NICE National Institute for Health and Care Excellence

Putting NICE guidance into practice

Resource impact report:
Chronic obstructive pulmonary disease in over 16s: diagnosis and management (update) (NG115)

Published: December 2018

The guideline has been updated in July 2019 following a review on inhaled triple therapy and oral corticosteroids for managing exacerbations. The price of triple therapy devices has been updated but the resource impact products published in December 2018 otherwise remain valid to support the updated guideline.

This report has also been updated in June 2022 to update the recommendation numbers used in the report

Summary

This guideline Chronic obstructive pulmonary disease in over 16s: diagnosis and management is an update of NICE guideline CG101 (published June 2010) and will replace it. NG115 was first published in December 2018 and updated in July 2019 following a review of inhaled triple therapy and oral corticosteroids.

The guideline covers diagnosing and managing COPD. The recommendations most likely to have a substantial resource impact are:

- recommendation 1.2.11, which recommends prescribing dual therapies for some people with newly diagnosed chronic obstructive pulmonary disease (COPD)
- recommendations 1.2.88-89, on criteria for referring patients for possible lung volume reduction surgery.

The full recommendations are given in paragraphs 3.1 and 3.2.

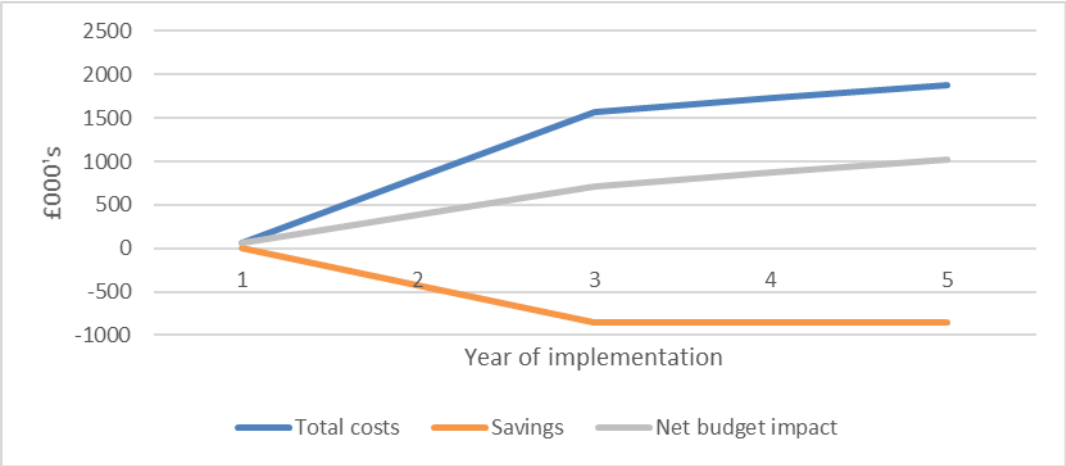
Financial impact

The estimated financial impact of implementing this guideline for England in the next 5 years is a cost of £57,000 in 2018/19 rising to £1,875,000 in 2022/23. These costs may be offset by savings of £426,000 in 2019/20 rising to £852,000 in 2022/23, giving a net impact of £57,000 in 2018/19 rising to £1,023,000 in 2022/23 as set out in table 1 and in a graph in figure 1 below.

Table 1 Estimated budget impact of implementing the guideline

Recommendation	2018/19 (£000)	2019/20 (£000)	2020/21 (£000)	2021/22 (£000)	2022/23 (£000)
Costs					
Recommendation 1.2.11	0	609	1,218	1,218	1,218
Recommendation 1.2.88-89	57	204	351	510	657
Total costs	**57**	**813**	**1,569**	**1,728**	**1,875**
Savings					
Recommendation 1.2.11	(0)	(426)	(852)	(852)	(852)
Net budget impact	**57**	**387**	**717**	**876**	**1,023**

Figure 1 Estimated budget impact of recommendations 1.2.11, 1.2.88 and 1.2.89



1 Introduction

1.1 The guideline offers best practice advice on diagnosing and managing chronic obstructive pulmonary disease in people aged 16 and over.

1.2 This guideline is an update of NICE guideline CG101 (published June 2010) and will replace it. There is new evidence on diagnosis and prognosis, inhaled combination therapies, prophylactic antibiotics, oxygen therapy, managing pulmonary hypertension and cor pulmonale, lung surgery and lung volume reduction procedures, education, self-management and telehealth monitoring for people with COPD.

1.3 A further update was made in July 2019 following a review of inhaled triple therapy and oral corticosteroids.

1.4 This report discusses the resource impact of implementing our guideline on chronic obstructive pulmonary disease in over 16s in England. It aims to help organisations plan for the financial implications of implementing this NICE guideline.

