

Better Practice Case Study: Pathology Queensland

Pathology Queensland provides pathology services to all Queensland Health public hospitals. Pathology Queensland comprises a hierarchical, networked system of 33 laboratories. These laboratories consist of district laboratories in rural hospitals, group laboratories in large regional hospitals and unit base laboratories providing tertiary referral services in the metropolitan teaching hospitals.

Pathology Queensland has approximately 1,500 consultant pathologists, scientists, technicians, operational and administrative staff.

This case study looks at the Pathology Queensland laboratories in the following hospitals and highlights some of the processes they have in place to minimise blood wastage, particularly with regards to transfer arrangements and stock movement:

- Royal Brisbane & Women's Hospital
- Redcliffe Hospital
- Toowoomba Hospital
- The Townsville Hospital

Pathology Queensland laboratories prepare emergency issue 'Medevac packs' for their site and supply O negative units to 40 non-laboratory sites such as the critical care aeromedical retrieval service 'CareFlight'. This requires management of over 200 units of O negative red blood cells (RBCs).

Laboratory workload involved in supplying Medevac units for laboratory and non-laboratory sites is considerable, especially impacting on smaller laboratories who provide units to multiple 'non-laboratory' sites. Keeping a stock of Medevac units at a non-laboratory site creates a significant workload and responsibility for the nursing and clinical staff who ensure refrigeration documentation is complete and units are stored and transported correctly.



For more examples of better practice case studies visit www.blood.gov.au

Transfer Arrangements

- In order to minimise wastage, all large laboratories receive 'short expiry' units from district laboratories, and non-laboratory sites return O negative units to the supplying laboratory. Ideally RBC units are rotated with at least 10 days to expiry.
- For remote sites that do not have laboratory staff on site, members of the nursing staff receive training in storage and transport of blood and blood products.
- All components transferred between Pathology Queensland facilities are accompanied by temperature indicators (Safe-T-Vue) and documentation which includes transport information for the receiving site. The units are checked on arrival to ensure they are suitable for transfusion before accepting into inventory/placing in the remote blood fridge.
- Pathology Queensland has revalidated the [Australian Red Cross Lifeblood](#) (Lifeblood) shipper for Queensland ambient conditions. All Queensland hub-and-spoke sites use the same procedures and material for inter-facility transfers.
- Using the Lifeblood shippers for inter-facility transfers helps address any environmental concerns, as shippers in remote sites are transported to the main hub facilities and returned to the Lifeblood.
- Transport costs for blood and blood products are an ongoing issue.

Royal Brisbane and Women's Hospital

The Royal Brisbane and Women's Hospital (RBWH) is a 1,023-bed hospital close to the Brisbane central business district. RBWH is a key provider of health care services for Queensland Health that provides care on several specialties including medicine, surgery, orthopaedics, obstetrics, gynaecology, neonatal intensive care, and trauma services.

The laboratory at the Royal Brisbane and Women's Hospital is the largest metropolitan pathology support service in Queensland Health and one of the largest in Australia.

- The RBWH laboratory receives three deliveries from the [Lifeblood](#) daily at 0900, 1500 and 2030.
- RBWH laboratory receives more than 2,000 RBC units per year from other laboratories, including Mount Isa and Longreach.
- RBWH supplies two units of O negative RBCs to Brisbane Ambulance Service that are transported in a specially validated shipper, the 'LifeBox', for up to 64 hrs (see images of Lifebox below).
- RBWH has implemented a single unit policy (i.e. provide one unit of blood, and reassess the patient for clinical symptoms before transfusing further units) which has resulted in a reduction in units transfused without compromising patient outcome.



Figure 1: Lifebox

Role of the Transfusion Nurse

The RBWH employs a permanent transfusion nurse in the pathology laboratory (transfusion) located in close proximity to the senior laboratory scientist. The transfusion nurse performs a number of functions including:

- working closely with the laboratory scientist and staff to review orders.
- liaising with clinical staff on blood and blood product orders.
- providing advice and training on blood-related issues and processes to clinical staff (e.g. expiry, cost, waste minimisation, packaging requirements and transport).
- obtaining and analysing data on an ongoing basis.
- reporting on any data discrepancies to clinical staff.
- promoting the uptake of national guidelines and standards.
- identifying any issues on blood-related processes and rectifying them through appropriate corrective interventions.
- participating in jurisdictional meetings on blood-related matters.

The Transfusion Nurse position was funded and established as part of a state-wide appropriate use project in 2011. The project was managed under guidance from a project team and was focussed on:

- appropriate use for blood and blood products with a view to minimising blood-related costs, encouraging compliance with national guidelines and standards, and improving wastage levels.
- the project included the funding of 5 transfusion nurse positions in some of Queensland largest public hospitals (Gold Coast, Royal Brisbane and Women's, Nambour, Townsville and Cairns).
- 'appropriate use' audits were conducted / bench marked and reported to hospital executives with the transfusion nurses driving change practice initiatives (single unit red cell transfusion) which saw fresh component usage at the project sites decline dramatically over the project term.

