



**Academic Health
Science Network**
North East and North Cumbria

Optimising the self-management of COPD exacerbations in primary care

Introduction

Chronic obstructive pulmonary disease (COPD) is an umbrella term for a group of lung conditions that make it difficult to empty air out of the lungs due to narrowing of the airways¹. Management of this condition is complicated, bridging both primary and secondary care.

Exacerbations of COPD are clinically important events; they are expensive and worsen patients' health². An exacerbation of COPD is defined by NICE as 'a sustained worsening of the patient's symptoms from their usual stable state which is beyond normal day-to-day variations, and is acute in onset.'³ Many patients routinely self-manage their exacerbations at home, through the use of a combination of antibiotics and steroids. Local and national guidelines have been developed to support patients and clinicians to manage exacerbations, with the intention to manage patients at home where possible.

Concerns have been raised about the potential mis-use of rescue packs, particularly when prescribing is not linked with an educational intervention⁴.

The proportion of people diagnosed with COPD in the North-East of England is increasing when compared nationally⁵. Data from the NHS Business Services Authority respiratory dashboard indicates that there are groups of patients who are using rescue packs in excess of recommended guidance, with some patients receiving more than 13 rescue packs in 12 months⁶.

This project was aimed at clinicians in general practice and conducted across a primary care network in North Tyneside. The project lead was Paul Davies, director of pharmacy for the North-West North Tyneside primary care network, supported by a pre-registration pharmacist Regan McCahill. Expert input was obtained from respiratory specialists Professor Stephen Bourke and Dr. Carlos Echevarria, and health programme manager for the academic health science network Sue Hart (respiratory nurse with special interest in COPD).

This project had 3 principal aims:

1. Establish a group of researchers with an interest in the management of COPD exacerbations in primary care
2. Compare currently available local and national guidelines,
3. Investigate current processes for the management of exacerbations of COPD across a variety of practices in the North-East of England

Method

Criteria for 'Rescue Pack' guidance

The first aim of this project was to establish criteria that should be included in a COPD self-management plan, and this consensus was reached quickly following a series of emails. The team agreed that the following information should be considered essential:

- Advice to practitioners on which medication should be in the rescue pack
- Patient education on the definition and severity of an exacerbation, which can then drive a self-management plan.

¹ MacNee W, Calverley PM. Chronic obstructive pulmonary disease • 7: Management of COPD. *Thorax* 2003;58:261-265

² Seemungal TA, Donaldson GC, Paul EA, et al. Effect of exacerbation on quality of life in patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 1998;157:1418–22

³ Chronic obstructive pulmonary disease in over 16s: diagnosis and management NICE guideline [NG115] Published date: December 2018 Last updated: July 2019

⁴ The Appropriate Use of Rescue Packs. *Primary Care Respiratory Update*. VOI 5 Issue 1 Spring 2018

⁵ <https://statistics.blf.org.uk/copd>

⁶ <https://www.nhsbsa.nhs.uk/epact2/dashboards-and-specifications/respiratory-dashboard>

- The accurate recording of an exacerbation.
- Clear guidance regarding a medical review after exacerbation
- Clear guidance regarding a referral to a specialist.
- Clear guidance regarding the correct prescribing process for rescue packs

An internet search using the terms "CCG COPD rescue pack guidance" identified several guidance documents from CCGs. There were common themes and similar formats in the majority of CCG guidelines. National and international guidelines were identified from NICE⁷ and The Global Initiative for Chronic Obstructive Lung Disease (GOLD)⁸. Two local guidelines relating to COPD were identified.

Identifying appropriate data sets

The next step was to identify differences in prescribing levels of rescue packs between practices. A number of different tools are available to primary care including RAIDR, openprescribing.net, and epact2. The only way of comparing patient-level prescribing patterns at a number of different organisational levels is through the use of the NHS Business Services Authority's Respiratory dashboard⁹. This dashboard was developed in collaboration with the National Respiratory Dashboard Task and Finish Group, utilising the prescribing data processed by the NHS Business Services Authority. The group included national respiratory specialists, who have agreed specific areas of focus with the aim of improving health outcomes for patients with respiratory conditions.