1.5 We encourage organisations to evaluate their own practices against the recommendations in the NICE guideline and assess costs and savings locally. Organisations can input estimates into the local resource impact template to reflect local practice and estimate the impact of implementing the guideline.

1.6 Services for people with chronic obstructive pulmonary disease are commissioned by CCGs. Providers are NHS hospital trusts and general practitioners.

2 Background

2.1 COPD is the second most common lung disease in the UK, after asthma. Around 2% of the population over 16 years old – 4.5% of all people aged over 40 – live with diagnosed COPD (British Lung

Foundation: Chronic obstructive pulmonary disease statistics) :July 2018.

2.2 COPD is the second most common cause of emergency admissions with an increase of 13% between 2008 and 2014. COPD is the fifth most common cause of mortality in the UK, and causes nearly 30,000 deaths every year in England.

3 Recommendations with potential resource impact

3.1 Inhaled combination therapy

The guideline recommends:

Offer LAMA+LABA to people who:

- have spirometrically confirmed COPD **and**
- do not have asthmatic features/features suggesting steroid responsiveness **and**
- remain breathless or have exacerbations despite:
  - having used or been offered treatment for tobacco dependence if they smoke **and**
  - optimised non-pharmacological management and relevant vaccinations **and**
  - using a short-acting bronchodilator. **[2018] (recommendation 1.2.11)**

Background

3.1.1 Long-acting bronchodilators can be taken as single or fixed-dose combination inhalers. The possible combinations of medicines include:

- Inhaled corticosteroid (ICS) combination
- Long-acting muscarinic antagonist (LAMA)
- long-acting beta-adrenoceptor agonist (LABA)
- LAMA+LABA

- LABA+ICS
- LAMA+LABA+ICS

3.1.2 This recommendation is assumed to only affect people newly diagnosed with COPD (the incident population). People who have previously been diagnosed with COPD are assumed to have their medication adjusted accordingly.

Population

3.1.3 There are around 80,000 people in England diagnosed with COPD each year of which 57% are prescribed a long acting bronchodilator. The remainder are either prescribed short-acting bronchodilators or have no medication. See table 2 for people newly diagnosed with COPD who use long acting bronchodilators and table 3 for current prescribing for newly diagnosed people with COPD who use long acting bronchodilators.

Table 2 Newly diagnosed people with COPD who use long acting bronchodilators

Variables	%	Number
Adult population (aged 16 and over)		43,482,790
Incidence of COPD in England	0.19	80,443
People with COPD who do not use long acting bronchodilators	43%	34,591
People with COPD who use long acting bronchodilators	**57%**	**45,852**
Total	100%	80,443

Table 3 Current prescribing for newly diagnosed people with COPD who use long acting bronchodilators

Variables	%	Number
People with COPD who use long acting bronchodilators		45,852
People with COPD who have LAMA	46%	20,915
People with COPD who have LABA	12%	5,631
People with COPD who use LAMA+LABA	5%	2,413
People with COPD who have LABA+ICS	21%	9,653
People with COPD who have LAMA+LABA+ICS	16%	7,240
Total	**100%**	**45,852**

Costs

3.1.4 Table 4 sets out the current costs of prescribing for people newly diagnosed with COPD.

Table 4 Current costs of prescribing of people newly diagnosed with COPD

Variables	Number	Unit cost per annum £	Total cost per annum £
People with COPD who have LAMA	20,915	355.41	7,433,400
People with COPD who have LABA	5,631	368.40	2,074,460
People with COPD who have LAMA+LABA	2,413	390.00	941,070
People with COPD who have LABA+ICS	9,653	360.72	3,482,030
People with COPD who have LAMA+LABA+ICS	7,240	594.31	4,302,790
Total	**45,852**		**18,233,750**

3.1.5 The implementation of recommendation 1.2.11 is anticipated to change current prescribing at the point treatment is stepped up to a long acting regimen for the first time for people newly diagnosed with COPD as follows:

- the use of LAMA, LABA and LABA+ICS will be partly replaced by treatment with LAMA+LABA
- the number of people who have triple therapy is not anticipated to change.

3.1.6 The estimated cost of future prescribing for people newly diagnosed with COPD is set out in table 5. Future practice proportions are based on clinical opinion.

