Clinical suspicion of COPD

Consider a diagnosis of COPD for people who are:

• > 35, and
  • smokers/ex-smokers – in most cases COPD is caused by cigarette smoking
  • occupational exposure
  • deprived communities
  • genetic risk of homozygous alpha1-antitrypsin deficiency - accounts for less than 1% of cases
  • environmental factors, e.g. air pollution

• And have any of following symptoms which can be variable from day-to-day:
  • chronic and progressive dyspnoea
  • chronic cough – may be intermittent initially but later is present every day, often throughout the day, and may be unproductive
  • regular sputum production
  • frequent winter ‘bronchitis’
  • wheeze

• Patients may also present with clinical features of asthma:
  • chronic unproductive cough
  • significant variable breathlessness
  • night-time waking with breathlessness and/or wheeze
  • significant diurnal or day to day variability of symptoms
History
• Unexplained weight loss, night sweats
• Haemoptysis
• Cough >3 weeks
• Persistent hoarseness >3 weeks
• Persistent sore throat
• Persistent cough in a smoker

Examination
• Rapid or slow respiratory rate
• SpO\textsubscript{2} <92\% in healthy individual or <88\% in patients with known chronic lung disease
• Pulse rate <40 >100 bpm
• Silent chest
• Confusion
• Persistent palpable neck lumps
• Persistent unilateral enlarged tonsil
• Difficulty completing sentences
• Difficulty swallowing (particularly own saliva)
• Shortness of breath
• Pleuritic chest pain
• Headache, photophobia and neck stiffness
• Non-blanching rash

1. Does the patient need to be seen in ED?
2. If suspected Lung Cancer – refer to two week wait pathway and referral proforma
3. Pulmonary fibrosis – refer to respiratory specialist
4. If suspected or confirmed tuberculosis then please refer URGENTLY via TB Referral Pathway

5. Other causes:
• Bronchogenic carcinoma
• Pneumonia
• Peritonsillar abscess (quinsy)
• Bronchitis
• Tracheitis
• Bronchiolitis
• Pulmonary embolus
• Meningoencephalitis
• Tonsillar malignancy

1. Consider RED FLAGS

Enquire about symptoms and their patterns, including:
- **RED FLAGS**
- effort intolerance
- waking at night
- ankle swelling
- fatigue
- chest pain - uncommon in COPD
- haemoptysis - uncommon in COPD

2. Take full case history

Take past medical history, including:
- asthma
- allergies
- sinusitis
- nasal polyps
- respiratory infections in childhood
- other respiratory disease
- past exacerbations or previous hospitalisation for respiratory disorders

Enquire about exposure to risk factors, e.g. smoking pack year, occupation, or environmental exposures.

Assess presence of co-morbidities, e.g.:
- heart disease
- malignancies
- osteoporosis
- musculoskeletal disorders

Review current medication, e.g. beta-blockers, ACE inhibitors, NSAIDs

Enquire about family history of COPD or other chronic respiratory disease and family history of alpha-1-antitrypsin deficiency

Assess impact on patient & carer’s life, e.g.:
- limitation of activity, effort intolerance, or exercise intolerance
- missed work and economic impact
- effect on family routine
- feeling of anxiety or depression

3. Physical Examination

There is no individual sign that is diagnostic of COPD. Some patients may have normal examination results.

Undertake Physical Examination to support differential diagnosis.

Measure height and weight.

The following signs may be present in COPD:
- hyperinflated chest
- wheeze or quiet breath sounds
- pursed-lip breathing
- use of accessory muscles of respiration
- paradoxical movement in the lower ribs (Hoover’s sign)
- reduced cricosternal distance
- cyanosis
- resting respiratory rate increased to more than 20 breaths per minute
- raised jugular venous pressure (JVP)
- loud pulmonary second heart sound
- tricuspid regurgitation
- peripheral oedema

Signs suggestive of hypercapnia include:
- bounding pulse
- flapping tremor (asterixis)
- drowsiness
- morning headaches
- daytime hypersomnolence

Finger clubbing is not a characteristic of COPD - if present it should prompt assessment to exclude lung cancer, bronchiectasis, or idiopathic fibrosis.
Requirements when undertaking spirometry

• Diagnosis should only be made via a calibrated spirometer and print out. A 3L syringe will be required.
• All health professionals involved in the care of people with COPD should have access to spirometry and be able to interpret results – NICE 2010 [https://www.nice.org.uk/guidance/cg101/chapter/1-Guidance](https://www.nice.org.uk/guidance/cg101/chapter/1-Guidance)
• Any healthcare worker undertaking diagnostic spirometry should have up-to date training in assessment and interpretation and use calibrated equipment
• All practices should have systems in place to ensure timely access to calibrated spirometry equipment, trained operators, assessors and interpreters for diagnostic purposes
• For diagnostic purposes hand held spirometry equipment should not be used
• Spirometry services should be supported by quality control processes
Spirometry and pulse oximetry

- **Must only be undertaken by Spirometry trained clinicians**
- Diagnosis should only be made via a calibrated spirometer and print out. A 3L syringe will be required.

