4.0 DAILY OPERATIONS

Policy	The Transfusion Medicine Service has established policies, processes and procedures for the: • Control of collection and examination of samples that ensure accurate and reliable examination results • Maintenance of inventory that is appropriate to the clinical service needs and the needs of satellite sites where inventory sharing and redistribution is in place • Issue of components and products that are safe and appropriate to support patient care
Reason	• The Transfusion Medicine Service provides services and blood components and products that are critical to patient care but carry inherent risk to recipients. The risk is reduced through the establishment and implementation of, and adherence to, controlled processes
Responsibilities of the Medical Director, Transfusion Medicine	• Overall responsibility for the daily laboratory operations of the Transfusion Medicine Service, including selection of instrumentation, and establishment of policies, processes and procedures for the collection and examination of samples • The Medical Director, Transfusion Medicine shall be aware of and ensure implementation of published standards for sample collection and examination • Detailed requirements are listed in the subsections that follow
Responsibilities of Transfusion Medicine Staff	• Follow technical procedures as written Transfusion Medicine Operating Procedures • Consult with the Medical Director, Transfusion Medicine (or delegate) as indicated in procedures or by circumstances • Train as required to maintain competency

REFERENCES

30. “Standards for Blood and Blood Components CAN/CSA-Z902-10.”

4.1 PATIENT IDENTIFICATION AND SAMPLE LABELING CRITERIA

Policy	• The Transfusion Medicine Service Shall develop and implement policies, processes and procedures for patient identification, and sample collection and identification, using first and family name plus at least one other unique identifier (e.g. hospital medical record number) • An alternative process must be developed to provide for interim identification of patients when name and other unique identifiers are unavailable
Reason	• Most serious and potentially fatal transfusion reactions are due to the administration of the wrong unit of blood to the wrong patient, so the transfusion service must take steps to ensure correct identification of patient samples, sub-samples and intended recipients • The Transfusion Medicine Service has a major role in educating nurses and other health care professionals collecting or administering blood, in correct recipient identification and should be involved in the development of appropriate patient identification systems

Patient identification at sample collection	Sample collection policies, processes and procedures for patients must include but are not limited to the following: • Samples should not be collected from patients lacking patient identification at least meeting the criteria above (see section 4.1 under policy) • Phlebotomists should only collect blood from in-patients displaying defined identification, e.g. hospital armband or other institutionally approved device • A specific policy should be developed to ensure accurate identification of out-patients and patients in the pre-admission process who are not displaying such defined identification • Instructions must include: » Measures required when the patient is not able to use an armband or other means of identification as normally defined » Measures to identify patients requiring urgent transfusion in the absence of identifying information, and to reconcile temporary identification with name and unique identifier information
Patient identification at transfusion	• Procedures defining the measures to be taken to identify patients to whom transfusion is to be administered shall be developed, which match the patient's unique or interim identifiers to the information provided on the label on the blood component or product • Transfusions shall not be administered to patients who lack some positive (including interim) identification • Procedures defining the measures required to cover emergency transfusions for unidentified patients and patients "not yet identified" shall be developed
Patient identification and sample labeling criteria	• Sample labeling policies and procedures must include, but are not limited to the following: • The phlebotomist must label the blood sample tubes with the first and family name of the patient, plus the unique identifier(s), and the collection date **BEFORE** leaving the patient • The phlebotomist must be identifiable on the sample label or the associated requisition and this information must be retrievable for one year • Policies, procedures and processes must include the steps to be followed by laboratory staff when the information on the blood sample tube(s) does not match that on the request form (i.e. sample rejection criteria)

