Blood System Inventory Management Best Practices Guide

Blood is a precious resource that must be carefully managed to ensure that each donor’s gift provides the greatest benefit to patients. Blood system stakeholders and patients expect a safe, secure, cost-effective, affordable and accessible supply of quality blood components and products.

Adherence to blood system wide inventory management best practices can optimize donor collections, component manufacturing, and the inventory that a blood supplier and a hospital needs to keep on hand to meet patient needs, and contribute to minimizing component outdate rates.

The following “vein to vein” blood system inventory management best practices are divided into 2 sections.

A. Blood Manufacturers/Suppliers
B. Hospital Transfusion Services/Blood Banks

Note: Implementation of some of the following may require prior consultation with the blood manufacturer/supplier or hospital transfusion service/blood bank management representative, medical director, or hospital transfusion committee.
A. Blood Manufacturer/Blood Supplier

1. Conduct regular hospital demand forecasting that considers historical demand trends, environmental scans, clinical trends, as well as hospital customer specific future plans. Demand forecasts provide the lead time necessary to ensure that supply is available to meet demand.

2. Establish blood collection targets based on the results of a demand forecast. Consider that hospital demand can be highly seasonal, and adjust collection and production targets accordingly.

3. Gather intelligence at regular intervals and review and adjust demand forecasts and collection targets as required. Agility is essential to consistently meet patient’s needs while operating a cost effective service.

4. Review collection and manufacturing discard data on a regular basis, and implement targeted continuous process improvement plans to reduce discards.

5. Collect hospital disposition data on a regular basis to determine the final disposition of all blood components and products. Knowing what blood components/products are used by each hospital will improve the accuracy of demand forecasts. Disposition data that includes hospital discards facilitates discussions with hospital customers about optimal inventory levels and routine blood delivery schedules. Balancing blood system inventory levels, discard rates, and delivery frequency is critical to operating a cost effective service.

6. Develop a blood system wide, real time, inventory monitoring tool that provides visibility of blood component levels for all stakeholders. Establish inventory level categories for all blood components and ABO/Rh blood group. Example inventory level categories are Excess, Optimal, Minimum, and Emergency, or Green, Amber, and Red.

7. Develop a tool to guide daily manufacturing plans, with defined targets for each component type by ABO/Rh blood group that considers current inventory levels.

8. Conduct daily inventory management meetings. Multisite blood suppliers should conduct daily inventory management meetings with all sites to communicate local demand challenges and facilitate inventory movement as required to best meet patient requirements and minimize discards.
9. Share inventory levels daily with hospital customers to promote system wide visible inventory levels, and establish a process for promptly notifying hospitals customers of any inventory challenges.

10. Establish a blood shortage plan in collaboration with all stakeholders that includes participant actions resulting from supply disruptions and/or disasters. Conduct mock exercises to ensure the plan will function as expected, and update the plan to reflect evolving scenarios.

11. Arrange “released” inventory to ensure that oldest (shortest remaining shelf life) are at the front of the storage unit. Alert staff to inventory with short outdates to help ensure they will be issued to hospital customers first. Post a list on the storage unit or tag the components/products as a visible cue.

12. Avoid providing a large number of components with the same expiry date when filling large hospital customer orders (>10 components of the same blood component type and blood group). Managing large numbers of components all expiring on the same day can be challenging for hospital customers. Other considerations may be appropriate for smaller, more distant hospital customers.

13. Establish delivery schedules in collaboration with hospital customers. Establish definitions for blood order delivery priorities (Routine, ASAP, STAT). Review frequency of non-routine requests on a regular basis and explore opportunities to adjust inventory levels to optimize such deliveries.
B. Hospital Transfusion Service/Blood Bank

1. Determine target inventory levels and maintain these levels by using an ‘order up to’ policy. Rule of thumb is to maintain a stock inventory of the equivalent to approximately 4-6 days of your average daily use of red blood cells (RBCs) and 2 days of your average daily use of platelets (based on averaging your annual use divided by the number of days you use the majority of your blood). Inventory calculators can provide a rough estimate. Inventory levels should be reviewed annually and when blood utilization practices change at your hospital, the target numbers should be revised as needed. Additional considerations:

- Review pre-admission and next day’s surgical schedule to improve inventory management by ensuring blood group specific units are available.
- Adjust inventory target levels if significant seasonal demand fluctuations occur, such as areas with seasonal residents and/or tourists.
- Define and review target inventory levels for all components/products.
- Identify target inventory levels as part of a hospital emergency blood management plan. Align with definitions provided in provincial or national emergency blood management plans.

