

National COPD Audit Programme



COPD: Working together

National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme:
Clinical audit of COPD exacerbations
admitted to acute hospitals in England
and Wales 2017

**National clinical audit report
April 2018**

Prepared by:



**Royal College
of Physicians**

**Imperial College
London**

In partnership with:



**British
Thoracic
Society**

Commissioned by:



Working in wider partnership with:



The Royal College of Physicians

The Royal College of Physicians (RCP) plays a leading role in the delivery of high-quality patient care by setting standards of medical practice and promoting clinical excellence. The RCP provides physicians in over 30 medical specialties with education, training and support throughout their careers. As an independent charity representing over 34000 fellows and members worldwide, the RCP advises and works with government, patients, allied healthcare professionals and the public to improve health and healthcare.

Healthcare Quality Improvement Partnership (HQIP)

The National COPD Audit Programme is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit (NCA) Programme. HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP holds the contract to manage and develop the NCA Programme, comprising more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual audits, also funded by the Health Department of the Scottish Government, DHSSPS Northern Ireland and the Channel Islands.

Citation for this document: Stone RA, McMillan V, Mortier K, Holzhauser-Barrie J, Riordan J, Stone P, Quint J, Roberts CM. *COPD: Working together. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Clinical audit of COPD exacerbations admitted to acute hospitals in England and Wales 2017*. National clinical audit report. London: RCP, April 2018.

Copyright © Healthcare Quality Improvement Partnership 2018

ISBN: 978-1-86016-723-2
eISBN: 978-1-86016-724-9

Royal College of Physicians

Care Quality Improvement Department
11 St Andrews Place
Regent's Park
London NW1 4LE

Registered charity no 210508

www.rcplondon.ac.uk/nacap @NACAPaudit #COPDAudit #COPDwhocares #COPDauditQI

Contents

Report at a glance	5
How to use this report	6
Introduction	7
Key findings	8
General information	8
Provision of timely care	9
Recording key clinical information	10
<i>QI priority: Ensure that a spirometry result is available for all patients admitted to hospital with an acute exacerbation of COPD.....</i>	<i>11</i>
<i>QI priority: Ensure that all current smokers are identified, offered, and if they accept, prescribed smoking cessation pharmacotherapy.</i>	<i>12</i>
Non-invasive ventilation (NIV).....	13
<i>QI priority: To ensure that all patients requiring NIV on presentation (ie that have evidence of respiratory acidosis) receive it within 60 minutes of the blood gas result associated with the clinical decision to provide NIV and within 120 minutes of arrival for those who present acutely.</i>	<i>13</i>
Discharge processes	14
Web-tool run charts	15
Conclusion.....	16
Areas showing improvement.....	16
Areas where further improvement is necessary	16
Recommendations	17
For providers	17
For commissioners/sustainability and transformation partnerships (STPs).....	17
For patients/carers and their families	17
For primary care	17
Appendix A: Chronic obstructive pulmonary disease in adults NICE Quality standard [QS10]	18
Appendix B: Chronic obstructive pulmonary disease in over 16s: diagnosis and management NICE Clinical guideline [CG101]	20
Appendix C: Document purpose	22
Appendix D: References.....	23

REPORT

AT A GLANCE

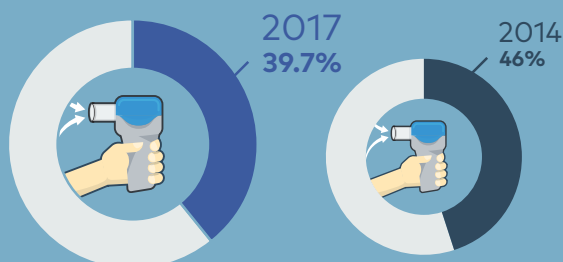


36,341 HOSPITAL
ADMISSIONS

BY 182 HOSPITALS IN
ENGLAND AND WALES

1. SPIROMETRY

Only **39.7%** of admissions had an available result (46% in 2014).



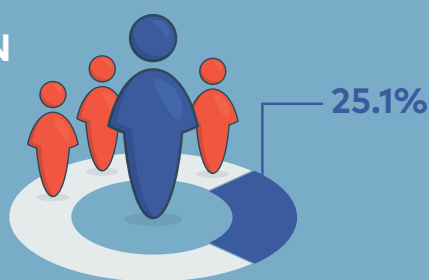
QI* Priority

Ensure a spirometry result is available for all admissions with an acute exacerbation of COPD

*QI = Quality Improvement

2. SMOKING CESSATION

Only **25.1%** of current smokers were prescribed smoking cessation pharmacotherapy during admission.

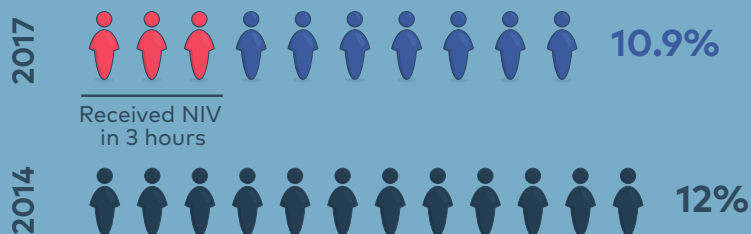


QI Priority

Ensure all current smokers are identified and, if they accept, offered smoking cessation pharmacotherapy

3. NON-INVASIVE VENTILATION (NIV)

10.9% of admissions received acute treatment with NIV (compared to 12% in 2014). Of those that received it, **only 30.1%** received NIV within the current standard of 3 hours.



Received NIV
in 3 hours

In 2014 NIV received within 3 hours was calculated from **time of arrival** rather than **time of admission** hence why it has not been depicted here.



QI Priority

Ensure all patients requiring NIV upon presentation at hospital receive it within:

- 60 mins of the arterial blood gas result;
- 120 minutes of arrival.[†]

OTHER AREAS



RESPIRATORY REVIEW

Review of admissions within 24 hours has improved from **49% in 2014** to **54.8% in 2017**.



