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Pathology and Laboratory Medicine
Nova Scotia Provincial Blood Coordinating Team

Nova Scotia Guideline for Blood Component Utilization in Adults and Pediatrics

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Version 2.2

PROMOTING EXCELLENCE IN TRANSFUSION MEDICINE

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Developed by the Nova Scotia Appropriate Blood Components Working Group

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1. BACKGROUND

The Nova Scotia Provincial Blood Coordinating Team (NSPBCT) under the Pathology and Laboratory Medicine Program provides leadership in collaborating with healthcare providers across the province and Canadian Blood Services (CBS) to maximize the safe and appropriate management of blood and blood products for patients in Nova Scotia. The NSPBCT maintains a surveillance program for adverse events related to transfusion therapy while ensuring appropriate standards for blood-transfusion therapy are being implemented and maintained with Nova Scotia health-care facilities.

These guidelines were developed based on the advice of the Appropriate Blood Components Working Group (ABC Working Group) consisting of physicians with expertise in hematology, orthopedics, multi-organ transplant, emergency medicine, trauma, CBS, transfusion medicine, anesthesiology, surgery, critical care, general practitioners, pediatrics and obstetrics/gynecology. Appendix A provides the membership of this group.

The National Advisory Committee on Blood and Blood Products (NAC) consists of a national group of clinicians that collaborates with and provides advice on the utilization management of blood and blood products and transfusion medicine practice to the provincial and territorial (PT) Ministries of Health and Canadian Blood Services (CBS). In April 2013, NAC endorsed the guidelines set forth in the document Red Blood Cell Transfusion: A Clinical Practice Guideline from the AABB (formally known as the American Association of Blood Banks) as they were most reflective of the current practice in Canada and therefore would be most palatable to a Canadian physician. These AABB guidelines include recommendations for the pediatric setting. In 2016, the AABB published the Clinical Practice Guidelines from the AABB: Red Blood Cell Transfusion Thresholds and Storage. Revisions in the Nova Scotia Guideline for Blood Component Utilization in Adults and Pediatrics Version 2.0 are based on the AABB recommendations.

A review of published literature and an environmental scan of Canadian and international plasma and cryoprecipitate guidelines provided the recommendations in this guideline. The ABC Working Group was convened to provide expert opinion for the guideline and it was presented to stakeholders within Nova Scotia and their feedback was incorporated.

In 2014, AABB developed evidence based guidelines for the prophylactic use of platelets for adult patients who are candidates for platelet transfusion. The BC Medical Journal and the British Journal of Hematology both provide guidelines for platelet use. The ABC Working Group convened to review the evidence and developed guidelines for Nova Scotia.

2. INTRODUCTION

The Nova Scotia RBC Working Group was established in July 2013 with a goal to develop/adopt tools for the appropriate utilization of red blood cells in Nova Scotia. Based on the recommendations from NAC and Choosing Wisely Canada, that a single unit red cell transfusion should be the standard for non-bleeding, hospitalized patients; a retrospective audit was conducted. The results of the audit found 7.1% of the RBC units transfused were inappropriate. The NSPBCT supported implementation of one red cell unit at a time as per its strategic plan.

The ABC Working Group was formed in 2015 with an objective to develop guidelines that will provide standardized clinical guidance to healthcare professionals on best practice pertaining to the appropriate triggers and use of plasma, cryoprecipitate and platelet transfusions.

3. GUIDELINE DEVELOPMENT

The objective of these guidelines is to provide clinical guidance to healthcare professionals on best practice pertaining to the appropriate use of blood components and restrictive transfusion triggers for adults and children.

3.1. DEFINITIONS

Actively bleeding: the presence of an overt discharge of blood occurring either grossly (e.g. gastrointestinal bleeding) or internally (e.g. retroperitoneal bleeding seen on imaging).

Acute coronary syndrome: cardiac conditions where there is a sudden reduced flow of blood to the heart i.e. angina, myocardial infarction. (Mayo Clinic)

Adult: in this guideline, an adult is any person 17 years and older.

Apheresis: "the process of withdrawing blood from a donor, separating specific blood components from the blood and returning the remaining blood components to the donor."4

Blood component: a therapeutic component of blood intended for transfusion (e.g. red cells, granulocytes, platelets, plasma, etc.) that can be prepared using the equipment and techniques (centrifugation, filtration, freezing) available at a blood center.

Blood product: any therapeutic product, derived from blood or plasma, and produced by a manufacturing process that pools multiple units (usually more than 12) (e.g. human serum albumin, immunoglobulin preparations and coagulation products, etc.)

Cryoprecipitate: a plasma component prepared from slowly thawed frozen plasma and centrifuged to separate the insoluble cryoprecipitate. The cryoprecipitate is removed and then refrozen. Cryoprecipitate is a source of fibrinogen (greater than or equal to 150 mg/unit), coagulation factors VIII, XIII and von Willebrand factor.

Cryosupernatant Plasma (CSP): plasma from which cryoprecipitate has been removed. Cryosupernatant Plasma (CSP) is mentioned for specific indications only.

