P139 table 1). Most Venturi barrels delivered a lower FiO2 than intended. Those closest to the desired FiO2 were designed to work at higher flow rates. The 24% Venturi barrels caused significant back pressure which reduced delivered FiO2 and caused the concentrator to alarm.

Abstract P139 Table 1 Venturi performance with home oxygen concentrator

Venturi %	Flow rate	Oxygen concentration	Concentrator outlet pressure (psig) and back pressure		Oxygen concentration post Venturi %
Intersurgical Venturi barrels					
24	2	94.0	19.4	7.0	22.8
28	4	94.1	19.4	0.6	26.0
31	6	95.8	19.4	0.3	28.7
35	8	84.7	19.4	0.2	33.2
Salter labs Venturi barrels					
24	4	94.1	19.4	12.0	23.7
28	4	94.1	19.4	0.9	26.0
31	6	95.8	19.4	0.6	28.0
35	8	84.7	19.4	0.4	30.5
Respironics					
24	3	94.5	19.4	1.50	22.0
28	6	95.8	19.4	0.5	27.2
35	10*	95.0	19.4	0.3	36.9

*In order to deliver 10 l flow rate 2 Intensity concentrators were used.

Conclusions Venturi barrels used with oxygen concentrators in the home are likely to deliver a lower oxygen concentration than expected and are unlikely to lead to hypercapnic respiratory failure. For a controlled FiO2 to be delivered, the chosen concentrator and Venturi need to be tested so flow rate can be set accordingly but concentrators alarm systems may prevent practical use.

Pulmonary rehabilitation: a challenging exercise?

P140 UPTAKE AND COMPLETION OF PULMONARY REHABILITATION: THE INFLUENCE OF REFERRAL SOURCE

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[1]A L Clark, [1]K A Ingram, [1]R P Fowler, [1]P Marns, [2]S S C Kon, [2]J L Canavan, [2]W D C Man. *[1]Harefield Pulmonary Rehabilitation Team, Royal Brompton & Harefield NHS Foundation Trust, London, UK; [2]Respiratory Biomedical Research Unit, Royal Brompton & Harefield NHS Foundation Trust, London, UK*

Background Pulmonary rehabilitation (PR) leads to significant improvements in exercise capacity, health status and dyspnoea in patients with chronic respiratory disease, supported by a strong evidence base. Despite the known benefits of PR, a proportion of referred patients never attend while others fail to complete the programme. The doctor-patient relationship is complex and may influence uptake and adherence to therapy. We hypothesised that uptake and completion of PR would be greater in patients referred from a senior doctor (hospital consultant or GP) compared with those referred by junior doctors or allied health professionals.

Methods 466 consecutive referrals to the Pulmonary Rehabilitation (PR) programme were divided according to referral source: Senior Doctor (Hospital consultant or GP), Junior Doctor (Any trainee doctor from hospital or primary care) and Allied Health Professional (AHP: typically community/practice nurses or hospital physiotherapists). Uptake (proportion of referrals that start PR), and completion (proportion of patients that attended more than 8 PR sessions and the post-course assessment) were calculated for each referral source and compared using χ^2 test.

Results Overall uptake and completion rates were 78% and 75% respectively (raw data Abstract P140 table 1). Uptake was significantly greater in referrals from Senior Doctor compared with Junior Doctor or AHP (82% vs 67% and 74% respectively; χ^2 p=0.02), although no significant difference was seen in completion (77% vs 70% and 68%; χ^2 p=0.25). Abstract P140 table 1 shows the raw data. There was no significant difference in baseline patient characteristics between the referral sources (age, FEV_1%, MRC dyspnoea score, Hospital Anxiety and Depression score, incremental shuttle walk distance, Chronic Respiratory Disease Questionnaire, Lung Information Needs Questionnaire or COPD Assessment Test).

Abstract P140 Table 1

Referrer	Referrals	Uptake	Completers
Senior doctor	318	260	200
Junior doctor	64	43	30
Allied health professional	84	62	42
Total	466	365	272

Conclusion There is increased uptake of PR in patients referred by a hospital consultant or GP than if referred by a junior doctor or AHP. Further work is required to explore the reasons for this observation.