Post-bronchodilator spirometry in:
- current/ex-smokers >35 years old with a chronic cough
- Chronic bronchitis (can develop air flow limitation)

**Calculation of Spirometry Results**
- Suggested calculator for Spirometry: [http://www.patient.co.uk/doctor/Spirometry-Calculator](http://www.patient.co.uk/doctor/Spirometry-Calculator) (calculator allows measurements and should be evaluated by comparison with reference values based on: age, height, sex, ethnicity)

*The presence of a post-bronchodilator forced expiratory volume in 1 second (FEV1)/forced vital capacity (FVC) ratio of less than 0.7, confirms the presence of airflow limitation.*

- Use ERS 1993 reference values but be aware these may lead to under diagnosis in older people and are not applicable in black and Asian populations*

**Diagnostic uncertainty:**
- clinically significant COPD is not present if FEV1 and FEV1/FVC ratio return to normal with drug therapy
- Asthma may be present if:
  - there is a more than 400mL response in either FEV1 or in PEF to bronchodilators
  - serial peak flow measurements show significant (≥ 20%) diurnal or day-to-day variability
  - there is a more than 400mL response in either FEV1 or in PEF to 30mg prednisolone daily for 2 weeks

Consider differential diagnoses

NB: Some of these conditions may coexist with COPD

1. Asthma
2. Congestive cardiac failure:
   Symptoms include breathlessness when lying flat, history of ischaemic heart disease, fine lung crackles
3. Bronchiectasis:
   Symptoms include copious sputum, frequent chest infections, history of childhood pneumonia, coarse lung crackles
4. Carcinoma of the bronchus:
   Symptoms include haemoptysis, weight loss, hoarseness
5. Lung cancer
6. Pneumonia
7. Pneumothorax
8. Interstitial lung disease
   Symptoms include dry cough and fine crackles
9. Recurrent pulmonary embolism (PE)
10. Tuberculosis (TB)
11. Obstructive sleep apnoea
12. Upper airway obstruction
Information to support differential diagnosis

1. Consider starting empirical treatment
   • http://www.enhertsccg.nhs.uk/respiratory-system

2. Consider differential diagnoses or further investigations in:
   • older people with no symptoms of COPD where the forced expiratory volume in 1 second (FEV1) /forced vital capacity (FVC) ratio is less than 0.7
   • younger people with symptoms of COPD where the FEV1/FVC ratio is more than 0.7

3. Consider that asthma may be present if:
   • there is a >400ml response to bronchodilators
   • serial peak flow measurements show significant (> 20%) diurnal or day-day variability
   • there is a >400ml response to 30mg prednisolone daily for 2 weeks
   • asthma and COPD can coexist

4. If lung cancer is suspected the patient should be managed according to the 2 week wait pathways

5. Refer to specialist services for more detailed investigations or specialist opinion, if needed.
Complete investigations including CXR and FBC

1. PEF measurement may underestimate the severity of obstruction

2. CXR to exclude other diagnosis (investigate abnormalities with CT scan).
   Signs suggestive of COPD include:
   - signs of lung hyperinflation
   - flattened diaphragm on lateral film
   - increase in volume of retrosternal air space
   - hyperlucency of lungs
   - rapid tapering of vascular markings

Alternative diagnoses and significant co-morbidities detected on CXR include:
   - lung cancer
   - left ventricular failure
   - pulmonary fibrosis
   - bronchiectasis
   - pleural diseases
   - kyphoscoliosis
   - cardiomegaly

CXR cannot diagnose mild emphysema.

CXR should be repeated if new symptoms develop because there is an increased incidence of lung cancer.

3. Blood tests
   - FBC to identify anaemia or polycythaemia
   - ABG if considering polycythaemia
   - alpha1-antitrypsin if age < 40 years

4. BMI
Risk stratify COPD severity using GOLD, CAT & MRC score

No single measure can give an adequate assessment of the true severity of COPD in an individual.

- Disability in COPD can be poorly reflected in the FEV1.
- Severity assessment has implications for therapy and relates to prognosis.

