# Round 2 Project Summary, Publications, aims and objectives

| Grant Type | Project Title | Administering Institute | Amount (inc. GST) | Principal Chief Investigator | Project Aims/Objectives | Project Summary | Publications |
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| **Patient Blood management Project Grant** | Implementing evidence-based bleeding management in cardiac surgery | University of the Sunshine Coast | $78,199.00 | Ms Bronwyn Pearse | 1. To determine the use of BM strategies, stratified by hospital setting, size and complexity of cardiac surgery programs in Australia.<br><br>2. To understand the barriers and facilitators to implementation of evidence-based BM in Australian adult cardiac surgery units.<br><br>3. To use the data to support the development of a conceptual model of BM implementation that is transferrable across cardiac surgery units in Australia | Over 25000 cardiac surgery operations are performed in 59 cardiac surgery units across Australia annually. An aging Australian population, evermore complex procedures, increased co-morbidities, anaemia and use of antiplatelet agents, dominates cardiac surgery. Risk of bleeding therefore, is high. Blood transfusion (BT) is a commonly used treatment option to manage bleeding and cardiac surgery units are known high users of blood products.<br><br>There is currently no literature from Australian cardiac surgery units identifying<br>(i) the degree to which evidence based bleeding management (BM) strategies are used, or<br>(ii) barriers or enablers that influence effective BM implementation.<br><br>The 2017/18 part of the study will comprise a cross-sectional national questionnaire survey to quantify the extent to which Australian cardiac surgery units are employing BM strategies that are identified and recommended in Clinical Practice Guidelines (CPGs). The survey will identify gaps between 'what is known' and 'what care is applied' and also highlight potential barriers to implementing best practice.<br><br>In 2018/19 The study will use semi structured interviews and thematic analysis to facilitate the exploration of clinician's experiences, as well as thegeneration of ideas in relation to barriers and facilitators to effective implementation of BM. Real life problems and solutions will be discussed and an inclusive list of<br>(i) barriers and<br>(ii) facilitators, will be developed and prioritised.<br>Prioritised issues may demonstrate distinct perspectives of individual centres highlighting department, demographic and geographical characteristics that need consideration when developing a conceptual model of BM implementation.<br><br>Data from these studies will support the development of a conceptual model of BM implementation that could be used by cardiac surgery units around Australia. | Bleeding Management Practices of Australian Cardiac Surgeons, Anesthesiologists and Perfusionists: A Cross-Sectional National Survey Incorporating the Theoretical Domains Framework (TDF) and COM-B Model<br><br>Barriers and facilitators to implementing evidence based bleeding management in Australian Cardiac Surgery Units: a qualitative interview study analysed with the theoretical domains framework and COM-B model |

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| **Patient Blood management Project Grant** | The effect of intravenous iron and blood transfusion on patients' outcomes in women with low haemoglobin after birth | Western Sydney Local Health District | $90,264.38 | Dr Seng Chai Chua | To compare the effect of oral iron sulfate, iron infusion and blood transfusion plus oral iron sulfate on haematological parameters and the physical and psychological wellbeing of postpartum women who develop anaemia after PPH | This project will investigate the effect of oral iron sulfate, iron infusion and blood transfusion plus oral iron sulfate on multiple haematological parameters including Hb, HCT, reticulocyte, ferritin and C-reactive protein (CRP) levels in postpartum women who develop anaemia after postpartum haemorrhage. The project will also explore the clinical efficacy and side effects of oral iron sulfate, iron infusion and blood transfusion plus oral iron sulfate, the cost-effectiveness of the treatments, and the impact of the treatments on maternal physical and psychological wellbeing as well as on infant feeding. | Intravenous iron vs blood for acute post-partum anaemia (IIBAPPA): a prospective randomised trial - PMC |
