Doncaster & Bassetlaw Medicines Formulary

Short-Acting $\beta_2$ Agonists (SABA)
- Salbutamol 100micrograms/dose CFC Free MDI
- Salbutamol 100micrograms/dose Easyhaler
- Salbutamol 2.5mg and 5mg Nebules
- Salbutamol 500micrograms/1ml and 5mg/5ml Injection
- Terbutaline 500micrograms/1ml and 2.5mg/5ml Injection

Long-Acting $\beta_2$ Agonists (LABA)
- Formoterol 12microgram Easyhaler
- Atimos Modulite (formoterol 6 and 12micrograms/dose)

Short-Acting Muscarinic Antagonists (SAMA)
- Ipratropium Bromide 20micrograms/dose CFC Free MDI
- Ipratropium Bromide 250 and 500micrograms Nebules

Long-Acting Muscarinic Antagonists (LAMA)
- Incruse Ellipta (umeclidinium 55micrograms/dose)

Methylxanthines
- Aminophylline (Phyllocontin) 225mg and 350mg Tablets
- Aminophylline 250mg in 10ml Injection
- Theophylline (Nuelin SA) 175mg and 250mg MR Tablets
- Theophylline (Slo-Phyllin) 60, 125 and 250mg MR Capsules
- Theophylline (Uniphyllin) 200, 300 and 400mg MR Tablets

Compound Bronchodilator Preparations (LAMA/LABA)
- Anoro Ellipta 55/22 (umeclidinium 55micrograms and vilanterol 22micrograms)

Other Adrenoceptor Agonists
- Adrenaline 1 in 1000 Injection (including auto-injectors; section 3.4)
- Ephedrine 30mg in 1ml Injection

Peak Flow Meters/Spacers
- Able Spacer
- AeroChamber Plus Spacer Device (Standard/Infant/Child)
- Peak Flow Meters (Standard/Low Range)
- Volumatic Large Volume Spacer Device

Approved by Drug and Therapeutics Committee: March 2018
Review by: March 2020

KEY: [UL] Unlicensed Preparation; Drug – first line choice; Drug – hospital only; Drug – Amber (TLS), Drug – Red (TLS), see http://medicinesmanagement.doncasterpct.nhs.uk/
Prescribing Guidance:

Prescribers should be familiar with the following guidelines (click to access):

- BTS guidelines for the Management of Asthma
- NICE Guidance for the Management of COPD

For local management of inhaled therapies in COPD, see:
- Formulary Guidance for Management of COPD Patients

Before initiating a new drug therapy practitioners should check compliance with existing therapies, inhaler technique and eliminate trigger factors.

Summary tables (outlining recommended first-line choices dependent on type of device) are available via Formulary First Line Choices for Asthma and COPD.

Prescribing outside this formulary should only take place via a New Product Request.
INHALED BRONCHODILATOR THERAPY

COPD

All people with COPD who still smoke, regardless of age, should be encouraged to stop, and offered help to do so at every opportunity.

Patients who are stopping smoking should be referred to a treatment agency in primary care, in order that care can be continued once they leave hospital:

See Section 4.10 for contact numbers.

The British Lung Foundation Support Network (BreatheEasy) has produced a booklet covering all aspects of COPD from:

Causes and diagnosis to healthy lifestyle choices and where to go for help.
The booklet is available by contacting:

Fiona Clamp, Cantley Health Centre
E: Fiona.clamp@rdash.nhs.uk
T: 01302 379501/379569

Requests for copies will be organised by either email or telephone request.

ASTHMA

The aim of asthma management is control of the disease. Complete control of asthma is defined as:

- no daytime symptoms
- no night-time awakening due to asthma
- no need for rescue medication
- no exacerbations
- no limitations on activity including exercise
- normal lung function (in practical terms FEV1 and/or PEF>80% predicted or best)
- minimal side effects from medication

Treatment should be tailored to the patients needs using the algorithm below (from the BTS guidelines for the Management of Asthma):

- All patients with symptomatic asthma should be prescribed an inhaled short-acting β2 agonist as short-term reliever therapy. As required use is at least as good as regular (four times daily) use. Salbutamol is the first-line short-acting β2 agonist
- Heavy or increasing use of β2 agonist therapy is associated with asthma death. Identify and urgently review people with asthma prescribed more than 12 reliever inhalers per year: they are likely to have poor controlled asthma. One canister containing 200 doses of salbutamol should last a year when asthma is well controlled.
Inhaled corticosteroids (introduced at step 2, above) should be added for any patient with any of the following asthma-related features:

- Exacerbations of asthma in the last 2 years
- Using inhaled $\beta_2$ agonist 3 times a week or more
- Symptomatic 3 times a week or more, or
- Waking 1 night a week

Long-acting inhaled $\beta_2$ agonists should only be started in patients who are already on inhaled corticosteroids, and the inhaled corticosteroid should be continued.

