

2015/2016 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on **3 July 2015**

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

Supervisor's Name and Title(s): Assoc Prof Dr R.R.Kennedy; Mrs Margie McKellow;

Department: Anaesthesia

Institution: UOC & CDHB

Phone: 03 3640288

E-mail: ross.kennedy@otago.ac.nz

Mailing Address: Department of Anaesthesia, Christchurch Hospital, PB 4710, Christchurch

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

Clinical : Yes

Laboratory

Community

Project Title (20 words MAXIMUM):

Quantifying the effect and variability of neuromuscular blocking drugs on patients undergoing surgery

Project Description:

Introduction: Neuromuscular blocking drugs (NMB) are commonly used during anaesthesia to provide muscle relaxation to facilitate surgery. Although various agents can be used to antagonise the residual effect of these drugs at the end of surgery there is clear evidence that a proportion of patients have residual effects of these drugs in the recovery (PACU) area and that this may be associated with increased morbidity in the post-operative period. These residual effects can be minimised by careful use and monitoring of these drugs and effects. New monitoring modalities (NMT monitors) allow us to more accurately measure the degree of paralysis produced by these drugs. We also have tools that calculate the levels of NMB drugs in the body. We have empirically observed that there is a large inter-patient variability in the drug levels associated with a given degree of blockade, but an individual patient will have a similar response at a similar drug level after repeated doses of NMBs.

Aim: The objective of this study is to explore these observations. The primary question is to quantify intra- and inter- patient variability. We also wish to document levels at the end of surgery. We will also follow up patients looking for potential adverse effects and examining their "Quality of Recovery" using a standard tool (PQRS).

Method: Ethical approval will be obtained and written informed consent obtained from patients. This will be an opportunistic sample of patients where surgery is expected to last >60 min and in whom more than one dose of NMB is expected. Based on our experience with previous studentships we would expect to be able to study at least 60 subjects.

Study patients will have the degree of blockade monitored (NMT) and drugs doses will be entered into the "Navigator" drug-modelling system. These tools are in routine use at Christchurch Hospital. The Navigator system also captures other drugs used and all monitored data. The primary event recorded will be the calculated drug level at the time the second twitch (T2) of a train-of-four (TOF) returns. We will also look at the time from the first dose of NMB drug to disappearance of T1 and the peak drug level at that time, the TOF ratio and drug level at the time any NMB antagonist is administered, and at the time of last NMT measurement.

We will explore outcome using the PQRS tool. This is based on a short assessment preoperatively, in the early post-operative period and the following day. We have used this tool with previous summer projects and different patient groups.

Significance: While NMBs are used in less than 50% of anaesthetics, with changes in surgical practice there is an increasing requirement for "deeper" block at the same time as the dangers of residual effects are being increasingly recognised. Newer tools allow us to better titrate and manage these drugs. The primary purpose of this study is to quantify variability in patient response, using

routine clinical tools, to give us an understanding of how we can use these tools to improve care. Specific follow-up will allow us to relate quality of recovery to usage of NMB drugs.

For the student this study will involve: finalising the study design and data collection processes and development of appropriate spreadsheets for recording and analysing the data. The student will be exposed to the operating theatre and PACU environments with the opportunity to increase their knowledge of anaesthesia and pain management, and will also spend time interacting with patients in the perioperative period.

Student Prerequisites (eg. Medical Student) if applicable:

Medical Student