P141 UNWARRANTED VARIATION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE CARE: PROVISION OF PULMONARY REHABILITATION FOR LONDONERS

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[1]M Buxton, [1]S Prigmore, [2]K Barnes, [1]A Coombes, [1]S Williams, [1]L Restrick. *[1]NHS London, Southside, London, UK; [2]NECLES HIEC, London & Essex, UK*

Introduction and Objectives Pulmonary Rehabilitation (PR) is recognised as an essential component of care for patients with chronic obstructive pulmonary disease (COPD). However there is no national database of available or delivered PR services. The aim of this study was to identify and characterise PR services and service variation for a 7.75 million population in one Health Authority with 31 Primary Care Trusts (PCTs).

Methods PR leads in each PCT were identified and a telephone interview conducted using 52 clinical and service related questions including estimated annual referrals, rolling/cohort model, sessions/week, PR duration, assessment (duration, exercise capacity (Incremental Shuttle Walk (ISW), 6 min Walk Test (6MWT)) and quality of life (QOL) measures), psychologist involvement, completion measures and availability of post PR-maintenance programmes. Provision of PR was compared to quality outcomes framework (QOF) prevalence of diagnosed COPD.

Results 26/31 (84%) PCTs provide PR (74 programmes) from 32 service providers; 5 PCTs provide no PR. Provision was not related to COPD prevalence; the range of service referrals received was <50 to >700/year. 15/26 (58%) PCTS offered maintenance programmes. 52 programmes were rolling, 22 cohort, programme duration 6–8 weeks. 31/32 services provide 2 sessions/week (1 service 1 session/week); 15/32 (47%) services had psychology input. Assessments took 0.5–2 h/patient. 32/32 (100%) services used walking tests and 11/32 (34%) followed repeat walk guidance; 11/23 ISWT, 0/9 6MWT. Questionnaires used ranged between 1 and 5, 13/32 (41%) services used more than two questionnaires (See Abstract P141 table 1 below). (insert table as separate attachment) There was no standard definition of completion; range 50%–100% sessions attended. The range of estimates of completion rates (using own definitions) was <30% to >80%.

Abstract P141 table 1

No. of questionnaires used	1	2	3	4	5
No. of services	4	15	8	4	1

Conclusions PR is not available in five PCTs, despite evidence for its value, and capacity does not match need. Half of PCTs offer post-PR programmes reflecting demand from patients who complete PR. Studies of the value of maintenance PR are now needed. Reducing unwarranted variation in assessment process (questionnaires and walking tests), and completion (definition and rates) using standardised approaches to delivery and measurement would potentially release capacity for unmet need.

P142 PEDOMETER AND ACTIVITY MONITOR STEP COUNT RELIABILITY COMPARED TO VISUAL DURING WALKING IN PATIENTS WITH CHRONIC RESPIRATORY DISEASE

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[1]L J Turner, [1]L Houchen, [2]S Singh. *[1]University Hospitals of Leicester NHS Trust, Leicester, UK; [2]Faculty of Health & Life Sciences, Coventry University, Coventry, UK*

Introduction Chronic respiratory disease (CRD) is associated with reduced physical activity (PA), which pulmonary rehabilitation (PR) can improve. There are a variety of devices which monitor PA. Activity monitors (AM) are relatively small devices which utilise several accelerometers, temperature sensors and the galvanic skin response to provide data regarding energy expenditure, metabolic equivalents and step counts. However, AM's are expensive compared to pedometers and do not provide instant feedback. Our aim was to assess the reliability of step counting by pedometers and AM's compared to visual counts at varying walking speeds in patients with CRD.

Methods 48 patients with CRD wore a Yamax pedometer and a Sensewear Pro^3 AM during an ESWT as part of their PR discharge assessment. Speeds were calculated from ISWT and patients had performed the ESWT at baseline, in line with standardised guidelines. Patients requiring walking aids were excluded. Step counts were measured by the pedometer, AM and visually by a separate assessor. Visual step counts were considered "gold-standard" for comparison. For analysis, average step counts for 1 min were calculated at slow, medium and fast speeds. A Friedman's ANOVA test with post-hoc Wilcoxon signed rank was used to compare visual step counts to the pedometer and AM, as the data were not normally distributed.

Results The Friedman's ANOVA demonstrated there was a significant difference between the pedometer, AM and visual step counts at slow (p=0.0001) and medium (p=0.009) speeds but not at fast speeds (p=0.174). Abstract P142 table 1 demonstrates where the differences are between the pedometer, AM and visual step counts from the Wilcoxon signed rank test.

