

## RESEARCH LETTER

## Pulmonary rehabilitation following hospitalisation for acute exacerbation of COPD: referrals, uptake and adherence

### Abstract

**Rationale** Several randomised controlled trials support the provision of early pulmonary rehabilitation (PR) following hospitalisation for acute exacerbation of chronic obstructive pulmonary disease (AECOPD). However, there is little real-world data regarding uptake, adherence and completion rates.

**Methods** An audit was conducted to prospectively document referral, uptake, adherence and completion rates for early post-hospitalisation outpatient PR in Northwest London over a 12-month period.

**Results** Out of 448 hospital discharges for AECOPD, 90 referrals for post-hospitalisation PR were received. Only 43 patients received and completed PR (9.6% of all hospital discharges) despite a fully commissioned PR service.

**Conclusions** Despite the strong evidence base, there are poor referral and uptake rates for early outpatient PR following hospitalisation for AECOPD, with only a small proportion of the intended target population receiving this intervention.

### INTRODUCTION

Outpatient pulmonary rehabilitation (PR) following hospitalisation for acute exacerbation of chronic obstructive pulmonary disease (AECOPD) improves exercise capacity, health status and reduces hospital readmissions.<sup>1</sup> However, there is little published data on process evaluation. The recent British Thoracic Society guidelines on PR recommend that 'clinical services should carefully record uptake, adherence and completion rates'.<sup>2</sup>

The aim of this audit was to record patient flow through a post-hospitalisation PR pathway, and document referral, uptake, adherence and completion rates for PR.

### METHODS

#### Setting

The Hillingdon Hospital is the acute care provider in Hillingdon borough, northwest London. The Hillingdon respiratory outreach team routinely use a chronic obstructive pulmonary disease (COPD) discharge bundle<sup>3</sup> and provide post discharge

telephone and home support for 14 days. PR is fully commissioned and is provided by Harefield Hospital on an outpatient basis through three sites across the borough. Transport is provided for assessments, but not classes.

### Audit

Data was collected between November 2011 and October 2012. Patients were identified through the hospital COPD outreach team and corroborated by the coding department (using ICD-10 codes for primary diagnosis: J44—COPD with an acute lower respiratory tract infection, J44.1—COPD with an AECOPD, J44.9—COPD unspecified). All identified patients had their medical and nursing notes examined. Number of post-hospitalisation PR referrals to Harefield Hospital was recorded, as well as uptake, adherence and completion rates. PR completion was defined as attendance at 50% or more sessions.

### RESULTS

Four hundred and forty eight patients were discharged from the Hillingdon Hospital following an AECOPD over the 12-month period; median (IQR) length of stay was 3 (1–5) days; 286 patients met referral criteria for post-hospitalisation PR; however only 90 referrals (32% of eligible) were received. Figure 1 is a Consolidated Standards Of Reporting Trials (CONSORT) diagram illustrating patient drop-out from hospital discharge to completion of post-hospitalisation PR. Reasons for drop-out are detailed in the online supplement. Sixty eight of the 90 referrals attended initial assessment, 60 started post-hospitalisation PR, with 43 patients completing (73% of starters; 9.6% of all hospital discharges for AECOPD). For completers, median (IQR) number of supervised sessions attended was 14 (10–16).

### DISCUSSION

Despite the strong evidence base,<sup>1 4</sup> we found that less than 10% of all hospital discharges for AECOPD complete early post-hospitalisation PR. The most notable discrepancy was that only 90 out of 286 eligible patients were referred (31%). A weakness of the audit was that we were not able to formally ascertain the reasons for non-referral despite careful scrutiny of notes. There were also drop-outs at uptake, adherence and completion stages, but these were in line with rates seen during PR of stable patients.<sup>5</sup>

Further studies are urgently required to investigate patient, staff and organisational

barriers to post-hospitalisation PR. Quality improvement solutions may improve acceptability to patients and stakeholders, but alternative approaches to delivering early post-hospitalisation outpatient PR may need to be considered, including starting PR earlier (eg, during inpatient admission or immediately after discharge in the home) as a bridge to outpatient PR, or at a later stage when the patient is more stable.

