British Thoracic Society

ACPRC

ARNS
Association of Respiratory Nurse Specialists

Better lung health for all

Face to face pulmonary rehabilitation: What does the future hold?

Dr Claire Nolan
Brunel University London

Slides courtesy of Professor Sally singh

Overview

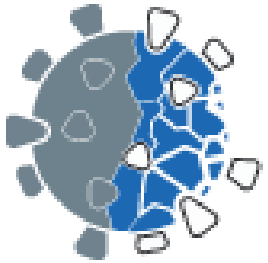
- What do we mean by face to face rehabilitation
- Value of face to face rehabilitation
- Challenges of face to face rehabilitation ?
- What might the future of face to face look like?

Pre, during and post (?) the pandemic

Strong evidence base
Guidance

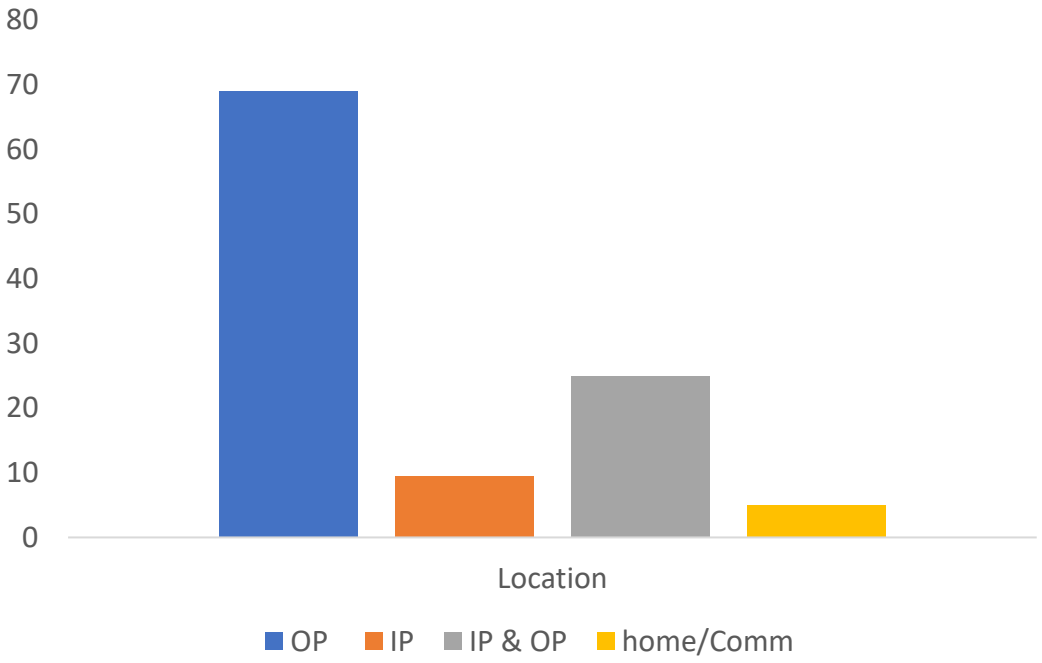
Package of individually prescribed and progressed exercise training and self management support

Limited evidence
Limited guidance

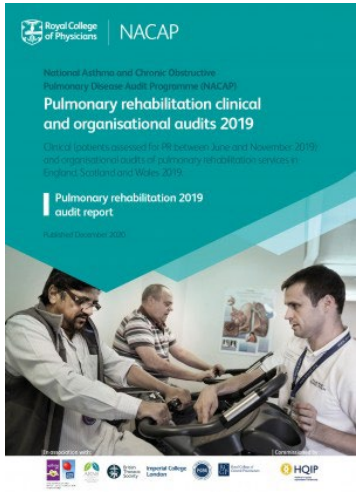


Potential to increase scope
Health inequalities/ digital competency

Pre COVID-19



430 centres from 40 countries[1]



Programme location[2]

97.9% of PR programmes offered were centre-based.

