

RBCs, Platelets, Plasma: W5 (Who, What, When, Where, Why) + How

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- This video conference presentation will be recorded, archived, and excerpts may be used for educational purposes.

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(ORBCoN website: www.transfusionontario.org).

- No commercial product conflicts of interest to declare
- Member of Transfusion Transmitted Injuries Surveillance System Education Committee
- Using Blood Wisely initiative, member nursing education development



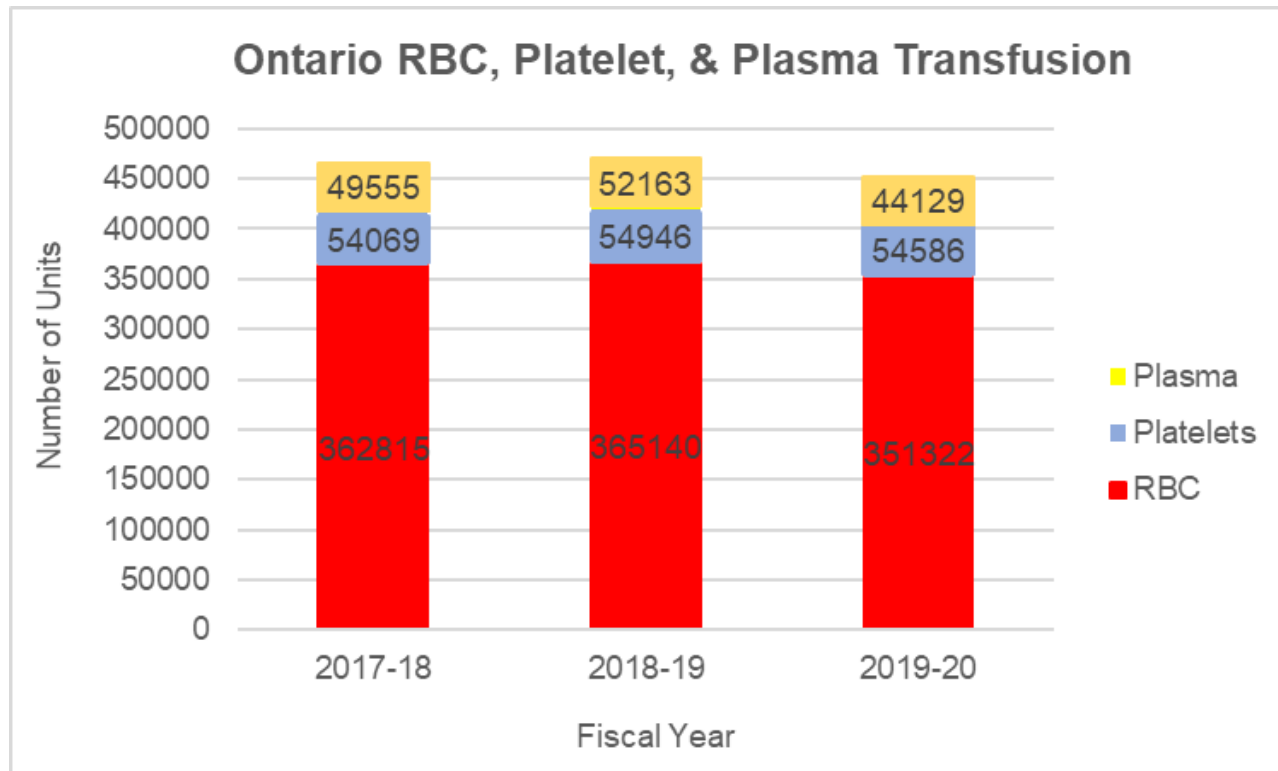
Objectives

After this talk participants will be able to:

- Outline the prevalence of RBC, platelet and plasma transfusion in Ontario
- For RBC, platelet and plasma transfusion:
 - Understand current evidence-based indications
 - Define nursing actions to ensure patient safety



Prevalence of RBC, Platelet and Plasma Transfusion in Ontario



2019-20: Total: 450,037 units Average each day: 1,233 units (963 RBC)

Transfusion is a frequent nursing care action!