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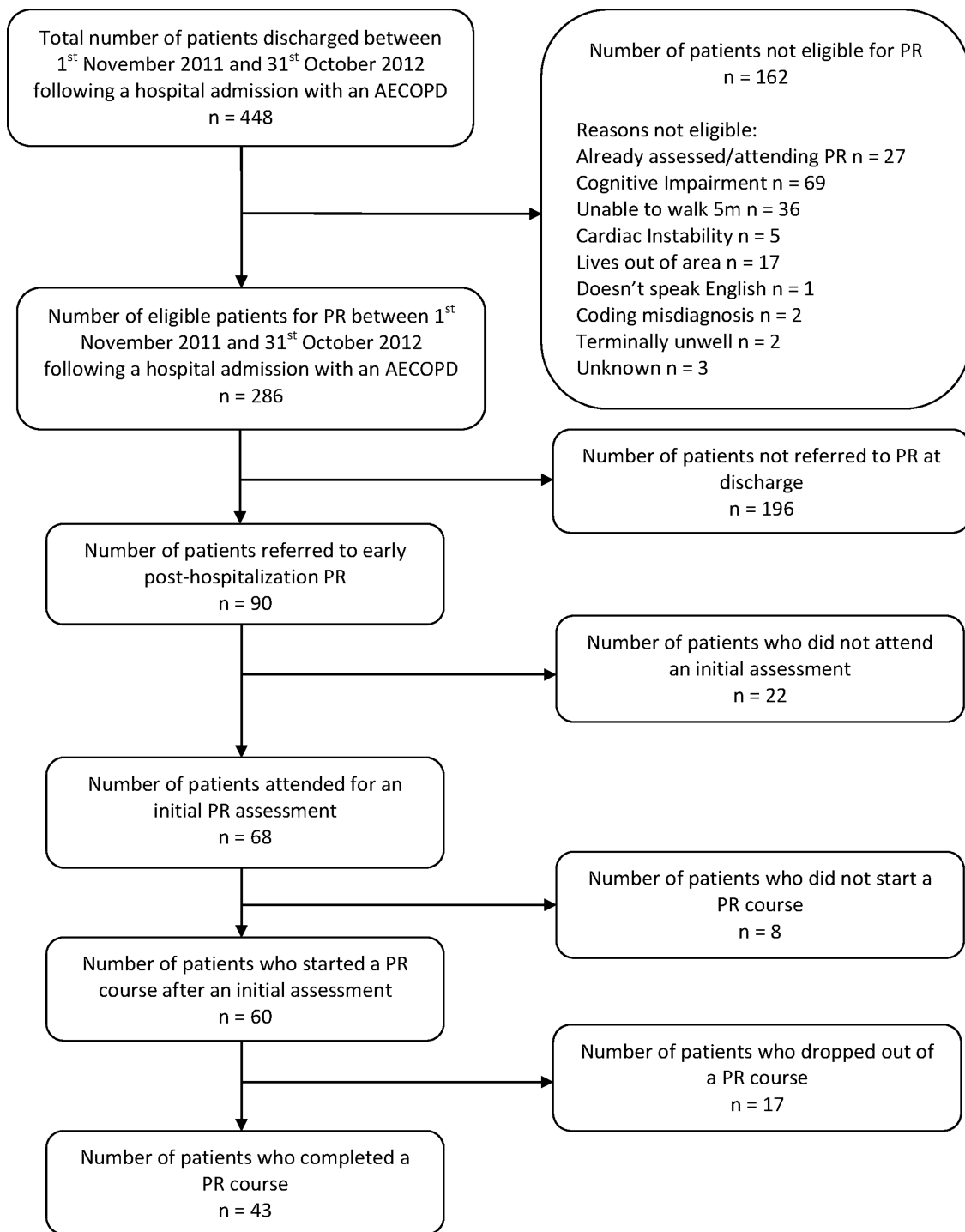


Figure 1 CONSORT diagram.

