

## Round 4 Project Summary, Publications, aims and objectives

Grant Type	Project Title	Administering Institute	Amount (inc. GST)	Principal Chief Investigator	Project Aims/Objectives	Project Summary	Publications
<b>Patient Blood Management Project Grants</b>	Prevention and management of bleeding in maternity patients to optimise patient outcomes	University of Sydney	\$227,771.50	Dr Jillian Patterson	To use linked routinely collected clinical and whole-of-population data for obstetric patients to inform management of women at increased risk of bleeding (including the use of interventional radiology and treatment of thrombocytopenia) and to determine the efficacy of IV iron compared with RBC transfusion for managing postnatal anaemia	<p>In Australia, most mothers leave hospital healthy and with a healthy baby, however for some, pregnancy is a time of risk. Around 1 in 10 will experience excessive bleeding post-childbirth and 1 in 50 mothers will receive a red blood cell transfusion. Generally, women are young and otherwise healthy, a small number may have risk factors such as thrombocytopenia, but all would benefit from avoiding exposure to red blood cells through reducing their risk of haemorrhage and/or through considering alternative methods to manage anaemia. While transfusion can be lifesaving in the context of massive haemorrhage, reductions in transfusion rates can occur through reducing the incidence of obstetric haemorrhage and through managing anaemia resulting from haemorrhage with non-transfusion methods.</p> <p>This research will address three gaps identified in the Patient Blood Management Guidelines for obstetrics and maternity:</p> <ol style="list-style-type: none"> <li>1) The safety of interventional radiology (IR) in maternity patients,</li> <li>2) the level of thrombocytopenia associated with increased bleeding risk for vaginal and caesarean birth and</li> <li>3) In women with moderate to severe postpartum anaemia, the comparative efficacy of intravenous (IV) iron versus RBC transfusion on short and longer-term patient outcomes.</li> </ol> <p>The research team will use data on all births in New South Wales (NSW) to identify outcomes related to the relatively uncommon use of interventional radiology, and to identify the risks and benefits of IV iron compared with red blood cell transfusion. In a healthy population such as pregnant women, with low adverse outcome rates, large numbers of women are required to understand the risks and benefits associated with any intervention. Using statistical methods to account for patient differences and careful study design, the team will emulate the design of a randomised trial in order to compare the outcomes and complications of similar women who received different treatments. Outcomes will include complications, length of stay, readmissions and maternal morbidity.</p> <p>Detailed hospital data on a subset of women will also be used to determine the level of thrombocytopenia (low platelet count) that is associated with an increased risk of bleeding. This will allow clinicians to identify women at increased bleeding risk and manage them to minimise the risk of transfusion. A multivariable statistical method will</p>	<a href="#">Interventional radiology in obstetric patients: A population-based record linkage study of use and outcomes - PubMed (nih.gov)</a>

						<p>be used to adjust for confounders and establish a cut-point associated with increased risk.</p> <p>The results will be translated into information for patient counselling and treatment; for training clinicians; for promoting patient blood management strategies in place of transfusion; and for informing future patient blood management guidelines.</p> <p>The project builds on a successful 8-year collaboration with the NSW Clinical Excellence Commission and Australian Red Cross Blood Service focussed on using routinely collected data to address knowledge gaps in obstetric transfusion.</p>	
<b>Patient Blood Management Project Grants</b>	A study of patient and healthcare provider experiences of blood transfusion in myelodysplastic syndromes (MDS)	Monash University	\$100,654.40	A/Prof Zoe McQuilten	<ol style="list-style-type: none"> <li>1. To explore the patient and staff experiences of a weekly RBC transfusion schedule including:</li> <li>2. Potential advantages and disadvantages of weekly transfusion versus current practices</li> <li>3. Potential enablers and barriers to weekly transfusion</li> <li>4. Patient and staff preferences and influencing factors</li> <li>5. Overall impact of weekly transfusion versus current practices, on patients' QoL, health, wellbeing and daily life</li> </ol>	<p>Transfusion is a major cornerstone of supportive care management for many patients with blood cancers. Of these, patients with myelodysplastic syndromes (MDS) use the largest amount of red blood cell (RBC) transfusions of all haematology patients.</p> <p>MDS are blood cancers which cause bone marrow failure and anaemia. Patients with MDS are often given RBC transfusions long-term to treat anaemia and prevent complications (e.g., heart failure) and anaemia symptoms (fatigue, shortness of breath).</p> <p>However, there is minimal evidence to guide optimal transfusion treatment in these mostly elderly patients. This includes evidence gaps as highlighted in the Patient Blood Management (PBM) guidelines, including:</p> <ol style="list-style-type: none"> <li>1) the optimal haemoglobin (Hb) trigger to start transfusion</li> <li>2) any other patient factors or symptoms which should guide transfusion,</li> <li>3) following transfusion, what Hb target to aim for and what are the best clinical features to monitor the effects of transfusion.</li> </ol> <p>There has also been limited research on the effects of transfusion on quality of life (QoL) outcomes, which is a key concern for many patients and their clinicians.</p> <p>This pilot clinical study, titled "Red cell transfusion schedules in myelodysplastic syndrome" (REDDS2) will investigate and compare a new weekly RBC transfusion schedule in patients with MDS.</p> <p>As a second phase of this trial, a 'qualitative' study will be undertaken to explore the experiences of patients and hospital staff (nurses, doctors, laboratory scientists) with the different transfusion practices. This will include interviews with individual patients and focus group discussions with hospital staff as the new weekly transfusion schedule is being trialled.</p>	No publication listed yet