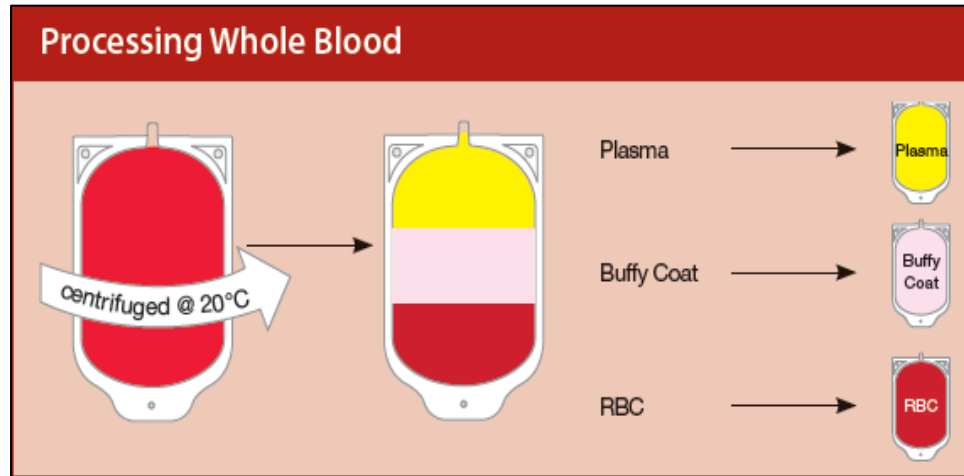


| Nursing Care Factor | RBC | Platelets | Plasma |
|--------------------------|-----|-----------|--------|
| Indication | | | |
| Dose | | | |
| Transfusion Order | | | |
| Informed Consent | | | |
| Group & Screen | | | |
| Preparing the Patient | | | |
| IV Access/Fluid/Meds | | | |
| Tubing/Filter | | | |
| Infusion Devices | | | |
| Picking Up Blood | | | |
| Checking Blood | | | |
| Assessment & Vital Signs | | | |
| Rate of Infusion | | | |
| Completing Transfusion | | | |
| Documentation | | | |



Canadian Blood Services

Collecting and Manufacturing Blood



**Apheresis
Collection:
cell
separating
machine**



RBC Transfusion (not massive hemorrhage, adult)

Red blood cells transport oxygen from the lungs to the tissue cells. Oxygen is needed for tissue cells to carry out their functions in the body.



Shelf Life: 42 days

Storage: at 1-6° C in approved, monitored refrigerator



RBC Transfusion (not massive hemorrhage, adult)

Transfusion Guidelines: Indication

Consider if

- Hb less than 70 g/L
- Hb 70 to 80 to 90 g/L with evidence of impaired tissue oxygen delivery (tachycardia, hypotension, cardiac ischemia, syncope, pre-syncope)

Of Note:

- Do not transfuse based on only the Hb value. RBC transfusion is indicated for symptomatic anemia.
- Consider if other therapies (e.g., iron) might be more appropriate, depending on cause of anemia



RBC Transfusion (not massive hemorrhage, adult)

Dose:

- 1 unit
- Volume = about 300 mL
- Consider a 2nd unit only if re-assessment indicates need

- If urgent re-assessment required, test Hb 15 minutes after RBC is transfused
- 1 unit = about 10 g/L Hb increase



RBC Transfusion (not massive hemorrhage, adult)

Transfusion Order: aligns with current transfusion guidelines

Includes:

- Patient's surname, first name and identification number
- Date the transfusion is to be given
- Blood component to be transfused
- Number of units or dose
- Rate or duration of infusion (may be hospital's standard protocol)
- Special modifications or requirements, if any (e.g., irradiated, washed)
- Medication orders related to transfusion, if any (e.g., premedication or diuretic)
- Use of blood warmer or rapid infusion device (exception: clinical areas with an established protocol)
- Sequence in which multiple components are to be transfused (e.g., transfuse platelets first, then RBC)



RBC Transfusion (not massive hemorrhage, adult)

Informed Consent:

- Obtained by health care professional **prescribing** the treatment
- Valid for the current course of treatment or hospital admission
- Documentation on patient's health record
- Information presented to the patient describes:
 - Blood component or blood product to be transfused
 - Reason transfusion is needed, benefits and risks of transfusion
 - Any alternatives appropriate to patient's clinical situation and their benefits and risks
 - Potential consequences of not receiving the transfusion
- Patient provided opportunity to ask questions and have any concerns addressed



RBC Transfusion (not massive hemorrhage, adult)

Informed Consent: Nurse's Role

- Confirm the informed consent policy and procedure has been fulfilled prior to beginning a transfusion
- If consent has not been completed, advise the prescriber
- **In emergency situations with health threatening or life threatening bleeding**, the prescriber may declare that transfusion proceed without informed consent. This situation must be documented as soon as possible.
- **Advocate for the patient**
Facilitate the consent process



RBC Transfusion (not massive hemorrhage, adult)

Informed Consent:

Information to engage in patient dialogue

Common Minor Reactions / Risks

- The majority of transfusion reactions are minor and not life threatening
- Itching and hives or fever occur in about 1 of every 100 to 300 transfusions



RBC Transfusion (not massive hemorrhage, adult)

Informed Consent:

Information to engage in patient dialogue

More Serious Reactions /Risks

- Fluid overload (TACO - Transfusion Associated Circulatory Overload) more serious and common transfusion reaction (occurs about 1 of every 100 transfusions)
- Lung injury (TRALI - Transfusion Related Acute Lung Injury), anaphylactic reaction, bacterial infection and receiving the wrong blood type are more serious but uncommon reactions (occur in about 1 of every 10,000 to 250,000 transfusions)
- These reactions can be medically treated
- Patient identification steps are meticulous to prevent receiving the wrong blood



RBC Transfusion (not massive hemorrhage, adult)

Informed Consent:

Information to engage in patient dialogue

Media Publicized Reactions/Risks

- Life altering infectious transfusion risks such as Hepatitis and Human Immunodeficiency Virus (HIV) are often described by the media
- In Canada, these risks are extremely rare (occur in about 1 of every 7.5 to 21 million transfusions)

Refer to [Bloody Easy 4](#)
for inclusive transfusion risk information



RBC Transfusion (not massive hemorrhage, adult)

Group and Screen Test (transfusion of compatible blood components):

- **Group:** determines patient's ABO and Rh(D) blood groups, testing for antigens and antibodies

ABO Blood Group System

| Blood group | Antigen(s) on red blood cells | Antibody(ies) in plasma |
|-------------|-------------------------------|-------------------------|
| O | zero, none | anti-A, anti-B |
| A | A | anti-B |
| B | B | anti-A |
| AB | A, B | none |

Rh(D) Blood Group System (no naturally occurring anti-Rh antibodies)

| | | |
|----------------|------|---|
| Rh(D) positive | D | none |
| Rh(D) negative | none | none; unless exposed to Rh(D) antigen (transfusion or pregnancy), then anti-D may be produced |

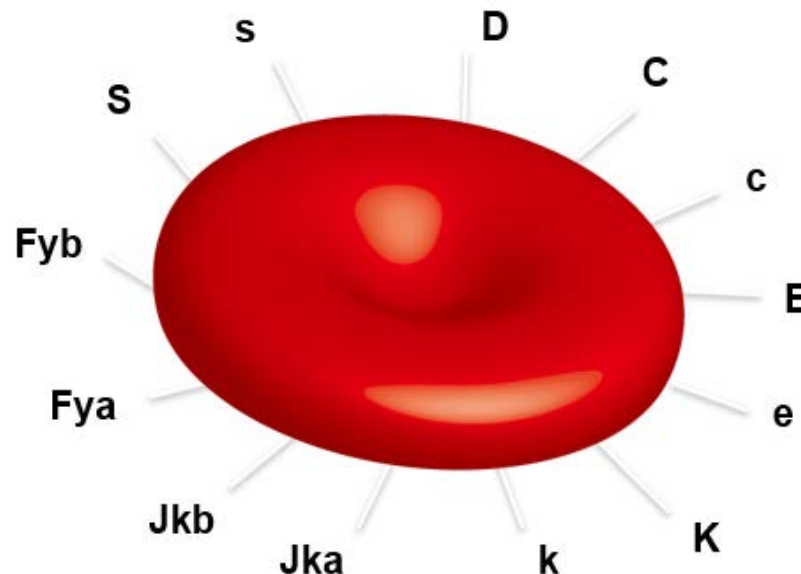


RBC Transfusion (not massive hemorrhage, adult)

Group and Screen Test (transfusion of compatible blood components):

- **Screen:** Testing to rule out or to identify **clinically significant antibody(ies)** in the patient's plasma

In addition to A and B antigens, human red blood cells have many other antigens against which antibodies can be formed.



Antibodies formed against these **ANTIGENS** are clinically significant (can cause hemolysis of red blood cells, like anti-A, anti-B antibodies).



RBC Transfusion (not massive hemorrhage, adult)

Group and Screen Test: for Crossmatching RBC units

- RBC must be crossmatched (i.e., compatible)
- Crossmatch: when RBC transfusion is ordered and group & screen testing completed, the TML procedure to detect any incompatibilities between the patient and donor RBC unit
- Computer (electronic) crossmatch — Only if antibody screen is negative, computerized procedure (used in place of a serologic crossmatch) to detect ABO incompatibility [computer selects an RBC unit that is an ABO & Rh(D) match]
- Serologic crossmatch — in vitro test performed between donor red cells (from a segment removed from the RBC unit) and patient's plasma (from the group and screen blood sample) to determine compatibility



RBC Transfusion (not massive hemorrhage, adult)

Group and Screen Test: Requirements (TM Standards)

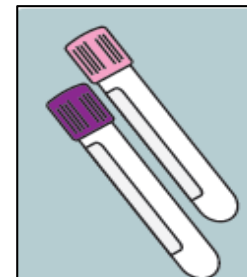
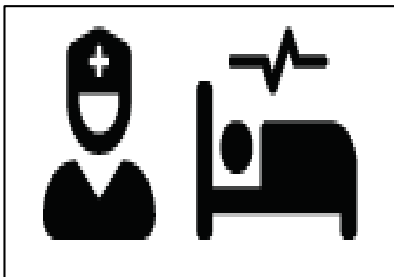
- To issue compatible, crossmatched RBC, TML requires 2 separate determinations of a patient's blood group.
One determination must be from a current blood sample.
- Expiry or “outdate” of group and screen test is defined by each TML.
After this time point, a new patient blood sample for repeat group and screen test is required to issue crossmatched RBC.
- If a patient was transfused or pregnant within the preceding 3 months (or if unknown/uncertain), blood sample for crossmatching must be collected within 96 hours prior to transfusion.
(ensures that the patient has not formed any new antibodies related to recent transfusion or pregnancy)



RBC Transfusion (not massive hemorrhage, adult)

Group and Screen Test: Collecting the Sample

1. In the presence of the patient, confirm **patient's surname, first name and identification number** on the patient's armband and the sample label are identical.
2. Immediately after you have collected the blood sample, place the label on the tube of blood at the patient's bedside. **Labeling a sample away from the patient greatly increases the risk of mislabeling.**
3. Document that you collected the sample. You are documenting your accountability for unequivocal (unmistakable) patient identification.