INPATIENT MORTALITY

This fell marginally to **3.9% in 2017** compared to **4.3% in 2014**



OXYGEN PRESCRIPTION

There was a marginal improvement to **57.3% in 2017** from **55% in 2014**.

[†] When the dataset for the audit was agreed in 2017 evidence/guidance suggested that provision of NIV within 3 hours of arrival was an appropriate measure of quality NIV care. Since this time a newer NIV guideline has been published by the BTS (<http://bmjopen.respres.bmj.com/content/5/1/e000283>) suggesting NIV should be provided within 120 minutes of arrival hence the QI priority here has been updated to reflect this.

How to use this report

The purpose of this report is to outline the main messages and key recommendations from the clinical component of the National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme's secondary care clinical audit. This report's audience includes healthcare professionals; NHS managers, chief executives and board members; service commissioners; policymakers; voluntary organisations; patient support groups; COPD patients and their families/carers; and the public.

The continuous audit, which captures the process and clinical outcomes of treatment in patients admitted to hospital in England and Wales with COPD exacerbations, launched on 1 February 2017. This report, which is the first report post launch of continuous data collection, presents the results of the cohort of patients discharged between the audit's launch date and 13 September 2017. In order for the report to be published in line with the National COPD Audit Programme's contract end date, the data were extracted prior to completion of a full year of data collection. Consequently, this report presents the results of a slightly truncated patient cohort.

References to the appropriate National Institute for Health and Care Excellence (NICE) quality statements^{*,†} (Appendix A) and clinical guidelines[‡] (Appendix B) are inserted throughout the key findings. The report also highlights the top three areas for quality improvement (QI) in 2018, and providers and commissioners should consider how these might best be delivered locally to the benefit of patients and the system.

The full data analyses are available online (via www.rcplondon.ac.uk/working-together) for in-depth perusal. The data are presented largely in tabular form with explanatory notes throughout. Although these data are available to the interested reader, it is not necessary to review them to appreciate the key messages. These data will also be made publicly available on www.data.gov.uk, in line with the government's transparency agenda.

Please note that all the appendices for this report, including the full methodology, can be found in the online data report. Copies of our datasets, our good practice repository as well as the resources supplied for both the clinical and organisational audits can be found via our website: www.rcplondon.ac.uk/projects/outputs/secondary-care-audit-2017-resources.

The Best practice tariff (BPT) for COPD is in place for the financial years 2017/18 and 2018/19 for trusts in England. Publically available quarterly and year-to-date BPT reports can be downloaded online from: www.nacap.org.uk/nacap/welcome.nsf/reportsSC.html. In the future regional reports will also be made available on a six monthly basis.

If you would like to discuss any of the findings or recommendations in more detail with other participants, or you have ideas you would like to share, you can log into our audit forum on the Respiratory Futures website: www.respiratoryfutures.org.uk/copdsecondarycareauditforum/.

* National Institute for Health and Care Excellence. *Chronic obstructive pulmonary disease in adults*. NICE Quality standard 10 (QS10). London: NICE, 2016. www.nice.org.uk/Guidance/QS10 [Accessed December 2017].

† National Institute for Health and Care Excellence. *Chronic obstructive pulmonary disease in adults*. NICE Quality standard 10 (QS10). 2011 edition. London: NICE, 2011. www.nice.org.uk/Guidance/QS10 [Accessed December 2017].

‡ National Institute for Health and Care Excellence. *Chronic obstructive pulmonary disease in over 16s: diagnosis and management* (partial update). NICE Clinical Guideline 101 (CG101). London: NICE, 2010. www.nice.org.uk/guidance/CG101 [Accessed December 2017].

Introduction

The National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme last conducted a clinical audit of COPD exacerbations in England and Wales in 2014.¹ The results highlighted a reduction in inpatient mortality (4.3% in 2014 in comparison to 7.8% in 2008) and length of stay (a median of 4 days in 2014 in comparison to 5 days in 2008).

Despite the improvements, the 2014 audit identified some variations in care, notably around the provision of respiratory specialist review (only 49% of admissions were reviewed by a member of the respiratory team within 24 hours of admission) and the consistency of discharge processes (for example, 44% of patients received no assessment for suitability for pulmonary rehabilitation at the time of discharge). Key processes (particularly time to NIV and documentation of spirometry) needed to improve, as did cross-sector integration of care. Access to respiratory teams was much reduced at weekends.

A similar theme was evident within the analyses detailing the outcomes of COPD care in the 2014 cohort.² A striking finding was that one-quarter (24%) of patients were readmitted at least once (for any reason) within 30 days of discharge. Although COPD was the commonest reason for readmission, it accounted for fewer than half (44%) of all these readmissions. Both reports remarked upon the urgent need to develop more effective collaborative working across the sectors in an effort to reduce readmissions.

The emergence of key themes and the resistance of some processes to change over repeated audit cycles have been drivers for two major developments in the secondary care clinical audit. The first is a switch to continuous collection of clinical data, allowing near real-time feedback of key performance indicators; the second is the introduction of a Best Practice Tariff (BPT) for COPD in England,³ designed specifically to drive improvements in discharge processes, known to reduce readmissions,⁴ and access to specialist care, associated with better care processes.⁵

The current report summarises data from **36,341 hospital admissions** entered by **182 hospitals in England and Wales** (median 263 admissions per hospital). It highlights improvements in the timing of acute medical care, respiratory specialist review and completion of discharge. However, COPD care remains very variable. The time to delivery of non-invasive ventilation (NIV), prescribing of oxygen and recording of spirometry requires particular attention, as does identification of current smokers and delivery of in-patient smoking cessation pharmacotherapy. There remain far fewer discharges at the weekend. These should become key targets for clinicians and managers for improvement in 2018.