One of the seven metrics developed identified the prescribing of prednisolone 5mg tablets where the quantity prescribed per item was less than or equal to 60 tablets. Although a proportion of these prescriptions will be issued for other inflammatory conditions, it is assumed that the majority will be issued to treat acute exacerbations of COPD and asthma. The system also allows users to refine the search to identify patients in defined age groups (e.g. over 40yrs, over 60yrs) and also to restrict the search results to patients who are prescribed specific medication, further narrowing the search results.

It was agreed to use the NHS BSA respiratory dashboard.

Analysis of prescribing behaviour

A questionnaire was developed to establish what processes were used to facilitate the ordering of rescue pack medication by patients. Due to COVID restrictions the project lead was unable to interview clinicians directly. Fortunately, each practice in the PCN has recruited a pharmacist who was able to encourage the practices to complete a short questionnaire. The following questions were asked:

1. Do you offer rescue packs on repeat prescription?
2. Do you provide written and verbal education on exacerbation recognition and management?
3. Which medications do you prescribe as part of a rescue pack?
4. Do you monitor the use of rescue medications and the condition of patients while they are using them?
5. Do you have a certain number of issues that trigger a referral into secondary care?
6. Do you conduct a review after the use of a rescue pack?
7. Do you give advice on the use/side effects of steroids?
8. Do you give advice on the use/side effects of antibiotics, including antimicrobial stewardship?

⁷ Chronic obstructive pulmonary disease in over 16s: diagnosis and management
NICE guideline [NG115] Published date: 05 December 2018 Last updated: 26 July 2019

⁸ <https://goldcopd.org/>

⁹ <https://www.nhsbsa.nhs.uk/epact2/dashboards-and-specifications/respiratory-dashboard>

Results

Guidance

The currently available guidance North of Tyne, Gateshead and North Cumbria Area Prescribing Committee¹⁰ has more detailed advice as follows:

COPD flare-ups: Reduce risk by annual flu vaccine, stop smoking, pulmonary rehab, avoid colds and flu contacts.

Overuse of antibiotics causes resistance: consider if substantial increase in sputum volume / purulence for two consecutive days.

First line Amoxicillin or doxycycline, second line co-trimoxazole or co-amoxiclav. 5 days usually sufficient (14 days if bronchiectasis). Fail to respond: sputum culture, alternative antibiotic. Overuse of steroids causes direct harm to patients: consider if substantial increase in breathlessness / wheeze for two consecutive days.

Prednisolone 30mg * 5days. Rescue packs: provide written and verbal information on exacerbation recognition and management and ensure understood—IF NOT DO NOT ISSUE. Consider referral secondary care if 3+ rescue packs taken over 12 months.

The NICE COPD clinical guideline is summarised in Clinical Knowledge Summaries¹¹ and has a specific section relating to exacerbations:

How should I treat a person with an acute exacerbation of COPD who does not require admission?

- If admission is not indicated, advise the person to increase the doses or frequency of short-acting bronchodilators (not exceeding the maximum dose).
 - If possible, keep to the same delivery system (inhaler, inhaler with spacer or nebulizer) as is used on a day-to-day basis — take into account the dose of drug needed, the person's ability to use the device, and resources available to supervise therapy when considering choice of delivery system.
 - If the person is likely to become fatigued, a nebulizer may be appropriate (depending on availability and local protocols) — the driving gas for nebulised therapy should always be specified in the prescription.
- If there are no contraindications, consider oral corticosteroids for people with a significant increase in breathlessness that interferes with daily activities.
 - Offer 30 mg oral prednisolone once daily for 5 days — discuss adverse effects of prolonged therapy.
 - Consider the need for osteoporosis prophylaxis for people requiring frequent courses of oral corticosteroids (3–4 courses per year).
- Consider the need for an antibiotic taking into account:
 - Severity of symptoms (particularly sputum colour changes and increase in volume or thickness beyond normal).
 - Risk of complications.
 - Previous sputum culture and susceptibility results.
 - Risk of antimicrobial resistance and current antibiotic prophylaxis (treatment should be with an antibiotic from a different class).
- First choice oral antibiotics include:
 - Amoxicillin 500 mg three times a day for 5 days.
 - Doxycycline 200 mg on first day, then 100mg once a day for 5-day course in total.
 - Clarithromycin 500 mg twice a day for 5 days.