RBC Transfusion (not massive hemorrhage, adult)

Preparing the Patient:

- **Patient must be wearing an identification armband**
- Education: what to expect during transfusion (periodic assessments, vital sign checks, symptoms indicative of a transfusion reaction)
- History of previous transfusions (if so, special requirements, antibody card, transfusion reactions)?
If indicated, follow up with prescriber/TML
- Is patient at risk for TACO (Transfusion Associated Circulatory Overload)?



RBC Transfusion (not massive hemorrhage, adult)

Preparing the Patient: TACO Risk/Prevention

TACO Risk Factors

- Advanced age
- History of heart failure
- History of myocardial infarction
- Left ventricular dysfunction
- Renal dysfunction
- Positive fluid balance

If risk factors, follow up with prescriber for preventative strategies

TACO Prevention Strategies

- Do not transfuse more than 1 unit at a time
- Transfuse slowly over longer time period (maximum 4 hours after removal from temperature controlled environment)
- Administer **pre-transfusion diuretic** (PO – 30 minutes prior
IV – just prior)
- TML to divide unit (if equipment available, transfuse each part over maximum 4 hours after removal from temperature controlled environment)



RBC Transfusion (not massive hemorrhage, adult)

The Equipment: IV Access

- IV access must be dedicated to transfusion; blood must not come in contact with incompatible IV solutions or any IV medications
- IV needle gauge must be large enough to allow appropriate flow rates and avoid cell damage.
- Adults:

| RBC Transfusion | IV Access |
|-----------------|---|
| Routine | 20 to 22 gauge |
| Rapid | 14 to 18 gauge |
| All | Central venous access device (if multiple lumens, 1 lumen dedicated to transfusion) |

- Ensure IV access site is patent prior to picking up the blood



RBC Transfusion (not massive hemorrhage, adult)

The Equipment: IV Fluids/Medication

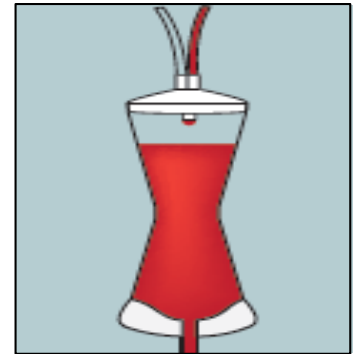
- Only 0.9% sodium chloride is compatible with RBCs, platelets and plasma
- Blood must not come in contact with any IV medications (i.e., all medications are incompatible)
- As possible, coordinate transfusion with timing of other medications; if necessary initiate another IV site
- If medication must be administered during transfusion, flush IV site with 0.9% Sodium Chloride flush syringes pre and post medication administration



RBC Transfusion (not massive hemorrhage, adult)

The Equipment: Tubing/Filter

- RBCs, platelets and plasma must be transfused through blood tubing with a 170 to 260 micron filter to capture any fibrin debris
- Blood tubing/filter may be primed with blood or with compatible IV fluid (0.9% sodium chloride)
- Blood tubing/filter must be changed after a maximum of 4 units of blood or 4 hours of time
- Be prepared for a potential transfusion reaction by setting up IV tubing such that if the transfusion must be stopped abruptly, IV access can be maintained:
 - Either: 0.9% sodium chloride flush syringes and an IV line with any IV solution are on hand, ready to infuse TKVO
 - Or: 0.9% sodium chloride IV line is on hand, ready to infuse TKVO



RBC Transfusion (not massive hemorrhage, adult)

The Equipment: Infusion Devices

- Infusion pumps approved as per Health Canada Medical Device Regulations can be used to transfuse blood RBCs, platelets and plasma
- Use of all devices must be based on manufacturer's recommendations.
- Refer to details found in the operator's manual of the specific device(s) used at your hospital
- If ordered, blood warmer and rapid infuser devices can be used to transfuse RBCs and plasma



RBC Transfusion (not massive hemorrhage, adult)

Picking Up Blood from TML:

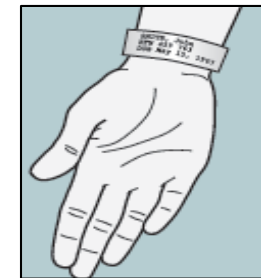
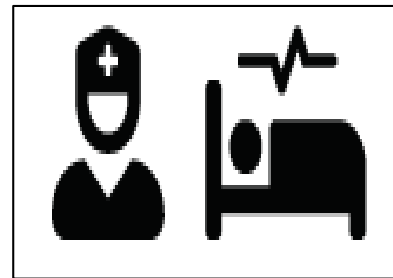
- **For patient safety, ensure all preparation steps have been completed before picking up blood from TML**
- TML requires documentation of patient identification (surname, first name and identification number) to issue blood to patient care area. Many hospitals have a form (pick up slip) which includes the required information.
- RBC, platelets, and plasma, transfusion must be completed within 4 hours of issue from TML (removal from temperature controlled environment)
- Blood should NEVER be stored in medication or patient care area refrigerators (temperature is not regulated)



RBC Transfusion (not massive hemorrhage, adult)

Checking Blood Components:

- Validate blood component received from TML matches transfusion order
- Steps must be carried out in the physical presence of the patient
- Patient must be wearing an identification armband
- Patient identification information must remain attached to the blood for the duration of the transfusion.



Checks:

- 1) Patient identification
- 2) ABO & Rh(D) blood groups
- 3) Unit number
- 4) Visual inspection & Expiry time



RBC Transfusion (not massive hemorrhage, adult)

Checking Blood Components: **1. Patient identification**

Patient's surname, first name & identification number match identically on:

- Patient's armband
- Prescriber's order for the blood transfusion
- Blood component's transfusion label or tag
- "Chart" transfusion label or tag
(patient health record documentation)



RBC Transfusion (not massive hemorrhage, adult)

Checking Blood Components: **2. ABO & Rh(D) blood groups**

ABO & Rh(D) of the blood component issued from TML are identical or compatible with the patient's ABO & Rh(D) blood groups.

Blood Component ABO & Rh(D) blood groups are listed on:

- CBS label
- Blood component's transfusion label or tag
- "Chart" transfusion label or tag (patient health record documentation)

Patient ABO & Rh(D) blood groups are listed on:

- Patient's health record – group and screen test results
- Blood component's transfusion label or tag
- "Chart" transfusion label or tag (patient health record documentation)

If not ABO & Rh(D) identical, review ABO and Rh(D) Compatibility Chart



ABO and Rh(D) Compatibility Chart

| Patient ABO/Rh(D) Blood Group | Compatible Blood Group for Transfusion | | | |
|--|--|---|--|-------------------------|
| | RBC (Red Blood Cell Concentrate) | Platelets* | Plasma***/ Cryosupernatant Plasma*** | Cryoprecipitate **** |
| O Positive | O Rh(D) positive or negative | O preferred** Rh(D) positive or negative | O, A, B, AB | Any Group |
| O Negative | O Rh(D) negative 1st choice* | O preferred** Rh(D) negative 1st choice* | O, A, B, AB | |
| A Positive | A, O Rh(D) positive or negative | A preferred** Rh(D) positive or negative | A, AB | |
| A Negative | A, O Rh(D) negative 1st choice* | A preferred** Rh(D) negative 1st choice* | A, AB | |
| B Positive | B, O Rh(D) positive or negative | B preferred** Rh(D) positive or negative | B, AB | |
| B Negative | B, O Rh(D) negative 1st choice* | B preferred** Rh(D) negative 1st choice* | B, AB | |
| AB Positive | AB, A, B, O Rh(D) positive or negative | AB preferred** Rh(D) positive or negative | AB | |
| AB Negative | AB, A, B, O Rh(D) negative 1st choice* | AB preferred** Rh(D) negative 1st choice* | AB | |



RBC Transfusion (not massive hemorrhage, adult)

Checking Blood Components: **2. ABO & Rh(D) blood groups**

Patient Special Requirements

1. Antigen Negative RBC

If patient's group and screen test identified a clinically significant antibody, then confirm on the CBS label the RBC unit is antigen negative e.g., patient has anti-Jka, the RBC unit is antigen "Jka-"

2. K Negative RBC

If patient is female, age 45 years and under with childbearing potential, then confirm on the CBS label the RBC unit is antigen "K-" (unless patient is known to be K positive)

3. Irradiated RBC or Platelet

If patient requires irradiated RBC or platelets, CBS irradiated label is included on the blood bag

TML provides special requirements as available per inventory/transfusion urgency. If transfusion delayed or if not available, the prescriber is advised.



RBC Transfusion (not massive hemorrhage, adult)

Checking Blood Components: 2. ABO & Rh(D) blood groups Patient Special Requirements



RBC Transfusion (not massive hemorrhage, adult)

Checking Blood Components: **3. Unit Number**

Unit number is an **identical match on:**

- CBS label
- Blood component's transfusion label or tag
- "Chart" transfusion label or tag
(patient health record documentation)



RBC Transfusion (not massive hemorrhage, adult)

Checking Blood Components: 4. Visual inspection & Expiry time

Visual inspection

- Check for clots, unusual colour, any leaking from ports.
- If concerns, contact TML

