COPD - Management of acute exacerbation in primary care
West Hampshire CCG area

Adapted from the Map of Medicine

Chronic obstructive pulmonary disease (COPD) – acute exacerbation

Assess severity of exacerbation

Assess whether the patient can be managed at home

Suitable for home management

End of life or palliative care

Severe exacerbation or poor social support consider admission

Initial management

Consider oxygen therapy while awaiting hospital transfer

Refer to Acute Medical Unit

Follow-up

Investigations are not usually required

Bronchodilators

Prednisolone

Antibiotics

Follow Up

Progress not satisfactory

Consider urgent liaison with Respiratory consultants

Go to COPD symptom control

Progress satisfactory

Go to COPD management of breathlessness

Adapted from Southampton COPD Map of Medicine Pathway 2013
1. Background information

Quick info:

Scope:
- Management of acute exacerbations of COPD in primary care and criteria for specialist referral

Out of scope:
- Children and adolescents

Exacerbations of chronic obstructive pulmonary disease (COPD):
- are defined as:
  - the sustained worsening of the patient’s symptoms from their usual stable state which is beyond normal day-to-day variations; and
  - acute in onset
  - needing a change in regular medication
- are common and are correlated with:
  - impaired quality of life (QoL)
  - accelerated decrease in lung function
  - increased health care costs
- cause the most deaths from COPD

The following can cause exacerbations of COPD, although the cause is unidentifiable in 30% of cases:
- infections of the tracheobronchial tree:
  - viral:
    - rhino viruses (common cold)
    - influenza
    - parainfluenza
    - coronavirus
    - respiratory syncytial virus
  - bacterial:
    - Haemophilus influenza (H. influenza)
    - Streptococcus pneumoniae (S. pneumoniae)
    - Moraxella catarrhalis (M. catarrhalis)
    - Staphylococcus aureus (S. aureus)
    - Pseudomonas aeruginosa (P. aeruginosa)
    - Mycoplasma pneumoniae (M. pneumoniae)
    - Chlamyphila pneumoniae (C. pneumoniae)
- common pollutants
- medications

Prognosis:
- Exacerbations requiring hospital admission are associated with a 3-4% mortality rate [this rises to 11-24% in patients treated in intensive care units (ICU):
  - the inpatient mortality rate in 2008 was 7.7% in 2008 compared to 7.5% in 2003
  - within 90 days of admission to hospital due to COPD, 33% of patients are readmitted and 14% are deceased
  - of those patients dying within 90 days of admission, fewer succumbed to COPD or its consequences in 2008 (65%) compared to 2003 (71%)

References:
- National Institute for Health and Clinical Excellence (NICE). Chronic obstructive pulmonary disease: management of
COPD - Management of acute exacerbation in primary care
West Hampshire CCG area

Adapted from the Map of Medicine


National information:
The following national information is available:

NICE Quality Standards for chronic obstructive pulmonary disease

This Quality Standard has been added to the Map of Medicine Chronic obstructive pulmonary disease (COPD) care map by QIPP Right Care. For further information see http://www.rightcare.nhs.uk/mapofmedicine/.

National Institute for Health and Clinical Excellence (NICE) Quality Standard

NICE quality standards are a set of concise statements that act as markers of high-quality, cost-effective patient care, covering the treatment and prevention of different diseases and conditions in order to improve health outcomes [i].

Each quality statement is located in the 'National info tab' of the relevant node throughout this pathway, accompanied by the quality measure for calculating the proportion of patients managed or staff trained in accordance with the quality statement, which can be used as the basis for audit.

NICE Quality Standard for chronic obstructive pulmonary disease [i] :
1. People with COPD have one or more indicative symptoms recorded, and have the diagnosis confirmed by post-bronchodilator spirometry carried out on calibrated equipment by healthcare professionals competent in its performance and interpretation.
2. People with COPD have a current individualised comprehensive management plan, which includes high-quality information and educational material about the condition and its management, relevant to the stage of disease.
3. People with COPD are offered inhaled and oral therapies, in accordance with NICE guidance, as part of an individualised comprehensive management plan.
4. People with COPD have a comprehensive clinical and psychosocial assessment, at least once a year or more frequently if indicated, which includes degree of breathlessness, frequency of exacerbations, validated measures of health status and prognosis, presence of hypoxaemia and comorbidities.
5. People with COPD who smoke are regularly encouraged to stop and are offered the full range of evidence-based smoking cessation support.
6. People with COPD meeting appropriate criteria are offered an effective, timely and accessible multidisciplinary pulmonary rehabilitation programme.
7. People who have had an exacerbation of COPD are provided with individualised written advice on early recognition of future exacerbations, management strategies (including appropriate provision of antibiotics and corticosteroids for self-treatment at home) and a named contact.
8. People with COPD potentially requiring long-term oxygen therapy are assessed in accordance with NICE guidance by a specialist oxygen service.
9. People with COPD receiving long-term oxygen therapy are reviewed in accordance with NICE guidance, at least annually, by a specialist oxygen service as part of the integrated clinical management of their COPD.
10. People admitted to hospital with an exacerbation of COPD are cared for by a respiratory team, and have access to a
specialist early supported-discharge scheme with appropriate community support.