						<p>The results of the REDDS study will provide important new information on the experiences of patients and staff, to complement the clinical and laboratory results from REDDS2, enhance outcomes for patients, and contribute to inform future transfusion guidelines and national and international policy development for patients with MDS.</p> <p>This project will also build Australian capacity in qualitative research related to PBM. Qualitative research, which explores not only 'what' people think but also 'why', will provide information about consumer and health professional views on transfusion practice.</p>	
<b>Patient Blood Management Project Grants</b>	RotEm-guided blood product in patients with cirrhosis undergoing invasive procedures (RECIPE)	Monash University	\$129,086.10	Dr Ammar Majeed	<ol style="list-style-type: none"> <li>1. To compare the proportion of procedures requiring prophylactic transfusion with blood procedure and the number of FFP and platelet transfusions given as bleeding-prophylaxis in the preprocedural setting between ROTEM-based decision making and standard of care</li> <li>2. To compare procedure-related bleeding between ROTEM-based decision making and standard of care management</li> <li>3. To compare occurrence of procedure-related non-bleeding complications (thromboembolism, infection), length of hospital stay and survival between ROTEM-based decision making and standard of care</li> <li>4. To compare transfusion-related events between ROTEM-based decision making and standard of care</li> </ol>	<p>This project will examine the role of a 'global' coagulation assay called Rotational Thromboelastometry (ROTEM) in the guidance of prophylactic blood product in patients with liver cirrhosis undergoing invasive procedures.</p> <p>Currently available laboratory tests (such as platelet count, International Normalised Ratio (INR) and activated partial thromboplastin time (aPTT)) are suboptimal for the assessment of bleeding risk in patients with chronic liver disease. These tests may overestimate the risk of bleeding, and their use may result in unnecessary transfusion of blood and coagulation products, exposing the patients to risk of serious adverse events and potentially overuse of scarce blood products.</p> <p>During the past few years, 'global' coagulation tests such as ROTEM have been developed to provide an overall measurement of the clotting system. These point of care tests provide quick results and have been used to assess coagulation and better guide blood product transfusion in a number of surgical and trauma multi-transfusion settings. However, the value of these global tests in predicting bleeding outcomes and guiding blood component transfusion in liver disease has not been well studied.</p> <p>The project will conduct a multi-centre randomised controlled trial (RCT) examining ROTEMbased decisions to guide FFP and platelet use in patients with cirrhosis undergoing invasive procedures.</p> <p>It is anticipated that the findings from this study will lead to improvement in the assessment of bleeding risk in patients with advanced chronic liver disease undergoing invasive procedures and identify patient groups and circumstances in which blood component use can either be avoided or provide benefit, which may lead to more efficient and effective use of blood products in this patient population.</p>	No publication listed yet