| **Immunoglobulin Project Grants** | Improving national immunoglobulin stewardship and clinical outcomes for patients with myeloma | Monash University | $492,323.70 | A/Prof Erica Wood | To conduct a national cohort study of Ig use in patients with MM, using the MRDR, to provide data to improve national Ig stewardship and improve patient outcomes. | Patients with the blood cancer myeloma are at risk of serious infection because of low levels of protective antibodies due to their condition and its treatment. Risks may be changing as new myeloma treatments are introduced.<br><br>Immunoglobulin therapy (made from plasma) is used to replace missing antibodies to prevent or treat infections in patients with blood cancers. This patient group represents the most common indication for immunoglobulin therapy in Australia, and demand continues to grow.<br><br>However, there is substantial variation in immunoglobulin use for this indication across Australia. Whether this is due to patient, disease, hospital or clinician practice, is not known. It is essential to establish whether therapy is being targeted to the patients most at risk because side-effects of immunoglobulin treatment can occur, plasma is a precious national resource, and immunoglobulin therapy is very expensive (more than $60 million dollars annually for this patient group alone).<br><br>Using the Australian and New Zealand Myeloma and Related Diseases Registry, this project will collect 'real world', up-to- date Australian clinical and laboratory information on immunoglobulin use to guide policy and clinical practice; to plan and deliver care; and to monitor practice, costs, and outcomes. We will also collect samples to store and test in future studies.<br><br>The results of this study will be important to provide better care for patients with myeloma and other blood cancers and to improve stewardship of the national blood supply.<br><br>The study will also provide a new and lower cost framework for conducting future large clinical trials of immunoglobulin therapy in Australia in myeloma and in other similar conditions. | Managing hypogammaglobulinaemia secondary to haematological malignancies in Australia and New Zealand: a clinician survey - PubMed (nih.gov)<br><br>Interventions to reduce infections in patients with hematological malignancies: a systematic review and meta-analysis |

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| **Immunoglobulin Project Grants** | Does intravenous immunoglobulin improve outcomes in chronic rejection of renal transplants? | Monash University | $495,000.00 | Dr William Mulley | To test the theory that IVIg treatment is beneficial in late antibody rejection of kidney transplants by randomly assigning patients with this condition to receive IVIg or not. | Rejection of kidney transplants by antibodies is the leading cause of transplant failure. Failure of a kidney transplant is associated with an increased likelihood of death and loss of quality of life, therefore preserving kidney function for as long as possible is vital. Currently there are no clearly effective treatment for antibody rejection occurring more than 6 months after the transplant. Intravenous immunoglobulin (IVIg) is used for this type of rejection there have been no randomised studies conducted to test it against no treatment. If it is beneficial it would be great to continue using it however if it is ineffective then it should be reserved for conditions in which it is beneficial.<br><br>This project will test the theory that IVIg treatment is beneficial in late antibody rejection of kidney transplants by randomly assigning patients with this condition to receive IVIg or not.<br><br>The research team will determine the effects of IVIg by comparing transplant survival and microscopy findings from biopsy samples of the kidney transplant taken periodically. The study will require active patient participation for 12 months with 4 kidney biopsies taken during that time. They will be followed indefinitely however to determine their long-term clinical outcomes.<br><br>Patients who have a biopsy which shows late antibody rejection will be invited to participate. All included patients will receive standard treatment for their rejection which comprises oral medications to control rejection, infusions of anti-inflammatory steroid medications and regular clinic visits. Half the patients will be randomised to receive IVIg at one dose per month for 3 months with a follow-up biopsy and a further round of 3 doses of IVIg if there is ongoing rejection at that stage. The final biopsy will be taken at 12 months to compare change from their initial biopsy and then compare this degree of change between the 2 groups.<br><br>Samples of blood, urine and the kidney biopsy material will be examined in detail at each time point for markers of effect of the IVIg such as changes in the numbers and composition of the cell types and the chemicals they release. This will address currently lacking information on the nature of effect of IVIg in antibody rejection. Additionally, if IVIg is effective in reducing damage related to antibody rejection its ongoing use can be justified to provide benefit to patients. Alternatively if it makes no difference to patient outcomes then its use for this indication could be ceased which would reduce the demand for this limited resource. | No publications received yet |