The RBWH transfusion nurse has performed a variety of clinical audits aimed at identifying areas to improve product utilisation and patient safety including:

- a clinical audit for albumin to identify clinical indication for infusion with a view to establishing guidelines for the use of the product.
- clinical audits on platelet and fresh plasma utilisation.
- ongoing collection and reporting of fresh and fractionated component usage/trending incorporated into regular reports to executive level management and clinical units.

Stock movement and packaging

The RBWH has validated a shipper for use within the hospital that allows RBCs removed from the Blood Bank fridge to be maintained in the clinical unit for up to 2 hours before needing to be returned to refrigerated storage. Theatre has been the main beneficiary of this process as it has not only reduced the amount of time dedicated to managing blood components but has also dramatically reduced wastage rates in this area (clinical staff were removing units to check details and then replacing units directly onto icebricks).

- Blood components are booked out to the clinical areas one unit at a time making returns of components to Blood Bank a rare occurrence.
- The time of despatch is added to the 'crossmatch' form so ward staff have an awareness of the '30 min rule' and know how long the unit has been out of the blood fridge.

For ease of reference, useful information regarding the safe transport and storage of blood and blood components is available on a poster in the laboratory.

With the implementation of the above processes, the RBWH pathology laboratory is achieving wastage levels for red cells in the order of 2.5% (year to date, April 2013).

For more information on Pathology Queensland: Royal Brisbane & Women's please contact:

Dr John Rowell, Director Haemophilia Centre

Email: John_rowell@health.qld.gov.au

Redcliffe Hospital

The Redcliffe hospital has approximately 270 beds and is 30-35 minutes north of Brisbane. The hospital services the population of Redcliffe which is around 50,000.

The pathology laboratory at Redcliffe is one of several satellites to the Prince Charles Hospital (TPCH) located around 30 minutes away. The staff at Redcliffe pathology laboratory are a small team of multi-disciplinary scientists. Staff have an assigned area of responsibility (e.g. transfusion, chemistry etc) where they spend an estimated 80% of their time, however, if required, staff can move to other departments and work on other areas. Redcliffe has a very close working relationship with TPCH and has a clear and defined process for transferring blood to that hospital.

The processes and procedures at the Redcliffe pathology laboratory have allowed this facility to achieve wastage rates of less than 1% (as at year to date, April 2013).

Some of the key processes and issues for the Redcliffe pathology laboratory include:

Transfer arrangements

- The laboratory has a service agreement in place with a courier for transfers of blood and blood products. In circumstances where the courier is unable to transfer product on time the contingency is for the courier to arrange for a taxi to transfer the blood. This service agreement has proven to be a cost saving and a more secure measure for blood transfers.

Stock rotation and packaging

The facility conducts stock inventory control checks electronically on a daily basis and checks for expired cross-matched stock before placing any orders for blood through the Blood Service. This helps to avoid any over-ordering, which in turn, means less wastage. When transferring blood to their hub (the Prince Charles Hospital), Redcliffe send stock with expiry of at least 10 days. Even if there's only a small number units of blood, they are forwarded to the Prince Charles hospital, as that hospital is bigger and is therefore more likely to use that blood.

Redcliffe participates in monthly meetings with the Transfusion Discipline Working Party, where one of the standing items on the agenda is discussion on wastage data. The Working Party comprises transfusion heads (i.e. scientists) across Queensland. The leading haematologist for Queensland chairs these meetings.

For particular blood products (e.g. platelets) Redcliffe does monthly audits, including how many come to the facility, how many are transferred to the Prince Charles Hospital, how many are used and how many are discarded.

Theatre is in close proximity to the pathology laboratory. All stock is therefore kept centrally in the laboratory blood fridge where theatre staff may collect one unit at a time. There is no need to take many units and store them separately, thus minimizing the risk of any contamination due to transport and storage arrangements. Redcliffe enforces the 'single unit' policy and only once the decision has been made to transfuse.

Blood is transferred to the Prince Charles Hospital on a weekly basis, although this depends on the level of workload at Redcliffe – a decreased workload means less blood orders and therefore less blood to transfer. Redcliffe evaluates its stockholding levels and processes based on its workload so as to minimise transfers to the Prince Charles Hospital.

- Any short expiry blood sent to TPCH is packed in Blood Service shippers with signage recording the date and time of packing and packing configuration used.
- Any requests for blood for patients who are transferring to RBWH or TPCH are provided in a Blood Service shipper with signage 'do not open unless decision to transfuse has been made'.