<b>Patient Blood Management Project Grants</b>	The impact of perioperative patient blood management guidelines on blood use and outcomes in cardiac surgery	Monash University	\$137,064.40	Prof Anthony Harris	<ol style="list-style-type: none"> <li>1. To evaluate the impact of perioperative PBM guidelines in cardiac surgery.</li> <li>2. To assess the variations across hospitals and surgeons in blood component and other haemostatic agent use (RBC, FFP, Platelets, rFVIIa, tranexamic acid).</li> <li>3. To determine impact of the perioperative PBM guidelines on clopidogrel, aspirin and other antiplatelet agent use.</li> <li>4. To analyse the effects of the guidelines on patient outcomes (length of hospital stay, ICU stay, complications and 30-day mortality)?</li> <li>5. To investigate the implementation of the guidelines differed across hospitals and surgeons.</li> <li>6. To assess the cost implications in terms of blood products and hospital related costs.</li> <li>7. To determine the influence of changes in clopidogrel, aspirin and other antiplatelet agent use had on blood use and patient outcomes.</li> <li>8. To assess the role of blood component and other haemostatic agent use had on patient outcomes.</li> </ol>	<p>This project will evaluate the impact of the perioperative patient blood management guidelines on blood use, patient outcomes and costs for cardiac surgery.</p> <p>This information is useful for improving the uptake of the current guidelines and their future adjustment by better understanding the barriers to implementation. With greater uptake of the guidelines, we would expect to see an improvement in patient outcomes through better medical and surgical management of cardiac surgery patients resulting in fewer transfusions of donated blood components and fewer transfusion associated complications. Evidence on the benefits in terms of reduced costs and better patient outcomes where the guidelines have been implemented in best practice hospitals can be a powerful means to encourage slow adopters of the guidelines to change their practices.</p> <p>The study will focus on cardiac surgery, a major area of blood transfusions, but the methods developed and results will be generalizable to other surgical specialities where blood transfusion is common practice.</p>	<a href="#">Impact of patient blood management guidelines on blood transfusions and patient outcomes during cardiac surgery</a>
<b>Patient Blood Management Seed Grants</b>	Assessment of blood quality in cardiac surgery	Griffith University	\$54,621.60	Dr Michael Simmonds	<p>To comprehensively study the quality of the primary sources of blood used during CPB</p> <ol style="list-style-type: none"> <li>1. rheological properties of blood and plasma (whole blood);</li> <li>2. biophysical functionality of erythrocytes;</li> <li>3. aggregation and activation levels of platelets;</li> <li>4. activation and function of leucocytes; and;</li> </ol>	<p>One of the major issues during Cardiopulmonary bypass (CPB) is the lack of evidence for optimal blood management practice. Despite CPB having been around for over 50 years, medical teams remain unclear on the most appropriate blood management strategy to employ during CPB, with many centres basing practice on small studies and surgical preferences. Variations in approach to blood management for infusion during the postsurgical period, for example, may include blood sourced from: i. Routine or selective collection of autologous blood before CPB, commonly in the operating room, that is stored using various anti-coagulants;</p>	No publication received yet.