REFERENCES

77. Lima, A. 2010.
98. "Ontario Laboratory Accreditation." 2011.

4.2 PRE-TRANSFUSION EXAMINATIONS

The following examinations must be performed before transfusion:	
Serologic examinations	ABO and RhD type • The indirect antiglobulin test (IAT) for weak expression of the RhD antigen is recommended in the following circumstances: • All patients where anti-D reagent(s) give <2+ reactions on immediate spin phase of tube testing and weak anti-D testing has not previously been performed. (Note: if D typing is automated, standardized cut off grading and interpretation for weak D testing should be established according to validation of Rh typing prior to implementation of automated platform) • Where RhD typing discrepancies are found between current and previous results, where previous results were RhD negative and one or both current anti-D test results are <2+ on immediate spin phase of testing » For RhD Negative newborn infants to determine the need for Rhig for an RhD Negative mother » For RhD Negative fathers upon request to determine the need for Rhig in a RhD Negative mother • Tests for weak RhD antigen are NOT recommended in the following circumstances: » Patients whose sample reactions are negative with both anti-D reagents » Weak anti-D testing has already been performed » If the DAT is positive on the test sample » If the patient has received transfusion within the previous 3 months with red blood cells of a different Rh type » Routine examination for other Rh antigens is not recommended » Policies should be established for Rh phenotyping and the provision of Rh phenotypically matched red blood cells when the diagnosis indicates chronic transfusion is likely e.g. myelodysplastic syndrome, sickle cell disease » If an RhD typing problem is detected and urgent transfusion is required, RhD negative components should be used if available, pending resolution Note: A policy for the administration of Rh Immune Globulin should be established for obstetrical patients who type as weak D. Rh genotyping is available through the National Reference Laboratory at CBS and could be considered for confirmation of weak D typing to determine the need for Rh prophylaxis in pregnant women. In addition to the determination of the ABO and RhD type: • The patient's historical record, should be reviewed • Antibody screen of patient's serum/plasma for unexpected red blood cell antibodies should be completed before red blood cells are transfused in non-emergency settings » Examination method for antibody screening must be sensitive enough to detect clinically significant antibody above a commonly accepted threshold level. Acceptable methods include solid phase, gel or indirect antiglobulin test » Negative controls or check cells must be included to validate negative saline indirect antiglobulin tube test results • There should be a guideline for the standardized interpretation and grading of hemagglutination reactions (see references)

Routine crossmatch examinations	• Blood samples for crossmatch examination should be collected and examined no more than 96 hours before the intended transfusion » This interval may be extended in patients with a history of no transfusion or pregnancy within 3 months » Procedures should be in place to ensure that "group and screen" results are completed and available before elective surgery commences where the chance of blood transfusion support being required is >5% • The hospital shall have a policy defining how long in advance of an intended surgical procedure pre-admission samples may be collected, and examined provided **ALL** of the following conditions are met: » Antibody screen is negative and » Patient has not been transfused within the last 3 months, and » Patient has not been pregnant within the last 3 months • The Transfusion Medicine Service must have in place a process to determine whether the patient is pregnant or has been transfused since the date of collection of the pre-admission sample » If the patient has been transfused or pregnant in the interval, or the history is unknown, a group and screen must be performed on a sample collected within 96 hours of the intended transfusion
Electronic Crossmatch	• Requires second determination of the patient's ABO blood group. Although not required by standards, it is advisable to establish an institutional policy to ensure that the second determination is carried out on a separate patient blood sample • Electronic crossmatch is adequate to issue red blood cell containing component when there is: » No clinically significant antibody detected in current antibody screening and » No previous record of a clinically significant antibody » Confirmation of the ABO group of all red blood cell containing units involved » An appropriately validated computer system licensed for the provision of electronic crossmatching
Immediate spin crossmatch	• Immediate spin crossmatch is adequate to issue red blood cell containing component when there is: » No clinically significant antibody detected on antibody screening, and » No previous record of a clinically significant antibody » Relevant isohemaglutinins (anti-A, anti-B) demonstrate a 1+ or greater reaction
Crossmatch examinations in emergency situations	• Emergency release policies, process and procedures apply when there is insufficient time before transfusion of a red blood cell containing component to: » Complete an antibody investigation » Source appropriate blood products » Perform a crossmatch
Crossmatch examinations with positive antibody screen	• If the antibody screen is positive, the antibody(ies) must be identified, with repeat investigations on subsequent samples from the same patient performed according to institutional policy • If the antibody(ies) is/are clinically significant: » Antigen negative units must be selected, if available » A full serological crossmatch must be completed and blood reserved for the patient

Antibody investigation and reporting	• All patient samples with positive antibody screen shall be investigated prior to transfusion unless clinical urgency requires immediate release of blood. » Issue indirect IgG antiglobulin test compatible units if possible » The Medical Director, Transfusion Medicine (or delegate) and ordering physician should be contacted prior to issue » Routine release of group O RhD negative units by emergency release is **not** an acceptable alternative • The interval between antibody detection examinations for patients with previously identified red blood cell antibodies who have been transfused or pregnant within the last 3 months should be 96 hours, to identify any new allo-antibodies. A policy establishing the interval between antibody investigation when antibody detection testing demonstrates no new detectable antibodies should be established • If antibody investigation services are not provided by the hospital Transfusion Medicine Service, samples may be referred to another Transfusion Medicine Service in an associated hospital or to an external reference laboratory such as CBS Patient Services • Results of the antibody investigation(s) must be forwarded to the patient's physician and the hospital Medical Records Service, and be recorded in the Transfusion medicine Service files

REFERENCES

2. American Association of Blood Banks. 2011.
30. "Standards for Blood and Blood Components CAN/CSA-Z902-10."
111. Reid, M.E. 2000.
123. *Standard Work Instruction Manual (SWIM). Reading and Recording Hemagglutination Reactions*.