Table 5 The estimated cost of future prescribing for people newly diagnosed with COPD

Variables	Future practice (current practice) %	Number	Unit cost per annum £	Total cost per annum £
People with COPD who have LAMA	5% (46%)	2,091	355.41	743,162
People with COPD who have LABA	1% (12%)	563	368.40	207,409
People with COPD who have LAMA+LABA	76% (5%)	34,992	390.00	13,646,880
People with COPD who have LABA+ICS	2% (21%)	965	360.72	348,095
People with COPD who have LAMA+LABA+ICS	16% (16%)	7,240	594.31	4,302,790
Total	**100% (100%)**	**45,852**		**19,248,336**

3.1.7 The budget impact of £1,218,000 of the change in prescribing as result of this recommendation for people newly diagnosed with COPD is summarised in table 6.

Table 6 The cost in the change in prescribing as result of this recommendation for people newly diagnosed with COPD

Variables	Number	Cost per annum £	VAT £	Total cost per annum £
Estimated cost of current prescribing	45,852	18,233,750	3,646,750	21,880,500
Estimated cost of future prescribing	45,852	19,248,336	3,849,668	23,098,004
Budget impact		**1,014,586**	**202,918**	**1,217,504**

Potential savings

3.1.8 By changing prescribing to dual therapy it is anticipated there will a reduction in hospital admissions for people with COPD with acute exacerbations.

3.1.9 The current rate for people admitted to hospital with COPD with acute exacerbation is 5.84%. This is expected to fall by 24% (to around 4.4%) for the population who move to LAMA+LABA based on the guideline economic model report.

3.1.10 The average cost of hospitalisation of £1,868 is a weighted average cost based on prices from National Tariff 2018/19 and activity data from NHS reference costs 2015-2016 for HRG codes DZ65A-J Chronic Obstructive Pulmonary Disease or Bronchitis.

3.1.11 The estimated savings from a reduction in hospital admissions for people with newly diagnosed COPD with acute exacerbations as a result of being prescribed LAMA+LABA is set out in table 7.

Table 7 Estimated savings from a reduction in hospital admissions for people with newly diagnosed COPD with acute exacerbations as a result of being prescribed LAMA+LABA

Variables	
Estimated number of people newly diagnosed with COPD currently prescribed LAMA+LABA	2,413
Estimated number of people newly diagnosed with COPD to be prescribed LAMA+LABA	34,992
Movement of people to LAMA+LABA	32,579
Percentage reduction in hospital episodes for people admitted to hospital with COPD with acute exacerbation (5.84%*24%)	1.40%
Reduction in the number of hospital episodes (32,579 *1.4%)	**456**
Cost per episode	£1,868
Estimated total saving	**£852,000**

3.1.12 The total resource impact of this recommendation is profiled over the next 5 financial years in table 8 below

Table 8 Resource impact of offering LAMA+LABA.

	2018/19 (£000)	2019/20 (£000)	2020/21 (£000)	2021/22 (£000)	2022/23 (£000)
Resource impact	**0**	**183**	**366**	**366**	**366**

Assumptions made

3.1.13 The proportion of people with COPD who use long acting bronchodilators (combinations of LAMA, LABA and ICS combination inhaled therapies) of 57% is taken from assessing the healthcare resource use associated with inappropriate prescribing of inhaled corticosteroids for people with chronic obstructive pulmonary disease (COPD) in GOLD groups A or B: an observational study using the Clinical Practice Research Data. James et al, 2018.

3.1.14 The proportion of people using each combination (see table 2 above) is taken from, assessing the healthcare resource use associated with inappropriate prescribing of inhaled corticosteroids for people with chronic obstructive pulmonary disease (COPD) in GOLD groups A or B: an observational study using the Clinical Practice Research Data. James et al, 2018.

3.1.15 The proportion of eligible people who are expected to have LAMA+LABA Inhaled combination therapies of 76% is based on clinical expert opinion. In 2018/19 5% of people are expected to have LAMA+LABA increasing to 41% in 2019/20 before reaching full impact of 76% from 2020/21 onwards.

3.1.16 Inhaled therapy costs are taken from the BNF and the average price for the current available inhalers has been used.

3.1.17 The current rate for people admitted to hospital with COPD with acute exacerbation of 5.84% is expected to fall by 24% for the population who move to LAMA+LABA based on the guideline economic model report.

3.1.18 The average cost of hospitalisation of £1,868 is a weighted average cost based on prices from National Tariff 2018/19 and activity data from NHS reference costs 2015-2016 for HRG codes DZ65A-J Chronic Obstructive Pulmonary Disease or Bronchitis.

Other benefits

3.1.19 Minimising the number and type of inhaler devices and avoiding unnecessary within-class switching may produce cost savings through lower upfront spending and better symptom control.

