BLOOD SYNERGY

2020 - 2021

Research Report

Welcome

Professor Erica Wood

Principal Investigator

It is a great pleasure to welcome you to this first research report from the NHMRC-funded Blood Synergy

The objective of the NHMRC Synergy grant scheme is "to support outstanding multidisciplinary teams of investigators to work together to answer major questions that cannot be answered by a single investigator". This is a wonderful opportunity for Australia to conduct high-quality transfusion research and to build national research capacity in this area – an area where, in the past, funding has been quite limited. As you will see from this report, we are determined to take full advantage of the opportunity!

We were extremely pleased to be awarded the inaugural Fiona Stanley Prize at the 2020 NHMRC Research Excellence Awards for the top-ranked Synergy application, emphasising the high quality of the proposal, the expertise and diversity of the investigator team, and importance of this research to health systems in Australia and internationally.

In the two years since, the collaboration has grown from the original group of investigators who conceived the proposal. We've established a project team and an external advisory committee, and welcomed additional clinical researchers and students from around Australia and New Zealand, and around the world.

In spite of difficult conditions, mostly related to the COVID-19 pandemic, we've made excellent progress on our research program. This is structured in project streams across transfusion support for critical bleeding, critical care and blood disorders, and improving the use of immunoglobulin.

We've also secured additional funding for major clinical trials such as RATIONALISE and FEISTY II, and other important projects such as the National Transfusion Dataset pilot. These successes really demonstrate the value of the research, and the possibilities presented by the Synergy funding and network.

Young investigators are a vital part of the Synergy, and we are providing them encouragement and funding to develop and lead their own projects and to chair the research stream activities, mentored by leading experts. We have appointed our first Synergy-funded PhD student, who will contribute to several projects and contribute to building Australia's future transfusion research capacity.

Please get in touch with an idea or feedback on the studies in this report. We're always looking to collaborate, so we hope to see you at a future Synergy meeting, in person or online, and to have your input to this important research.

About Us

The Blood Synergy is an NHMRC-funded program of research that includes clinical studies, trials, and patient registries concerned with blood transfusion practice and patient outcomes. We're focusing on making better use of blood products and improving outcomes for patients requiring blood in the settings of trauma, critical illness, or blood disease.

Used wisely, blood transfusions save lives. However, limitations still exist in ensuring their best use. A significant challenge is the lack of evidence to guide best practice. Patient blood management (PBM) is an approach that places patient outcomes at the core of blood transfusion. It is international best practice, supported by the World Health Organization, health policy-makers, and professional societies. However, evidence in many areas is inadequate to formulate solid PBM recommendations, including how blood is used, clinical outcomes, patient and clinician preferences, and costs. The result is a potentially inefficient, and ineffective use of blood, with reduced patient benefit.

Transfusion support is also not always available when and where it is needed, due to the labile nature of blood components and unexpected bleeding events. Treatment of major haemorrhage may require urgent delivery of large volumes of red blood cells, platelets, and plasma. Access to these products in out-of-hospital or remote settings is particularly limited. The outcome can be a significant delay in the timely delivery of blood products, with the potential for serious clinical consequences.

The Blood Synergy program is addressing these shortcomings by identifying current practice, testing new products, and closing evidence gaps, particularly in areas of high-volume use, high risk to patients, and high product costs. Our objective is to make the best use of this most precious natural resource and improve patient outcomes.

We are building Australia's transfusion research capacity, bringing together expertise and resources from across clinical and research fields.

Our team are international leaders in transfusion medicine and its related disciplines, and we're passionate about improving patient outcomes.

How is blood used?

A key goal is to improve knowledge around how blood is currently used across Australia. To establish the current standard of care, we're using observational studies and expanding our established massive transfusion registry into a dataset collating information on all types of transfusions. Together these data will identify areas of greatest need and improvement.

Improving access

We're exploring ways to increase access to blood components in prehospital and rural and remote settings by examining alternatives to conventional blood products, such as those with an extended shelf-life. We are also using interventional studies to evaluate how blood products can be most efficiently and effectively used in the treatment of critical bleeding and critically ill patients.

Optimising outcomes

We're addressing evidence gaps in the management of bleeding and anaemia. We're studying how best to use immunoglobulins and other measures to prevent infections in blood cancer patients. These studies will help identify optimal use of blood products, and improve patient outcomes as well as reduce transfusion risks and costs.

Scope

The Blood Synergy team conducts research that is focused on addressing Australia's national transfusion priorities to deliver safer and more appropriate transfusion support for patients, help guide better stewardship of national blood supplies, and reduce costs to the community.

Our research provides new knowledge on conventional and novel blood products, transfusion practice, and health systems and health economics data to tackle the fundamental questions: How is blood used in Australia, and how can its use be improved and made more cost effective?

Observational studies, data linkages, and clinical trials will provide the evidence that informs blood policy and practice both within Australia, and internationally.

Addressing Australia's national transfusion research priorities

Impact

Our team are international leaders with established research and practice improvement collaborations with governments, blood services, community and professional organisations, and industry, to rapidly translate new evidence into practice.

Multidisciplinary

Combining expertise in haematology and transfusion medicine, emergency and trauma, military medicine, critical care, anaesthesia, nursing, transfusion laboratory science, public health, epidemiology, biostatistics, health economics, and health systems research.

Reach

We're working to improve access to and outcomes of transfusion support for diverse patient groups in different settings across Australia, including in regional and remote areas and for Australian Defence Force personnel.

Our Approach

The Blood Synergy is an alliance of Australian and international clinical researchers, affiliated with a number of university and government institutions and organisations across Australia. Our research and clinical networks span all jurisdictions.

The program is managed by the Transfusion Research Unit in the School of Public Health and Preventive Medicine at Monash University. We work closely with the Australian & New Zealand Intensive Care Research Centre (ANZIC RC), as well as the Centre for Health Economics at Monash Business School, Monash University.

Meet the Team

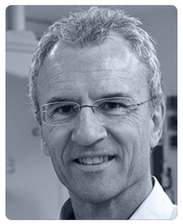
The Blood Synergy team consists of national and international leaders in blood transfusion, haematology, trauma medicine, and intensive care, as well as anaesthesia, nursing, biostatistics, health economics, health infomatics, and transfusion science.