Clinical and audit teams are however to be commended for delivering not only improvements in care under sometimes challenging circumstances, but also for collecting what is believed to be the largest COPD audit dataset worldwide at the time of analysis.

Key findings

It is important to consider these data in the context of COPD service organisation, outlined in the 2018 organisational report,⁶ the main observations from which were:

- a reported increase in the median number of emergency, respiratory and COPD admissions (although it is not known whether this is due to increased prevalence or acuity of the cohort, or to a rise in avoidable admissions)
- respiratory team staffing was unchanged since 2014, despite the apparent increase in workload
- the majority of COPD patients were treated on non-respiratory wards where specialist care access is lowest
- improved provision of palliative care and integrated, cross-sector services
- reduced access to respiratory teams and cross-sector care at weekends.



General information

To see the data analysis in full, please access the data analysis and results report available at www.rcplondon.ac.uk/working-together

Admissions/discharge

- **COPD admissions** were again more common in **females** (53.1% in 2017, compared to 51% in 2014). The median **age at admission** was **73 years**, compared to 72 years in 2014.
- Overall, **COPD admissions** from the most **deprived areas in England** remain unchanged from 2014, at 33.1%.
 - However there has been an **absolute increase** of approximately 4% in **COPD admissions** from the **most deprived areas in Wales** (38.4% in 2017, compared to 34% in 2014).
- The median **time from arrival to admission** was **3.4 hours**.[§]
 - **Admission rates** for COPD were **greater during weekdays** than at weekends. The **highest percentage** of admissions were on a **Monday (15.7%)**.^{**}
- As per the results of the 2014 audit, **fewer patients** were **discharged on a weekend** (8.4% on a Saturday and 6.4% on a Sunday in 2017, 7% on a Saturday and 5% on a Sunday in 2014), in comparison to during the weekday (for example, 15.9% on a Monday and 17.8% on a Tuesday in 2017, 16% on a Monday and 19% on a Tuesday in 2014).

Length of stay

- The **median length of stay** remained unchanged from that reported in 2014, at **4 days**.

Mortality

- **Inpatient mortality** fell marginally (3.9% reported in 2017 vs 4.3% reported in 2014).

[§] There is no comparative data from 2014, as only date and time of admission were captured in that audit (ie not of arrival).

^{**} Comparative data from 2014 cannot be reported here as admission was calculated from time recorded of arrival to the unit.



Provision of timely care

To see the data analysis in full, please access the data analysis and results report available at www.rcplondon.ac.uk/working-together

Acute physician review (*NICE [CG101] 1.1.8.2*)

- **82.3% of admissions** were reviewed by an acute physician of grade specialty trainee 3 (ST3) or above.^{††}

Respiratory specialist review (*NICE [QS10], statement 10, 2011*)

- **78% of admissions** were reviewed by a member of the respiratory team.
- Access to respiratory teams was **reduced at weekends**; in 2017, 52.8% of admissions on a Saturday were reviewed in comparison to 97.2% of admissions on a Monday that were reviewed.^{‡‡}
- The median time from admission to review by a member of the specialist respiratory team has reduced (16.2 hours in 2017, compared to 21 hours in 2014^{§§}).
- There was an improvement in the number of admissions **reviewed by a member of the respiratory team within 24 hours** (54.8% in 2017, compared to 49% in 2014).
- Specialist review of patients within 24 hours of admission had an impact on:^{***}
 - **oxygen prescription**; patients who received a respiratory team review within 24 hours and required oxygen were **61% more likely** (odds ratio (OR): 1.61 [95% confidence interval (CI): 1.53–1.70]) to receive an oxygen prescription than patients who did not receive a respiratory team review within 24 hours and required oxygen.
 - **smoking cessation pharmacotherapy**; patients who received a respiratory team review within 24 hours and were a current smoker were **2.4 times more likely** (OR: 2.42 [95% CI: 2.17–2.69]) to receive smoking cessation pharmacotherapy than patients who did not receive a respiratory team review within 24 hours and were a current smoker.
 - **NIV**; patients who received a respiratory team review within 24 hours and required NIV during their admission were **35% more likely** (OR: 1.35 [95% CI: 1.16–1.57]) to receive NIV within 3 hours than patients who did not receive a respiratory team review within 24 hours and required NIV during their admission.
 - **discharge processes**; patients who received a respiratory team review within 24 hours and were discharged were **4.3 times more likely** (OR: 4.32 [95% CI: 4.11–4.53]) to receive a discharge bundle than patients who did not receive a respiratory team review within 24 hours and were discharged.

Weekend admissions

- Day of admission had no clear impact on:
 - inpatient mortality
 - oxygen prescribing
 - smoking cessation pharmacotherapy
 - time to NIV.
- Day of admission had an impact on:^{***}
 - **discharge processes**; patients who were admitted at the weekend and were discharged

^{††} This was a new question in the 2017 dataset and, therefore, there is no comparative data from the 2014 audit.

^{‡‡} There was no comparative data from the 2014 audit that was available to be presented alongside the 2017 data. The 2014 audit reported whether the patient was seen on the actual day of admission.

^{§§} Seen by a respiratory consultant or a respiratory nurse/member of the COPD/respiratory team.

^{***} There was no comparative data from the 2014 audit as this analysis was not conducted.

were **11% less likely** (OR: 0.89 [95% CI: 0.85–0.94]) to receive a discharge bundle than patients who were admitted during the week and were discharged.

- **length of stay**; patients who were admitted at the weekend (relative to those admitted during the week) **were 17% less likely** (OR: 0.83 [95% CI: 0.80 to 0.88]) to have a length of stay greater than the median of 4.