11. People admitted to hospital with an exacerbation of COPD and with persistent acidotic ventilatory failure are promptly assessed for, and receive, non-invasive ventilation delivered by appropriately trained staff in a dedicated setting.

12. People admitted to hospital with an exacerbation of COPD are reviewed within 2 weeks of discharge.

13. People with advanced COPD, and their carers, are identified and offered palliative care that addresses physical, social and emotional needs.

Reference:

2. 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
2.1 Bronchodilators
Best administered by a hand-held inhaler device (including a spacer device if appropriate).

2.1.1 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 indacaterol inhalation in clinical trials

2.1.2 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.
  - Glycopyrrrolate
  - Aclidinium
  - Umeclidinium

2.1.3 Inhaler devices
- MDI with spacer is preferred device in all patients who can use it correctly
  - AeroChamber Plus
2.1.4 Nebulisers
• Consider nebulisers if distressing or disabling breathlessness, despite maximal therapy using inhalers [3]
• Continue to prescribe only after assessment confirms on 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, eg anticholingeric drugs [3]
• provide with equipment, servicing, advice, and support [1]

2.2 Inhaled Corticosteroids (ICS)
• Combination products (high dose ICS and LABA):
  • Budesonide /formoterol Turbobalher (Symbicort)
  • Fluticasone /salmeterol Accuhaler (Seretide)
  • Formoterol/Beclostrason MDI (Fostair)
  • Fluticasone/Vilanaterol 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].

2.3 Treatments that are not recommended
• anti-oxidant therapy (alpha tocopheryl 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

3. Patient information

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

4. Updates to this pathway

Quick info:

This pathway has been locally developed for West Hampshire.

Contributors to this pathway:
Dr Alan Roberts, HHFT
5. Chronic obstructive pulmonary disease (COPD) - acute exacerbation

Quick info:

Presenting features of acute exacerbations of COPD:
- worsening breathlessness (common) change in sputum colour (common) increased cough (common)
- increased sputum production (common)
- increased sputum purulence
- upper airway symptoms
- increased wheeze
- chest tightness
- reduced exercise tolerance
- oedema
- increased fatigue
- acute confusion
- chest pain (uncommon - should prompt a search for other aetiologies)
- fever (uncommon - should prompt a search for other aetiologies)

The diagnosis of an exacerbation is made clinically:
- it does not depend on the results of investigations, but investigations may at times assist in ensuring appropriate treatment is given
- exacerbations may be due to bacterial or, viral infection or caused by pollutants

6. Consider differential diagnoses

Quick info:

Consider the following differential diagnoses for an exacerbation:
- pneumonia
- pneumothorax
- left ventricular failure
- pulmonary embolism (PE)
- upper airway obstruction
- pleural effusion
- lung cancer
- recurrent aspiration
- cardiac arrhythmias

7. Assess severity of exacerbation

Quick info:

Assess the severity of the exacerbation:
- by measuring the following:
COPD - Management of acute exacerbation in primary care
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Adapted from the Map of Medicine

- blood pressure (BP)
- respiratory rate
- oxygen saturation by pulse oximetry (SaO2)
- based on the patient's medical history before the exacerbation:
  - number of previous exacerbations/hospitalisations
  - pre-existing co-morbidities
  - symptoms
  - physical examination
  - present treatment regime

Signs of severity include:
- use of accessory muscles
- paradoxical chest wall movement
- worsening or new onset central cyanosis
- hemodynamic instability
- signs of right heart failure
- reduced alertness

Sputum samples are not routinely indicated.