Chief Investigators

Prof Erica Wood
Monash University

A/Prof Zoe McQuilten
Monash University

Prof Peter Cameron
Monash University



Prof Jamie Cooper AC
Alfred Hospital

Prof Michael Reade AM
University of Queensland

Dr Lisa Higgins
Monash University

Prof Judith Trotman
Concord Repatriation General Hospital

Prof Simon Stanworth
Oxford University Hospitals NHS Trust, UK

Ms Linley Bielby
Department of Health, Victoria

Associate Investigators

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Monash University

Dr Andrew Flint
Monash University

Prof Tony Harris
Monash University

Dr Brenton Sanderson
Macquarie University

Prof Craig French
Western Health

Prof Enrico Coiera
Macquarie University

A/Prof John Reynolds
Monash University

A/Prof Rosemary Sparrow
Monash University

Partner Investigators

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Menzies School of Health Research

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Canberra Hospital

Dr Robert Weinkove
Malaghan Institute of Medical Research, NZ

Program Staff & Students

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Program Manager

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Deputy Director - Operations, Transfusion Research Unit

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Project Manager, National Transfusion Dataset

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Data Manager

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Senior Research Fellow, Biostatistician (from 2022)

Dr Adam Irving
Research Fellow, Health Economist

Dr Khai Li Chai
PhD Student

Ms Sara Carrillo de Albornoz
PhD Student (from 2022)

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Data Officer

Ms Jennifer Griffiths
Clinical Trial Coordinator, RATIONALISE

Ms Amber Degelia
Clinical Trial Coordinator, TREATT

Ms Tina van Tonder
Clinical Trial Coordinator, RATIONAL

Mr Alex Poole
Project Manager, InPUT study

Mrs Helen Haysom
Project Coordinator, Massive Transfusion Registry

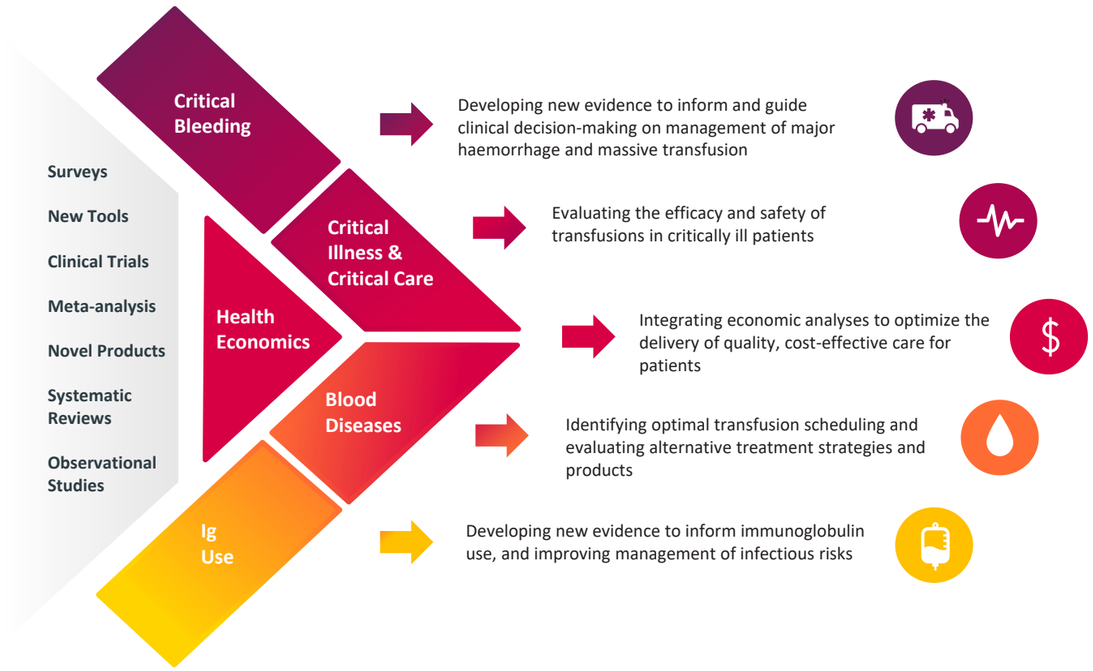
Research Streams

Critical Bleeding

Major haemorrhage is a leading cause of early death. It is often unexpected, and may require large quantities of different blood products urgently – a daily challenge for blood services and health systems. We're expanding our Massive Transfusion Registry into the National Transfusion Dataset, and together with a network of specialists working across prehospital and hospital settings developing new evidence to inform recommendations and guide clinical decision-making on management of critical bleeding.

Critical Illness

Critically ill patients in intensive care often receive blood transfusions, yet major evidence gaps still exist regarding the optimal use of blood components and other therapies in this context. We are conducting observational and interventional studies to evaluate the efficacy and safety of transfusions in critically ill patients, providing data that will inform policy and guide clinical decision-making in transfusion support for patients in the critical care setting.



Blood Diseases

Patients with blood cancers and other blood diseases are the major users of red cell and platelet products. However, much of the evidence base for transfusion practice in this area is weak and in some cases, outdated, as treatments of these disorders have advanced significantly in recent years. We are investigating optimal transfusion and alternative treatment strategies and products, to improve clinical management and outcomes, and reduce transfusion risks.