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## Online Supplement

### **Research Letter: Pulmonary rehabilitation following hospitalisation for acute exacerbation of COPD - referrals, uptake and adherence.**

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## **Inclusion and exclusion criteria for early post-hospitalisation pulmonary rehabilitation**

### **Inclusion criteria:**

- Admission for acute exacerbation of COPD, or pneumonia resulting in exacerbation of COPD;
- Functional and symptomatic impairment (typically MRC dyspnoea score 3 or above);
- Ability to mobilise 5 metres independently (with or without mobility aids);
- Motivated to undergo pulmonary rehabilitation

### **Exclusion criteria:**

- Unstable cardiac disease precluding safe exercise;
- Unable to follow simple commands;
- Terminally unwell;
- Pulmonary rehabilitation within last 3 months

## Patient Drop-Outs

90 patients were referred for early post-hospitalisation pulmonary rehabilitation with 43 eventually completing. Reasons for drop-out are outlined below:

<b>Stages in pathway</b>	<b>Reason for dropping out</b>
Failed to attend an initial assessment (n = 22)	No response to minimum 4 telephone calls or letter (n= 5) Declined initial assessment (n= 3) Did not attend at least 2 agreed assessment times (n= 10) Re-admitted to hospital (n= 3) Died (n= 1)
Non-starters of PR course (n = 8)	Cardiac issues requiring further investigations (n= 2) Re-admitted to hospital (n= 2) Transport issues (n= 4)
Non-completers of PR course (n = 17)	AECOPD (n= 7) Continued non-attendance - no reason (n= 7) Family illness (n= 1) Transport issues (n= 1) Failed to attend an end of course assessment (n= 1)

## **Pulmonary rehabilitation programme**

The pulmonary rehabilitation (PR) programme comprised an 8-week multi-disciplinary outpatient programme, involving two supervised outpatient exercise and education classes per week. Patients were also asked to exercise at home for at least one other occasion per week. Each supervised class comprised 1 hour of exercise (mixture of aerobic and resistance training) and 1 hour on education with an emphasis upon self-management.

## **Outcome measurements**

All measurements were carried out before and after the PR programme. Patients had exercise capacity assessed using the incremental shuttle walk (ISW) test. Further measurements included spirometry (at baseline only), health related quality of life (HRQL) questionnaires (Chronic Respiratory Disease (CRDQ)),<sup>(1)</sup> COPD Assessment Test (CAT)<sup>(2)</sup> and the St Georges Respiratory Questionnaire (SGRQ)),<sup>(3)</sup> and the five-repetition sit-to-stand test (5STS).<sup>(4)</sup>

## **Response to early post hospitalisation pulmonary rehabilitation**

Data from the 43 patients (28 male), that completed early post hospitalisation PR were analysed. Baseline characteristics, expressed as mean (SD), were age 74 (9) years, body mass index 26.9 (4.7) kg/m<sup>2</sup>, FEV<sub>1</sub> percentage predicted 49 (22) %. The response to early post hospitalisation PR is shown below.

Outcome	Pre-PR	Post-PR	p-value
CAT	18 (7)	16 (7)	p = 0.03
CRQ – Dyspnoea	15 (10, 19)	21 (15, 28)	p < 0.01
CRQ – Fatigue	14 (5)	17 (5)	p < 0.01
CRQ – Emotion	32 (10)	37 (9)	p < 0.01
CRQ – Mastery	17 (5)	21 (5)	p < 0.01
ISW (m)	220 (130, 330)	260 (140, 380)	p < 0.01
5STS (secs)	15.3 (11.2, 20.9)	13.3 (10.4, 17.0)	p < 0.01
SGRQ Symptoms	61.5 (16.8)	57.2 (17.6)	p < 0.01
SGRQ Activities	62.3 (23.7)	61.1 (23.1)	p = 0.54
SGRQ Impact	33.0 (17.7)	27.7 (15.4)	p = 0.01
SGRQ Total	46.6 (16.4)	42.7 (15.5)	p = 0.02

Data expressed as mean (SD) or median (IQR). Groups compared using paired *t* tests or non-parametric equivalent. CAT, COPD Assessment Test; CRQ, Chronic Respiratory Disease Questionnaire; ISW, incremental shuttle walk; 5STS, five-repetition sit-to-stand test; SGRQ, St Georges Respiratory Questionnaire;

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