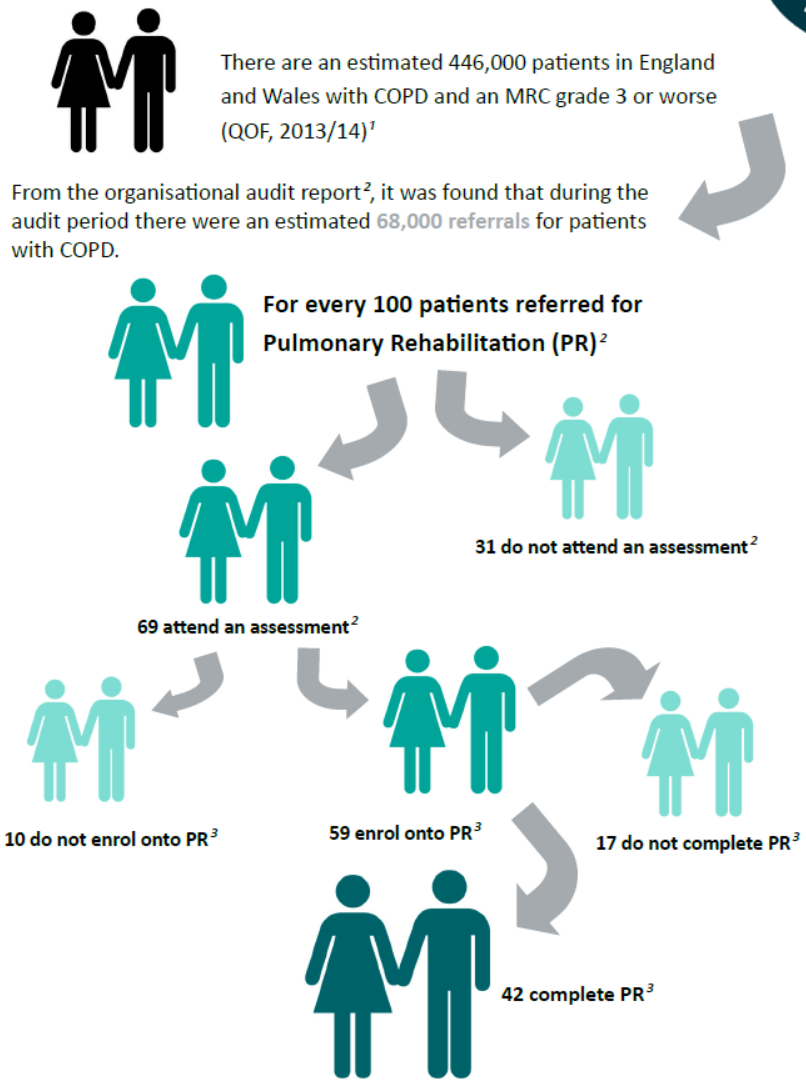
34.0% of services offered home-based PR but only **1.6%*** of PR programmes offered were home-based.

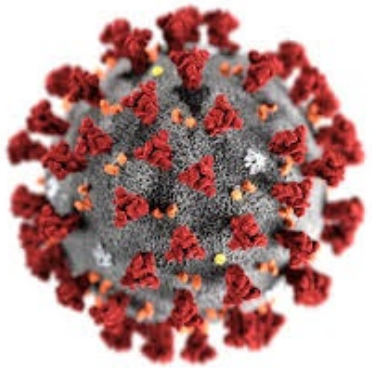
1. *Spruit MA et al.* Differences in content and organisational aspects of pulmonary rehabilitation programmes.,, *ERS Rehabilitation and Chronic Care, and Physiotherapists Scientific Groups., American Association of Cardiovascular and Pulmonary Rehabilitation., ATS Pulmonary Rehabilitation Assembly and the ERS COPD Audit team. Eur Respir J. 2014 May; 43(5):1326-37*

2. Singh S, et al. . National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP). Pulmonary rehabilitation audit report 2019. Combined clinical and organisational audit of pulmonary rehabilitation services in England, Scotland and Wales. London: RCP, 2020.

Current challenges (the old and the new)?

UPTAKE/DROP OUT





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. London: RCP.

British Thoracic Society

ACPRC

ARNS
Association of Respiratory Nurse Specialists

What do we mean by face to face?

It works

Cochrane Library

British Thoracic Society

ACPRC

Outcomes	Illustrative comparative effects* (95% CI)		Number of participants (studies)	Quality of the evidence (GRADE)
	Response on control	Treatment effect		
	Usual care	Rehabilitation versus usual care		
QoL - Change in CRQ (dyspnoea) CRQ Questionnaire. Scale from 1 to 7 (Higher is better and 0.5 unit is an important difference) Follow-up: median 12 weeks	Median change = 0 units	Mean QoL - change in CRQ (Dyspnoea) in the intervention groups was **0.79 units higher** (0.56 to 1.03 higher)	1283 (19 studies)	⊕⊕⊕○ **Moderate**[1,2,3]
QoL - Change in SGRQ (total) Scale from 0 to 100 (Lower is better and 4 units is an important difference) Follow-up: median 12 weeks	Median change = 0.42 units	Mean QOL - change in SGRQ (total) in the intervention groups was **6.89 units lower** (9.26 to 4.52 lower)	1146 (19 studies)	⊕⊕⊕○ **Moderate**[2,3,4]
Change in maximal exercise (Incremental Shuttle walk test (ISWT)) Distance metres Follow-up: median 12 weeks	Median change = 1 metre	Mean maximal exercise (incremental shuttle walk test) in the intervention groups was **39.77 metres higher** (22.38 to 57.15 higher)	694 (8 studies)	⊕⊕⊕○ **Moderate**[2,3,5]

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 process.
10	Pulmonary rehabilitation programmes produce an agreed standard operating procedure.