Fibrinogen Deficiency: types of deficiency

a. **Afibrinogenemia:** complete absence of fibrinogen (less than 0.2 g/L of plasma)
b. **Hypofibrinogenemia:** lower than normal fibrinogen level (between 0.2 g/L and 1.5 g/L)
c. **Dysfibrinogenemia:** normal fibrinogen level (between 2 and 4 g/L), but the fibrinogen does not **function properly**.

FP (Frozen Plasma): plasma collected from the blood of an individual donor and frozen within 24 hours of collection.

INR (International Normalized Ratio): derived from prothrombin time (PT) which is calculated as a ratio of the patient's PT to a control PT standardized for the potency of the thromboplastin reagent developed by the World Health Organization (WHO). 38

Life-threatening / major bleeding:

a. hemorrhage resulting in airway compromise
b. hemorrhage with a drop in Hgb of greater than or equal to 20 g/L or requiring transfusion of 2 units of RBC
c. major trauma
d. critical site bleeding (e.g. intracranial, retroperitoneal, intra-spinal, intra-ocular, intra-articular or pericardial, ruptured abdominal aortic aneurysm, acute dissection, intramuscular with compartment syndrome), or
e. actual or impending hemodynamic compromise (e.g. massive or unstable gastrointestinal bleed not responding to initial resuscitation).

Minor Surgery/Invasive Procedure: major body cavities are not opened — surgery to superficial structures of the body or manipulative procedure. Minor surgery can involve the use of local, regional or general anesthesia.

Major Surgery/Invasive Procedure: involves opening a major body cavity, abdomen (laparotomy), chest (thoracotomy) or skull (craniotomy) and can stress vital organs.

One Unit at a Time Policy: hospital policies require a clinical reassessment followed by a repeat hemoglobin measurement, if required, for all hemodynamically stable patients before they may be transfused with a second or subsequent red blood cell unit. There are exemptions from this policy.

Pre-existing cardiovascular disease: having a prior history of cardiac disease i.e. myocardial infarction, coronary artery disease, arrhythmia, congestive heart failure, congenital heart defects. (Mayo Clinic)

Restrictive Transfusion Trigger: the hemoglobin value at which physicians in Nova Scotia may consider transfusion for stable hospitalized inpatients. The Nova Scotia Red Blood Cell Clinical Expert Working Group has set this level at 70 g/L. Not all patients will require transfusion at this level. Well compensated patients tolerate much lower hemoglobin levels while patients with symptoms of anemia may require a transfusion when hemoglobin is above this threshold.

S/D Plasma (Solvent Detergent-treated Plasma): plasma treated with solvent detergent reagents producing a virus inactivated product. The S/D process inactivates enveloped viruses (HIV, HBV and HCV) but has no effect on the non-enveloped viruses (HAV, parvovirus B19).

4. GUIDELINES

4.1. RED BLOOD CELLS (RBCS)

Hemoglobin levels must be obtained within 24 hours of the request with the exception of outpatients which must be obtained within 96 hours of the request.

The following conditions/criteria are exempt from the RBC guideline:

- Actively bleeding, massively bleeding and suspected bleeding

- Acute coronary syndrome
- Pediatric patients less than four months (corrected age)
- Intrauterine transfusions
- Chronically transfused patients
- Sickle cell disease
- Palliative care transfusions
- Requests from the operating room

The following indications and dosing recommendations are illustrated on the RBC Transfusion Pathway in Appendix B.

Adult Indications and Dosing

Hemoglobin Level and Indications	Recommendation and Dose
Less than or equal to 70 g/L	Transfuse 1 unit and re-check patient symptoms and hemoglobin prior to transfusing a 2nd unit
Outpatient or a patient undergoing dialysis and hemoglobin less than or equal to 70 g/L	Transfuse as requested
Less than or equal to 80 g/L with one or more of the following: • **Pre-existing cardiovascular disease** • **Hematology/Oncology patient with chemotherapy-induced cytopenia** • **Undergoing orthopedic surgery or cardiac surgery**	Transfuse as requested
Patient is undergoing radiation therapy and hemoglobin less than or equal to 100 g/L	Transfuse as requested
Obstetrical patient with a high risk of postpartum hemorrhage and hemoglobin is between 80 g/L and 100 g/L	Discuss with Medical Director or designate on call. Requests for RBCs may be appropriate

Indications and Dosing Pediatric Patients Greater than 4 Months Corrected Age

Hemoglobin Level and Indications	Recommendation and Dose
Stable patient with hemoglobin greater than 50 g/L and up to 70 g/L	Transfuse 10-15 mL/kg PRBCs over a recommended time of 3.5 hours and re-check patient symptoms and hemoglobin prior to transfusing again
Stable patient with hemoglobin less than or equal to 50 g/L	Transfuse 10% of pre-transfusion hemoglobin level in mL/kg over a recommended time of 3.5 hours and re-check patient symptoms and hemoglobin prior to transfusing again (EXAMPLE: If pre-transfusion hemoglobin level is 40 g/L, then initial infusion rate is 4 mL/kg IV over a recommended time of 3.5 hours)
Patient is hematology/oncology patient with chemotherapy-induced cytopenia with hemoglobin less than or equal to 80 g/L	Transfuse 10-15 mL/kg PRBCs over a recommended time of 3.5 hours and re-check patient symptoms and hemoglobin prior to transfusing again
Patient is undergoing radiation therapy and hemoglobin less than or equal to 100 g/L	Transfuse as requested

