1. Background information

Quick info:

Scope:
- Early detection, diagnosis, assessment and management of chronic obstructive pulmonary disease (COPD) in adults
- Interventions include:
  - inhaled and oral therapies
  - oxygen therapy
  - pulmonary rehabilitation
  - surgical interventions
  - management of psychological sequelae
  - health promotion and preventive measures
- Management of complications of COPD including:
  - respiratory failure
  - cor pulmonale
  - abnormal body mass index (BMI)
- Covers criteria for specialist referral
- Covers principles of palliative care in COPD

Out of scope:
- Smoking cessation (see map of medicine smoking cessation pathway)
- Palliative care (see map of medicine palliative care pathway)

Definition:
- COPD is characterised by non-reversible airflow obstruction:
  - FEV1/forced vital capacity (FVC) ratio less than 0.7
- Airflow obstruction is due to a combination of airway and parenchymal damage
- COPD is an umbrella term that includes:
  - emphysema
  - chronic bronchitis
  - chronic airflow limitation
  - the definition may include some cases of chronic asthma

Incidence and prevalence:
- An estimated 3 million people are effected by COPD in the UK:
  - approximately 2 million of these remain undiagnosed
- Rate of COPD in the population is estimated to be between 2-4%
- Incidence is difficult to determine as disease develops insidiously
- Prevalence rates are increasing in women but have reached a plateau in men

Prognosis:
- COPD accounts for approximately 30,000 deaths each year in the UK (more than 90% of these occur in those over age 65 years)
- Mortality from COPD in England shows a strong urban rural gradient

Risk factors:
- Smoking
- Occupational exposure
- Increasing age
- Deprived communities
References:


2. Clinical features differentiating COPD and asthma

Quick info:

Clinical features of COPD:
- Smoker/ex smoker = common
- Symptoms age < 35 years = rare
- Chronic productive cough = common
- Breathlessness: persistent and progressive
- Night time waking with breathlessness and/or wheeze = uncommon
- Significant diurnal or day-to-day variability of symptoms = uncommon

Clinical features of asthma:
- Smoker/ex smoker = possibly
- Symptoms age < 35 years = common
- Chronic productive cough = uncommon
- Breathlessness = variable
- Night time waking with breathlessness and/or wheeze = common
- Significant diurnal or day-to-day variability of symptoms = common
- allergic comorbidities (e.g. rhinitis) and family history of asthma: common NB: asthma and COPD can co-exist in the same person

3. Patient information including travel and leisure advice

Quick info:

http://www.patient.co.uk/health/Chronic-Obstructive-Pulmonary-Disease.htm
http://www.blf.org.uk/Page/chronic-obstructive-pulmonary-disease-COPD

Advice on travel and leisure:
Travel is possible by land and sea in virtually all cases.
Air travel:
- Assess those who use long-term oxygen therapy or have forced expiratory volume in 1 second (FEV1) less than 50% predicted in line with British Thoracic Society (BTS) recommendations
- Warn patients with bullous disease about theoretically increased risk of pneumothorax
- May be hazardous if the partial pressure and oxygen in arterial blood (PaO2) breathing air is less than 6.7kPa – check availability of oxygen on chosen flight
Scuba diving is not recommended.
Avoid high altitude.

4. Updates to this pathway

Quick info:
COPD – Making the diagnosis – West Hampshire CCG
Adapted from the Map of Medicine

This pathway has been locally developed for West Hampshire.

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5. Joint Formulary

Please note that the medications for COPD (including the new drugs and drug combinations) are due for review and the revised formulary is due to be released shortly

Follow NICE Guidelines
Inhaler technique crucial to medical management

COPD Symptom Control
5.1 Bronchodilators
Best administered by a hand-held inhaler device (including a spacer device if appropriate).

5.1.1 Adrenoceptor agonists
- Short-acting beta2 agonists (SABA)
  - Salbutamol CFC-free MDI/Easi-B
  - Terbutaline
  - Last for approximately 4 hours
- Long-acting beta2 agonists (LABA)
  - Formoterol first line LABA
  - Salmeterol CFC-free MDI/ Accuhaler
  - Indacaterol
  - Bronchodilator effect significantly greater than that of salmeterol or formoterol, and similar to tiotropium, a long-acting muscarinic antagonist (LAMA)
  - However a significant number of patients experienced a cough following indaceterol inhalation in clinical trials