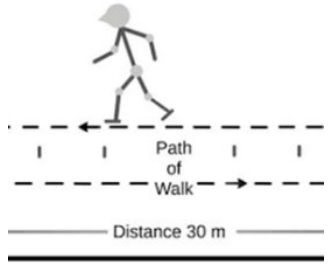
‘additional RCTs comparing pulmonary rehabilitation and conventional care in COPD are not warranted. Future research studies should focus on identifying which components of pulmonary rehabilitation are essential, its ideal length and location, the degree of supervision and intensity of training required and how long treatment effects persist’.

McCarthy B et al. Pulmonary rehabilitation for chronic obstructive pulmonary disease.Cochrane Database of Systematic Reviews 2015, Issue 2. Art. No.: CD003793.
Puhan MA et al. Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease. Cochrane Database Syst Rev. 2011 Oct 5;(10):CD005305.

Efficacy of unsupervised exercise in adults with obstructive lung disease: a systematic review and meta-analysis

Sixteen trials (13 COPD, 2 asthma, 1 chronic bronchitis: 1184 patients)

- Statistically but not clinically significant improvement in the 6-Minute Walk Test (n=5, MD=22.0 m, 95% CI 4.4 to 39.6 m, p=0.01).



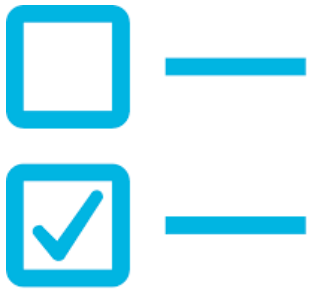
?

- Statistically significant and clinically meaningful improvements in St. George's Respiratory Questionnaire (n=4, MD=−11.8 points, 95% CI −21.2 to −2.3 points, p=0.01) & the Chronic Respiratory Disease Questionnaire domains (compared with non-exercise-based usual care.

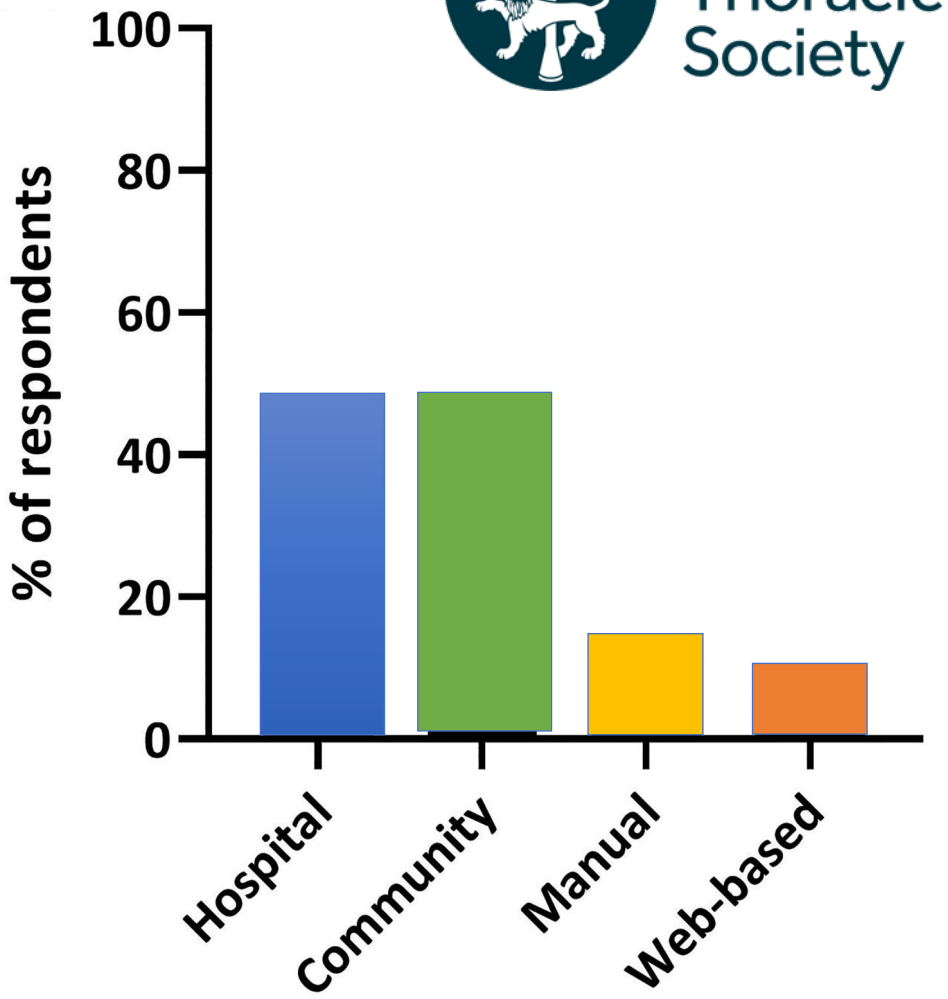
High-quality randomised trials are needed

Taylor D, Jenkins AR, Parrott K, *et al*. Efficacy of unsupervised exercise in adults with obstructive lung disease: a systematic review and meta-analysis. *Thorax* 2021;**76:**591-600.