- For hemodynamically stable patients (adult and pediatric) a transfusion threshold of 70 g/L is appropriate.
- For adult and pediatric hematology/oncology patients with chemotherapy-induced cytopenia, a transfusion threshold of 80 g/L is considered appropriate, until further evidence becomes available.
- Transfusion may not be required in well compensated patients, such as those with chronic anemia, vitamin B12 deficiency or iron deficiency anemia, or where other therapies are available even when hemoglobin levels are below 70 g/L.
- The ordering clinician shall be aware of recipient risk factors for transfusion associated circulatory overload (TACO) and tactics to reduce risk as outlined in appendix F in the **NSHA CL-BP-030, IWK-625 Blood Component and Blood Product Administration**

4.2. PLASMA

Exempted from the plasma guideline are massively bleeding patients, pediatric patients less than four months (corrected age) and requests from the operating room.

With the exception of lower levels of protein S and alpha-2 antiplasmin, the coagulation activity of Solvent Detergent-treated Plasma (S/D Plasma) values are close to the corresponding values of FP. Dosing by number of units, however, will differ as unit volume is smaller (200 mL S/D plasma vs. 270-300 mL FP).

The following indications are illustrated on the *Ordering Algorithm for Plasma in Appendix C*.

<table>
<tr><th>Indication</th><th>Specific Criteria</th><th>Recommendation and Dose</th></tr>
<tr><td rowspan="2">Bleeding or requiring an invasive or operative procedure within 6 hours</td><td>– INR is greater than 1.7
– not on a vitamin K antagonist (e.g. Warfarin), low molecular weight heparin (LMWH), unfractionated heparin (UFH), direct oral anticoagulant (DOAC) or other anticoagulants</td><td>Adult dose: FP - 10-15 mL/kg, S/D Plasma - 12-15 mL/kg
e.g. a 75 kg adult would require 3-5 units of FP (270-300 mL/unit) or 5-7 units of S/D plasma (200 mL/unit)
Pediatric dose: FP - 10-15 mL/kg S/D Plasma 12-15 mL/kg</td></tr>
<tr><td colspan="2">NOTE:
– Plasma requirements may increase when a consumptive process is ongoing
– Prothrombin Complex Concentrate (PCC) (octaplex® or Beriplex®P/N) are recommended for adult patients on vitamin K antagonists with an INR greater than or equal to 1.7 and are bleeding or require a surgery/invasive procedure within 6 hours. There is insufficient published evidence to recommend the routine use of PCCs in the pediatric population. Consultation with a pediatric hematologist/oncologist is required (Refer to the Nova Scotia Guideline for the Use of Prothrombin Complex Concentrates in Patients on Vitamin K Antagonists and Direct Oral Anticoagulants)
– Protamine sulfate is the treatment for prolonged aPTT (activated partial thromboplastin time) from heparin (if the patient is bleeding or will be undergoing an invasive procedure)</td></tr>
</table>

<table>
<tr><td rowspan="2">Treatment of congenital or acquired thrombotic thrombocytopenic purpura (TTP) and adult hemolytic uremic syndrome (HUS)</td><td colspan="2">Dosing determined by patient’s plasma volume</td></tr>
<tr><td colspan="2">NOTE:
– Plasma may also be indicated in therapeutic plasma exchange (TPE) if the INR is initially elevated or becomes elevated after repeated TPEs or when the TPE occurs shortly after a surgical procedure
– CSP may be used for this indication
– S/D plasma is recommended for patients who require a high volume of transfusions annually because of TTP, HUS with associated factor H deficiency or clotting factor deficiencies for which specific licensed concentrates may not be readily available (e.g. factor V, factor XI, factor XIII) and who:
i. have experienced a severe allergic reaction to FP or
ii. have a pre-existing lung disorder or
iii. need FP but a blood group compatible product is not available in a timely manner</td></tr>
<tr><td>Disseminated intravascular coagulopathy (DIC)</td><td>• INR greater than 1.7
• Life-threatening bleeding</td><td>Adult dose: FP - 10-15 mL/kg, S/D Plasma - 12-15 mL/kg
Pediatric dose: FP - 10-15 mL/kg S/D Plasma - 12-15 mL/kg</td></tr>
<tr><td>Coagulation factor replacement when a factor concentrate is not available (e.g. Factor II, Factor V, Factor X deficiency) or the factor concentrate is contraindicated (e.g. Factor XI deficiency in a patient with high thrombotic risks)</td><td>• INR greater than 1.7 or an aPTT greater than 1.5 times normal
• bleeding or scheduled for an invasive or surgical procedure</td><td>Contact the Bleeding Disorder Clinic
Adult: 902-473-5612 (after hours – contact the hematologist on call 902-473-2222)
Pediatric: 902-470-8752 (after hours – contact the hematologist on call 902-470-8888)</td></tr>
</table>

- The ordering clinician shall be aware of recipient risk factors for transfusion associated circulatory overload (TACO) and tactics to reduce risk as outlined in appendix F in the **NSHA CL-BP-030, IWK-625 Blood Component and Blood Product Administration**.

NOTE:

The anticoagulant effect of the following antithrombotics will not be reversed by the administration of vitamin K or plasma – DO NOT transfuse plasma to reverse an elevated aPTT or INR.

