1. Detailed methods and results

Methods

Audit Methodology

The National COPD Audit Programme, commissioned by the Health Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA), delivers a programme of work that aims to drive improvements in the quality of care and services provided for COPD patients in England and Wales. 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), the Royal College of General Practitioners (RCGP) and the Health and Social Care Information Centre (HSCIC).

The first national audit of clinical outcomes of PR in England and Wales (E&W) reported clinical outcomes in 2016.[1] A detailed account of the audit methodology is provided in the online supplement and reports are also in publically accessible at www.rcplondon.ac.uk/projects/national-copd-audit-programme-pulmonary-rehabilitation-workstream.

Prior to undertaking the audit, PR services across E&W were comprehensively surveyed and mapped. 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 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 the BTS websites, at specialist conferences and through social media (eg Twitter). 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 the trust / health board provided any PR service that did not appear on the list, they were asked to reply identifying their programme(s) along with programme lead contacts or, if they did not provide any PR, they were asked to confirm this.

Identification of PR programmes continued throughout 2014 and included several approaches to CCGs to request information on the services they commission. CCGs were then 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 including acute and community NHS trusts and health boards, charities and private healthcare providers. These 230 individual PR programmes were contacted and enrolled with high participation rates in the clinical audit (210 programmes enrolled patients to the audit).

Programmes were requested to audit all patients with a primary respiratory diagnosis of COPD who attended an initial assessment for PR between 12 January and 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 onto the online data collection tool. The clinical audit dataset was developed by the PR workstream group, in consultation with COPD experts across England and Wales. The dataset is provided in the online supplementary material and is also available to download via the weblink above. Section 251 approval was obtained via the National Confidentiality Advisory Group for the collection of patient identifiable data. Caldicott Guardian approval was obtained from each participating unit before access to the online audit web tool was granted and patients enrolled to the audit provided individual written consent before their data was uploaded.

The term '*PR programme*' was used to indicate 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 were termed '*providers*' – these range from NHS trusts and health boards to community interest companies (CICs) and other private providers. A total of 230 programmes were identified within 158 different providers. Programmes were requested to audit all patients with a primary respiratory diagnosis of COPD who attended an initial assessment for PR (or where there was no separate initial assessment, attended a first PR appointment) between 12 January and 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 onto the online data collection tool. 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.

The clinical dataset was developed by the PR workstream group, in consultation with COPD experts across England and Wales. The dataset is available to download from the programme website: www.rcplondon.ac.uk/COPD. The PR clinical audit involved the collection of patient identifiable data and patient consent obtained from each patient enrolled to the audit permitting the audit team to upload their data. Participating programmes were asked to approach all eligible patients for written consent, preferably at their initial assessment when a patient became eligible. The person taking the consent was instructed to provide the patient with a patient information leaflet and a brief explanation of the audit, and then give the patient the opportunity to ask questions before asking them to sign a consent form. Programmes were asked to keep a record of their total number of eligible patients for the audit, the number of patients approached for consent and the number of patients who consented.

Index of Multiple Deprivation

Definitions and assessment of deprivation and socioeconomic position are complex. Social deprivation arises from the inequity of an individual's socio-economic position comparative to others, formed from the hierarchical distribution of wealth, welfare and opportunity within society[2]. Deprivation covers a broad range of issues and refers to unmet needs caused by a lack of resources of all kinds, not just financial.

England and Wales produce their own separate indices of multiple deprivation (www.neighbourhood.statistics.gov.uk/dissemination/MetadataDownloadPDF; www.gov.uk/government/uploads/system/uploads/attachment_data/file/6222/187153 8.pdf), with scores that are not directly comparable. For this audit, patient postcodes were used to obtain a set of deprivation indices data pertaining to the area in which the patient lived at the time of their enrolment to Pulmonary Rehabilitation these data being publically available. These indices provide a relative measure of deprivation at small area level, and as such relate to areas and not individuals – within each area there will be individuals who are deprived and individuals who are not. The most widely used of these indices is the IMD 2010 for England and WIMD 2011 for Wales, both of which combine other indices to give an overall score. The small area scores within England are ranked from most deprived (rank 1) to least deprived (rank 32482) whilst in Wales areas are ranked from most deprived (rank 1) to least deprived (rank 1896). For England the Index of Multiple Deprivation (IMD) is a weighted combination of other

indices (income, employment, health & disability, education/skill/training, crime, barriers to housing & services to services and living environment). In Wales the Welsh Index of Multiple Deprivation (WIMD) 2011 is a weighted combination of other indices (Income, employment, health, education, housing, physical environment, geographic access to services and community safety)

