For example, an inhaler with an in use expiry of 6 weeks: one inhaler lasts 1 month with regular use. If 2 inhalers are prescribed and dispensed and both opened at the same time, they will both expire 6 weeks later, but if opened one at a time they would have lasted 8 weeks.* • Inhaler-induced cough by MDI may be alleviated by use of a spacer or change of device. • It is essential to specify inhaler device, strength and dose. • Not all spacers are compatible with all inhalers; users should seek advice from their local pharmacist regarding the appropriate spacer to be used.

Pathway 10	Nebulisers – acute hospital use

/1	**Salbutamol** SUO	Salbutamol 2.5mg/2.5ml nebuliser liquid unit dose vials Salbutamol 5mg/2.5ml nebuliser liquid unit dose vials Salbutamol 5mg/ml nebuliser liquid	2.5–5mg up to 4 times daily or more frequently. In severe cases 5mg, repeat every 20–30 minutes or when required.
/2	**Ipratropium** SUO	Ipratropium bromide 250micrograms/1ml nebuliser liquid unit dose vials Ipratropium bromide 500micrograms/2ml nebuliser liquid unit dose vials	500micrograms as required; maximum 2mg per day.

Prescribing notes	• Nebulisers are not currently prescribable in general practice; patients should be referred for respiratory assessment and if suitable they will be leased a machine. A spacer should be tried before considering a nebuliser. • All nebulisers should be serviced regularly. However, difficulties are often encountered in the servicing of privately owned nebulisers. Patients should be discouraged from buying a nebuliser. • Ipatropium nebuliser should not be given with a LAMA.

Pathway 11	Nebulisers – long-term primary care

/1

Nebulisers should only be used in patients with an FEV_1<50% and on maximum inhaled therapy under care of a respiratory specialist.

Salbutamol SI	Salbutamol 2.5mg/2.5ml nebuliser liquid unit dose vials Salbutamol 5mg/2.5ml nebuliser liquid unit dose vials Salbutamol 5mg/ml nebuliser liquid	2.5–5mg up to 4 times daily or more frequently. In severe cases 5mg, repeat every 20–30 minutes or when required.

/2

Ipratropium SI	Ipratropium bromide 250micrograms/1ml nebuliser liquid unit dose vials Ipratropium bromide 500micrograms/2ml nebuliser liquid unit dose vials	500micrograms as required; maximum 2mg per day.

Prescribing notes	• Nebulisers are not currently prescribable in general practice; patients should be referred for respiratory assessment and if suitable they will be leased a machine. A spacer should be tried before considering a nebuliser. • All nebulisers should be serviced regularly. However, difficulties are often encountered in the servicing of privately owned nebulisers. Patients should be discouraged from buying a nebuliser. • Ipatropium nebuliser should not be given with a LAMA.

Pathway 12	Spacer devices

/1	**AeroChamber Plus Flow-Vu Anti-Static**	AeroChamber Plus Flow-Vu Anti-Static AeroChamber Plus Flow-Vu Anti-Static with adult small mask AeroChamber Plus Flow-Vu Anti-Static with adult large mask	For use with pressurised inhalers
OR	**Volumatic**	Volumatic	For use with pressurised inhalers

Prescribing notes	• A poster has been developed to provide guidance on selecting the correct *AeroChamber Plus Flow-Vu Anti-Static* valved holding chamber. • Local advice is that patients should inhale from the spacer device using a single breath with 5-10 second breath hold. • Spacers should be cleaned no more than weekly with water and washing-up liquid, or put in a dishwasher, and allowed to air dry. More frequent cleaning affects their performance due to build-up of static. • AeroChamber Plus Flow-Vu and Volumatic should be replaced every 12 months following regular use.

Group	Respiratory disorders
Condition	Cough

Pathway 1	Management of cough

Prescribing notes	• There is little evidence to support the use of cough suppressants. • For persistent cough lasting 4-6 weeks, the underlying cause should be established.

Group	Respiratory disorders
Condition	Croup

There are no adult pathways for this condition, please see the paediatric Respiratory chapter.

Group	Respiratory disorders
Condition	Cystic fibrosis

Pathway 1	Treatment with mucolytics

/1

Sodium chloride SI	Sodium chloride 0.9% nebuliser liquid 2.5ml unit dose ampoules Sodium chloride 0.9% inhalation solution 2.5ml vials Sodium chloride 3% inhalation solution 4ml ampoules Sodium chloride 3% inhalation solution 4ml vials Sodium chloride 6% inhalation solution 4ml ampoules Sodium chloride 6% inhalation solution 4ml vials Sodium chloride 7% inhalation solution 4ml vials Sodium chloride 7% nebuliser liquid Sodium chloride 7% nebuliser liquid 5ml ampoules Sodium chloride 7% nebuliser liquid 5ml bottles Sodium chloride 7% nebuliser liquid 10ml bottles Sodium chloride 7% nebuliser liquid 20ml vials Sodium chloride 7% nebuliser liquid 30ml bottles	To be used as directed.

OR	**Dornase alfa** SI	Dornase alfa 2.5mg/2.5ml nebuliser liquid ampoules	2.5mg once daily, administered by jet nebuliser, patients over 21 years may benefit from twice daily dosage.

Prescribing notes	• Dornase alfa is used in some patients with cystic fibrosis. It is appropriate for a shared care arrangement to facilitate the seamless transfer of individual patient care from secondary care to general practice. • Hypertonic saline (7%) may be prescribed in cystic fibrosis. • Mucolytics are not approved for use in COPD. If prescribed they should be reviewed after 4 weeks to assess if there has been any clinical benefit. If of benefit the dose should be reduced as the condition improves.

Group	Respiratory disorders
Condition	Pulmonary fibrosis

Pathway 1	Treatment of idiopathic pulmonary fibrosis (IPF)

/1	**Nintedanib** SUO	Ofev 100mg capsules Ofev 150mg capsules	Dose as per specialist.
OR	**Pirfenidone** SUO	Esbriet 267mg tablets Esbriet 801mg tablets	Dose as per specialist.

Prescribing notes	• Before initiating systemic vascular endothelial growth factor (VEGF) pathway inhibitors (nintedanib), carefully consider the risk of aneurysm and artery dissection in patients with risk factors. In patients who receive a systemic VEGF pathway inhibitor, reduce as far as possible any modifiable risk factors such as hypertension. For further advice see MHRA Drug Safety Update, July 2020. • Nintedanib and pirfenidone are approved for the treatment of mild to moderate idiopathic pulmonary fibrosis for use in patients with a predicted forced vital capacity less than or equal to 80%. • Serious liver injury has been reported in patients treated with pirfenidone. For further advice on liver function testing see MHRA Drug Safety Update November 2020. • Patients should be monitored on a regular basis. The need for ongoing treatment should be reviewed after 3 months and 12 months. • Due to different formulations of nintedanib being licensed for different indications prescribe by brand name only.

Pathway 2	Treatment of other chronic fibrosing interstitial lung disease (ILD)

/1	**Nintedanib** SUO	Ofev 100mg capsules Ofev 150mg capsules	Dose as per specialist.

Prescribing notes	• Nintedanib is approved for use for the treatment of other chronic fibrosing interstitial lung diseases with a progressive phenotype.