- Direct thrombin inhibitors:
  - Argatroban (Argatroban®), B*ivalirudin* (Angiomax®), Dabigatran (Pradax®)
- Factor Xa inhibitors:
  - Direct – Apixaban (Eliquis®), Edoxaban (Lixiana®), Rivaroxaban (Xarelto®)
  - Indirect – Fondaparinux (Arixtra®)

4.3. CRYOPRECIPITATE

Exempt from the cryoprecipitate guideline are massively bleeding patients, pediatric patients less than four months (corrected age) requests from the operating room.

A fibrinogen level is required for cryoprecipitate appropriateness.

Cryoprecipitate provides a source of fibrinogen, coagulation factors VIII, XIII, von Willebrand factor (AHF-VWF) and fibronectin.

Indication	Specific Criteria	Recommendation
Congenital fibrinogen deficiency	• bleeding or the risk of bleeding **AND** fibrinogen concentrate is **NOT** available • fibrinogen level less than 1.5 g/L	Consultation with the Bleeding Disorder Clinic is suggested **Adult:** 902-473-5612 (after hours – contact the hematologist on call 902-473-2222) **Pediatric:** 902-470-8752 (after hours – contact the hematologist on call 902-470-8888)
Acquired hypofibrinogenemia	• bleeding • fibrinogen levels less than 1.5g/L Note: For this indication, fibrinogen concentrate is an approved alternative for cryoprecipitate	In bleeding Adults: 10 units will provide 1.2-1.8 g of fibrinogen. One unit of cryoprecipitate per 10 kg body weight will raise the plasma fibrinogen by approximately 0.5 g/L Pediatric dosing: 1 unit per 10 kg body weight or 6 units/m²
Acquired hypofibrinogenemia with DIC	• bleeding • fibrinogen levels less than 1.5 g/L • if fibrinogen levels are greater than 1.5 g/L in the setting of active bleeding secondary to DIC, consider FP instead of cryoprecipitate to address the multiple factor deficiencies typical of DIC Note: For this indication, fibrinogen concentrate is an approved alternative for cryoprecipitate	

Acquired hypofibrinogenemia in postpartum hemorrhage	• bleeding • *consider* fibrinogen replacement when the fibrinogen level is greater than or equal to than 2 g/L • *require* fibrinogen replacement when the fibrinogen level is less than 2 g/L	
Specific factor deficiencies: • **von Willebrand (vWD) disease** • **Hemophilia A (HA)** • **Factor XIII deficiency**	• *C*ryoprecipitate is not the first choice for treatment and should **ONLY be considered** if the specific factor product is **NOT** available **AND** bleeding or requiring an invasive procedure	Consultation with the Bleeding Disorder Clinic is suggested **Adult:** 902-473-5612 (after hours – contact the hematologist on call 902-473-2222) **Pediatric:** 902-470-8752 (after hours – contact the hematologist on call 902-470-8888)

Fibrinogen replacement therapy "plays an important role in the management of bleeding in cardiac surgery, trauma and obstetrical bleeding"26 however there is limited evidence providing the optimal dose or the optimal replacement product (cryoprecipitate or fibrinogen concentrate).

4.4. PLATELETS

Exempt from the platelet guideline are massively bleeding patients, pediatric patients less than four months (corrected age) and requests from the operating room.

Platelet counts must be obtained within 24 hours of the request with the exception of outpatients which must be obtained within 96 hours of the request.

There is a lack of evidence to suggest a special platelet threshold is required for antiplatelet therapy patients.

Indication	Platelet Count	ADULT Recommendation and Dose
• **Immune thrombocytopenia purpura (ITP) with major bleeding** • **Bone marrow failure** • **Hematopoietic stem cell transplantation/chemotherapy** • **Therapy-induced hypoproliferative thrombocytopenia**	Less than 10 x 10^9/L* * Platelet count less than 15 X10^9/L are appropriate where platelets are not stocked.	1 unit
NOTE – The trigger for platelet transfusion may be higher when the patient's platelet count must be a specific level, as determined by the treatment protocol, for chemotherapy administration or concurrent anticoagulation.		
• **Elective central venous catheter placement in internal jugular vein or femoral vein** • **Non-surgical invasive procedures including paracentesis, thoracentesis other than epidural anesthesia or lumbar puncture**	Less than 20 x 10^9/L	1 unit
NOTE – Interventional Radiology may require higher platelet level triggers/targets to perform a procedure.		
• **Elective central venous catheter placement in subclavian vein** • **Elective diagnostic lumbar puncture** • **Major elective non-neuraxial surgery** • **Other significant bleeding**	Less than 50 x 10^9/L	1 unit If related to procedure, administer 1 unit immediately before procedure and recheck platelet count again before starting procedure
• **Head trauma or CNS hemorrhage** • **CNS surgery**	Less than 100 x 10^9/L	1 unit and check platelet count

