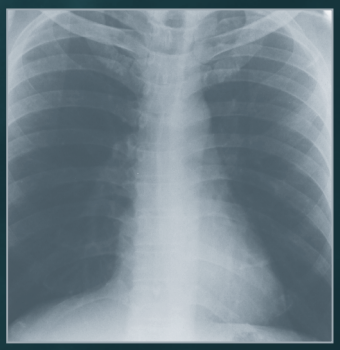
National COPD Audit Programme



Pulmonary Rehabilitation: Time to breathe better

National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Resources and organisation of Pulmonary Rehabilitation services in England and Wales 2015

National organisational audit report
November 2015

Prepared by:

Royal College of Physicians

British Thoracic Society

In partnership with:

Primary Care Respiratory Society UK (PCRS)

Royal College of General Practitioners (RCGP)

British Lung Foundation

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 30000 fellows and members worldwide, the RCP advises and works with government, patients, allied healthcare professionals and the public to improve health and healthcare.

The Clinical Effectiveness and Evaluation Unit (CEEU) of the RCP runs projects that aim to improve healthcare in line with the best evidence for clinical practice: national comparative clinical audits, the measurement of clinical and patient outcomes, clinical change management and guideline development. All of the RCP's work is carried out in collaboration with relevant specialist societies, patient groups and NHS bodies. The CEEU is self-funding, securing commissions and grants from various organisations including the Department of Health and charities such as the Health Foundation.

The British Thoracic Society

The British Thoracic Society (BTS) was formed in 1982 by the amalgamation of the British Thoracic and Tuberculosis Association and the Thoracic Society, but their roots go back as far as the 1920s. BTS is a registered charity and a company limited by guarantee. The Society's statutory objectives are: 'the relief of sickness and the preservation and protection of public health by promoting the best standards of care for patients with respiratory and associated disorders, advancing knowledge about their causes, prevention and treatment and promoting the prevention of respiratory disorders'. Members include doctors, nurses, respiratory physiotherapists, scientists and other professionals with an interest in respiratory disease. In September 2014, BTS had 2950 members. All members join because they share an interest in BTS's main charitable objective, which is to improve the care of people with respiratory disorders.

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 Programme (NCA). 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: Steiner M, Holzhauer-Barrie J, Lowe D, Searle L, Skipper E, Welham S, Roberts CM. Pulmonary Rehabilitation: Time to breathe better. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Resources and organisation of Pulmonary Rehabilitation services in England and Wales 2015. National organisational audit report. London: RCP, November 2015.

ISBN 978-1-86016-581-8
eISBN 978-1-86016-582-5

Royal College of Physicians
Clinical Effectiveness and Evaluation Unit
11 St Andrews Place
Regent's Park
London NW1 4LE

www.rcplondon.ac.uk/COPD #COPDaudit #COPDPRaudit #COPDPRbreathebetter
Registered charity no 210508

Document purpose	To disseminate the results of the national audit of the resources and organisation of Pulmonary Rehabilitation services in England and Wales 2015
Title	Pulmonary Rehabilitation: Time to breath better. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Resources and organisation of Pulmonary Rehabilitation services in England and Wales 2015
Author	Steiner M, Holzhauer-Barrie J, Lowe D, Searle L, Skipper E, Welham S, Roberts CM (on behalf of the National COPD Audit Programme: pulmonary rehabilitation workstream)
Publication date	18 November 2015
Audience	Healthcare professionals, NHS managers, chief executives and board members, service commissioners, policymakers, COPD patients, their families/carers and the public
Description	This is the first of the COPD Pulmonary Rehabilitation audit reports, published as part of the National COPD Audit Programme. This report details national data relating to the resourcing and organisation of Pulmonary Rehabilitation services in England and Wales. It also documents attainment against relevant Pulmonary Rehabilitation guidelines and quality standards as published by the British Thoracic Society (BTS) in 2013 and 2014. The report is relevant to anyone with an interest in COPD. It provides a comprehensive picture of Pulmonary Rehabilitation 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 in need of change and to facilitate development of improvement programmes that are relevant not only to Pulmonary Rehabilitation programmes but also to commissioners and policymakers.
Supersedes	N/A
Related publications	• Department of Health. *An outcomes strategy for people with chronic obstructive pulmonary disease (COPD) and asthma in England*. London: DH, 2011. www.gov.uk/government/publications/an-outcomes-strategy-for-people-with-chronic-obstructive-pulmonary-disease-copd-and-asthma-in-england • NHS England. *NHS Outcomes Framework – 5 domains resources* [accessed September 2015]. www.england.nhs.uk/resources/resources-for-ccgs/out-frwrk/ • British Thoracic Society. *BTS guideline for pulmonary rehabilitation in adults*. London: BTS, 2013. www.brit-thoracic.org.uk/guidelines-and-quality-standards/pulmonary-rehabilitation-guideline/ • British Thoracic Society. *BTS quality standards for pulmonary rehabilitation in adults*. London: BTS, 2014. www.brit-thoracic.org.uk/guidelines-and-quality-standards/pulmonary-rehabilitation-quality-standards/ • National Institute for Health and Clinical Excellence. *Chronic obstructive pulmonary disease: Management of chronic obstructive pulmonary disease in adults in primary and secondary care (partial update) (CG101)*. London: NICE, 2010. www.nice.org.uk/guidance/CG101 • National Institute for Health and Clinical Excellence. *Chronic obstructive pulmonary disease quality standard (QS10)*. London: NICE, 2011. www.nice.org.uk/Guidance/QS10 • National Institute for Health and Clinical Excellence. *Services for people with chronic obstructive pulmonary disease.* NICE commissioning guides (CMG43) London: NICE, 2011. www.nice.org.uk/guidance/cmg43/chapter/41-specifying-a-pulmonary-rehabilitation-service • National Institute for Health and Clinical Excellence. *Chronic obstructive pulmonary disease quality standard (QS10)*. London: NICE, 2011. www.nice.org.uk/Guidance/QS10

	• Stone RA, Holzhauer-Barrie J, Lowe D, Searle L, Skipper E, Welham S, Roberts CM. *COPD: Who cares? National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Resources and organisation of care in acute NHS units in England and Wales 2014. National organisational audit report.* London: RCP, November 2014. www.rcplondon.ac.uk/projects/outputs/copd-who-cares-organisational-audit-2014
Contact	COPD@rcplondon.ac.uk

Report preparation

This report was written by the following, on behalf of the national COPD pulmonary rehabilitation audit 2015 workstream group. (The full list of workstream group members is included at Appendix D.)

Professor Michael C Steiner MB BS MD FRCP
Clinical Lead, National COPD Audit Programme Pulmonary Rehabilitation workstream; Consultant Respiratory Physician, University Hospitals of Leicester NHS Trust, Glenfield Hospital, Leicester; and Honorary Clinical Professor, School of Sport, Exercise and Health Sciences, Loughborough University

Professor C Michael Roberts MA MD FRCP ILTHE FAcadMEd
Associate Director, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, Royal College of Physicians, London; Programme Clinical Lead, National COPD Audit Programme; and Consultant Respiratory Physician, Whipps Cross University Hospital, Barts Health, Barts and The London School of Medicine and Dentistry, Queen Mary University of London

Mr Derek Lowe MSc C.Stat
Medical Statistician, Care Quality Improvement Department, Royal College of Physicians, London

Miss Sally Welham MA
Deputy Chief Executive and British Thoracic Society Lead for the National COPD Pulmonary Rehabilitation Audit, the British Thoracic Society, London

Ms Laura Searle PGDip
Project Coordinator, National COPD Pulmonary Rehabilitation Audit, the British Thoracic Society, London

Mrs Emma Skipper PGDip
Programme Manager, National COPD Audit Programme, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, Royal College of Physicians, London

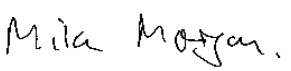
Ms Juliana Holzhauer-Barrie MA
Programme Coordinator, National COPD Audit Programme, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, Royal College of Physicians, London

Foreword

Pulmonary Rehabilitation (PR) is one of the most effective therapies for chronic lung disease. Alongside smoking cessation and influenza immunisation, it offers tangible long-term benefits that are not currently provided by any pharmacological therapy. It is also very popular with patients, but may not always be freely available or provided to a standard that might produce the desired results. This audit report on the resources and organisation of PR services is the first comprehensive national audit of PR provision anywhere in the world, and it offers insight into the quality and quantity of provision of 224 programmes. The tough audit standards were set by the most recent evidence-based British Thoracic Society (BTS) clinical guidelines and quality standards, and therefore reflect the clinical standards that we would currently expect.

There is much to be admired about the operation of most of the PR programmes. In the main, they offer the appropriate components, although there is some variation in the detail and not all programmes understand that behaviour change and ongoing support may be necessary to maintain the benefit. The most encouraging aspect is that, almost without exception, the programmes routinely collect outcomes data on health status and exercise capacity. This is not something that usually occurs in most medical services. We look forward to seeing the second report from the audit that will focus on these outcomes in the large number of patients included in the dataset.

At first sight, the inclusion of 224 programmes would seem to be a remarkable achievement as compared with what is perceived as the generally poor provision of PR in all countries. The reality, however, might be different when viewed against the potential need. The capacity of most programmes is too small to meet the demand or the need. Approximately one-third of patients who are referred to rehabilitation subsequently do not attend, which says something about the way that it is sold. What is more concerning is that the referral rate is much lower than would be expected from the number of potentially eligible patients; perhaps many healthcare professionals are also unaware of the benefits. We should be pleased that the number of commissioned programmes seems to have grown in recent years, as recommended by clinical guidelines and commissioning advice from NHS England and the Welsh Government. However, as with other services, much of what is commissioned is for the short term and often temporary. It would be more sensible, as with other similar services, to commission longer duration contracts to allow programmes to mature and conclusively demonstrate their effectiveness. Hopefully this audit report will encourage that transformation.



Professor Mike Morgan
National Clinical Director for Respiratory Services in England

Contents

Executive summary

This report presents results from the National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Resources and organisation of Pulmonary Rehabilitation services in England and Wales 2015. The Pulmonary Rehabilitation (PR) component of the National COPD Audit Programme provides a comprehensive overview of PR service provision and treatment outcome across England and Wales. This is the first time PR services have been audited at a national level, and therefore a requirement was a detailed exercise in identifying and enrolling local PR programmes across England and Wales. A further report, due to be published in early 2016, will document the results of the clinical component of the National COPD Pulmonary Rehabilitation Audit. The audit outcomes presented here were measured against the British Thoracic Society (BTS) PR quality standards (1), which in turn were informed by evidence summarised in the BTS PR guideline (2).

Summary of recommendations

These recommendations are directed collectively to commissioners, provider organisations and to PR practitioners themselves. Implementing these recommendations will require discussions between commissioners and providers, and we suggest that the findings of the audit are considered promptly at board level in these organisations so that these discussions are rapidly initiated. Commissioners and providers should ensure they are working closely with patients, carers and patient representatives when discussing and implementing these recommendations.

- Action should be taken by commissioners and providers to ensure that supervised PR is offered to and available for all suitable COPD patients across the range of severity of exercise limitation shown to benefit from this intervention (Medical Research Council (MRC) breathlessness grades 2–5). Action should also be taken:
    - to review and enhance referral pathways for PR and ensure referrers are aware of local referral processes
    - to review and improve written information about PR and its benefits that is provided to patients and referrers, to improve uptake of treatment by patients who are offered PR.

- Commissioners should take steps to ensure PR providers have an adequate, long-term funding framework that will allow programmes to recruit and retain staff with an appropriate skill and seniority mix.

- Action should be taken by commissioners and providers to ensure that local PR services are able to offer supervised treatment for eligible patients due to other chronic respiratory diseases.

- PR providers should initiate urgent discussions with commissioners and acute care providers to ensure robust referral pathways for post-exacerbation PR are in place, and that sufficient PR capacity and flexibility exists to meet this demand.

- PR programmes should review their programme structure (frequency and duration) and content to ensure that they are providing treatment in line with BTS quality standards. In particular, this should include:
    - a review of exercise prescription practice to ensure this is being rigorously performed in line with published guidelines
    - a review of discharge processes to ensure each patient receives a written, individualised plan for ongoing exercise and maintenance when they finish rehabilitation

- taking steps to ensure a written Standard Operating Procedure (SOP) is agreed with the provider organisation.

PR is a multicomponent healthcare intervention that has been shown to improve symptoms and overall health and wellbeing in people with COPD. The evidence for the effectiveness of PR is sufficiently strong that its provision for patients reporting significant exercise limitation due to COPD is mandated in all current national and international COPD treatment guidelines.

The large body of scientific evidence regarding the structure and content of PR has been summarised in the BTS PR guideline published in 2013 (2), which subsequently informed the development and publication of BTS quality standards for PR (1). These standards offer commissioners and PR providers clear guidance on what constitutes a high-quality service and provide patients with information about the treatment they should expect to receive. This audit of resources and organisation is designed to measure the structure and processes of PR services against these quality indicators. The performance and clinical outcomes of these services will be reported in the clinical audit, which will be published in early 2016.

Prior to this audit, there was no detailed database or register of PR services in the UK. As a result, before conducting the audit, we undertook a mapping exercise to identify programmes (both NHS and non-NHS) across England and Wales, to make contact with PR leads and to request that they enrol in the audit. This mapping exercise (which we believe was comprehensive) identified 230 PR programmes, of which 97% participated in England and 100% participated in Wales.

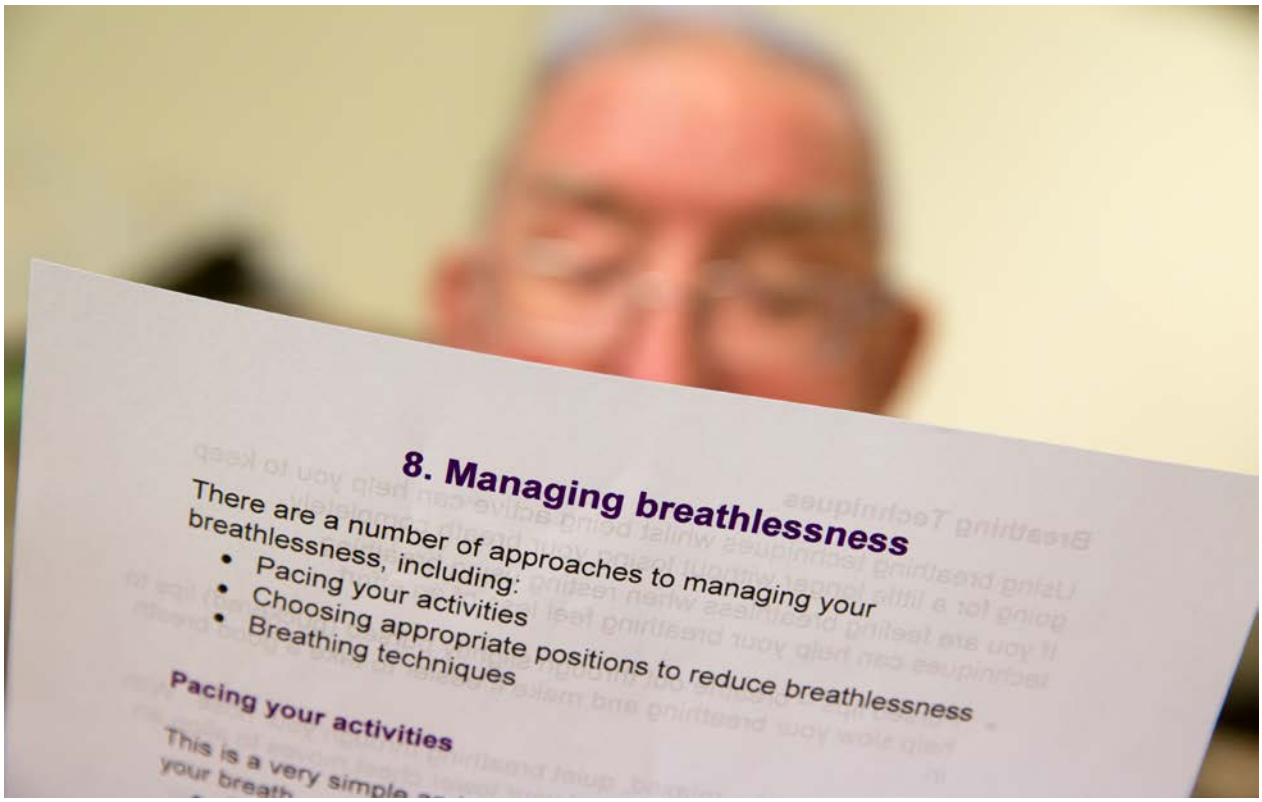
The audit suggests that, for the most part when assessed against the BTS quality standards, patients with COPD receive care from PR services with robust processes. Provision of appropriate modes of exercise (a central component of PR) is widespread, and there is universal provision of disease management education. There is a strikingly widespread use of objective measures of individual patient treatment outcome, suggesting that a culture of rigorous outcome measure assessment is deeply embedded in UK PR practice.

However, the audit also identifies areas where there is unsatisfactory variation in the quality of care when measured against these standards. Although referral practice was not audited, when the reported capacity of PR programmes is compared with the known prevalence of COPD, it is clear that not all eligible patients who would benefit from attending PR are being referred, and a significant number of those who are referred do not attend for treatment. Moreover, the audit demonstrates that availability of treatment across the full range of severity of disability is not universal. We urge commissioners to ensure there is sufficient local capacity to allow *all* eligible patients to benefit from PR and encourage healthcare professionals in both primary and secondary care to give PR the high priority it deserves when discussing treatment options with patients. Given that PR is one of the few therapies that has been shown to reduce subsequent time spent in hospital (one of the costliest aspects of COPD care), this should be a high priority for national and local health policymakers. Indeed, referral of patients with COPD for PR is included in the 2015/16 clinical commissioning group (CCG) outcomes indicator set (3).

Attending and benefiting from PR requires commitment and time from patients. The low attendance rate for initial assessment is an indicator that significant barriers remain for patients, some of which could be addressed by improvements in referral processes and accessibility (eg availability of transport). Delivering and sustaining high-quality services such as PR is heavily reliant on the recruitment of appropriately trained and committed health professionals. The audit indicates that some PR programmes do not have long-term funding security, and we urge commissioners to commit to longer term financial planning to ensure PR is provided on a firmer footing so that high-quality staff can be recruited and retained, and that programmes can develop and enhance current service provision.

The audit also identifies areas where the structure and content of PR could be improved. Despite evidence that rigorous exercise training prescription improves treatment outcome, this is not undertaken by all programmes. One of the primary aims of PR is to encourage patients to adopt a more active and healthy lifestyle. This requires a clear, individualised ongoing exercise plan after PR is completed, which was not always provided. We encourage all programmes to review their exercise prescription and ongoing exercise advice processes to ensure they meet the standards set out in the BTS guideline and quality standards. The audit highlights that PR is provided at a wide range of healthcare and non-healthcare venues (such as local gyms and community centres). There is no evidence that treatment provided in non-healthcare settings is inferior, indeed they may offer advantages of proximity to patients' homes and improved transport access. However, these venues require sufficient staff (in numbers and training) and equipment to be able to provide treatment to all eligible patients including those with complex or advanced disease or those with greater disability. If some patients are deemed to be not suitable for treatment in some community venues (for example, because onsite emergency resuscitation equipment is not available), we encourage these programmes to work closely with other providers (such as acute trusts) to ensure eligible patients are not denied treatment.