Recording key clinical information

To see the data analysis in full, please access the data analysis and results report available at www.rcplondon.ac.uk/working-together

Oxygen prescription (NICE [CG101] 1.3.6/NICE [QS10] statement 6)

- There was a marginal improvement in the number of admissions being prescribed oxygen; **57.3% in 2017**, compared to 55% in 2014.
 - However, it is of concern that 25% of admissions requiring oxygen⁺⁺⁺ were still not prescribed oxygen, an intervention associated with lower mortality and length of stay.⁷

Spirometry (QI priority 1) (NICE [CG101] 1.1.2/NICE [QS10] statement 1)

- A clear problem was identified with the recording/noting of spirometry. A **spirometry result** was available for only **39.7% of admissions in 2017**, compared to 46% in 2014.
- Importantly, 12.4% of patient admissions in whom spirometry was recorded had no evidence of airflow obstruction ($FEV_1/FVC \geq 0.7$), despite being managed for COPD exacerbation.

Smoking cessation (QI priority 2) (NICE [CG101] 1.2.1)

- The recording of **smoking status** has not improved (**9.1% of admissions** in 2017 were **not asked** about their smoking status/it was not recorded by hospitals, compared to 8% in 2014).
- There was a **reduction** in the number of **self-reported current smokers** (31.3% in 2017, compared to 34% in 2014).
 - Of the admissions that were current smokers, only **25.1% were prescribed smoking cessation pharmacotherapy** during their admission.
 - **35.9%** of admissions were offered but **declined treatment**.⁺⁺⁺

Dyspnoea, eosinopenia, consolidation, acidaemia and atrial fibrillation (DECAF) score^{§§§}

- A **DECAF score** was recorded in **14.5% of admissions**.
- For those admissions in whom a DECAF score was recorded (14.5%), **more than half** (54%) had a **DECAF score of 0 or 1**, identifying them as being at low mortality risk and therefore potential candidates for immediate discharge, for early/supported discharge or for hospital at home schemes.
 - Admissions with a **DECAF score of 2 or higher** were **2.7 times more likely** to have a **length of stay of 4 or more days** (60% vs 36%).

⁺⁺⁺ 18% of patients did not require supplemental oxygen.

⁺⁺⁺ This was a new question in the 2017 dataset and, therefore, there is no comparative data from the 2014 audit.

^{§§§} The DECAF score predicts in-hospital mortality in patients admitted to the hospital with acute exacerbation of COPD.



QI priority: Ensure that a spirometry result is available for all patients admitted to hospital with an acute exacerbation of COPD. (*NICE [QS10] statement 1, NICE [CG101] 1.1.2*)

Why is it a priority?

- **NICE guidance** and the **quality standard** state that all patients **over the age of 35** who present with **symptoms of COPD** should have a **spirometry test** to confirm their diagnosis.
- COPD can only be diagnosed in the presence of a risk factor, symptoms and confirmatory spirometry (and possibly further lung function tests or a CT scan).
- Documentation continues to be very poor, a spirometry result was available for only 39.7% of admissions in 2017, compared to 46% in 2014.
- In addition 12.4% of patient admissions in whom spirometry was recorded had no evidence of **airflow obstruction** ($FEV_1/FVC > 0.7$), despite being managed for COPD exacerbation.

Tips on how you might achieve this:

- Introduce **near-patient spirometry testing** on the wards.
- Undertake **spirometry prior to discharge** in all those patients fit to perform the procedure.
- Consider including **spirometry results** on the patient's **discharge summary**.
- Work to implement **shared access to spirometry results** across the hospital and between primary and secondary care.
- **Accredited training in spirometry** is available via e-learning.⁸

Case study:

- **Musgrove Park Hospital**
 - In February 2017 just over 48% of patients at **Musgrove Park Hospital** had a record of spirometry. By November 2017 this figure has risen to 100% of patients.
- **How they did this:**
 - A **bedside spirometry service** is provided by the **lung lab** and although GP results cannot specifically be accessed automatically as yet, there is access to the patient primary care record with patient consent.
 - To find out more please visit the secondary care good practice repository.⁹





QI priority: Ensure that all current smokers are identified, offered, and if they accept, prescribed smoking cessation pharmacotherapy. (*NICE [CG101] 1.2.1*)

Why is it a priority?

- Identification of **current smokers** and prescribing of smoking cessation pharmacotherapy is poor.
- Smoking cessation is a **therapy for COPD**.
- **Improving quit rates** reduces readmissions and improves other outcomes.^{10, 11}

Tips on how you might achieve this:

- Offer all current smokers **nicotine replacement therapy (NRT)** on admission.
- Address smoking cessation via the **COPD care bundle prior to discharge** from hospital.
- Encourage management of your hospital to **implement a smoke-free policy** if one is not already in place
- Conduct a **quality improvement project** utilising the [BTS quality improvement tool for smoking cessation](#).¹²
- Review and investigate the national CQUIN for 2017–19 on preventing ill health by risky behaviours – alcohol and tobacco, which seeks to incentivise tobacco screening and onward advice and referrals.¹³

Case study:

- **Royal Sussex County Hospital**
 - For the period April 2017 to October 2017 the **Royal Sussex County Hospital** has on average been prescribing smoking cessation pharmacotherapy to 52% of current smokers compared to a national average of 25%.
- **How they did this:**
 - They have a **full-time smoking cessation service lead** (see photo) which has been initially funded for 5 years from October 2014.
 - All patients who are ready to quit will receive cessation advice and behavioural support.
 - All cardiac rehabilitation specialists have received **level 2 Intermediate smoking cessation training**.
 - To find out more please visit the secondary care good practice repository.⁹



From left to right: Jemma Clarke (lead pharmacist), Debbie Eaton (respiratory nurse specialist), Anna Fairhurst (smoking cessation service lead), Jo Congleton (consultant in integrated respiratory care)



Non-invasive ventilation (NIV)

To see the data analysis in full, please access the data analysis and results report available at www.rcplondon.ac.uk/working-together