& participants prefer it



N=193, 68% COPD
51% used the Internet daily
31% had never accessed it



- 79% preferred PR delivered face to face in a hospital or community setting
- 11% preference for an exercise manual at home supervised by weekly telephone calls
- 9% a Web-based app with no supervision

Polgar O et al. Digital habits of PR service-users: Implications for home-based interventions during the COVID-19 pandemic. *Chronic Respiratory Disease*. January 2020.

What can we do to make face to face PR better?

- Health inequalities
- Disease groups
- Personalisation/ stratification – matching the intervention to the patient characteristics/adjuncts/ training regimes etc.

Health inequalities

Health inequalities are unfair and avoidable differences in health across the population, and between different groups within society.

Often analysed and addressed by policy across four factors:

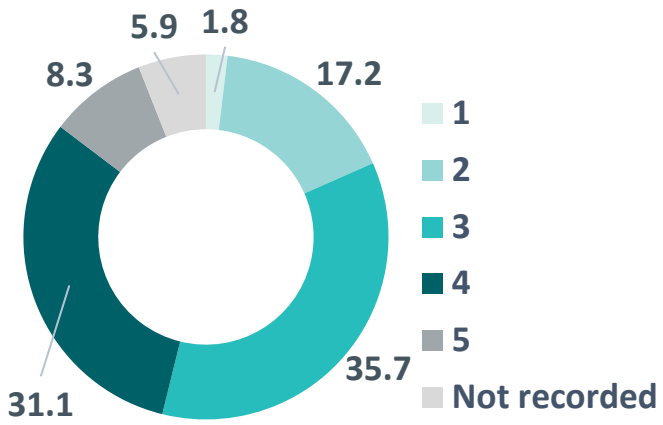
- socio-economic factors, e.g. income
- geography, e.g. region or whether urban or rural
- specific characteristics including those protected in law, such as sex, ethnicity or disability
- socially excluded groups e.g. people experiencing homelessness.

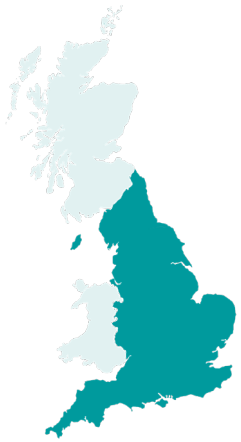
Has rehabilitation adapted to accommodate the needs of the population?

Access to pulmonary rehabilitation – MRC

Medical Research Council (MRC) scores

The majority of patients had either an MRC score of 3 **(35.7%)** or 4 **(31.1%)**.





MRC scores offered PR

Not all services in England offered PR for MRC grade 3–5. In particular, MRC grade 5 was not offered PR in **12.9%** of services in England.

O1

National QI priority O1: Offer PR to **all** patients with a COPD self-reported exercise limitation (Medical Research Council grade 3–5).

*An area of care or service provision highlighted as a patient priority (something of particular importance to patients) by the NACAP patient panel.

BY THE NACAP SELECTED PATIENT PANEL

Access to pulmonary rehabilitation

Equity of access[1]

Transport

65.3% of PR services **did not** offer transport to support patients' access to the service.

Referral from primary care[2]

A total of 13,297 people (16%) with COPD were referred from primary care for PR

Generally appropriate patients are being prioritised for PR referral; however, women, current smokers, and more deprived patients appear to have lower odds of referral.

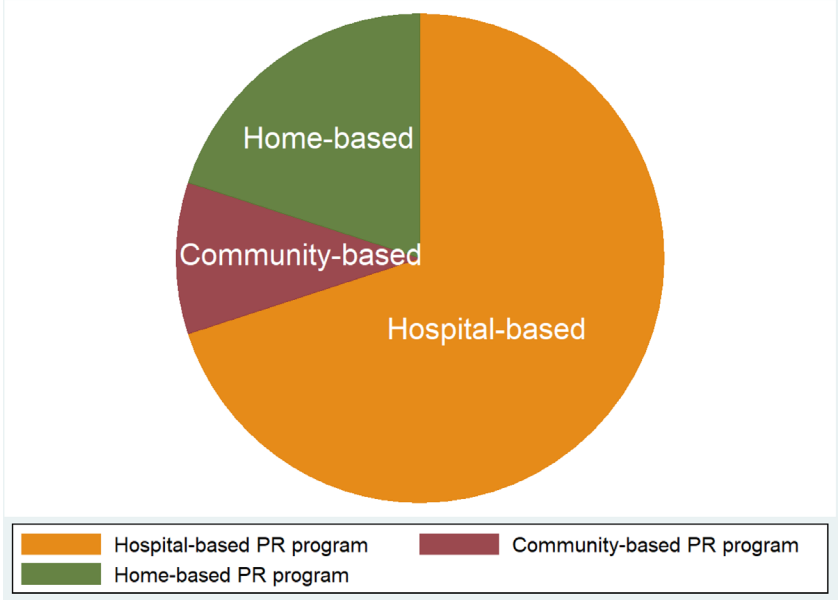
1. Singh S, Latchem S, Andrews R, Garnavos N, Long N, Stone P, Adamson A, Quint J, Roberts CM. National Asthma and Chronic Obstructive Pulmonary Disease Audit Programme (NACAP). Pulmonary rehabilitation audit report 2019. Combined clinical and organisational audit of pulmonary rehabilitation services in England, Scotland and Wales. London: RCP, 2020.
2.Stone, Philip W et al. "Predictors of Referral to Pulmonary Rehabilitation from UK Primary Care." *International journal of chronic obstructive pulmonary disease* vol. 15 2941-2952. 16 Nov. 2020, doi:10.2147/COPD.S273336

