

2017/2018 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on 3 July 2017

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

First Supervisor's Name and Title: Dr Ben van der Griend

Department - UOC &/or CDHB (if applicable): Anaesthetics Department, Christchurch Hospital

First Supervisors Phone: +64 3 3640288

First Supervisors Email: ben.vandergriend@cdhb.health.nz

First Supervisors Mailing Address: : Dept of Anaesthesia, Christchurch Hospital, Private Bag 4710, Christchurch

Co-Supervisors Name and Title(s): Assoc Prof Ross Kennedy; Margie McKellow

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

Clinical

Laboratory

Community

Project Title (20 words MAXIMUM):

Volatile Anaesthetic Agent Use During Induction of Paediatric Anaesthesia

Project Description:

Introduction:

Anaesthesia in children is often induced with an inhaled volatile anaesthetic agent. The agents most commonly used in developed economies are sevoflurane and nitrous oxide. These agents come with high economic and environmental costs. Considerable gains have been made to reduce fresh gas flow and anaesthetic agent consumption during volatile anaesthesia. This is done by reducing the wastage while ensuring the same amount of anaesthetic agent reaches the patient. In paediatric anaesthesia, high gas flows and anaesthetic agent are still commonly employed, especially during induction of anaesthesia, which leads to increased consumption.

Our Department has a long interest in gas flow reduction with comprehensive data collected and published over many years in adults. We have shown that a range of approaches can encourage anaesthetists to decrease gas flow rates. However, we have little hard data on gas flow utilisation in children.

Aim:

The aim of this study is to quantify the use of sevoflurane and nitrous oxide during the induction and the maintenance phases of anaesthesia for children presenting for surgery. Collecting this data will allow us to understand current practice and to design strategies to encourage flow reduction.

Possible impact (in lay terms):

The tools available for administering volatile (inhaled) anaesthetics have changed immensely over the last 10-20 years. Traditional approaches were akin to keeping a glass full by continually pouring liquid in and ignoring spillage. By the same analogy, we now have tools that allow the glass to be kept perfectly full regardless of the amount being drunk, while minimizing the spill (or waste).

The cost of volatile anaesthetic agents, such as sevoflurane, used in a single case is not high, but when multiplied across 30,000 adult and nearly 5,000 paediatric cases in Christchurch each year, small reductions in the amount used in each case can have a large overall effect. Christchurch Hospital spends around \$300,000 a year on these agents. We estimate that if we were using the same flow rates as 10 years ago, which are still common in reports from US hospitals, we would be spending more than \$500,000. Both volatile anaesthetics and nitrous oxide are greenhouse gases. We estimate our reduction in gas flow represents the equivalent of 200-300 tons of CO₂ each year.

During paediatric anaesthesia, high flow rates are commonly used during induction of anaesthesia and also sometimes during the maintenance of anaesthesia.

The goal of this study is to explore flow rates and anaesthetic agent consumption used during anaesthesia for children in the dedicated paediatric theatre at Christchurch Hospital. Having this information will help us to understand how gas flows and anaesthetic agents are used. This should help us devise strategies to reduce consumption in paediatric anaesthetic practice.

Method:

Children (12 months to 18 years old) presenting for surgery, over a 6-8 week period in Operating Theatre 2 at Christchurch Hospital, having anaesthesia using inhaled (volatile) agents, will be included in this observational study. There will be no change to the anaesthetic.

We will record the gas flows and amount of agent sevoflurane and nitrous oxide consumed in both the induction room and the operating theatre, along with patient demographics (age, weight and physical status score & ethnicity), and duration of anaesthesia. Anaesthetic consumption is logged by the machine and can be downloaded after each case.

From this data we will be able to explore gas flows and agent usage at different phases of the anaesthetic. We will compare this to our existing adult and limited paediatric data sets.

Our Summer Student will be responsible for downloading the relevant recorded drug data from operating theatre machines and for helping analyse and compare results.

Student Prerequisites (eg. Medical Student) if applicable:

Medical

Administration Details

1. Is ethical approval required? Yes

If Yes: please circle or tick one of the following:

- a) Applied for (provide application #)
- b) Approved (attach a copy of the letter of approval from the ethics committee or application #)
- c) To be done

2. Are you able to provide the funding for this project (ie. \$5,000 for the student, incidental expenses should be met from departmental or research funds) Yes

If Yes: Please provide name of the funder: **Anaesthetists' Instrument Pool**

If No: Please provide ideas of possible funding sources, including past funding agents and topics often associated with this research area, for the Research Office to contact.

If Yes: You will be sent a request for more information.

3. Medical Records or Decision Support accessed No

4. Health Connect South or other DHB records No

5. Signatures:

- I have read the 2017/2018 Summer Studentship programme handbook.
- I am prepared to supervise the project and will be available to the student during the studentship (including Christmas/New Year break if the student is working during this time).
- I agree to assume responsibility for the submission **of the student's reports to the Research Office** by the due date 29 January 2018.
- I agree that the project lay report may be available to local media for publicity purposes.

Signature of Project Supervisor(s):

Dr B van der Griend (signed)

Date:

30/6/17

- I understand that I am responsible for hosting the Summer Student chosen for this project and will meet any costs incurred. I agree that incidental expenses will be met from departmental or research funds.

Signature of Head of Department:
(Print Name)

Date:

Signature of Clinical Director:

Dr A. Padayachee (signed)

Date: 30/6/17