Conclusions At slow and medium walking speeds, there was a significant difference between visual counts and the pedometer and AM. There was also a significant difference between the AM and pedometer at slow speeds. At fast walking speeds there was no significant difference between the visual, pedometer and AM step counts. Overall, both the pedometer and AM underestimated steps at slow and medium walking speeds and are therefore not be suitable for use in patients with CRD who often walk slowly.

P143 EXPLORATION OF PATIENT ACTIVITY LEVELS FOLLOWING THORACOTOMY AND LUNG RESECTION

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[1]P Agostini, [1]H Cieslik, [1]B Naidu, [2]S Singh. *[1]Heart of England NHS Foundation Trust, Birmingham, UK; [2]Coventry University, Coventry, UK*

Background Reduced activity is a routine observation following major surgery, however no studies have yet measured or explored this. Causative factors include sedative drugs, reduced exercise tolerance and pain, as well as pre-existing pathology. We aimed to measure postoperative activity and observe outcomes of thoracotomy and lung resection patients, as well as identify predictive factors.

Methods A prospective observational study was conducted in a regional thoracic surgery centre. Sense Wear Pro 3 armbands were worn by patients from postoperative day (POD) 1 to 4. Postoperative physiotherapy included early mobilisation, which was progressed daily.

Results 99 patients were observed, 46 male (46%) and 92 (93%) had lung cancer. Mean (SD) age was 67 (±10) years and percentage predicted FEV_1 75% (±19). During PODs 2/3 patients took a median (IQR) of 472 (908) steps with >99% of time spent in sedentary activity (<3 METs). Low activity was defined as <500 steps during PODs 2/3 (n=50), and high activity >500 steps (n=49). Patients with lower activity demonstrated a median of only 220 (282) steps compared to 1128 (960) in more active patients (p<0.001), less time spent in moderate activity >3 METS (p=0.003) and more perceived pain during PODs 2/3 (p=0.013 and 0.004 respectively). Frequency of postoperative pulmonary complication (PPC) was 4% (n=2) vs 20% (n=10) (p=0.34) in patients with lower activity, with a median LOS of 6 (3) days vs 5 (2) days (p=0.013). Logistic regression identified age =75 years, predicted FEV_1 <70% and poor preoperative activity to be predictive of reduced postoperative activity, and COPD predictive of PPC (p<0.05).

Conclusion Low activity levels following thoracotomy are common despite regular physiotherapy; studies measuring pre and postoperative activity are needed to reveal the exact impact of surgery. It is not known whether reduced activity may cause PPC, or vice versa, and studies randomising patients to lower/ higher activity are needed to confirm this. Predictive factors could potentially be modified by preoperative physiotherapy/rehabilitation, and targeted postoperative exercise and escalation of analgesia may also be beneficial, however, evaluation of these strategies is required.

P144 EVALUATION OF MULTIDISCIPLINARY PULMONARY REHABILITATION EDUCATION DELIVERED BY EITHER DVD OR SPOKEN TALK

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[1]S Ward, [1]L Sewell, [1]S Singh, [2]S Singh. *[1]University Hospitals of Leicester, Leicester, UK; [2]Faculty of Health and Life Sciences, Coventry University, Coventry, UK*

Introduction Education is a core component of a multidisciplinary Pulmonary Rehabilitation (PR) programme. It is commonly delivered as a spoken session. This can create delivery problems when speakers are unavailable, and adds to the costs of a PR programme.

Abstract P142 Table 1

Speed	Mean visual steps (SD)	Mean AM steps (SD)	p Value between visual and AM	Mean pedometer steps (SD)	p Value between visual and pedometer	p Value between pedometer and AM
Slow (1.78–2.72 km/h)	79.46 (15.72)	67.98 (15.47)	0.001*	59.43 (22.31)	0.001*	0.023*
Medium (3.00–3.79 km/h)	96.19 (9.80)	77.50 (27.26)	0.004*	72.04 (38.40)	0.003*	0.836
Fast (4.11–5.54 km/h)	107.00 (14.18)	102.42 (16.46)	0.134	105.19 (24.80)	0.605	0.255

* denotes significant difference (p=0.0167 after bonferroni correction).