To facilitate the combination of English and Welsh data and the presentation of results the (W)IMD score rankings assigned to audit patients were grouped under national quintiles– the most deprived quintile of residential areas comprising ranks 1-6496 for England and 1-379 for Wales, the next quintile comprising ranks 6497-12993 for England and 380-758 for Wales, and so on up to the last and least deprived quintile of residential areas comprising ranks 25986-32482 for England and 1518-1896 for Wales.

Clinical Outcomes

Three outcomes were chosen to reflect success or otherwise in various aspects of a PR programme. First, patients were considered to have completed PR if they attended a discharge assessment (irrespective of attendance rates during the programme) where other outcomes were recorded. The other two outcomes relate to improvements in health status and in exercise performance, and applied to those with relevant baseline and discharge values. The Incremental Shuttle Walk test (ISWT) and the six minute walk test (6MWT) were by far the two most frequently used exercise tests and their results were amalgamated by taking the percentage change from initial to discharge assessment. Five cases that improved from zero metres ISWT were excluded as no percentage could be computed, and for 34 cases having both ISWT and 6MWT the best percentage change was selected. Health status measures comprised the St George's Respiratory Questionnaire (SGRQ), the Chronic Respiratory Questionnaire (CRQ), and the COPD Assessment Test (CAT). Since these ordinal scales were unsuitable for computing percentage change, a combined health status outcome was obtained by amalgamating minimum clinically important differences (MCID). The MCID for the SGRQ was a reduction of 4 points in the total score, for the CRQ an increase of 0.5 points in the average of the four domain scores, and for the CAT a reduction of 2 points.[3-5] The combined health status outcome measure was then the achievement of any of these MCID. Baseline scores for exercise and health status were categorised into quartiles - best quartile through to worst quartile of scores. Patients having more than one type of assessment (e.g. ISWT and 6MW for exercise, or SGRQ and CAT for health status) were placed according to the assessment quartile they performed best on. These and all other

baseline patient/clinical characteristics used in the analysis were as categorized in Table 2.

Statistical Analysis

The chi-squared test was used to test for association between deprivation quintiles and other baseline characteristics, for association between baseline characteristics and whether or not patients attended a discharge assessment and (for those with relevant data) whether an MCID was achieved in regard to health status. The Mann-Whitney (2 groups) or Kruskal-Wallis test (>2 groups) was used to test for association in the percentage change in exercise distance, the distribution of which was notably skewed. Preliminary visual graphical inspection of outcomes by IMD within each stratum of factors in Table 1 and baseline assessment quartiles was undertaken to inspect for evidence of interaction. No such evidence was found. Binary regression (STATA binreg procedure, rr link option) was used to assess the association of deprivation quintile with whether or not patients attended a discharge assessment, and with whether or not an MCID in health status was achieved. Median regression (STATA qreg/qreg2 procedures) was used to assess the association of deprivation quintile with percentage change in exercise scores; the object being to estimate the median of the dependent outcome variable, conditional on the values of the independent variables. Risk ratios (binary regression) or coefficients (median regression) were estimated, with adjustments made for possible confounder variables as independent predictors (those described in Table 1, together with baseline quartiles for health status and exercise). P values and confidence intervals were also estimated and adjusted for programme clustering effects; standard errors that are robust to intra-cluster correlation were obtained for both types of regression by using the option 'cluster'. Unknown data were coded to preserve the full sample size in the regression, notably affecting MRC grade and BMI. Due to the number of tests performed statistical significance was regarded as P<0.001. Also, the large sample sizes sometimes resulted in small, clinically non-relevant differences being statistically significant and this is reflected in the overall interpretation.

Additional analyses were performed to consider the potential impact that categorizing IMD may have had, particularly in regard to discharge assessment. These were done for England alone (96% of all cases) since the numerical scale for Wales was different. Random effects logistic regression modelling was also performed as an alternative to binary regression.

