

## Chapter 3. Respiratory system

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Key

	<b>Red drug</b> see <a href="#">GMMMG RAG list</a> <i>Click on the symbols to access this list</i>
	<b>Amber drug</b> see <a href="#">GMMMG RAG list</a> <i>Click on the symbols to access this list</i>
	<b>Green drug</b> see <a href="#">GMMMG RAG list</a> <i>Click on the symbols to access this list</i>
<b>U</b>	If a medicine is unlicensed this should be highlighted in the template as follows <b>Drug name U</b>
	<b>Not Recommended</b>
<b>OTC</b>	<b>Over the Counter</b>
<b>Order of Drug Choice</b>	Where there is no preferred 1 <sup>st</sup> line agent provided, the drug choice appears in alphabetical order.

<b>BNF chapter</b>	<b>3</b>	<b>Respiratory system</b>
<b>Section</b>	<b>3.1</b>	<b>Bronchodilators</b>
<b>Subsection</b>	<b>3.1.1</b>	<b>Adrenoreceptor agonists</b>
<b>Short acting</b>		
<b>First choice</b>	<p><b>Salbutamol</b> 100 micrograms/dose CFC free MDI (Ventolin Evohaler®) (Airomir® inhaler)</p>	<p><a href="#">GM COPD Management Plan</a></p> <p><a href="#">BTS/SIGN asthma guideline</a></p>
<b>Alternatives</b>	<p><b>Salbutamol</b> 100 micrograms/dose, 200 micrograms/dose Dry powder (Easyhaler®) Breath actuated (Airomir® Autohaler) Breath actuated (Salamol Easi-Breathe®) <b>Terbutaline</b> 500 micrograms/dose DPI (Bricanyl® Turbohaler) <b>Salbutamol</b> DPI capsules 200 micrograms /dose (Ventolin® Accuhaler)</p>	<p><a href="#">RDTC Cost Comparison charts</a></p> <p><a href="#">NICE TA38: Inhaler device</a></p>
	<p><b>Salbutamol</b> Nebuliser solution 2.5mg /2.5ml, 5mg / 2.5ml <b>Terbutaline</b> Nebuliser solution 5mg/2ml (Respules)® <b>Salbutamol</b> Injection 500 microgram/ml Solution for intravenous infusion 5mg/5ml <b>Terbutaline</b> Injection 500 microgram/ml 2.5mg/5ml (Bricanyl®)</p>	<b>R</b>
<p>Respiratory solutions should be reserved for patients with distressing or disabling breathlessness despite maximum therapy with inhalers. The need for continued therapy with respiratory solutions should be reviewed by a specialist respiratory service.</p> <p><a href="#">MHRA DSU: short-acting beta 2 agonists, Nov 2013</a>: the use of short-acting adrenoreceptor agonists for tocolysis in premature labour has been restricted to 48 hours' maximum parenteral use under specialist supervision, after a European safety review.</p>		
<b>Long acting</b>		
<b>First choice</b>	<p><b>Formoterol</b> DPI 12 micrograms/dose (Easyhaler)® DPI 6 micrograms/dose, 12 micrograms/dose</p>	

	(Oxis <sup>®</sup> Turbohaler)	
<b>Alternatives</b>	<p><b>Salmeterol</b></p> <p>MDI 25 micrograms/dose (Serevent Evohaler)<sup>®</sup></p> <p>DPI 50 micrograms/dose (Serevent Accuhaler)<sup>®</sup></p>	
<p><b>MHRA update 2010:</b></p> <p>Long-acting beta 2 agonists (LABAs) should always be prescribed with concomitant inhaled corticosteroid (ICS) and only when ICS alone is not sufficient to control asthma symptoms. Review LABA therapy regularly, prescribe the lowest effective dose, and stop if there is no benefit.</p>		
<b>Subsection</b>	<b>3.1.2 Antimuscarinic bronchodilators</b>	
<b>Short acting</b>		
	<b>Ipratropium</b> MDI 20 microgram/dose	
<b>Long acting</b>		
<b>First Choice</b>	<p><b>Tiotropium</b></p> <p>2.5 microgram/2.5 microgram, inhalation solution (Spiriva Respimat<sup>®</sup>)</p>	<p><a href="#">GM COPD Management Plan</a></p> <p><a href="#">MHRA DSU: Respimat compared with Handihaler, Feb 2015</a></p>
<b>Alternatives</b>	<p><b>Aclidinium</b>▼</p> <p>Inhalation powder, 400 microgram/metered inhalation (Eklira Genuair<sup>®</sup>)</p> <p><b>Glycopyrronium</b>▼</p> <p>Inhalation powder, 50 microgram capsules with inhaler device (Seebri Breezhaler<sup>®</sup>)</p> <p><b>Umeclidinium</b>▼</p> <p>Inhalation powder, 55 mcg per inhalation (Incruse Ellipta<sup>®</sup>)</p>	
<b>Respiratory solutions</b>	<p><b>Ipratropium</b></p> <p>250micrograms/1ml, 500micrograms/2ml</p>	
<b>Subsection</b>	<b>3.1.3 Theophylline</b>	
<b>First choice</b>	<p>Uniphyllin Continus<sup>®</sup> (<b>theophylline</b>)</p> <p>Modified release tablets 200mg, 300mg, 400mg</p>	
<b>Alternatives</b>	<p><b>Aminophylline</b> (Phyllocontin Continus<sup>®</sup>)</p> <p>Modified release tablets 225mg, 350mg</p> <p>Injection 250mg/10ml</p>	
<b>Subsection</b>	<b>3.1.4 Compound bronchodilator preparations</b>	
	<b>Aclidinium/formoterol</b> 340/12 DPI	<a href="#">GM COPD Management Plan</a>