- Only **10.9%** of admissions received acute **treatment with NIV** (compared to 12% in 2014). Evidence suggests that approximately 20% of admissions may be acidotic on arrival, thus indicated for treatment with NIV.¹⁴ ([NICE \[CG101\] 1.2.6, 1.3.7](#))
 - Of those that received it, only **30.1%** received NIV within **3 hours** of arrival (**QI priority 3**).^{****}
 - It should be noted that the audit did not distinguish patients who deteriorated later in the admission and were appropriately managed with late NIV from those that presented with an acidosis and received inappropriate late NIV.^{14,15}
- The median time from **arrival to acute treatment with NIV was 4.3 hours**.
 - However the **interquartile range was 1.7 to 13.6 hours** suggesting a **high degree of variability**.
 - There were also some very **increased times from arrival to acute treatment with NIV**, producing a **high mean and standard deviation of 19.7 hours and 57.4 hours**, respectively.⁺⁺⁺⁺ ([NICE \[QS10\] statement 7](#))
 - 67.3%** of patients receiving **NIV had a median length of stay (LOS) >4 days** (the audit cohort median LOS being 4 days)
- There was a strong association between time to treatment with NIV and increased inpatient mortality.
 - Patients who received acute treatment with NIV more than 24 hours after arrival were **2.8 times more likely** (OR: 2.82 [95% CI: 2.13–3.74]) to die as an inpatient ($p < 0.0001$).⁺⁺⁺⁺



QI priority: To ensure that all patients requiring NIV on presentation (ie that have evidence of respiratory acidosis) receive it within 60 minutes of the blood gas result associated with the clinical decision to provide NIV and within 120 minutes of arrival for those who present acutely. ([BTS NIV QS4](#))

Why is it a priority?

- The delay to receiving NIV remains too long.
- When the dataset for the audit was agreed evidence/guidance suggested that provision of NIV within 3 hours of arrival was an appropriate measure of quality NIV care hence the key findings and analysis presented support this. However since then the National Confidential Enquiry into Patient Outcome and Death (NCEPOD)¹⁶ and the British Thoracic Society (BTS) have provided further evidence/guidance

Tips on how you might achieve this:

- Introduce a **NIV standard operating procedure (SOP)** within your hospital or trust, tailored to avoiding delays in initiation of NIV. This, along with **regular annual competency training** for staff, could ensure that patients requiring NIV receive it within 3 hours of arrival.
- Review and address **compliance with the current BTS NIV guidelines**¹⁷ and NCEPOD report.¹⁶
- Address specifically your **escalation policy**

^{****} In the 2014 audit this data was reported on patients receiving NIV within 3 hours of admission (42.4%) rather than arrival, therefore it is not directly comparable but has been provided here for reference.

⁺⁺⁺⁺ There were no comparative data from the 2014 audit as this analysis was not conducted.

reflected in our QI priority. - Improvement in timing of NIV leads to better patient outcomes. Error! Bookmark not defined. Prompt application of acute NIV substantially reduces the risk of death in appropriately selected patients with acute hypoxemic respiratory failure (AHRF). - Improvement is readily achievable.	and protocols for patients who may need NIV, paying particular attention to how and where you manage patients whose respiratory failure deteriorates during the course of their admission.
Case study: Northumbria Specialist Emergency Care Hospital - Between February and October 2017 on average over 66% of patients who required NIV at Northumbria Specialist Emergency Care Hospital received it within 3 hours of arrival. How they did this: - They developed a standard operating procedure (SOP) in order to achieve prompt initiation of NIV. - To find out more please visit the secondary care good practice repository.⁹	



Discharge processes

To see the data analysis in full, please access the data analysis and results report available at www.rcplondon.ac.uk/working-together

- Only **53%** of admissions received a **discharge bundle**. (*NICE [QS10] statement 8*)
- 18.8%** of admissions had '**no follow-up arrangements apparent**' given as a dataset response. (*NICE [CG101] 1.3.11*)



Web-tool run charts

To see the data analysis in full, please access the data analysis and results report available at www.rcplondon.ac.uk/working-together

During 2017 the National COPD Audit Programme undertook a phased release of run charts via the secondary care audit web-tool.¹⁸ The charts were derived from the data entered by hospitals registered for the audit, and introduced to be used by clinical teams to help drive quality improvement by providing near real-time feedback on service quality and compliance with national care standards. The charts display hospital level data, benchmarked to the national average and are only available to be viewed by registered users of the web-tool.

The charts depicted that between February 2017 and February 2018 there was improvement in performance (notably so for the BPT items) across most of the key indicators:

Key indicator	February 2017	February 2018	Increase or decrease
Best practice tariff (BPT)³ (released March 2017)			
Patients receiving a review by a member of the respiratory team during admission	72.7%	91.2%	↑
Patients receiving a review by a member of the respiratory team within 24 hours of admission	48.4%	69.3%	↑
Patients receiving a discharge bundle upon discharge	48.2%	81.5%	↑
Patients where care meets the BPT for COPD	31.1%	62.0%	↑
Oxygen (released May 2017)			
Patients being prescribed oxygen	70.3%	74.7%	↑
Patients being prescribed oxygen to target saturation	95.7%	97.7%	↑
Spirometry (released May 2017)			
Patients with spirometry result available	36.4%	40.8%	↑
Smoking cessation pharmacotherapy (released June 2017)			
Current smokers that have been prescribed smoking cessation pharmacotherapy	23.9%	26.6%	↑
NIV (released July 2017)			
Patients receiving NIV	11.8%	10.1%	↓
Patients receiving NIV within 3 hours of arrival	26.6%	29.8%	↑

Conclusion

Areas showing improvement

'Front-end' services have continued to improve, as evidenced by:

- relatively rapid patient transit from arrival to admission
- improvement in the prescription of oxygen to those that require it
- earlier input from specialist respiratory teams.

In-patient mortality remains stable, and the impression given by this very large dataset is one of safer, more efficient COPD care.