Results

210 programmes (195 in England and 15 in Wales) enrolled 7413 patients to the audit. (W)IMD deprivation data was available for 7263 patients, but unknown for 150 (2%) (across 75 programmes). Based on individual programme activity data provided as part of the audit of the organisation and resources of PR[6] for the same time period as the clinical audit, the response rate was estimated as 73% of eligible patients. If the COPD PR audit sample living in England and Wales was comparable to England and Wales as a whole, then 20% of the sample would live within each national quintile of postcode areas. This was not so (goodness of fit test, P<0.001, Table 1). The sample was relatively deprived with 48% living in the two most deprived quintiles and only 31% in the two 'least deprived' quintiles. Table 1 shows statistically significant associations between deprivation quintile and other baseline variables. Patients living in deprived areas were more likely to be younger, currently smoking, living alone and with mental health comorbidity. In separate analyses deprivation quintile was also associated (P<0.001) with undertaking of initial exercise testing at baseline assessment, from 91% in the most deprived quintile and rising progressively to 97% in the least deprived quintile; similarly (P<0.001) for the completion of health status questionnaires, from 84% through 92%. For those having baseline exercise tests there was an association (P<0.001) between exercise result and deprivation, with 22% in the least deprived quintile having exercise results in the worst quartile of results, 21% for the next least deprived quintile, rising to 24%, 27% and then 30% for the most deprived quintile. A similar pattern was seen for baseline health status scores, from 11% in the least deprived quintile with health status scores in the worst quartile of scores, rising to 16%, 20%, 24% and then 30% for the most deprived quintile (P<0.001).

Baseline characteristics of the sample and the univariate association with the three audit outcomes are shown in Table 2. Many baseline factors were associated with attendance at a discharge assessment, which was achieved for 59% overall. There was a gradient by IMD quintile, with discharge assessment achieved by 70% in the least deprived quintile and by 50% in the most deprived quintile. The rate of attendance at a discharge assessment was below 50% for patients below the age of 60 years (45%), for current smokers (47%), for those with a mental health comorbidity (49%), hospitalised two or more times for a COPD exacerbation in the previous 12 months (47%) and with grade 5 MRC dyspnoea (49%). Also, there were associations indicating that the worse the baseline result for exercise or health status the lower the rate of discharge assessment. 61% of those with initial and discharge scores achieved a MCID. Baseline score quartile was associated with outcome (P<0.001), with 45% from the best baseline

score quartile achieving an MCID compared with 76% from the worst quartile. There was also an association with baseline MRC dyspnoea score with achievement of an MCID rising from 55% for grades 1/2 to 67% for grade 5.

The overall median percentage change in ISWT/6MWT exercise test distance was 25%, IQR 8-54%. The strongest predictor was the baseline exercise test quartile (median range: 14% for best quartile to 78% for worst quartile). There was also a significant association between baseline MRC grade (median range: 18% for grades1/2 to 46% for grade 5), and for number of comorbidities (median range: 22% for none to 35% for at least four) with percentage change in exercise test distance. Median percent change was also highest for patients living in the two most deprived quintile areas (27% & 29%), for patients aged under 60 years (median 33%), for patients with a mental health disorder (median 32%) and for those hospitalised two or more times for a COPD exacerbation in the previous 12 months (median 36%).

Regression analyses to assess the association of IMD deprivation quintile with each outcome both before and after adjusting for other baseline variables that were associated with both IMD and outcome are presented in Tables 3, 4 and 5. Adjustments were made for the variables from Table 1, together with baseline exercise and health status as appropriate, and for PR programme clustering effects. In respect of patients having a discharge assessment, adjustments in the binary regression did diminish the IMD quintile gradient (Table 3) but a statistically significant association remained; the risk ratio (95% confidence Interval) for patients in the most deprived quintile relative to patients in the least deprived quintile was 0.79 (0.73-0.85), that is a 21% (15-27%) less chance of having a discharge assessment. Furthermore an IMD gradient was observed at each categorisation level of all others variables listed in Table 2 (results not shown). In additional analyses, for England alone, and with IMD categorization replaced by IMD numerical score then the IMD score was a statistically significant predictor of outcome, Z=6.79, P<0.001. Random effects logistic regression gave a similar result, Z=-4.86, P<0.001, with intra-class class correlation estimate of 0.170. Random effects logistic regression using IMD categorization also produced a gradient (0.68, 0.69, 0.85, 0.89) in the odds ratios for quintiles 1-4 relative to the least deprived 5th quintile.