¹⁰ <http://www.northoftyneapc.nhs.uk/wp-content/uploads/sites/6/2020/02/COPD-management-guidelines-v2.0.pdf>

¹¹ <https://cks.nice.org.uk/chronic-obstructive-pulmonary-disease#!scenario:1>



- If there is no improvement in symptoms on first choice taken for at least 2 to 3 days; guided by susceptibility and where admission is not indicated:
 - Send a sputum sample for culture and susceptibility testing.
 - Offer an alternative first choice antibiotic from different class (guided by susceptibilities when available).
- If the person is at higher risk of treatment failure (for example frequent antibiotic use; previous or current sputum culture with resistant bacteria or high risk of developing complications) consider prescribing co-amoxiclav 500/125 mg three times a day for 5 days — seek specialist advice if unsure.
- If an antibiotic is prescribed, give advice on:
 - Potential adverse effects, including diarrhoea.
 - When to seek medical help, for example if:
 - Symptoms worsen rapidly or significantly or
 - Symptoms do not start to improve within 2–3 days (or other agreed time) or
 - They become systemically very unwell.
- If no antibiotic is given, advise the person to seek medical help immediately if:
 - Symptoms (such as sputum colour changes and increases in volume or thickness) worsen rapidly or significantly or
 - Symptoms do not start to improve within an agreed time or
 - They become systemically very unwell.
- If a sputum sample has been sent and an antibiotic given:
 - Review the choice of antibiotic when results are available.
 - Only change the antibiotic according to susceptibility results if bacteria are resistant and symptoms are not improving.
- Seek specialist advice if:
 - Symptoms are not improving with repeated courses of antibiotics or
 - Bacteria resistant to oral antibiotics are identified or
 - The person cannot take oral medication.

The WHO Gold 2020 guidelines¹² have detailed higher level guidance relating to the management of exacerbations, but cover only 2 points identified by our expert panel:

The medication included in the rescue packs should be prednisolone 30mg to be taken for 7 days, first line is either amoxicillin 500mg TDS for 5 days/doxycycline 200mg on the 1st day and 100mg for a further 4 days/clarithromycin 500mg BD for 5 days.

Practices need a system for monitoring the use of rescue medications and the condition of their patients while they are using them. These medications should only be prescribed in conjunction with a self-management plan and Rescue Packs should never be on repeat prescription

¹² <https://goldcopd.org/wp-content/uploads/2019/11/GOLD-2020-REPORT-ver1.0wms.pdf>

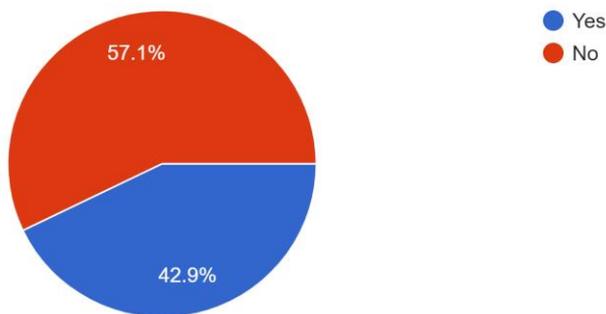
In order to validate this data a further analysis of two practices was undertaken. Forest Hall Medical Group and Garden Park Surgery have a combined practice list of over 19,000 patients, representing over 25% of the patient population of the PCN. Both practices use System1, and a report was built that was able to identify the number of acute prescriptions issued for prednisolone, co-amoxiclav, amoxicillin and doxycycline for patients with a diagnosis of COPD.

124 patients with COPD were identified who received a rescue pack prescription over the 12-month period. 100 patients from this group received more than 3 acute prescriptions for prednisolone over a 12-month period, and 15 received more than 10 prescriptions. This data set also demonstrated that most rescue packs were issued as a combination of steroid and antibiotic. A total of 736 rescue packs were issued for prednisolone, and 710 prescriptions for antibiotics. This represents over 700 exacerbations of COPD in 12 months.