					<p>5. functionality of proteins associated with haemostasis (e.g., von Willebrand Factor) and vascular regulation (e.g., nitric oxide synthase).</p>	<p>The most important factor that contributes to the lack of certainty and the non-standardised approach to blood management during CPB is that no studies have explored blood “quality” in a holistic manner. Rather, approaches have been limited in scope and only explored individual blood components with little regard to treating blood as a tissue.</p> <p>The audit conducted at the Gold Coast University Hospital, indicated that intraoperative red cell transfusion rate for elective cardiac surgery is 11%; however, the total in-hospital transfusion rate is 32%. This disappointing 200% increase in transfusion following surgery cannot be explained by post-operative bleeding or clinician-specific thresholds for transfusion. It seems that red cell mass is not being maintained after cardiac surgery.</p> <p>To address this problem, this project will combine current state of the art point-of-care and hospital-based assays in conjunction with gold-standard and field-leading laboratory-based tests and assays to explore, a systematic approach to identifying the functional properties of blood cells and proteins in the various sources of blood utilised in CPB, with the ambition to guide future guidelines in clinical perfusion practice.</p> <p>A long-term goal of the project is to minimise the overrepresentation of multiorgan injury in CPB patients and to develop the first evidencebased practice guidelines for blood management in perfusion practice.</p>	
<b>Patient Blood Management Seed Grants</b>	Evaluation of transfusion triggers in elderly patients admitted to the Intensive Care Unit (ICU) and the prevalence of anaemia on discharge from ICU and hospital	Flinders University	\$27,500.00	A/Prof David Roxby	<p>To examine the transfusion triggers for RBC transfusion in the elderly population in ICU and the prevalence of anaemia at ICU and hospital discharge.</p>	<p>Anaemia is now recognized as a risk factor for a number of adverse outcomes in older adults, including hospitalization, morbidity, and mortality. There is an increasing prevalence of anaemia with age mainly in the elderly population. In persons 65 years of age or older, there is an underlying aetiology for the anaemia such as chronic disease, iron deficiency, or myelodysplastic syndromes (MDS). Blood transfusion strategies to treat anaemia in the elderly are poorly understood. The normal compensatory mechanism may be impaired in the elderly, particularly those with cardiovascular disease. Following a series of randomised clinical trials, restrictive transfusion strategies have been adopted by multidisciplinary clinical groups including medical, critical care and anaesthesia. However, except for the one study, eligibility for trial participation was not centred on the elderly.</p> <p>This project will examine the transfusion triggers for RBC transfusion in the elderly population in ICU and the prevalence of anaemia at ICU and hospital discharge.</p>	<p><a href="#">Anaemia in elderly patients at discharge from intensive care and hospital - Sinha - 2021 - Vox Sanguinis - Wiley Online Library</a></p>

<b>Patient Blood Management Seed Grants</b>	Is the use of washed red blood beneficial in transfused pre-term newborns?	University of Adelaide	\$43,428.00	A/Prof Michael Stark	To determine whether transfusion of washed packed red blood cells results in a reduction in post-transfusion levels of pro-inflammatory cytokines and markers of endothelial activation in the very preterm newborn.	<p>Of all babies cared for in specialized intensive care settings the smallest and most premature babies are at the highest risk of dying or surviving with long term disability. This high-risk group of babies is also likely to receive a number of red blood cell transfusions during their hospital stay. Although these transfusions are often life saving there is some evidence that blood transfusions are associated with frequent and severe heart, lung, gut and brain injuries resulting in lifelong disability. This adverse response may contribute to the associations between transfusion and common major morbidities associated with preterm birth.</p> <p>In vitro evidence suggests washing red blood cells may reduce the adverse immune response to transfusion exposure. Whether this is also true in in critically ill patients, such as preterm newborns receiving washed blood, remains unknown. This randomised trial in extremely preterm newborns will compare the immune response to transfusion with standard red blood cells with the response to transfusion of washed red blood cells.</p> <p>This study will provide important insights into the biological actions of transfused blood and fill a significant knowledge gap. Interrogating immune mechanisms that may contribute to the development of common neonatal morbidities is a critical first step towards identifying the potential benefit of transfusion with washed red blood cells as an alternative to standard transfusion practice. With washed red blood already routinely available proof of a beneficial effect would be rapidly translatable into clinical practice.</p>	<a href="#">Effect of washed versus unwashed red blood cells on transfusion-related immune responses in preterm newborns</a>
<b>Patient Blood Management Seed Grants</b>	Intravenous iron for treatment of suboptimal iron Stores in non-anaemic patients presenting for major surgery (ISNAPS)	University of Western Australia	\$34,800.70	Clinical Prof Michael Leahy	To assess feasibility of a research protocol prior to a multi-centre randomised controlled trial of intravenous iron in patients with non-anaemic iron deficiency undergoing major surgery with an anticipated blood loss of greater than 500mL.	<p>Iron infusions are a commonly used treatment to correct iron deficiency anaemia (low blood haemoglobin); they are frequently utilised in surgical patients to optimise a patient's own blood iron stores prior to surgery and improve postsurgical outcomes. International guidelines recommend the pre-operative administration of iron to surgical patients who are not anaemic, but have iron stores considered sub-optimal, when substantial blood loss that would result in depletion postoperatively is anticipated.</p> <p>This pilot study will examine the feasibility and tolerability of a research protocol to compare outcomes (including recovery of iron stores, exposure to blood transfusion and quality of recovery after surgery) in a group of hospital patients having major surgery.</p> <p>Non-anaemic patients with suboptimal iron will either receive an iron infusion preoperatively or placebo. Patients will be examined by questionnaire; physiological testing (maximal distance walked in six minutes, and a non-invasive measure of muscle oxygen use); and blood tests postoperatively and at 30 days after their operation to quantify and qualify outcomes for comparison between these groups.</p>	Terminated

