MEDICINE, NURSING AND HEALTH SCIENCES (HTTPS://WWW.MONASH.EDU/MEDICINE)

New transfusion dataset a first step in nationally streamlined blood use

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September 2022 UPDATE – A $2.9 million MRFF grant will further expand this project, enabling the addition of even more structured data from national hospital and pre-hospital services, and clinical registries; de-identified donation data from Lifeblood Australia; and a cutting-edge project using AI algorithms to analyse unstructured data (e.g. free text clinical notes) found in electronic medical records.

The expansion will facilitate research into national priority areas in transfusion, including:

- areas of high use of blood products, such as to support critically ill patients and those with major haemorrhage or bone marrow failure;
- development of a suite of surveillance systems to monitor blood product safety across the entire blood transfusion chain, from donation to transfusion;
- health economic analyses of blood product usage; and
- Australia's first registry-based transfusion clinical trial: a trial of haemoglobin triggers for red cell transfusions in patients supported by extracorporeal membrane oxygenation (ECMO), in partnership with the EXCEL Registry

Read more on the National Transfusion Dataset webpage (https://bloodsynergy.org/ntd).

Donated blood is a precious community resource which can help save lives. Each unit also represents the incredible generosity of volunteer donors, and hours of testing and processing by Lifeblood staff and pathology staff to get these gifts to patients who need them. Managing blood stocks so that they are used to their full potential is therefore a vital part of the Australian health system.

Our Transfusion Research Unit (https://www.monash.edu/medicine/sphpm/units/transfusionresearch) established the Australian and New Zealand Massive Transfusion Registry in 2011 to collect transfusion data on patients experiencing major haemorrhage – that is, people receiving five or

more units of blood within four hours, which may occur following trauma, major surgery or obstetric complications. The registry has captured data on more than 10,000 cases of critical bleeding.

Thanks to a recent funding injection from the Australian Research Data Commons, the Transfusion Research Unit's Blood Synergy program team are expanding this registry to capture data on **all** transfusion episodes, beyond major events.

The National Transfusion Dataset will provide evidence on blood use that will help support evidence-based policy decisions, leading to better blood utilisation and improved clinical outcomes for Australian patients.

Working with hospital collaborators, the team piloted the dataset in 2019 at the Alfred Hospital in Melbourne, Flinders Medical Centre in Adelaide, and Wimmera Health in Horsham. The pilot was a success, and this new funding enables further expansion of the project.

One of the major challenges is securely linking up all the relevant records. For example, Lifeblood maintain records of blood donations, processing and product distribution to health services. Information on patients requiring transfusion during transfer to hospital is held by ambulance and retrieval services. Pathology departments manage data on blood units received and issued, along with patient blood group and compatibility testing records, and information on any transfusion reactions. Clinical information is held in hospital medical records, which are increasingly in the form of electronic medical records (EMR) systems. And many clinical registries capture and analyse data on patients with blood disorders and other conditions, some of whom need transfusions of many types of blood products.

Professor Erica Wood (https://research.monash.edu/en/persons/erica-wood), Head of the Transfusion Research Unit, says "Currently these datasets are not 'joined up' to see a full picture of transfusion practice from donor to product to patient. Having these data available will be extremely helpful to hospitals and pathology services, our national blood service, governments who fund these services, and everyone in the community to see how blood is used in Australia, and how its use can be improved".

"As the dataset is built, it will also be securely linked with data from several national registries to capture even more clinical information relevant to analysing transfusion practice and outcomes."

Transfusion Dataset project leader Dr Kim Huynh says, "Harmonising the data items and processes and ensuring everything is captured but there are no double-ups or conflicting information is a huge part of this project. We're being very careful, in order to deliver what should be a fantastic resource.

"A key part of this is trying to find patterns: What patient characteristics predict high-level clinical need for blood? How common are each of those groups of people? What side-effects are experienced, and by whom? How cost-effective are our current systems? By having a clearer picture, we can inform clinical guidelines, help improve logistics and reduce wastage, and streamline practice nationally."

The project is already underway at the Alfred Hospital, Flinders Medical Centre and Ambulance Victoria, with The Royal Melbourne Hospital and Royal Darwin Hospital waiting in the wings.

Kim says, "We have 60 different hospital sites enrolled on our Massive Transfusion Registry, and we plan to work our way through this list and onboard them as new sites to the National Transfusion Dataset over the next several years.

"We've got a lot of experience working alongside peak national bodies like the National Blood Authority as well as Departments of Health, so it will be great to have their involvement and support when we start sharing our findings."

More information is available at: bloodsynergy.org/ntd (https://bloodsynergy.org/ntd)

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