5.1.2 Antimuscarinic bronchodilators
- Short-acting muscarinic antagonists (SAMA)
  - Ipratropium Bromide
  - Onset of action is between 5-20 minutes and lasts for approximately 3-6 hours
- Long-acting muscarinic antagonists (LAMA) bronchodilators
  - Tiotropium 'Handihaler' (preferred device)
  - If starting Tiotropium, discontinue the short-acting muscarinic antagonist (SAMA), if using, and switch to a short-acting beta2-agonist (SABA) as required.
  - Glycopyrrolate
  - Aclidinium
  - Umeclidinium

5.1.3 Inhaler devices
- MDI with spacer is preferred device in all patients who can use it correctly
  - AeroChamber Plus
  - Babyhaler
  - Haleraid

Adapted from Southampton COPD Map of Medicine Pathway 2013
5.1.4 Nebulisers
- Consider nebulisers if distressing or disabling breathlessness, despite maximal therapy using inhalers [3]
- Continue to prescribe only after assessment confirms one of more of the following [1]:
  - A reduction in symptoms
  - An increase in the ability to undertake activities of daily living
  - An increase in exercise capacity
  - An improvement in lung function
- Assess patient's and/or carer's ability to use it [1]
- Offer a choice between a facemask and a mouthpiece, unless the medication specifically requires a mouthpiece, e.g. anticholinergic drugs [3]
- Provide with equipment, servicing, advice, and support [1]

5.2 Inhaled Corticosteroids (ICS)
- Combination products (high dose ICS and LABA):
  - Budesonide/formoterol Turbohaler (Symbicort)
  - Fluticasone/salmeterol Accuhaler (Seretide)
  - Formoterol/Beclometasone MDI (Fostair)
  - Fluticasone/Vilanterol Ellipta (Relvar)
- LABA plus ICS combined inhalers have been shown to reduce the frequency of exacerbations compared with LABA alone, however further research directly comparing different inhalers and with different doses of ICS is required
- Long-term treatment containing ICS should not be prescribed outside their indications due to the possibility of an increased fracture risk following long-term exposure [2] and ICSs should not be used alone to treat COPD [3]. Additionally Fluticasone/Salmeterol (Seretide) has been shown to increase the risk of pneumonia [1]
- If ICS is declined or not tolerated consider LABA plus long-acting antimuscarinic (LAMA) [3].

5.3 Treatments that are not recommended
- Anti-oxidant therapy (alpha tocopherol and beta-carotene supplements) [3]
- Antitussive therapy [3]
- Prophylactic antibiotic therapy; however, antibiotics do have a role in the management of COPD exacerbations [1]

Please note that the medications for COPD (including the new drugs and drug combinations) are due for review and the revised formulary is due to be released shortly

6. MRC Dyspnoea Scale

Quick info:

Grade degree of breathlessness related to activities:
1. Not troubled by breathlessness except on strenuous exercise
2. Short of breath when hurrying or walking up a slight hill
3. Walks slower than contemporaries on level ground because of breathlessness, or stop for breath when walking at own pace
4. Stops for breath after walking ~100m of after a few minutes on level ground
5. Too breathless to leave house, or breathless when dressing or undressing

7. COPD - Making the diagnosis

Quick info:
There is considerable evidence that about 2/3 of patients with COPD have not been identified in the community. A
A strategy to identify undiagnosed or misdiagnosed cases of COPD should be developed in individual practices.

- Chronic obstructive pulmonary disease (COPD) is characterised by airflow obstruction.
- Diagnosis relies on clinical judgement based on a combination of history, physical examination and presence of airflow obstruction on spirometry.
- COPD produces symptoms, disability and impaired quality of life which may respond to pharmacological and other therapies that have limited or no impact on the airflow obstruction.

Presenting features of COPD:

- Mild morning cough, recurrent infection, dyspnoea on vigorous exertion
- May be relatively asymptomatic
- Encourage case finding for those with early disease. Many people with mild COPD do not often exert themselves enough to produce symptoms.
- Moderate productive cough, dyspnoea on moderate exertion, infective exacerbation
- Severe wheeze, paroxysmal dyspnoea, cor pulmonale, limitation of activities of daily living (ADLs)

8. History

Quick info:

Consider chronic obstructive pulmonary disease (COPD) in patients who:

- Are older than age 35 years
- Are smokers or ex-smokers
- Have associated symptoms:
  - Exertional breathlessness
  - Chronic cough
  - Regular sputum production
  - Frequent winter 'bronchitis'
  - Wheeze

COPD is occasionally caused by chronic dust exposure, or burning open stoves in confined areas (usually in third world). COPD may co-exist with clinical features of asthma (see clinical features differentiating COPD and asthma).