Expiry time

- CBS label expiry date is based on component being stored in its required temperature controlled environment (e.g., RBC: 42 days)
- When issued to a patient care area, blood is no longer in temperature controlled environment
- **Transfusion must be completed within 4 hours of time of issue (removal from the temperature controlled environment)**
- If not completed within 4 hours of time of issue, discard remainder
- Time of issue noted on blood component's transfusion label or tag



RBC Transfusion (not massive hemorrhage, adult)

Patient Assessment & Vital signs:

- Document patient baseline within 30 minutes prior to starting transfusion
- Assessment: recent fever, rashes, on oxygen, laboured respiration, chest auscultation if TACO risk
- Vital signs parameters:
 - Temperature
 - Blood Pressure
 - Pulse
 - Respiratory Rate
 - Oxygen saturation



RBC Transfusion (not massive hemorrhage, adult)

Patient Assessment & Vital signs:

- Closely monitor/observe patient during transfusion per hospital policy
- At minimum, patient assessment & vital signs
 - 15 minutes after start of transfusion
 - After transfusion is completed
 - Periodically post-transfusion
reactions may occur up to 4 hours post-transfusion
for dyspnea reactions, up to 24 hours post transfusion



RBC Transfusion (not massive hemorrhage, adult)

Rate of Infusion:

- For the first 15 minutes, suggested rate is 50 mL/hour
- Assess patient & re-check vital signs 15 minutes after infusion started.

If no signs/symptoms of transfusion reaction, increase to rate ordered (usually over 2 hours, slower if patient at risk for circulatory overload)

Of Note:

- If blood tubing was primed with 0.9% sodium chloride, re-priming tubing with the blood component is required to ensure initial slow infusion rate is actually infusing the blood component (volume of blood tubing is 12-15 mL)



RBC Transfusion (not massive hemorrhage, adult)

Completing Transfusion:

- Comply with the expiry time: within 4 hours of time of issue (removal from the temperature controlled environment), otherwise discard the remainder
- Flush blood tubing with 0.9% sodium chloride
- Disconnect blood tubing when transfusion is completed (blood tubing can harbour bacteria)
- Hospitals may require returning the empty blood bag to TML



RBC Transfusion (not massive hemorrhage, adult)

Documenting Transfusion (per Transfusion Medicine Standards):

- Patient/recipient's first name, surname and identification number
- Patient/recipient and unit/donor ABO/Rh(D) blood groups
- Recipient compatibility status
- Unit number of component
- Type of blood component
- Volume/dose transfused
- Date and time of issue
- Start and finish date & time of transfusion
- Identity of transfusionist

Most TMLs issue a “Chart” transfusion label or tag (patient health record documentation) that includes this information

Transfusionist: add start and finish date & time, their identity; patient care



Platelet Transfusion (not massive hemorrhage, adult)

Platelets are another cellular component of blood suspended in plasma. They are the first responders in the clotting process to stop bleeding (sticky cells, form the platelet plug).



Shelf Life: 7 days Storage: at 20-24° C on an approved, monitored agitator



Platelet Transfusion (not massive hemorrhage, adult)

Transfusion Guidelines: Indication

| Clinical Situation | Platelet count x 10 ⁹ |
|--|----------------------------------|
| Prophylactic transfusion | Less than 10 |
| Pre-procedures not associated with significant blood loss | Less than 20 |
| Taking anticoagulants that should not be stopped | Less than 30 |
| Pre-procedures/surgery with anticipated major blood loss, epidural anesthesia, lumbar puncture, significant bleeding | Less than 50 |
| Pre-neurosurgery, head trauma (exception: patient with intra-cranial hemorrhage, not requiring surgery, taking anti-platelet agents – increased morbidity) | Less than 100 |
| If bleeding and platelet dysfunction (i.e., medications: aspirin, clopidogrel; post cardiopulmonary bypass) | Any platelet count |
| Of Note: Immune thrombocytopenia (ITP) with life threatening bleeding, clinical situation specific with hematology consultation | |



Platelet Transfusion (not massive hemorrhage, adult)

Dose:

- 1 dose (Pooled or Apheresis)
minimum platelets 240×10^9 /dose
- Volume: Pooled - mean 342 mL;
Apheresis - mean 242 mL
- If pre-procedure, give just prior to procedure
- Re-check platelet count 10-60 minutes after platelet is transfused
- 1 dose = $15-25 \times 10^9/L$ increase in platelet count at 10 to 60 minutes post transfusion



Platelet Transfusion (not massive hemorrhage, adult)

Transfusion Order:

- No blood warmer, no rapid infusion device

Group & Screen Test: required

- Ideally ABO & Rh(D) identical
- Should be compatible
- If platelets in short supply, TML will follow their policy for ABO blood group substitution

Equipment: IV Access

- Any gauge IV is appropriate



Platelet Transfusion (not massive hemorrhage, adult)

Equipment: Tubing/Filter

- Transfuse through NEW/FRESH blood tubing/filter (if filter was previously used, the platelets will adhere to fibrin that has been captured in the filter)