Indication	Platelet Count	Pediatric Patients Greater Than 4 Months Corrected Age Recommendation and Dose
• **Immune thrombocytopenia purpura (ITP) with major bleeding** • **Bone marrow failure** • **Hematopoietic stem cell transplantation/chemotherapy** • **Therapy-induced hypoproliferative thrombocytopenia**	Less than 10 x 10^9/L* * Platelet count less than 15 X10^9/L are appropriate where platelets are not stocked.	Body weight less than or equal to 20 kg, give 10-15 mL/kg Body weight greater than 20 kg, give 1 unit of platelets
• **Severe mucositis** • **Sepsis** • **DIC in the absence of bleeding** • **Anticoagulant therapy** • **Risk of bleeding due to local tumor infiltration** • **Insertion of non-tunneled CVL**	Less than or equal to 20 x 10^9/L	Body weight less than or equal to 20 kg, give 10-15 mL/kg Body weight greater than 20 kg, give 1 unit of platelets
• **Elective central venous catheter placement in subclavian vein** • **Elective diagnostic lumbar puncture** • **Major elective non-neuraxial surgery** • **Other significant bleeding**	Less than or equal to 50 x 10^9/L	Give the following immediately before procedure and recheck platelet count again before starting procedure: Body weight less than or equal to 20 kg, give 10-15 mL/kg Body weight greater than 20 kg, give 1 unit of platelets
• **Head trauma or CNS hemorrhage** • **CNS surgery**	Less than or equal to 100 x 10^9/L	Body weight less than or equal to 20 kg, give 10-15 mL/kg Body weight greater than 20 kg, give 1 unit of platelets

- Platelet transfusions are indicated for prophylaxis against bleeding or for management of acute bleeding in patients with thrombocytopenia or platelet dysfunction
- In general, 1 unit raises the platelet count by approximately 15-25 x 109/L

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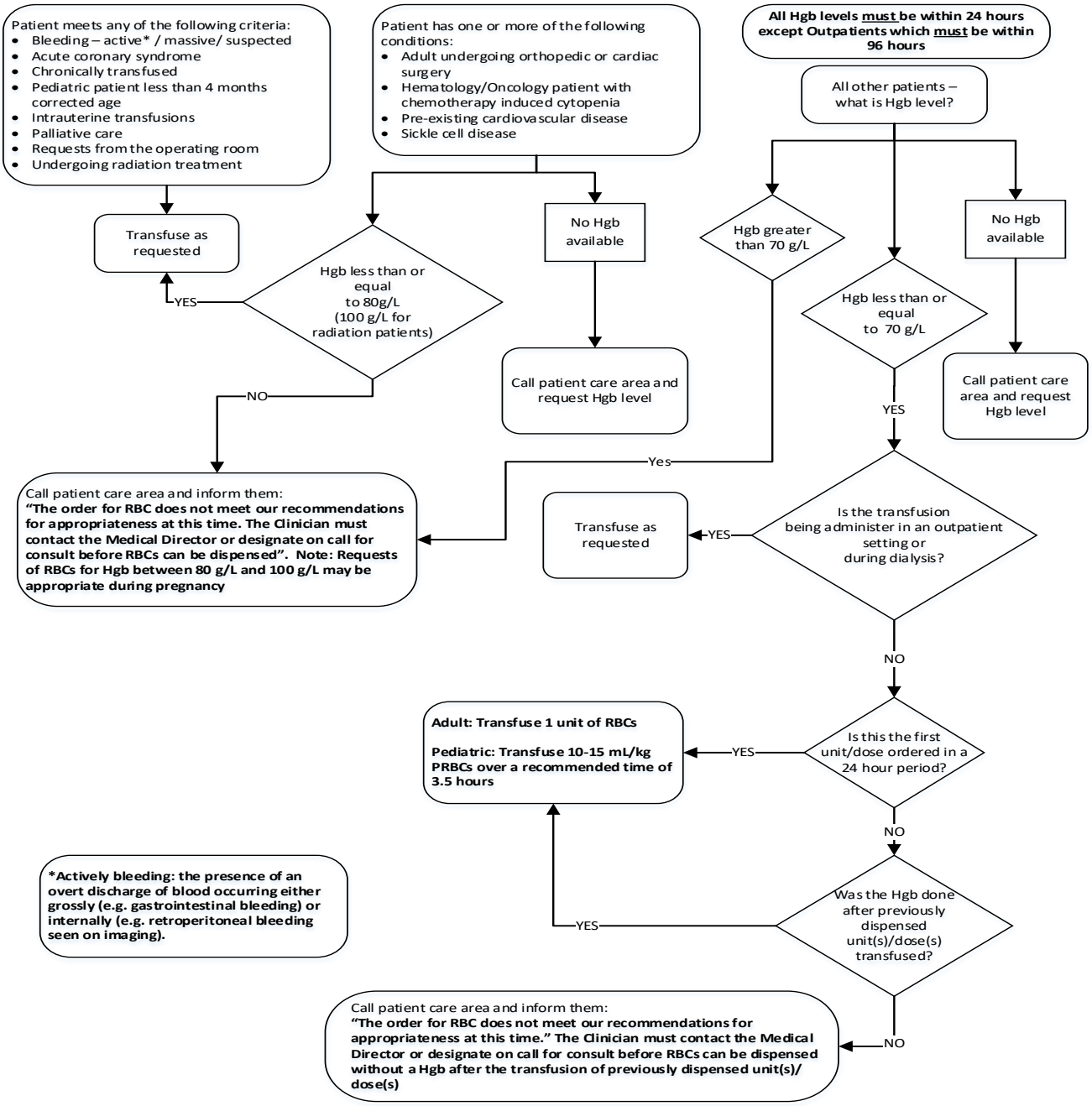
APPENDIX A – APPROPRIATE BLOOD COMPONENTS WORKING GROUP (ABC WG)