History to include:

- Clinical history including:
  - Weight loss
  - Waking at night
  - Ankle swelling
  - Fatigue
  - Chest pain
  - Haemoptysis
  - Smoking history (including pack years smoked = number of cigarettes smoked/day ÷ 20 × number of years smoked) and occupational hazards
  - Exercise tolerance
  - History of childhood wheezing or bronchitis and atopy
  - Family history
  - Occupational history
  - Co-existing conditions eg heart disease, rhino-sinusitis, reflux

9. Referral to Smoking Cessation Service

Southampton Quitters:

[www.southamptonquitters.nhs.uk](http://www.southamptonquitters.nhs.uk)

Telephone: 02380 515221

Address: Southampton Quitters, Adelaide Health Centre, William Macleod Way, Millbrook, Southampton, SO16 4XE
10. Examination

Quick info:
- Tar staining of fingers may be present
- Examination may be normal in mild disease
- There may be a wheeze, quiet breath sounds or features of over-inflation
- The degree of airways obstruction cannot be predicted from symptoms or signs
- In patients with severe disease the following physical signs may be present – none is sufficiently diagnostic to remove the need for objective confirmation of the diagnosis:
  - breathlessness on mild exertion or at rest
  - pursed-lip breathing and use of accessory respiratory muscles
  - signs of chronic over-inflation (loss of cardiac dullness, decreased cricosternal distance, increase in the AP diameter of the chest)
  - wheeze, especially on forced expiration
  - loss of weight is common but may also indicate occult carcinoma
  - central cyanosis, but its absence does not exclude minor degrees of hypoxaemia
  - flapping tremor, bounding pulse, drowsiness (signs of hypercapnia) may occur during acute exacerbations, but a high partial pressure of oxygen in arterial blood (PaCO2) can occur in patients with stable severe chronic obstructive pulmonary disease (COPD) without these signs
  - peripheral oedema may indicate the presence of cor pulmonale which is of prognostic significance
  - raised jugular venous pressure, right ventricular heave, loud pulmonary second sound, tricuspid regurgitation – these signs of cor pulmonale can be modified or masked by over-inflation

11. Perform post bronchodilator spirometry

Quick info:
NICE recommend that spirometry is carried out after giving a bronchodilator and the results should be compared with predicted normal values, taking into account age, height and sex.
Routine spirometric reversibility testing is not necessary as a part of the diagnostic process or to plan initial therapy.

12. DIAGNOSTIC CRITERIA FOR COPD

Quick info:
Diagnosis of COPD is likely if the following apply:
- patient is older than 35 years
- patient has a smoking history (usually at least 10 pack years) and
- spirometry shows FEV1/FVC ratio < 0.7 after bronchodilator

Consider alternative diagnoses:
- in older people without typical symptoms of COPD and FEV1/ FVC ratio < 0.7
- in younger people with symptoms of COPD and FEV1/ FVC ratio ≥ 0.7

13. Reversibility testing only if uncertainty over diagnosis of asthma/COPD

Adapted from Southampton COPD Map of Medicine Pathway 2013
Quick info:

**Differentiating asthma and chronic obstructive pulmonary disease (COPD):**
COPD and asthma are frequently distinguishable on the basis of history and examination in untreated patients presenting for the first time (see "Clinical features differentiating COPD and asthma " box)
- if patients report a marked improvement in symptoms in response to inhaled therapy, the diagnosis of COPD should be reconsidered
- longitudinal observation of patients (whether using spirometry, peak flow or symptoms) will show greater variability in asthma

**Use of reversibility testing**
Where diagnostic doubt remains, or both COPD and asthma may be present, asthma is likely if:
- a large (greater than 400mL) FEV1 response to bronchodilators
- a large (greater than 400mL) FEV1 response to 30mg oral prednisolone daily for 2 weeks
- serial peak flow measurements showing 20% or greater diurnal or day-to-day variability
- clinically significant COPD is not present if the FEV1 and FEV1/FVC ratio return to normal with drug therapy
If uncertainty remains, consider more detailed investigations, including imaging and measurement of lung transfer factor (TLCO).