2. Arrange your inventory to ensure the oldest (shortest remaining shelf life) are at the front of the storage unit. Alert staff to units that will be outdating soon (e.g. RBC in the next 5 days, platelets same day, plasma protein products and frozen products in next 3 months) to help ensure they will be used first. Use visual aids such as an expiring units list on the storage unit or place distinctive tags on the units. Ensure that a strict ‘oldest unit first out’ policy is adhered to, unless operating procedures dictate specific requirements for particular patients. Include reserved units (which may be kept in a separate area) in this process by moving them into useable inventory before they reach the end of their shelf life.

3. Perform an inventory count prior to placing a ‘stock up’ order with your blood supplier. Ensure that the inventory count includes any stock that is held in remote locations such as Emergency Rooms or Operating Rooms, and includes a regular verification between computer inventory count and a physical count.

4. Implement policies to address the management of group O Rh negative RBCs to preserve these lower incidence blood components. These policies should include reserving them for female patients of child bearing potential and children. The use of O Rh negative RBC for non O Rh negative recipients should be minimized wherever possible. This practice should be monitored and reviewed regularly to ensure inventory levels are kept at optimum levels to avoid wastage and to ensure there is a sufficient supply for those patients who really need them.

5. Limit crossmatch/reserve inventory. Use of electronic or immediate spin crossmatch techniques can aid in reducing the length of time units remain on
hold for a patient. Regular review and return to available inventory as soon as possible (within 24 hours) will reduce the number of units being held. For surgical patients, a review of the patient’s surgical blood use, the most recent post-operative hemoglobin result, and the presence of any clinically significant alloantibodies may assist with the decision.

6. Establish a maximum surgical blood order schedule (MSBOS). A MSBOS is based on a hospital’s past RBC use and serves as a guideline for future surgical and other treatment RBC requests. A MSBOS can guide ordering practice and avoid ‘just in case’ ordering. Note: Endorsement by a hospital’s transfusion committee, communication of the MSBOS guidelines to your hospital’s physicians, surgeons, and nurse practitioners, and regular review of the MSBOS guidelines are critical to the success of a MSBOS. Crossmatch requests that exceed the MSBOS guidelines may require consultation. The use of pre-printed order sets can also improve ordering practices.

7. Implement redistribution to minimize outdates. Smaller hospitals should consider an arrangement to transfer “soon to outdate” blood components and products to a nearby larger hospital with a higher demand. Packing procedures must ensure the blood components/products are maintained at the appropriate conditions during transport and that the appropriate documentation accompanies the transfer.

8. Train your staff. Staff training and awareness can contribute to improved inventory management practice. Provide clear standard operating procedures and ensure staff understands the importance and value of the blood components and products to minimize wastage. Having experienced staff perform the inventory count and ordering can minimize variability in practice which will contribute to better overall inventory management and control.

9. Collaborate with clinical staff. This can make a significant difference in improving component/product ordering practices. Screening of orders, audits, guidelines and consultation with a transfusion medicine physician can help reduce unnecessary or inappropriate ordering of blood. Increasing awareness of the value of blood components and products, timelines for availability, and the risks involved with transfusion can also improve practice and minimize wastage.

10. Avoid large numbers of units expiring on the same day. When replacing stock orders for one blood type, ask your blood supplier to send units with a mixture of expiry dates. Trying to manage large numbers of components all expiring on the same day can be challenging.
References
5. Chapman JF. Unlocking the essentials of effective blood inventory management. Transfusion 2007;47:190S-196S.

Suggested Reading

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