



> Better Practice Case Study: NSW Health Pathology – North (Hunter)

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Background: NSW Health Pathology – North (Hunter) is renowned for better practice inventory management and has one of the lowest blood and blood product wastage rates in the country.

Their wastage rate against stock issued for red blood cells was less than 1% for both 2010-11 and 2011-12. These rates are even more impressive given blood deliveries are received from the Australian Red Cross Lifeblood (Lifeblood) Sydney Distribution Centre, a three to four hour drive from the hospital.

NSW Health Pathology – North (Hunter) is part of Pathology North. It is based at the John Hunter Hospital and services the following eleven hospitals in the Hunter Valley, NSW:

- John Hunter Hospital
- John Hunter Children's Hospital
- Royal Newcastle Centre Hospital
- Calvary Mater Newcastle Hospital
- Belmont Hospital
- Maitland Hospital
- Cessnock Hospital
- Tomaree Hospital
- Muswellbrook Hospital
- Singleton Hospital, and
- Scott Memorial Hospital.

So what makes NSW Health Pathology – North (Hunter) Different:

The NSW Health Pathology – North (Hunter) laboratory staff at the John Hunter Hospital are responsible for maintaining the ordering, delivery and inventory management of blood and blood products for all the hospitals serviced by NSW

Health Pathology – North (Hunter) in the Hunter Valley.

Careful vigilance and tight control of the blood and blood product inventory have been achieved through the involvement of laboratory scientists, Greg Irwin, Bridget Partridge and Vicki Martens.

The team have identified the following four key areas which they believe allows for the success of this system:

- Strong inventory management and control
- Quick release of products upon request
- Involved and supportive team, including the haematologists
- Close monitoring of age of blood for timely rotation or transfusion of stock

Strong Inventory Management and Control: Hunter Area Pathology Service maintains strict inventory control for all hospitals in its transfusion service. This inventory is actively managed and regularly reviewed for possible improvements in process or policy. There are three key areas of management:

1. order management
2. delivery management
3. inventory management.

1. Order management: To ensure consistency, two NSW Health Pathology – North (Hunter) senior scientists at the John Hunter Hospital laboratory are primarily responsible for placing orders for blood and blood products in BloodNet. This allows those two scientists to have control and accountability over what is ordered ensuring consistency in ordering practices and wastage rates. In addition to utilising BloodNet for the order and receipt of blood and blood products, NSW Health Pathology – North (Hunter) have developed and utilise the electronic system, eBlood, for monitoring and managing all inventory.

This eBlood system, which is interfaced with BloodNet, generates order requirements based on predetermined stock levels for the John Hunter Hospital laboratory and each satellite laboratory. These stock levels have been defined by the NSW Health Pathology – North (Hunter) scientists and are reviewed periodically for their appropriateness. The eBlood system produces an inventory report for each satellite laboratory that indicates:

- expected stock to be returned to the





John Hunter Hospital laboratory

- actual stock at the satellite laboratories, and
- product required to be ordered for each laboratory.

The NSW Health Pathology – North (Hunter) senior scientists place orders for the satellite hospital laboratories according to the requirements identified in eBlood. However, in addition to the reviewing the report above, the orders for John Hunter Hospital laboratory are generated only after reviewing the following additional information:

- type and amount of planned surgery
- existing stock levels, and
- anticipated return of older stock from satellite hospitals.

Immunoglobulin is only ordered weekly and is not released for a patient until an authorisation is sighted by one of the NSW Health Pathology – North (Hunter) senior scientists.

2. Delivery management:

The NSW Health Pathology – North (Hunter) laboratory receives eleven routine deliveries per week for the stock required by the John Hunter Hospital and their satellite laboratories. The delivery schedule is as follows:

- Monday to Friday – two deliveries per day, one large delivery in the morning and one smaller delivery during the night
- Saturday – one delivery per day, a small delivery in the afternoon.

Around 50–80 packs of red blood cells are delivered each day to the John Hunter Hospital laboratory for receipt and group check by the NSW Health Pathology – North (Hunter) scientists before redistribution onto the satellite laboratories. Deliveries bound for satellite hospitals are repackaged by laboratory staff and sent via a NSW Health Pathology – North (Hunter) courier.

Urgent or life-threatening deliveries outside these scheduled times can be delivered to NSW Health Pathology – North (Hunter) in three to four hours from Sydney by taxi. The cost of such deliveries is around \$500 and funded by Lifeblood. Due to the careful and efficient management of inventory by the

NSW Health Pathology – North (Hunter) team, this method of delivery is rarely utilised.

3. Inventory management:

The electronic system eBlood allows laboratory staff to review actual inventory data over several years and develop reliable statistics and assumptions from that data. As a result, optimal stock numbers are reviewed regularly against historical usage and changes to that usage over time resulting in an adjustment to that inventory where required. Stock is actively managed by the Senior Scientist for all laboratories under their management.



One such way that stock is actively managed is a policy decision where expired products are only discarded at the John Hunter Hospital laboratory. This enables staff to have control over the age of stock and also to be responsible and accountable for all products that are time expired. The NSW Health Pathology – North (Hunter) scientists enter the reason for discard into both eBlood and the BloodNet Fate module before disposal of the discard.