Our recommendations are aimed at both widening access to PR and ensuring that patients can be confident that when they attend PR they are receiving state-of-the-art, evidence-based treatment. The evidence from this audit indicates that many programmes across England and Wales have the structure and processes in place to provide treatment to this standard. We hope this audit report will provide the necessary information and impetus to ensure this high standard of care is provided universally to patients with COPD.



BTS quality standards for Pulmonary Rehabilitation in adults (2014)

Summary of quality statements

No.	Quality Statement
1	Referral for pulmonary rehabilitation: a. People with COPD and self reported exercise limitation (MRC dyspnoea 3–5) are offered pulmonary rehabilitation. b. If accepted, people referred for pulmonary rehabilitation are enrolled to commence within 3 months of receipt of referral.
2	Pulmonary rehabilitation programmes accept and enrol patients with functional limitation due to other chronic respiratory diseases (for example bronchiectasis, ILD and asthma) or COPD MRC dyspnoea 2 if referred.
3	Referral for pulmonary rehabilitation after hospitalisation for acute exacerbations of COPD: a. People admitted to hospital with acute exacerbations of COPD (AECOPD) are referred for pulmonary rehabilitation at discharge. b. People referred for pulmonary rehabilitation following admission with AECOPD are enrolled within one month of leaving hospital.
4	Pulmonary rehabilitation programmes are of at least 6 weeks duration and include a minimum of twice-weekly supervised sessions.
5	Pulmonary rehabilitation programmes include supervised, individually tailored and prescribed, progressive exercise training including both aerobic and resistance training.
6	Pulmonary rehabilitation programmes include a defined, structured education programme.
7	People completing pulmonary rehabilitation are provided with an individualised structured, written plan for ongoing exercise maintenance.
8	People attending pulmonary rehabilitation have the outcome of treatment assessed using as a minimum, measures of exercise capacity, dyspnoea and health status.
9	Pulmonary rehabilitation programmes conduct an annual audit of individual outcomes and progress.
10	Pulmonary rehabilitation programmes produce an agreed standard operating procedure.

British Thoracic Society. *Quality standards for pulmonary rehabilitation in adults*. London: BTS, 2014. www.brit-thoracic.org.uk/guidelines-and-quality-standards/pulmonary-rehabilitation-quality-standards/

Key findings

Performance against British Thoracic Society PR quality standards (QS)

QS1: Referral for pulmonary rehabilitation:

a. **People with COPD and self reported exercise limitation (MRC dyspnoea 3–5) (see Appendix E) are offered pulmonary rehabilitation.**
b. **If accepted, people referred for pulmonary rehabilitation are enrolled to commence within 3 months of receipt of referral.**

- The majority of PR programmes accept patients with COPD who report significant exercise limitation. Almost all accept patients who report MRC grades 3 (96%) and 4 (97%), but 19% do not accept patients with more severe disability (MRC grade 5).
- Almost all programmes (97%) will accept repeat referral for patients who have previously attended PR more than 1 year ago.
- Of those patients referred to PR, a significant proportion (31%) do not attend assessment for treatment.

QS2: Pulmonary rehabilitation programmes accept and enrol patients with functional limitation due to other chronic respiratory diseases (for example bronchiectasis, interstitial lung disease (ILD and asthma) or COPD MRC dyspnoea 2, if referred.

- Most programmes will accept referrals for patients with disability due to conditions other than COPD, although there is considerable variation in the range of conditions accepted and 6% of programmes will only treat patients with COPD.
- Twenty-eight per cent of programmes do not accept patients with less severe dyspnoea (MRC 2).

QS3: Referral for pulmonary rehabilitation after hospitalisation for acute exacerbations of COPD:

a. **People admitted to hospital with acute exacerbations of COPD (AECOPD) are referred for pulmonary rehabilitation at discharge.**
b. **People referred for pulmonary rehabilitation following admission with AECOPD are enrolled within one month of leaving hospital.**

- Sixty-eight per cent of programmes offer PR following hospitalisation for exacerbation of COPD.
- Only 22% of programmes are able both to offer post-exacerbation PR and provide this within 1 month of discharge from hospital.

QS4: Pulmonary rehabilitation programmes are of at least 6 weeks duration and include a minimum of twice-weekly supervised sessions.

- The majority of programmes provide programmes for 6 weeks or more (88%) and offer twice-weekly (or more) supervised sessions (93%).

QS5: Pulmonary rehabilitation programmes include supervised, individually tailored and prescribed, progressive exercise training including both aerobic and resistance training.

- Nearly all programmes offer aerobic training (either walking based (94%) and/or cycling (82%)).
- Similarly, nearly all (99.6%) offer resistance/strength training.
- Accurate prescription of aerobic and resistance training is variable, with a significant number of programmes not offering rigorous prescription from objective measures of exercise performance measured at baseline.

QS6: Pulmonary rehabilitation programmes include a defined, structured education programme.

- All programmes provide disease education but the content, format and quantity of the education offered is highly variable.

QS7: People completing pulmonary rehabilitation are provided with an individualised structured, written plan for ongoing exercise maintenance.

- A sizeable minority (35%) of programmes do not offer a clear, written plan for ongoing exercise and maintenance to all patients after completion of treatment.

QS8: People attending pulmonary rehabilitation have the outcome of treatment assessed using as a minimum, measures of exercise capacity, dyspnoea and health status.

- Nearly all programmes record the outcome of treatment using measures of exercise capacity, health status and dyspnoea. Ninety-eight per cent of programmes measure all three of these outcomes.
- Despite the widespread provision of resistance training and the requirement for an assessment of strength to accurately prescribe this mode of exercise, measurement of strength as an outcome of treatment is provided only by a minority of programmes (22%).

QS9: Pulmonary rehabilitation programmes conduct an annual audit of individual outcomes and process.

- Nearly all programmes (96%) keep a database of programme information including patient outcomes, attendance and completion rates (all >90%).

QS10: Pulmonary rehabilitation programmes produce an agreed standard operating procedure.

- An SOP was available in only 67% of programmes.
- There is considerable variation in the settings within which PR is provided and within the organisation of programmes (cohort or rolling).
- There was also variation in the number and professional mix of staff allocated to programmes but, importantly, only 1% of programmes were providing treatment with only one member of staff present. However, 27% of programmes have unfilled staff vacancies.
- A sizeable number of programmes reported insecurity of ongoing funding. Of those with fixed-term funding, 79% reported that this was for 2 years or less.

Recommendations

1. Patient referral

Although the majority of programmes accept patients with a wide range of respiratory disability and a wide range of diagnoses, there is room for improvement in treatment availability for patients with milder exercise limitation (MRC grade 2), in whom PR may be an important prevention measure, and in those with the most severe disability (MRC grade 5) whose need is greatest. Similarly, extension of the availability of PR to all patients with respiratory disease (regardless of the cause) and significant exercise limitation is needed.

We recommend that where programmes are not currently able to accept these groups of patients, providers and commissioners urgently initiate discussions about addressing this need. This may entail equipping programmes with the facilities and staff needed to extend provision of care to these groups. We recognise that there are challenges to providing treatment to patients with more complex and advanced disease in non-health or community settings that may require linking with local hospital-based programmes.

The audit estimates that for 2013/2014 around 68,000 referrals were received by PR programmes for patients with COPD across England and Wales. The estimated prevalence of COPD patients that should be offered PR (MRC grades 3 to 5) for the same period was about 446,000 across England and Wales (4, 5). It is clear, therefore, that there is significant under-referral of patients for treatment. Given the strong evidence base for the effectiveness and economic value of PR, addressing this deficiency should be a high priority for commissioners and for primary and secondary care providers. The low attendance rate for PR assessment among patients who have been referred indicates significant patient factors contributing to suboptimal uptake of treatment.

We recommend that commissioners and providers work together to review and enhance referral pathways for PR and education and training for referring healthcare professionals. We also recommend that written information for patients and referrers is reviewed, highlighting the benefit of PR with the aim of maximising the uptake of treatment by patients referred for PR. Barriers to patient access to PR such as availability of transport and parking should also be reviewed. It is likely that these measures will result in an appropriate rise in referral and attendance rates, which will also require the commissioning of greater PR capacity. Providers will need to ensure they offer treatment in suitably equipped facilities of sufficient scale, breadth and range of location to meet this demand. We note that a small number of programmes (4%) do not accept smokers (contrary to the BTS PR guideline), and we recommend this practice should be ended.

The data highlight difficulty in meeting the demands of the most recent development in rehabilitation practice: the provision of post-exacerbation PR (PEPR). There are particular logistic issues related to meeting this demand given the unscheduled nature of these events and the requirement set out in the quality standards to provide treatment within 4 weeks of discharge from hospital.

We recommend that PR providers initiate urgent discussions with commissioners and acute care providers to ensure that robust referral pathways for PEPR are in place and that sufficient PR capacity exists to meet this demand. This capacity needs to be provided with sufficient flexibility to accommodate provision of treatment following discharge from acute care within 4 weeks (as stated in the PR quality standards) without compromising timeliness of assessment for stable-state PR.

2. Structure and content of programmes

The data are notable in demonstrating that most programmes provide the exercise component of PR in line with the PR management guidelines and quality standards. There is an impressive breadth of clinical outcome recording, highlighting that a culture of objective assessment of treatment outcome is deeply embedded in UK PR practice.

Most PR programmes provide treatment of sufficient duration and frequency, but there remain a minority that do not meet this quality standard. The data also show that accurate prescription of both aerobic and resistance exercise training is not universal.

We recommend that PR programmes review their programme structure and exercise prescription practice and ensure that they are providing treatment in line with accepted standards. This will entail ensuring that exercise intensity is individually prescribed using validated exercise measures performed at assessment for both aerobic training and resistance training. The widespread recording of suitable exercise outcomes means that this should not be difficult to implement for aerobic training. To achieve this for resistance training, incorporating individual assessment of muscle strength as an outcome measure will need to be much more widespread. Commissioners will need to ensure they provide PR programmes with sufficient resource to carry this out, and providers will need to ensure facilities and equipment are fit for this purpose. If exceptions to these standards continue, programmes should pay particular attention to outcome audit data (including data from the clinical component of the PR audit, which will be reported to programmes later in 2015) to ensure patient outcomes are satisfactory.

3. Education and patient information

An education programme is provided almost universally by PR programmes, but there is substantial variation in format, content and quantity of education provision. This reflects the lack of clear, evidence-based guidance on what represents best practice in this area.

Sustaining the benefits of PR is critically dependent on lifestyle and behaviour change with the aim of encouraging the patient to adopt a more active lifestyle. Data from the audit indicate that the provision of clear, written advice about ongoing exercise (QS7) is not provided by a significant minority of programmes.

We recommend that programmes who do not do this examine their PR discharge processes to ensure this need is met.

4. Programme resources and staffing

The audit identifies wide variation in staffing, likely reflecting differences in programme size and setting. There is a strong focus on providing safe care, with virtually all programmes ensuring at least two members of staff are present during sessions and widespread provision of life-support training, although community and church hall venues had lower availability of onsite emergency resuscitation equipment.

The audit reveals a significant number of programmes with ongoing staff vacancies and a significant number providing care in an environment of funding uncertainty. We recognise the challenges across the NHS of recruiting and retaining well-trained healthcare professionals, which will apply equally to PR programmes. It is our view that these problems will be best overcome by ensuring programmes are commissioned over sufficiently long time frames to attract and retain staff, and that staff of sufficient seniority and experience occupy leadership positions locally in PR programmes.

We recommend that commissioners take steps to ensure providers have a clear, long-term funding framework that will allow programmes to recruit and retain staff with an appropriate skill and seniority mix.

The vast majority of programmes keep detailed and relevant information about the care they provide, to allow them to audit and improve their service. However, a significant number of programmes do not have an established standard operating procedure (SOP) in line with QS10. We believe local development of such a document will assist in ensuring the core principles of accessibility, safety, effectiveness and capacity are aligned to the context of the local patient population and environment.

We recommend that all programmes take steps to make sure a written SOP is agreed with their provider organisation. In line with QS10, this document should include local policies relating to treatment venues (including patient transport facilities), equipment requirements, safety systems (including risk assessment of PR venues and emergency treatment arrangements) and provision of staff (skill mix, seniority and competencies). It is likely that attention to these details will help to ensure that other recommendations made in this audit report are addressed.

5. Quality improvement and future development

As highlighted above, the development of local quality improvement will require discussions between healthcare professionals delivering PR, management teams in provider organisations and CCGs / local health boards (LHBs). We believe a national focus for quality improvement is also needed, which will be offered by the newly established BTS Pulmonary Rehabilitation Quality Improvement Advisory Group (PRQIAG).

If possible, future audits should be undertaken using continuous, automated data collection, as this will improve the fidelity of data acquisition and reduce the burden of participation for PR programmes. The widespread routine recording of clinical outcomes and existence of local databases highlighted by the current audit indicates that the PR community is well placed to move in this direction.

The complex, multicomponent nature of PR means that attention to maintaining the quality of the intervention is required, particularly in times of economic constraint. The development of structures to benchmark quality for PR programmes such as accreditation would be welcome and could be supported by the aforementioned PRQIAG. The presence of evidence-based guidelines and quality standards for PR allied to widespread collection of clinical audit data indicates that the UK PR community is well placed to take this next step. We believe this development would assist in enshrining high-quality, evidence-based care while also raising the profile and status of the intervention to referrers and health policymakers.

The audit highlights a number of areas that are not covered by the quality standards where PR programmes are adding value to the treatment they provide. For example, additional clinically relevant assessments such as psychological status, physical activity, patient satisfaction and patient knowledge are in widespread use. We think this finding illustrates the commitment of PR programmes to innovation and development of their practice, and ensures the PR community is well placed to incorporate cutting-edge developments as the scientific evidence base develops.

The audit also highlights a number of areas where there is significant variation in care. Where there is variation in the provision of evidence-based care, we have highlighted them above. In many areas, however, variation reflects a lack of clear evidence/guidance on current best practice. We do not advocate a ‘one size fits all’ model of PR provision, but we encourage communication and exchange of practice between PR programmes across the UK so that programmes can undertake service improvement by learning from each other. A UK network to link programmes in this respect would be valuable and could be supported by the PRQIAG.

1. Introduction

The National COPD Audit Programme, commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA), sets out an ambitious programme of work that aims to drive improvements in the quality of care and services provided for COPD patients in England and Wales. For the first time in respiratory audit, the programme is looking at COPD care across the patient pathway, both in and out of hospital, bringing together key elements from the primary, secondary and community care sectors.

The programme is led by the Royal College of Physicians (RCP), working in partnership with the British Thoracic Society (BTS), the British Lung Foundation (BLF), the Primary Care Respiratory Society UK (PCRS-UK) and the Royal College of General Practitioners (RCGP), and with the Health and Social Care Information Centre (HSCIC).

There are four programme workstreams:

1. Primary care audit: collection of audit data from general practice patient record systems – delivered by the RCP and the HSCIC, working with the PCRS-UK and the RCGP.
2. Secondary care audit: audits of patients admitted to hospital with COPD exacerbation, and outcomes at 30 and 90 days, plus organisational audits of the resourcing and organisation of COPD services in acute units admitting patients with COPD exacerbation – delivered by the BTS, working with the RCP.
3. Pulmonary rehabilitation: audits of patients attending PR, and outcomes at 180 days, plus organisational audits of the resourcing and organisation of PR services for COPD patients – delivered by the BTS, working with the RCP.
4. Patient Reported Experience Measures (PREMs): 1–year development work exploring the potential/feasibility for PREMs to be incorporated into the programme in the future – delivered by the BLF, working with Picker Institute Europe.

Reported here are data from the 2015 audit of the resourcing and organisation of PR services in England and Wales.

Background

This is the first national audit of PR services in England and Wales. Prior to this audit, there was no comprehensive list of where PR was being provided, and the BTS project team was therefore tasked with mapping PR services in England and Wales.

For the purposes of the mapping exercise (and the audit), all services describing themselves as 'pulmonary rehabilitation' were included, and a total of 230 services were identified. Details of this mapping exercise are given in Appendix A. We believe this to be a comprehensive picture of services in England and Wales but we cannot rule out the possibility that PR services exist that were not identified and contacted, and therefore did not participate in the audit. Participation in the audit for those programmes who were contacted was high (97% and 100% for England and Wales respectively).

For the purposes of the audit, we have used the term '*PR programme*' to mean a PR service with a shared pool of staff and central administration where referrals are received (a PR programme may operate at several different sites). The organisations delivering these PR programmes are termed a '*provider*' – these range from NHS trusts and health boards to community interest companies (CICs) and other private providers. Many providers deliver more than one PR programme.

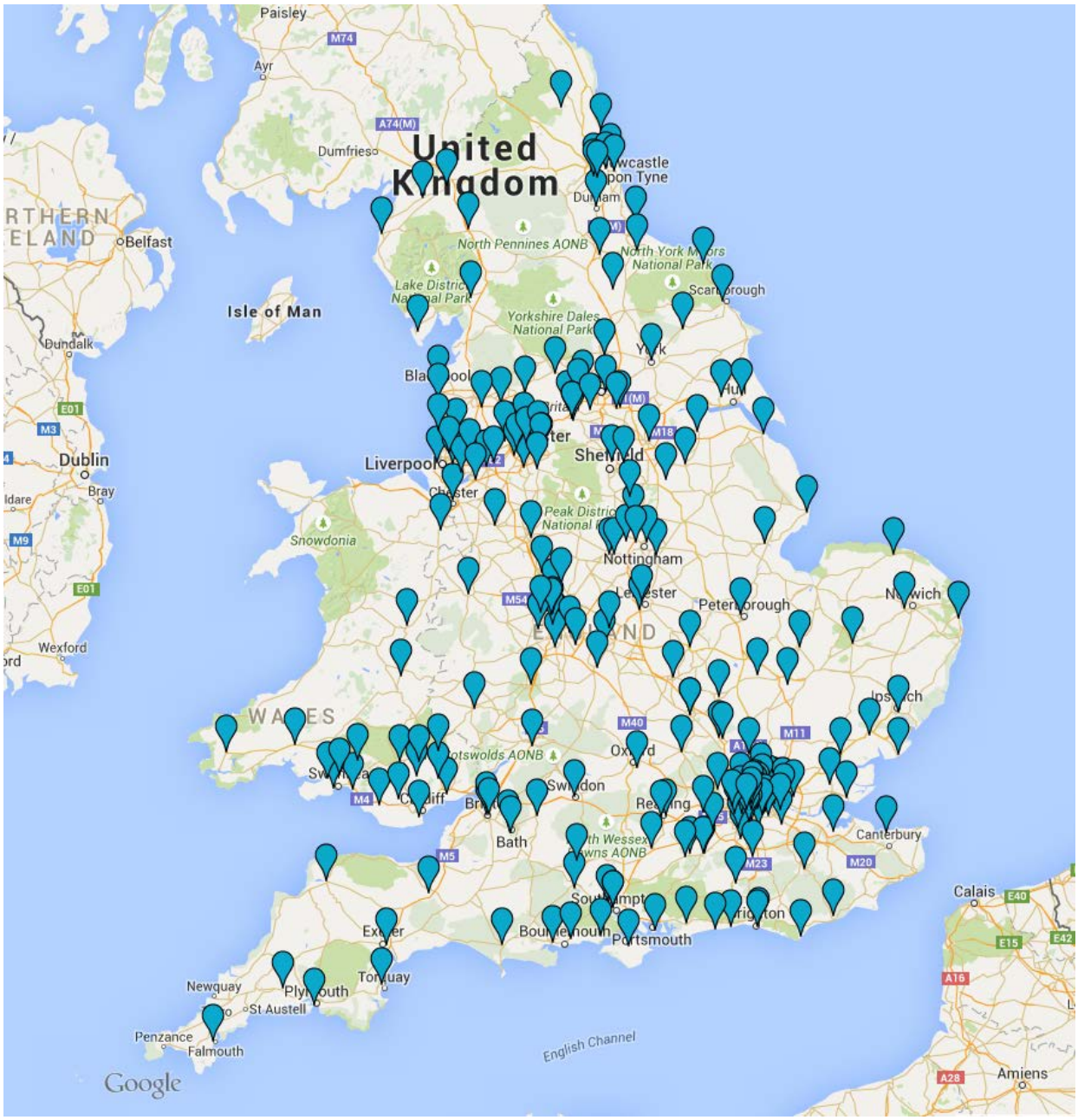


Fig 1: PR programmes in England and Wales

Please see the appendices for further detail on the mapping of PR services, the audit methodology and the programme governance.