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| **Immunoglobulin Seed Grants** | Improved strategies in management of immune thrombocytopenia | Australian National University | $115,953.20 | A/Prof Elizabeth Gardiner | 1. To redefine clinical descriptors of immune thrombocytopenia based on disease biology.<br><br>2. To investigate disease biomarkers, such as autoantibody antigen characteristics, for patient stratification and as tools in predicting responses to treatment | The appropriate clinical use of blood and blood products is critical to optimise patient outcomes and to manage the use of a limited resource. Immunoglobulin usage occurs across a spectrum of diseases and while the benefits and utility of IVIg in managed clinical care is clear, guidelines around the usage of IVIg in ITP are vague and often rely on personal local experience. This project aims to provide scientific approaches to define subpopulations of people with ITP who do better with IVIg and others who do not receive any benefit of IVIg.<br><br>This study will define a new set of parameters that allow stratification of ITP patients at disease onset, and refinement of IVIg usage, thus paving the way for a large study prospectively evaluating a stratified usage of IVIg based on disease etiology at onset of ITP. | Novel scientific approaches and future research directions in understanding ITP<br><br>Bleeding Propensity in Waldenstorm Macroglobulinemaia: Potential Causes and Evaluation<br><br>The molecular basis of immune-based platelet disorders |
| **Patient Blood management Early Career Research Grant (Scholarship)** | Intraoperative cell salvage a safer and cost-effective alternative to allogeneic blood transfusion | University of Queensland | $33,000 | Dr Michelle Roets | To confirm that by receiving intraoperative cell salvage instead of allogeneic blood transfusion a patient would have a lower plasma level of inflammatory markers and associated lower risk of transfusion related immunomodulation than when receiving allogeneic blood transfusion. | As a result of surgery ~800 patients experience significant blood loss and require allogeneic blood transfusion at the Royal Brisbane and Women's Hospital (RBWH) each year. Allogeneic blood is donated, processed and made available within the blood bank at the hospital to be used when required urgently for transfusion during surgery.<br><br>The safety of blood transfusion has improved over decades however a significant risk remains. These risks include wrong blood to wrong patient, transfusion-related lung injury, infection, allergic reaction and many others.<br><br>According to Australian blood transfusion safety data 617 transfusion-related adverse events were reported in 2013-2014, an increase from 429 reported in 2012-2013. Adverse event reporting in Australia is not mandatory therefore these numbers are likely underestimated. Adverse event reporting in the UK is mandatory. The SHOT (Serious hazards of transfusion) database in the UK reported 26 deaths related to blood transfusion in 2015.<br><br>Emerging evidence has also found a link between allogenic blood transfusion and higher risk of infection (potentially avoidable by intraoperative cell salvage), cancer recurrence, organ failure and death (transfusion related immunomodulation /TRIM effects).<br><br>Transfusion related immunomodulation or TRIM is a delayed (>24 hours), immunological transfusion reaction associated with an increased rate of tumour recurrence in cancer surgery patients and an increased rate of bacterial infection after surgery, organ failure and death. | Intraoperative Cell Salvage as an Alternative to Allogeneic (Donated) Blood Transfusion: A Prospective Observational Evaluation of the Immune Response Profile<br><br>Incorporative cell salvage: The impact on immune cell numbers |

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| | | | | | | This collaborative research project will compare the cost effectiveness and clinical safety profiles of intraoperative cell salvage and allogeneic blood transfusion. The objective of this project is to identify a novel diagnostic method to predict and to evaluate the incidence of infection and cancer recurrence that results from allogeneic blood transfusion (Transfusion Related Immunomodulation / TRIM).<br><br>In addition to the risks involved, allogeneic blood is also expensive. According to the National Blood Authority, the estimated cost associated with blood transfusion is over $1 billion per year in Australia. [9] This figure still does not include the full cost of blood transfusion associated with overhead costs, adverse outcomes associated with transfusion related immunomodulation.