8. Assess whether the patient can be managed at home

Quick info:

Assess the need for hospital admission based on clinical findings and social circumstances. Consider the following when deciding where to manage exacerbations of COPD:
- severity of exacerbation
- rapid rate of onset
- significant co-morbidity, particularly cardiac disease and insulin-dependent diabetes
- patient's wishes
- confusion
- medical history
- patient's ability to cope at home
- level of consciousness

9. Suitable for home management

Quick info:

Consider whether patient needs additional support or can manage alone.

10. Severe exacerbation or poor social support: consider admission

Quick info:

The following factors favour treatment in hospital:
- signs of severe exacerbation, eg:
  - oxygen saturation (SaO2) of less than 90%
  - tachypnoea
  - acute confusion
  - cyanosis present
  - signs of cor pulmonale
• significant co-morbidities present, eg:
  - pneumonia
  - cardiac arrhythmia
  - congestive cardiac failure
  - diabetes mellitus (DM)
  - renal or liver failure
• severe breathlessness
• impaired physical functions
• inability to cope at home, need for social support, or lack of such support
• impaired level of consciousness
• worsening of peripheral oedema
• use or need for long-term oxygen therapy (LTOT)
• inability to eat or sleep due to symptoms
• rapid rate of onset
• need for therapy not available at home, eg:
  - oxygen therapy
  - nebulised agents
• symptoms require intravenous (IV) treatment
• previous or current need for non-invasive ventilation (NIV)
• previous exacerbation which required intensive care unit (ICU) admission

11. End of life or palliative care

Quick info:
If a decision is made to support a patient at home and the illness is likely to be terminal, then consider use of the gold standard framework

12. Initial management

Quick info:

Management:
• Nebuliser or hand-held inhalers with spacer can be used to administer inhaled therapy during exacerbations
• Choice of delivery should reflect the:
  • dose of medication required
  • the ability of the patient to use the device
• If the patient becomes fatigued, consider using a nebuliser
• All patients should receive a short-acting bronchodilator prior to hospital transfer
• Start treatment with oral prednisolone 30mg daily, if not contraindicated

13. Usual primary care support and self management

Quick info:
Many patients will be able to manage their own exacerbation and only involve their GP if initial treatment is unsuccessful. Such patients will require a supply of antibiotic and prednisolone to keep at home, with written instructions on appropriate use. A named contact should be provided in case of failure to respond to treatment.
14. Consider involvement of the Community Team

Integrated service leads may be contacted by the Hub:

Winchester (city and North): 01962 831010
Winchester (rural): 01489 878629
Romsey: 01794 834710
Eastleigh: 02380 627495
Chandlers Ford: 02380 247027
Southern Parishes: 02380 452292
Alton: 01420 828111
Andover: 01264 835372

15. Consider oxygen therapy while awaiting hospital transfer

Quick info:

If the patient:
- is not receiving home oxygen therapy, only give oxygen in a severe acute exacerbation whilst awaiting hospital transfer. Use a 28% Venturi mask at 4L/min
- is already using home oxygen therapy, increase the flow rate if their oxygen saturation falls below 90%
- aim to keep oxygen saturation between 88% and 92% until blood gas result is available. Increasing the SaO2 too much can lead to a rise in carbon dioxide levels and type 2 respiratory failure

NB: Pulse oximetry should ideally be measured before and after receiving oxygen therapy; however, if not available short term oxygen therapy can be prescribed if the patient is breathless.

16. Prevention of exacerbation

Quick info:

Provide self-management advice for patients at risk of an exacerbation by:
- starting oral corticosteroid therapy if increased breathlessness interferes with activities of daily living (unless contraindicated)
- starting antibiotic therapy if their sputum becomes more purulent with increased breathlessness
- optimise therapy to control symptoms

Give patient contact details for a healthcare professional in case symptoms do not improve.

18. Investigations are not usually required

Quick info:

The following are not routinely recommended:
- sputum culture
- blood tests
- electrocardiogram (ECG) - indicated if the resting heart rate is:
  - less than 60 beats per minute; or
  - greater than 110 beats per minute

Indications for pulse oximetry vary between guidelines:
- National Institute for Health and Clinical Excellence (NICE) recommend that pulse oximetry is necessary if severe
exacerbation is clinically evident

19. Follow-up

Quick info:

Follow-up of patients discharged from hospital:
• All patients must be reviewed within 2 weeks of hospital discharge, either by their GP or a hospital specialist
Patient’s recovery should be monitored by regular clinical assessment of their symptoms and their functional capacity, in order to
• optimise current treatment
• assess whether a change in medication is appropriate
• discuss vaccinations
• consider adding new treatments, if appropriate
• review the patient’s self-management plan
• provide information on recognising exacerbations and early intervention

