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Cardiopulmonary exercise testing for pulmonary rehabilitation and exercise tailoring for people with pulmonary fibrosis

Submission date
25/06/2026

Recruitment status
Recruiting

Registration date
26/06/2026

Overall study status
Ongoing

Last Edited
25/06/2026

Condition category
Respiratory

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Interstitial lung diseases (ILDs) are a group of around 200 long-term lung conditions, which often lead to lung failure. Pulmonary rehabilitation is a mix of exercise, advice and education used to support people with these diseases to help maintain their lung function and quality of life. The main aim of this research project is to improve pulmonary rehabilitation practice for people with pulmonary fibrosis by using a tailored approach.

Who can participate?
Adult patients from the ILD Clinic at the Royal Devon and Exeter University Trust and the EPIC-PF PPIE group.

What does the study involve?
All participants will be provided with a project information pack to include all the relevant consent forms, study details and questionnaires.

A cardiopulmonary exercise test (CPET) will be performed to see if the tailored methods are suitable. Five minutes of unloaded cycling will also be used as a ‘warm up’ and ‘cool down’.

Study Visit 1: Participant characteristics and anthropometric measures will be recorded and added to their individual, anonymised study profiles. An incrementally ramped CPET will be conducted on an electronically braked cycle ergometer, which is linked to a metalyzer for breath-by-breath gas analysis and a 12-lead Electrocardiogram (ECG).

If deemed appropriate, the next phase of the project will consist of Study visit 2 and study visit 3. The same CPET set up from Study Visit 1 will be used.

Study Visit 2: a 10-minute bout of aerobic exercise at ‘below’ the participants’ gas exchange threshold. Five minutes of unloaded cycling will also be used as a ‘warm up’ and ‘cool down’.

Study Visit 3: a 10-minute bout of aerobic exercise at ‘above’ the participants’ gas exchange threshold.

After completion, a series of questionnaires will be provided so that people with PF can give their perspectives on a range of elements related to quality of life, behaviours and attitudes.

What are the possible benefits and risks of participating?
Benefits: Taking part will give participants the confidence to perform exercise as it will be tailored to their individual capabilities and hopefully benefit their health and quality of life. However, the participant may receive no personal benefit from their participation in the research.

Risks: All exercise carries a risk, whether this is serious adverse events during exercise and/or minor injuries. Each individual patient and session will be risk-assessed in an attempt to mitigate these risks. Furthermore, all participants will have clearance from their consultant to participate in the study, and all exercises will be supervised by a medical practitioner with experience working with this patient population.

Where is the study run from?
University of Exeter, UK.

When is the study starting and how long is it expected to run for?
June 2026 to June 2029

Who is funding the study?
NIHR Exeter Biomedical Research Centre, UK.

Who is the main contact?
Dr Owen Tomlinson, O.W.Tomlinson@exeter.ac.uk

Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Integrated Research Application System (IRAS)
354740

Protocol number
24-25-39

Study information

Scientific Title
Cardiopulmonary exercise testing for Pulmonary rehabilitation and Exercise Tailoring - for people with Pulmonary Fibrosis (CPET-PF)

Acronym
CPET-PF

Study objectives
To explore if Cardiopulmonary Exercise Testing (CPET) can support tailored exercise prescription for patients with Pulmonary Fibrosis (PF).

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 17/04/2026, Brighton and Sussex Research Ethics Committee (2 Redman Place, Stratford, London, E20 1JQ, United Kingdom; +44 020 7104 8202; brightonandsussex.rec@hra.nhs.uk), ref: 26/LO/0111

Primary study design
Observational

Secondary study design
Cohort study

Study type(s)

Health condition(s) or problem(s) studied
Pulmonary fibrosis

Interventions
This is an observational study, consisting of three study visits:

Visit 1: Baseline assessments and cardiopulmonary exercise test to determine gas exchange threshold (GET) and exercise capacity (VO_2peak)
Visit 2: 10-minute exercise session below GET (‘moderate’ exercise).
Visit 3: 10-minute exercise session above GET (‘heavy’ exercise).

Each session includes a 5-minute warm-up and a 5-minute cool-down.

Patient-reported experience measures (PREMs) and health-related quality of life (HRQoL) questionnaires will assess acceptability and perceived benefit.

Visits 1, 2 and 3 will be separated by a minimum of 72 hours to allow sufficient recovery between exercise bouts. Visits 2 and 3 will be randomised; therefore, patients may perform 'moderate'

first or 'heavy' first. The second bout will therefore be the condition that they have not already done.

Intervention Type
Mixed

Primary outcome(s)
1. Peak volume of oxygen consumption (VO2peak) measured using CPET (mL.kg-1.min-1 and L. min-1) at all 3 study visits

2. Peak work rate (WRpeak) measured using CPET (W) at all 3 study visits

3. Volume of oxygen consumption at Gas Exchange Threshold (GET) measured using CPET (mL. kg-1.min-1 and L.min-1) at all 3 study visits

4. Peak minute ventilation (VEpeak) measured using CPET (L/min) at all 3 study visits

5. Heart Rate measured using CPET (beats·min-1) at all 3 study visits

Key secondary outcome(s)
1. Functional disability due to dyspnoea measured using the Modified Medical Research Council (mMRC) Breathlessness scale (0-10) at all 3 study visits

2. Self-perceived exertion measured using the Rate of Perceived Exertion (RPE) scale (0-10) at all 3 study visits

3. Affective response to exercise measured using the Affective Response to Exercise scale (-5 to +5) at all 3 study visits

4. Oxygen saturations measured using a pulse oximeter (%sp02) at all 3 study visits

5. Lung function measured using a spirometer or body plethysmograph to assess diffusing capacity of the lungs for carbon monoxide (DLCO), forced expiratory volume in one second (FEV1), and forced vital capacity (FVC) at Visit 1

6. Lung sounds measured using a digital stethoscope at Visit 1

7. Volatile Organic Compounds (VOCs) measured using Spironose at Visit 1

8. Grip strength measured using a grip strength dynamometer (N) at Visit 1

9. Acceptability measured using the Theoretical Framework of Acceptability (TFA) via a questionnaire (customised) at Visit 1, 2 and 3

10. Health status measured using the King's Brief Interstitial Lung Disease (K-BILD) questionnaire at Visit 1

11. Symptoms and quality of life measured using the Living with Pulmonary Fibrosis (L-PF) questionnaire at Visit 1

12. Lung resistance and reactance measured using oscillometry; R5 (resistance at 5 Hz), X5 (reactance at 5 Hz), R20 (resistance at 20 Hz), and the difference between R5 and R20 (R5-R20) at Visit 1

Completion date
25/06/2029

Eligibility

Key inclusion criteria
1. Confirmed diagnosis of PF
2. Aged 35 to 85 years
3. Able to provide informed consent/assent
4. Able to perform CPET

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
35 Years

Upper age limit
85 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Presence of severe co-morbidity limiting mobilisation or physical activity participation (e.g. Orthopaedic, cardiac or neurological condition)
2. Previous lung transplantation
3. Pregnancy

Date of first enrolment
25/06/2026

Date of final enrolment
25/06/2028

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Royal Devon & Exeter Foundation Hospital
Barrack Road
Exeter
England
EX2 5DW

Sponsor information

Organisation
University of Exeter

ROR
https://ror.org/03yghzc09

Funder(s)

Funder type

Funder Name
NIHR Exeter Biomedical Research Centre

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	version 3	15/04/2026	25/06/2026	No	Yes
Protocol file	version 2	20/02/2026	25/06/2026	No	No