2. Results

Presentation of results

This report gives national results for all PR services participating in this audit.

For the purposes of the audit, a programme was defined as 'a pulmonary rehabilitation service with a shared pool of staff and central administration where referrals are received'. An organisation may run one or more programmes, and a programme may operate at several 'sites'. National results are presented at programme level and at site level, and local results are presented at programme level.

Visual methods are used to convey programme/site variation in some sections. Each section is preceded by a short summary of key messages and of areas needing improvement. The executive summary, earlier in this report, provides an overview of all the key messages and recommendations, particularly in relation to published guidelines and quality standards for PR.

There was some data cleaning required to account for illogical data. There was a sizeable amount of data cleaning required of 'other' free-text entries, as it was apparent that some auditors gave free text that should have been recorded as one of the listed options. Occasionally there were missing data, resulting in data cells being blank.

In tables and text, please note that when categories are combined to give a combined percentage, it is the numbers that are added and not the percentages.

Please also be aware that the numbering of the tables relates to the numbering of the audit questions; however, for the purposes of this report these have been reordered.

Results 2015

The organisational audit had two parts: all participating programmes were asked to complete one record for Part 1 (which contained questions on the content of their service, staffing and internal procedures); and then to complete one Part 2 record for each site at which they delivered PR (this contained site-specific questions, eg on what emergency medical facilities were available).

Organisational audit data were received from 224/230 programmes (154/158 providers).

In total, 224 Part 1 records were exported and included in the main organisational audit analyses, from 224 PR programmes within 154 provider organisations.

There were 205 Part 1 records from 205 English PR programmes within 147 providers, and 19 records from 19 Welsh PR programmes within 7 providers.

The overall Part 1 response rate for programmes was 97%: England 97% (205/211) and Wales 100% (19/19). The overall Part 1 response rate for providers was: England 97% (143/147) and Wales 100% (7/7) (Appendix B).

The Part 1 data stated that these programmes were offering PR at a total of 674 sites, median (IQR) of 2 (1–4) sites per programme, range 1–14. Audit data pertaining to sites were received for 670 of the 674 sites from 223 programmes. The non-participating programme was a home-based service and so this part of the audit was not applicable to them.

Section 1: Patient referral and acceptance (Quality Standards 1, 2 and 3)

KEY FINDINGS

- The majority of programmes accept patients with clinically important exercise limitation (96% and 97% accept MRC grades 3 and 4 respectively). Some programmes (19%) are unable to accept patients with the most severe disability (MRC grade 5) **(QS1)**.
- The median number of referrals per programme per year was 299 (approximately six per week). Data on the proportion of referrals with COPD were only available for a minority of programmes but, where available, these data indicate that 84% of patients were referred with COPD.
- For the 174 programmes where data were provided, a total of 61504 referrals were received for the financial year 2013/14. Where data were available (71 programmes), 84% were for patients with COPD. Extrapolating these figures to the total of 230 programmes identified nationally provides an estimated national total number of referrals of around 81000, and an estimated national total number of COPD referrals of around 68000.
- The majority of programmes (97%) accept the need to re-offer PR after 1 year or more **(QS1)**.
- Assessment attendance rate (as a proportion of overall referrals) was 69%. The degree to which this reflects patient factors or referrer/programme organisational factors is unclear **(QS1)**.
- Programmes accept referrals from a wide range of sources including 29% who accept 'self-referral'. It is unclear whether these self-referrals are restricted to patients who were previously known to the service **(QS1)**.
- Provision of PR for respiratory conditions other than COPD is variable, but most programmes accept interstitial lung disease (ILD) (86%) and bronchiectasis (91%). There were 13 programmes (6%) that only accepted patients with a primary diagnosis of COPD **(QS2)**.
- Some programmes (28%) do not accept patients who are referred with less severe exercise intolerance (MRC grade 2) **(QS2)**.
- Very few programmes (4%) do not accept current smokers.
- Some programmes (32%) do not accept referrals following admission to hospital for exacerbations of COPD (post-exacerbation PR (PEPR)) although some of these programmes may not be linked to an acute care provider **(QS3)**.
- Overall, only a minority of programmes (22%) are fully able to meet the demands of PEPR referral (enrolment within 1 month), suggesting there are significant capacity and flexibility barriers to reaching this standard **(QS3)**.

AREAS IDENTIFIED AS NEEDING IMPROVEMENT

- Improvement in rates of uptake of PR assessment in patients who have been referred for PR **(QS1)**.
- More consistent acceptance of patients referred with respiratory diagnoses other than COPD and with a greater range of respiratory disability **(QS2)**.
- Increased capacity required to ensure all patients who accept a referral for PR following hospital admission can be seen within 1 month **(QS3)**.

	National audit (n=224)	
1.1 Which self-reported MRC graded patients do you offer PR to? (QS1)		
Grade 1	18%	40
Grade 2	72%	162
Grade 3	96%	214
Grade 4	97%	217
Grade 5	81%	182
Not known / not recorded	2%	4

Main combinations:

					Programmes
-	Grade 2	Grade 3	Grade 4	Grade 5	44% (98)
-	-	Grade 3	Grade 4	Grade 5	20% (45)
Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	16% (35)
-	Grade 2	Grade 3	Grade 4	-	11% (24)
-	-	Grade 3	Grade 4	-	3% (6)
-	-	-	Grade 4	Grade 5	2% (4)
Grade 1	Grade 2	Grade 3	Grade 4	-	2% (4)
-	-	Grade 3	-	-	1% (2)
Grade 1	Grade 2	-	-	-	0.4% (1)
-	-	-	Grade 4	-	0.4% (1)
Not known	Not known	Not known	Not known	Not known	2% (4)

	National audit (n=224)	
1.2 Do you exclude patients who are current smokers? (QS1)		
Current smokers excluded	4%	8

	National audit (n=224)	
1.3 Do you offer PR to patients who have completed a programme over a year ago? (QS1)		
Yes – 1-2 years ago	93%	208
Yes – 3-4 years ago	65%	146
Yes – 5 or more years ago	62%	139
No	3%	6

	National audit (n=224)	
4.2 From which sources does your PR programme accept referrals? (QS1)		
GPs	96%	215
Practice nurses	94%	211
Hospital physicians	99.6%	223
Respiratory nurse specialists	99.6%	223
Physiotherapists	94%	210
Occupational therapists	70%	157
Respiratory physiologists	48%	108
Community services	80%	179
Home oxygen teams	72%	162
Self-referral	29%	65
Other	3%	7*

*Other included: third-sector organisations, other professions (eg cardiac specialists, exercise instructors, pharmacists, researchers), carers and through public awareness events.

	National audit (n=224)	
1.4 Which non-COPD conditions would be accepted by your PR programme? (QS2)		
None	6%	13
Asthma	72%	160
Bronchiectasis	91%	203
Heart failure	14%	31
Interstitial lung disease	86%	193
Kyphoscoliosis	37%	83
Lung cancer	52%	117
Obstructive sleep apnoea	33%	73
Obesity-related breathlessness	25%	57
Primary pulmonary hypertension	35%	78
Sarcoidosis	63%	140
Other (coded from free text):		
• Peri-operative	6%	13
• Dysfunctional breathing	3%	6
• Others*	5%	11

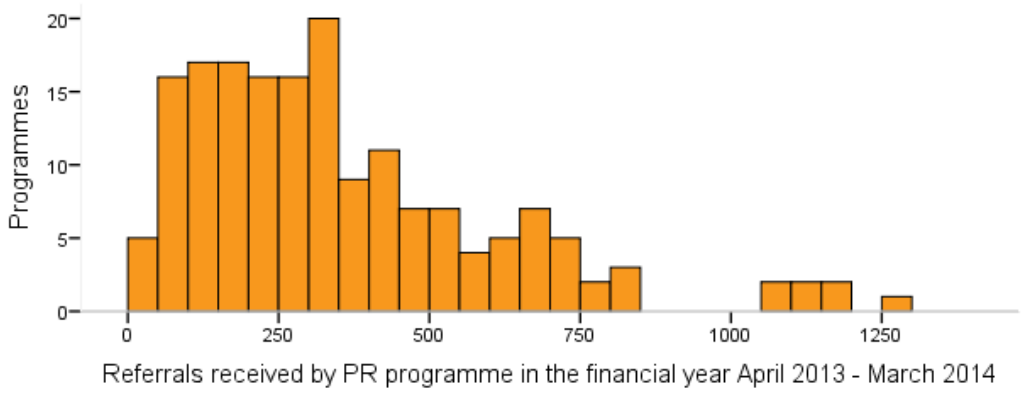
*Others included: a variety of non-respiratory conditions (eg diabetes, hypertension), rarer conditions (such as lymphangioleiomyomatosis (LAM) and tracheobronchomalacia) and referrals following treatment on the intensive care unit.

	National audit (n=224)	
1.5 Do you provide early post-discharge PR (within 1 month of discharge) for patients discharged from hospital with a diagnosis of acute exacerbation of COPD (AECOPD)? (QS3)		
Yes – fully met	22%	49
Yes – partially met	46%	103
No	32%	72

	National audit (n=224)	
1.6 Do you accept referrals for elective PR following discharge from hospital for AECOPD?		
Referrals accepted	89%	200

	National audit (n=224)
4.5 How many referrals did your PR programme receive in the financial year April 2013 – March 2014? (QS1,9)	
No. of programmes where known	174
Median (IQR)	299 (169-477)

For these 174 programmes, the total number of referrals was 61504, and the projected estimate for the 230 PR programmes identified nationally was 81298.



	National audit (n=224)
4.6 How many of the referrals noted at *(audit question)* 4.5 were for COPD? (QS1,9)	
No. of programmes where known	73
Median (IQR)	197 (90-364)
Ratio of COPD to total referrals: Median (IQR)	0.85 (0.76-0.93), n=71*

*For these 71 programmes, the total number of referrals was 23130 and of these, 83.7% (19357) were for COPD. Applying this percentage to the estimated total of 81298 referrals for the 230 PR programmes identified nationally gives a national estimate of 68037 COPD referrals.

	National audit (n=224)
4.7 How many initial assessments did your PR programme complete in the financial year April 2013 – March 2014? (QS8,9)	
Known	219
Median (IQR)	180 (100-306)
Ratio of initial assessments to total referrals: Median (IQR)	0.69 (0.56-0.83), n=174*

*For these 174 programmes, the total number of referrals was 61504, with 69% (42411) initial assessments.

For the 219 programmes in the table for audit question 4.7, the total number of initial assessments was 48558, with a projected estimate for the 230 PR programmes identified nationally of 50997 initial assessments.

	National audit (n=224)	
4.8 How many programme spaces (for all sites) did your PR programme offer in the financial year April 2013 – March 2014? (QS9)		
0-50	9%	20
51-100	16%	36
101-150	16%	35
151-200	16%	35
201-300	18%	40
301-400	9%	20
401-500	7%	16
>500	10%	22

Section 2: Programme structure and content (Quality Standards 4, 5 and 8)

KEY FINDINGS

Programme structure

- Eighty-eight per cent of programmes provide treatment for a minimum of 6 weeks **(QS4)**.
- Ninety-three per cent provide supervised sessions twice weekly or more **(QS4)**.
- Additional exercise sessions at home are widely included (97%) and individually prescribed in 79% of these programmes **(QS4)**.
- Similar numbers of programmes provide rolling (58%) and cohort (57%) programmes. Seventeen per cent provided both. Nearly all (98%) involve group activity.
- A small number (5%) are not open all year round.
- Initial and discharge assessments are provided very widely (99%), suggesting that a culture of objective outcome assessment is widely embedded in UK clinical practice **(QS8)**.

Programme content: exercise provision

- The majority of programmes provide aerobic exercise (79% offer both cycling and walking, 16% walking only, 4% cycling only, five programmes offered neither) **(QS5)**.
- A wide variety of additional exercise/rehabilitation therapies are provided across different programmes.
- Accurate prescription of aerobic exercise is variable. Eighteen per cent of programmes either do not prescribe aerobic exercise or use a non-standardised, 'best guess' prescription **(QS5)**.
- Fifty-two per cent of programmes use either symptom scores or 'best guess' alone to prescribe aerobic training intensity. For those using symptom scores (BORG) only, intensity prescription was 'not done' or 'not applicable' in 69% (compared with 29% of programmes using other prescription methods) **(QS5)**.
- Three per cent of programmes prescribed exercise intensities only below 65% maximum performance, and 21% prescribed intensities only below 75% **(QS5)**.
- Provision of resistance training is widespread (94%), but prescription methodology is frequently ad hoc (31%) or using perceived effort scores (70%) **(QS5)**.
- Progression of exercise training is widely recorded in a diary during treatment (91%) **(QS5)**.

Programme content: outcome assessment

- Exercise outcome assessment is widely performed, with high penetration of field walking tests as outcome measurements (incremental shuttle walk test (ISWT) in 67%, endurance shuttle walk test (ESWT) in 17%, 6-minute walk test (6MWT) in 69%). Eleven per cent of programmes perform all three of these field tests **(QS8)**.
- Measures of muscle strength are recorded infrequently (22%), despite resistance training being widely provided **(QS8)**.
- Very few programmes (1%) do not measure health status **(QS8)**.
- All programmes record self-reported breathlessness, with the MRC scale being the most widespread measurement (94%) **(QS8)**.
- Programmes report widespread recording of additional outcomes; for example psychological status (84%), patient satisfaction (93%) and physical activity (34%).

AREAS IDENTIFIED AS NEEDING IMPROVEMENT

- Improvement in rigorous prescription of both aerobic and resistance exercise training **(QS5)**.
- Wider use of muscle strength testing, given that this is needed to accurately prescribe resistance training **(QS8)**.
- Re-enforce the need for sufficient frequency and duration of programmes (at least twice weekly for a minimum of 6 weeks) **(QS4)**.

	National audit (n=224)	
2.1 What types of PR programme do you offer? (QS10)		
Rolling	58%	131
Cohort	57%	128
Other	3%	7*

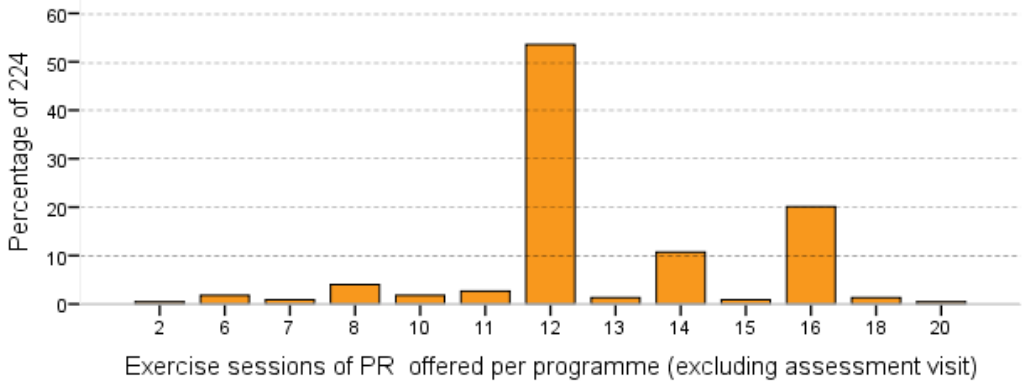
*Other included: hybrid programmes and, in three programmes, home treatment.

Seventeen per cent (38) provided both formats, 42% (93) provided rolling only and 40% (90) provided cohort only.

	National audit (n=224)	
2.2 Do you offer a group-based and/or one-to-one PR programme? (QS10)		
Group-based	71%	158
One-to-one	2%	4
Both	28%	62

	National audit (n=224)	
2.3 Is your PR programme open all year round? (QS10)		
Open all year round	95%	213

	National audit (n=224)	
2.4 How many exercise sessions of PR do you offer per programme (excluding assessment visits)? (QS4)		
Median (IQR)	12	(12-14)



	National audit (n=224)	
2.5 How frequently do patients usually attend? (QS4)		
1 session per week	7%	15
2 sessions per week	93%	208
3 sessions per week	0.4%	1
4 or more sessions per week	-	-
Other	-	-

		2.5 How frequently do patients usually attend?			
		1 session per week	2 sessions per week	3 sessions per week	Total
2.4 How many exercise sessions of PR do you offer per programme? (excluding the assessment visits)	2	0	1	0	1
	6	4	0	0	4
	7	1	1	0	2
	8	7	2	0	9
	10	2	2	0	4
	11	0	6	0	6
	12	1	118	1	120
	13	0	3	0	3
	14	0	24	0	24
	15	0	2	0	2
	16	0	45	0	45
	18	0	3	0	3
	20	0	1	0	1
Total		15	208	1	224

	National audit (n=224)	
2.4/2.5 At least a six week programme twice a week: (QS4)		
Yes	88%	197

	National audit (n=224)	
2.6 Do you offer an initial assessment before enrolment onto the PR programme? (QS8)		
Offered	99%	221

	National audit (n=224)	
2.7 Do you offer a discharge assessment? (QS8)		
Offered	99.6%	223

	National audit (n=224)	
2.8 What modes of exercise training are offered during the rehabilitation? (QS5)		
Circuit training	75%	169
Cycling	82%	184
Interval training	48%	107
Neuromuscular electrical stimulation (NMES)	1%	2
Strength training using free weights	99.6%	223
Strength training using multi-gym equipment	30%	68
Walking	94%	211
Other (as coded from free text):		
• General aerobic training (on a variety of platforms)	8%	17
• Others	9%	19*

*Other included: balance/posture training, tai chi, dance, quoits, skipping, 'sit to stand' and chair rising exercise, and Thera-Band exercise.

Seventy-nine per cent (176/224) offered both cycling and walking, 16% (35/224) offered walking only, 4% (8) offered cycling only, and five programmes offered neither.

	National audit (n=224)	
2.9 How is aerobic exercise prescribed? (QS5)		
Not done / not applicable	2%	4
Using Borg or perceived exertion scores to assess intensity	88%	198
CPET test to measure peak VO_2	-	-
ISWT to predict peak VO_2	39%	87
6MWD equation	13%	29
Ad hoc / best guess	17%	37
Other	1%	3*

*Other included: treadmill exercise and goal-oriented methods.

This was a multiple response question in which BORG only was selected by 40% (90), and BORG and/or ad hoc only was selected by 52% (116/224).

	National audit (n=224)	
2.10 What intensity of aerobic exercise prescription is used? (multiple responses possible) (QS5)		
<65%	16%	35
66-75%	32%	71
76-85%	33%	73
>85%	8%	17
Not done / not applicable	45%	100

For those only using BORG (audit question 2.9), intensity prescription was not done / not applicable for 69% (60/87), as compared with 29% (40/137) of other programmes.