3.2 Lung surgery and lung volume reduction procedures

The guideline recommends:

Offer a respiratory review to assess whether a lung volume reduction procedure is a possibility for people with COPD when they complete pulmonary rehabilitation and at other subsequent reviews, if all of the following apply:

- they have severe COPD, with FEV1 less than 50% and breathlessness that affects their quality of life despite optimal medical treatment (see recommendations 1.2.11 to 1.2.16)
- they do not smoke
- they can complete a 6-minute walk distance of at least 140 m (if limited by breathlessness.) **[2018] (recommendation 1.2.88)**

At the respiratory review, refer the person with COPD to a lung volume reduction multidisciplinary team to assess whether lung volume reduction surgery or endobronchial valves are suitable if they have:

- hyperinflation, assessed by lung function testing with body plethysmography **and**
- emphysema on unenhanced CT chest scan **and**
- optimised treatment for other comorbidities. **[2018] (recommendation 1.2.89)**

Background

3.2.1 People with severe COPD who have lung volume reduction surgery show improvements in lung function, exercise capacity, quality of life and long-term mortality. The criteria for who should be referred for this procedure was based on the criteria used in the trials reviewed by the committee and the committee's clinical expertise, taking into account current practice in the NHS.

3.2.2 The criteria for referring people to a multidisciplinary team (MDT) to assess for lung volume reduction assessment have been broadened with recommended treatment options now including endobronchial valves. However a respiratory review is only

available to people who meet the criteria set out in recommendation 1.2.88. This will mean the numbers still remain small.

Assumptions made

3.2.3 The current annual number of lung volume procedures is 262 (Hospital Admitted Patient Care Activity, 2015-16 - NHS Digital; Main procedures and interventions: Reduction of lung volume E54.6).

3.2.4 Uptake of lung volume reduction surgery in the prevalent population is assumed to increase by 2% in financial year 2018/19 then 5% per year between financial year's 2019/20 and 2022/23, reaching overall an increase of 22% by year 2022/23, based on clinical expert opinion.

3.2.5 The average cost of lung volume reduction surgery of £11,331 is a weighted average cost based on prices from National Tariff 2018/19 and activity data from NHS reference costs 2015-2016 for HRG codes DZ62A-C Very Complex Thoracic Procedures).

Costs

3.2.6 It is anticipated that there will be more referrals and improved access to lung volume reduction surgery.

3.2.7 The net cost of providing additional lung volume reduction surgeries is summarised in table 8 and the increase is profiled over 5 years in table 9.

Table 8 Estimated costs from an increase in lung volume reduction surgery

Variable	Number of people who receive lung volume surgery	Cost per procedure £	Total cost £
Current practice	262	11,331	2,968,722
Future practice	320	11,331	3,625,920
Budget impact	**58**		**657,198**

Table 9 Estimated annual costs of additional lung volume reduction surgeries and the number of people affected

	Current practice	2018/19	2019/20	2020/21	2021/22	2022/23
Number of people who have lung volume surgery currently	262	262	262	262	262	262
Percentage increase in the number of people who have lung volume surgery above current baseline	0%	2%	7%	12%	17%	22%
Increase in the number of people who have lung volume surgery	0	5	18	31	45	58
Unit cost		£11,331	£11,331	£11,331	£11,331	£11,331
Total resource impact (£000)	0	57	204	351	510	657

3.3 Other recommendations with a potential resource impact

Background

3.3.1 Oral prophylactic antibiotic therapy (recommendations 1.2.45 to 1.2.53). It is likely that these recommendations will increase the number of people taking prophylactic antibiotics. This is unlikely have a significant resource impact, given the relatively low cost of

antibiotics. Reducing exacerbation frequency may reduce the amount of oral corticosteroids taken by people with COPD.

3.3.2 Long-term oxygen therapy (recommendations 1.2.55 to 1.2.66). These recommendations may result in an increase in demand for stop smoking services, and may also reduce the cost of managing harms associated with oxygen use, including falls, burns and the wider costs of fires.

3.3.3 Do not offer ambulatory oxygen to manage breathlessness in people with COPD who have mild or no hypoxaemia at rest**. [2018]** (1.2.67). Reducing the use of ambulatory and short-burst oxygen therapy in people who would not benefit is likely to be cost saving.

4 Implications for commissioners

4.1 The guideline is anticipated to change prescribing for people with COPD who have long acting bronchodilators.

4.2 Commissioners may also need to review chronic obstructive pulmonary disease commissioning policies in order to meet the recommendations on oral prophylactic antibiotic therapy. Demand and capacity planning may be needed to model any changes to smoking cessation services.

4.3 Chronic obstructive pulmonary disease falls under programme budgeting category 11X (problems of the respiratory system).

About this resource impact report

This resource impact report accompanies the NICE guideline on chronic obstructive pulmonary disease in over 16s: diagnosis and management and should be read in conjunction with it. See terms and conditions on the NICE website.