<br><br>Intraoperative cell salvage is a cost-effective and safe alternative to allogeneic blood transfusion. During intraoperative cell salvage the patient's own blood, lost during surgical procedures, can be collected, processed and reinfused.<br><br>By using intraoperative cell salvage blood instead of allogeneic blood transfusion adverse events associated with transfusion related immunomodulation can be avoided. By using existing laboratory facilities within the Australian Red Cross the research team will identify markers within allogeneic blood and absent in intraoperative cell salvage blood associated with transfusion related immunomodulation.<br><br>This project will be highly significant to the hospital system as the research team anticipate better patient care, less harm to patients and a more acceptable alternative to allogeneic blood transfusion. | |
| **Patient Blood Management Early Career Research Grant (Scholarship)** | Understanding risks and clinical outcomes of anaemia in the elderly to inform transfusion policy | Monash University | $33,000 | Dr Alison Mo | 1. To evaluate the current evidence base correlating anaemia and Hb levels with health outcomes (QoL, exercise capacity, cognitive function) in elderly individuals, and transfusion thresholds in the elderly.<br><br>2. To describe the incidence, epidemiology and risk factors for AE in the Australian community in well individuals ≥70yo. | Almost 1 in 6 Australians older than 75 years is anaemic. This number will rise in coming decades with an ageing population, with significant implications for individual patient care and the impact on Australia's national health system and blood supply.<br><br>Older patients receive more blood transfusions for treatment of anaemia than younger patients, and the 75-85 year old age group receives the most transfusions of any age bracket. Anaemia management is an important patient blood management (PBM) issue to be addressed to ensure the ongoing sustainability of the national blood supply. Important evidence gaps include:<br><br>Knowledge of characteristics of the elderly who develop anaemia, and identifiable risk factors. Data are required to formulate strategies for | Red cell transfusions: Is less always best? |

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| | | | | | 3: To determine the significance of AE overall and to assess if the current WHO cutoff for anaemia is appropriate for elderly patients, by correlating haemoglobin with clinical factors such as age, quality of life measures, comorbidities, functional outcomes and survival. | prevention and early intervention strategies to treat anaemia, and reduce the need for transfusions.<br><br>Consequences of anaemia on health outcomes in the elderly. Some studies have shown that mild anaemia is common with ageing and associated with functional impairment, such as physical disability, cognitive impairment or affects psychosocial wellbeing.<br><br>Lack of data to guide treatment of anaemia and provide guidance on appropriate use of red cell transfusions in the elderly.<br><br>This project will address these questions through:<br><br>1. A review of studies investigating effect s of anaemia on physical, mental and psychosocial health outcomes in the elderly, and the use of specific transfusion triggers in the elderly.<br><br>2. Re -analysis of data acquired from the “ASPirin in Reducing Events in the Elderly” (ASPREE) clinical trial, as a substudy on anaemia in the elderly.<br><br>ASPREE is a large Australian/US randomised trial investigating the effects of low -dose aspirin on long -term health outcomes. Participants are assigned to receive either aspirin 100mg daily, or placebo.<br><br>The trial is being conducted in Australian general practice clinics, involving patients over 70 years who are otherwise well. The trial has completed recruitment (16,703 patients ) and will close in late 2017.<br><br>Blood samples are taken annually, and a range of functional outcomes (quality of life [QoL], physical function and cognitive performance) are measured, and data collected about their medical conditions, with an average follow up of 5 years .<br><br>This trial design offers a unique opportunity to follow a large group of elderly patients over several years. Participants are not anaemic at study entry, so team can study incidence and causes of anaemia in this group, as well as the effects of aspirin. The research will compare participants who do and do not develop anaemia to investigate risk factors for anaemia and the overall impact of anaemia on a range of health outcomes and survival.<br><br>The findings will provide important information on the burden of anaemia in the Australian community, including red cell transfusions given for anaemia, and identify areas for prevention and treatment strategies to better manage anaemia and minimise blood transfusions in the elderly. | |