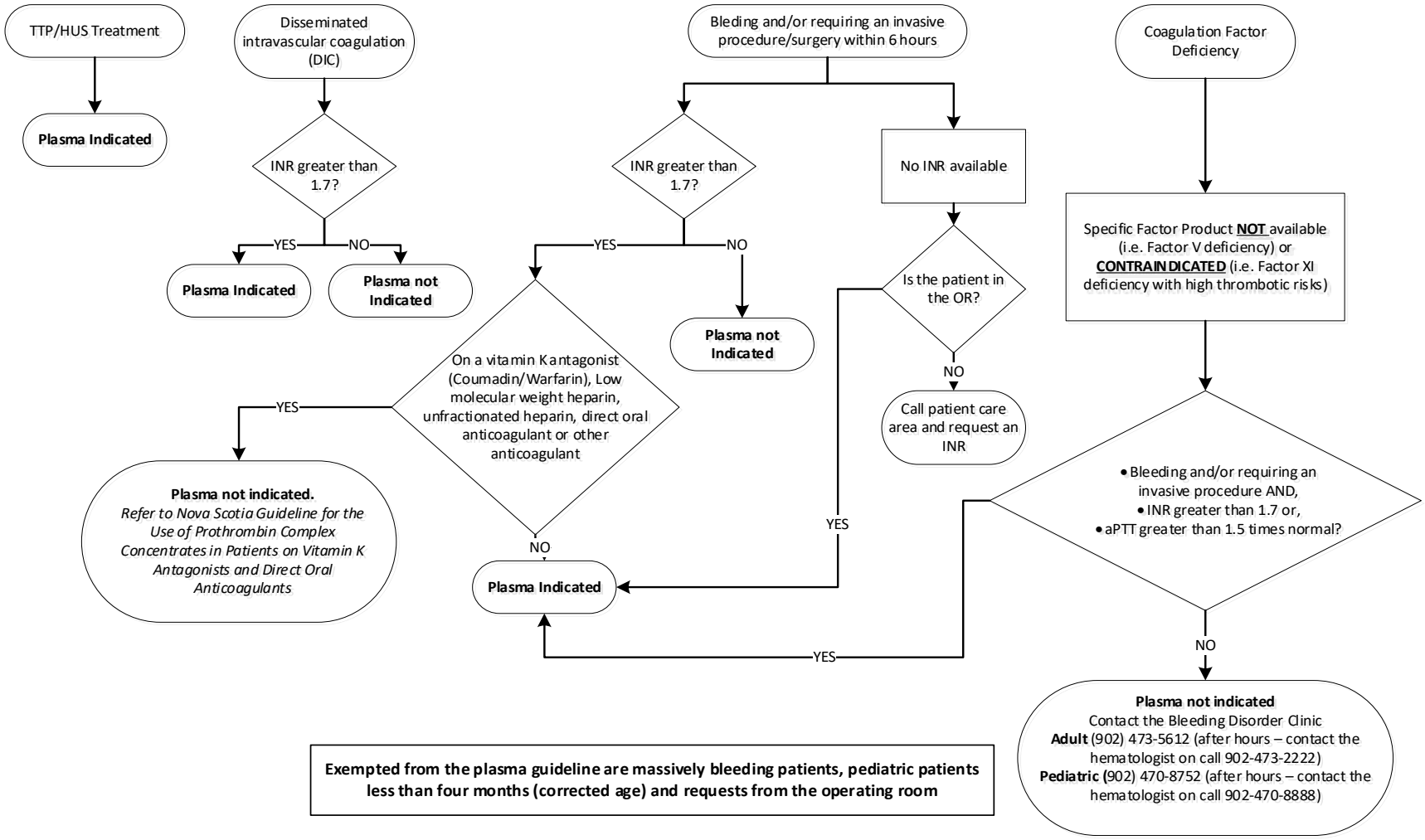
The Nova Scotia Provincial Blood Coordinating Team (NSPBCT) acknowledges the tremendous and diligent work of the provincial ABC Working Group for providing valuable expertise in the development of this guideline.