	<p>(Duaklir® Genuair®▼)</p> <p><b>Glycopyrronium/indacaterol</b> 85/43 DPI</p> <p>(Ultibro Breezhaler®▼)</p> <p><b>Umeclidinium/vilanterol</b> 55/22</p> <p>DPI (Anoro Ellipta®▼)</p> <p><b>Olodaterol/tiotropium</b> 2.5/2.5</p> <p>Soft mist inhaler (Spiolto Respimat®)</p>	
<b>Subsection</b>	<b>3.1.5 Peak flow meters, inhaler devices and nebulisers</b>	
<b>Spacer devices</b>		
	<p><b>A2A® Spacer</b></p> <p><b>Aerochamber® Plus</b></p> <p>Standard device with mouthpiece</p> <p>Standard device with adult face mask</p> <p><b>Volumatic®</b></p> <p>Large volume device with mouth piece</p>	<p><a href="#">NICE TA10: Inhaler devices in children under 5</a></p> <p><a href="#">NICE TA38: Inhaler device</a></p>
<b>Additional notes</b>		
<p><b><a href="#">MHRA DSU: inhaled corticosteroids and spacers, July 2008</a></b></p> <p>Spacers should not be regarded as interchangeable: patients who use a spacer with their inhaler should use the spacer device named in the Summary of Product Characteristics (where specified by name.)</p>		
<b>Nebuliser diluents</b>		
	<p><b>Sodium chloride</b></p> <p>Nebuliser solution 0.9% 2.5ml</p>	

<b>BNF chapter</b>	<b>3</b>	<b>Respiratory system</b>
<b>Section</b>	<b>3.2</b>	<b>Corticosteroids</b>
<b>First choice</b>	<p>Clenil (<b>beclometasone dipropionate</b>) Modulite® MDI 50, 100, 200, 250 microgram/dose</p> <p>Qvar® (<b>beclometasone dipropionate</b>) MDI 50, 100 microgram/dose Easi-Breathe® or Autohaler®</p>	<p>Prescribe beclometasone dipropionate by brand</p> <p><a href="#">GM COPD Management Plan</a></p> <p><a href="#">BTS/SIGN asthma guideline</a></p> <p><a href="#">NICE TA131: Corticosteroids asthma (children)</a></p> <p><a href="#">NICE TA138: Corticosteroids asthma (adult)</a></p>
<b>Alternatives</b>	<p><b>Budesonide</b> 100, 200, 400 micrograms / dose DPI (Easyhaler®) (Pulmicort® Turbohaler®)</p> <p><b>Fluticasone propionate</b> MDI (Flixotide® Evohaler®) 50, 125, 250 micrograms/dose DPI 50,100, 250, 500 micrograms /dose (Flixotide® Accuhaler®)</p>	<p><a href="#">NICE TA131: Corticosteroids asthma (children)</a></p> <p><a href="#">NICE TA138: Corticosteroids asthma (adult)</a></p>
<b>Respiratory solutions</b>	<p><b>Budesonide</b> 250micrograms/ml, 500micrograms/ml Respules®</p> <p><b>Fluticasone propionate</b> 250micrograms/ml, 1mg/ml Nebules®</p>	
<p><a href="#">MHRA DSU: inhaled corticosteroids and spacers (July 2008)</a></p> <p>The MHRA has advised that beclometasone dipropionate CFC-free inhalers should be prescribed by brand name. Clenil Modulite® and Qvar® are not interchangeable. Qvar® has extra fine particles, and is approximately twice as potent as Clenil Modulite®</p> <p><a href="#">MHRA DSU: Corticosteroids: rare risk of central serous chorioretinopathy with local as well as systemic administration (August 2017)</a></p> <p>Advise patients to report any blurred vision or other visual disturbances during corticosteroid treatment</p>		
<p><b>Combination ICS / LABA inhalers</b></p>		
	<p><b>Beclometasone/formoterol</b> 100/6, 200/6 MDI (Fostair®100/6, 200/6) DPI (Fostair NEXThaler® 100/6, 200/6)</p> <p><b>Budesonide /formoterol</b> 100/6, 200/6, 400/12 DPI (Symbicort Turbohaler®)</p> <p><b>Budesonide/formoterol</b> 160/4.5, 320/9 DPI (Duoresp Spiromax®)</p> <p><b>Fluticasone/formoterol</b> 50/5, 125/5, 250/10</p>	<p><a href="#">GM COPD Management Plan</a></p> <p><a href="#">NICE TA131: Corticosteroids asthma (children)</a></p> <p><a href="#">NICE TA138: Corticosteroids asthma (adult)</a></p> <p><a href="#">NTS recommendation: Symbicort® and Fostair® as</a></p>