**INTRAVENOUS BRONCHODILATORS**

Parenteral $\beta_2$ agonists should be reserved for those patients who cannot reliably use inhaled therapy.

**NEBULISED BRONCHODILATORS**

- During an acute exacerbation of asthma or COPD short-acting bronchodilators may be administered via either a nebuliser or pMDI plus spacer
- Combining nebulised ipratropium bromide with a nebulised $\beta_2$ agonist has been shown to produce significantly greater bronchodilation than a $\beta_2$ agonist alone. This combination should be used in patients with acute severe or life threatening asthma or those with an initial poor response to $\beta_2$ agonist therapy

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- The choice of delivery system should reflect the dose of drug required, the ability of the patient to use the device and the resources available to supervise administration of the therapy
- Asthmatic patients should have the nebuliser driven by oxygen
- COPD patients who are hypercapnic or acidotic should have the nebuliser driven by compressed air, not oxygen (to avoid worsening hypercapnia). If oxygen therapy is needed it should be administered simultaneously via nasal cannulae
- The driving gas for nebulised therapy should always be specified in the prescription

Commencement of long term nebulised therapy should be preceded by a formal nebuliser trial and it is recommended this be done under the supervision of a Respiratory Consultant. For further information see: ERS Guidelines on the use of nebulizers (July 2001)

METHYLXANTHINES

Theophylline has a narrow therapeutic range 55-110µmol/L (10-20mg/L) levels should be within this range for maximum bronchodilation. Pharmacokinetics are complex and can be influenced by many factors (see below)

Plasma Clearance:
- Theophylline clearance is reduced in patients with severe congestive heart failure, cor pulmonale, pulmonary oedema, severe liver disease and hypoxaemic state. The dose may need to be lowered in these patients.
- Theophylline clearance is increased in smokers.
- Plasma Theophylline levels may be increased by
  - macrolide antibiotics
  - calcium channel blockers
  - quinolone antibiotics
  - cimetidine etc. (see BNF for complete listing)
- Plasma Theophylline levels may be reduced by
  - Rifampicin
  - Lithium
  - Phenytoin
  - carbamazepine etc. (see BNF for complete listing)

Signs of Toxicity: nausea, vomiting, diarrhoea, tremor, epigastric pain, headache, insomnia, hypotension, cardiac arrhythmias and convulsions.

ORAL METHYLXANTHINES

- Due to variations in bioavailability with different preparations of oral theophylline the brand name should be specified when prescribing (see

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Aminophylline should be used as first-line oral methylxanthine.

- Peak concentrations occur 4-6 hours after the administration of slow release oral preparations.

Asthma

- Methylxanthines have some beneficial effects in the treatment of asthma and a trial of the drug is recommended as “add-on” therapy (step 3 BTS guidelines) if patient has no response to addition of long-acting β₂ agonist or if patient experiences benefit but control still inadequate or at step 4 “persistent poor control.”

COPD

- Methylxanthines should only be used in the treatment of stable COPD after a trial of short-acting bronchodilators and long-acting bronchodilators, or in patients unable to use inhaled therapy.
- The effectiveness of treatment should be assessed by improvements in symptoms, activities of daily living, exercise capacity and lung function.

**INTRAVENOUS METHYLXANTHINES**

- Used as an adjunct in the treatment of acute exacerbations of COPD if there is an inadequate response to nebulised bronchodilators.
- Some patients with near fatal asthma or life-threatening asthma with a poor response to initial therapy may gain additional benefit from intravenous aminophylline.

**Dosage (see also Intravenous Aminophylline Treatment):**

**LOADING DOSE**

A loading dose should not be given to patients who have received theophylline or aminophylline during the previous 24 hours unless a plasma concentration is available.

Loading Dose: 5mg/kg in 100ml normal saline 0.9% (infused over 30 minutes)

**MAINTENANCE DOSE**

If plasma clearance is altered the maintenance dose may need to be altered.

Maintenance dose: 0.5mg/kg/hour (given by intravenous infusion)

*n.b. if patient is obese use ideal body weight (IBW) for all calculations*