Appropriate Blood Components Working Group	
Dr. Sudeep Shivakumar	NSPBCT Clinical Advisor and Hematologist QEII Health Sciences Centre
Dr. William Beveridge	Orthopedic Surgeon Valley Regional Hospital
Dr. Samuel Campbell	Chief, Department of Emergency Medicine QEII Health Sciences Centre
Dr. Jennifer Fesser	Division Head, Transfusion Medicine and Laboratory Hematology Queen Elizabeth Hospital, PEI
Dr. Robert Green	Medical Director of Trauma Nova Scotia Trauma Program
Dr. Blaine Kent	Chief, Division of Cardiac Anesthesia Surgical Director, Perioperative Blood Management Program QEII Health Sciences Centre
Dr. Grayson Lloyd	Department of Anesthesia Valley Regional Hospital
Dr. Lynne McLeod	Maternal Fetal Medicine – Division Head, Obstetrics and Gynecology IWK Health Centre
Dr. Samuel Minor	Associate Professor General Surgery, Critical Care Medicine Medical Director QEII Trauma Program QEII Health Sciences Centre
Dr. Jennifer Duncan	Head, Division of Hematopathology IWK Health Centre
Dr. Kevork Peltekian	Hepatologist and Division Head of Digestive Care & Endoscopy QEII Health Sciences Centre
Dr. Victoria Price	Pediatric Hematologist IWK Health Centre
Dr. Jason Quinn	Medical Director, Blood Transfusion Services, QEII Health Sciences Centre
Dr. Mark Walsh	Assistant Professor of Surgery Surgical Director, Liver Transplantation QEII Health Sciences Center
Dr. Wendy Winsor	Gastroenterologist, Division of Digestive Care & Endoscopy QEII Health Sciences Centre
NSPBCT	
Jennifer LeFrense	Manager
Jill Wilson	Utilization Management Coordinator
Michael Farrell	Utilization Management Coordinator
Consultations	
Dr. Bruce MacAulay	Department of Anesthesia, Women and Obstetrics IWK Health Centre
Dr. Robert Nunn	Chief of Anesthesia, Women and Obstetrics IWK Health Centre
Dr. K. S. Robinson	Hematologist, Director of the Provincial Adult Bleeding Disorder Clinic QEII Health Sciences Centre

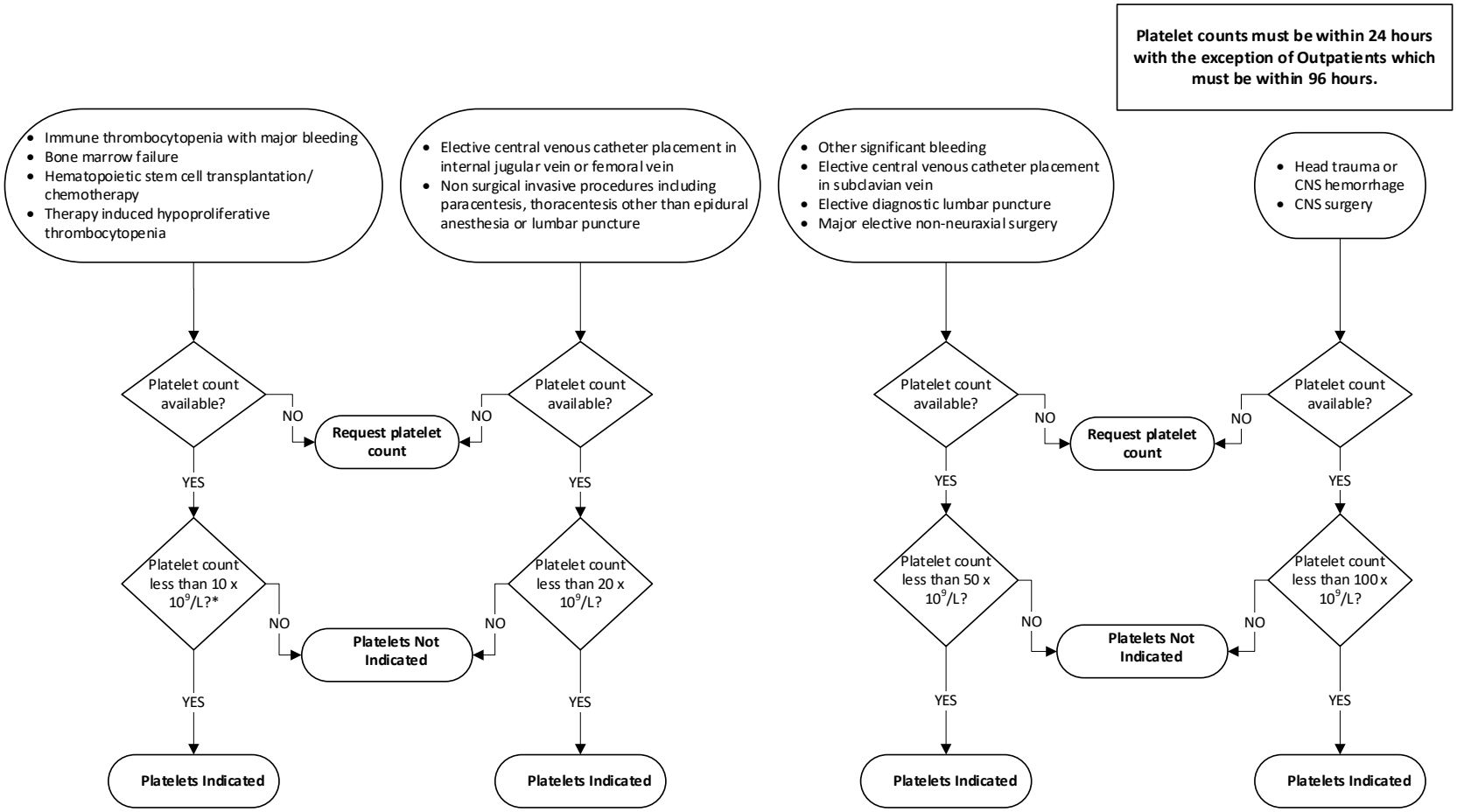
APPENDIX B – NOVA SCOTIA RED BLOOD CELL TRANSFUSION PATHWAY



APPENDIX C – NOVA SCOTIA PLASMA TRANSFUSION PATHWAY



APPENDIX D – NOVA SCOTIA PLATELET TRANSFUSION PATHWAY (ADULT)



