

2016/2017 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on **4 July 2016**

Supervisor Information (First named supervisor will be the contact):

First Supervisor's Name and Title: Professor Lutz Beckert

Department - UOC &/or CDHB (if applicable): Medicine, UOC

First Supervisors Phone: 027 4677583

First Supervisors Email: Lutz.Beckert@cdhb.health.nz

First Supervisors Mailing Address: Department of Medicine, UOC

Co-Supervisors Name and Title(s): Dr Paul T Kelly

Research Category (Choose one category only – to be used for judging the students' presentations):

Clinical ✓

Laboratory

Community

Project Title (20 words MAXIMUM):

Nasal high flow therapy: The effect on exercise performance in patients with Chronic Obstructive Pulmonary Disease.

Project Description:

Introduction: The six minute walk test (6MWT) is a standardised test for assessing exercise capacity in patients with cardiopulmonary disease¹. In chronic obstructive pulmonary disease (COPD), the 6MWT is commonly used to assess the effectiveness pulmonary rehabilitation². COPD is characterised by a reduced ventilatory reserve during exercise which is usually the prime contributing factor to exercise limitation. During exercise, patients with COPD may change their breathing strategy by increasing the respiratory rate and lowering tidal volume which is associated with an increased work of breathing. Further exercise abnormalities include inefficient ventilation due to the increased dead space ventilation³.

Nasal high flow therapy (NHFT) is an emerging therapeutic treatment for a range of patients with acute and chronic respiratory conditions. Nasal high flow therapy provides patients with heated (37 degrees), high flow (up to 60 L.min⁻¹) air via a large bore nasal cannula. Proposed mechanisms of action of NHFT include a washout of nasopharyngeal dead space, attenuation of inspiratory resistance, improvement in conductance and compliance, and reduction in the energy expenditure associated with gas conditioning⁴. Given that exercise limitation in patients with COPD is primarily ventilatory driven, it may be possible that providing NHFT may attenuate some of these limitations by providing initial gas conditioning, assisting with dead space washout, and providing a respiratory resistance thereby reducing the work of breathing.

Aim: The purpose of this study is to investigate the effect of NHFT on exercise capacity in patients with COPD. The primary hypothesis is: NHFT will improve the 6MWT walk distance. Mechanisms of action will be explored.

Possible impact (in lay terms): NHFT may be a practical and efficacious therapy to help improve exercise tolerance in patients with COPD.

Method: Twenty subjects with severe COPD will be recruited for this project. Subjects will have baseline lung function tests. Subjects will then perform two 6MWT with a 30 minute break between tests. One of the 6MWT's will be performed while using NHFT, while the other will be performed without. These conditions will be randomised. Both 6MWT's will be performed using a walking frame

with wheels that will house the NHFT device and pulse oximeter. Outcome measures will include walk distance, exercise oxygenation, respiratory effort and perceived exertion and dyspnoea.