Developing culturally appropriate rehabilitation

a) initial survey of HCP and patients - Uganda

Patients with Chronic Respiratory Disease, including post-TB lung disease, were interested in attending Pulmonary Rehabilitation.

Health care workers considered PR as worthwhile in the management of CRD but they don't know enough about PR.



Uptake of PR can be increased through training and education for referrers about PR programs, and educating patients about the benefits of PR.

Katagira W et Assessing the knowledge and enthusiasm for Pulmonary Rehabilitation in Uganda: Global RECHARGE. BMJ Open 2021

RECHARGE

Developing culturally appropriate rehabilitation

b) qualitative work with patients –Kyrgyzstan

- Face to face interviews with patients conducted by staff
- Underlying assumption that singing and dancing would be an important cultural adaptation of the intervention

RECHARGE

Future demand – The long term plan

Better care for major health conditions

Cancer
Cardiovascular & Stroke
Diabetes
Adult mental health services
Respiratory disease (new)

…….By expanding pulmonary rehabilitation services over 10 years, 500,000 exacerbations can be prevented and 80,000 admissions avoided.

Extending the scope to other disease groups

British Thoracic Society

Association of Respiratory Nurse Specialists

Psychiatric

Neurological

Metabolic

Cardiovascular

MSK

Scand J Med Sci Sports 2015: (Suppl. 3) 25: 1–72
doi: 10.1111/sms.12581

SCANDINAVIAN JOURNAL OF MEDICINE & SCIENCE IN SPORTS

Exercise as medicine – evidence for prescribing exercise as therapy in 26 different chronic diseases

B. K. Pedersen[1], B. Saltin[2]

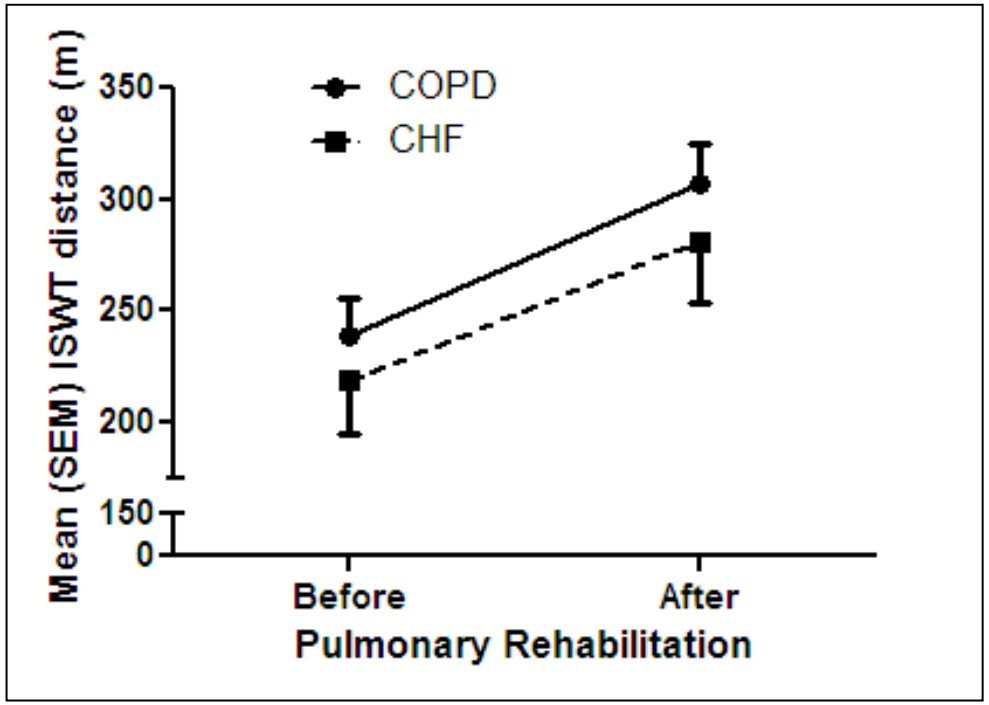
[1]The Centre of Inflammation and Metabolism and The Center for Physical Activity Research, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark, [2]The Copenhagen Muscle Research Centre, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark
Corresponding author: Bente Klarlund Pedersen, Rigshospitalet Section 7641, Blegdamsvej 9, DK-2100, Copenhagen, Denmark. Tel.: +45 35 45 77 97, Fax: +45 35 45 76 44, E-mail: bkp@rh.dk