Areas where further improvement is necessary

- The data show clear advantages from early specialist review, but demonstrate this still needs to occur in a higher proportion of patients earlier in the hospital admission.
- Key processes (including the time to NIV, documentation of spirometry and smoking status, and prescribing of oxygen and smoking cessation pharmacotherapy) remain very variable and slow to improve but are all more likely to occur in a timely way if there has been an early specialist review.
- Mortality is high for patients who receive NIV, particularly those who receive NIV beyond 24 hours of arrival.
- Far fewer patients are discharged at weekends (organisational data show much-reduced availability of respiratory services across the sector at weekends⁶) and, although the proportion of patients with a completed discharge bundle is increasing in-year, the percentage of patients in whom no follow-up arrangement is apparent remains high.

Recommendations

For providers

We have defined three key improvement targets for 2018, based on a strong evidence base for their effectiveness in improving outcomes:

- **QI priority 1** Ensure that a spirometry result is available for all patients admitted to hospital with an acute exacerbation of COPD. (*NICE [QS10] statement 1, NICE [CG101] 1.1.2*)
- **QI priority 2:** Ensure that all current smokers are identified, offered, and if they accept, prescribed smoking cessation pharmacotherapy. (*NICE [CG101] 1.2.1*)
- **QI priority 3:** To ensure that all patients requiring NIV on presentation (ie that have evidence of respiratory acidosis) receive it within 60 minutes of the blood gas result associated with the clinical decision to provide NIV and within 120 minutes of arrival for those who present acutely. (*BTS NIV QS4*)

The audit data suggest other care processes would also benefit from further collaborative improvement work:

- To ensure all patients that require oxygen are receiving it, and to target saturation. (*NICE [QS10] statement 3, statement 6*)
- To ensure colleagues within the ED, AMU, respiratory department and trust management work together to determine how more patients can access respiratory specialist care within 24 hours of arrival (including at weekends).
- Consider the implementation of a discharge bundle which optimises follow-up and, therefore, can help minimise the chance of a readmission. (*NICE [QS10] statement 8, NICE [CG101] 1.3.11*)

For commissioners/sustainability and transformation partnerships (STPs)

- Providers and commissioners/STPs should work together to develop a 7-day, cross-sector COPD service that focuses particularly on delivering early respiratory specialist care.
 - Start with an assessment of how the existing resource might be best deployed and linked into evolving frailty and social care services.
 - If necessary, consider drafting a business case for developing the team according to local need.
- Improve prescription of smoking cessation pharmacotherapy help services by funding a smoking cessation service lead to drive improvement.

For patients/carers and their families

- Complete the British Lung Foundation (BLF) patient passport for your COPD care, as this will facilitate a better discussion with your healthcare professional, improve understanding of your medication, help with smoking cessation (if needed), and enhance your chance of referral to pulmonary rehabilitation.¹⁹

For primary care

- If a patient has been discharged from secondary care without having spirometry performed, start with a comprehensive breathlessness assessment. If the cause is COPD, then ensure that the correct spirometric test and result is documented within the patient record and shared with secondary care respiratory health professionals involved in the patient's care. The reason for doing the assessment should be clearly explainable to your patient's satisfaction.

Appendix A: Chronic obstructive pulmonary disease in adults NICE Quality standard [QS10]

Please note: In 2016 this quality standard was updated and statements prioritised in 2011 were updated (2011, updated 2016) or replaced (new 2016).

Statements are marked as [new 2016] or [2011, updated 2016]:

- [new 2016] if the statement covers a new area for quality improvement
- [2011, updated 2016] if the statement covers an area for quality improvement included in the 2011 quality standard and has been updated.

No.	Quality statement
1	People aged over 35 years who present with a risk factor and one or more symptoms of chronic obstructive pulmonary disease (COPD) have post-bronchodilator spirometry. [2011, updated 2016]
2	People with COPD who are prescribed an inhaler have their inhaler technique assessed when starting treatment and then regularly during treatment. [2011, updated 2016]
3	People with stable COPD and a persistent resting stable oxygen saturation level of 92% or less have their arterial blood gases measured to assess whether they need long-term oxygen therapy. [2011, updated 2016]
4	People with stable COPD and exercise limitation due to breathlessness are referred to a pulmonary rehabilitation programme. [2011, updated 2016]
5	People admitted to hospital for an acute exacerbation of COPD start a pulmonary rehabilitation programme within 4 weeks of discharge. [2011, updated 2016]
6	People receiving emergency oxygen for an acute exacerbation of COPD have oxygen saturation levels maintained between 88% and 92%. [new 2016]
7	People with an acute exacerbation of COPD and persistent acidotic hypercapnic ventilatory failure that is not improving after 1 hour of optimal medical therapy have non-invasive ventilation. [2011, updated 2016]
8	(Placeholder ^{****}) Hospital discharge care bundle. [new 2016]

**** A placeholder statement is an area of care that has been prioritised by the Quality Standards Advisory Committee but for which no source guidance is currently available. A placeholder statement indicates the need for evidence-based guidance to be developed in this area.

Statements from the 2011 quality standard for COPD that may still be useful at a local level, but are no longer considered national priorities for improvement:

- 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.
- 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.
- People with COPD who smoke are regularly encouraged to stop and are offered the full range of evidence-based smoking cessation support.
- 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.
- 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.
- 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.
- People admitted to hospital with an exacerbation of COPD are reviewed within 2 weeks of discharge.
- People with advanced COPD, and their carers, are identified and offered palliative care that addresses physical, social and emotional needs.