The NSW Health Pathology – North (Hunter) scientists also closely monitor the stock on hand and ensure that it is rotated regularly to keep the age of stock low (see Age of Blood). As well rotating to keep the age of stock low, the stock is rotated to ensure that the requirements of the satellite laboratories are met and the policies implemented by the John Hunter Hospital laboratory are adhered to.

These policies include direction on expiry of standard stock, trauma patients who require blood that is less than 14 days old, irradiated product requirements and paediatric patients. The NSW Health Pathology – North (Hunter) staff manage to maintain the lowest expiry rates in the country while complying with all of the above policies, a truly inspiring feat.

In addition to the satellite laboratories and fridges, NSW Health Pathology – North (Hunter) supply products to medical retrieval teams (e.g. ambulances and helicopter) on request. Products are issued as stock

would be to a remote refrigerator or a satellite laboratory. On this basis it can be monitored as part of the John Hunter Hospital laboratory inventory. Unused stock is immediately returned to the laboratory and accepted, subject to a verified cold chain.

Platelets are a special case when concerned with inventory management. They are routinely ordered and held in stock by the NSW Health Pathology – North (Hunter) laboratory for routine issue to the John Hunter Hospital, the John Hunter Children's Hospital and the Calvary Mater Newcastle. Satellite hospitals do not hold platelets in stock.

Platelets can only be requested from the John Hunter Hospital laboratory for a specific patient. The haematologist on call must approve all platelet infusions prior to laboratory release to any patient



in any hospital. The private laboratories do not routinely stock platelets either, but can obtain them from the John Hunter Hospital laboratory if required. The John Hunter Hospital laboratory has transfer arrangements in place with private laboratories in the area for platelet exchange. Platelet age on delivery is generally 2-3 days old (expiry is 5 days) so limited stock is maintained to keep unnecessary wastage to a minimum.

Speed of release: Another way that the John Hunter Hospital laboratory manages their inventory so effectively is the speed of release of product that they can achieve, even without pre-cross-matched blood. The current cross-match to transfusion ratio is currently 1:1, a ratio that is only achievable as blood products are held as a group and save and is only electronically cross-matched and tagged for a patient at the time of release for the actual infusion.

The systems in place allow the tagging and release of product to take the same amount of time as releasing pre-cross-matched blood. The time to cross-match blood using this system is approximately 30 seconds and is the same regardless of whether the situation is expected or if it is an emergency.

Only cross-matching blood on its release rather than holding for a period of time ensures:

- the requirements of those in need of the blood are met
- the availability of blood in stock is increased, and
- a decrease in over-ordering caused by units being held cross-matched for an extended period, consequently resulting

in unnecessary wastage.

The only red blood cell units cross-matched in advance are for patients with complex or extended phenotypes.

If irradiated units are required, they are irradiated at the time of release. However, the exception to this policy is paediatric units. These packs are all irradiated on delivery as this assists in reducing the time needed to process requests, ensuring product can be released as quickly as possible.

The John Hunter Hospital laboratory ran an introductory session into the workings of the laboratory for clinicians when they first enacted these policies. This resulted in those



clinicians who were initially sceptical about the speed of release with this system being confident their service requirements would be met at all times. This inspired greater confidence in the John Hunter Hospital laboratory staff and their management of blood by clinicians and other clinical staff alike.

Involved haematologists:

Another key area identified by NSW Health Pathology - North (Hunter) laboratory staff

as helping them achieve their impressive wastage rates is the strong support they receive from the haematology team.

There is a culture of empowerment for the laboratory at the John Hunter Hospital, the laboratory staff know and understand that their decisions and practices are supported by the haematology team. The haematologists do so by providing a 24 hour a day on call service for advice to laboratory and medical staff on the administration of blood and blood products

Age of blood : Another focus for the John Hunter Hospital laboratory in keeping their wastage levels low is concentrating on the age of their inventory and the ways that the stock can be utilised prior to expiry. To this end, NSW Health Pathology - North (Hunter) has a policy of stock rotation between the John Hunter Hospital laboratory and their satellite laboratories. Adopting this practice has enabled them to reduce the age of transfusion while maintaining the low wastage rates of red blood cells, at around 0.1% of stock issued.

To ensure products are utilised before expiry, stock is carefully monitored and rotated between the core laboratory at John Hunter Hospital and the satellite laboratories. This is achieved by:

1. careful review of satellite laboratory inventory in eBlood and request for return of stock older than 21 days to the John Hunter Hospital laboratory
2. replacement of older stock in satellite laboratories with more recently delivery products from Lifeblood

A delicate balance is managed by the scientists at the John Hunter Hospital laboratory to ensure that both the satellite



laboratories and the John Hunter Hospital laboratory themselves have both an adequate number of products and that inventory is of appropriate age. This balance is important to maintain to ensure that the product is available for the clinical use that it is required for, while maintaining a low wastage rate ensuring the optimal utilisation of a precious product.

Careful attention is paid to the cold chain requirements and stock is only accepted back into the John Hunter Hospital laboratory if the cold chain can be verified.

For more information : This case study is accompanied by short media clips which explain further some of the content available in this factsheet. To see this case study in full or for information on other case studies visit www.blood.gov.au/case-studies

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