Table 4.1 Clinical Significance of Antibodies and Provision of Red Blood Cells

Antibody Category	Antibodies to antigens as described	Is phenotyped antigen negative blood required	Full serological indirect antiglobulin XM required?
Common clinically significant antibodies	D,C,E,c,e,K,k,S,s,Jk^a,Jk^b,Fy^a, Fy^b,	Yes	Yes
Uncommon clinically significant antibodies	Kp^a,Wr^a,Js^a,Di^a,Co^a,C^w, M (if reactive at 37C) _____ Antibody to above + panreactive warm antibody	No. Serological crossmatch compatible only. _____ Yes, if antisera available	Yes _____ Yes
Common clinically in-significant antibodies	M (unreactive at 37oC). N,P_1,Le^a.Le^b,Lu^a,A_1, Bg	**No. Crossmatch compatible only**	No if screen is negative _____ Yes if screen is positive
Passive anti-Rh-D (Recent RHIG documented)	Passive anti-D	Yes, as RhD negative	No
Warm auto- antibodies		Yes (requires Transfusion Medicine Consult)	Yes
Unidentified or inconclusive antibodies	All major blood groups excluded.	Not applicable	Yes

4.3 INVENTORY MANAGEMENT

Policy	The Transfusion Medicine Service has established an inventory management program appropriate to support the clinical programs delivered in the hospital. Inventory management is crucial to avoid unnecessary wastage due to over stocking and to support effective utilization of blood, blood components and products.
Reason	The objective is to provide adequate supplies of blood, blood components and products for routine and emergency situations while minimizing loss by outdating.
Responsibilities of the Medical Director, Transfusion Medicine	• To determine minimum and optimum hospital inventory levels and to review the inventory levels periodically, or in light of clinical program changes which may influence requirements • To implement measures that assist in improving inventory management • To provide the communication link between treating physicians and the Transfusion Medicine Service in critical shortage situations and to discuss alternatives or cancellation of elective procedures • Ensure that a hospital plan in place for the management of blood shortages is established in accordance with the Ontario Contingency Plan for the Management of Blood Shortages • Implement when necessary the measures laid out in the Ontario Contingency Plan for the Management of blood shortages
Responsibilities of Transfusion Medicine Service staff	• Maintain the inventory according to the guidelines and implement policies and procedures as required • Ensure that defined proper procedures are used in packing, shipping or receiving blood, blood components and products

Components of an inventory/ conservation management system	An inventory management/conservation system should have: • Ability to select the oldest blood for transfusion, provided it is of an appropriate ABO and Rh group, and meets any necessary special requirements (e.g. irradiated) • Flexibility to use fresher blood when indicated (e.g. dedicated aliquots for neonates) • Where feasible, a blood redistribution program, especially for any components or products near expiry, as sender or receiver, at the discretion of the Medical Director, Transfusion Medicine • A policy regarding the issue of non-group specific platelets that are about to outdate • A mechanism to minimize inventory sequestered for specific patients (use of abbreviated crossmatch procedures; immediate spin, electronic) • A maximum surgical blood order (MSBOS) schedule based on local practices and patient population to provide screening guidelines to monitor requests, updated at scheduled intervals • A mechanism to review wastage data by patient location to identify process improvement strategies to minimize component and product loss • Monitoring crossmatch/transfusion ratios • Transfusion Committee review and audit of effectiveness and safety of inventory management and conservation measures
Critical shortages	The Transfusion Medicine Service shall have established policies processes and procedures to respond to shortages: • An approved, institution-specific contingency plan for the management of blood shortages that ensures conformity with the National and Provincial Contingency Plans for Blood Shortages • Procedures should detail circumstances under which the Medical Director, Transfusion Medicine will: » Convene the Hospital Emergency Blood Management Committee (HEMBC) » Activate the communication plan to clinical staff and patients regarding the cancellation of elective surgical procedure » In conjunction with treating physicians, implement blood conservation strategies • Define steps to be taken when to: » Switch from ABO identical to ABO compatible units » Switch from RhD negative to RhD positive units » Initiate inter-hospital redistribution » Decrease platelet dose from 1 single donor (apheresis) unit or 1 pool of 4 buffy-coat derived platelets to “half-unit” platelet transfusions » Triage all blood component/product requests to ensure compliance with the Provincial Blood Shortage Contingency Plan

REFERENCES

2. American Association of Blood Banks. 2011.
91. “Ontario Contingency Plan for Management of Blood Product Shortages.” 2008
124. Stanger, S.H.W. 2012