Intensity combinations:

				Programmes
-	-	-	-	100
-	-	76-85%	-	33
-	66-75%	-	-	29
<65%	66-75%	76-85%	-	14
	66-75%	76-85%	-	12
<65%	66-75%	-	-	11
-	-	76-85%	>85%	8
<65%	-	-	-	7
-	-	-	>85%	4
-	66-75%	76-85%	>85%	3
<65%	66-75%	76-85%	>85%	2
<65%	-	76-85%	-	1

Three per cent of programmes (7) prescribed exercise intensities only below 65% maximum performance, and 21% (47) only prescribed intensities under 75%.

		National audit (n=224)
2.11 How is strength training prescribed? (multiple responses possible) (QS5)		
Not done / not applicable	6%	13
Ad hoc / best guess	31%	70
Borg perceived exertion scores	70%	156
One repetition maximum (1RM)	17%	37
Other	6%	13*

*Other included: prescription based on other measurements (eg 6MWT), assessment of co-morbidities and other patient effort reports.

Strength training combinations:

				Programmes
-	-	Borg	-	105
-	Ad hoc	Borg	-	35
-	Ad hoc	-	-	30
-	-	-	1RM	19
-	-	Borg	1RM	13
Not done / not applicable	-	-	-	13
-	-	-	-	4
	Ad hoc	Borg	1RM	3
	Ad hoc		1RM	2

		National audit (n=224)
2.12.1 Is home exercise prescribed? (QS7)		
Prescribed	97%	218
2.12.2 If yes, is the home exercise prescription individually tailored? (QS7)		
Prescribed individually	79%	165/210

	National audit (n=224)	
2.13 How is muscle strength measured? (multiple responses possible) (QS8,9)		
Isometric	5%	12
1RM	14%	31
Not done / not applicable	78%	175
Other	7%	14*

*Other included: Oxford muscle grading, performance during weight training, predictive equation (Epley), and grip strength.

	National audit (n=224)	
2.14 Which measures of aerobic exercise performance do you use at assessment or refer to as outcome measures? (QS8,9)		
Not done / not applicable	0.4%	1
Incremental shuttle walk test (ISWT)	67%	149
Endurance shuttle walk test (ESWT)	17%	37
Six minute walk test (6MWT)	69%	154
Cycle or treadmill ergometry	1%	2
Cycle or treadmill endurance test	2%	4
4 metre gait speed test	1%	3
Cardio pulmonary exercise test (CPET)	-	-
Other	4%	9*

*Other included: 'sit to stand' assessments, treadmill tests and functional walk tests.

Combinations involving ISWT, ESWT and 6MWT:

			Programmes
ISWT	ESWT	6MWT	11% (24)
ISWT	ESWT	-	6% (13)
ISWT	-	6MWT	26% (58)
ISWT	-	-	24% (54)
-	-	6MWT	32% (72)
-	-	-	1% (3)

	National audit (n=224)	
2.15 Which measures of health status do you use? (QS8,9)		
Not done / not applicable	1%	3
St George's Respiratory Questionnaire (SGRQ not SGRQ-C)	10%	22
Chronic Respiratory Questionnaire (CRQ)	50%	112
COPD Assessment Test (CAT)	60%	135
Other	25%	55*

*Other: a wide variety of questionnaires were listed in this category including assessments of psychological status, patient knowledge and activities of daily living, which are captured in the table for audit question 2.17.

Combinations involving SGRQ, CRQ and CAT:

			Programmes
-	-	CAT	34% (76)
-	CRQ	-	30% (66)
-	CRQ	CAT	20% (45)
SGRQ	-	CAT	6% (14)
SGRQ	-	-	4% (8)
-	-	-	6% (14)

	National audit (n=224)	
2.16 Which measures of dyspnoea do you use? (QS8,9)		
Not done / not applicable	-	-
Medical Research Council (MRC) breathlessness scale	94%	210
Baseline Dyspnoea Index/Transition Dyspnoea Index (BDI/TDI)	1%	2
COPD Assessment Test (CAT)	49%	109
Other (coded from free text):		
CRQ/CRDQ	3%	7
Others*	15%	33*

*Other: several programmes cited measures of task-related breathlessness/effort (eg Borg score) rather than patient self-reported breathlessness.

	National audit (n=224)	
2.17 Do you measure any of the following? (QS8,9)		
Not done / not applicable	2%	4
Activities of daily living	37%	83
Knowledge gained during education	33%	75
Patient satisfaction	93%	208
Physical activity	34%	77
Psychological status	84%	189

	National audit (n=224)	
2.18 Is training progression recorded in a written patient exercise diary? (QS5)		
Recorded	91%	204/223

	National audit (n=224)	
2.19 Does your programme inform referrers of the outcome of PR for each patient? (QS8,10)		
Yes – always	78%	174
Yes – mostly	14%	32
Yes – sometimes	7%	16
Never	1%	2

	National audit (n=224)	
2.20 Does your programme inform GPs of the outcome of PR for each patient? (QS8,10)		
Yes – always	90%	201
Yes – mostly	6%	13
Yes – sometimes	4%	9
Never	0.4%	1

Section 3: Education and patient information (Quality Standards 6 and 7)

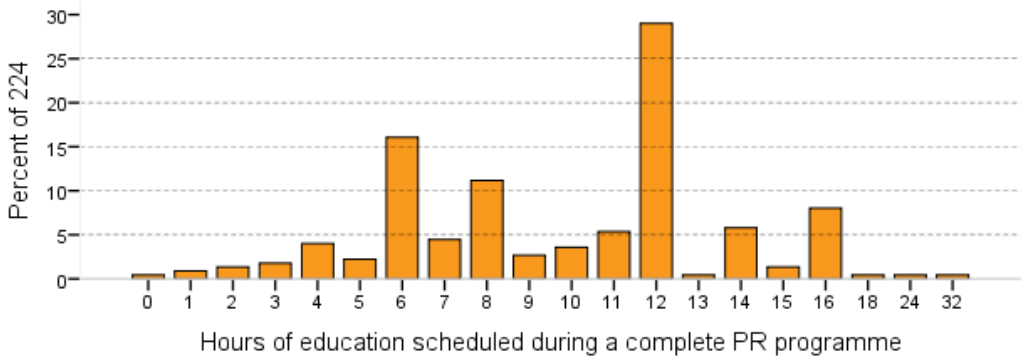
KEY FINDINGS

- All programmes provide disease education with a wide range of formats **(QS6)**.
- Most provide either face-to-face education or give written handouts, with 93% doing both, 6% providing face-to-face only and 1% giving a written handout only (one of which also gave a DVD, while the other also gave information on a dedicated website) **(QS6)**.
- Written information is usually provided prior to enrolment (88%).
- A significant minority of programmes do not provide a written discharge exercise plan (35% do not provide it or provide it occasionally) **(QS7)**.

AREAS IDENTIFIED AS NEEDING IMPROVEMENT

- Wider and clearer provision of a written, individual ongoing exercise plan with advice on maintenance **(QS7)**.

	National audit (n=224)
3.1 How many hours of education are scheduled during a complete PR programme? (QS6)	
Median (IQR)	11 (6-12) hours



	National audit (n=224)	
3.2 How is education provided? (QS6)		
Face-to-face taught group sessions	99%	222
Written handouts	94%	211
DVD given to patients	14%	32
CD given to patients	14%	31
Information on dedicated website	17%	38
Not done / not applicable	-	-
Other (as coded from free text):		
• One-to-one	3%	6
• Other	3%	6*

*Other included: patient support groups, group discussion and use of social media.

All programmes either provided face-to-face education or gave written handouts, with 93% (209) doing both, 6% (13) providing face-to-face only and 1% (2) giving a written handout only (one of which also gave a DVD, while the other also gave information on a dedicated website).

	National audit (n=224)	
3.3 If you offer face-to-face group sessions, who delivers these? (QS6)		
Physiotherapist	98%	218
Registered nurse	87%	195
Dietician	60%	134
Occupational therapist	54%	121
Healthcare/therapy assistant	36%	80
Fitness instructor	25%	57
Respiratory physician	25%	55
Pharmacist	24%	53
Clinical psychologist	21%	48
Technical instructor	17%	39
Health psychologist	12%	26
Exercise physiologist	4%	8
Social worker	4%	10
Respiratory physiologist	2%	5
Not done / not applicable	0.4%	1
Other	32%	72*

*Other included: Breathe Easy or other patient support groups/charities, benefits officer, Citizens Advice Bureau, smoking cessation service and expert patients.

	National audit (n=224)	
3.4 Do you send patients written information about your PR programme prior to their initial appointment? (QS10)		
Written information sent	88%	196

	National audit (n=224)	
3.5 Do you provide patients with a written discharge exercise plan with maintenance advice? (QS7)		
Yes	65%	145
Occasionally	17%	37
No	19%	42

	National audit (n=224)	
3.6 If needed, are you able to offer written information in a format that meets the needs of non-English speaking or partially sighted patients? (multiple responses possible) (QS6,10)		
Yes – translated material in any language required	18%	41
Yes – translated material in some languages	37%	83
Yes – large print	50%	112
Yes – Braille	11%	25
No	33%	74

Note that there were three programmes that offered translated material in 'any' language required and also in 'some' languages.

	National audit (n=224)	
3.7 Are interpreters available when required? (QS6,10)		
Yes – always	41%	91
Yes – mostly	25%	55
Yes – sometimes	23%	52
Never	12%	26

Section 4: Programme resources and staffing

KEY FINDINGS

- Twenty-three per cent of programmes have funding only for a fixed term; of these programmes, 79% were funded for 2 years or less.
- Eighty-one per cent of programmes provide treatment over four or fewer sites.
- Twenty-six programmes (12%) were provided by 'non-NHS' providers (CIC, charity or private provider).
- Median (IQR) total whole-time equivalent (WTE) staffing was 2.90 (1.50–4.94) per programme.
- Eighty-six per cent of programmes involved at least one member of staff of at least band 7 seniority.
- Twenty-seven per cent have staff vacancies.
- Life-support training is very widespread.

AREAS IDENTIFIED AS NEEDING IMPROVEMENT

- Greater security of long-term programme funding.

	National audit (n=224)	
4.1 What type of organisation provides your PR programme? (multiple responses possible) (QS10)		
NHS trust or health board	88%	196
Community interest company (CIC)	7%	15
Private healthcare provider	4%	9
Charity	1%	2
Research	-	-
Other	2%	4*

*Other included: borough council, GP practices and social enterprise.

Twenty-six programmes (12%) were provided by 'non-NHS' providers (CIC, charity or private provider). The definition of a 'community interest company' can be found on the CIC association website: (www.cicassociation.org.uk/about/what-is-a-cic).

	National audit (n=224)	
4.3 How is your PR programme funded? (multiple responses possible) (QS10)		
CCG commissioned	81%	181
Hospital funded	21%	48
Post-discharge rehabilitation tariff	2%	5
Other	3%	7*

*Other included: mixed funding, community/health board funding, and 'not funded'.

		National audit (n=224)
4.4.1 Does your PR programme have a fixed term of funding? (QS10)		
Known		196
Fixed term of funding	23%	46
4.4.2 If yes, how many years' future funding does the programme have?		
Known for 43/46:		
0	9%	4
1	44%	19
2	26%	11
3	12%	5
4	5%	2
5	5%	2

		National audit (n=224)
4.9 How many sites does your programme offer PR at (applicable for n=223)?* (QS10)		
1	31%	69
2	20%	44
3	21%	46
4	9%	21
5	7%	16
6	4%	8
7	1%	3
8	4%	9
9	1%	3
10-14	2%	4
Median (IQR)	2 (1-4)	

*One was a home PR programme.

5.1 Please give details of all funded staff at your PR programme as at 1 January 2015. (QS10)

	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7	Band 8a	Band 8b	TOTAL
N of programmes with data	224	224	224	224	224	224	224	224	224
% of programmes with WTE:									
No WTE	157	67	149	164	60	48	170	211	3
0.01-0.25	20	20	4	10	19	24	17	11	6
0.26-0.50	8	18	14	7	13	36	12	1	7
0.51-1.00	32	77	41	30	69	80	24	1	26
1.01-2.00	7	26	10	10	38	25	1	-	40
2.01-3.00	-	14	2	3	15	7	-	-	42
>3.0	-	2	4	-	10	4	-	-	100
Median WTE	0	0.60	0	0	0.80	0.60	0	0	2.90

Median (IQR) total WTE staffing was 2.90 (1.50-4.94).

Median (IQR) total referrals (audit question 4.5 for the financial year 2013/14) per total 1.0 WTE staffing was 104 (65-169), n=172.

Median (IQR) total initial assessments (audit question 4.7 for the financial year 2013/14) per total 1.0 WTE staffing was 70 (38-121), n=216.

Eighty-six per cent (193/224) of programmes involved at least one member of staff of at least band 7 seniority.

5.1.1a Which roles does this include? (national data) (QS10)

	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7	Band 8a	Band 8b	TOTAL*
N of programmes with WTE	67	157	75	60	164	176	54	12	221
Admin and clerical	58	116	34	4					177
Health support worker	23	127	59	1					172
Qualified nurse				15	64	54	12	8	105
Qualified physiotherapist				32	134	144	36	9	206
Qualified occupational therapist				8	26	22	-	-	50
Dietician				5	13	6	-	-	23
Pharmacist					4	2	4	1	10
Other	5	17	18	8	6	10	6	1	55

*Role represented within one or more bands.

	National audit (n=224)	
5.2 How many WTE funded posts were vacant as at 1 January 2015? (QS10)		
No WTE	73%	164
0.01-0.25	2%	4
0.26-0.50	4%	10
0.51-1.00	15%	34
1.01-2.00	4%	8
2.01-3.00	1%	3
>3.0	0.4%	1

	National audit (n=224)	
5.3 What percentage of staff have received annual basic life-support training in the past 12 months? (QS10)		
None	2%	4
1-25%	1%	2
26-50%	-	-
51-75%	0.4%	1
76-90%	1%	2
91-100%	96%	215

Section 5: Record keeping (Quality Standards 9 and 10)

KEY FINDINGS

- Standard operating procedures (SOPs) detailing local policies were available in 67% of programmes **(QS10)**.
- Programmes offering treatment over multiple sites were more likely to have a written SOP in place.
- Ninety-six per cent of programmes keep a local database of service provision. Of these, 97% keep records of patient outcomes **(QS9)**.

AREAS IDENTIFIED AS NEEDING IMPROVEMENT

- Improved provision of SOPs in line with **QS10**.

	National audit (n=224)	
6.1 Do you have a standard operating procedure detailing local policies? (QS10)		
Standard operating procedure	67%	150
6.2 If yes, what does the standard operating procedure cover?		
Accessibility	71%	106
Patient safety	91%	136
Minimum staffing levels	89%	134
Capacity	76%	114
Environment	85%	127
Risk assessments	87%	131
Other	14%	22

For programmes providing treatment at one site, provision of a local SOP was 55% (38/69). For two sites this was 59% (26/44), for three or more sites it was 78% (86/110).

	National audit (n=224)	
6.3 Do you keep a local database of programme information? (QS9,10)		
Yes	96%	214
6.4 If yes, what does the database cover?		
Patient details	93%	199
Attendance	97%	207
Treatment	56%	119
Outcomes	97%	207
Completion rates	92%	196
Other	26%	56

Section 6: Site-specific questions

KEY FINDINGS

- Nearly all sites provide two or more members of staff for PR sessions (99%). Two members of staff is the most prevalent figure (81%).
- A significant number of sites provide treatment in non-health settings (53% in leisure centres-gym/community halls).
- For sites with a minimum of two staff, the spread of group size is 6–25 (most ≤16).
- Staff:patient ratio calculations suggest that few sites are providing ratios lower than 1:8.
- Provision of patient transport is variable. Of the 439 sites that did not offer funded transport (site specific audit question 1.6), 84% offered free parking, 13% offered paid parking and 3% offered no parking.
- Funded transport is less frequently available at leisure centre or church/community hall sites, but many offer free parking.

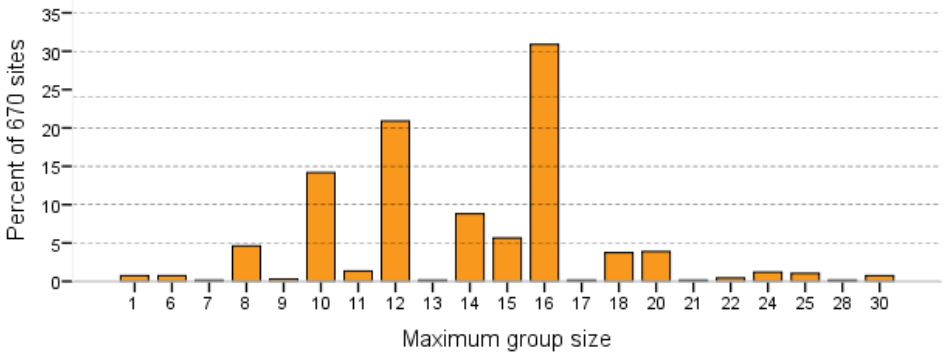
Audit data were submitted by 223 programmes for 670 sites.