20. Antibiotics

Quick info:

When to give antibiotics:
Prescribe an antibiotic if there is a history of more purulent sputum. Patients with exacerbations without more purulent sputum do not need antibiotic therapy unless there is clinical evidence of pneumonia.
Choice of antibiotics:
The antibiotic must be chosen to reflect local resistance patterns and cover the main pathogens (Non-typical Haemophilus influenzae, Streptococcus pneumoniae, Moraxella catarrhalis). Once or twice daily treatment is preferred to aid adherence.
Current recommended treatments are:
• Amoxycillin 500g three times daily for 5 days
• Doxycycline 200mg stat and then 100mg once daily for 5 days
• If patient is allergic to penicillin and doxycycline is contraindicated – clarithromycin 500g twice daily for 5 days
• If patient has antibiotic resistance - Co-amoxiclav 625mg three times daily for 5 days

National information:
The following national information is available:
NICE Quality Standards for chronic obstructive pulmonary disease

This Quality Standard has been added to the Map of Medicine Chronic obstructive pulmonary disease (COPD) care map by QIPP Right Care. For further information see http://www.rightcare.nhs.uk/mapofmedicine/.
future exacerbations, management strategies (including appropriate provision of antibiotics and corticosteroids for self-treatment at home) and a named contact.

- Denominator - the number of people who have had an exacerbation of COPD.

**Reference:**

### 21. Bronchodilators

**Quick info:**

During an exacerbation the use of bronchodilator treatment should increase, either via a metered dose inhaler (MDI) or nebuliser, depending on the severity of disease and the severity of the exacerbation.

Consider:
- salbutamol 2-4 hourly, 2 puffs via MDI (via spacer) or 2.5mg nebulised 2-4 hourly
- ipratropium 6 hourly, 2 puffs via MDI (via spacer) or 500 micrograms nebulised 2-4 hourly
- continue long acting beta agonist/inhaled corticosteroid combinations as prescribed
- stop tiotropium during exacerbation while using ipratropium
- If patient becomes fatigued consider using a nebuliser

### 22. Prednisolone

**Quick info:**

All patients with an acute exacerbation of COPD should have a short course of corticosteroid:
- start corticosteroids as early as possible during an exacerbation
- initial treatment is prednisolone 30mg once daily for 7 days
- if no improvement, continue for 14 days
- if no improvement after 14 days, stop prednisolone and consider alternative diagnosis, e.g. resistant organism, pneumonia, heart failure or pulmonary embolus
- advise patient's that oral corticosteroids should not be used for more than 14 days. There is no need to taper the dose if taken for less than 3 weeks
- consider osteoporosis prophylaxis for patients requiring a frequent course of oral corticosteroids

### 23. Follow-up

**Quick info:**

Follow-up of patients treated at home:
- if not fully improved in 2 weeks consider chest X-ray and hospital referral
- reassess inhaler technique and patient's understanding of the recommended treatment regimen

Patients' recovery should be monitored by regular clinical assessment of their symptoms and their functional capacity, in order to:
- optimise current treatment
- assess whether a change in medication is appropriate
- discuss vaccinations
- consider adding new treatments, if appropriate
- review the patient's self-management plan
- provide information on recognising exacerbations and early intervention
24. Progress not satisfactory

Quick info:

Assess progress by:
• change in symptoms
• functional capacity
• activities of daily living, ie ability to cope
Assessment should also include:
• re-assessment of:
  • inhaler technique
  • the patient’s understanding of the recommended treatment regimen
• advice on smoking cessation as necessary
Most patients do not require follow-up during an exacerbation, but if there are signs of deterioration reassess to see whether admission to hospital is necessary

25. Progress satisfactory

Quick info:

Assess progress by:
• improvement in symptoms
• functional capacity
• activities of daily living, ie ability to cope
Assessment should also include:
• re-assessment of:
  • inhaler technique
  • the patient’s understanding of the recommended treatment regimen
• advice on smoking cessation as necessary

If patient shows an exceptionally good response to treatment, perform spirometry to reconsider the diagnosis - see COPD map of medicine - making the diagnosis pathway.

Key Dates:
Published: 6th Jan 2015
Map of medicine due for revision following introduction of integrated care service

Evidence summary for COPD - management of acute exacerbation in primary care - Southampton pathway
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)