	<p>MDI (Flutiform®)</p> <p><b>Fluticasone/salmeterol</b> 50, 125, 250</p> <p>MDI (Seretide® Evohaler® 50, 125, 250, Sirdupla® 125, 250)</p> <p><b>Fluticasone/salmeterol</b> 100, 250, 500</p> <p>DPI (Seretide Accuhaler® 100, 250, 500, AirFluSal Forspiro®500/50)</p> <p><b>Fluticasone/vilanterol</b> 92/22</p> <p>DPI (Relvar Ellipta®)</p>	<p><a href="#">regular maintenance and reliever treatment in asthma as per the SMART/MART regimes</a></p>
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**Combination ICS / LABA / LAMA inhalers**

	<p><b>Fluticasone/umeclidinium/vilanterol</b> 92/55/22</p> <p>DPI (Trelegy®)</p> <p><b>Beclometasone/formoterol/glycopyrronium</b> 87/5/9</p> <p>MDI (Trimbow®)</p>	<p><b>G<sub>n</sub></b></p> <p><a href="#">GM COPD Management Plan</a></p> <p>Patients currently on triple therapy should not be automatically switched onto these agents without a clear assessment being undertaken to confirm a need for triple therapy to continue</p>
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**[MHRA DSU: inhaled corticosteroids and spacers, July 2008](#)**

Fostair® is a CFC-free, fixed-dose combination of beclometasone and formoterol, which is licensed for the management of asthma and COPD in patients aged 18 years or older. Similar to Qvar®, Fostair® contains an extra fine formulation of beclometasone and is more potent than traditional CFC-containing beclometasone inhalers.

Fostair NEXThaler® is licensed for the regular treatment of asthma in patients over the age of 18 years where a combination of ICS/LABA is appropriate. Unlike the pressurised metered dose inhaler Fostair NEXThaler® is not licensed for the management of COPD, or for maintenance and reliever therapy (MART) in adults with asthma.

**Duoresp Spiromax® only indicated for use in those over the age of 18 years**


<b>BNF chapter</b>	<b>3</b>	<b>Respiratory system</b>
<b>Section</b>	<b>3.3</b>	<b>Cromoglicate and related therapy and leukotriene receptor antagonists</b>
<b>Subsection</b>	<b>3.3.2</b>	<b>Leukotriene receptor antagonists</b>
<b>First choice</b>	<b>Montelukast</b> Tablets 10mg	
<b>Subsection</b>	<b>3.3.3</b>	<b>Phosphodiesterase type-4 inhibitors</b>
	<b>Roflumilast (Daxas®)</b> ▼ 500 microgram tablet	<b>G<sub>n</sub> Following specialist initiation</b> <a href="#">Approved for the treatment of COPD in line with NICE TA461</a>

<b>BNF chapter</b>	<b>3</b>	<b>Respiratory system</b>
<b>Section</b>	<b>3.4</b>	<b>Antihistamines, hyposensitisation, and allergic emergencies</b>
<b>Subsection</b>	<b>3.4.1</b>	<b>Antihistamines</b>
<b>Non-sedating antihistamines</b>		
<b>First choice</b>	<b>Cetirizine</b> Tablets 10mg Oral solution <sup>SF</sup> 5mg / 5mL	<a href="#">GMMMG (2017): The management of chronic urticaria in primary care for adults and children</a>
<b>Second choice</b>	<b>Loratadine</b> Tablets 10mg Oral solution 5mg / 5mL	
<b>Sedating antihistamines</b>		
<b>First choice</b>	<b>Chlorphenamine</b> Tablets 4mg Oral solution 2mg / 5mL	Hydroxyzine is favoured by dermatologists for its anti-itch and sedating effects  <a href="#">MHRA DSU: Hydroxyzine: risk of QT prolongation and Torsade de Pointes, April 2015</a>
<b>Second choice</b>	<b>Hydroxyzine</b> Tablets 10mg, 25mg Oral solution 10mg / 5mL	
<b>Subsection</b>	<b>3.4.2 Allergen immunotherapy</b>	
	<b>Bee and Wasp Allergen Extracts</b> Pharmalgen® Subcutaneous injection, initial and maintenance treatment sets	<a href="#">NICE TA246 Venom anaphylaxis - immunotherapy pharmalgen</a> <b>Specialist use only</b>
	<b>Mepolizumab</b> ▼ (Nucala®) 100 mg powder for solution for injection	<b>R</b> <a href="#">NICE TA431: Mepolizumab for treating severe refractory eosinophilic asthma</a>
	<b>Omalizumab</b> Injection pre-filled syringe 75mg/0.5ml, 150mg/1ml	<b>R</b> <a href="#">NICE TA339: Omalizumab for previously treated chronic spontaneous urticaria</a> <a href="#">NICE TA278: asthma (severe, persistent, patients aged 6+, adults) - omalizumab (rev TA133, TA201)</a>