						<p>The outcome measures will holistically examine recovery after surgery and assess the bone marrow response to bleeding (by producing more red blood cells), a patient's physical recovery, and quality of life including mental/emotional well-being and return to normal activities.</p> <p>In addition, this study will assess for any change in hospital readmissions or complications, transfusion rates between groups, and provide data to support a cost benefit analysis for intravenous iron. If the outcomes in the iron infusion groups are superior to that of placebo, it will provide evidence for benefit in this group of patients and encourage this practice to become standard of care in hospitals that perform major surgeries including cancer surgery joint replacement and vascular surgery.</p>	
<b>Patient Blood Management Seed Grants</b>	A mixed method pilot feasibility study of self-managing red cell transfusion requirements in chronic anaemia	Australian National University	\$56,367.30	Dr Philip Crispin	To assess the potential for a patient self-management of transfusion in chronic anaemia program to improve patient quality of life.	<p>National and international guidelines have identified red cell transfusion thresholds based primarily on haemoglobin (Hb) concentration. They also acknowledge that the decision to transfuse needs to be based on more than this, considering patient factors and symptoms when the decision to transfuse is made. There is mixed evidence on restrictive thresholds (Hb&lt;?0g/L) in cardiovascular disease and further studies are underway with mortality being the primary endpoint in these studies.</p> <p>While mortality is clearly a critical endpoint, the majority of transfusions in Australia are given to patients where the aim of therapy is to improve quality of life by reducing symptoms of anaemia, either short term or for chronic anaemia. The decision of transfusion is complicated, as the symptoms of anaemia are not specific. Patients with anaemia may be transfused unnecessarily based on symptoms attributable to their underlying disease, or transfusions may be withheld based on what clinicians perceive as an acceptable Hb, keeping patients' activities limited by anaemia.</p> <p>The study will evaluate the feasibility of a patient self-directed transfusion strategy. People with anaemia on chronic transfusion regimens will be recruited. After a baseline assessment and education, they will have a regularly transfusion as prescribed by their doctor and assessments repeated, they will then keep a symptom diary, and when they feel they need a transfusion, asked to contact the study team who will arrange daily red cell transfusions until the recipient feels that they have satisfactorily controlled their symptoms, or where they feel there has been no improvement with additional transfusions. The study will also evaluate quality of life, exercise tolerance before and after transfusion, the Hb at which patients choose to have transfusions and feel that they have reached their maximum benefit. There will also be patient interviews at the end of the study to assess acceptability of the self-directed approach.</p>	No publication received yet