	National audit (n=670)	
1.1 What type of venue is this site?		
Church or community hall	31%	207
Local leisure centre or gym	22%	147
Community hospital	17%	113
Acute hospital	13%	86
Health centre	9%	58
GP surgery	2%	13
Prison	0.3%	2
Other	7%	44

Type of venue mix according to the number of sites per PR programme

Number of sites within PR programme	1	2	3	4	5	6	7	8	9	10	11	12	14
Number of PR programmes	71	43	46	20	16	8	3	9	3	1	1	1	1
Total number of sites	71	86	138	80	80	48	21	72	27	10	11	12	14
Church or community hall	8	18	36	24	31	18	12	37	11	5	5	2	-
Local leisure centre or gym	8	23	36	10	27	10	1	7	5	4	2	1	13
Community hospital	10	13	22	14	7	8	3	25	4	1	-	6	-
Acute hospital	30	12	18	9	5	7	1	-	1	-	-	3	-
Health centre	7	13	17	11	2	1	4	-	2	-	1	-	-
GP surgery	-	-	3	2	2	4	-	-	2	-	-	-	-
Prison	-	-	-	-	-	-	-	-	-	-	2	-	-
Other	8	7	6	10	6	-	-	3	2	-	1	-	1

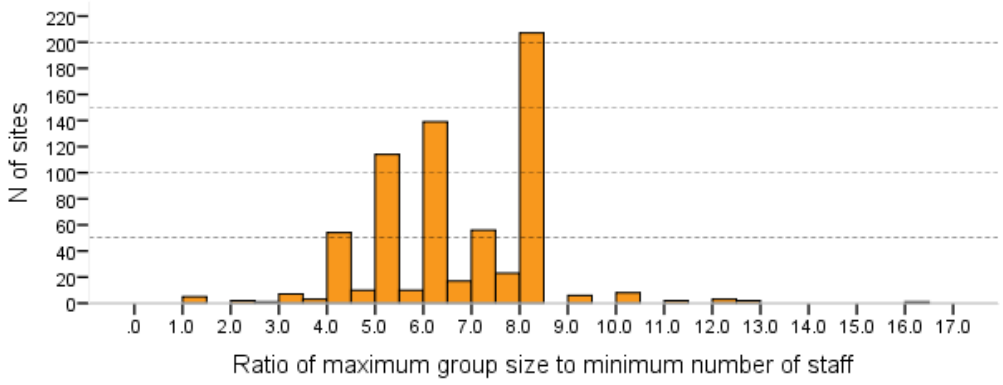
	National audit (n=670)
1.2 What is the maximum group size?	
Median (IQR)	14 (12-16)



	National audit (n=670)	
1.3 What is the minimum number of staff for a maximum sized group?		
1	1%	9
2	81%	545
3	15%	100
4	2%	12
5	0.2%	1
6	0.2%	1
10	0.3%	2

1.2 What is the maximum group size?	1.3 What is the minimum number of staff for a maximum sized group?							
	1	2	3	4	5	6	10	Total
1	5	-	-	-	-	-	-	5
6	2	3	-	-	-	-	-	5
7	-	1	-	-	-	-	-	1
8	-	31	-	-	-	-	-	31
9	-	2	-	-	-	-	-	2
10	-	91	4	-	-	-	-	95
11	-	9	-	-	-	-	-	9
12	1	118	21	-	-	-	-	140
13	-	1	-	-	-	-	-	1
14	-	54	5	-	-	-	-	59
15	-	20	16	2	-	-	-	38
16	1	197	6	2	-	1	-	207
17	-	-	1	-	-	-	-	1
18	-	5	17	3	-	-	-	25
20	-	7	16	1	-	-	2	26
21	-	-	1	-	-	-	-	1
22	-	2	1	-	-	-	-	3
24	-	2	6	-	-	-	-	8
25	-	2	4	1	-	-	-	7
28	-	-	1	-	-	-	-	1
30	-	-	1	3	1	-	-	5
Total	9	545	100	12	1	1	2	670

The ratio of maximum group size (site specific audit question 1.2) relative to the minimum number of staff (site specific audit question 1.3) was computed and the median (IQR) was 6.0 (5.0-8.0), range 1.0-16.0. See the histogram below:



	National audit (n=670)	
1.4 Do you have access to on-call on-site emergency medical assistance during PR classes?		
Yes – available on site	30%	198
Yes – available over telephone	16%	109
No	57%	384
Other	2%	12

	National audit (n=670)	
1.5 Do you have access to emergency resuscitation equipment at this site?		
Access	75%	502

	National audit (n=670)	
1.6 Is funded transport offered to enable patients to attend PR at this site?		
Yes – to all who require it	12%	81
Yes – to those who fit local transport provision criteria	22%	150
No – but we provide information on voluntary services	43%	288
No	23%	151

	National audit (n=670)	
1.7 What parking facilities are available at this site?		
Free parking	78%	525
Paid parking	20%	132
None	2%	13

Provision of patient transport is variable. Of the 439 sites that did not offer any funded transport (site specific audit question 1.6), 84% (369) had free parking, 13% (58) had paid parking and 3% (12) had no parking.

	National audit (n=670)	
1.8 Are patients at this site routinely formally referred to follow-up services?		
Yes – in-house follow-on services	4%	30
Yes – external follow-on services	44%	294
Yes – in-house and external follow-on services	37%	245
No	13%	90
Not known	2%	11

Site specifics by type of site

1.2 What is the maximum group size?

	AH	CH	GP	HC	LCG	CCH	P	OTH
N of sites with data	86	113	13	58	147	207	2	44
Maximum group size:								
<10	7	20	-	6	4	3	-	5
10	17	21	6	20	5	17	2	6
11	-	1	-	-	-	8	-	-
12	24	32	5	14	26	30	-	9
13	-	-	-	-	-	1	-	-
14	12	15	1	3	12	12	-	4
15	3	5	1	3	7	14	-	5
16	12	16	-	10	61	99	-	9
17	-	-	-	-	-	-	-	1
18	5	1	-	1	10	6	-	2
20	2	1	-	1	15	7	-	-
>20	4	1	-	-	7	10	-	3
Median max size	12	12	12	12	16	16	10	14

AH: acute hospital, CH: community hospital, GP: GP surgery, HC: health centre, LCG: local leisure centre or gym, CCH: church or community hall, P: prison, OTH: other.

1.3 What is the minimum number of staff for a maximum sized group?

	AH	CH	GP	HC	LCG	CCH	P	OTH
N of sites with data	86	113	13	58	147	207	2	44
Minimum number:								
1	2	2	-	-	3	-	-	2
2	71	95	11	54	103	176	2	33
3	12	13	2	1	36	28	-	8
4	1	2	-	1	4	3	-	1
5	-	-	-	-	1	-	-	-
6	-	-	-	1	-	-	-	-
10	-	1	-	1	-	-	-	-
% stating two staff	83%	84%	85%	93%	70%	85%	100%	73%
Median number	2	2	2	2	2	2	2	2

AH: acute hospital, CH: community hospital, GP: GP surgery, HC: health centre, LCG: local leisure centre or gym, CCH: church or community hall, P: prison, OTH: other.

1.4 Do you have access to on-call on-site emergency medical assistance during PR classes?

	AH	CH	GP	HC	LCG	CCH	P	OTH
N of sites with data	86	113	13	58	147	207	2	44
Yes – available on site	93% 80	39% 44	85% 11	40% 23	18% 26	3% 7	-	16% 7
Yes – available over telephone	8% 7	29% 33	15% 2	16% 9	17% 25	13% 26	-	16% 7
No	2% 2	38% 43	15% 2	45% 26	69% 101	86% 178	100% 2	68% 30
Other	1% 1	1% 1	-	2% 1	1% 2	3% 6	-	2% 1

AH: acute hospital, CH: community hospital, GP: GP surgery, HC: health centre, LCG: local leisure centre or gym, CCH: church or community hall, P: prison, OTH: other.

1.5 Do you have access to emergency resuscitation equipment at this site?

	AH	CH	GP	HC	LCG	CCH	P	OTH
N of sites with data	86	113	13	58	147	207	2	44
Access	100% 86	96% 108	85% 11	74% 43	88% 130	46% 96	-	64% 28

AH: acute hospital, CH: community hospital, GP: GP surgery, HC: health centre, LCG: local leisure centre or gym, CCH: church or community hall, P: prison, OTH: other.

1.6 Is funded transport offered to enable patients to attend PR at this site?

	AH	CH	GP	HC	LCG	CCH	P	OTH
N of sites with data	86	113	13	58	147	207	2	44
Yes – to all who require it	21% 18	15% 17	-	19% 11	10% 14	7% 15	-	11% 5
Yes – to those who fit local transport provision criteria	48% 41	46% 52	23% 3	21% 12	10% 15	10% 20	-	18% 8
No – but we provide information on voluntary services	19% 16	27% 30	46% 6	31% 18	62% 91	54% 112	100% 2	30% 13
No	13% 11	12% 14	31% 4	29% 17	18% 27	29% 60	-	41% 18

AH: acute hospital, CH: community hospital, GP: GP surgery, HC: health centre, LCG: local leisure centre or gym, CCH: church or community hall, P: prison, OTH: other.

1.7 What parking facilities are available at this site?

	AH	CH	GP	HC	LCG	CCH	P	OTH
N of sites with data	86	113	13	58	147	207	2	44
Free parking	21% 18	73% 83	92% 12	86% 50	85% 125	95% 196	50% 1	91% 40
Paid parking	79% 68	27% 30	8% 1	9% 5	13% 19	3% 6	-	7% 3
None	-	-	-	5% 3	2% 3	2% 5	50% 1	2% 1

AH: acute hospital, CH: community hospital, GP: GP surgery, HC: health centre, LCG: local leisure centre or gym, CCH: church or community hall, P: prison, OTH: other.

1.8 Are patients at this site routinely formally referred to follow-up services?

	AH	CH	GP	HC	LCG	CCH	P	OTH
N of sites with data	86	113	13	58	147	207	2	44
Yes – in-house follow-on services	1% 1	8% 9	-	3% 2	5% 7	4% 8	-	7% 3
Yes – external follow-on services	49% 42	42% 48	38% 5	43% 25	47% 69	41% 85	100% 2	41% 18
Yes – in-house and external follow-on services	36% 31	38% 43	62% 8	41% 24	33% 49	34% 71	-	43% 19
No	13% 11	11% 12	-	12% 7	15% 22	16% 34	-	9% 4
Not known	1% 1	1% 1	-	-	-	4% 9	-	-

AH: acute hospital, CH: community hospital, GP: GP surgery, HC: health centre, LCG: local leisure centre or gym, CCH: church or community hall, P: prison, OTH: other.

3. Improvement planning

Quality improvement (QI)

We recommend that PR programmes begin to develop improvement plans that are relevant to their site-specific needs, guided by their site-specific data and recommendations within the national audit reports. Discussions should take place not only within a programme's management, governance and improvement groups, but also with managerial and clinical colleagues in primary and secondary care. Programmes should develop an improvement plan, agreed by and supported formally at board and/or CCG/HB level, based upon the recommendations within the national report and their site-specific report. The plan should contain clear timelines for change, and provide the basis for successful re-audit.

The National COPD Audit Programme has collated a limited range of materials to assist with local improvement work. A selection of these is listed below, and further resources will be available on our website (www.rcplondon.ac.uk/copd) in due course.

- Respiratory Futures (6)

Planning templates

- BTS clinical audit action plan: www.brit-thoracic.org.uk/audit-and-quality-improvement/bts-audit-programme-reports/
- Australian Children's Education & Care Quality Authority QI plans: www.acecqa.gov.au/quality-improvement-plan_1
- NHS Improvement (archived site) service improvement tools and techniques: http://webarchive.nationalarchives.gov.uk/20130221101407/http://www.improvement.nhs.uk/lung/ServiceImprovementTools/tabid/92/Default.aspx
- Suite of tools available from the NHS Institute for Innovation and Improvement: www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/quality_and_service_improvement_tools_for_the_nhs.html
- The NHS Improvement System: http://improvementsystem.nhsiq.nhs.uk/ImprovementSystem/Login.aspx?ReturnUrl=%2fImprovementSystem%2fdefault.aspx.

Smoking cessation

- BTS materials, including a return on investment calculator, and links to the NICE smoking cessation guidelines and quality standards: www.brit-thoracic.org.uk/clinical-information/smoking-cessation/
- BTS *recommendations for hospital smoking cessation services for commissioners and health care professionals* (Stop Smoking Champions): www.brit-thoracic.org.uk/document-library/clinical-information/smoking-cessation/bts-recommendations-for-smoking-cessation-services/
- BTS Stop Smoking Champions, *The case for change*: www.brit-thoracic.org.uk/document-library/clinical-information/smoking-cessation/bts-case-for-change/.

Integrating care

- NHS Improving Quality, *Pioneering integrated care and support*: www.nhsiq.nhs.uk/resource-search/publications/integrated-care-leaflet.aspx.

COPD general

- NHS Improvement's COPD resources – including a Model for Improvement (archived site): http://webarchive.nationalarchives.gov.uk/20130221101407/http://www.improvement.nhs.uk/lung/NationalProjects/ManagingCOPD/Howtogetstarted/tabid/191/Default.aspx.

4. Appendices:

- **Appendix A**
  - Audit methodology
  - Mapping of Pulmonary Rehabilitation programmes in England and Wales
  - Recruitment
  - Development of the audit questions
  - Definitions
  - Information governance
  - Data collection period
  - Data collection
  - Telephone and email support
- **Appendix B**
  - Participating and non-participating Pulmonary Rehabilitation providers and programmes
- **Appendix C**
  - BTS audit tools website
- **Appendix D**
  - National COPD Audit Programme governance
  - National COPD Audit Programme board members
  - National COPD Audit Programme steering group members
  - National COPD Audit Programme pulmonary rehabilitation workstream group
- **Appendix E**
  - Medical Research Council (MRC) dyspnoea scale
- **Appendix F**
  - Glossary of terms and abbreviations
- **Appendix G**
  - References

Appendix A

Audit methodology

The National COPD Audit Programme builds on previous national COPD audits which took place in 1997, 2003 and 2008. These involved audits of the resourcing and organisation of care at NHS units across the UK, as well as clinical audits of COPD admissions to those units. The 2008 audit introduced several additional elements designed to explore the COPD care pathway: a sample of the patients were sent an anonymous survey; a survey was sent to GPs of the first 30 patients audited at each unit; and primary care organisations were asked to complete a questionnaire. The National COPD Audit Programme has expanded the cross-pathway approach by including clinical and organisational audits of PR services for COPD patients. This is the first time that PR services have been audited at a national level.

The current iteration of the National COPD Audit Programme has been commissioned by HQIP as part of the National Clinical Audit Programme (NCA), and is therefore restricted to England and Wales, unlike previous rounds which covered the whole of the UK. Another new aspect of the programme is that it includes the collection of patient identifiable data. In the case of the PR clinical audit, this is to allow outcome data to be extracted and linked by the Health and Social Care Information Centre (HSCIC) without the need for participants to carry out any subsequent notes audit. It will also allow data to be linked between the workstreams.

The new 2015 PR audit comprised two distinct elements:

- an audit of the resourcing and organisation of PR services during the period of clinical case ascertainment
- an audit of all patients with a primary respiratory diagnosis of COPD who were assessed (or if not assessed, began PR) between 12 January and 10 April 2015.

To achieve sufficient case numbers for meaningful site comparisons, participating PR programmes were instructed to audit all eligible cases, subject to obtaining patient consent.

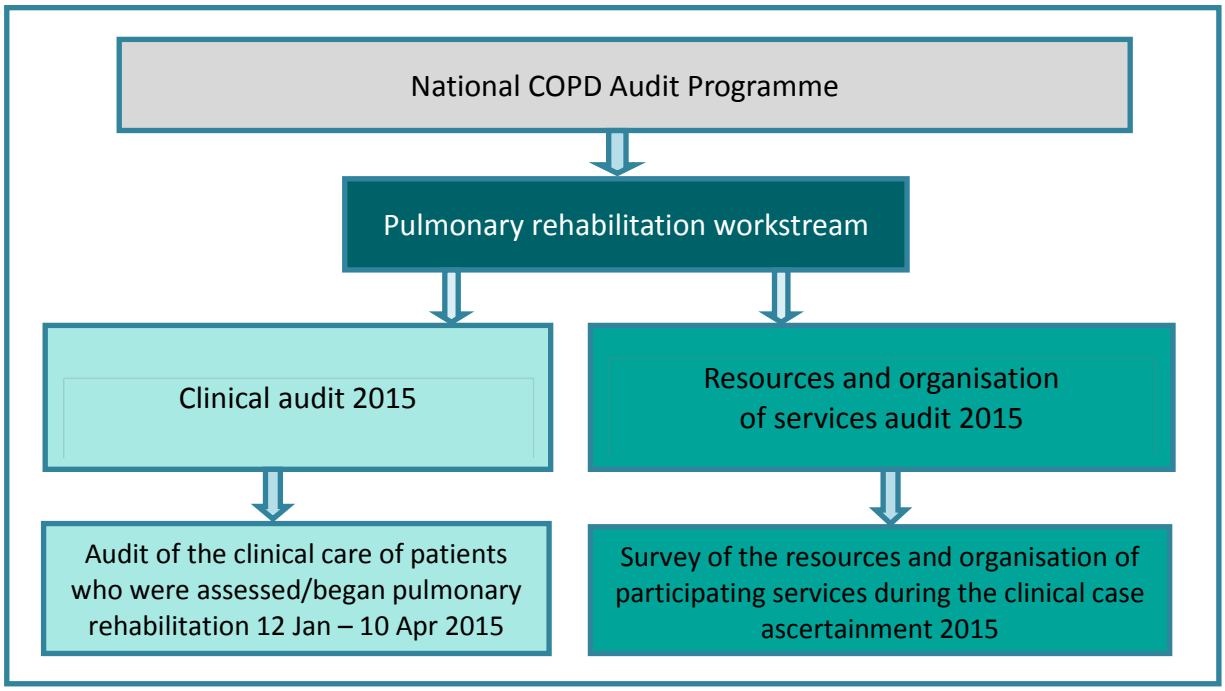


Fig 2: National COPD Pulmonary Rehabilitation Audit methodology

Mapping of Pulmonary Rehabilitation programmes in England and Wales

This is the first time a comprehensive national audit of PR services has been undertaken. Prior to this, there was no established list or database of PR services and, therefore, before registration could start, the BTS project team was tasked with identifying and mapping PR services in England and Wales.

For the purposes of the mapping exercise, PR was not tightly defined in terms of national or international guideline documents. The objective of the mapping exercise was to identify all services describing themselves as PR programmes so that the breadth and quality of clinical care provided under this description was audited.

Contact with healthcare professionals involved with PR began in late 2013, and information about the audit was disseminated via professional organisations such as the Association of Respiratory Nurse Specialists (ARNS) and the Association of Chartered Physiotherapists in Respiratory Care (ACPRC). The audit was also promoted via the RCP and BTS websites, at specialist conferences and through social media (eg Twitter). In October 2014, letters were sent to the chief executives of all NHS trusts and health boards in England and Wales, to notify them about the audit and request details of local PR services if not already known to the audit team (a list of services mapped at that point was included for reference).

Identification of PR programmes continued throughout 2014 and included several approaches to CCGs to request information about the services they commission. CCGs were also sent freedom of information (FOI) requests where this information had not already been provided.

At the end of this mapping exercise, 230 programmes were identified within 158 different providers (see Fig 3 and Fig 4 below); providers included acute and community NHS trusts and health boards, charities and private healthcare providers.

