ACT HEALTH VACATION STUDY PROGRAM

PROJECT SUMMARY

Project Title	**Neonatal Acute Kidney Injury and Nephrotoxin exposure in an Australian and New Zealand population**
Supervisor	**Dr Amanda Dyson/ Adjunct Professor Margaret Broom**
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Lead discipline (please select one)	
☐ **Nursing and Midwifery**	☐ **Health Economics**
☐ **Allied Health**	☐ **Biostatistics**
☐ **Medicine**	☐ **Value-based Healthcare**
☐ **Pre-clinical**	☐ **Epidemiology**
☐ **Health Policy**	☐ **Other**

Outline of the project 250 words max

In critically ill neonates Acute Kidney Injury (AKI) independently increases mortality and length of hospital stay. It has been associated with an increased risk of developing chronic kidney disease, a faster progression to end stage chronic kidney disease and an increased risk of hypertension. The multinational Assessment of Worldwide Acute Kidney Injury Epidemiology in Neonates (AWAKEN) study demonstrated that 30% of neonates admitted to Newborn Intensive Care Units experience an episode of AKI. Although the AWAKEN study did include a single Australian site, Australian patients accounted for less than 2% of the cohort which was predominantly North American. The incidence of AKI in Neonatal Intensive Care Unit (NICU) populations in Australia and New Zealand (ANZ) is currently unknown. A modifiable risk factor for AKI is nephrotoxin exposure which is prevalent in NICU patients. The Nephrotoxic Injury Negated by Just-in-Time Action (NINJA) clinical practice improvement initiative was developed and implemented in a quaternary paediatric hospital in the United States and showed a reduction in the rate of exposure to nephrotoxic medications by 38% and decrease the rates of AKI by 64% through increased awareness of nephrotoxin exposure and increased monitoring of kidney function. There is no published data regarding nephrotoxin exposure in an ANZ NICU population. We aim to assess the incidence of and risk factors for neonatal AKI in a sample of Australian and New Zealand Neonatal Intensive care units as well as document nephrotoxin exposure and nephrotoxin associated AKI.

Proposed research methods

Methods. Retrospective review of 6 months of data from the 01/01/2019 to the 30/06/2019. This timeframe has been chosen to avoid confounding secondary to the COVID 19 pandemic. No significant practice change has occurred in this time frame.

Population:

Setting: A sample of perinatal and mixed perinatal/surgical level 5 and 6 NICUs in

Australia/New Zealand. For this vacation study program, the student will look at the data from The Canberra Hospital only.

Population: All babies admitted to a level 5 or 6 NICU in the first 14 days of life over a 6 - month period who receive at least 48 hours of intravenous fluid.

Exclusion Criteria: died within 48 hours of admission to NICU, congenital heart defect that required surgical repair or prostaglandins within the first week of life, presence of lethal chromosomal anomaly, severe congenital kidney or urinary tract defects

Sample size:

The incidence of neonatal AKI overseas is around 30%. A small unpublished Australian single center audit recently demonstrated a lower rate of AKI of approximately 8%. Assuming a true incidence of around 20% with a precision of 0.05 a sample size of 733 would be required.

Outcome measures:

Primary outcome measure: Incidence of modified KDIGO defined neonatal AKI

Secondary outcome measures: Risk factors for AKI in our population, incidence nephrotoxin exposure, incidence of 'high nephrotoxin' exposures, incidence of nephrotoxin associated AKI and the association between AKI, mortality and increased duration of hospital stay when controlling for gestational age, 5-minute Apgar score, birthweight, and severity of illness score (CRIB II)

Preferred study discipline being undertaken by the student

Medicine

Benefits to the student and to the department

Benefits to the student:

- Experience in gathering information from the clinical record to complete a dataset
- Mentorship and education relating to how the project has been set up, why the data points have been chosen
- Experience analysing data
- Observation of and involvement in a multi-centre collaborative project

Alignment with Government Research Priorities 100w max

This collaborative multi-centre project will allow our team to make a valuable contribution to an understudied problem in an Australian and New Zealand high risk population. We hope that better understanding the size of neonatal AKI in Australia and New Zealand will allow us to advocate for more work in this field, hopefully improving the long-term health of a high-risk group. The collaboration between different sites will strengthen our research partnerships.

Department within ACT Health Directorate / Canberra Health Services where the student will be based

Department of Neonatology, Women's Youth and Children's, Canberra Health Services

Please submit form to preclinical.research@act.gov.au