

Prehab Study

A pilot study of a home-based intervention to treat frailty in lung transplant candidates

Study Protocol

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Potential subjects will be selected from existing enrollment in Dr. Jonathan Singer's ongoing Frailty study (UCSF CHR: Frailty 12-08437) or in the Global UCSF Study (UCSF CHR: Global 13-10738).

In-Person Assessment and Training:

1. Explain the goal of the program: to treat frailty in order to optimize physical functioning status before lung transplantation
2. Frailty assessment if not already performed within the previous 14 days. Frailty will be assessed with the Short Physical Performance Battery (SPPB). The SPPB is a well-validated battery of 3 lower extremity performance measures: walking speed, chair stands, and balance. Measures are scored from 0-4 and integrated into a summary score ranging from 0-12. The battery has excellent inter-observer reliability, test-retest reliability, and predictive validity.
 - Balance: test whether subjects can stand on their own without assistive devices with their feet in tandem for 10 seconds, staggered for 10 seconds, and one directly in front of the other for 10 seconds.
 - Chair stands: time (in seconds) required to stand up and sit down from a chair five times.
 - Walk speed: time (in seconds) required to walk 4.57 meters at subject's usual pace.
3. Determine exercise capacity according to ATS Guidelines (<https://www.thoracic.org/statements/resources/pfet/cardioexercise.pdf>):
 - Six Minute Walk Test (6MWT) if not performed in the previous 14 days
 - Perform and teach oxygen titration with exercise/activity.
4. Determine nutritional status:
 - Meet with a clinical dietician to review dietary habits
 - Measure height and weight to calculate body mass index and ideal body weight
5. Develop prescription for exercise: frequency, duration, modes, intensity, plans for progression based on American Thoracic Society Guidelines. Exercise prescription will be developed by Chris Garvey, NP, who develops treatment plans and exercise prescriptions at the UCSF Pulmonary Rehabilitation Program and previously did the same at the Seton Hospital Pulmonary and Cardiac Rehabilitation Program for 20 years.
 - Aerobic: walking or exercise bike or treadmill based on available equipment at home
 - Strength training:
 - Arms: with latex-free elastic bands and push-ups against a wall
 - Legs: repeated chair stands, extension with latex-free elastic bands
 - Based on the Weight-Bearing and Better Balance Protocols
 - Strategies for improving balance
 - Teach and model teach-back of exercises
 - Distribution of tablets with Aidcube app preloaded and training on how to use the program at home - each subject's exercise plan will be programmed by Chris Garvey through the "provider portal"
 - Exercise plans are customizable: different plans can be developed for days of the week, times of the day, and frequencies

- Exercise plans will be advanced over time: the provider sees the participant activity through the provider portal and can adjust the exercise plans in real time, allowing for “exercise progression”.
 - The patient portal provides the exercise prescription to the patient and direct feedback allowing them to track progress and interact with their provider through a messaging interface
 - Notably, the Aidcube app is commercially available and approved and reimbursed by insurers in the Netherlands for home pulmonary rehabilitation in patients with COPD.
6. Develop a diet plan based on estimated caloric needs, food habits, and body mass index
 - For supplements, will recommend commercially available, high energy, high protein supplements
 7. Self-management skills: control of dyspnea, fatigue, motivation, and support
 8. Training in protocol implementation at home by coordinator trained in principles of behavior change, adult learning theory, and dyspnea control techniques

Subjects will be compensated \$30 to cover the cost of parking when coming in for the in-person assessment.

Home Program:

The frequency, intensity, and progression of the individually tailored three-month exercise program will be based upon results acquired through Aidcube. However, the program will target no less than 30 minutes of combined aerobic and strength training exercises three times a week.

Method of monitoring

- Aidcube app
- Fitbit activity tracker
- A study coordinator will call subjects weekly in addition to interacting with participants through the app interface.

Adherence

- Weekly phone calls for encouragement
- Checking Fitbit activity data

In person follow up after the 8 week intervention:

Participants will return 8 weeks after their in-person assessment and will repeat the SPPB and 6MWT with the study coordinator.