



RACP Foundation Research Awards

FINAL REPORT

Project Title	Near Infrared spectroscopy for Monitoring brain Oxygenation in Premature infants (NIMO-Prem)	
Name	Dr Maria Saito-Benz	
Award Received	2017 New Zealand Research Development Scholarship	
Report Date	9 March 2018	
Chief Investigator / Supervisor	Dr Max Berry	
Administering Institution	University of Otago, Wellington	
Funding Period	Start Date:	1 January 2017
	Finish Date:	31 December 2017

PROJECT SUMMARY

One in 12 New Zealander babies are born premature. Premature infants, especially those born less than 28 weeks of gestation ('extremely premature infants'), have a higher mortality rate and increased risk of cognitive, behavioural and psychiatric problems later in life compared to their term-born peers.

For healthy brain development ensuring adequate supply of oxygenated blood to the brain is critical; however, what constitutes the 'optimal' brain perfusion and oxygenation in premature infants is currently unknown. We will combine state-of-the-art non-invasive equipment to develop better understanding of the optimal brain perfusion and oxygenation targets to prevent mortality and later neurodevelopmental disability.

PROJECT AIMS / OBJECTIVES

Objectives of this research are to determine in extremely premature infants:

1. High and low cerebral perfusion pressures that are associated with an increased mortality rate and an increased incidence of neurovascular injuries
2. Cerebral hypoxia and hyperoxia burdens that are associated with an increased mortality rate and an increased incidence of neurovascular injuries
3. The effect of common neonatal interventions on cerebral perfusion and oxygenation. These interventions are:
 - a) Indomethacin for closure of patent ductus arteriosus
 - b) Caffeine citrate for prevention of apnoea of prematurity

SIGNIFICANCE AND OUTCOMES

Better understanding of the physiology underpinning oxygen delivery to a baby's brain is essential for us to develop strategies to prevent preterm-associated brain injury. It is hoped that this research will form the basis for future randomised controlled trials aiming to improve neuro-cognitive outcomes of extremely preterm babies through evidence-based clinical interventions, and translation of a low-cost and non-invasive monitoring technology into a routine neonatal practice. These data will be the first in NZ to explore the relationship between brain oxygenation and other key clinical measures, and is an exciting opportunity for us to further refine and improve the already high standard of care infants receive in NZ.

PUBLICATIONS / PRESENTATIONS

We anticipate a number of abstract and article publications from this project when completed after December 2019

The preliminary data are presented at the 'Protecting Babies' Brains: Mini-Symposium' at the University of Otago, Wellington on 29th March 2018.