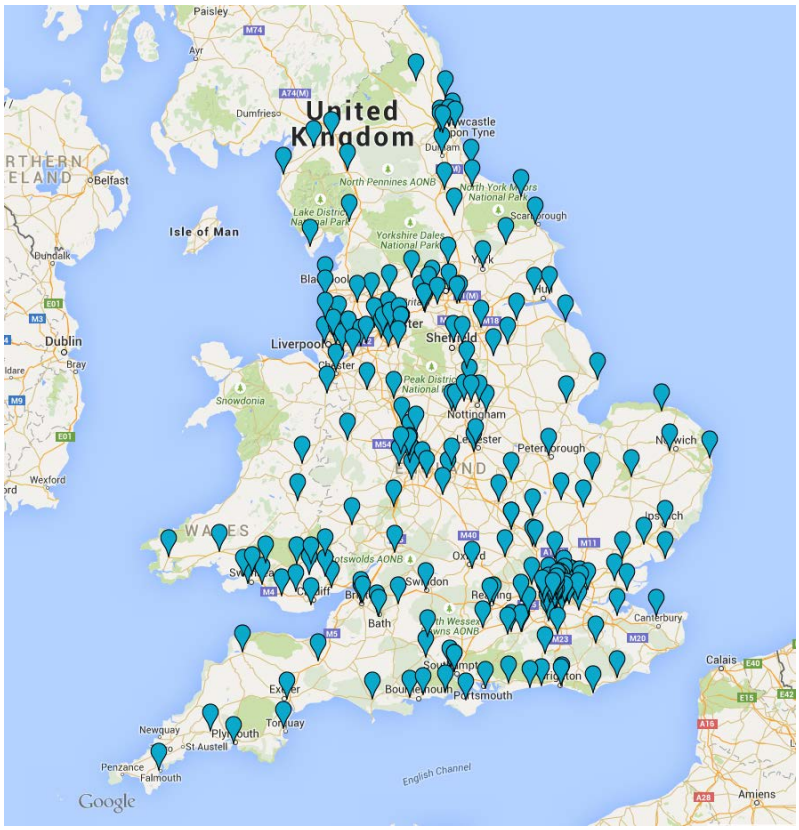


Fig 3: PR programmes in England and Wales

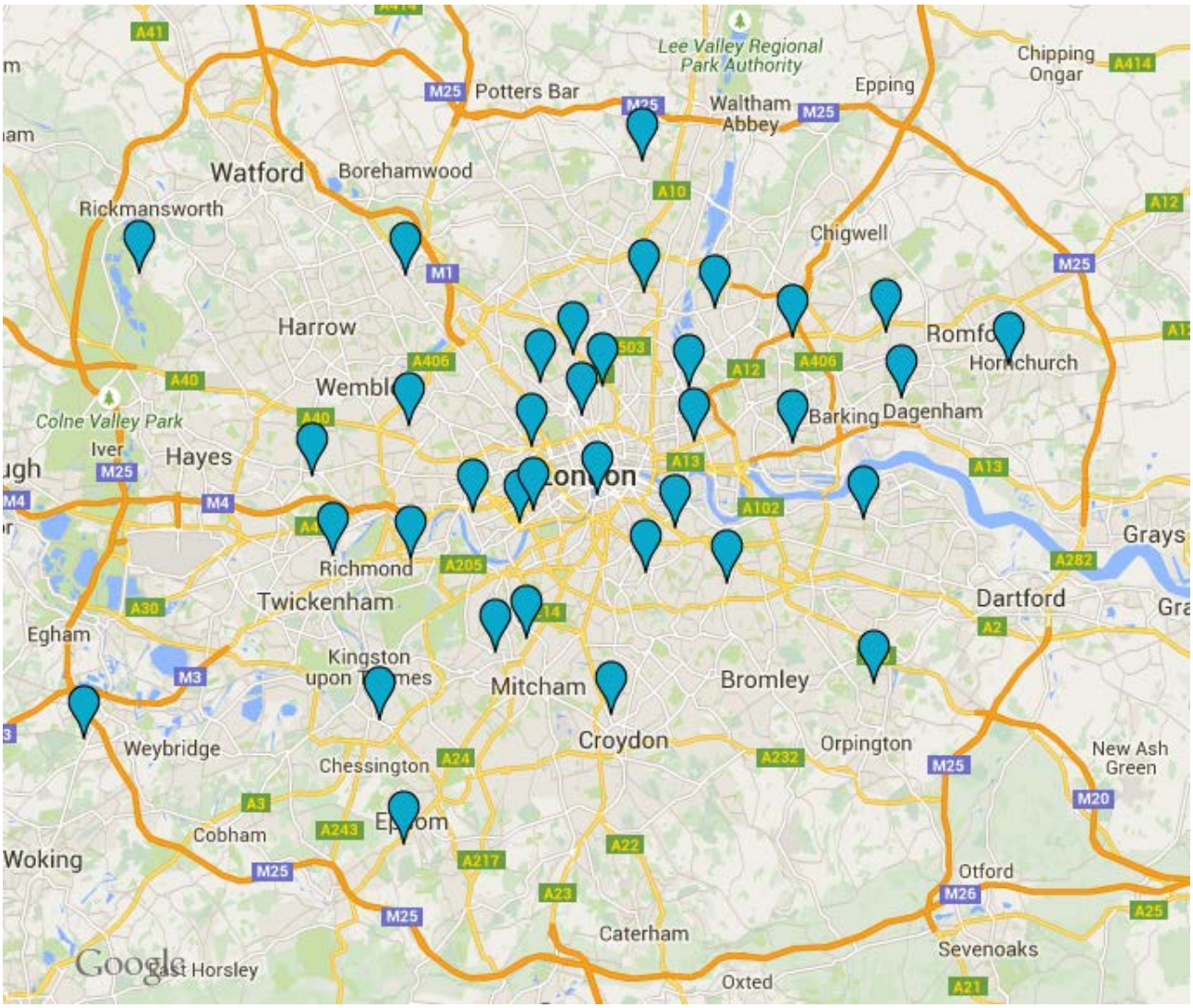


Fig 4: PR programmes in London

Recruitment

Registrations were collected throughout the mapping process, and in October 2014 letters were sent to the chief executives / medical directors of all NHS trusts and health boards, notifying them of the audit and enclosing a list of PR services mapped at that point. If their services were already listed, no further action was required other than to ensure to liaise with their audit department and others to ensure the audit was properly supported. If the trust/health board did not appear to provide any PR services, they were asked to confirm this or, if they did provide a PR service that did not appear on the list, they were asked to reply identifying their programme(s) along with programme lead contacts.

Of the 230 programmes identified by the mapping exercise, 224 PR programmes went on to participate in the organisational audit (205/211 English PR programmes and 19/19 Welsh PR programmes). Participation at programme level in England and Wales was 97% and 100% respectively, assuming that all eligible programmes were identified and approached.

Development of the audit questions

The clinical and organisational datasets were developed by the PR workstream group, in consultation with COPD experts across England and Wales. Copies of both datasets are available to download from the

programme website: www.rcplondon.ac.uk/COPD. Questions included in both datasets were ordered broadly around four audit questions:

1. questions identifying clinical characteristics of individual audit cases to allow adjustment for case mix
2. questions outlining the treatment provided to patients by PR programmes
3. questions assessing clinical outcomes for patients who received treatment by PR programmes
4. questions identifying resources available to PR programmes for the provision of care.

The questions covered a number of domains of care, to ensure that general data were collected but also information about specific areas including the referral process, initial assessment and discharge. Similarly, the organisational dataset focused on areas including patient intake, content of programme, staffing and record keeping. To ensure PR care was audited against accepted standards, audit questions were also mapped to the recently published BTS PR quality standards (which in turn arose from the BTS PR guideline document that made recommendations for evidence-based PR practice). A specific effort was made to ensure that each question could be mapped to a quality standard and conversely that each quality standard was represented within the audit datasets.

Feedback on both datasets was invited during a pilot clinical audit that took place in June 2014. Subsequent modifications were made to both datasets, and improvements were also made to the functionality of the online web tool.

Definitions

Programme: a PR service with a shared pool of staff and central administration where referrals are received. A programme may operate at several sites.

Site: the physical location where the PR services are provided, eg a hospital gym or church hall.

Date of referral: the date given in the referral letter. A referrer may be a GP, consultant, community team, early discharge team etc.

Date of receipt of referral: the date a referral letter is received by a programme.

Date of assessment: the date the patient attends an appointment to be assessed before beginning PR sessions. If there was no separate assessment appointment, programmes were asked to enter the date of the first appointment/session.

Date of enrolment: the date of the first PR session attended.

Information governance

The PR clinical audit involved the collection of patient identifiable data, which meant that it was necessary to either obtain individual patient consent or obtain an exemption under section 251 of the NHS Act 2006. It is considered best practice to opt for patient consent wherever practicable, and the Health Research Authority Confidentiality Advisory Group (CAG) therefore requested that patient consent was trialled as part of the pilot clinical audit. This did not have a significant impact on the numbers of patients included in the pilot audit, and patient consent was therefore adopted for the main audit. To support the consent process, a consent form and patient information leaflet were developed with input from patient groups, and these were ultimately approved by the HSCIC Data Access Advisory Group (DAAG).

Additionally, Caldicott Guardian consent was also obtained from each provider organisation before access was given to participants to allow them to submit data via the online data collection tool.

Data collection period

The case ascertainment period for the clinical audit ran from 12 January to 10 April 2015, with a further 3-month period (to 10 July 2015) to allow the patients who had been recruited and consented to complete their PR and for data to be entered. The organisational audit ran concurrently with the clinical case ascertainment, with a further 2 weeks (to 24 April 2015) to allow data to be finalised after final patient numbers were known.

Data collection

Data were collected by PR staff at each participating PR programme, with support from audit and administrative staff. Data were submitted via the BTS web-based audit data collection system, developed in 2009 by Westcliff Solutions Ltd (Appendix C).

Documentation to support participation in the audit was posted on the RCP National COPD Audit Programme website (www.rcplondon.ac.uk/projects/secondary-care-workstream), including audit instructions, data collection sheets, datasets with help notes and consent documentation. Regular email updates were also sent to audit participants in the run up to the audit and throughout the audit period, with information about the audit and reminders about deadlines.

At the end of the data collection period, the BTS made contact with the PR programmes that had started records that had not been submitted, to ensure that those records were finalised and included in the national dataset. During and after the closure of the audits, the BTS also contacted units where data were missing or appeared to be incorrect, so that this could be corrected.

Telephone and email support

The BTS project team provided dedicated support to deal with queries from participants throughout the audit: a telephone helpline was available from Monday to Friday during office hours, and queries could be emailed directly to the BTS project team. Queries were then logged for future learning.

Appendix B: Participating and non-participating Pulmonary Rehabilitation providers and programmes

Participating PR providers and programmes

Provider	Programme
5 Boroughs Partnership NHS Foundation Trust	St Helens PR Programme
Abertawe Bro Morgannwg (ABM) University Health Board	Bridgend PR Programme Llwchwr PR Programme Morriston Hospital PR Programme Port Talbot PR Programme Singleton Hospital PR Programme
Aintree University Hospitals NHS Foundation Trust	Aintree PR Programme
Airedale NHS Foundation Trust	Craven PR Programme
Aneurin Bevan University Health Board	Blaenau Gwent PR Programme Caerphilly PR Programme Nevill Hall PR Programme Newport PR Programme Torfaen PR Programme
Anglian Community Enterprise CIC	Anglian Community PR Programme (Essex)
Ashford and St Peter's Hospitals NHS Foundation Trust	St Peter's PR Programme
Atrium Health Limited	Atrium PR Programme (Coventry)
Barts Health NHS Trust	Barts ARCARE PR Programme Barts Newham PR Programme
Bedford Hospital NHS Trust	Bedford PR Programme
Berkshire Healthcare NHS Foundation Trust	Berkshire West PR Programme
Berkshire Healthcare NHS Foundation Trust and Frimley Health NHS Foundation Trust	East Berkshire PR Programme
Betsi Cadwaladr University Health Board	BCUHB PR Programme
Birmingham Community Healthcare NHS Trust	Birmingham Community PR Programme
Blackpool Teaching Hospitals NHS Foundation Trust	Wyre and Fylde PR Programme
BOC Healthcare	BOC Hounslow PR Programme BOC North East Hampshire and Farnham PR Programme BOC Somerset Community PR Programme BOC South Nottingham PR Programme BOC Staffordshire PR Programme BOC West Norfolk PR Programme
Bolton NHS Foundation Trust	Bolton PR Programme
Bradford District Care Trust	Better Breathing for Better Living PR Programme
Bridgewater Community Healthcare NHS Foundation Trust	Bridgewater PR Programme
Brighton and Sussex University Hospitals NHS Trust	Royal Sussex PR Programme
Bristol Community Health CIC	Bristol Community Health PR Programme
Bromley Healthcare CIC	Bromley PR Programme
Buckinghamshire Healthcare NHS Trust	Bucks PR Service

Provider	Programme
Calderdale and Huddersfield NHS Foundation Trust	Calderdale Home PR Programme Calderdale PR Programme Greater Huddersfield PR Programme
Cambridgeshire Community Services NHS Trust	Cambridge and Huntingdon PR Programme Luton PR Programme
Cardiff and Vale University Health Board	Llandough PR Programme
Care Plus Group	Grimsby Care Plus PR Programme
Central and North West London NHS Foundation Trust	Camden PR Programme Milton Keynes Community PR Programme
Central London Community Healthcare NHS Trust	Barnet Community PR Programme Hammersmith and Fulham PR Programme West Herts Community PR Programme
Central Manchester University Hospitals NHS Foundation Trust	Manchester Community PR Programme Manchester Royal Infirmary PR Programme
Chelsea and Westminster Hospital NHS Foundation Trust	Chelsea and Westminster Hospital PR Programme
Cheshire and Wirral Partnership NHS Foundation Trust	Cheshire and Wirral PR Programme
City Health Care Partnership CIC	City Health Care PR Programme (Hull)
Colchester Hospital University NHS Foundation Trust	Colchester Hospital PR Programme
County Durham and Darlington NHS Foundation Trust	North Durham PR Programme South Durham PR Programme
Croydon Health Services NHS Trust	Croydon PR Programme
CSH Surrey	CSH Surrey PR Programme
Cumbria Partnership NHS Foundation Trust	Carlisle Community PR Programme Copeland Community PR Programme Furness Community PR Programme Solway PR Programme South Lakes Community PR Programme
Cwm Taf University Health Board	Cwm Taf North PR Programme Cwm Taf South PR Programme
Derbyshire Community Health Services NHS Trust	Breathe Ability (South Derbyshire) PR Programme Erewash PR Programme North Derbyshire PR Programme
Dorset County Hospital NHS Foundation Trust	Weymouth and Dorchester PR Programme
Dorset Healthcare University NHS Foundation Trust	Dorset Healthcare PR Programme
East Cheshire NHS Trust	East Cheshire PR Programme
East Lancashire Hospitals NHS Trust	East Lancashire Hospitals PR Programme
East Sussex Healthcare NHS Trust	East Sussex PR Programme
Enfield Community Services (Barnet, Enfield and Haringey Mental Health Trust (MHT))	Enfield PR Programme
First Community Health and Care CIC	East Surrey Community PR Programme
Gateshead Health NHS Foundation Trust	Gateshead Hospital PR Programme
George Eliot Hospital NHS Trust	George Eliot PR Programme
Glenroyd Medical	Glenroyd Medical PR Programme (Blackpool)
Gloucestershire Care Services NHS Trust	Gloucestershire PR Programme
Great Western Hospitals NHS Foundation Trust	PACE Wiltshire Community PR Programme
Guy's and St Thomas' NHS Foundation Trust	St Thomas' Hospital PR Programme

Provider	Programme
Harrogate and District NHS Foundation Trust	Harrogate Hospital PR Programme
Heart of England NHS Foundation Trust	Heart of England PR Programme Solihull Community PR Programme
Hertfordshire Community NHS Trust	Hertfordshire Community PR Programme
Homerton University Hospital NHS Foundation Trust	Homerton Hospital PR Programme
Hounslow and Richmond Community Healthcare NHS Trust	Hounslow and Richmond PR Programme
Humber NHS Foundation Trust	East Riding PR Programme
Hywel Dda University Health Board	Pembrokeshire PR Programme Carmarthenshire PR Programme
Imperial College Healthcare NHS Trust	Kensington, Chelsea and Westminster PR Programme
Isle of Wight NHS Trust	St Mary's Hospital PR Programme
James Paget University Hospitals NHS Foundation Trust	James Paget Community Breathing Exercise Education Therapy (BEET) PR Programme
Kent Community Health NHS Trust	Kent Community Health PR Programme
Kettering General Hospital NHS Foundation Trust	Kettering Rocket PR Programme
King's College Hospital NHS Foundation Trust	Lambeth and Southwark Community and King's College Hospital PR Programme
Lancashire Care NHS Foundation Trust	Blackburn PR Programme Preston and Chorley PR Programme
Lawrence Hill Health Centre	North Bristol CLEAR PR Programme
Leeds Community Healthcare NHS Trust	Leeds Community PR Programme
Leicestershire Partnership NHS Trust	Leicestershire Community Programme
Lewisham and Greenwich NHS Trust	Lung Exercise and Education Programme (LEEP) Lewisham PR Programme
Lincolnshire Community Health Services NHS Trust	Lincolnshire North East PR Programme Lincolnshire North West PR Programme Lincolnshire South East PR Programme Lincolnshire South West PR Programme
Liverpool Community Health NHS Trust	Liverpool Community PR Programme
Liverpool Heart and Chest Hospital NHS Foundation Trust	Knowsley Community PR Programme Liverpool PR Programme
London North West Healthcare NHS Trust	Brent PR Programme Ealing PR Programme
Luton and Dunstable University Hospital NHS Foundation Trust	Luton and Dunstable PR Programme
Maidstone and Tunbridge Wells NHS Trust	West Kent Community PR Programme
Medway Community Healthcare CIC	Medway Community PR Programme
Norfolk and Norwich University Hospitals NHS Foundation Trust	Norfolk and Norwich PR Programme
Norfolk Community Health and Care NHS Trust	Norfolk Community PR Programme
North Bristol NHS Trust	Bristol LEEP PR Programme
North Cumbria University Hospitals NHS Trust	North Cumbria Hospitals PR Programme
North East London NHS Foundation Trust	NEL FT Barking and Dagenham PR Service NEL FT Havering PR Service NEL FT Redbridge PR Service NEL FT Waltham Forest PR Service

Provider	Programme
North Somerset Community Partnership CIC	North Somerset Community PR Programme
North Tees and Hartlepool NHS Foundation Trust	Stockton and Hartlepool PR Programme
Northampton General Hospital NHS Trust	Northampton Respiratory Therapy Acute Response Team (RESTART) PR Programme
Northern Devon Healthcare NHS Trust	Devon CREADO PR Programme
Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	Northern Lincolnshire and Goole PR Programme
Northumbria Healthcare NHS Foundation Trust	North Tyneside Hospital PR Programme Northumbria Community PR Programme Wansbeck Hospital PR Programme
Nottingham CityCare Partnership CIC	Nottingham CityCare PR Programme
Nottinghamshire Healthcare NHS Trust	Ashfield and Mansfield PR Programme Cotgrave and Bingham PR Programme Nottingham North and East PR Programme
Oxford Health NHS Foundation Trust	Oxford Health PR Programme
Oxleas NHS Foundation Trust	Greenwich PR Programme
Papworth Hospital NHS Foundation Trust	Papworth Hospital PR Programme
Peninsula Community Health CIC	Cornwall Community PR Programme East Cornwall Community PR Programme
Pennine Care NHS Foundation Trust	Trafford Inspire PR Programme
Peterborough and Stamford Hospitals NHS Foundation Trust	Peterborough PR Programme
Plymouth Community Healthcare CIC	Plymouth Community PR Programme
Powys Teaching Health Board	Mid Powys PR Programme North Powys PR Programme South Powys PR Programme
Provide CIC	Mid Essex PR Programme Cambridgeshire PR Programme
Royal Berkshire NHS Foundation Trust	Royal Berkshire Hospital PR Programme
Royal Brompton and Harefield NHS Foundation Trust	Harefield Hospital PR Programme Royal Brompton Hospital PR Programme
Royal Devon and Exeter NHS Foundation Trust	Royal Devon and Exeter PR Programme
Royal Free London NHS Foundation Trust	Royal Free Hospital PR Programme
Royal Surrey County Hospital NHS Foundation Trust	Royal Surrey PR Programme
Royal United Hospitals Bath NHS Foundation Trust	Royal United PR Programme
Salford Royal NHS Foundation Trust and Salford Community Leisure	Salford's Breathing Better PR Programme
Salisbury NHS Foundation Trust	Salisbury LEEP PR Programme
Salisbury Plain Health Partnership	South Wiltshire Community PR Programme
Sandwell and West Birmingham Hospitals NHS Trust	Sandwell PR Programme
Sheffield Teaching Hospitals NHS Foundation Trust	Sheffield Community PR Programme
Shropshire Community Health NHS Trust	Shropshire and Telford PR Programme
Sirona Care and Health CIC	Bath and Somerset PR Programme
Solent NHS Trust	Solent Hampshire PR Programme Solent Portsmouth PR Programme
Solent NHS Trust / University Hospital Southampton NHS Foundation Trust	Southampton Integrated COPD Team PR Programme