Prescribing processes - responses

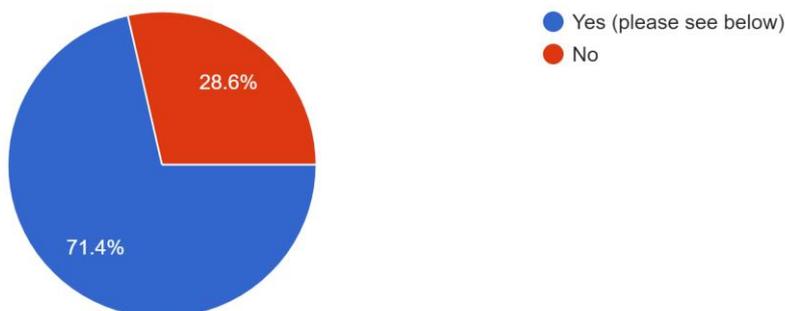
1. Do you offer rescue packs on repeat prescription?

7 responses



2a. Do you provide written and verbal education on exacerbation recognition and management?

7 responses



2b. If you offer written and verbal education on exacerbation recognition and management, can you provide a brief description below

- There is no standardised way of doing this, patients are educated during their annual review
- Discuss as a part of management plan with rescue pack specially during annual review. advise exacerbation symptoms and when to use rescue pack. give copd exacerbation management leaflets from BLF and PCRS.



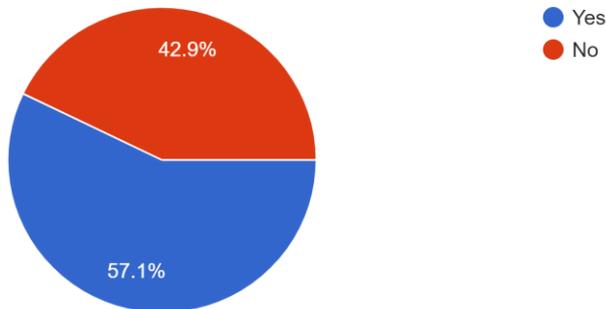
- Only during the annual review while discussing management plan with rescue pack
- Each patient has a COPD care plan with details in when to take either/both
- As per care plan

3. Which medications do you prescribe as part of a rescue pack? 6 responses

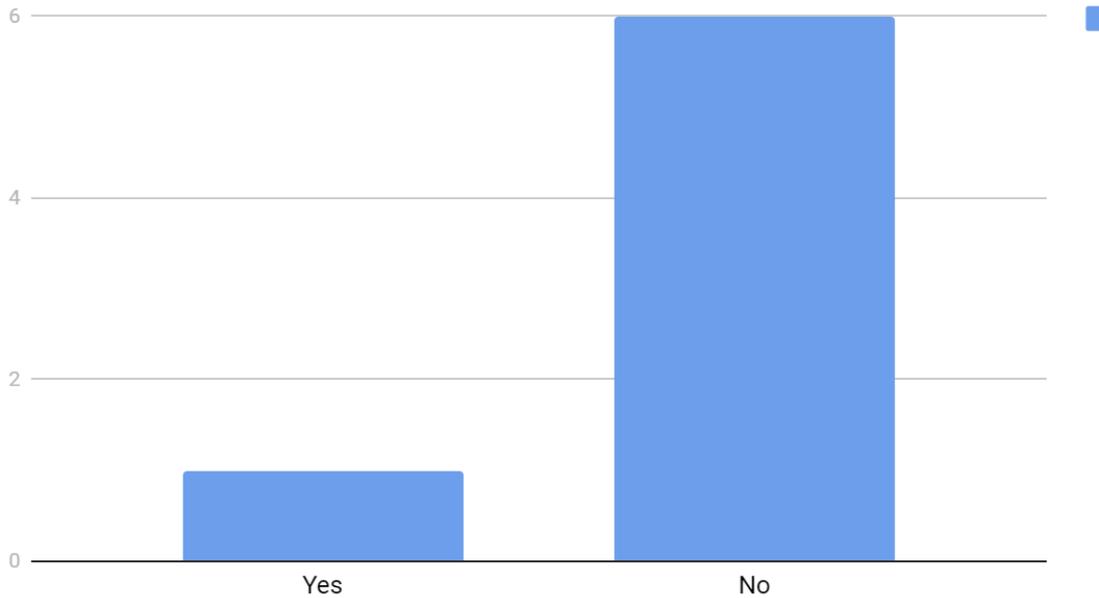
- Amoxicillin and prednisolone, or doxycycline and prednisolone
- antibiotics with rescue pack (doxycycline/amoxicillin unless contraindicated with prednisolone)
- antibiotics & steroids (doxycycline & prednisolone)
- Doxycycline and Prednisolone
- Prednisone + amoxicillin/doxycycline
- Oral steroid and abx