Accepted for publication 16 September 2015

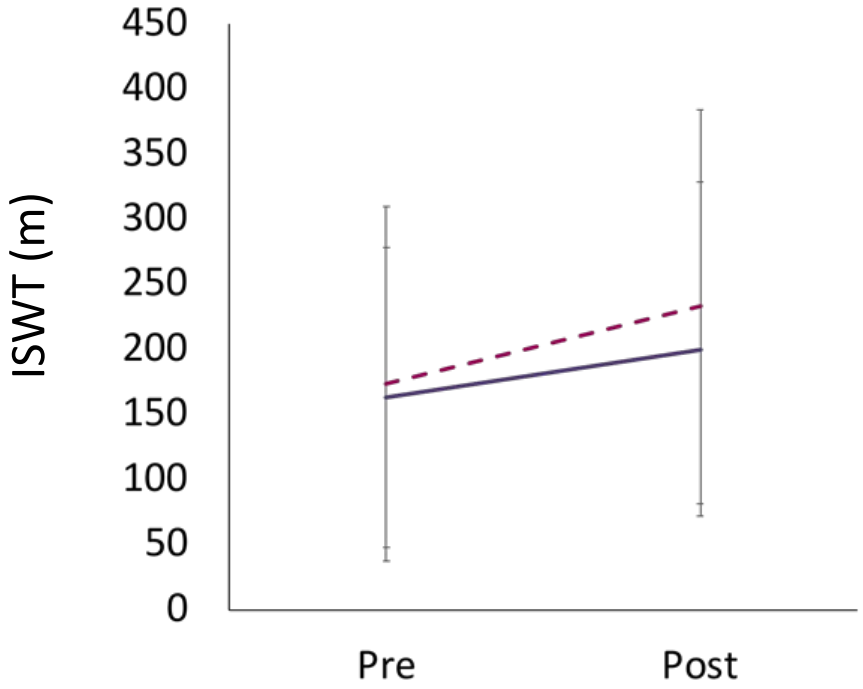
Pedersen, B.K. and Saltin, B. (2015), Exercise as medicine – evidence for prescribing exercise as therapy in 26 different chronic diseases. Scand J Med Sci Sports, 25: 1-72.

The evidence (limited!)

- Rehabilitation (exercise and education) is recommended for patients with lung and heart disease.
- Recruited individuals with either COPD or heart failure
- Based upon PR model (adaptation of the education programme)