Provider	Programme
South Devon Healthcare NHS Foundation Trust	Torbay PR Programme
South Doc Services Limited	South Doc PR Programme (Birmingham)
South Essex Partnership University NHS Foundation Trust (SEPT)	SEPT PR Programme
South Tees Hospitals NHS Foundation Trust	East Cleveland and James Cook PR Programme Friarage and Friary PR Programme
South Tyneside NHS Foundation Trust	Gateshead Community PR Programme South Tyneside Acute PR Programme Sunderland Community PR Programme
South Warwickshire NHS Foundation Trust	South Warwickshire PR Programme
South West Yorkshire Partnership NHS Foundation Trust	Barnsley PR Programme
Southend University Hospital NHS Foundation Trust	Southend PR Programme
Southern Health NHS Foundation Trust	Southern Health PR Programme
Southport and Ormskirk Hospital NHS Trust	West Lancashire PR Programme
St George's Healthcare NHS Trust	St George's PR Programme
Staffordshire and Stoke on Trent Partnership NHS Trust	Cannock and Rugeley PR Programme East Staffs PR Programme Stafford PR Programme Stoke Community PR Programme
Stockport NHS Foundation Trust	Ashton Under Lyne and Glossop PR Programme Stockport PR Programme
Suffolk Community Healthcare (Serco Limited)	Suffolk Community PR Programme
Sussex Community NHS Trust	Brighton Hospital PR Programme Crawley, Horsham and Haywards Heath PR Programme Rustington PR Programme
Sutton and Merton Community Services (The Royal Marsden)	SMCS PR Programme
Swindon Borough Council	Healthy Lives PR Programme
Taunton and Somerset NHS Foundation Trust	Musgrove Park PR Programme
The Dudley Group NHS Foundation Trust	Dudley Group PR Programme
The Mid Yorkshire Hospitals NHS Trust	MY Therapy Services PR Programme North Kirklees PR Programme
The Newcastle upon Tyne Hospitals NHS Foundation Trust	Newcastle upon Tyne PR Programme
The Pennine Acute Hospitals NHS Trust	Fairfield PR Programme North Manchester PR Programme Oldham PR Programme
The Rotherham NHS Foundation Trust	Breathing Space PR Programme
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	Christchurch Hospital PR Programme
The Royal Wolverhampton NHS Trust	New Cross Hospital PR Programme
University Hospital of South Manchester NHS Foundation Trust	South Manchester PR Programme
University Hospital Southampton NHS Foundation Trust	University Hospital Southampton PR Programme
University Hospitals of Leicester NHS Trust	Glenfield and Leicester Hospitals PR Programme

Provider	Programme
Virgin Care	Farnham PR Programme
Walsall Cardiac Rehabilitation Trust	Walsall PR Programme
Walsall Healthcare NHS Trust	Walsall Manor PR Programme
Warrington and Halton Hospitals NHS Foundation Trust	Halton Runcorn and Widnes PR Programme Warrington Wolves PR Programme
Western Sussex Hospitals NHS Foundation Trust	Chichester and Bognor Regis PR Programme Worthing and Southlands PR Programme
Whittington Health NHS Trust	Haringey Community PR Programme Islington Community PR Programme Whittington Hospital PR Programme
Wirral University Teaching Hospital NHS Foundation Trust	Wirral PR Programme
Worcestershire Acute Hospitals NHS Trust	Worcestershire PR Programme
Wye Valley NHS Trust	Herefordshire PR Programme
York Teaching Hospital NHS Foundation Trust	Ryedale PR Programme Scarborough PR Programme Whitby PR Programme York Community PR Programme
Your Healthcare CIC	Royal Borough of Kingston PR Programme

Non-participating Pulmonary Rehabilitation providers and programmes

Provider (programme)	**Reason**
Doncaster and Bassetlaw Hospitals NHS Foundation Trust	Declined to take part
Inform Health and Fitness Limited, London	Declined to take part
Milton Keynes Hospital NHS Foundation Trust	Declined to take part
North East London NHS Foundation Trust (South West Essex PR Programme)	Took over service mid-way through the audit period
Old Orchard Clinic, Eastbourne	Declined to take part
Nottinghamshire Healthcare NHS Trust (Bassetlaw PR Programme)	Identified after the audit period

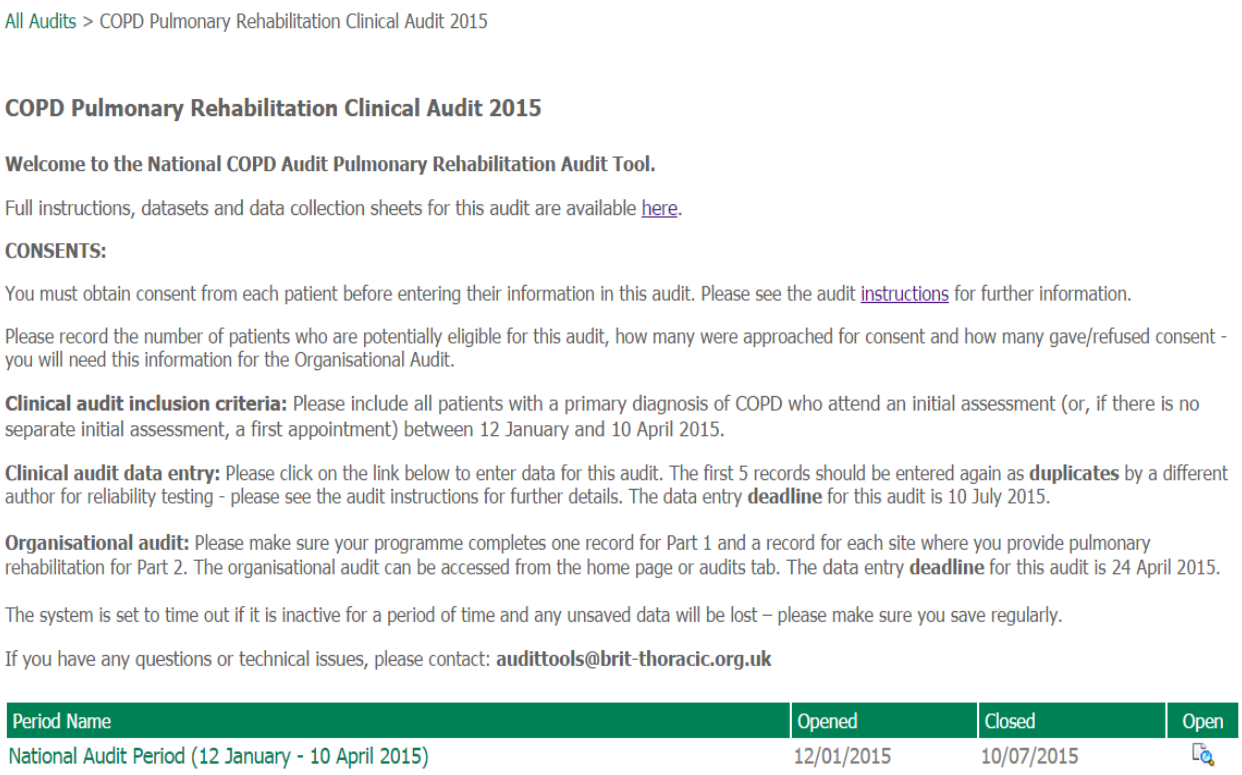
Appendix C: BTS audit tools website

Access to the BTS audit tools website is by individual username and password. Audit participants (users) were required to register for an account, and registrations were approved by nominated BTS head office staff.

The PR audit tool was only made available to users who had been specifically granted access to this audit. Existing users of the website who had registered for the PR audit were granted access to the PR audit tool upon receipt of approval from their Caldicott Guardian. New users' accounts were approved for access to the PR audit tool on request (subject to receipt of Caldicott Guardian approval).

Accounts were linked to a named PR programme within a named provider organisation. Accounts would normally only be approved for access to one PR programme (and the user would only be able to access data for that PR programme). However, some users were granted access to multiple PR programmes within their provider organisation, if necessary.

Once a user's account had been authorised and access had been given to the PR audit tool, they could access the landing page for the PR audit (Fig 5), which contained brief instructions for the audit, links to full instructions on the RCP audit website and contact details for the BTS audit team for questions or technical issues.


All Audits > COPD Pulmonary Rehabilitation Clinical Audit 2015

COPD Pulmonary Rehabilitation Clinical Audit 2015

Welcome to the National COPD Audit Pulmonary Rehabilitation Audit Tool.

Full instructions, datasets and data collection sheets for this audit are available here.

CONSENTS:

You must obtain consent from each patient before entering their information in this audit. Please see the audit instructions for further information.

Please record the number of patients who are potentially eligible for this audit, how many were approached for consent and how many gave/refused consent - you will need this information for the Organisational Audit.

Clinical audit inclusion criteria: Please include all patients with a primary diagnosis of COPD who attend an initial assessment (or, if there is no separate initial assessment, a first appointment) between 12 January and 10 April 2015.

Clinical audit data entry: Please click on the link below to enter data for this audit. The first 5 records should be entered again as **duplicates** by a different author for reliability testing - please see the audit instructions for further details. The data entry **deadline** for this audit is 10 July 2015.

Organisational audit: Please make sure your programme completes one record for Part 1 and a record for each site where you provide pulmonary rehabilitation for Part 2. The organisational audit can be accessed from the home page or audits tab. The data entry **deadline** for this audit is 24 April 2015.

The system is set to time out if it is inactive for a period of time and any unsaved data will be lost – please make sure you save regularly.

If you have any questions or technical issues, please contact: **audittools@brit-thoracic.org.uk**

Period Name	Opened	Closed	Open
National Audit Period (12 January - 10 April 2015)	12/01/2015	10/07/2015	

Fig 5: Landing page for PR audit tool

Users would then click through to the data entry summary page (Fig 6), which contained the links to 'Add a new Record' or 'Add a new Duplicate'. The table at the bottom of Fig 6 displayed all records created by users for that PR programme. Users could view and edit records created by colleagues, but only the user who created the record could commit or delete the records. The table showed: the record ID; the patient NHS number and date of birth to avoid inadvertent duplication of records; the record state ('Incomplete', 'OK' or 'Committed'); the record type (original or duplicate); and which user created it.

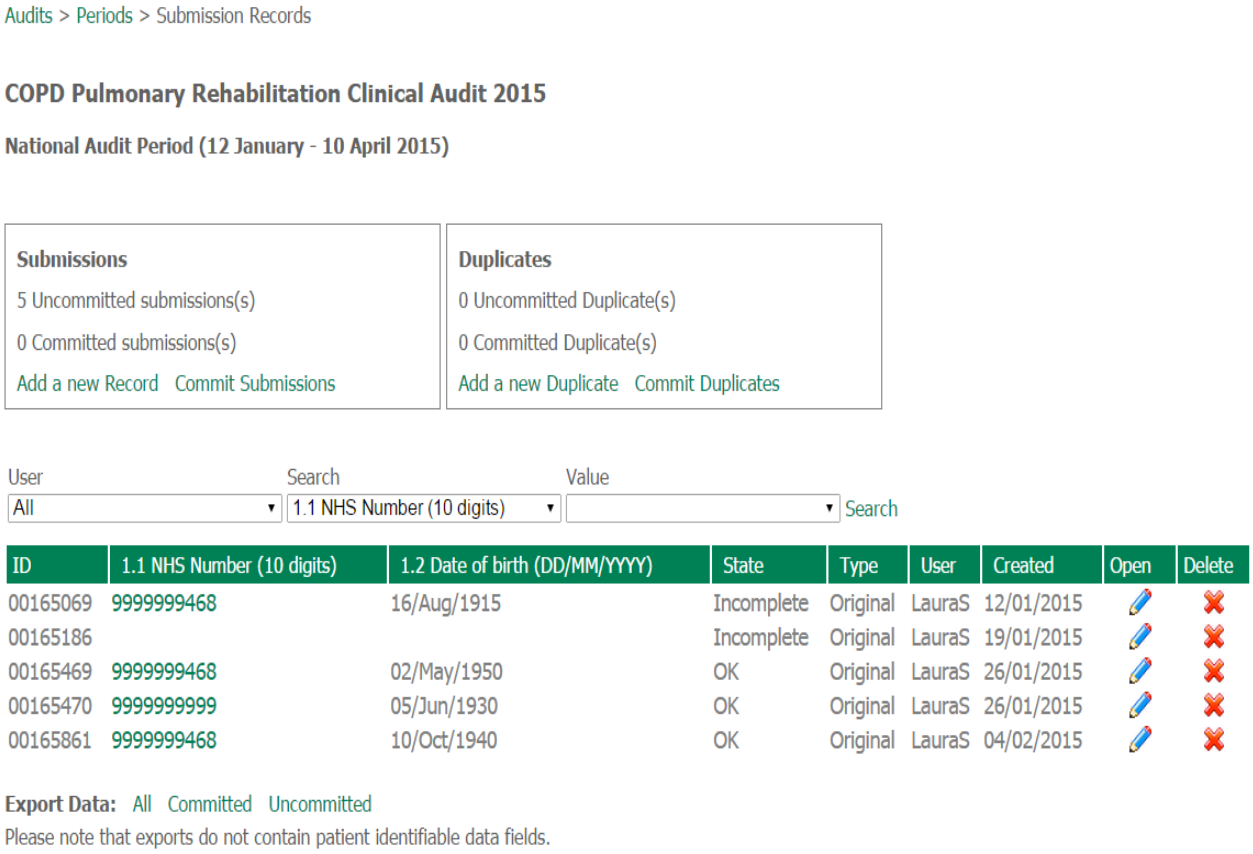


Fig 6: Example of data entry summary page

Fig 7 shows a partially complete record. The clinical audit questions were divided into four sections, indicated by tabs across the top of the record: general information; key clinical information at time of assessment; key clinical information relating to the programme; and key clinical information at discharge. Text in the section tabs turned from red when data entry was incomplete, to green when the section had been completed. Users could move between sections using the 'Previous section' or 'Next section' icons. The organisational audit was similarly structured.

The data entry fields comprised a mixture of check boxes, dropdown lists, number fields, date fields and free text boxes. Help note '?' icons beside questions contained clarification and suggestions for sources of data, where appropriate. Additional red text was used to prompt users to complete all mandatory fields, and red text was also used to alert users to range restrictions and logic restrictions, eg the date of assessment must be after the date of referral.

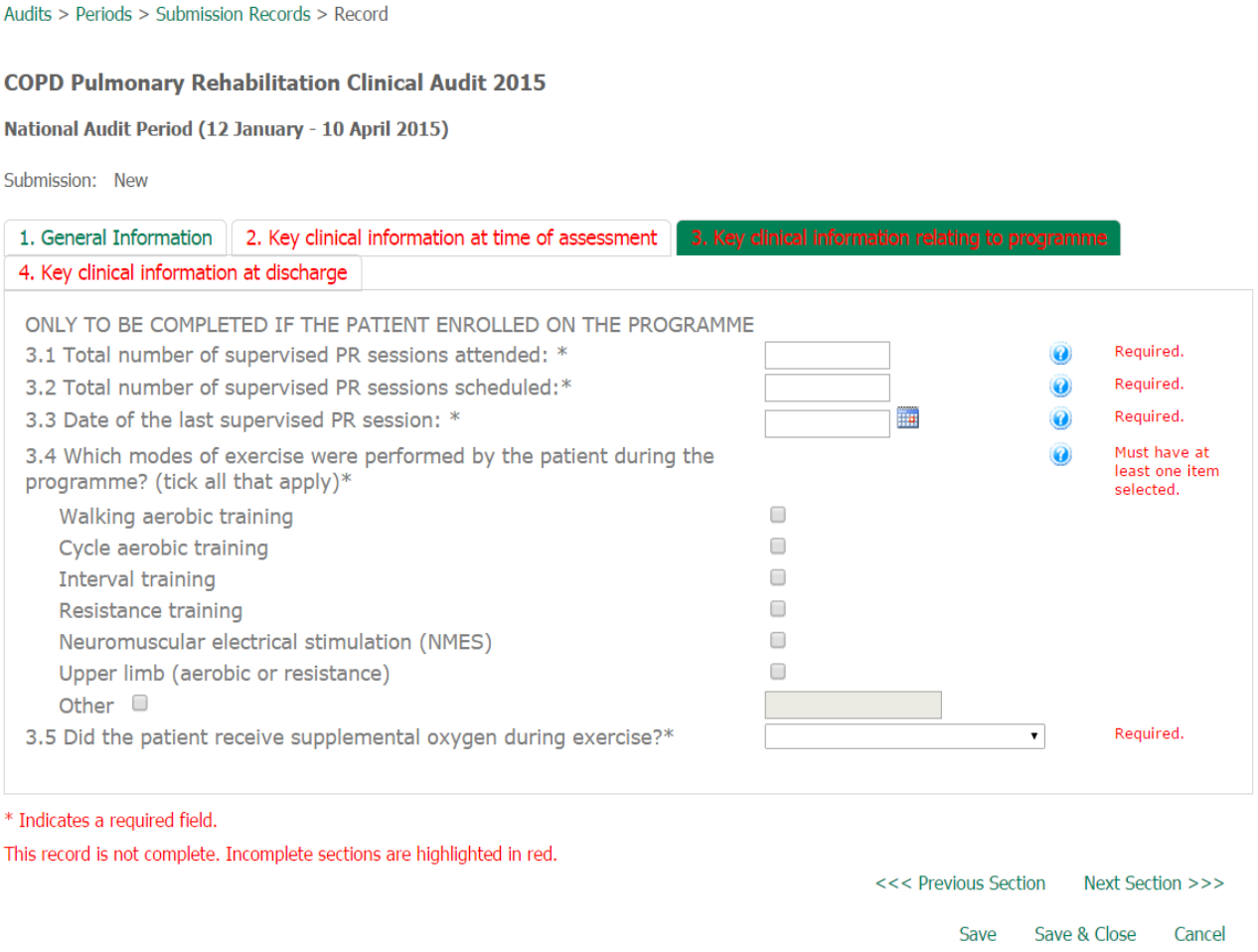


Fig 7: Example of a partially completed record

Records could be saved and returned to at any point by clicking the 'Save' or 'Save & Close' icons. When the record was complete, this was confirmed by clicking 'Commit submissions'. Only committed data went forward for analysis.

After the record was committed, it could not be edited. However, BTS head office staff could commit or uncommit records on request, but they would not make any corrections or delete data.

Appendix D

National COPD Audit Programme governance

The National COPD Audit Programme is led by the Clinical Effectiveness and Evaluation Unit (CEEU) of the Royal College of Physicians (RCP), working in partnership with the British Thoracic Society (BTS), the British Lung Foundation (BLF), the Primary Care Respiratory Society UK (PCRS-UK) and the Royal College of General Practitioners (RCGP).

The programme is guided by a programme board, consisting of programme delivery partners, and a wider programme steering group (membership listed below). Both groups are chaired by Professor Mike Roberts, overall clinical lead for the programme. Within the programme, each workstream is led by a dedicated clinical lead and workstream advisory group.