14. Consider differential diagnoses

**Quick info:**
Consider:
- asthma
- lung cancer
- upper airway obstruction
- bronchiectasis
- left ventricular failure and/or pulmonary oedema
- recurrent pulmonary embolism
- anaemia
- respiratory muscle weakness
- pulmonary fibrosis
Consider possibility of alternative diagnosis if diagnostic criteria not fully met.
If patient's clinical picture is not consistent with diagnostic criteria seek specialist advice (referral to Secondary Care)

15. Other essential tests

**Quick info:**

* Chest X-ray:
  - to exclude other pathologies at the time of their initial diagnostic evaluation since the incidence of co-existing diseases with moderate and severe COPD is relatively high

* Pulse oximetry:
  - check twice yearly in:
    - patients with severe COPD (FEV1 below 50% predicted
    - patients with cyanosis or cor pulmonale
  - oxygen saturation of arterial blood (SaO2) of 92% or less, refer for arterial blood gas (ABG)

* Haemoglobin:
  - correction of unsuspected anaemia (which may itself require further investigation) may improve the symptoms of chronic obstructive pulmonary disease (COPD)
  - polycythaemia (haematocrit more than 47% in women or more than 52% in men) may be present and should not be assumed to be secondary without measurement of arterial blood gas tensions. Venesection may be considered if the haematocrit is more than 50%

Body mass index (BMI):
• should be performed on initial diagnostic evaluation
• BMI = (weight [kg]/ height [m])^2
• see body mass index (BMI)

Sputum:
• routine culture of non-purulent sputum samples is not useful
• sputum culture, to identify organisms if sputum is persistently present and purulent

Alpha-1 antitrypsin:
• if early onset (<40 years), minimal smoking history or positive family history

17. Patient education

Quick info:
At the time of diagnosis, written disease information should be provided, which should include:
• advice on smoking
• advice on nutrition and activity
• vaccination recommendation
• a written management plan for exacerbations

See Map of Medicine COPD management of breathlessness pathway.

18. Assessment of severity

Quick info:
Severity classification refers only to severity of lung function impairment, and may not correlate with disability (mild airflow obstruction can be associated with significant disability).

Comprehensive assessment of severity of COPD includes:
• degree of airflow obstruction and disability
• frequency of exacerbations
• prognostic factors such as breathlessness (using Medical Research Council [MRC] dyspnoea scale - see box), carbon monoxide lung transfer factor, health status, exercise capacity, BMI, cor pulmonale, arterial oxygen partial pressure

19. Mild to Moderate (COPD stages 1 & 2)

Quick info:

Stage 1 (Mild):
• FEV1/FVC ratio < 0.7
• FEV1 <80% predicted
• no abnormal signs
• smokers’ cough
• little or no breathlessness
• NB: symptoms should be present to diagnose COPD in people with mild airflow obstruction

Stage 2 (Moderate):
• FEV1/FVC ratio < 0.7 FEV1 50-79% predicted
• breathlessness (with or without wheeze) on moderate exertion
• cough (with or without sputum)
• variable abnormal signs, general reduction in breath sounds, presence of a wheeze

20. Severe to Very Severe (COPD stages 3 & 4)
Quick info:

Stage 3 (Severe):
- FEV1/FVC ratio < 0.7 and
- FEV1 30-49% predicted
- breathlessness on any exertion or at rest
- wheeze and cough often prominent
- lung over-inflation usual, cyanosis, peripheral oedema

Stage 4 (Very severe):
- FEV1/FVC ratio < 0.7 and
- FEV1 < 30% predicted or < 50% predicted with respiratory failure
- breathlessness on any exertion or at rest
- wheeze and cough often prominent
- lung over-inflation usual, cyanosis, peripheral oedema and polycythaemia in advanced disease, especially during exacerbations

21. THRESHOLD: consider referral for specialist assessment

Quick info:

Indications for referral:
- COPD in patient less than age 40 years: to identify antitrypsin deficiency, consider therapy and screen family
- symptoms disproportionate to lung function deficit
- frequent infections: to exclude bronchiectasis
- haemoptysis: to exclude carcinoma of the bronchus
- rapidly deteriorating

22. Follow-up care in severe to very severe disease

Quick info:

After initial assessment with the respiratory consultants regular hospital review not usually needed if stable.

Key Dates

Published: 06 Jan 2015
Map of medicine due for revision following introduction of integrated care service

Evidence summary for COPD - making the diagnosis
The pathway is consistent with the following quality-appraised guidelines (1,6). All intervention nodes have been assessed for consistency with high quality guidelines and underlying evidence.

References
This is a list of all the references that have passed critical appraisal for use in the care map Chronic obstructive pulmonary disease (COPD)
References


Adapted from Southampton COPD Map of Medicine Pathway 2013