For more information on Pathology Queensland: Redcliffe, please contact:

Philip Winwood, Scientist, Queensland Pathology – Redcliffe Hospital;

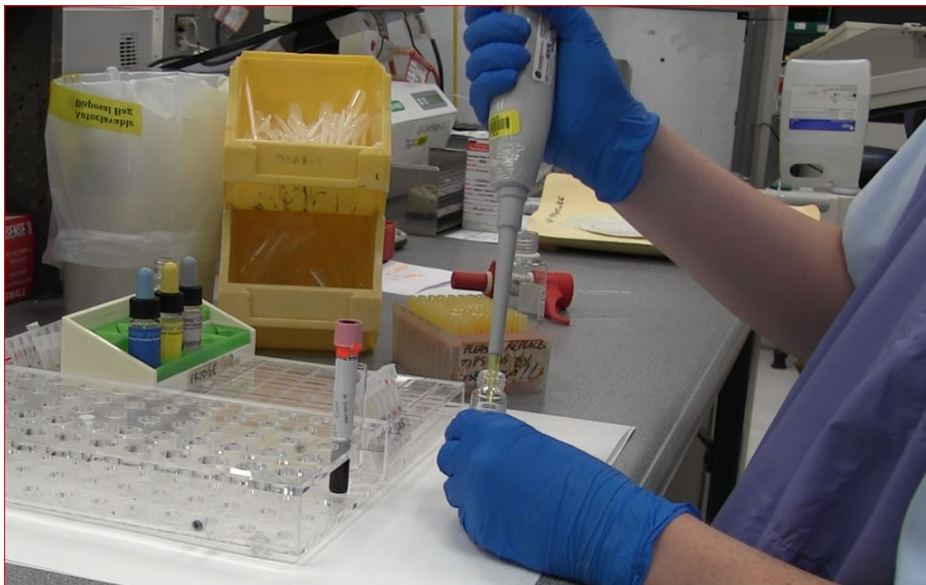
Email: Phillip_Winwood@health.qld.gov.au

Toowoomba

The Toowoomba Hospital has over 320 beds and is part of the Darling Downs–West Moreton Health Service District. The hospital is a major referral hospital for south west Queensland. The Toowoomba catchment is around 250,000 and growing. Specialist services at this hospital include a combined oncology-haematology unit, cancer care, paediatrics and obstetrics.

The Toowoomba pathology laboratory has five district laboratories. Four laboratories - Charleville (around 7 hours by road), Warwick (1 hour by road), Dalby (1 hour by road) and Roma (around 4 hours by road) send their 'short expiry' stock to Toowoomba.

The wastage rate for red cells at the Toowoomba hospital's pathology laboratory is 1.9% (year to date, April 2013). Key processes in place at this facility include:



Transfer arrangements and stock movement

Due to their proximity from Toowoomba, 'short expiry' stock (10-14 days until expiry) from Charleville and Roma laboratories is delivered into Toowoomba by freight plane, while stock from Warwick and Roma is delivered by road transport. To reduce wastage, these four sites only hold O positive, O negative and A positive RBCs.

Longreach is the fifth district laboratory for the Toowoomba group. Transport arrangements mean it is more feasible to send 'Short expiry' stock to the Royal Brisbane and Women's Hospital.

Toowoomba also transfers 'short expiry' stock to the Royal Brisbane and Women's Hospital if required.

The Toowoomba laboratory takes great care when ordering stock. The laboratory orders blood to coincide with the delivery schedule provided by the Blood Service. If the laboratory is aware there is stock coming from the satellite laboratories, this is taken into consideration and less blood is ordered from the Blood Service in Brisbane (around 2 hours by road).

Toowoomba has a service agreement with a private courier to deliver product to non-laboratory sites or RBWH. The courier may subcontract to a bus company to do the deliveries.

Crossmatched blood is electronically allocated where appropriate and retained for 24 hours. Unused RBCs are returned to stock at 0800 each morning prior to ordering stock.

All of Toowoomba's satellite laboratories use BloodNet for ordering, receipting and transferring stock.

Only Roma and Warwick laboratories are able to maintain an inventory of fresh frozen plasma. Due to the short expiry of platelets, none of the satellite laboratories stock platelets.

In an emergency, Toowoomba laboratory liaises with private laboratories in the vicinity to source platelets. This informal arrangement serves both parties well.

Storage

Crossmatched blood is stored in the laboratory or theatre fridge which is maintained by the laboratory staff. Two units of 'Medevac blood' are provided to the Emergency Department.

Information sharing with other Pathology Queensland laboratories (e.g. Royal Brisbane and Women's) and the availability of accurate data through BloodNet has created greater awareness of inventory management. The laboratory also supports and implements a "single unit" policy for blood.