 In regard to achieving MCIDs for health status the binary regression to adjust for all Table 1 variables was not achieved because of model convergence issues. However adjustment was possible for the two most predictive variables, namely baseline score

quartile and MRC dyspnoea score. After adjustment no statistically significant (P<0.001) risk ratios were seen (Table 4). In additional analyses, for England alone, and with IMD categorization replaced by IMD numerical score then the IMD score was not a statistically significant predictor of outcome, Z=-1.16, P=0.25. Random effects logistic regression did not have convergence issues and after adjustment also gave a non-significant result, Z=-0.41, P=0.68 with intra-class class correlation estimate of 0.060. Random effects logistic regression using IMD categorization also showed no statistically significant odds ratios after adjustment: 0.90, 0.99, 1.08, 0.83.

In respect of percentage change in ISWT/6MWT exercise test distance the better results for patients living in more deprived areas suggested by unadjusted univariate analyses were largely extinguished after adjustment for baseline exercise score quartile and other variables (Table 5).

Supplement References

1. Steiner M, Holzhauer-Barrie J, Lowe D, et al. Pulmonary Rehabilitation: Steps to breathe better. National Chronic Obstructive Pulmonary Disease (COPD) Audit Programme: Clinical Audit of Pulmonary Rehabilitation services in England and Wales 2015. London: Royal College of Physicians, 2016.

2. Marmot MG. Understanding social inequalities in health. *Perspect Biol Med* 2003; **46**(3 Suppl): S9-23.

3. Schunemann HJ, Puhan M, Goldstein R, Jaeschke R, Guyatt GH. Measurement properties and interpretability of the Chronic respiratory disease questionnaire (CRQ). *COPD* 2005; **2**(1): 81-9.

4. Kon SS, Canavan JL, Jones SE, et al. Minimum clinically important difference for the COPD Assessment Test: a prospective analysis. *Lancet Respir Med* 2014; **2**(3): 195-203.

5. Jones PW. St. George's Respiratory Questionnaire: MCID. *COPD* 2005; **2**(1): 75-9.

6. Steiner M, Holzhauer-Barrie J, Lowe D, et al. 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. London: Royal College of Physicians, 2015.

2. Clinical Audit Dataset

	AUDIT QUESTIONS	Response options	Help Notes	Mapping to Quality Standard	Audit Question 1. Casemix 2. Treatment provided 3. Clinical outcomes 4. Programme resources
1	**General Information**				
1.1	NHS Number	Number	Encrypted	-	Linkage
1.2	Date of birth	Date field	Encrypted	-	1 + Linkage
1.3	Gender	M/F		-	1, 3
1.4	Home Postcode	Plain text	Encrypted	-	1 + Linkage + Referral Patterns
1.5	Ethnicity	White British White Irish Any other White background White and Black Caribbean White and Black African White and Asian Any other mixed background Indian Pakistani Bangladeshi Any other Asian background Caribbean African Any other Black background Chinese Any other ethnic group		-	1, 3

		Not stated			
1.6	Date of referral to PR?	Date field	This should be available from the referral letter or form. This should be the date the referral was made, not the date it was received.	1b, 3b	2, 3 + to monitor timeliness
1.7	Date of receipt of referral?		For this question, please enter the date the referral letter was received by your programme, not the date of the letter. If this is not known please leave the date box blank and select "Tick here if not known". The date of the letter should be entered at question 1.6	1b, 3b	2, 3 + to monitor timeliness
1.7a	Tick here if not known				
1.8	Date of assessment appointment?	Date field		1b, 3b	2, 3 + to monitor timeliness
1.8a	Length of time from referral to assessment?	Calculated field	In whole days, calculated from referral to assessment date	1b, 3b	2, 3 + to monitor timeliness
1.8b	Length of time from receipt of referral to assessment?	Calculated field		1b, 3b	2, 3 + to monitor timeliness
1.9	Where was the patient referred from?	GP/practice team Community services Hospital consultant (or member of clinical team)	Select the one that fits best	3	2 + referral patterns