Rate of Infusion

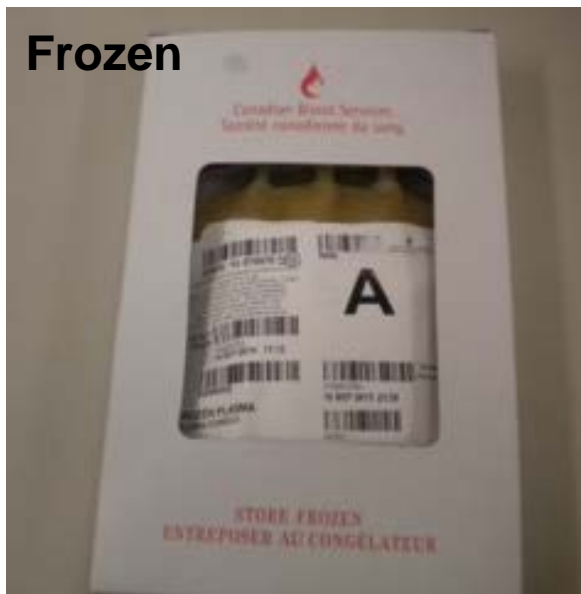
- For the first 15 minutes, suggested rate is 50 mL/hour
- Assess patient & re-check vital signs 15 minutes after infusion started.

If no signs/symptoms of transfusion reaction, increase to rate ordered (usually over 60 minutes, slower if patient at risk for circulatory overload)



Plasma Transfusion (not massive hemorrhage, adult)

Plasma is the fluid part of the blood and contains all the coagulation factors necessary for the clotting process to stop bleeding.



FROZEN: minus 18° C, up to 1 year (approved, monitored freezer)

THAWED: approved, monitored refrigerator, at 1- 6° C, storage time varied

Thawing requires about 30 minutes of time



Plasma Transfusion (not massive hemorrhage, adult)

Transfusion Guidelines: Indication

- Active bleeding or prior to major procedure*/surgery in patient** with INR ≥ 1.8 due to multiple coagulation factor deficiency (if no coagulation factor concentrates or alternatives available)
 - * Major radiology procedures with bleeding risk include: lumbar puncture or spinal procedure with hematoma risk, arterial intervention, biliary tract intervention or TIPS procedure, deep abscess drainage, urinary tract intervention, solid organ biopsy
 - ** Liver disease patients have conserved thrombin generation despite increased INR levels; often correction of abnormal INR is not needed before procedures

Of Note:

- Plasma should not be used for urgent reversal of warfarin unless prothrombin complex concentrate (PCC) is unavailable or is contraindicated (e.g., history of heparin-induced thrombocytopenia)



Plasma Transfusion (not massive hemorrhage, adult)

Dose:

- 10 to 15 mL/kg; 1 unit = about 250 mL; for adults ordered in units
Small adult - 3 units; Large adult – 4 units

| Plasma | Anticoagulant | Volume (approx.) | After Thawing, storage time |
|--------------------------------------|--|------------------|-----------------------------|
| AFFP (apheresis fresh frozen plasma) | Sodium Citrate | 500 mL | Up to 24 hours |
| | ACD-A (acid citrate dextrose – Solution A) | 250 mL | Up to 120 hours |
| FP (frozen plasma) | CPD (citrate, phosphate, dextrose) | 250 mL | Up to 120 hours |

- AFFP and FP are clinically equivalent, referred to as plasma
- TML will issue ordered number of units based on available inventory
- 1 dose increases coagulation factors about 20 % for about 6 hours
- Per clinical situation, check INR,PTT 10 to 60 minutes post-transfusion



Plasma Transfusion (not massive hemorrhage, adult)

Group & Screen Test: required

- ABO identical/compatible
- Plasma does not contain red blood cells and cannot expose recipients to the Rh(D) antigen.
The Rh(D) blood group is not relevant for plasma transfusion.

Equipment: IV Access

- Any gauge IV is appropriate



Plasma Transfusion (not massive hemorrhage, adult)

Rate of Infusion: for each unit

- For the first 15 minutes, suggested rate is 50 mL/hour
- Assess patient & re-check vital signs 15 minutes after infusion started.

If no signs/symptoms of transfusion reaction, increase to rate ordered (usually over 30 minutes to 2 hours, slower if patient at risk for circulatory overload)

- Adult plasma dose is 750 to 1000 mL; poses a high risk for circulatory overload



| Nursing Care Factor | RBC | Platelets | Plasma |
|---------------------|---|--|--|
| Indication | <ul style="list-style-type: none"> - validate aligns with transfusion guidelines - refer to slide # 8 | <p style="text-align: center;">→</p> <ul style="list-style-type: none"> - refer to slide # 42 | <p style="text-align: center;">→</p> <ul style="list-style-type: none"> - refer to slide # 47 |
| Dose | <p>1 unit = about 10 g/L increase Hb</p> | <p>1 dose = 15-25 x10⁹/L increase platelet count at 10-60 minutes post transfusion</p> | <p>10-15 mL/kg, 3 units small adult 4 units large adult</p> |
| Transfusion Order: | <p>Must include:</p> <ul style="list-style-type: none"> - surname, first name, identification number - date - blood component name - # units/dose - infusion rate/duration - if special requirements - if medications - if blood warmer/rapid infusion device - if multiple components, sequence | <p style="text-align: center;">→</p> <p>exception: no blood warmer, no rapid infusion device</p> | <p style="text-align: center;">→</p> |