Appendix B: Chronic obstructive pulmonary disease in over 16s: diagnosis and management NICE Clinical guideline [CG101]

Below is only a summary of the NICE Clinical guidelines [CG101] that we specifically refer to within this report. To see the full guideline please use the following link: www.nice.org.uk/guidance/cg101

1.1	Diagnosing COPD
1.1.8	Referral for specialist advice
1.1.8.2	Patients who are referred do not always have to be seen by a respiratory physician. In some cases they may be seen by members of the COPD team who have appropriate training and expertise. [2004]
1.1.2	Spirometry
1.1.2.1	Spirometry should be performed: • at the time of diagnosis • to reconsider the diagnosis, if patients show an exceptionally good response to treatment. [2004]
1.1.2.2	Measure post-bronchodilator spirometry to confirm the diagnosis of COPD. [new 2010]
1.1.2.3	Consider alternative diagnoses or investigations in: • older people without typical symptoms of COPD where the FEV₁/FVC ratio is <0.7 • younger people with symptoms of COPD where the FEV₁/FVC ratio is ≥0.7. [new 2010]
1.1.2.4	All health professionals involved in the care of people with COPD should have access to spirometry and be competent in the interpretation of the results. [2004]
1.1.2.5	Spirometry can be performed by any healthcare worker who has undergone appropriate training and who keeps his or her skills up to date. [2004]
1.1.2.6	Spirometry services should be supported by quality control processes. [2004]
1.1.2.7	It is recommended that ERS 1993 reference values ²⁰ are used but it is recognised that these values may lead to under-diagnosis in older people and are not applicable in black and Asian populations. ^{§§§§} [2004]

1.2	Managing stable COPD
1.2.1	Smoking cessation
1.2.1.1	An up-to-date smoking history, including pack years smoked (number of cigarettes smoked per day, divided by 20, multiplied by the number of years smoked), should be documented for everyone with COPD. [2004]
1.2.1.2	All COPD patients still smoking, regardless of age, should be encouraged to stop, and offered help to do so, at every opportunity. [2004]
1.2.1.3	Unless contraindicated, offer NRT, varenicline or bupropion, as appropriate, to people who are planning to stop smoking combined with an appropriate support programme to optimise smoking quit rates for people with COPD. ²¹ [2010]
1.2.6	Non-invasive ventilation
1.2.6.1	Adequately treated patients with chronic hypercapnic respiratory failure who have required assisted ventilation (whether invasive or non-invasive) during an exacerbation or who are hypercapnic or acidotic on LTOT should be referred to a specialist centre for consideration of long-term NIV. [2004]

§§§§ Definitive spirometry reference values are not currently available for all ethnic populations. The GDG was aware of ongoing research in this area.

1.3	Management of exacerbations of COPD
1.3.6	Oxygen therapy during exacerbations of COPD *****
1.3.6.1	The oxygen saturation should be measured in patients with an exacerbation of COPD, if there are no facilities to measure arterial blood gases. [2004]
1.3.6.2	If necessary, oxygen should be given to keep the SaO ₂ within the individualised target range. [2004, amended 2010]
1.3.6.3	Pulse oximeters should be available to all healthcare professionals involved in the care of patients with exacerbations of COPD and they should be trained in their use. Clinicians should be aware that pulse oximetry gives no information about the PCO ₂ or pH. [2004]
1.3.6.4	When the patient arrives at hospital, arterial blood gases should be measured and the inspired oxygen concentration noted in all patients with an exacerbation of COPD. Arterial blood gas measurements should be repeated regularly, according to the response to treatment. [2004]
1.3.7	Non-invasive ventilation (NIV) and COPD exacerbations
1.3.7.1	NIV should be used as the treatment of choice for persistent hypercapnic ventilatory failure during exacerbations despite optimal medical therapy. [2004]
1.3.7.2	It is recommended that NIV should be delivered in a dedicated setting with staff who have been trained in its application, who are experienced in its use and who are aware of its limitations. [2004]
1.3.7.3	When patients are started on NIV there should be a clear plan covering what to do in the event of deterioration and ceilings of therapy should be agreed. [2004]
1.3.11	Discharge planning
1.3.11.1	Spirometry should be measured in all patients before discharge. [2004]
1.3.11.2	Patients should be re-established on their optimal maintenance bronchodilator therapy before discharge. [2004]
1.3.11.3	Patients who have had an episode of respiratory failure should have satisfactory oximetry or arterial blood gas results before discharge. [2004]
1.3.11.4	All aspects of the routine care that patients receive (including appropriateness and risk of side effects) should be assessed before discharge. [2004]
1.3.11.5	Patients (or home carers) should be given appropriate information to enable them to fully understand the correct use of medications, including oxygen, before discharge. [2004]
1.3.11.6	Arrangements for follow-up and home care (such as visiting nurse, oxygen delivery, referral for other support) should be made before discharge. [2004]
1.3.11.7	Before the patient is discharged, the patient, family and physician should be confident that he or she can manage successfully. When there is remaining doubt a formal activities of daily living assessment may be helpful. [2004]

***** The exacerbation section of this guideline was outside the scope of the 2010 update. However the GDG was aware that some recommendations in this section of the guideline were out of date, and these have been removed. Readers should refer to local protocols.

Appendix C: Document purpose

Document purpose	To disseminate the results of the national COPD secondary care clinical audit 2017.
Title	<i>COPD: Working together. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Clinical audit of COPD exacerbations admitted to acute hospitals in England and Wales 2017. National clinical audit report.</i>
Authors	Stone RA, McMillan V, Mortier K, Holzhauer-Barrie J, Robinson S, Stone P, Quint J, Roberts CM (on behalf of the National COPD Audit Programme's secondary care workstream group)
Publication date	12 April 2018
Audience	Healthcare professionals; NHS managers, chief executives and board members; service commissioners; policymakers; voluntary organisations; patient support groups; COPD patients and their families/carers; and the public.
Description	This report outlines the main messages and key recommendations from the clinical component of the National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme's secondary care clinical audit. The continuous audit, which captures the process and clinical outcomes of treatment in patients admitted to hospital in England and Wales with COPD exacerbations, launched on 1 February 2017. This report presents the results of the cohort of patients discharged between the audit's launch date and 13 September 2017. The report is relevant to anyone who has an interest in COPD. It provides a broad view of secondary care services, and will enable lay people, as well as experts, to understand how COPD services function currently, and where change needs to occur. The information, key findings and recommendations outlined in the report are designed to provide readers with a basis for identifying areas that are in need of change and to facilitate the development of improvement programmes that are relevant not only to secondary care providers but also to commissioners and policymakers. There is no scheduled review date for the report
Supersedes	Stone RA, H Holzhauer-Barrie J, Lowe D, Searle L, Skipper E, Welham S, Roberts CM. <i>COPD: Who cares matters. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Clinical audit of COPD exacerbations admitted to acute units in England and Wales in 2014.</i> National clinical audit report. London: RCP, February 2015.
Contact	COPD@rcplondon.ac.uk