Assessment:
It is recommended that the following assessments are undertaken to obtain a comprehensive assessment of COPD:

1. **Assess Severity of Airflow Obstruction**
   - reduction in forced expiratory volume in 1 second (FEV1) as a percentage of the predicted value
   - the Global Initiative for Chronic Obstructive Lung Disease (GOLD) & NICE 2010 classify the severity of airflow limitation based on the post-bronchodilator FEV1.
   - Guidance can be found at: https://www.nice.org.uk/guidance/cp101/chapter/1-Guidance

2. **MRC dyspnoea scale**
   - Use to grade breathlessness
   - Guidance can be found at: http://www.gpnotebook.co.uk/simplepage.cfm?lID=x20100228140605261069

3. **Impact Assessment**
   - Facilitate meaningful discussion
   - Improve management
   - Identify deterioration

4. **Prognostic Indicators**
   - Breathlessness (assessed using the MRC scale)
   - transfer factor for carbon dioxide (TlCO),
   - FEV1
   - exercise capacity e.g. 6 minute walking test
   - Presence of cor pulmonale
   - DOSE (Dyspnoea, Obstruction, Smoking, Exacerbation) http://www.prpp.org.uk/assessment/dose/about/

5. **Other considerations**:  
   - Investigate symptoms that seem disproportionate to the Spirometric impairment using a CT Scan or TlCO testing.
   - Consider alternative diagnosis in older people without symptoms of COPD and FEV1/ FEC ratio <0.7, and younger people with symptoms of COPD and FEV1/ FEC > 0.7.
   - Spirometric reversibility testing is not usually necessary as part of the diagnostic process or to plan initial therapy
1. Criteria to consider in Diagnosis

Early accurate diagnosis and appropriate treatment can reduce the number of premature deaths from COPD. Late or under diagnosis has a strong association with hospital admissions for exacerbations.

**There is no single diagnostic test for COPD** diagnosis is based on clinical judgement based on a combination of:

- signs and symptoms
- confirmation of the presence of airflow obstruction using spirometry - measure post-bronchodilator

NICE recommend considering a diagnosis of COPD in patients age > 35 years who have a risk factor (e.g. smoking) and present with the following:

- exertional breathlessness
- chronic cough
- regular sputum production
- frequent winter bronchitis
- wheeze

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) provides further resources to support the diagnosis of COPD [http://goldcopd.org/?s=diagnosis+of+COPD](http://goldcopd.org/?s=diagnosis+of+COPD)

2. Complications associated with COPD include

- cor pulmonale (right heart failure secondary to lung disease) - characterised by:
  - peripheral oedema
  - raised jugular venous pressure

3. Recording of diagnosis and baseline measures

FOR ALL PEOPLE WITH DIAGNOSED COPD

- Highlight the diagnosis of COPD in the notes and on the computer database (using Read codes)
- Record the results of Spirometric tests at diagnosis – absolute and percentage of predicted
- Record baseline assessments of severity - MRC, CAT, BODE, DOSE

4. Provide with information and advice to promote self-management. This may include:

- a personal health plan
- a self-management pack
- an individual action plan (this may be imbedded in the above)

See Managing Stable COPD pathway for further information

5. Consider referral to voluntary sector e.g. Breathe Easy Groups

If there is no doubt about diagnosis of COPD, start treatment – go to Hertfordshire Treatment guidelines for COPD: [http://www.enhertscrg.nhs.uk/respiratory-system](http://www.enhertscrg.nhs.uk/respiratory-system)
**Consider further Investigations and need for consultant advice**

1. **In-house investigations:**
   a. serial domiciliary peak flow measurements - to exclude asthma
   b. pulse oximetry:
      • to assess need for referral for oxygen assessment
      • if cyanosis or cor pulmonale present, or if forced expiratory volume in 1 second (FEV1) is less than 50% predicted
   c. sputum culture - to identify organisms if sputum is persistently present and purulent

2. **Consider Referral to respiratory specialists for:**
   a. full pulmonary function testing:
      • to investigate symptoms that seem disproportionate to the Spirometric impairment
   b. CT scan of the thorax to investigate: (Can be via primary care or if uncertain refer to secondary care using 2WW if appropriate)
      • symptoms that seem disproportionate to the Spirometric impairment
      • abnormalities seen on a chest radiograph
      • to assess suitability for surgery
Reversibility testing if diagnosis uncertain

Use of reversibility testing to aid differentiation of asthma from COPD

It should be performed when the patient is clinically stable and free from respiratory infection
Patients should not have taken:
- inhaled short-acting bronchodilators in the previous 6 hours
- long-acting bronchodilators in the previous 12 hours
- sustained release theophylline in the previous 24 hours
- long acting anticholinergic bronchodilators should be avoided for 36 hours

Where diagnostic doubt remains, or both COPD and asthma are present, the following findings should be used to help identify asthma:
- a large (greater than 400mL) response in forced expiratory volume in 1 second (FEV1) to bronchodilators
- a large (greater than 400mL) response in FEV1 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/forced vital capacity (FVC) ratio return to normal with drug therapy

If uncertainty remains, consider more detailed investigations, including imaging and measurement of transfer factor for carbon monoxide (TLCO)

If patient reports a marked improvement in symptoms in response to inhaled therapy, a diagnosis of COPD should be reconsidered.