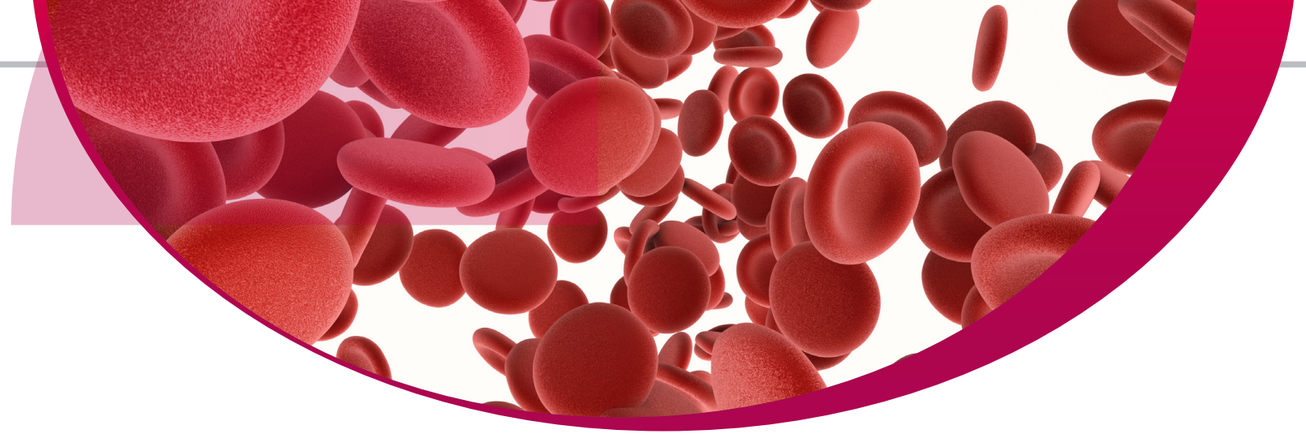
Immunoglobulin Use

Immunoglobulin (Ig) therapy, made from plasma, is used to treat patients with a wide range of conditions; for patients with blood cancers, it is generally used to prevent or treat infections. Ig use accounts for over half Australia's national blood budget, but supply is limited and its use continues to grow. Our research investigates the efficient and effective use of Ig, including optimal duration of use, clinical outcomes for patients receiving Ig, and other interventions to manage infectious risks.

Health Economics

Our health economic analyses are conducted alongside each research stream, embedded within each of the research projects. This approach provides important new information to improve health system performance and deliver quality, cost-effective care for patients.

Adequate supplies of safe blood are a critical element of national health infrastructure, and fundamental to modern healthcare



At a Glance

The Blood Synergy's program of research includes:

MAJOR HAEMORRHAGE MANAGEMENT

- Developing a National Transfusion Dataset (NTD), through expansion of the Australian & New Zealand Massive Transfusion Registry (ANZ MTR)
- Integration of prehospital haemorrhage and transfusion datasets

ACCESS AND USE OF BLOOD PRODUCTS FOR MAJOR HAEMORRHAGE

- Modelling demand and availability of blood products
- Uptake and impact of point-of-care testing on coagulation management and blood use

NEW APPROACHES TO MASSIVE TRANSFUSION SUPPORT

- FEISTY II: Fibrinogen concentrate for the treatment of critical bleeding
- Development of clinical decision support systems for critical bleeding

TRANSFUSION SUPPORT IN CRITICALLY ILL PATIENTS

- Observational studies of blood product use in intensive care
- Platelet transfusion thresholds in sepsis

MANAGEMENT OF ANAEMIA AND BLEEDING IN HAEMATOLOGIC MALIGNANCIES

- Alternatives to conventional platelet transfusion to prevent and manage bleeding
- Optimising red blood cell transfusion strategies in myelodysplasia

IMMUNOGLOBULIN USE

- Observational studies of immunoglobulin use in patients with blood cancers
- Comparing immunoglobulin therapy versus antibiotics for the prevention and treatment of infection
- Convalescent plasma for treatment of SARS-CoV-2 infection (COVID-19)

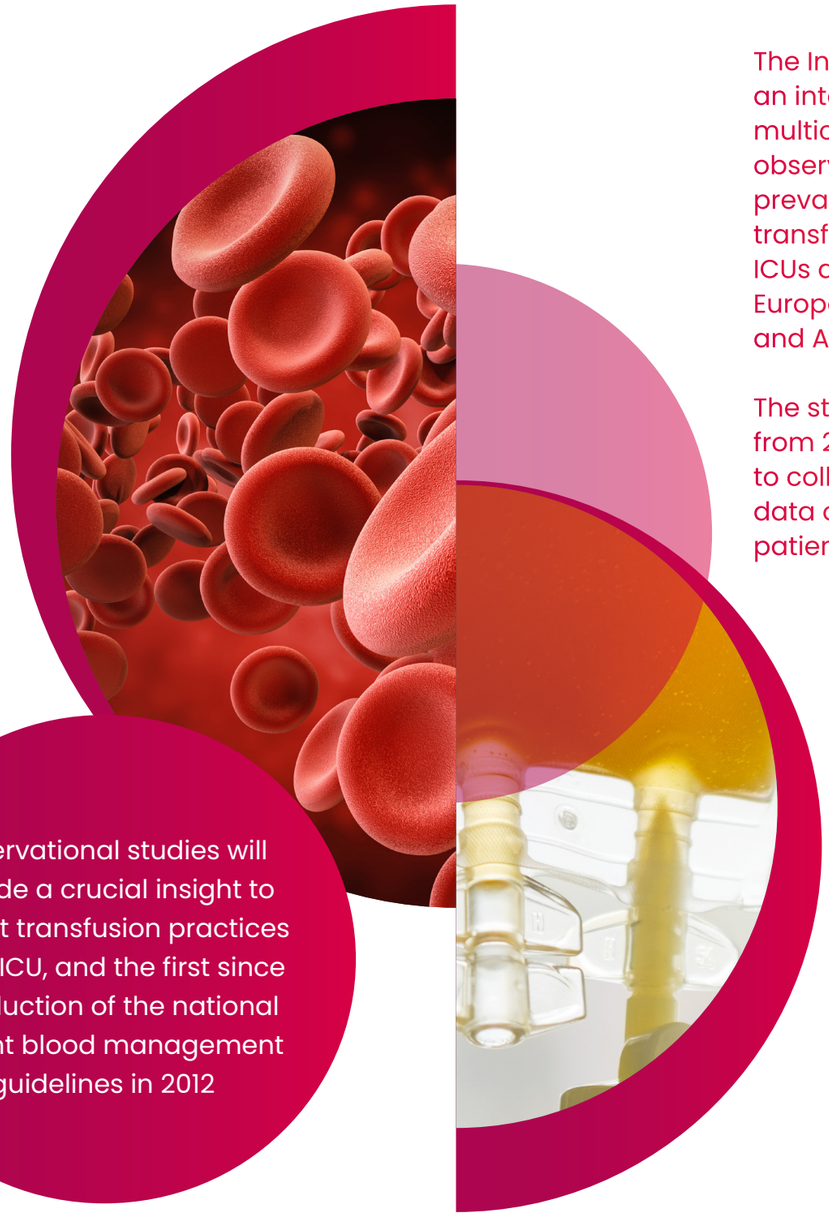
Health economic and health service research underpins and amplifies all our clinically themed activities, with the aim of providing evidence-based guidelines and outcomes to inform quality care and price setting

Blood in the ICU

Blood transfusion is a common occurrence in intensive care, where many patients develop life-threatening bleeding and clotting conditions. While the decision to provide blood products to critically ill patients can be based on a variety of clinical features and/or test values, there remain a number of evidence gaps to guide blood transfusion decisions in these settings. As a result, variations exist in how and when blood products are used within Australian ICUs, and internationally.

An important step in addressing these evidence gaps is to document current practice: which ICU patients receive blood products, which blood components are used (and why), and what are the outcomes?

Dr Andrew Flint is leading a one-day snapshot of **blood transfusion practices in the ICU**, as part of the Point Prevalence Program conducted in collaboration with the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG) and The George Institute. Andrew's study is gathering data on the proportion of patients receiving blood products, the types and quantity of products transfused, and laboratory results for all adults admitted to participating Australian and New Zealand ICUs over a 24-hour period, as well as 28-day outcomes (mortality and morbidity).



Observational studies will provide a crucial insight to current transfusion practices in the ICU, and the first since introduction of the national patient blood management guidelines in 2012

The InPUT study is an international multicentre prospective observational point prevalence study of transfusion practice in ICUs across Australia, Europe, North America and Asia.

The study conducted from 2020 to 2022 is set to collate transfusion data on up to 4000 patients worldwide.

A one-week snapshot of transfusion practice is also underway in the **InPUT** study: an International Point Prevalence Study of Intensive Care Unit Transfusion Practices led by Prof Alexander Vlaar and colleagues (University of Amsterdam, The Netherlands) . The Australian and New Zealand component of this study is led by **A/Prof Zoe McQuilten,** and collates data from up to 45 participating ICUs over a one-week period. All adult patients admitted to ICU will be followed for one week, gathering data on the types of transfusions and triggers for transfusion, as well as mortality and length of stay in hospital.

When combined with the outcomes of our international collaborators the study will provide the most comprehensive and up to date understanding of current transfusion practice in ICU in Australia, New Zealand, and worldwide.

Gaining a picture of how blood is used for critically ill patients helps improve the way we use blood in the future. We'll be able to identify where we're deviating from current guidelines and international practice, and how to improve the evidence base through future trials and studies.

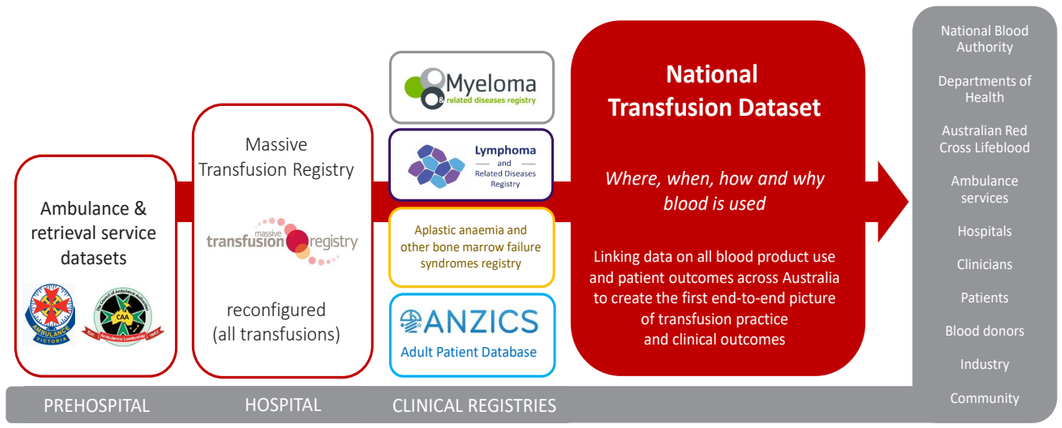
These studies are supported by the Blood Synergy and ANZIC RC, and research grants from the National Blood Authority, and Australian and New Zealand Society for Blood Transfusion.

Building a National Asset

National Transfusion Dataset

Since 2011 the Australian and New Zealand Massive Transfusion Registry (ANZ MTR) has collated information on more than 10,000 cases of massive transfusion. All occurrences of patients receiving five or more units of red blood cells within a 4-hour period were gathered from over 40 participating hospitals across Australia and New Zealand, including regional sites. This provides a valuable data repository that unveils where and why large volumes of blood products are required.

In partnership with the Australia Research Data Commons (ARDC) our team, led by **Prof Erica Wood** and project manager **Dr Kim Huynh**, are now set to expand data coverage through development of the **National Transfusion Dataset** (NTD). We're taking the first steps to capture the full picture of blood product use in Australia. The dataset will include all treatment in prehospital ambulance/retrieval settings, to hospital transfusions, through to blood use in the community for patients with blood cancers. We'll see for the first time an end-to-end picture of where, when, how and why blood is used.

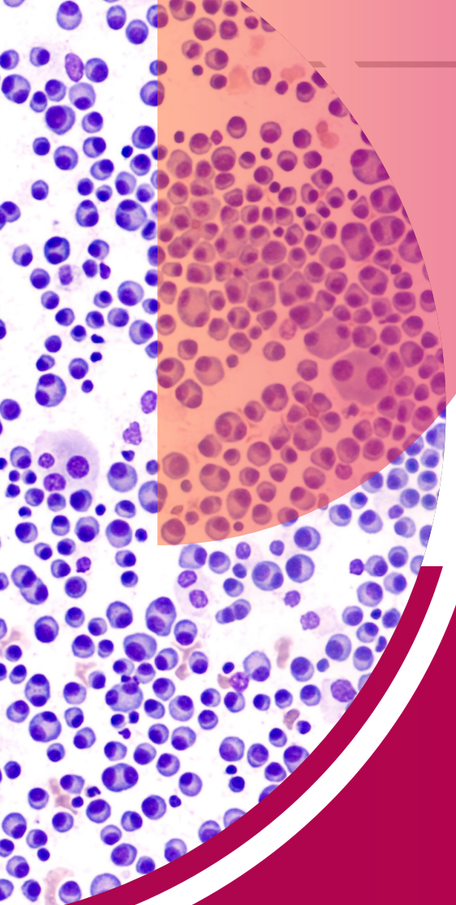


National Transfusion Dataset

Our partners in establishing the NTD include Ambulance Victoria, the Australia and New Zealand Intensive Care Society (ANZICS) Adult Patient Database, and the Prehospital and Emergency Care Centre of Research Excellence Australia and New Zealand (PEC-ANZ). In the first phase of the NTD we're establishing the integration of transfusion data from Ambulance Victoria with hospital data from centres such as the Alfred Hospital. This will be followed by expansion to other ambulance/retrieval services and hospitals, and linkage with the ANZICS APD, which captures data from more than 90% of ICUs across the country. And finally, we'll integrate transfusion data from the blood disease registries – Lymphoma and Related Diseases Registry (LaRDR), Myeloma and Related Diseases Registry (MRDR), and Aplastic Anaemia Registry (AAR) – which together contain longitudinal data on more than 10,000 heavily transfused patients from over 70 hospitals across ANZ.

Once established the dataset will provide a unique resource for policy-makers, government, and research, with the end-goal of improving blood utilisation and patient management and outcomes. By improving access to transfusion data, we have an opportunity to identify areas of need, and variance in transfusion practice. It also allows us to see where there are gaps in knowledge or evidence, and ultimately, inform national transfusion policy and practice.

The NTD links individual prehospital and hospital datasets with clinical registry data to show how and why issued blood products are used, and the clinical outcomes of transfused patients



Efficient use of Immunoglobulins

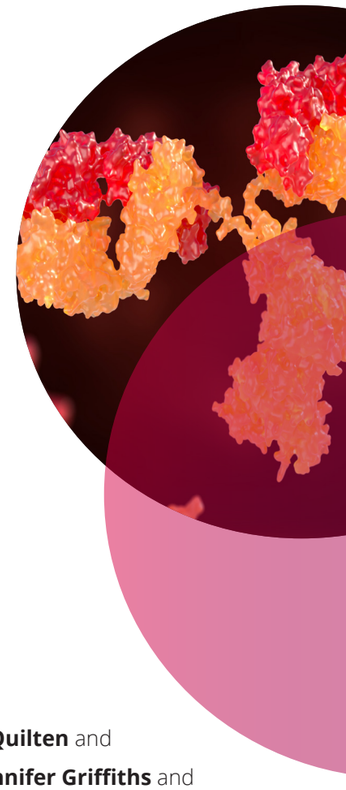
Immunoglobulins (Ig), made from donated plasma, are routinely used to prevent serious infection in people with blood cancers such as chronic lymphocytic leukaemia (CLL), multiple myeloma (MM), and non-Hodgkin lymphoma (NHL). Infection is a major cause of mortality and serious morbidity in this patient group, and results in substantial additional healthcare resource use and costs.

Low antibody levels are seen in a large proportion of individuals with CLL, MM and NHL, and are associated with recurrent and/or severe bacterial, fungal and viral infections. Treatment with Ig aims to prevent infection. However, evidence to support this approach is limited to a few small studies conducted more than 25 years ago. In the interim, major changes to cancer therapy and supportive care have changed immune profiles and infection risks. There is now uncertainty in how Ig replacement therapy applies to current practice. Evidence gaps in Ig use, including dose and optimal duration, have been identified by Australian health authorities as a national research priority, because Ig supplies are limited, use is increasing, and it is very expensive: Australia spends ~$100 million annually on Ig products for blood cancer patients alone.

Prophylactic antibiotics are a potential inexpensive alternative to Ig, yet both options carry risks. The **RATIONAL** phase II feasibility trial examined whether oral antibiotics were equivalent to Ig in reducing the risk of infections in people with blood cancers newly eligible for Ig. Completed in 2021, RATIONAL demonstrated feasibility of patient recruitment and tolerability of prophylactic antibiotics as a treatment. Importantly, over the 12-month period of the trial, the number and severity of infections were not greater in the patient group receiving antibiotics, thereby setting the scene for larger phase III trials.

Currently, Australian government Criteria governing access to Ig state that "Cessation of Ig therapy should be considered at least after each 12 months of treatment." This recommendation is not evidence-based, as there are no data available on the optimal duration of use, or outcomes after stopping. We do not know when to stop, how to predict when it is safe to stop, or what to monitor prior to and after stopping.

To answer these key questions we initiated the **RATIONALISE** study: a phase II/III multi-arm trial evaluating the cessation of Ig therapy in blood cancers. Up to 300 eligible patients with CLL, MM or NHL across Australia and New Zealand will be randomised to either continue Ig therapy, cease Ig therapy, or cease Ig and commence prophylactic antibiotic treatment for a period of 12 months.



RATIONALISE collects information on the number of serious infections, time to first infection, and mortality, along with patient quality of life. Running alongside is our economic analysis evaluating how to cost-effectively utilise Ig and alternate interventions, and our qualitative analysis exploring patient perspective on Ig therapy. Lastly, patient blood and faecal samples to investigate the microbiome will provide valuable information on how disease status and treatment relate to immune function. By providing the much-needed evidence on the benefits of therapies used to prevent infections, and their cost-effectiveness, we expect translation into Australasian and international policy and guidelines will support clinical decision-making and ultimately, reduce infection risk to patients, and improve the long-term sustainability and affordability of national Ig supplies.

The RATIONAL and RATIONALISE trials are led by **Prof Erica Wood**, **A/Prof Zoe McQuilten** and **Dr Khai Li Chai**, as part of her PhD program, together with trial coordinators **Ms Jennifer Griffiths** and **Ms Tina van Tonder**, and biostatistician **A/Prof John Reynolds**. The trials teams encompass a strong collaborative network with expertise in health economics, infectious diseases, and qualitative assessment, and are supported by the Australasian Leukaemia & Lymphoma Group (ALLG), a National Blood Authority research grant (RATIONAL), and NHMRC Clinical Trials and Cohort Studies grant (RATIONALISE).

How Much Does Timing Matter?