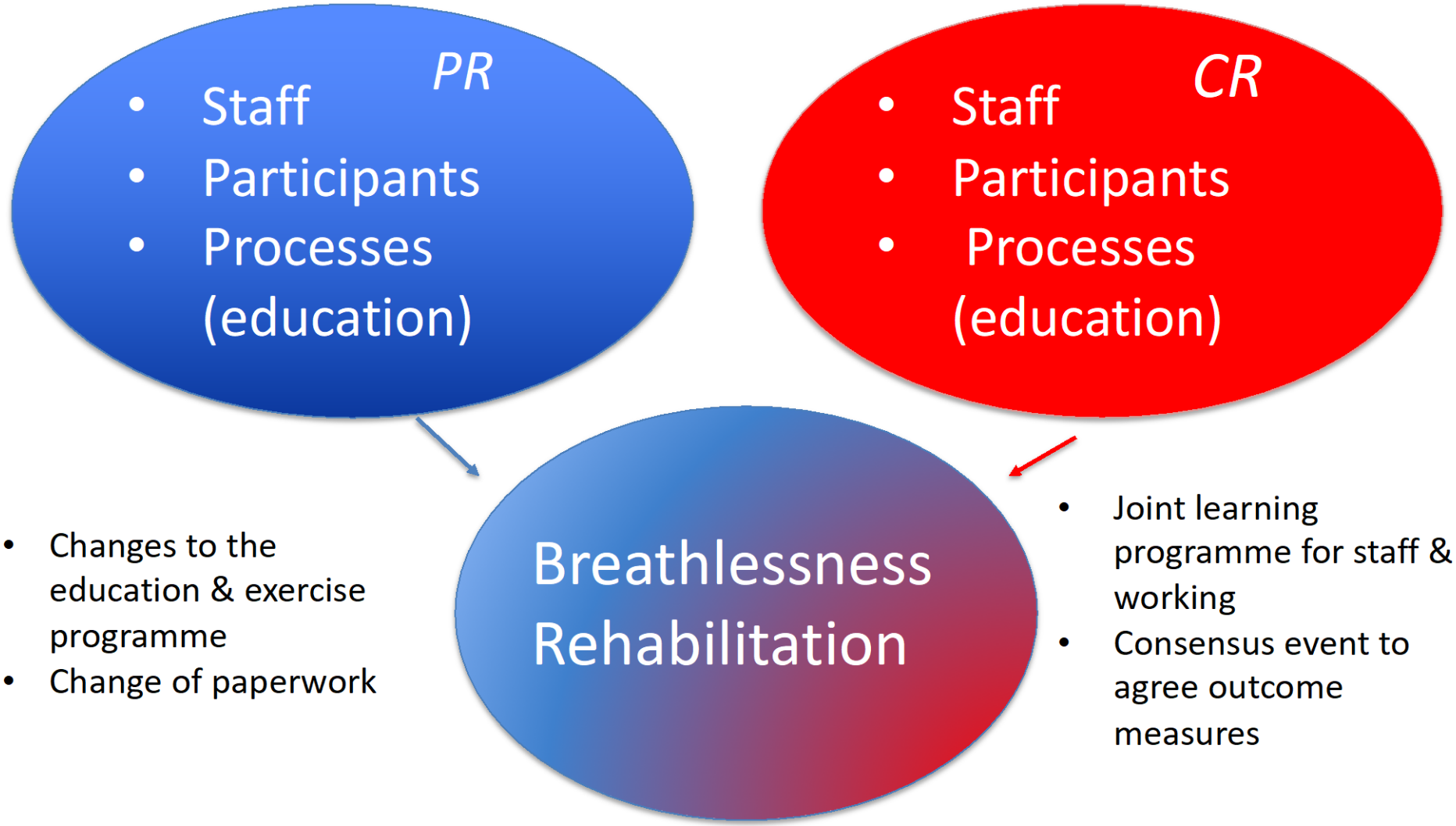


Evans R et al Resp Med 2010



- Data collected in 7413 adults, 2.6% (n=190) COPD+CHF
- n=232 propensity matched (n=116 in each group)
- Comparable changes in HRQOL

Blending the programmes



- Changes to the education & exercise programme
- Change of paperwork

- Joint learning programme for staff & working
- Consensus event to agree outcome measures

Clinical Results

- 99 patients went through the programme in 8 months. Mainly COPD and heart failure. 58% male, age 69.3 years, BMI 29.9.

Outcome	Pre	Post	Change
ISWT: incremental shuttle walk test m	254.1 (142.3)	307.0 (159.6)	52.9 (58.4)**
ESWT: endurance shuttle walking test sec	221.1 (129.9)	661.7 (426.8)	440.6 (387.2)**
Dyspnoea (CRQ/ CHQ):	3.1 (1.1)	4.0 (1.2)	1.0 (1.2)**
Anxiety (HADS)	7.5 (3.7)	5.8 (2.4)	-1.7 (3.1)*
Depression (HADS)	6.2 (3.2)	4.8 (3.4)	-1.4 (2.1)*

Clinical outcome measures following rehabilitation. Data are mean (SD). **p<0.001

Chaplin E Respiratory Research Open 2021

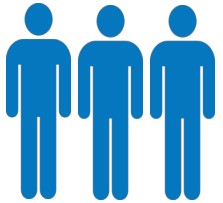
Multi-morbid rehabilitation

(Personalised Exercise-based Rehabilitation FOR people with Multiple LTCs (PERFORM)).

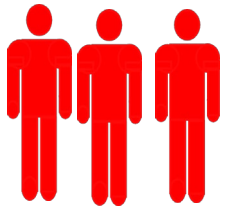
- Multimorbidity, commonly defined as the presence of two or more chronic medical conditions within an individual.
- Exercise based rehabilitation beneficial for a large number of long terms conditions.
- No appetite for replicate single index rehabilitation programmes.
- Requires intervention development and training programme for staff

Multimorbid

Common symptom burden & disability:
fatigue, breathlessness,
pain, anxiety, reduced exercise tolerance &
reduced health related quality of life (QoL)



Pulmonary rehabilitation (PR)



Cardiac rehabilitation (CR)

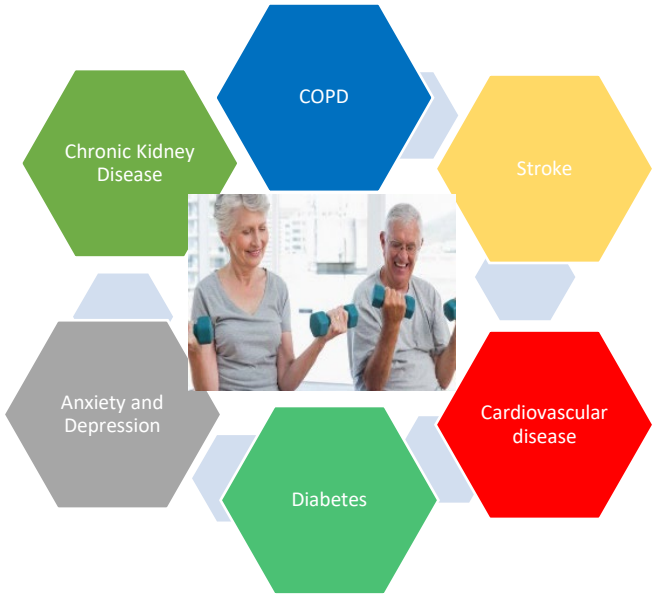
Personalised **E**xercise **R**ehabilitation **FOR** People with **M**ultiple Long Term Conditions (PERFORM)