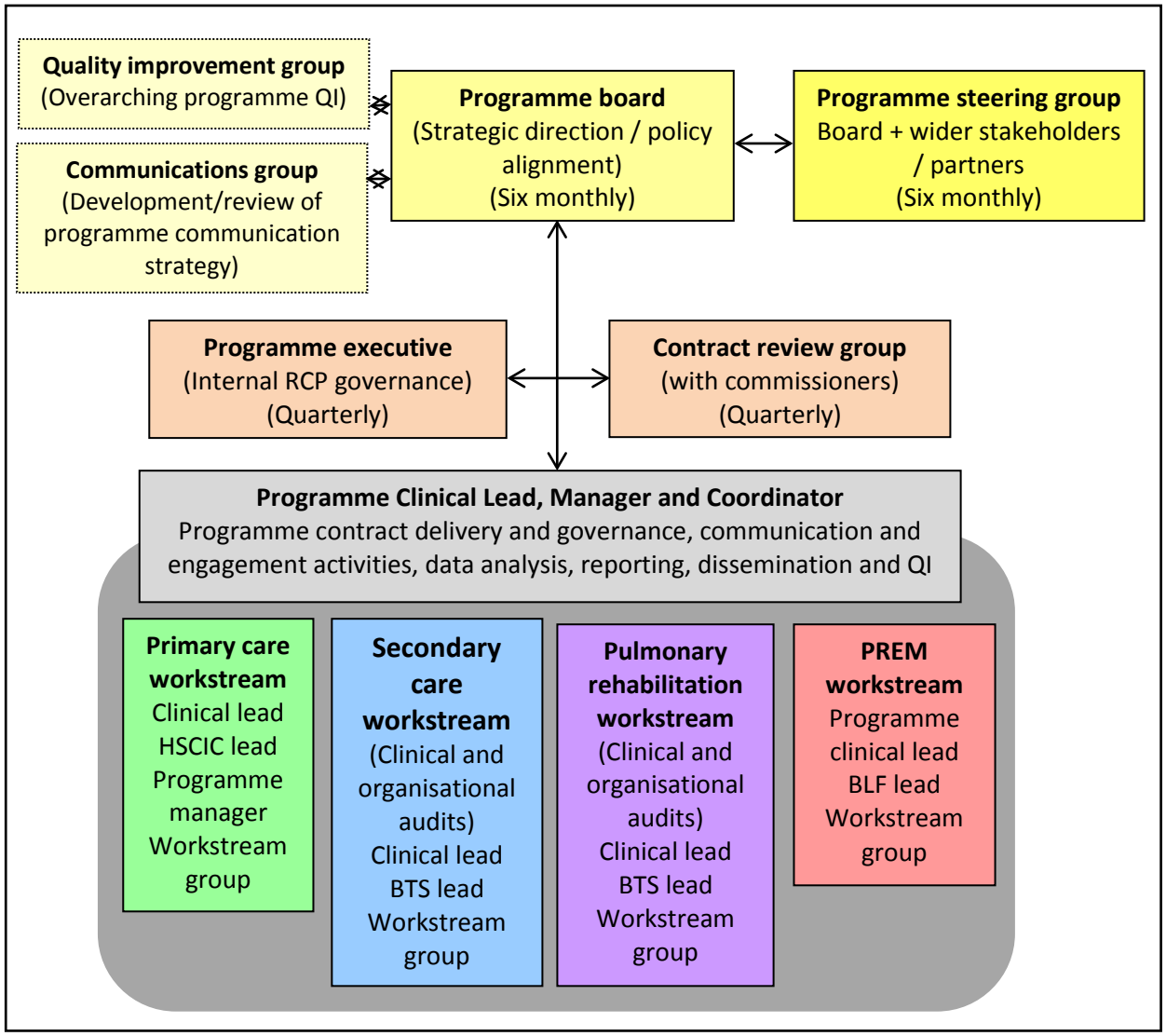


Fig 8: National COPD Audit Programme governance structure

- The programme board meets at least twice yearly, to provide strategic direction and to ensure that the National COPD Audit Programme achieves its objectives. It comprises the programme and workstream clinical leads, and representatives from the programme delivery team (RCP, BTS, BLF and HSCIC).

- The programme steering group meets twice yearly, to ensure the National COPD Audit Programme's relevance to those receiving and delivering COPD services in England and Wales. It comprises the programme strategic partners and wider representation from organisations such as the Royal College of Nursing (RCN), the Association of Respiratory Nurse Specialists (ARNS), NHS Wales and Picker Institute Europe.

- The workstream advisory groups are tasked with the development and day-to-day running of their specific element of the programme. Membership of the PR workstream group is drawn from the steering group, supported by expert representatives from respiratory medicine, nursing and physiotherapy. The workstream group meets quarterly or as necessary to monitor progress, and to support and direct the project, with more frequent communications between the BTS project team and the PR clinical lead.

The National COPD Audit Programme is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA).

Any enquiries in relation to the National COPD Audit Programme should be directed to: COPD@rcplondon.ac.uk.

National COPD Audit Programme board members

Programme clinical leadership

- Professor C Michael Roberts, National COPD Audit Programme – Programme Clinical Lead; and Consultant Respiratory Physician, Whipps Cross University Hospital NHS Trust, Barts Health, Barts and The London School of Medicine and Dentistry, Queen Mary University of London
- Dr Rupert Jones, National COPD Audit Programme Clinical Lead – Primary Care Workstream; Senior Clinical Research Fellow, Centre for Clinical Trials and Population Research, Plymouth University Peninsula School of Medicine and Dentistry; and General Practitioner
- Professor Michael Steiner, National COPD Audit Programme Clinical Lead – Pulmonary Rehabilitation Workstream; Honorary Clinical Professor at Loughborough University; and Consultant Respiratory Physician, Glenfield Hospital, Leicester
- Dr Robert A Stone, National COPD Audit Programme Clinical Lead – Secondary Care Workstream; and Consultant Respiratory Physician, Taunton and Somerset NHS Foundation Trust, Musgrove Park Hospital, Taunton

British Thoracic Society

- Miss Sally Welham, Deputy Chief Executive and BTS Project Lead for the National COPD Secondary Care Audit
- Ms Laura Searle, National COPD Audit Project Coordinator

British Lung Foundation

- Dr Penny Woods, Chief Executive
- Mr Mike McKevitt, Head of Patient Services

Health and Social Care Information Centre

- Mr James Duffy, Clinical Audit Manager, Clinical Audit Support Unit (CASU)

Royal College of Physicians

- Rhona Buckingham, Operations Director, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department
- Dr Ian Bullock, Executive Director, Care Quality Improvement Department; and Chief Operating Officer, National Clinical Guideline Centre
- Ms Juliana Holzhauer-Barrie, National COPD Audit Programme Coordinator, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department
- Mrs Emma Skipper, National COPD Audit Programme Manager, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department
- Dr Kevin Stewart, Clinical Director, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department

National COPD Audit Programme steering group members

Programme clinical leadership

- Professor C Michael Roberts, National COPD Audit Programme – Programme Clinical Lead; and Consultant Respiratory Physician, Whipps Cross University Hospital NHS Trust, Barts Health, Barts and The London School of Medicine and Dentistry, Queen Mary University of London
- Dr Rupert Jones, National COPD Audit Programme Clinical Lead – Primary Care Workstream; Senior Clinical Research Fellow, Centre for Clinical Trials and Population Research, Plymouth University Peninsula School of Medicine and Dentistry; and General Practitioner
- Professor Michael Steiner, National COPD Audit Programme Clinical Lead – Pulmonary Rehabilitation Workstream; Honorary Clinical Professor at Loughborough University; and Consultant Respiratory Physician, Glenfield Hospital, Leicester
- Dr Robert A Stone National COPD Audit Programme Clinical Lead – Secondary Care Workstream; and Consultant Respiratory Physician, Taunton and Somerset NHS Foundation Trust, Musgrove Park Hospital, Taunton

Association of Chartered Physiotherapists in Respiratory Care

- Ms Catherine Thompson, Association of Chartered Physiotherapists in Respiratory Care (ACPRC) Chair; and Head of Patient Experience for Acute Services, NHS England

British Lung Foundation

- Dr Penny Woods, Chief Executive
- Mr Mike McKevitt, Head of Patient Services

British Geriatrics Society

- Dr Chris Dyer, Consultant Geriatrician, Royal United Hospitals, Bath; Chair of BGS respiratory specialist interest group (from April 2015)

British Thoracic Society

- Ms Laura Searle, National COPD Audit Project Coordinator
- Dr Nick Hopkinson, Reader in Respiratory Medicine, the National Heart and Lung Institute of Imperial College, London; and Honorary Consultant Chest Physician, Royal Brompton Hospital, London
- Miss Sally Welham, Deputy Chief Executive; and BTS Project Lead for the National COPD Secondary Care Audit

Health and Social Care Information Centre

- Ms Emma Adams, Clinical Audit Project Lead, Clinical Audit Support Unit (CASU) (until Dec 2014)
- Mr James Duffy, Clinical Audit Manager, Clinical Audit Support Unit (CASU) (from Jan 2015)

Healthcare Quality Improvement Partnership

- Ms Yvonne Silove, National Clinical Audit Development Manager (until Dec 2014)
- Mrs Jane Ingham, Chief Executive (from Jan 2015)

NHS England

- Mr Alex Porter, Clinical Informatics Network Support Manager, Medical Directorate, NHS England (until Jan 2015)

NHS Wales

- Dr Patrick Flood-Page, Welsh Health Boards Representative; Consultant Respiratory Physician, Royal Gwent Hospital; Chair of the British Lung Foundation in Wales; Lecturer at Cardiff University; Training Programme Director for Respiratory Medicine at the Wales Deanery; and part of the Royal College Specialist Advisory Committee for Respiratory Medicine

Patient Representative

- Ms Suzie Shepherd, Chair of Leeds Occupational Health Advisory Service; Patient Advisor to the Leeds Rheumatology Scientific Advisory Board; Vice Chair of the Clinical Accreditation Alliance; and Patient Lead on the RCP Future Hospitals Programme

Picker Institute Europe

- Mr Chris Graham, Director of Research and Policy

Primary Care Respiratory Society UK

- Dr Rupert Jones, Primary Care Respiratory Society UK Executive and Research Lead; National COPD Audit Programme Clinical Lead – Primary Care Workstream; Senior Clinical Research Fellow, Centre for Clinical Trials and Population Research, Plymouth University Peninsula School of Medicine and Dentistry; and General Practitioner

Royal College of Nursing

- Ms Caia Francis, Senior Lecturer, Nursing and Midwifery Department, Faculty of Health and Applied Sciences, University of the West of England

Royal College of Physicians

- Rhona Buckingham, Operations Director, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department
- Ms Jane Ingham, Clinical Standards Director, Clinical Standards Department (to November 2014)
- Dr Ian Bullock, Executive Director, Care Quality Improvement Department; and Chief Operating Officer, National Clinical Guideline Centre (from April 2014)
- Ms Juliana Holzhauer-Barrie, National COPD Audit Programme Coordinator, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department
- Professor Derek Lowe, Medical Statistician, Care Quality Improvement Department,
- Mrs Emma Skipper, National COPD Audit Programme Manager, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department
- Dr Kevin Stewart, Clinical Director, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department

Royal College of General Practitioners

- Dr Kevin Gruffydd-Jones, Respiratory Clinical Lead, Royal College of General Practitioners; Honorary Lecturer at University of Bath; and General Practitioner
- Ms Megan Lanigan, Programme Manager, Clinical Innovation and Research Centre (CIRC) (until Feb 2015)
- Ms Nicola O'Reilly, Interim Programme Manager, Clinical Innovation and Research Centre (CIRC) (from May 2015)
- Dr Imran Rafi, Chair of the Clinical Innovation and Research Centre (CIRC); Senior Lecturer in Primary Care Education, St George's University of London; and General Practitioner

National COPD Audit Programme pulmonary rehabilitation workstream group

- Professor Michael Steiner, National COPD Audit Programme Clinical Lead – Pulmonary Rehabilitation Workstream; Honorary Clinical Professor at Loughborough University; and Consultant Respiratory Physician, Glenfield Hospital, Leicester
- Mrs Katy Beckford, Community Respiratory Team Lead, Berkshire Healthcare NHS Foundation Trust, Bracknell
- Dr Elaine Bevan-Smith, Community COPD Team Clinical Lead (retired), Worcestershire Acute Hospitals NHS Trust
- Dr John Blakey, Senior Clinical Lecturer at the Liverpool School of Tropical Medicine; and Consultant Respiratory Physician, Aintree University Hospital, Liverpool
- Dr Charlotte Bolton, Senior Lecturer at the University of Nottingham; and Consultant Respiratory Physician, Nottingham City Hospital, Nottingham
- Dr Sarah Elkin, Consultant Respiratory Physician, St Mary's Hospital, London
- Mrs Sian Goddard, Specialist Respiratory Physiotherapist, Royal Cornwall Hospitals NHS Trust, Truro
- Dr Neil Greening, Clinical Lecturer in Respiratory Medicine, University of Leicester; and Specialist Registrar, Glenfield Hospital, Leicester
- Mrs Karen Heslop, Nurse Consultant, Royal Victoria Infirmary, Newcastle upon Tyne
- Ms Juliana Holzhauer-Barrie, National COPD Audit Programme Coordinator, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, Royal College of Physicians, London
- Professor Derek Lowe MSc, C.Stat Medical Statistician, Care Quality Improvement Department, Royal College of Physicians, London
- Dr Will Man, Consultant Respiratory Physician, Harefield Hospital, London
- Mr Mike McKevitt, Head of Patient Services, British Lung Foundation
- Professor C Michael Roberts National COPD Audit Programme – Programme Clinical Lead; and Consultant Respiratory Physician, Whipps Cross University Hospital NHS Trust, Barts Health, Barts and The London School of Medicine and Dentistry, Queen Mary University of London
- Ms Laura Searle, National COPD Audit Project Coordinator, British Thoracic Society, London
- Dr Louise Sewell, Occupational Therapist; Senior Lecturer in Occupational Therapy, Coventry University; and Clinical Lead for Pulmonary Rehabilitation, University Hospitals of Leicester NHS Trust
- Professor Sally Singh, Head of Pulmonary and Cardiac Rehabilitation, Glenfield Hospital, Leicester
- Mrs Emma Skipper, National COPD Audit Programme Manager, Clinical Effectiveness and Evaluation Unit, Care Quality Improvement Department, Royal College of Physicians, London
- Dr Paul Walker, Consultant Respiratory Physician, Aintree University Hospital, Liverpool
- Mrs Sandy Walmsley, Respiratory Nurse Specialist, Heart of England NHS Foundation Trust, Birmingham
- Miss Sally Welham, BTS Deputy Chief Executive; and BTS Project Lead for the National COPD Pulmonary Rehabilitation Audit, the British Thoracic Society, London
- Dr Penny Woods, Chief Executive, British Lung Foundation

Appendix E: Medical Research Council (MRC) dyspnoea scale

MRC dyspnoea scale	
Grade	**Degree of breathlessness related to activity**
1	Not troubled by breathless except on strenuous exercise
2	Short of breath when hurrying on a level or when walking up a slight hill
3	Walks slower than most people on the level, stops after a mile or so, or stops after 15 minutes' walking at own pace
4	Stops for breath after walking 100 yards, or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when dressing/undressing

Adapted from Fletcher CM. The clinical diagnosis of pulmonary emphysema – an experimental study. *Proc R Soc Med* 1952;45:577-584. [Accessed via PCRS-UK website: www.pcrs-uk.org/mrc-dyspnoea-scale]

Appendix F: Glossary of terms and abbreviations

An outcomes strategy for chronic obstructive pulmonary disease (COPD) and asthma in England	Sets out the outcomes that need to be achieved in COPD and asthma to deliver the government's commitment to improve health outcomes and reduce inequalities: Department of Health. *An outcomes strategy for chronic obstructive pulmonary disease (COPD) and asthma in England*. London: DH, 2011. www.gov.uk/government/uploads/system/uploads/attachment_data/file/216139/dh_128428.pdf
Audit	A process that measures care against set criteria, to identify where changes can be made to improve the quality of care
BTS guideline for Pulmonary Rehabilitation in adults	The first BTS guideline for PR in adults: www.brit-thoracic.org.uk/guidelines-and-quality-standards/pulmonary-rehabilitation-guideline/ (BTS, 2013)
BTS quality standards for Pulmonary Rehabilitation in adults	Quality standards for PR in adults with chronic respiratory disease in the UK (applies to both primary and secondary care): www.brit-thoracic.org.uk/guidelines-and-quality-standards/pulmonary-rehabilitation-quality-standards/ (BTS, 2014)
CCG	Clinical commissioning group
Chronic obstructive pulmonary disease (COPD)	A collection of lung diseases including chronic bronchitis, emphysema and chronic obstructive airways disease, which cause difficulties with breathing, primarily due to narrowing of the airways
Domains	The NHS Outcomes Framework sets out five domains focusing on improving health and reducing health inequality that the NHS should be aiming to improve: **Domain 1** – Preventing people from dying prematurely **Domain 2** – Enhancing quality of life for people with long-term conditions **Domain 3** – Helping people to recover from episodes of ill health or following injury **Domain 4** – Ensuring that people have a positive experience of care **Domain 5** – Treating and caring for people in a safe environment and protecting them from avoidable harm
Health board (HB)	Health boards in Wales plan, secure and deliver healthcare services in their areas
Health communities	The loose collective term used to describe a locality in which healthcare is provided by groups of professionals to patients and their carers

Integrated care	The coordination of care across different health settings, notably between the primary and secondary care sectors, particularly for patients with complex or long-term conditions
Interquartile range (IQR)	The IQR is the range between 25th and 75th centile which is equivalent to the middle half of all values
Mean	The mean is the average value of the data (ie the data values are added together and then divided by the number of data items)
Median	The median is the middle point of a data set: half of the values are below this point, and half are above this point
Multidisciplinary team (MDT)	Several types of health professionals working together, eg physiotherapists, occupational therapists, dieticians, nurses and doctors
NICE guideline on COPD	Guidance for the care and treatment of people with COPD in the NHS in England and Wales: http://guidance.nice.org.uk/CG101 (NICE, 2010)
NICE quality standard for COPD	Defines clinical best practice within this topic area, covering the assessment, diagnosis and clinical management of COPD in adults: http://guidance.nice.org.uk/QS10 (NICE, 2011)
Primary care	Local healthcare delivered by GPs, NHS walk-in centres and others, which is provided and managed by CCGs/LHBs
Pulmonary Rehabilitation (PR)	A programme, typically including patient education, exercise training and advice, which is designed to improve the health of patients with chronic breathing problems including COPD
Secondary care	Planned and unplanned care that is provided in hospitals
Specialist	A clinician whose practice is limited to a particular branch of medicine or surgery, especially one who is certified by a higher educational organisation
Whole-time equivalent (WTE)	A measurement of staff resource where 1 person working full time is 1 WTE, a person working 2 days per week is 0.4 WTE, etc

Appendix G: References

1. British Thoracic Society. *BTS quality standards for pulmonary rehabilitation in adults*. London: BTS, 2014. www.brit-thoracic.org.uk/guidelines-and-quality-standards/pulmonary-rehabilitation-quality-standards/

2. British Thoracic Society. *BTS guideline for pulmonary rehabilitation in adults*. London: BTS, 2013. www.brit-thoracic.org.uk/guidelines-and-quality-standards/pulmonary-rehabilitation-guideline/

3. NHS England. *CCG outcomes indicator set 2015/16: At-a-glance guide*. London: NHS England, 2015. www.england.nhs.uk/wp-content/uploads/2012/12/ccg-ois-2015-glance.pdf

4. Health and Social Care Information Centre. *Quality and outcomes framework 2013–14*. Leeds: HSCIC, 2014. www.hscic.gov.uk/qof [accessed September 2015]

5. StatsWales. *Quality and outcomes framework.* Welsh Government, 2014. https://statswales.wales.gov.uk/Catalogue/Health-and-Social-Care/NHS-Primary-and-Community-Activity/GMS-Contract [accessed 9 September 2015]

6. Respiratory Futures. Working together for better lung health. 2014. www.respiratoryfutures.org.uk/ [accessed September 2015]

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

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

Tel: +44 (020) 3075 1502
Email: copd@rcplondon.ac.uk
www.rcplondon.ac.uk/copd

#COPDaudit #COPDPRaudit
#COPDPRbreathebetter

We also have a quarterly newsletter, so please send us your email address and contact details if you would like to join the mailing list.

Commissioned by:

HQIP
Healthcare Quality Improvement Partnership