		Hospital specialist COPD team Specified post-AECOPD early PR pathway Other (specify)			
1.10	Was the patient enrolled on your PR programme?	Yes No	For the purposes of this audit, enrolled means attended at least one supervised PR session.	1a, 3a	2
1.11	Date of enrolment to PR programme if enrolled?	Date field	Please enter the date of first supervised PR session attended by patient.	1b, 3b	2, 3 + to monitor timeliness
1.11a	Length of time from referral to enrolment?	Calculated field		1b, 3b	2,3 + to monitor timeliness
1.11b	Length of time from receipt of referral to enrolment?	Calculated field			
1.11c	Length of time from assessment to enrolment?	Calculated field		1b, 3b	2, 3 + to monitor timeliness
1.12	If assessed but not enrolled, what was the reason?	PR not clinically appropriate PR arranged elsewhere Died Hospitalised COPD Exacerbation Co-morbidities Psycho-social problems Did not wish to attend/did not feel PR would benefit Problems with transport Exercises at home Other commitments Not known	If the patient attended an assessment appointment but did not then enrol (begin) the PR programme please give details of the reasons for this (tick all that apply).	1b, 2, 3b	3

		Other (specify)				
1.13	What type of programme was the patient enrolled on?	Rolling Cohort Other	To be eligible for this audit a PR programme must include PR sessions which are supervised by a healthcare professional. A rolling programme is a continuing cycle of sessions, with patients joining when there is a space and leaving after completing a programme of sessions. A cohort programme is where all patients start and finish the programme at the same time.	4	2	
1.14	Has the patient attended a PR programme previously?	Yes – completed Yes – not completed Yes – completion unknown No Not known	Please answer yes, it the pt attended a PR programme at any time in the past, even if the pt did not complete the programme and/or attend a discharge assessment.	1a	1	
2	**Key clinical information at time of assessment**					
2.1	Smoking status (tick all that apply):	Current smoker	Pts who stopped smoking	5, 6	1	

		Ex-smoker Never smoked Not recorded	at least 4 weeks before the assessment apt should be entered as "ex-smoker", pts stopping within 4 weeks of assessment should be marked as a "smoker".		
2.2	Does the patient have any other significant medical conditions (tick all that apply)?	Alcohol-related condition Atrial fibrillation Cor pulmonale Dementia/confusion Diabetes Gastro-intestinal condition Hearing impairment Hypertension Ischaemic heart disease Kidney disease Learning disability Left heart failure (LVF) Locomotor problems Lung cancer Mental health disorder Neurological condition Osteoporosis Stroke Thromboembolic disease (PE, DVT) Visual impairment Other cardiovascular disease Other endocrine disorder	Tick all that apply, whether current or past conditions. Significant means a condition requiring medical treatment or causing symptoms. Locomotor problems include arthritis and amputation. Please select "mental health disorder" if there is documented evidence of the patient having a mental health disorder e.g. anxiety state, depressive illness, schizophrenia, personality disorder etc.	2	1, 3

		Other malignant disease Other respiratory disease No other medical conditions Other			
2.3	How many times has the patient been hospitalised for a COPD exacerbation in the past 12 months?	Number		-	1
2.3a	Tick here if not known	Not known		-	1
2.4	Was the patient receiving oxygen therapy at home at the time of assessment? (tick all that apply)	Yes – long term home oxygen Yes – ambulatory oxygen Yes – short burst oxygen/palliative use Yes - type not known No Not known		-	1
2.5	Was the patient receiving non-invasive ventilation (NIV) at home at the time of assessment?	Yes No Not known		-	1
2.6	What are the patient's living arrangements?	Community hospital/rehab ward or equivalent Residential placement Sheltered accommodation House/flat alone House/flat with another person Not recorded Other		-	1
2.7	Was transport arranged for the patient by your programme/health	Yes No		-	