Oral corticosteroid reversibility tests do not predict response to inhaled corticosteroid therapy and should not be used to identify which patients should be prescribed inhaled corticosteroids.
GOLD C + D

To confirm diagnosis and optimise therapy if:
• there is diagnostic uncertainty
• the patient requests a second opinion
• there is onset of cor pulmonale

Unusual symptoms, e.g. haemoptysis - to investigate causes and exclude malignancy

Potential for surgery:
• lung volume reduction surgery - to identify candidates for surgery
• lung transplant - to identify candidates for surgery

Bullous lung disease:
• to confirm diagnosis
• to identify candidates for surgery
• refer to medical or surgical units for bullectomy

Rapid decline in forced expiratory volume in 1 second (FEV1):
• to encourage early interventions
• to optimise management

Dysfunctional breathing:
• to confirm diagnosis
• optimise pharmacotherapy and non-pharmacological management (also consider physiotherapy)

Patients younger than age 40 years or with a family history of alpha1-antitrypsin deficiency:
• establish diagnosis
• to identify alpha1-antitrypsin deficiency
• consider therapy and family screen
• arrange for the measurement of alpha1-antitrypsin in the patient prior to referral

Symptoms disproportionate to lung function - to look for other explanations

Frequent infection - to exclude bronchiectasis

Specialist investigations may include:
• CT scan of the thorax, if not already carried out
• bronchoscopy

Patients who are referred do not always have to be seen by a respiratory physician - they may be seen by members of the respiratory team who have appropriate training and expertise
Consider O2 therapy if patient on maximum inhaled therapy with O2 sats ≤ 92%

**Oxygen assessment**
- when resting SpO2 ≤92% on air when the patient is free from exacerbation for 8 weeks
- when SpO2 is <90% when mobilising and with more than 4% drop
- Pulse oximetry ≤92% and on maximum inhaled therapy

**Long-term nebuliser therapy**
- to optimise therapy and exclude inappropriate prescriptions

**Acute exacerbation**
- significant deterioration in symptoms but where the patient can be managed safely at home

**Post discharge support and supported discharge**

**Additional support**
- education, medication management, nutrition advice, breathlessness management, anxiety about condition
Consider a referral to pulmonary rehab for patients at GOLD stage B or MRC 3+

For improvement of:
• exercise capacity
• dyspnoea
• health status, including cardiovascular conditions
• psychological wellbeing
• smoking cessation
• nutrition
• inhaler technique

Can also aid with:
• information, advice, and education about COPD
• reduced hospital admissions

1. Consider referral for:
• All newly diagnosed patients with an MRC score of 2 or more (who feel functionally disabled by breathlessness)
• Patients who have not previously been referred or completed a pulmonary rehabilitation course
• If the patient has had a hospital admission for exacerbation (within one month)

2. Consider repeat Pulmonary Rehabilitation:
• for patients whose condition is worsening or situation changes e.g. after previous non-completion or after hospital discharge.
• Patients that are on 'optimal treatment' and feel functionally disabled by their breathlessness

Exclusion
• patients who have significant mobility problems due to co-morbidities such as e.g. severe arthritis or severe peripheral vascular disease
• patients with unstable cardiac disease
• patients who have had a recent myocardial infarction, less than 6 weeks previously

On referral provide the patient with a pulmonary rehabilitation leaflet to maximize potential for attendance and self-management.
**Evidence bases**

NICE Guidance: [http://www.nice.org.uk/guidance/cg101/chapter/1-recommendations](http://www.nice.org.uk/guidance/cg101/chapter/1-recommendations)


Hertfordshire Treatment guidelines for COPD: [http://www.enhertscrg.nhs.uk/respiratory-system](http://www.enhertscrg.nhs.uk/respiratory-system)


GPNotebook: [http://www.gpnotebook.co.uk/simplepage.cfm?ID=x20100228140605261069](http://www.gpnotebook.co.uk/simplepage.cfm?ID=x20100228140605261069)


The Primary Care Respiratory Society UK: [https://pcrs-uk.org/](https://pcrs-uk.org/)

If initial attempt to quit smoking was unsuccessful review in 6 months and re-offer

Referral form for Hertfordshire Smoking Cessation Service and Nicotine Replacement Therapy (NRT) voucher: [http://www.enhertsccg.nhs.uk/](http://www.enhertsccg.nhs.uk/)