4. Do you monitor the use of rescue medications and the condition of patients while they are using them?

7 responses



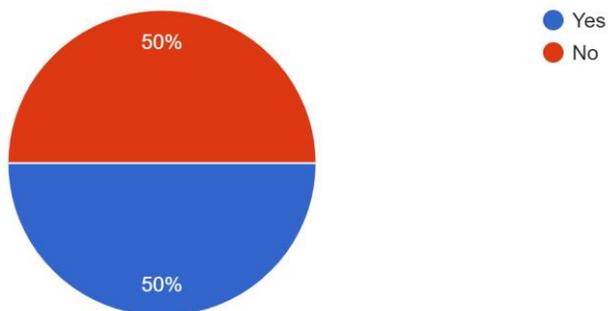
5. Do you have a certain number of issues that trigger a referral into secondary care? If so, how many



It was stated that 3 issues would trigger a referral

6. Do you conduct a review after the use of a rescue pack?

6 responses



7. Do you give advice on the use/side effects of steroids? If so please give details.

No - 2 responses

Yes - 5 responses. Details below:

- give leaflets . GI disturbances, etc & risk of antimicrobial resistance.
- not to overuse, affecting bone density (+ COVID-19)
- In copd care plan



- long term / repetitive risk of re-infection, osteoporosis, peptic ulcer, weight increase
- dosage instructions only.

8. Do you give advice on the use/side effects of antibiotics, including antimicrobial stewardship? If so please give details.

- Yes, but not standardised
- Yes. BLF leaflets. Reinforce the risk of antibiotic resistance with unnecessary use.
- Yes. antibiotic resistance, GI disturbances, etc
- In care plan



Discussion

It is clear from this project that COPD exacerbations represent a significant clinical challenge for primary care, and the use of rescue packs in primary care is an important part of the treatment pathway. Even amongst this group of practices who have been working closely over many years, and now form a Primary Care Network, there is considerable variation in the prescribing processes for rescue packs. There are more detailed guidelines available in other areas, but no evidence from the national dashboard that they result in a reduction in exacerbations. The current guidelines available for the North of Tyne region do not meet the criteria established by our expert group.

This does raise the question about how to make sure best practice around COPD exacerbation management is encouraged in primary care. It could be argued that the current system of locally produced guidelines needs to be standardised, and also further education developed to help reinforce good prescribing behaviour. Further work exploring this, including a more detailed view of the health and financial burden would be of great benefit to patients and the NHS.

Although we have not formally validated the NHS BSA data, it is possible that it underestimates the number of exacerbations as it does not take into account the use of antibiotics. This suggests that the actual number of exacerbations in primary care is much higher than expected. Each GP practice in England has a cohort of patients who are using short courses of steroids on a regular basis. In addition to improving the prescribing processes, it is vital that we support patients to improve self-management. There are a number of examples of local initiatives aimed at this, as well as several apps. Again, this would benefit from formal evaluation of the impact on patient care.

Our proposals for next steps involve the following research questions:

1. Is there variation in prescribing levels between practices when practice size and demographics are taken into account. What are the common themes amongst the outliers?
2. What are the benefits and harms from the current prescribing levels of both steroids and antibiotics.
3. Is there a patient-level intervention that would improve self-management