Appendix D: References

- 1 Stone RA, Holzhauser-Barrie J, Lowe D *et al.* COPD: *Who cares matters*. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Clinical audit of COPD exacerbations admitted to acute units in England and Wales 2014. National clinical audit report. London: RCP, February 2015. www.rcplondon.ac.uk/projects/outputs/copd-who-cares-matters-clinical-audit-2014 [Accessed January 2018].
- 2 Stone R, Holzhauser-Barrie J, Lowe D *et al.* COPD: *Who cares when it matters most?* National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Outcomes from the clinical audit of COPD exacerbations admitted to acute units in England 2014. National supplementary report. London: RCP, February 2017. www.rcplondon.ac.uk/projects/outputs/copd-who-cares-when-it-matters-most-outcomes-report-2014 [Accessed January 2018].
- 3 National tariff payment system 2017/18 and 2018/19. <https://improvement.nhs.uk/resources/national-tariff-1719/> [Accessed February 2018].
- 4 Lavery AA, Elkin SL, Watt HC *et al.* Impact of a COPD discharge care bundle on readmissions following admission with acute exacerbation: interrupted time series analysis. Kostikas K, ed. *PLoS One* 2015;10(2):e0116187. doi:10.1371/journal.pone.0116187.
- 5 Price LC, Lowe D, Hosker HSR *et al.* UK National COPD Audit 2003: impact of hospital resources and organisation of care on patient outcome following admission for acute COPD exacerbation. *Thorax* 2006;61:837–42.
- 6 Stone RA, McMillan V, Holzhauser-Barrie J *et al.* COPD: *Time to integrate care*. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Resources and organisation of care in hospitals in England and Wales 2017. National organisational audit report. London: RCP, April 2018. www.rcplondon.ac.uk/time-to-integrate-care [Accessed April 2018].
- 7 Case study: BTS COPD care bundle pilot project. 2017. www.respiratoryfutures.org.uk/features/case-study-bts-copd-care-bundle-birmingham-heartlands-hospital/ [Accessed January 2018].
- 8 The Institute of Clinical Science & Technology. ARTP spirometry e-learning (full). www.clinicalscience.org.uk/course/artp-spirometry-e-learning-full/ [Accessed January 2018].
- 9 The National COPD Audit Programme's secondary care resources page including the good practice repository. www.rcplondon.ac.uk/projects/outputs/secondary-care-audit-2017-resources [Accessed March 2018].
- 10 Wu J, Sin DD. Improved patient outcome with smoking cessation: when is it too late? *Int J Chron Obstruct Pulmon Dis* 2011;6:259–67. doi:10.2147/COPD.S10771.
- 11 Mullen KA, Manuel DG, Hawken SJ *et al.* Effectiveness of a hospital-initiated smoking cessation programme: 2-year health and healthcare outcomes. *Tob Control* 2017;26:293–9.
- 12 British Thoracic Society. Smoking Cessation Quality Improvement Tool. London: BTS, 2018. www.brit-thoracic.org.uk/standards-of-care/quality-improvement/smoking-cessation/ [Accessed January 2018].
- 13 Commissioning for Quality and Innovation (CQUIN) Indicator Specification 2017–2019 www.england.nhs.uk/publication/cquin-indicator-specification/ [Accessed January 2018].
- 14 Roberts CM, Stone RA, Buckingham RJ *et al.* Acidosis, non-invasive ventilation and mortality in hospitalised COPD exacerbations. *Thorax* 2011;66:43–8.
- 15 Lightowler JVJ, Elliott MW Predicting the outcome from NIV for acute exacerbations of COPD. *Thorax* 2000;55:815–6.

- 16 The National Confidential Enquiry into Patient Outcome and Death. *Inspiring change: a review of the quality of care provided to patients receiving non-invasive ventilation*. London: NCEPOD, 2017. www.ncepod.org.uk/2017niv.html [Accessed January 2018].
- 17 Davies M, Allen M, Bentley A, et al British Thoracic Society Quality Standards for acute non-invasive ventilation in adults BMJ Open Respiratory Research 2018;5:e000283. doi: 10.1136/bmjresp-2018-000283
- 18 The National Asthma and COPD Audit Programme's web tool home page. www.nacap.org.uk [Accessed March 2018].
- 19 British Lung Foundation. COPD Patient Passport. <https://passport.blf.org.uk/> [Accessed January 2018].
- 20 Quanjer PH, Tammeling GJ, Cotes JE *et al*. Lung volumes and forced ventilatory flows. Report Working Party Standardization of Lung Function Tests, European Community for Steel and Coal. Official Statement of the European Respiratory Society. *Eur Respir J Suppl* 1993;16;5–40.
- 21 Stop smoking services. NICE Public health guidance [PH10]. www.nice.org.uk/guidance/ph10 [Accessed January 2018].



For further information on the overall audit programme or any of the workstreams, please see our website or contact the national asthma and COPD audit team directly:

National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP)
formerly National COPD Audit Programme
Royal College of Physicians
11 St Andrews Place
Regent's Park, London NW1 4LE

Tel: +44 (020) 3075 1526
Email: copd@rcplondon.ac.uk
www.rcplondon.ac.uk/nacap

@NACAPaudit
#COPDaudit
#COPDauditQI

If you would like to join our mailing list and be kept informed of updates and developments in the National Asthma and COPD Audit Programme, please send us your email address and contact details.

Commissioned by:

