BLOOD SYNERGY

RESEARCH REPORT

2024 - 2025

Making Better Use Of Blood

This report provides a snapshot of the activities of the Blood Synergy research program during 2024-2025.

Contents

Welcome

It is a pleasure to share with you this research report from the NHMRC-funded Blood Synergy program.

We established the Blood Synergy in 2020 to address Australia's national transfusion research priorities and deliver safer and more appropriate transfusion support for patients, better stewardship of national blood supplies, and reduced costs to the community. We were delighted to be awarded the Fiona Stanley Prize for the top-ranked application in the first (2019) round of Synergy grants.

In September 2024 we were awarded a second NHMRC Synergy grant, enabling us to continue our work for a further five years from 2025, and build on the investments and achievements to date. An enormous and heart-felt 'thank you' to everyone who has supported our research and contributed to this excellent outcome – and a sincere welcome to new collaborators joining us for "Synergy 2.0".

Our research attempts to answer these fundamental questions: How is blood used in Australia, and how can its use be improved and made more cost-effective? These are priorities for patients and their families, blood donors, clinicians, national blood services, policy-makers and the broader community.

Our program is structured in streams, and with our research addressing transfusion support in critical bleeding, critical care and blood disorders, and improving the use of immunoglobulins. We have continued to make excellent progress in all streams. We have conducted practice surveys, observational studies, supported a range of pilot projects, and opened new phase III clinical trials to recruitment. You can read about these in the following pages of this report, on our website, and find more detail in our published works.

In 2024, to continue to guide the direction and nature of our work, we sought input on Australia's transfusion research priorities directly from community stakeholders. This national consultation confirmed the importance and direction of our research, and helped guide our 2024 NHMRC application and future projects.

We have been able to leverage the initial NHMRC Synergy funding to secure additional NHMRC, MRFF, Australian Research Data Commons and other funding for several major trials and registry-based projects, as well as additional NHMRC and professional society PhD scholarships. During this reporting period we have further expanded our collaborations and partnerships, nationally and internationally.

We have now held four very successful Blood Synergy meetings. Everyone is invited to engage with and contribute to transfusion research. These events have been well attended nationally and internationally, both online and in person, and highly productive.

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". As you can see, we are a truly multidisciplinary team, and this report showcases the work of many people, including PhD students supported by the Blood Synergy, early and mid-career investigators and senior researchers across a range of disciplines, and an experienced research management team. We are guided by our independent Advisory Committee, expertly chaired by Professor Mike Murphy. I thank everyone for their hard work and support.

I hope you enjoy this research report. We look forward to your feedback, and to your ongoing collaboration on "Blood Synergy 2.0".

Prof Erica Wood AO FAHMS
Lead Investigator

The Blood Synergy brings together a multidisciplinary team to address Australia's national transfusion research priorities.

Who we are

Investigators

- Ms Linley Bielby
- Prof Jeannie Callum
- Prof Peter Cameron
- Prof Enrico Coiera
- Prof Jamie Cooper AO
- Dr James Daly
- Dr Andrew Flint
- A/Prof Craig French
- A/Prof Shane George
- Prof Anthony Harris
- Dr Alisa Higgins
- Dr Adam Irving
- Dr Thao Le
- Prof Zoe McQuilten
- Prof Biswadev Mitra
- Dr Allison Mo
- Prof Dennis Petrie
- Prof Michael Reade AM
- A/Prof John Reynolds
- Dr Elizabeth Ryan
- Dr Brenton Sanderson
- A/Prof Rosemary Sparrow
- Prof Simon Stanworth
- Prof Judith Trotman
- Prof Robert Weinkove
- Ms Kate Wilson
- Dr James Winearls
- Prof Erica Wood AO

Program team

- Dr Elham Ashrafi
- Dr Karina Brady
- Ms Kirsten Caithness
- Ms Sara Carrillo de Albornoz
- Dr Khai Li Chai
- Dr Fiona (Pin-Yen) Chen
- Dr Nicole Eise
- Ms Jennifer Griffiths
- Ms Jessica Guglielmino
- Mrs Helen Haysom
- Dr Joanna Loh
- Dr Aleece MacPhail
- Mr Karthik Mandapaka
- Dr Catriona Parker
- Dr Briony Shaw
- Dr Sasha Taylor
- Ms Tina van Tonder
- Mr Neil Waters
- Dr Cameron Wellard

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Introduction

The use of blood transfusion is one of most frequent procedures conducted in hospitals and similar clinical settings. It has significant benefits but also has risks and costs. Reports of avoidable adverse effects of transfusion and inappropriate use of blood, both overuse and underuse, indicate that further efforts are needed to improve transfusion practice. Poor transfusion care may occur because of lack of evidence for what is good practice or poor compliance with evidence-based guidelines.

The Blood Synergy program has been successful in developing a strong multidisciplinary team to identify gaps in the evidence that need to be addressed and to provide new evidence through clinical trials and other studies. The findings have been published and widely promulgated and will enable healthcare practitioners to have greater certainty and confidence about what is optimal blood transfusion practice and how to deliver it.

This comprehensive report describes the many activities of Blood Synergy which, as well as novel research, include the development of young investigators, collaboration with international investigators, and the provision of online and in-person education. It is very exciting that a successor Blood Synergy program has been funded to build on what has already been achieved and continue to generate much needed high quality evidence in the field of transfusion medicine and its translation into clinical practice.

Prof Mike Murphy
Chair, Blood Synergy Advisory Committee

The Blood Synergy team would like to take the opportunity to congratulate Mike Murphy on receiving the 2025 Emily Cooley Memorial Award and Lectureship from the Association for the Advancement of Blood and Biotherapies (AABB).

The award citation reads: “In grateful recognition of his many years of strong and generous leadership in the blood and biotherapies field, both in the United Kingdom and throughout the world. During his remarkable career, Dr. Murphy has served as an educator, researcher, mentor and essential leader in the field - including as president of AABB.

His myriad accomplishments have led to indispensable advancements in transfusion safety and clinical practice.”
We couldn’t agree more! “Strong and generous leadership” defines Mike’s career, and in addition to his many contributions worldwide, we thank him for his support of the Blood Synergy program.

About the program

The Blood Synergy is a research program funded by the National Health and Medical Research Council (NHMRC) Synergy scheme. The program focuses on making better use of blood products and improving outcomes for patients requiring blood in the settings of trauma, critical illness, and blood disorders.

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?

We are 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.

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.

Research streams

Critical bleeding

Often unexpected, and requiring large quantities of blood products urgently, major haemorrhage is a daily challenge for blood services and health systems. Our network of specialists working across prehospital and hospital settings are focused on generating new evidence to inform clinical decision-making in the management of critical bleeding.

Projects include:

- National Transfusion Dataset (NTD), including integration of prehospital haemorrhage and transfusion datasets
- FEISTY II: fibrinogen concentrate for treatment of critical bleeding
- CLIP II: cryopreserved platelets vs. conventional liquid-stored platelets
- Modelling demand and availability of blood products
- Prehospital lyophilised plasma
- Point-of-care testing on coagulation management and blood use
- Clinical decision-support systems
- International definitions of massive transfusion

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. Our observational and interventional studies are evaluating 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.

Projects include:

- Blood transfusion practice in ICU observational studies, including the international InPUT point-prevalance study
- ROSETTA pilot: haemoglobin thresholds in ECMO
- Linkage of ICU dataset and NTD
- T4P: platelet thresholds in ICU

Blood diseases

Patients with blood diseases and cancers 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.

Projects include:

- TREATT: trial to evaluate tranexamic acid therapy in thrombocytopenia
- REDDS-2: optimising red cell transfusion strategies in myelodysplasia syndromes (MDS)
- Home transfusion pilot

Immunoglobulin use

Immunoglobulin (Ig), made from plasma, is used to treat patients with a wide range of conditions including blood cancers. Though accounting for over half of Australia's national blood budget, Ig supply is limited and its use continues to grow. Our research investigates the efficient and effective use of Ig, including optimal duration, patient outcomes, and alternative interventions to manage infectious risks.

Projects include:

- RATIONAL Platform Trial: Ig vs antibiotics for infection prevention, including the RATIONALISE trial
- PAIRS: observational study of Ig use after allogeneic haematopoietic stem cell transplant
- Convalescent plasma for treatment of SARS-CoV-2 infection (COVID-19)

Health economics

Our health economic analyses are conducted alongside the 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.

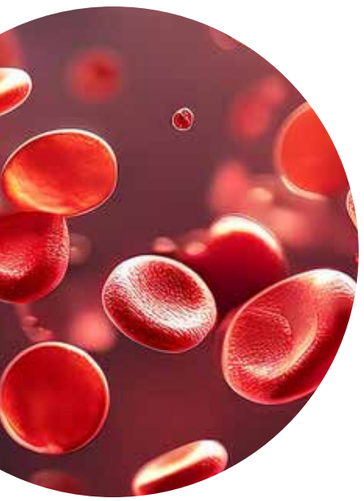
Projects include:

- TRUST-MDS: true cost of red cell transfusion in MDS
- TRUST-Ig: true cost of Ig for infection prevention

*Some projects have now reached completion - see the following pages for more information, including key presentations and publications.

Changing what we know about blood product use

Documenting and analysing how blood products are used in practice provides important insight into developing trends. It allows us to identify compliance with clinical guidelines and areas for improvement, and it supports data-driven policy and clinical decision-making.



Quantifying how blood products are actually used

The National Transfusion Dataset (NTD) captures information about when, where, how, and why blood products are being used in hospitals, and links this together with prehospital blood use, and patient outcomes from ICU and disease registries. By tracking the use of all blood products in all settings, the NTD provides a unique opportunity to identify trends, and explore the underlying causes and factors at play.

The power of the NTD is highlighted in two recent publications arising from the dataset's predecessor, the Australian & New Zealand Massive Transfusion Registry (ANZ-MTR). Published in *Transfusion Medicine Reviews*, the first paper described the frequency, predictors, and outcomes of ultra-massive transfusion (Maclean *et al.* 2024). It revealed that ultra-massive transfusion was not a futile practice, and patients had similar survival in the 5 years after discharge as those who received a massive transfusion.

In the second paper, the team examined outcomes of using ABO-incompatible fresh frozen plasma during massive transfusion in a cohort of >7000 patients over the time period 2011-2018. As reported in *Transfusion* (Loh *et al.* 2025), the practice was found to be uncommon (occuring in just 1% of patients) and was not associated with higher mortality.

As clinical trials, studies and systematic reviews provide new knowledge on how blood products should be used, guidelines and policies change, and the landscape of blood use evolves. The NTD provides the means to monitor practice, identify changes and patterns (pinpointing their origins), and capture the impact on patients, hospital systems and the blood supply more broadly.

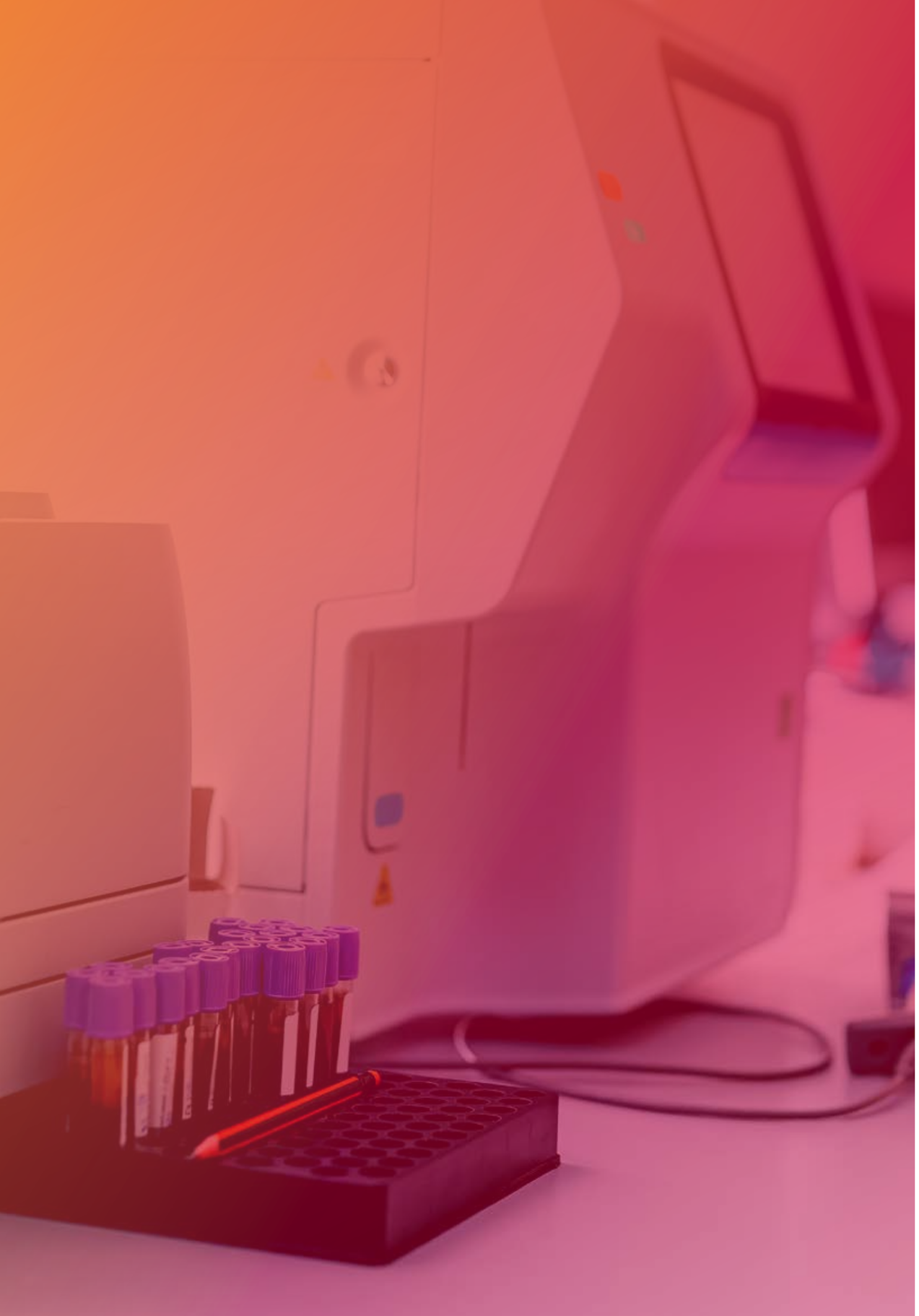
Identifying evidence gaps and changing practice

In 2021 to 2022 our team led the Australian and New Zealand arm of the InPUT study - a large international point prevalance study of ICU transfusion practice. Conducted in 40 intensive care units across Australia and New Zealand over a one-week period, data was collected from >900 patients, almost a quarter of who recieved a blood transfusion.

The study, recently published in *Critical Care Explorations* (Flint *et al.* 2025), identified changes in ICU transfusion practice in the decade since the 2008 Blood Observational Study and 2012 introduction of the National Blood Authority's guidelines.

Compared with 2008, there was more variation in practice across hospital sites, and patients who received transfusions were more likely to receive more units. Non-red cell transfusions were also more commonly inconsistent with guidelines. This outcome highlighted the poor level of evidence available to guide non-red cell transfusion in critically ill patients, and the need for further research to fill the evidence gaps.

The study also contributed a quarter of data for the global InPUT study, one of the largest international observational studies of ICU blood use. Outcomes from the full international cohort highlighted large variability in practice with respect to each of red cell (Raasveld *et al. JAMA* 2023), plasma (van Haeren *et al. Transfusion* 2025), and platelet transfusion (van Wonderen *et al. Critical Care Medicine* 2025), and reaffirmed the need for stronger guidance in the use of plasma in this patient group.



Identifying the real costs of treatment

The True cost of Transfusion (TRUST) projects look to provide an indication of the total healthcare-related costs associated with transfusion, beyond the cost of the blood product alone.

Determining the total cost of delivering therapy

Delivering blood products to a patient takes a complex path, involving a range of pathology, laboratory, and pharmacy services before reaching the bedside. The resources and costs to the healthcare system are often poorly understood, and may differ between patient groups and settings.

To identify the full costs involved for health services, the TRUST team conducted two prospective time-driven activity-based costing studies at an Australian tertiary hospital in patient cohorts with frequent transfusion needs - patients with myelodsyplastic syndrome (MDS) receiving red cell transfusion (TRUST-MDS), and patients receiving immunoglobulin (Ig) due to haematological malignancy (TRUST-Ig).

The TRUST-MDS study found that there can be more than 600 steps involved in delivering a single red cell unit to a patient with MDS. This costs the health system at least $250 per infusion beyond the list price of the blood product itself, with further costs ranging from $30 to $250 if antibody investigations or additional testing is required.

Meanwhile the TRUST-Ig study showed that the cost to the healthcare system per patient for a full year of treatment was significantly lower for intravenous Ig (IVIg) compared to subcutaneous Ig (SCIg). While the hospital-associated costs for IVIg were higher (~$1360) compared to SCIg (~$340), adding in the price of the product itself and home consumables yielded a total annual cost of ~$35,900 for SCIg versus ~$25,950 for IVIg. The difference was driven by the higher proportion of (more expensive) imported Ig for SCIg, and a higher dose per patient.

Identifying the total direct costs to the healthcare system, beyond the product costs, is key to inform economic models of new treatment strategies and facilitate decision-making around healthcare resource allocation.

Finding out what's important to the community

To ensure our research program remains aligned with the most urgent and important transfusion research priorities, we asked the healthcare community, including those with lived experience, what issues were important to them.

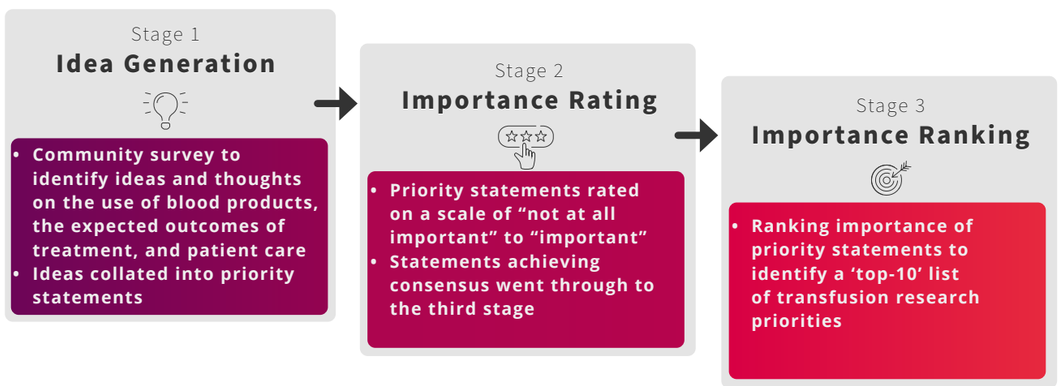
Focusing on the community's highest priorities

Informed by the published experience of the James Lind Alliance who identified research priorities for blood donation and transfusion research in the UK (Hibbs *et al. Transfusion* 2019), our team used a three-stage modified Delphi method to identify and prioritise research ideas.

Using a range of professional and consumer networks, and outreach to the broader community through social media, input was invited from clinicians and healthcare professionals, medical scientists, researchers, blood donors, industry and government representatives, as well as people and families with lived experience of transfusion.

Around 100 people participated in stage 1, providing ~230 suggestions, which were then condensed into 49 priority statements. A smaller panel of 50 community members (drawn from stage 1) were invited to rate and rank the importance of the statements, culminating in a list of 'top 10' transfusion research priorities.

The top priority highlighted the importance of supporting transfusion research through clinical trial networks, harmonising research activities, generating new knowledge, and providing trial opportunities for patients. Though not all of the top 10 priorities will be feasibly addressed through the Blood Synergy program, the list will be helpful to the wider Australian blood sector in establishing and supporting national transfusion research priorities.



Pinpointing the impact of resuscitation strategies

Clinical guidelines recommend activation of a major haemorrhage protocol (MHP) for the treatment of critically bleeding patients. Whether the MHP is guided by issuing a pre-defined formula or pack of blood products, or the results of point-of-care testing, varies between trauma centres.

Measuring how different protocols influence blood use

To identify whether using a set ratio of blood products (the formulaic approach) or being guided by viscoelastic assay (VHA) results will influence blood use and patient mortality, the team undertook a registry-based retrospective study to compare outcomes at two large, level one trauma centres - the Gold Coast University Hospital in Queensland, and the Alfred Hospital in Victoria.

The study, published in *Transfusion Medicine* (Mitra *et al.* 2024), found that shocked trauma patients treated with a VHA-guided resuscitation strategy received fewer blood products than those with a formulaic-guided MHP, though there was no difference seen in patient mortality.

These results suggest that a VHA-guided approach to resuscitation can lead to a more efficient and targeted use of blood products.











Fostering a conversation about trauma trials

Led by our critical bleeding working group, the team convened two Transfusion in Trauma workshops to bring together experts in prehospital care, transfusion, and trauma medicine.

Initiating a research roadmap for transfusion in trauma

The first meeting, held alongside the SWAN conference in Sydney 2024, summarised the current landscape for clinical trials in Australia, and initiated a conversation amongst the multidisciplinary audience about trial design and future research priorities.

The next workshop was held in Brisbane in conjunction with the Trauma 2024 conference convened by the Australian & New Zealand Trauma Society (ANZTS). With a focus on the question of 'what trial do we do next?', this workshop included pitches for trials of different blood products and perspectives on trauma care and clinical trials in different settings (prehospital, emergency, surgery, and ICU). Following a priority-setting survey, the afternoon was spent in fruitful discussion around development of a research roadmap.

These consultations highlighted key priorities for future research, which will be taken forward in Synergy 2.0.

Providing new insight to a common therapy

Immunoglobulin replacement therapy (IgRT) is used in people with compromised immune function as a result of blood cancers as a way to prevent infection. But who really needs it, and how do we know?

Using real-world data to identify the impact of treatment

Immunoglobulin (Ig; pooled antibodies from donated plasma) is an expensive blood product, with high demand and limited supply. However, most studies supporting its use in blood cancer patients were small, and conducted more than 30 years ago, prior to the availability of many current treatments. These new therapies have dramatically changed the landscape for decision-making for patients and clinicians.

To assess the impact of IgRT in patients with chronic lymphocytic leukaemia (CLL), our team linked data from the Victorian Cancer Registry, Death Index, and Admitted Episodes Dataset. The study looked at data from more the 6000 patients diagnosed with CLL between 2008 and 2022.

Recently published in *Blood Advances* (Carrillo de Albornoz *et al*. 2025), the longitudinal study found an increase in IgRT over the course of the 14-year period. Yet, despite this increase, there was no decrease in infection rates or hospitalisation for those receiving immunoglobulin. Patients were also often found to be on IgRT for lengthy periods of time - many for more than five years.

Given the significant cost of Ig, and the burden on patients of monthly hospital visits for treatment, this study highlights the need to better identify the patients who benefit most from IgRT, and pinpoint when treatment is most effective.

Improving knowledge of immunoglobulin effectiveness

Cellular therapies such as allogeneic stem cell transplant and CAR-T, while a crucial treatment for life-threatening blood cancers, may be accompanied by low antibody levels and high infection risk. Ig is therefore often given with the aim of reducing infection risk. Though, whether this treatment is effective, which patients are most likely to benefit, and what doses should be used, is not known.

The post-allograft immunoglobulin study (PAIRS) aims to understand the effectiveness of Ig use in patients who receive cellular therapies, to help optimise use of this treatment in the future.

An Australia-wide cohort study, PAIRS collects data from cellular therapy patients to understand:

1. How immunoglobulin is currently used and whether there are variations in practice,
2. Whether infections are lower in patients who receive immunoglobulin, and
3. Which patients are most likely to benefit from treatment.

The data will also be used for dosing studies (pharmacokinetics and pharmacodynamics analysis) to identify the best dosing in this group to achieve effective protection from infection.

Data from PAIRS will help improve future immunoglobulin use to allow targeted, effective, and standardised use of immunoglobulin in cellular therapy patients at risk of infection.

Sharing research outcomes with the community

The Blood Synergy Open Meetings 2024 and 2025 were each attended by nearly 200 registrants, with many joining online from across Australia and overseas.

In 2024 and 2025 we were delighted to once again showcase the work being undertaken by the Blood Synergy team and our international partners, and to promote discussion of important topics in transfusion medicine and patient care.

The 2024 Open Meeting's keynote presentation was delivered by Prof Jeannie Callum, who provided insight to the latest in transfusion research in Canada. This was followed by a presentation from Prof Cecile Aubron on transfusion research in critical care in France. We then heard updates from Blood Synergy staff and students on projects in critical care, prehospital blood use, immunoglobulin use and costs, and recent data on changing demand for blood products.

A highlight of the 2024 meeting was the session and panel discussion on community engagement in transfusion research. We heard the unique perspectives of community members and researchers on how to better navigate community and consumer involvement in research. Lastly, the meeting finished with some wonderful insights on the processes of translating transfusion research into policy and practice.

At the 2025 Open Meeting, Prof Erica Wood provided an overview of the Blood Synergy's progress to date before Prof Simon Stanworth - our UK-based investigator co-funded by the NIHR and NHSBT - delivered the keynote presentation. Prof Stanworth spoke to the program of data-driven transfusion practice he leads through the Blood & Transplant Research Unit.

The morning session also included talks from our talented team of early and mid-career researchers, spanning topics from paediatric transfusion, platelets transfusion in ICU, and measuring the true costs of tranfusion, to immunoglobulin use following stem cell transplant, and transfusion-at-home.

The afternoon session took on an educational slant, describing new ways to approach transfusion research through trial emulation, platform trials, qualitative research, and co-design methods, and finished with an outline for the future of clinical trials addressing transfusion.







Highlights 2024-2025

Awarded grants reflect the success of investment in infrastructure and parternships funded by the NHMRC Synergy grant.

The Blood Synergy team's ongoing commitment to excellence in clinical research was recognised by a number of grants to expand and support our program of work.

Recognition of research expertise and excellence was also received through various awards, as well as invitations to present the work of the Blood Synergy team at key national and international meetings and conferences. Likewise, study outcomes were published in the leading peer-reviewed journals to ensure that our research is disseminated widely and makes a meaningful and lasting contribution to the clinical research landscape.

Grants

2024 ANZSBT Research Fund:
Management of patients with critical bleeding in rural and regional Victoria
Chief Investigators: Biswadev Mitra, Erica Wood, Shalini George, Jacoba von Wielligh, Caroline Field, Amy Sheppard, Robyn White

2024 MRFF International Clinical Trials Collaboration:
T4P: platelet transfusion thresholds in ICU
Chief Investigators: Elissa Milford, Michael Reade, Erica Wood, Zoe McQuilten, Andrew Flint, Edward Litton, James Daly, Craig French, Adam Irving, Dale Trevor, Belinda Howe, Kate Wilson, Claire Rickard, Peter Watkinson, Alexina Mason

2025 NHMRC Synergy Grant:
Making better use of blood: new knowledge to improve stewardship of Australia's national blood supplies and outcomes for transfused patients
Chief Investigators: Erica Wood, Zoe McQuilten, Michael Reade, Judith Trotman, Simon Stanworth, Craig French, Dennis Petrie, Thao Le, James Daly, Peter Cameron

2025 NHMRC Investigator Grant:
Prof Erica Wood

Awards

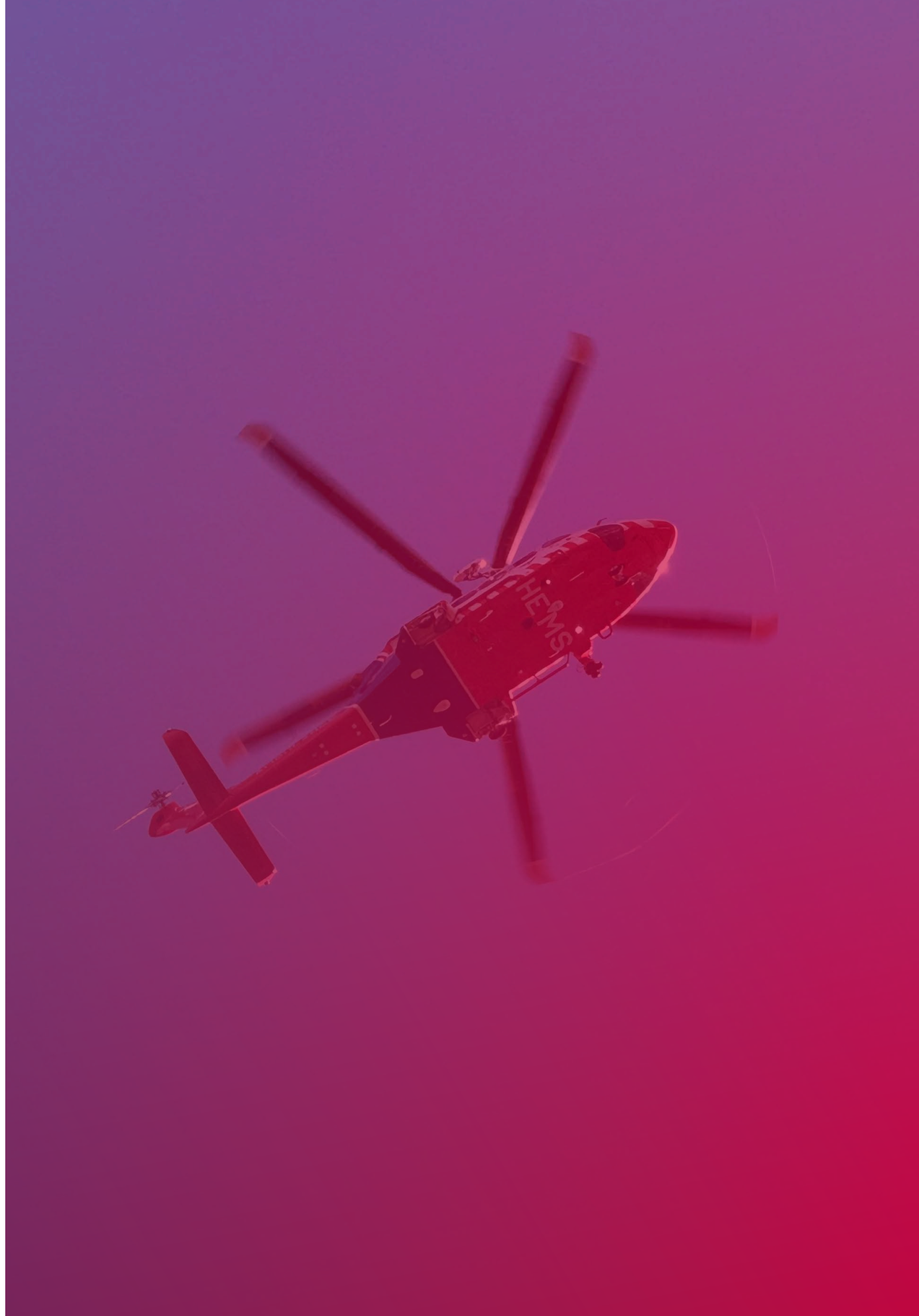
- Ms Linley Bielby received the International Society for Blood Transfusion (ISBT) Award 2024 for her outstanding contribution to transfusion education, practice and research.
- Dr Lisa Higgins was awarded the International Early Career Achievement Award 2024 from the American Thoracic Society Assembly on Critical Care.
- Prof Michael Reade was awarded the 2024 Surgeon General Medal from the Australasian College of Tropical Medicine.
- Prof Biswadev Mitra recieved the 2024 Pesidential Symposium Award from the Australian & New Zealand Society of Blood Transfusion.
- Dr Allison Mo was awarded a Dana Devine Fellowship (2025) from the Biomedical Excellence for Safer Transfusion (BEST) Collaborative.
- Dr Lisa Higgins recieved the 2024-25 Victorian Premier's Award for Health and Medical Research Excellence, and 2024 Victoria Premier's Clinician Researcher Award.
- Prof Mike Murphy awarded the 2025 Emily Cooley Memorial Award and Lectureship from the Association for the Advancement of Blood and Biotherapies (AABB).

Media and podcasts

- the limbic, June 2024: article reporting outcomes from the study of ultra-massive transfusions in the Australian and New Zealand Massive Transfusion Registry, following the presentation of results at the European Hematology Association Congress, 2024.
- the limbic, November 2024: reporting outcomes from the Blood Synergy community consultation, following a poster presentation at Blood 2024.
- the limbic, March 2025: coverage of results from the prospective observational study of transfusion practice in ICU (Flint *et al. Critical Care Explorations* 2025).
- the limbic, March 2025: article describing the Australian and New Zealand Massive Transfusion Registry study on outcomes for patients receiving ABO-incompatible transfusions (Loh *et al. Transfusion* 2025).
- ABC Radio National Health Report (May 17, 2025): Taking iron deficiency seriously, featuring Prof Judith Trotman.
- the limbic, June 2025: coverage of new international guidelines on platelet transfusion (Medcalf *et al. JAMA* 2025).
- American Society of Hematology (ASH) press release, July 2025: highlighting publication by Carrillo de Albornoz *et al. Blood Advances* 2025.
- the limbic, August 2025: coverage of research on immunoglobulin use to reduce infections in patients with chronic lymphocytic leukaemia (Carrillo de Albornoz *et al. Blood Advances* 2025).
- Blood Podcast, Season 9, Episodes 20 & 21: How I Treat Transfusion Medicine, with Prof Erica Wood (host) and Prof Jeannie Callum.
- the limbic, September 2025: summarising the findings of Mitra *et al.* (*Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2025) describing a reduction in blood wastage with introduction of a transfusion team.

Presentations (presenting author/s listed)

- Highlights of ASH in the Asia-Pacific, Sydney, 2024: Erica Wood
- Malaysian Blood Transfusion Society & International Society of Blood Transfusion, Transfusion Medicine Update Asian Pacific Symposium, Kota Bharu Kelantan (Malaysia), 2024: Erica Wood
- International Society for Blood Transfusion 38th Regional Congress, Barcelona (Spain), 2024: Neil Waters
- European Hematology Association (EHA) 2024 Congress, Madrid (Spain), 2024: Marsali Maclean
- Brigham and Women's Hospital/Harvard University, Hematology Grand Rounds, Boston (USA), 2024: Erica Wood
- MEDLAB Asia and Asia Health, Bangkok (Thailand), 2024: Erica Wood
- The Critically Unwell Pregnant Patient, Melbourne (virtual), 2024: Erica Wood
- Indian Society of Blood Transfusion "Transmedcon" (virtual), 2024: Erica Wood & Neil Waters
- Philippine College of Hematology and Transfusion Medicine, Manila (Philippines), 2024: Erica Wood
- World Congress on Military Medicine, International Committee of Military Medicine, Brisbane, 2024: Michael Reade, Andrew Flint
- Emergency Care Research Symposium 2024, Gold Coast Hospital Foundation, Gold Coast, 2024: James Winearls, Shane George
- Indonesian Red Cross (Palang Merah Indonesia), Rational Use of Blood Seminar (virtual), 2024: Erica Wood
- Omani Society of Hematology, 6th National Conference, Muscat (Oman), 2024: Erica Wood
- Blood 2024, Brisbane, 2024: Zoe McQuilten, Biswadev Mitra, Michael Reade, Catriona Parker, Allison Mo, Andrew Flint
- ASEAN Congress of Clinical Laboratory Sciences, Brunei Darussalam, 2024: Erica Wood
- The National Trauma Symposium, Wellington (NZ), 2024: Michael Reade
- Blood Matters SCIg Forum, Melbourne, 2024: Erica Wood
- Association for the Advancement of Blood & Biotherapies (AABB), Houston (USA), 2024: Michael Reade
- American Society of Hematology (ASH) Annual Meeting, San Diego (USA), 2024: Zoe McQuilten
- National Scientific Conference on Blood Transfusion Services, Thai Red Cross Society National Blood Center, Bangkok (Thailand), 2025: Erica Wood
- Society of Critical Care Medicine, 2025 Critical Care Congress, Orlando (USA), 2025: Andrew Flint
- International Society for Blood Transfusion 39th Regional Congress, Milan (Italy), 2025: Catriona Parker
- ALLG Scientific Meeting, Sydney, 2025: Simon Stanworth
- Asia Pacific Intensive Care Symposium, Singapore, 2025: Lisa Higgins
- Collaborative Clinical Trials in Intensive Care Medicine Conference, Prato (Italy), 2025: James Winearls, Michael Reade
- ISBT Webinar: Meet the Expert (virtual), 2025: Simon Stanworth
- South African National Blood Transfusion Conference, Johannesburg (South Africa), 2025: Erica Wood
- Australasian Military Medicine Association Conference 2025, Adelaide, 2025: Michael Reade
- Blood 2025 / ISBT, Perth, 2025: Erica Wood, Zoe McQuilten, Adam Irving, Sara Carrillo de Albornoz, Allison Mo
- Association for the Advancement of Blood & Biotherapies (AABB), San Diego (USA), 2025: Simon Stanworth
- Trauma 2025, Australian & New Zealand Trauma Society, Wellington (NZ), 2025: Michael Reade, Zoe McQuilten
- THOR Thunder Conference, Perth, 2025: Michael Reade, James Winearls
- Critical Care Reviews Down Under 2025, Melbourne, 2025: Michael Reade
- Australasian College for Emergency Medicine Annual Scientific Meeting, Gold Coast, 2025: Biswadev Mitra, Shane George



Building capacity in transfusion research

The Blood Synergy program aims to build Australia's transfusion research capacity through support for early- and mid-career researchers, and through the expansion and development of our multidisciplinary collaborative network.

Investigators joining the Blood Synergy team

Our research team continues to expand, with a number of new chief and associate investigators recently joining the program. Though many already had strong collaborative ties with our team, and had participated as members of project teams, or our Advisory Committee, we officially welcomed the following people to the Blood Synergy team in 2025:

- **Prof Dennis Petrie** (Centre of Health Economics, Monash University), is a health economist with expertise in economic evaluations of healthcare interventions.
- **Dr Thao Le** (Transfusion Research Unit, Monash University), a biostatistician and emerging leader in prediction modelling, complex survival analysis, and novel trial design.
- **Dr James Daly** (Australian Red Cross Lifeblood), a haematologist with expertise in transfusion medicine and oversight of medical and pathology services at Lifeblood. James previously served as a member of the Blood Synergy Advisory Committee.
- **Ms Kate Wilson** is our consumer representative, who also brings significant experience in clinical trials as a research development manager, and more recently, a PhD candidate. Kate was previously a member of the Blood Synergy Advisory Committee.
- **Prof Biswadev Mitra** (Alfred Health) is an emergency physician, with a focus on acute trauma resuscitation using blood and blood components.
- **Dr James Winearls** (Gold Coast University Hospital) is a specialist in intensive care medicine, with a research interest in transfusion support in trauma and point-of-care testing.
- **Dr Elizabeth Ryan** (Monash University) is an early-career biostatistician with expertise in adaptive designs, platform trials and Bayesian statistics.
- **A/Prof Shane George** (Gold Coast University Hospital) is a paediatric critical care physician, and an early-career researcher interested in resuscitation techniques in haemorrhage.
- **Prof Jeannie Callum** (Queen's University at Kingston, Canada) is a haematologist and co-director of the Canadian Transfusion Trials Group, with an interest in blood utilisation and the management of coagulopathy associated with traumatic injury.
- **Prof Robert Weinkove** (Malaghan Institute of Medical Research, New Zealand) is a clinical haematologist interested in supportive care in haematologic malignancies.
- **Dr Adam Irving** (Centre of Health Economics, Monash University) is an early-career health economist focused on models of demand, and outcomes of transfusion.

Supporting early- and mid-career researchers

The Blood Synergy provides support to the early- and mid-career researchers in our team through a number of mechanisms and opportunities, including mentoring, training, seed funding, research support, conference funding, and leadership opportunities. Included amongst the early-career researchers, we are pleased to support a number of PhD candidates:

- **Ms Sara Carrillo de Albornoz:** Sara, an experienced health economist, undertook her PhD (submiited in 2025) through the Transfusion Research Unit (Monash University). The project, funded through the Blood Synergy, assessed the cost and cost-effectiveness of immunoglobulin (Ig) in haematological malignancies.
- **Dr Khai Li Chai:** Khai Li's PhD looks at developing new evidence for antibody therapy in the prevention of infections. During her PhD studies, haematologist Khai Li has been involved in the RATIONAL platform trial, RATIONALISE trial, and evaluating convalescent plasma and hyperimmune Ig in the treatment of SARS-CoV-2 infection.
- **Dr Andrew Flint:** Andrew's PhD project investigates platelet transfusions in critically ill and bleeding patients, particularly in intensive care units (ICUs). Andrew, an associate investigator of the Blood Synergy who is undertaking specialist training in critical care, led the analysis of outcomes from the observational studies of blood practice in ICU.
- **Dr Allison Mo:** Allison, a haematologist and Blood Synergy associate investigator, undertook her PhD to investigate the optimal usage of blood products (in particular, red cell and platelet transfusion) in patients with myelodysplastic syndromes (MDS).
- **Dr Aleece MacPhail:** Aleece is an infectious diseases specialist undertaking a PhD that aims to produce a broad overview of sepsis epidemiology and risks, current strategies to reduce infections, and targets for intervention.
- **Dr Brenton Sanderson:** Brenton, an anaethetist and associate investigator of the Blood Synergy, was awarded his PhD in 2024. His project, explored the role of decision support and health informatics in massive transfusion for critical bleeding.
- **Dr Briony Shaw:** Briony is a haematologist undertaking a PhD focusing on identifying novel approaches for improving the quality of life and supportive care practices for patients with blood cancers (such as lymphoma, leukaemia and myeloma).

Engagement 2024-2025

The Blood Synergy investigators, staff and students work closely with a variety of organisations, and contribute to peer-review and policy development as members of a range of committees, professional societies, and advisory groups. The following list highlights just some of their contributions.

World Health Organization (WHO)

- Advisory Group on Blood Regulation, Availability and Safety: Erica Wood (co-Chair)
- Advisory Group on Global Patient Safety Action Plan 2021-2030: Erica Wood
- Expert Advisory Panel in Transfusion Medicine: Erica Wood
- Working Group on Developing Tools for Costing Blood Establishments: Adam Irving
- Working Group on Military-Civilian Cooperation in Emergency Medical Teams: Michael Reade
- Working Group on Transfusion: Michael Reade
- Guideline Development Group – Anaemia: Erica Wood
- Guideline Development Group for the creation of WHO Donor Human Milk Banking guidelines: Erica Wood

NATO

- Blood Panel: Michael Reade

International Collaboration on Transfusion Medicine Guidelines (ICTMG)

- Executive Committee: Simon Stanworth (Chair), Erica Wood, James Daly

Biomedical Excellence for Safer Transfusion (BEST)

- Honorary Lifetime Member: Rosemary Sparrow
- Member: Erica Wood, Simon Stanworth, Allison Mo

International Society for Blood Transfusion (ISBT)

- Past President (2022-2024): Erica Wood
- International Scientific Advisory Committee: Erica Wood (Chair)
- Transfusion Evidence Round-Up Project Manager: Allison Mo
- Awards and Prizes Committee: Erica Wood (Chair)
- Nominations Committee: Erica Wood

Association for the Advancement of Blood and Biotherapies (AABB)

- Associate Editor of Transfusion: Zoe McQuilten

AABB International Clinical Practice Guidelines

- Red Cell Guidelines Working Group: Erica Wood, Simon Stanworth

AABB & ICTMG International Clinical Practice Guidelines

- Platelet Guidelines Working Group: Erica Wood, Simon Stanworth

American Society for Hematology (ASH)

- Scientific Committee on Transfusion Medicine: Erica Wood
- Associate Editor of Blood: Erica Wood
- Editorial Board of Blood: Judith Trotman, Robert Weinkove

US National Heart Lung Blood Institute

- Myelodysplastic Syndrome (MDS) International Guideline Steering Committee: Zoe McQuilten

Systematic Reviews Initiative, NHS Blood & Transplant/University of Oxford

- International Steering Group: Erica Wood, Simon Stanworth

Transfusion Medicine Reviews

- Associate Editor: Zoe McQuilten, Jeannie Callum
- Editorial Board: Erica Wood, Simon Stanworth

Transfusion Medicine

- Editorial Board: Erica Wood

Women in Lymphoma (WiL)

- Steering Committee: Judith Trotman

National Blood Authority (NBA)

- Haemovigilance Advisory Committee: Erica Wood (Chair), Linley Bielby, James Daly
- PBM Critical Bleeding Guidelines: Biswadev Mitra (Chair), Michael Reade, Craig French, James Winearls
- Patient Blood Management Advisory Committee: James Daly

Australian Red Cross Lifeblood

- Advisory Committee: Zoe McQuilten, Biswadev Mitra

Commonwealth Government of Australia

- Medical Services Advisory Committee, Evaluation Subcommittee: Erica Wood
- Therapeutic Goods Administration, Advisory Committee on Biologicals: Erica Wood (Chair)
- National Haemopoietic Progenitor Cell Sector Clinical Advisory Group: Erica Wood

Blood Matters

- Advisory Committee: Zoe McQuilten (Chair)
- Serious Transfusion Incident Reporting (STIR) expert working group: Erica Wood

Australasian Leukaemia & Lymphoma Group (ALLG)

- Board of Management: Judith Trotman
- Scientific Advisory Committee: Judith Trotman (Chair), Zoe McQuilten (Deputy Chair)
- Registry Operations Committee: Zoe McQuilten, Judith Trotman
- Supportive Care Working Group: Zoe McQuilten (Co-Chair), Robert Weinkove (Co-Chair), Erica Wood, Catriona Parker, Aleece MacPhail, Briony Shaw, Allison Mo

Australian & New Zealand Society of Blood Transfusion (ANZSBT)

- Research Advisory Committee: Erica Wood
- Engagement and Learning Committee: Allison Mo

Australasian Clinical Trials Alliance (ACTA)

- Board: Judith Trotman

Emergency Medicine Australasia

- Section Editor: Peter Cameron, Biswadev Mitra

Injury

- Editor: Peter Cameron
- International Editorial Board: Biswadev Mitra

Publications 2024-2025

- Mitra, Talarico, Olaussen, *et al.* Blood lactate after pre-hospital transfusion for major trauma by helicopter emergency medical services. *Vox Sanguinis* 2024 (doi: 10.1111/vox.13598)
- Mo, Wood, Shortt, *et al.* Rethinking the transfusion pathway in myelodysplastic syndromes: study protocol for a novel randomized feasibility n-of-1 trial of weekly-interval red cell transfusion in myelodysplastic syndromes. *Transfusion* 2024 (doi: 10.1111/trf.17706)
- Carrillo de Albornoz, Higgins, Petrie, *et al.* Economic evaluation: immunoglobulin vs prophylactic antibiotics in hypogammaglobulinemia and hematological malignancies. *Blood Advances* 2024 (doi: 10.1182/bloodadvances.2023012047)
- McQuilten, Weinkove, Thao, *et al.* Immunoglobulin replacement vs prophylactic antibiotics for hypogammaglobulinemia secondary to hematological malignancy. *Blood Advances* 2024 (doi: 10.1182/bloodadvances.2023011231)
- MacPhail, Dendle, Slavin, *et al.* Neutropenic sepsis in the intensive care unit: differences in clinical profile and outcomes according to the cause of neutropenia. *Open Forum Infectious Diseases* 2024 (doi: 10.1093/ofid/ofae289)
- Carrillo de Albornoz, Chai, Higgins, *et al.* A systematic review of the cost and cost-effectiveness of immunoglobulin treatment in patients with hematological malignancies. *International Journal of Technology Assessments in Health Care* 2024 (doi: 10.1017/S026646232400028X)
- MacPhail, Dendle, Slavin, *et al.* Sepsis mortality among patients with haematological malignancy admitted to intensive care 2000–2022: a binational cohort study. *Critical Care* 2024 (doi: 10.1186/s13054-024-04932-0)
- Morrow, Flannery, Charles, *et al.* A novel method to quantify fibrin–fibrin and fibrin–α2-antiplasmin cross-links in thrombi formed from human trauma patient plasma. *Journal of Thrombosis and Haemostasis* 2024 (doi: 10.1016/j.jtha.2024.03.001)
- Irving, Harris, Petrie, *et al.* Can clinical guidelines reduce variation in transfusion practice? A pre–post study of blood transfusions during cardiac surgery. *Vox Sanguinis* 2024 (doi: 10.1111/vox.13751)
- Mitra, Essery, Somesh, *et al.* Agreement of point-of-care and laboratory lactate levels among trauma patients and association with transfusion. *Vox Sanguinis* 2024 (doi: 10.1111/vox.13770)
- Mo, Wood, & McQuilten. Platelet transfusion. *Current Opinion in Hematology* 2024 (doi: 10.1097/MOH.0000000000000843)
- Maclean, Wellard, Ashrafi, *et al.* Ultra-massive transfusion: predictors of occurrence and in-hospital mortality from the Australian and New Zealand Massive Transfusion Registry (ANZ-MTR). *Transfusion Medicine Reviews* 2024 (doi: 10.1016/j.tmrv.2024.150857)
- Mitra, Wake, Talarico, *et al.* Resuscitation of adult shocked trauma patients using major haemorrhage protocol guided by viscoelastic haemostatic assays versus formulaic approach. *Transfusion Medicine* 2024 (doi: 10.1111/tme.13109)
- TREATT Trial Investigators. Tranexamic acid versus placebo to prevent bleeding in patients with haematological malignancies and severe thrombocytopenia (TREATT): a randomised, double-blind, parallel, phase 3 superiority trial. *The Lancet Haematology* 2025 (doi: 10.1016/S2352-3026(24)00317-X)
- van Haeren, Raasveld, Bruin, *et al.* Plasma transfusion in the intensive care unit. *Transfusion* 2025 (doi: 10.1111/trf.18071)
- Loh, Wellard, Haysom, *et al.* Outcomes of massive transfusion recipients administered ABO-incompatible fresh frozen plasma. *Transfusion* 2025 (doi: 10.1111/trf.18071)
- Flint, Poole, Raasveld, *et al.* Blood transfusion practices in intensive care: a prospective observational binational study. *Critical Care Explorations* 2025 (doi: 10.1097/CCE.0000000000001197)
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- Latona, Smith, Grant, & Mitra. Coagulation and transfusion informatics in chronic liver disease: A data linkage study of emergency department presentations. *eJHaem* 2025 (doi: 10.1002/jha2.70101)
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- Mo, Wood, Shortt, & McQuilten. Red blood cell transfusion practice and cardiac comorbidities in patients with myelodysplastic syndromes. *Transfusion* 2025 (doi: 10.1111/trf.18391)
- Ali, Gruen, Bernard, *et al.* Tranexamic acid timing and mortality impact after trauma. *Annals of Emergency Medicine* 2025 (doi: 10.1016/j.annemergmed.2025.06.609)
- van Wonderen, Raasveld, Flint, *et al.* Platelet transfusion practices in the ICU: A prospective multicenter cohort study. *Critical Care Medicine* 2025 (doi: 10.1097/CCM.0000000000006880)
- Sparrow, Haysom, Loh, *et al.* The Australian and New Zealand Massive Transfusion Registry: An innovation focusing on data collection, standardisation and interoperability between healthcare systems. *Health Information Management* 2025 (doi: 10.1177/18333583251375121)
- Milford, Marjanovic, Ho, *et al.* Tranexamic acid did not attenuate the acute rise in plasma syndecan-1 in a severely injured cohort: A laboratory analysis of the PATCH clinical trial. *Intensive Care Medicine Experimental* 2025 (doi: 10.1186/s40635-025-00784-2)
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Governance 2024-2025

Steering Committee

- Prof Erica Wood (Chair)
- Ms Linley Bielby (to 2024)
- Dr Karina Brady
- Prof Jeannie Callum
- Prof Peter Cameron
- Dr Khai Li Chai
- Prof Enrico Coiera
- Prof Jamie Cooper
- A/Prof James Daly (2025 -)
- Prof Craig French
- Dr Andrew Flint
- A/Prof Shane George
- Prof Anthony Harris
- Dr Alisa Higgins
- Dr Adam Irving
- Prof Zoe McQuilten
- Prof Biswadev Mitra
- Dr Allison Mo
- Dr Catriona Parker
- Prof Dennis Petrie
- Prof Michael Reade
- A/Prof John Reynolds
- Dr Elizabeth Ryan
- Dr Brenton Sanderson
- A/Prof Rosemary Sparrow
- Prof Simon Stanworth
- Dr Sasha Taylor
- Prof Judith Trotman
- Mr Neil Waters
- Dr Robert Weinkove
- Dr Cameron Wellard
- Ms Kate Wilson (2025 -)
- Dr James Winearls

Advisory Committee

- Prof Mike Murphy (Chair)
- Ms Jo Cameron
- A/Prof James Daly (to 2024)
- Prof Wendy Erber
- Prof Sant-Rayn Pasricha
- Prof Mark Polizzotto
- Dr Kobie von Wielligh
- Ms Kate Wilson (to 2024)

Operations Committee

- Prof Erica Wood
- Prof Zoe McQuilten
- Dr Karina Brady
- Ms Kirsten Caithness
- Ms Tina van Tonder (to 2024)
- Mr Neil Waters

Projects 2020-2025

Patient Blood Management

	Critical Bleeding	Critical Illness	Blood Diseases	Immunoglobulin Use
Clinical Trials	• CLIP II # • FEISTY II #		• TREATT # • REDDS-2 # • Frozen platelets	• RATIONAL pilot# • RATIONAL Platform # • RATIONALISE # • COVID convalescent plasma #
Observational Studies		• InPUT *# • Blood transfusion in ICU (point prevalence) #	TRUSTT-MDS: cost of RBC transfusion in MDS *	• PAIRS: Ig after allogeneic HSCT tx * • TRUST-Ig: cost of Ig transfusion *
Pilot Studies / Novel Products	Prehospital lyophilised plasma #	• ROSETTA: Hb thresholds in ECMO *# • *Frozen platelets in ICU*		
Registries	National Transfusion Dataset (NTD)*#	ANZICS APD - NTD linkage *#	Aplastic anaemia, lymphoma, myeloma registries linkage with NTD *#	ICAN / IMPROVE #
Surveys	• International definitions of massive transfusion • Prehospital blood use		Home transfusion / palliative care	
New Tools	• Clinical decision support • Machine learning • Models of demand			
Systematic reviews and meta-analyses	International definitions of massive transfusion	Age of blood RBC IPDMA	Anaemia and QoL/ functional outcomes in patients with MDS	• Cochrane CCP/ MoAb/hyperIg • Ig and other measures to prevent infection

Health Economics

* Blood Syngery co-funded; # Independent funds obtained

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We acknowledge the traditional owners of the lands on which our research is conducted. We pay our respects to their Elders, past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

Blood Synergy

transfusion research unit

MONASH University

Australian Government
National Health and Medical Research Council

NHMRC

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