# Protocol for a single-arm feasibility trial assessing home-based pulmonary rehabilitation for adults with idiopathic pulmonary fibrosis in Delhi, India

This research is part of the Global RECHARGE Project, an NIHR (National Institute for Health and Care Research)-funded Global Health Research Group for Pulmonary Rehabilitation in low- and middle-income countries.

### **ABSTRACT**

**Background and objectives:** Pulmonary rehabilitation (PR) is recommended for individuals with idiopathic pulmonary fibrosis (IPF). Limited access and barriers such as distance and cost associated with center-based PR in India support the development of home-based PR (HBPR) as an additional option for services. This study assessed the feasibility and acceptability of HBPR for individuals with IPF in Delhi, India.

## Methods and analysis

This study comprised of three work packages (WPs).

WP1 Collected qualitative data and conducted interviews with adults with a diagnosis of IPF, family caregivers, and healthcare professionals to guide the content of the home-based PR trial using the SPACE for COPD Manual(n=40).

WP2 is a single-arm feasibility trial, Individuals with IPF were recruited to a 6-week HBPR program using a paper-based manual. home-based PR for people living with IPF in Delhi, India (n=30). The primary outcome was feasibility; with progression to a full trial based on recruitment (percentage of eligible patients recruited), retention (percentage who completed the outcome assessment), and acceptability. Secondary outcome measures included measures of exercise capacity, respiratory symptoms, psychological well-being, and the economic burden of chronic respiratory disease.

WP3 conducted a qualitative evaluation of the PR intervention through interviews with patients (up to n=30).

**Results:** Three major themes were generated from pre qualitative interview: (i) Health impact, which included pathophysiological changes, range of symptoms experienced, disease consequences, and impact of comorbidities; (ii) Disease management, which described strategies to control the progression and overall management of IPF, such as medications and exercises; (iii) Mode of Pulmonary Rehabilitation, which described perceptions regarding HBPR, comparisons with center-based programmes, and how HBPR may fit as part of a menu of PR delivery options. Out of 42 screened, 36 individuals with IPF were eligible (86% of screened). Of these, 30 were recruited (83% of eligible, 71% of screened; 60±13 years, 53% female), with 25 completing their follow-up assessment (83% of recruited). HBPR was generally well-accepted in this population, with qualitative themes including: 'facilitators and

barriers to HBPR' (family support and flexibility of home environment were facilitators whereas lack of supervision and inability to follow a routine were barriers), 'perceived changes from taking part in HBPR' (improved exercise capacity, breathlessness, confidence, and independency), and 'how to improve HBPR in the future' (translating the manual into various languages, and incorporating into a more hybrid approach).

Conclusion: HBPR using a paper-based manual was feasible and acceptable, making it potentially suitable to improve uptake and completion of PR for individuals with IPF in Delhi, India.

# Paper-based ILD manual SPACEforCOPD©' manual developed in the UK



#### Your walking diary.







You can check your walking durat smartwatch as well.

How hard was it today? 0 = very easy, 10 = almost impossible

		_					
Date	Minutes of continuous walking	How hard was it?	Total walk time (minutes/ seconds)	Date	Minutes of continuous walking	How hard was it?	Total walk time (minutes/ seconds)
7/11	4.02	7	21 min 18 mc				

Chape 1 How to get little

#### Let's get going!.

Your starting point

When you were assessed, your walking time was \_

The speed you walked at was\_

The speed you are being asked to walk at is \_

This combination of time and distance forms the basis of your exercise

Now set yourself a target to start your walking programme.

My goal is to walk continuously for ...... .... minutes.

When I will do this:
Where I will do this:

How I will do this: (For example, do you need any equipment? Do you need to drive somewhere to walk on the flat?)

Who I will do this	IS WITH

Stage 3: How to get stronger)

# ARM STRENGTHENING

#### 1. Shoulder side raise:

- . Stand with your arms by your side, keep your elbow straight and hold the weight or contains (Figure a)
- Raise your arms outward to overhead (Figure b)
- Breath out while moving up, breath in when moving down



### 2. Overhead Press:

- Hold the weights or containers in hand at chest level (Figure a)
- Raise both arms overhead straight up (Figure b) and out together and then lower the arms in starting position.
- breath out while moving up. breath in while moving down



#### 3. Diagonal outward:

- . Stand or sit. Hold the weights or containers in your hand, raise your right hand diagonally (Figure b) and bring it down diagonally (figure a), do vice versa with left arm.
- Breath out while moving up. breath in while moving do



#### 4. Bicep curls

- Hold one weight or container in each hand.
- Straighten your arms by your side (palms facing out, Figure a).
- Keep your elbows tucked into your chest (Figure b).
- . Bend your elbows bringing your hands to your shoulders. Repeat.
- . Breath out while moving up. Breath in while lowering down





Chage 2: How to get stronger

#### 5. Pull-ups

- . Hold a weight or container in each hand (palms facing in).
- Stand with your arms in front of your thighs (Figure a) and draw your hands up to your face until your elbows are pointing outwards (Figure b).
- Slowly lower. Repeat.
- Breath out while moving up, breath in while lowering down the arms.





limitations, all above exercises can be done in sitting position

#### LEG STRENGTHENING EXERCISES:

#### 1. Knee Extensions

- Sit in a chair with your back straight and place feet flat on the floor (Figure a).
- Tie weight cuff on ankles, as suggested by your Rehabilitation Specialist.
- Raise your right leg straight, hold it for 10 count and do vice versa

with left leg (Figure b), you can complete 10 repetitions

 Breath in while lowering your leg down, breath out while raising your leg up.



#### 2. Hip Marching

- . Sit in a chair with back straight and place feet flat on the floor (Figure a)
- Tie weight cuff on ankles suggested by your Rehabilitation Specialist
- · Raise up your right knee as high as comfortable. Lower your leg (Figure b).
- Raise your right knee as high as comfortable. Lower your leg.
- Breath in while lowering your leg down, Breath out while raising