	service to enable the patient to attend?	Not known			
2.8	What were the most recent available values for the following:				
2.8.1	FEV1 (litres):	Decimal	Please enter the FEV1 value to 1 decimal place.		
2.8.1a	Tick here if not known	Not known			
2.8.2	FEV1 % predicted:	Decimal	Please enter the FEV1 % predicted value to 1 decimal place.	8	1
2.8.2a	Tick here if not known:	Not known		8	1
2.8.3	Patient's height (metres):	Decimal	Please enter the patient's height in metres to 2 decimal places.	8	
2.8.3a	Tick here if not known:	Not known		8	1
2.8.4	Patient's weight (Kg):	Decimal	Please enter the patient's weight in kilos to 1 decimal place.	8	1
2.8.4a	Tick here if not known:	Not known		8	1
2.8.5	Patient's body mass index (BMI):	Decimal	Please enter the patient's BMI to 1 decimal place.	8	1
2.8.5a	Tick here if not known:	Not known		8	1
2.9	What was the patient's oxygen saturation at rest?	%		8	1
2.9a	Tick here if not known	Not known		8	1
2.10	Was the patient breathing supplemental oxygen when saturation was recorded?	Yes No Not known		8	1
2.11	If yes, what was the recorded flow rate? (L/min)	Flow rate		8	1

2.11a	Tick here if not known	Not known		8	1
2.12	What was the patient reported MRC dyspnoea score at assessment?	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5 Not known/Not recorded	Give the score as reported by the patient at assessment or tick not known/not recorded. **Grade 1** – Not troubled by breathlessness except on strenuous exercise **Grade 2** – Short of breath when hurrying or walking up a slight hill **Grade 3** – Walks slower than contemporaries on level ground because of breathlessness, or has to stop for breath when walking at own pace. **Grade 4** – Stops for breath after walking about 100 metres [109 yards] or after a few minutes on level ground. **Grade 5 –** Too breathless to leave the house or breathless when dressing or undressing.	1a, 2	1, 3
2.13	Was exercise performance assessed at the initial assessment? If yes, please provide values for all that apply:	Y/N		8,9	1,3
2.13.1	Incremental shuttle walk test (ISWT) (metres)	Number		8,9	1,3
2.13.2	Endurance shuttle walk test (ESWT) (seconds)	Number		8,9	1,3

2.13.3	Six minute walk test (6MWT) (metres)	Number		8,9	1,3
2.13.4	Cycle or treadmill ergometry (peak VO2)	Number		8,9	1,3
2.13.5	Cycle or treadmill endurance test (seconds)	Number		8,9	1,3
2.13.6	4m gait speed test (seconds)	Number		8,9	1,3
2.13.7	Other test (please specify)	Free text		8,9	1,3
2.14	Was a practice test performed	Yes No Not known	Was a practice test performed for any of the tests listed in question [2.13] before a final value was recorded?	-	2,3
2.15	Was muscle strength measured at the initial assessment	Yes No Not known		8,9	3
2.16	Were any health status questionnaires completed? If yes, please provide values for all that apply:	Y/N	Please complete all applicable heath status test values.	8,9	1, 3
2.16.1	**St. George's Respiratory Questionnaire (SGRQ <u>not</u> SGRQ-C)**		Please only complete for the traditional/general SGRQ. If your PR programme uses the SGRQ-	8,9	1,3

			C please record this in the organisational audit (question [•]).		
2.16.1a	Symptoms score (1-100)	Decimal			
2.16.1b	Activity score (1-100)	Decimal			
2.16.1c	Impacts score (1-100)	Decimal			
2.16.1d	Total score (1-100)	Decimal			
2.16.2	**Chronic Respiratory Questionnaire (CRQ)**			8,9	1,3
2.16.2a	Dyspnoea average score (1.0-7.0)	Decimal			
2.16.2b	Fatigue average score (1.0-7.0)	Decimal			
2.16.2c	Emotion average score (1.0-7.0)	Decimal			
2.16.2d	Mastery average score (1.0-7.0)	Decimal			
2.16.3	**COPD Assessment Test (CAT)**			8,9	1,3
2.16.3a	Total score (0-40)	Integer			
2.17	Were any of the following outcomes recorded as part of the programme (tick all that apply)	Patient knowledge Activities of daily living Psychological status Physical activity questionnaire Physical activity monitor Measure of patient experience <mark>Not known</mark> <mark>None</mark>		9	3
3	**Key Clinical Information relating to Programme**				