Up to two-thirds of people with myelodysplastic syndromes (MDS) are dependent on receiving red blood cell transfusions every three to four weeks. MDS are disorders characterised by changes in blood cell production in the bone marrow. This is commonly accompanied by anaemia, which may result in severe fatigue, shortness of breath and heart complications as an outcome of fewer circulating red blood cells. These symptoms may be improved by regular transfusions.

Yet whilst transfusions relieve the impact of anaemia, chronic transfusions may also be associated with a poorer quality of life. This may relate to the many hospital visits associated with receiving transfusions and pre-transfusion testing, and/or possible fluctuations in haemoglobin levels between transfusions. We are investigating whether changing the frequency of transfusions will help stabilize haemoglobin levels, and improve patient wellbeing and daily function.

Individuals who undergo frequent transfusions are also more likely to encounter transfusion reactions as a result of alloimmunization; an immune response to antigens in donated blood. The rate of such reactions may be reduced by matching the donated blood to the recipients' own. However, the use of "matched" red cells has not been previously explored in MDS.

The REDDS-2 study is a randomised n-of-1 clinical trial assessing the feasibility of a weekly transfusion schedule (using matched red cells) and its impact on quality of life and daily function in transfusion-dependent MDS. A qualitative sub-study will explore the patient and healthcare provider experiences. This study is led by **Dr Allison Mo** as part of her PhD, **A/Prof Zoe McQuilten** and **Prof Erica Wood** in collaboration with **Prof Simon Stanworth** and researchers from Radboud University Medical Center (Netherlands). Thirty patients will be recruited through hospitals in Australia, the UK and the Netherlands.

Australia is one of the highest per capita users of immunoglobulin products. Demand is growing by 10-12% every year, straining supplies, and costing the community in excess of $500 millon per year

What Does It Cost?

Adequate supplies of safe blood are a critical element of national health infrastructure, and fundamental to modern healthcare. Yet blood is a scarce resource, donated by the community, and relies on continuous blood donations to ensure constant supply. It is also costly to produce: Australia spends more than $1.3 billion every year on just the supply of blood products alone. The additional costs associated with administering blood transfusions within the health services are unknown.

Building our understanding of the real transfusion costs can help ensure that blood is used in a more efficient and cost-effective way

Our health economics analysis is led by **Dr Lisa Higgins**, with support from **Dr Adam Irving** and the Centre for Health Economics, led by **Prof Anthony Harris**. The program incorporates health economics alongside each of our trials and studies. We're examining where different products are used to determine the true costs to health services, as well as the ongoing healthcare costs after transfusion. This information is also linked to patient outcomes and preferences to provide a fuller picture of where transfusion is most beneficial. With this knowledge we can provide evidence-based guidance to optimise blood use and patient care.

Building Capacity

A primary objective of our program is to build Australia's transfusion research capacity, through support of early career researchers and emerging leaders.

Dr Adam Irving is an early career Research Fellow with the Transfusion Research Unit and the Centre for Health Economics, Monash University. Adam's expertise is in the demand and supply of blood products and outcomes of transfusion, particularly those related to major haemorrhage and critical illness. Awarded his PhD in early 2020, he has 10 years' experience in the field of health economics, including evaluations for health technology assessment, and economic analysis of clinical trials.

Dr Allison Mo is a clinical and laboratory haematologist at Austin Health and Monash Health, and an early career clinical researcher undertaking a PhD with Monash University. She is a Blood Synergy associate investigator and co-chairs the Blood Diseases & Immunoglobulin Use working group. Allison's PhD research focuses on optimisation of transfusion practices in patients with myelodysplastic syndromes, which includes a leading role in the REDDS-2 study.

Dr Khai Li Chai is a consultant haematologist and PhD candidate at Monash University with interests in blood diseases and supportive care. Her PhD studies examine whether immunoglobulin therapy or antibiotics are more effective in managing recurrent infections in people living with blood cancers such as chronic lymphocytic leukaemia, non-Hodgkin lymphoma, and multiple myeloma. Khai Li is an associate investigator on the RATIONALISE study, and co-chair of the Blood Diseases & Immunoglobulin Use working group.

Blood Synergy associate investigator **Dr Brenton Sanderson** is a specialist anaesthetist with an interest in integration of IT systems and anaesthesia care to improve patient outcomes. His PhD, undertaken at Macquarie University under a team of multidisciplinary supervisors, Prof Enrico Coiera, Prof Erica Wood, A/Prof Lise Estcourt (Oxford) and Dr Jeremy Field, (Westmead) investigates decision support tools for massive transfusion. Brenton is co-chair of the Blood Synergy program's Critical Illness working group.

Clinician PhD student **Dr Andrew Flint** is an associate investigator of the Blood Synergy, and co-chair of our Critical Illness working group. Andrew is also a chief investigator on both observational studies of blood transfusion in the ICU. His research examines both the clinical and health economics aspects of platelet transfusions in critical illness, with the ultimate focus on improving platelet transfusion practices and outcomes. In parallel to his PhD studies, Andrew is also a medical officer in the Royal Australian Navy supported under the Military Specialist Program to do specialty training in intensive care medicine.

Highlights 2020-2021

Our team has been awarded a number of grants to support specific Blood Synergy projects, and in recognition of their expertise, and excellence in clinical research. Project funding ($6.4m in total) was made possible by the investment in infrastructure funded by the NHMRC Synergy grant.