For more information on Pathology Queensland: Toowoomba please contact:

Michael Burrett, Senior Scientist, Queensland Pathology – Toowoomba Hospital

Email: Michael_Burrett@health.gov.au

Townsville

The Townsville Hospital is a tertiary referral hospital located in Douglas, Townsville. The hospital has over 580 beds and provides a number of services including cardiac, obstetric, gynaecological, paediatric, orthopaedic, oncology, neonatal and intensive care.

The Townsville pathology laboratory services primarily the Townsville Hospital, Ingham, Palm Island, Ayr, Home Hill, Bowen, Charters Towers, Hughenden, and Richmond. Some of their key issues and processes for blood include:

Transfer arrangements and stock movement

Townsville uses bus freight or private couriers to transfer blood to non-laboratory sites. All blood is transferred using validated packing configurations. Shipments include a quality transport sheet which is attached to the shipment.

Mt Isa and Mackay are Townsville's satellite laboratories. Blood Products for these sites are ordered direct from the Blood Service using BloodNet. Stock rotation of RBCs with at least a week expiry, are sent to the Royal Brisbane and Women's Hospital, as an internal review determined that this was a more reliant and consistent transport channel.

Unused blood from satellite non-laboratory health services is rotated back to Townsville with a week left on the expiry date. Most transfers take place early in the morning. After hours, staff at Townsville package the blood and forward to the bus station by courier. In order to keep freight costs down, transfers are minimised as much as possible.

On arrival at its destination, blood is unpacked and stored in a blood fridge. Non-laboratory sites are required to provide their fridge records to Townsville on a monthly basis who then check for compliance. Townsville also audits the number/percentage returns on their transport sheets and follow up to offer support to the relevant facility if they are experiencing any problems.

Townsville has an informal partnership with private laboratories for emergency situations when blood and blood products such as platelets and cryoprecipitate are required and in short supply. Having this arrangement in place allows the laboratory to resupply quickly in emergencies.

An issue affecting the urgent transport of blood in tropical areas such as Townsville is the three-hour lag regulation imposed by the International Air Transport Association (IATA). Under this rule, freight, including blood shippers, have to wait three hours at the airport before being transported by air. For this reason, the pathology laboratory needs to maintain a “buffer” for blood products with short expiry dates such as platelets.

The Townsville laboratory has very good communication systems and working relationships with areas in the Townsville hospital (e.g. oncology) and externally on blood supply arrangements.

The Townsville laboratory receives good support from the Blood Service in Brisbane and Townsville – they tend to keep Townsville as well stocked as they can in times of short supply.

Storage

- The Townsville pathology laboratory has two blood fridges on site (the laboratory) and two additional fridges – one in theatre and one at the Townsville airport. They are also in the process of obtaining a blood fridge for the emergency department of the hospital.
- There is an electronic audit currently on trial for blood to the theatre fridge which includes a form for theatre staff to record information on blood (e.g. time in, time out, timeframe to temperature blood temperature) and a register. The trial has been developed in coordination with the theatre’s anaesthetic nurses, as they are the staff who handle the blood in theatre. The laboratory will be auditing the processes around this trial. Although it has not been completed yet, there has been a reduction in wastage from theatre with this process in place – estimated to be around two to three units a month.

Education / training

Townsville offers education and support to satellite health services as required through video conferencing or demonstrations and keeps in regular contact with satellites by email and phone.

The Townsville health service also offers an orientation program for staff on issues around clinical use of blood and blood products and wastage minimization.

For more information on Pathology Queensland: Townsville please contact:

Michael Wilhelm – Supervisor, Transfusion Medicine

Email: Michael.Wilhelm@health.qld.gov.au

Acknowledgements

The National Blood Authority extends its appreciation to the staff of the Queensland Pathology laboratories at the Royal Brisbane and Women's, Redcliffe, Toowoomba and Townsville hospitals for their support, contributions and involvement in the development of this case study. In particular a special thank you to:

- Dr John Rowell: Director Haemophilia Centre, RBWH
- Sue Williams: Senior Scientist, Pathology Queensland – RBWH
- Nick McKeough: Transfusion Nurse, Pathology Queensland – RBWH
- Tamie Hall: Scientist, Pathology Queensland – RBWH
- Phillip Winwood: Scientist, Pathology Queensland – Redcliffe Hospital
- Michael Burrett: Senior Scientist, Pathology Queensland – Toowoomba Hospital
- Michael Wilhelm: Supervisor, Transfusion Medicine Department, Pathology Queensland – Townsville Hospital
- Janelle Toombes: Clinical Nurse Consultant, Haemovigilance, Townsville Hospital