COMPREHENSIVE PERSONALISED REHABILITATION ASSESSMENT

GENERIC EDUCATION

- Healthy living
- Healthy diet
- Smoking cessation
- Anxiety management
- Stress management
- Symptom management
- Exercise & physical activity
- Self management support

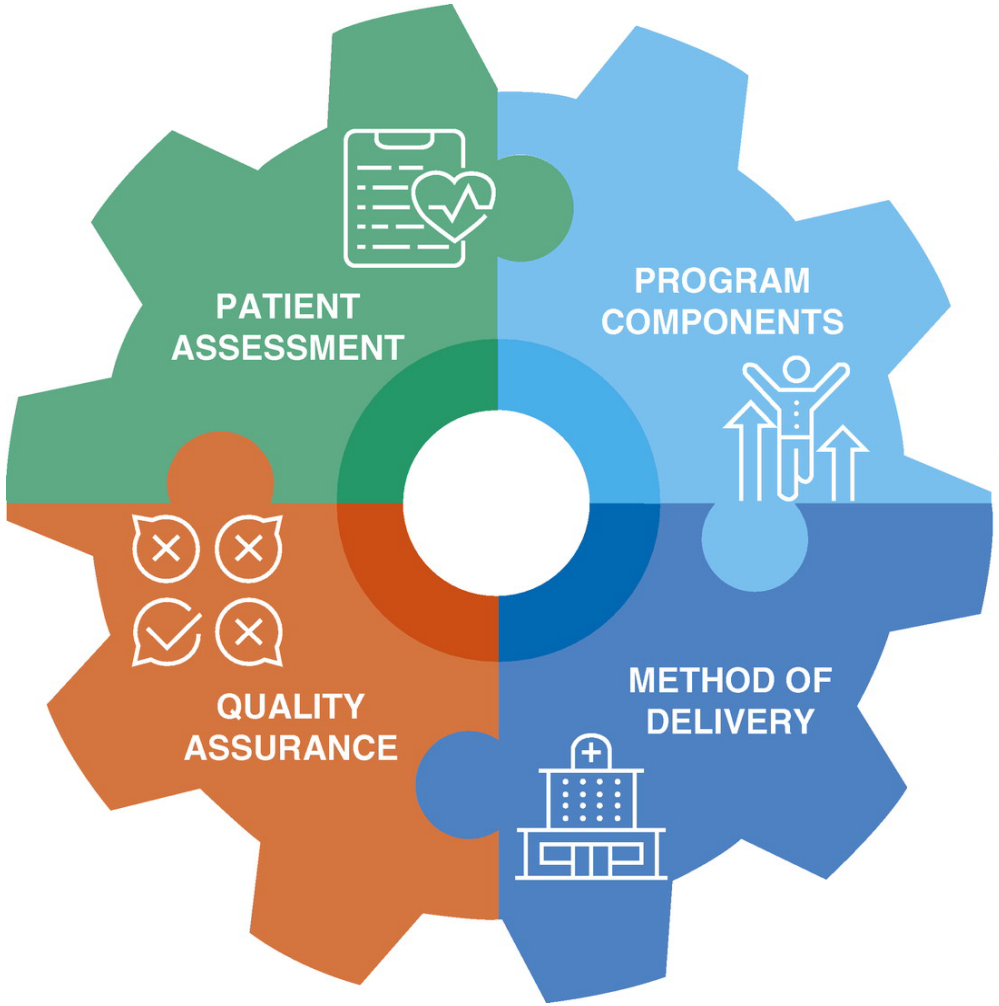
Personalised exercise training



PERSONALISED EDUCATION

- Managing acute exacerbations (respiratory/cardiac)
- Avoiding hypoglycaemia with exercise (diabetes)
- Managing medication and interrelated side effects (polypharmacy)

Defining modern pulmonary rehabilitation - essential



1. An initial center-based assessment by a health care professional
2. An exercise test at the time of assessment
3. A field exercise test
4. Quality of life measure
5. Dyspnea assessment
6. Nutritional status evaluation
7. Occupational status evaluation

8. Endurance training
9. Resistance training

10. An exercise program that is individually prescribed
11. An exercise program that is individually progressed
12. Team includes a health care professional with experience in exercise prescription and progression

13. Health care professionals are trained to deliver the components of the model that is deployed

Essential components of pulmonary rehabilitation. Essential components of the pulmonary rehabilitation model were identified through a Delphi process. An essential component was defined as having a median score ≤2 (strongly agree or agree it is essential) and high consensus (interquartile range, 0).

Holland A E et al ;Defining Modern Pulmonary rehabilitation ; *Annals ATS* 18e12-e29.2021

Summary

- Centre based rehabilitation has a strong evidence base and accompanying guidance/standards
- Face to face assessment and discharge inevitable for the foreseeable future
- High quality trails needed of unsupervised PR to complement F2F -PR
- High demand for F2F- PR –but community need to increase the scope of interventions delivered

Improve access to centre based PR

Increase scope of PR

Develop high quality alternative interventions