Grants

NHMRC Investigator Grants 2020:
A/Prof Zoe McQuilten

Australian Research Data Commons Partnership Program 2020:
A national transfusion data asset for Australia (*Investigators: Erica Wood, Zoe McQuilten, Neil Waters, Karina Brady, Cameron Wellard, Peter Cameron, Biswadev Mitra, David Pilcher, Andrew Spencer, Stephen Opat, Lucy Fox, Steve Bernard, Karen Smith, Kim Huynh*)

National Blood Authority Project & Seed Grants 2021:
The International Point Prevalence Study of Intensive Care Unit Transfusion Practices (InPUT) (*Investigators: Zoe McQuilten, Jamie Cooper, Andrew Flint, Craig French, Lisa Higgins, Adam Irving, Michael Reade, Alexander Vlaar, James Winearls, Erica Wood, Karina Brady*)

Prehospital lyophilised plasma (*Investigators: Dev Mitra, Steve Bernard, Michael Reade, Erica Wood, Zoe McQuilten, Russell Gruen*)

ANZSBT Research Fund 2021:
Blood transfusion practices in intensive care (*Investigators: Andrew Flint, Erica Wood, Michael Reade, Zoe McQuilten, Karina Brady*)

NHMRC Clinical Trials and Cohort Studies Grant 2021:
Preventing infections in patients with blood cancer through evidence-based use of immunoglobulin or alternatives: The RATIONALISE trial (*Investigators: Erica Wood, Zoe McQuilten, Orla Morrissey, Judith Trotman, Andrew Spencer, Stephen Opat, Laura Fanning, John Reynolds, David Paterson, Stephen Mulligan, Khai Li Chai, Dennis Petrie, Andrew Grigg, Robert Weinkove, Jonathan Wong, Philip Crispin, Michael Gilbertson, Kyle Crassini, Brendan Beaton*)

MRFF Rare Cancers, Rare Diseases & Unmet Needs Grant 2021:
Fibrinogen Early In Severe Trauma StudY II (FEISTY II) (*Investigators: Zoe McQuilten, James Winearls, Jamie Cooper, Michael Reade, Craig French, Jeffrey Presneill, Zsolt Balogh, Stephane Heritier, Lisa Higgins, Erica Wood, Nicola Curry, Donald Campbell, Elizabeth Wake, Dev Mitra, Katherine Martin, Jeremy Hsu, James Daly, Gillian Heller, Brian Burns, David Conway*)

NHMRC Investigator Grants 2021:
Dr Lisa Higgins
Prof Enriico Coiera

Awards

- The Blood Synergy team were recipients of the inaugural NHMRC Fiona Stanley Synergy Grant Award, for the top-ranked Synergy grant
- A/Prof Zoe McQuilten received a Monash University Vice-Chancellor's Prize for Excellence by an Early Career Researcher 2020, and Dean's Prize for Research Excellence by an Early Career Researcher, 2020 from the Faculty of Medicine, Nursing & Health Sciences, Monash University
- Ms Linley Bielby delivered the ANZSBT Ruth Sanger Oration in 2021 - the Society's highest honour
- Prof Jamie Cooper AO was appointed as a Sir John Monash Distinguished Professor, Monash University in 2021 in recognition for his contribution to intensive care research
- Dr Allison Mo received an award for the best presentation on patient blood management at the Blood2021 conference

Presentations

Invited plenary and conference presentations by the investigator group in 2020 and 2021 include:

- A/Prof Zoe McQuilten presented an overview of hospital transfusion services' responses to COVID-19 at Transfusion United (2020)
- Dr Allison Mo spoke at Transfusion United (2020) on the changing transfusion needs of MDS patients, and provided an update on dataset linkage in MDS at the American Society of Hematology (2020)
- Prof Michael Reade was invited to present at the ISBT International Congress (2020), Medical Technology Association of Australia Annual Meeting (2020), UK Armed Forces Triservice Emergency Medicine Conference (2020) and HSANZ / ALLG Annual Scientific Meeting (2020), speaking on a variety of topics including medical innovation in trauma, fibrinogen concentrate and lyophilised plasma, and the pathophysiology of trauma
- Prof Erica Wood was an invited speaker at the Annual Meeting and Exposition of the American Society of Hematology (ASH) (2020), and NIH Red cell genotyping symposium (2020)
- A/Prof Zoe McQuilten presented an update on the use of convalescent plasma for COVID-19 at the Royal College of Pathologists of Australasia Pathology Update (2021), and presented the preliminary results of the RATIONAL trial at the 2021 European Hematology Association Congress
- Prof Michael Reade was an invited speaker at the Australasian Trauma Society Annual Scientific Meeting (2021) and gave a presentation on Australia's contribution to Pacific health security at the Royal Australasian College of Surgeons Annual Scientific Congress (2021)
- Prof Erica Wood was the plenary speaker at the Indian Society of Transfusion Medicine's 9th TRANSMEDCON (2021), a speaker at the Thalassaemia International Federation's Global forum on access to safe blood products for patients in need of regular transfusion (2021), and delivered the JG Jolly Oration at the International Symposium on Blood Safety (2021). Prof Wood was also invited to speak at the WHO Regional workshop (Africa) on establishing national haemovigilance systems (2021)
- Dr James Winearls gave presentations on viscoelastic testing, and cryoprecipitate and fibrinogen concentrate at the Australian Trauma Society Annual Scientific Meeting (2021), as well as the ANZICS Clinical Trials Group Meeting (2021)
- Dr Khai Li Chai presented preliminary results of the IMPROVE cohort study at the International Immunocompromised Host Society Symposium (2021)
- Many of our team presented at Blood2021, including Ms Linley Bielby, A/Prof Zoe McQuilten, Dr Allison Mo, Dr Brenton Sanderson, A/Prof Rosemary Sparrow, Dr James Winearls, and Prof Erica Wood

Blood Synergy investigators work closely with a variety of organisations, and contribute to policy development as members of a range of committees, professional societies, and advisory groups

Sharing our Knowledge

Recent contributions of our team to policy development, committees and society groups include:

- Australasian Clinical Trials Alliance (ACTA): Board of Directors (Judith Trotman), and Tools for Research Prioritisation Reference Group (Lisa Higgins)
- Australasian Leukaemia & Lymphoma Group (ALLG): Chair of Supportive Care Group (Zoe McQuilten), Scientific Advisory Committee (Zoe McQuilten) and CLL and Lymphoma Working Groups (Judith Trotman)
- Australasian Trauma Society (ATS): Past-President (Michael Reade)
- Australian & New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG): Immediate Past Chair (Craig French)
- Australian & New Zealand Society of Blood Transfusion (ANZSBT): Research Committee (Erica Wood), and Education Standing Committee (Allison Mo)
- Australian Red Cross Lifeblood: Advisory Committee (Zoe McQuilten). and National Blood Transfusion Committee (Micheal Reade)
- Biomedical Excellence for Safer Transfusion (BEST) Collaborative (Rosemary Sparrow)
- European Hematology Association (EHA): Guidelines Committee (Simon Stanworth), and Chair of the Transfusion Scientific Working Group (Simon Stanworth)
- International Collaboration on Transfusion Medicine Guidelines (ICTMG): Executive Chair (Simon Stanworth), and Executive Committee (Erica Wood)
- International Haemovigilance Network (IHN): Immediate Past President (Erica Wood)
- International Society for Blood Transfusion (ISBT): President (Erica Wood), and Global Blood Safety Working Party (Neil Waters)
- Lymphoma Hub, Executive Steering Committee Member (Judith Trotman)
- Maddie Riewoldt's Vision: Scientific Advisory Committee (Zoe McQuilten)
- Monash/Alfred Injury Network: Chair (Peter Cameron)
- National Blood Authority (NBA): Haemovigilance Advisory Committee (Erica Wood), and PBM Module 1 Guideline Review Comittee (Craig French, Dev Mitra, James Winearls)
- National Health & Medical Research Council (NHMRC): National COVID-19 Health and Research Advisory Committee (Michael Reade)
- Royal Australasian College of Surgeons: Trauma Verification Committee (Michael Reade)
- Therapeutic Goods Administration (TGA): Advisory Committee on Biologicals (Erica Wood)
- World Health Organization (WHO): Advisory Group on Blood Regulation, Availability and Safety (Erica Wood) and Global Patient Safety Action Plan 2021-2030 (Erica Wood)

Governance

Steering Committee Members

- Prof Erica Wood (Chair)
- Ms Linley Bielby
- Dr Karina Brady
- Prof Peter Cameron
- Dr Khai Li Chai
- Prof Enrico Coiera
- Prof Jamie Cooper
- Prof Craig French
- Dr Andrew Flint
- Prof Anthony Harris
- Dr Lisa Higgins
- Dr Adam Irving
- A/Prof Zoe McQuilten
- Prof Dev Mitra
- Dr Allison Mo
- Prof Michael Reade
- A/Prof John Reynolds
- Dr Brenton Sanderson
- A/Prof Rosemary Sparrow
- Prof Simon Stanworth
- Prof Judith Trotman
- Mr Neil Waters
- Dr Cameron Wellard
- Dr James Winearls

Working Group Members

Critical Bleeding

- Prof Michael Reade (Chair)
- Dr Brendon Beaton
- Dr Karina Brady
- Dr Edward Chew
- Dr Andrew Flint
- Dr Lisa Higgins
- Dr Chris Hogan
- Dr Kim Huynh
- Dr Adam Irving
- Dr Giles Kelsey
- A/Prof Zoe McQuilten
- Prof Dev Mitra
- A/Prof Tina Noutsos
- Dr David Read
- Dr Brenton Sanderson
- Prof Karen Smith
- A/Prof Rosemary Sparrow
- Mr Neil Waters
- Ms Kate Wilcox
- Dr James Winearls
- Prof Erica Wood

Critical Illness

- Dr Andrew Flint (Chair)
- Dr Brenton Sanderson (Chair)
- Dr Karina Brady
- Prof Jamie Cooper
- Prof Craig French
- Dr Lisa Higgins
- Dr Adam Irving
- A/Prof Zoe McQuilten
- A/Prof Tina Noutsos
- Mr Alex Poole
- Prof Michael Reade
- Mr Neil Waters
- Ms Kate Wilcox
- Dr James Winearls
- Prof Erica Wood

Blood Diseases & Immunoglobulin Use

- Dr Khai Li Chai (Chair)
- Dr Allison Mo (Chair)
- Dr Brendon Beaton
- Ms Linley Bielby
- Dr Karina Brady
- Ms Sara Carrillo de Albornoz
- Dr Philip Crispin
- Dr Lisa Higgins
- Dr Adam Irving
- A/Prof Zoe McQuilten
- A/Prof Tina Noutsos
- Prof Judith Trotman
- Mr Neil Waters
- Dr Robert Weinkove
- Prof Erica Wood

Operations Committee Members

- Dr Karina Brady
- Dr Kim Huynh
- A/Prof Zoe McQuilten
- Mr Neil Waters
- Prof Erica Wood

Advisory Committee Members

Independent Chair

- Mrs Jennifer Roberts

Consumer Respresentatives

- Ms Vera Thomas
- Ms Kate Wilson

Independent experts in blood transfusion and clinical sciences

- A/Prof James Daly (Australian Red Cross Lifeblood)
- Prof Sant-Rayn Pasricha (WEHI)
- Prof Mark Polizzotto (Australian National University)

ANZSBT Representative

- Prof Wendy Erber (University of Western Australia)

National Blood Authority Representative

- Ms Claire Bramwell

Projects

Patient Blood Management

	Critical Bleeding	Critical Illness	Blood Diseases	Immunoglobulin Use
Clinical Trials	• CLIP II # • FEISTY II #		• TREATT # • REDDS-2 # • *Frozen platelets*	• RATIONAL # • RATIONALISE # • COVID convalescent plasma #
Observational Studies		• InPUT *# • Point Prevalence Program #	• *Cost of RBC transfusion in MDS*	• Ig after allogeneic HSCT tx * • Cost of Ig transfusion
Pilot Studies / Novel Products	• Prehospital lyophilised plasma #	• *Frozen platelets in ICU*		
Registries	• National Transfusion Dataset *#	• ANZICS APD - NTD linkage *#	• Aplastic anaemia, lymphoma, myeloma registries linkage with NTD *#	• ICAN / IMPROVE #
Surveys	• International definitions of massive transfusion • Prehospital blood		• Home transfusion / palliative care	
New Tools	• Clinical decision support • Machine learning • Models of demand			
Systematic reviews and meta-analyses	• SR of international definitions of massive transfusion	• RBC IPDMA		• Cochrane CCP/ MoAb/hyperIg • Ig and other measures to prevent infection

Health Economics

* Blood Syngery co-funded; # Independent funds obtained; *Projects planned / in preparation*

Acknowledgements

The Blood Synergy is funded by the National Health and Medical Research Council (Synergy Grant 1189490).

We gratefully acknowledge the contributions of all members of the Blood Synergy team, working groups and committees. We also thank the investigator teams of individual projects, along with their respective steering committees, advisory committees, participating hospital and laboratory staff, and project management groups.

Blood Synergy

transfusion research unit

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