| Nursing Care Factor | RBC | Platelets | Plasma |
|-----------------------|--|--|---|
| Informed Consent | <ul style="list-style-type: none"> - prescriber to obtain - required unless prescriber declares emergency (life threatening bleeding) - nurse: patient advocate, facilitate | → | → |
| Group & Screen Test | <ul style="list-style-type: none"> - required, 2 separate determinations (one must be from a current blood sample) - crossmatched - ABO & Rh(D) identical or compatible <p>Sample collection:</p> <ul style="list-style-type: none"> - patient's surname, first name, identification number identical on armband and the sample label - place label on tube of blood at patient bedside - document phlebotomist identity | <ul style="list-style-type: none"> - required - ideally ABO & Rh(D) identical - should be compatible - if short supply, TML follows policy re:ABO group substitution <p>Sample →</p> | <ul style="list-style-type: none"> - required - ABO identical or compatible <p>Sample →</p> |
| Preparing the Patient | <ul style="list-style-type: none"> - wearing an identification armband - education: assessments, vital signs, symptoms of a reaction - transfusion history, follow up if need - TACO risk factors, follow up if need | → | → |



| Nursing Care Factor | RBC | Platelets | Plasma |
|---------------------|---|--|---------------------------------|
| IV Access | patent IV dedicated to transfusion - IV gauge: routine: 20-22, rapid:14-18 - Central venous access device OK | → exception: any IV gauge | → exception: any IV gauge |
| IV Fluid/Meds | - only 0.9% NaCl (sodium chloride) - all medications are incompatible | → | → |
| Tubing/Filter | - blood tubing with a 170 to 260 micron filter - prime with component or 0.9% NaCl - changed after maximum of 4 units of blood or 4 hours of time - IV setup to stop abruptly & maintain TKVO: 0.9% NaCl flush syringes + any fluid IV line or 0.9% NaCl IV line | → exception: new/fresh for each dose of platelets | → |
| Infusion Devices | - infusion pumps approved per Health Canada Medical Device Regulations - refer to operator's manual - if ordered, blood warmer, rapid infusion device | → exception: no blood warmer no rapid infusion device | → |



| Nursing Care Factor | RBC | Platelets | Plasma |
|---------------------|---|--|--|
| Picking Up Blood | <ul style="list-style-type: none"> - ensure all preparation steps completed - TML requires surname, first name, identification number | → | → |
| Checking Blood | <ul style="list-style-type: none"> - blood component received from TML matches transfusion order - carried out in the physical presence of the patient (at the bedside) - patient must be wearing an identification armband <p>Checks</p> <ol style="list-style-type: none"> 1) Patient identification (surname, first name, identification number) 2) ABO & Rh(D) blood groups (identical/compatible) 3) Unit number 4) Visual inspection & Expiry time (complete transfusion within 4 hours after issue from TML, removal from temperature controlled environment) | <p style="text-align: center;">→</p> <p>exception: if short supply, TML follows policy re:ABO group substitution</p> | <p style="text-align: center;">→</p> <p>exception: Rh(D) blood group of plasma is not relevant for transfusion</p> |



| Nursing Care Factor | RBC | Platelets | Plasma |
|--------------------------|--|--|---|
| Assessment & Vital Signs | <ul style="list-style-type: none"> - within 30 minutes prior to start - 15 minutes after start of transfusion - after transfusion is completed - periodically post-transfusion - close monitoring/observation | → | → |
| Rate of Infusion | <ul style="list-style-type: none"> - If blood tubing primed with 0.9% NaCl, re-priming tubing with blood to ensure initial slow infusion rate is actually infusing the blood (blood tubing volume is 12-15 mL) - 50 mL/hour for first 15 minutes - re-check after 15 minutes, if no indication of reaction, increase to rate as ordered - usually over 2 hours, slower if at risk for circulatory overload | <p style="text-align: center;">→</p> <p>exception: usually over 60 minutes, slower if at risk for circulatory overload</p> | <p style="text-align: center;">→</p> <p>exception: <u>each unit</u> usually over 30 minutes to 2 hours, slower if at risk for circulatory overload</p> |
| Completing Transfusion | <ul style="list-style-type: none"> - comply with expiry time: within 4 hours of time of issue (removal from the temperature controlled environment), otherwise discard the remainder | → | → |



| Nursing Care Factor | RBC | Platelets | Plasma |
|---------------------|---|-----------|--------|
| Documentation | <ul style="list-style-type: none"> - complete “Chart” transfusion label or tag (patient health record documentation) issued from TML (includes required information) - transfusionist adds start and finish date & time and their identity document patient care | → | → |



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Questions