3.1	Total number of supervised PR sessions attended	Number	A PR session means a PR class/group which is supervised by a healthcare professional. Sessions done alone e.g. at home should not be included. Please enter the total number of supervised PR sessions that the patient attended during the programme.	4	2, 3
3.2	Total number of supervised PR sessions scheduled	Number	Please enter the total number of sessions that were planned for this patient.	4	2, 3
3.3	Date of last supervised PR session?	Date		4	2,3
3.4	Which modes of exercise were performed by the patient during the programme? (tick all that apply)	Walking aerobic training Cycle aerobic training Interval training Resistance training Neuromuscular electrical stimulation Upper limb Other (please specify)		5	2, 3
3.5	Did the patient receive supplemental oxygen during exercise?	Y N Not known		5	2, 3, 4
4	**Key Clinical Information at**				

	Discharge				
4.1	Was a discharge assessment arranged and attended?	Arranged and attended Arranged but not attended Not arranged Not known		4	2, 3
4.2	Date of discharge assessment, if performed:	Date		4	2,3
4.3	Did the patient complete the programme?	Y N	There is no fixed definition of "complete" for the purposes of this audit. At your PR programme, do you consider that the patient completed the programme e.g. attended sufficient sessions?	4	3
4.4	If the programme was not completed, what was the reason?	Still enrolled as at 10/7/15 PR arranged elsewhere Attended programme but did not attend discharge or follow-up appointment Problems with transport Died Hospitalised COPD Exacerbation Co-morbidities Psycho-social problems Did not wish to attend/did not feel PR would benefit Exercises at home Other commitments		4	3

		Not known Other (specify)			
4.5	Was a written discharge exercise plan provided for the patient?	Y N Not known		7	2, 3
4.6	What was the patient reported MRC dyspnoea score at discharge?	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5 Not known/Not recorded	Give the score as reported by the patient at discharge or tick not known/not recorded. **Grade 1** – Not troubled by breathlessness except on strenuous exercise **Grade 2** – Short of breath when hurrying or walking up a slight hill **Grade 3** – Walks slower than contemporaries on level ground because of breathlessness, or has to stop for breath when walking at own pace. **Grade 4** – Stops for breath after walking about 100 metres [109 yards] or after a few minutes on level ground. **Grade 5** – Too breathless to leave the house or breathless when dressing or undressing.	8, 9	1, 3
4.7	Was exercise performance assessed at discharge? If yes, please provide values for all that	Y/N		8,9	2, 3

	apply:				
4.7.1	Incremental shuttle walk test (ISWT) (metres)	Number			
4.7.2	Endurance shuttle walk test (ESWT) (seconds)	Number			
4.7.3	Six minute walk test (6MWT) (metres)	Number			
4.7.4	Cycle or treadmill ergometry (peak VO2)	Number			
4.7.5	Cycle or treadmill endurance test (seconds)	Number			
4.7.6	4m gait speed test (seconds)	Number			
4.7.7	Other test (specify)	Free text			
4.8	Was muscle strength measured at discharge assessment?	Y/N			2, 3
4.9	Were any health status questionnaires completed at discharge? If yes, please provide values for all that apply:	Y/N	Please complete all applicable heath status test values.	8,9	2, 3
4.9.1	**St. George's Respiratory Questionnaire (SGRQ <u>not</u> SGRQ-C)**		Please only complete for the traditional/general SGRQ. If your PR programme uses the SGRQ-	8,9	2, 3

			C please record this in the organisational audit (question [•]).		
4.9.1a	Symptoms score (1-100)	Decimal			
4.9.1b	Activity score (1-100)	Decimal			
4.9.1c	Impacts score (1-100)	Decimal			
4.9.1d	Total score (1-100)	Decimal			
4.9.2	**Chronic Respiratory Questionnaire (CRQ)**			8,9	2, 3
4.9.2a	Dyspnoea average score (1.0-7.0)	Decimal			
4.9.2b	Fatigue average score (1.0-7.0)	Decimal			
4.9.2c	Emotion average score (1.0-7.0)	Decimal			
4.9.2d	Mastery average score (1.0-7.0)	Decimal			
4.9.3	**COPD Assessment Test (CAT)**			8,9	2, 3
4.9.3a	Total score (0-40)	Integer			
5	**Linked Outcomes from the IC**				
5.1	Hospital admission within [90/180] days of assessment date				3
5.2	Mortality within [90/180] days of assessment date				3