

## 2014/2015 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on **4 July 2014**

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

Supervisor's Name(s): Paul Kelly; Lutz Beckert;

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

**Clinical**

**Laboratory**

**Community**

### The effect of high flow, humidified air via Airvo on oxygen content, humidity and temperature

#### Project Description:

As part of a Masters project we have published a new methods to measure intra-tracheal oxygen concentrations via a measuring tube placed just above the carina through the suctioning channel bronchoscopy. This study provided great insights into the effect of different flow rates of oxygen delivery, was peer reviewed published and the clinical utility was highlighted by Prof Christine McDonald in her editorial (Respirology 2014).

Fisher and Paykel Healthcare (New Zealand) have used our measurements to create mathematical modelling based on our published data on the effects of intra-tracheal oxygen concentrations, humidity and temperature, if one were to apply high flow, heated, humidified air with or without supplemental oxygen. Their Airvo has been shown to be cost effective in the management in COPD and is widely used on the medical and respiratory wards.

The purpose of the summer studentship is to explore this data further. Of particular interest are the effect of high flow, humidified air on the airway temperature, as a higher temperature may have a protective effect against virus infections. Another aspect is the effect of high flow humidified airflow on the carbon dioxide content and oxygen concentrations. As in the previous study we will again recruit 10 – 15 normal volunteers or the placement of an intratracheal catheter or thermal cup under local anesthetic.

Following catheter / thermometer placement we be taking the following measurement of the next hour:

Airway temperature breathing room air.

Airway temperature breathing cooled air at 10 degree using our Respiratory Air cooler

Airway temperature breathing room air via Airvo - 30L / min at 37 degree at the end of the mouth piece

Airway temperature breathing room air via Airvo 60 l / min at 37 degree at the end of the mouth piece

Airway temperature breathing room air via Airvo - 30L / min at 41 degree at the end of the mouth piece

Airway temperature breathing room air via Airvo 60 l / min at 41 degree at the end of the mouth piece

It will be the role of the medical staff to consent volunteers for the bronchoscopy and tube placement. Medical staff will also be present during the measurements to provide back-up, assess comfort and safely remove the sampling catheter / thermal cup.

The summer student will lead the project. He / she will coordinate booking of the volunteers onto the bronchoscopy list. He / she will assist with creating the data collection sheets. He / she will collect the main outcome data i.e. change in temperature or change in oxygen concentrations. He / she will create a spreadsheet under supervision, enter the data and be a part of analyzing the data. Some mathematic back-up can be provided from Fisher and Paykel Healthcare