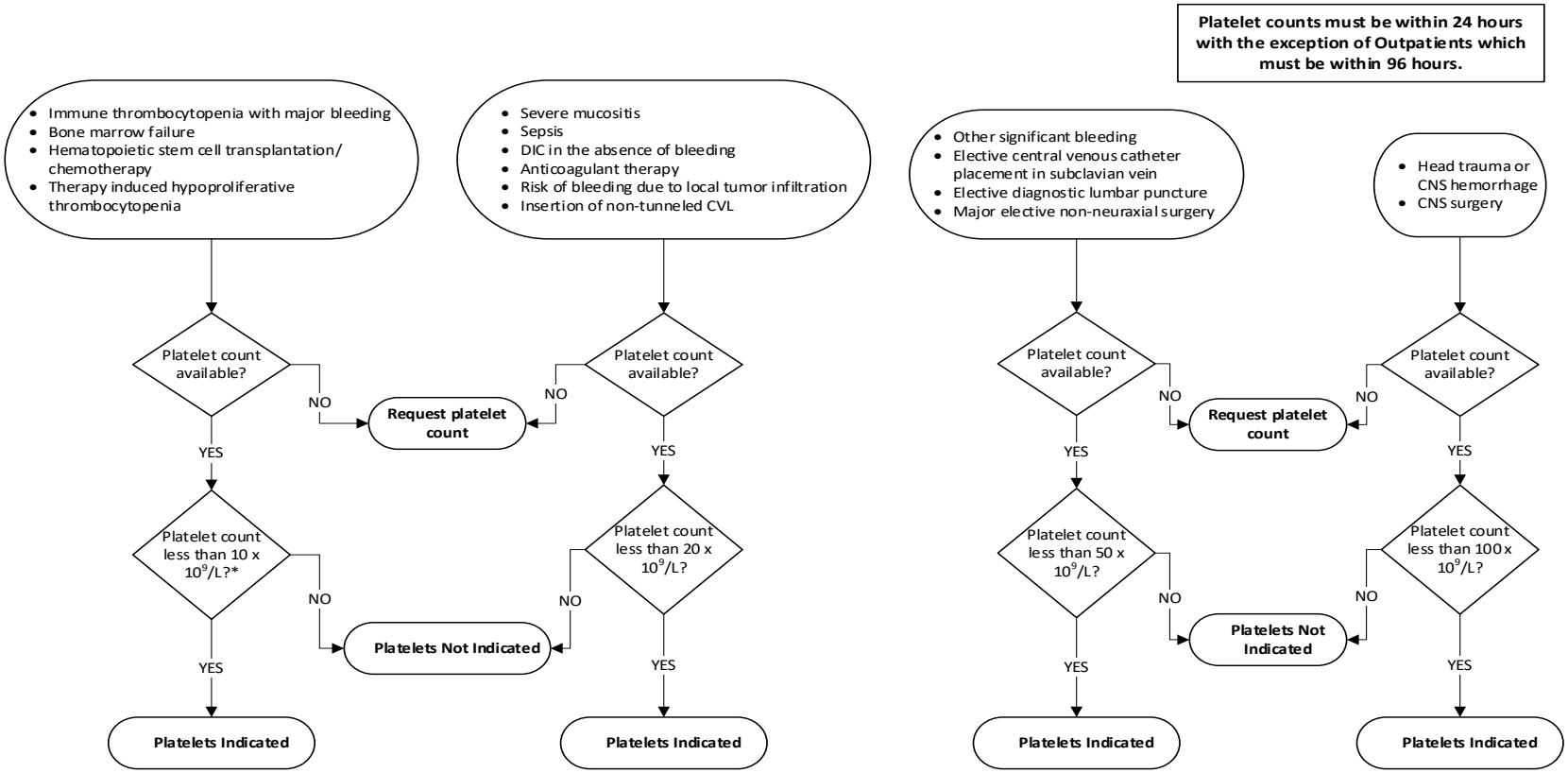
*** Platelet counts of less than 15X10^9/L are appropriate at sites where platelets are not stocked.***

Note:

- **The trigger for platelet transfusion may be higher when the patient's platelet count must be a specific level, as determined by the treatment protocol, for chemotherapy administration.**
- **Interventional Radiology may require higher platelet level triggers/targets to perform a procedure.**

Massively Bleeding patients and patients in the Operating Room are exempt from this process.

APPENDIX E – NOVA SCOTIA PLATELET TRANSFUSION PATHWAY (PEDIATRICS)



*** Platelet counts of less than 15X10^9/L are appropriate at sites where platelets are not stocked.***

Note:

- **The trigger for platelet transfusion may be higher when the patient's platelet count must be a specific level, as determined by the treatment protocol, for chemotherapy administration.**
- **Interventional Radiology may require higher platelet level triggers/targets to perform a procedure.**

Massively Bleeding patients, patients in the Operating Room and pediatric patients less than 4 months corrected age are exempt from this process.

APPENDIX F – NOVA SCOTIA CRYOPRECIPITATE TRANSFUSION PATHWAY