	<p><b>Reslizumab</b>▼ (Cinqaero®) 10 mg/mL concentrate for solution for infusion</p>	<p><b>R</b></p> <p><a href="#">NICE TA479: Reslizumab for treating severe eosinophilic asthma</a></p> <p>(NHS England commmissioned)</p>
<b>Subsection</b>	<b>3.4.3 Allergic emergencies</b>	
<b>Anaphylaxis</b>		
	<p><b>Adrenaline / Epinephrine</b> Intramuscular injection for self-administration 1 in 1000 - 0.5ml, 1ml</p> <p><b>Emerade</b>® Auto-injector 150, 300 and 500 microgram dose (adrenaline)</p> <p><b>Epipen</b>® Auto-injector 300 microgram dose (adrenaline)</p> <p><b>Jext</b>® Auto-injector 300 microgram dose (adrenaline)</p>	<p><a href="#">Resuscitation Guidelines</a></p> <p><a href="#">MHRA DSU (2017): Adrenaline auto-injectors: updated advice after European review</a></p>
<p><b>Note:</b> It is advisable to prescribe adrenaline auto-injector by brand to avoid confusion. There may be differences in the shelf life between brands, please check the SPC for details.</p>		

<b>BNF chapter</b>	<b>3</b>	<b>Respiratory system</b>
<b>Section</b>	<b>3.6</b>	<b>Oxygen</b>
<p><b>Home Oxygen Provision</b></p> <p>Most patients who are prescribed oxygen have respiratory disease, typically COPD, Cystic fibrosis or pulmonary fibrosis. People with chronic asthma or sleep disordered breathing may also benefit. Oxygen therapy is also an effective treatment for some people with cardiac or neurological disease (e.g. cluster headaches) and is an important element in palliative medicine.</p> <p>There is a requirement of CCGs to formally commission a HOS-AR (Home Oxygen Assessment and Review) service that will clinically deliver the full requirements of oxygen therapy to the community, ensuring that good assessment and review provision will impact positively on emergency hospital admissions and out-patient appointments.</p> <p>For further advice and support please contact the clinical lead of your HOS-AR service or your regional oxygen lead; Karen Hatch on 07733318436 or Karen.hatch@lancashirecare.nhs.uk</p> <p>Refer to additional notes document for further information.</p>		

<b>BNF chapter</b>	<b>3</b>	<b>Respiratory system</b>
<b>Section</b>	<b>3.7</b>	<b>Mucolytics</b>
	<b>Carbocisteine</b> Capsules 375mg, liquid 250mg/5ml	
<b>Dornase alfa</b>		
	<b>Dornase Alfa</b> nebuliser solution 2500 units/2.5mL	
<b>Additional notes</b> <b>Dornase alfa must only be initiated within hospital for the treatment of cystic fibrosis.</b>		
<b>Hypertonic sodium chloride</b>		
	<b>Hypertonic sodium chloride</b> for nebulisation 3%, 6% (MucoClear®) 4ml vials 7% (Nebusal®) 4mL vials	Prescribe by brand to avoid unlicensed special use.
<b>Mannitol</b>		
	<b>Mannitol</b> inhalation powder Hard capsules 40mg	<a href="#">NICE TA 266: Mannitol for cystic fibrosis</a>
<b>Additional notes</b> <a href="#">NICE TA398 (July 2016): Lumacaftor-ivacaftor for treating cystic fibrosis homozygous for the F508del mutation</a> <b>NOT RECOMMENDED</b> <a href="#">NICE NG78: Cystic fibrosis: diagnosis and management</a>		

<b>BNF chapter</b>	<b>3</b>	<b>Respiratory system</b>
<b>Section</b>	<b>3.11</b>	<b>Antifibrotics</b>
	<b>Pirfenidone</b> ▼ Capsules 267mg	<a href="#">NICE TA282: Idiopathic pulmonary fibrosis - pirfenidone</a> 