<b>Patient Blood Scholarship Grants</b>	Computerised support for decision-making during massive transfusion to improve efficiency and outcomes	Macquarie University	\$33,000.00	Dr Brenton Sanderson	<p>To improve the efficiency and efficacy of surgical MT management and patient outcomes through optimised decision-making processes.</p>	<p>Major bleeding can occur in any surgical, trauma, obstetric or critically ill patient. Recent studies show that MT patients have a 30-day mortality of over 20%.</p> <p>Massive transfusion (MT) requires a time-critical coordinated effort between front-line clinicians (usually anaesthetists, emergency physicians and nursing staff), haematologists and the hospital blood bank staff, working in separate physical environments to expedite complex transfusion support requirements. Most hospitals organise this process through a locally adapted MT Protocol (MTP) that directs the staff roles and activities, specifies the type and quantity of blood products, and provides guidance for ongoing laboratory investigation, markers for success of resuscitation and ongoing management specific to the cause of bleeding.</p> <p>Current evidence shows that that if this process is completed safely, effectively and efficiently, the patient will have a better outcome, require less blood (a precious resource in limited supply) and cost the health system less.</p> <p>Clinical decision support systems (CDSS) involve the computerised application of evidence-based algorithms to patient-specific information to help guide clinicians. CDSS have been shown to improve decision-making in a range of complex, high-stakes clinical settings. However, they have not been specifically studied in life-threatening bleeding requiring a MT.</p> <p>This project aims to demonstrate that, CDSS based on current transfusion guidelines, the specific cause of a patient's bleeding, and their latest blood tests will reduce the amount of blood required to manage their bleeding and improve patient outcomes. Since MT requires large volumes of blood products (a finite resource), there is a clear need and opportunity to improve blood utilisation.</p> <p>To address major gaps in the PBM guidelines, this research project will:</p> <ol style="list-style-type: none"> <li>1. Review the evidence for quality indicators in MTPs to facilitate the quality improvement process</li> <li>2. Survey Australian and New Zealand anaesthetists on their experience of MT in the surgical setting and attitudes towards decision support for MT</li> <li>3. Develop and pilot a prototype CDSS for MT based on clinical requirements</li> <li>4. Evaluate this system in a simulated surgical critical bleeding and MT scenario.</li> </ol>	<p><a href="#">How well does your massive transfusion protocol perform? A scoping review of quality indicators</a></p> <p><a href="#">Massive transfusion experience, current practice and decision support: A survey of Australian and New Zealand anaesthetists</a></p> <p><a href="#">Clinical decision support versus a paper-based protocol for massive transfusion: Impact on decision outcomes in a simulation study</a></p> <p><a href="#">Multicentre, multidisciplinary user-centred design of a clinical decision-support and simulation system for massive transfusion</a></p> <p><a href="#">Massive transfusion experience, current practice and decision support: A survey of Australian and New Zealand anaesthetists</a></p> <p><a href="#">How well does your massive transfusion protocol perform? A scoping review of quality indicators</a></p>
<b>Ig Scholarship Grants</b>	Neuromuscular ultrasound as a biomarker in chronic inflammatory	University of Melbourne	\$22,178.20	Dr Nicholas Crump	<p>To assess whether addition of ultrasound to routine clinical practice will allow better diagnosis, classification and treatment of CIDP patients.</p>	<p>Chronic inflammatory demyelinating polyneuropathy (CIDP) requires long term treatment to minimise progressive neurological damage and disability, using immune suppressing drugs and/or intravenous immunoglobulin (IVIg). Treatment can have debilitating side effects</p>	<p><a href="#">A Retrospective Study of Ultrasound Accuracy for the Diagnosis of Chronic Inflammatory Demyelinating Polyneuropathy</a></p>



demyelinating  
polyneuropathy  
(CIDP)

requiring frequent hospitalisation and uses health resources that are limited and expensive.

Treatment decisions in CIDP are based on assessment using examination findings and subjective patient-reported symptoms. These clinical markers, along with routine nerve conduction studies (NCS), are somewhat limited in monitoring disease progression and effectiveness of therapy. Biomarkers assisting with diagnosis and treatment optimisation for CIDP would be of clear benefit.

Advances in neuromuscular ultrasound (NMUS) have the potential to provide more information about nerve function and structure and response to treatment than current techniques. These parameters can be obtained non-invasively, relatively quickly, and with minimal patient discomfort, and thus are good candidates for repeatable testing. Combined with more rigorous and objective clinical assessment (validated disability and quality of life scales, formal muscle strength testing such as by grip dynamometry), repeated assessment of CIDP patients could be more standardised, and hopefully improved.

The aim of this project is to assess whether addition of the safe and painless NMUS technique to routine clinical practice will improve disease diagnosis and classification, and effectiveness of treatment for CIDP patients.

Candidate parameters have been identified from the existing literature and retrospective chart review, and techniques confirmed in a cross-sectional cohort. The team has now proceeded to a longitudinal assessment of clinical and ultrasound parameters over 12 months, seeking those that correlate with clinical and treatment-related outcomes.

This project has the potential to add to the efficient and effective use of intravenous immunoglobulin in CIDP, the largest specific diagnosis in terms of patient numbers, as well as total volume of IVIg used in Australia. In particular, this predictive biomarker study has the potential of addressing identified priority areas for immunoglobulin research around better prediction of possible responders to IVIg, and identification of remission. This includes improved dosing and administration (eg tools to better assess frequency and titration of IVIg therapy); predictors that may allow early identification of responders, “under-responders” and non-responders to IVIg therapy (thus guiding optimisation of IVIg dose, or switch to alternate therapy); and recognising patients in long term remission (thus guiding safe IVIg wean or cessation).

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