Labrador-Grenfell Health

Blood Administration

Content derived from
Bloody Easy - Blood Transfusions, Blood Alternatives and Transfusion Reactions Version 4, 2016
and the NL Provincial Blood Coordinating Program Transfusion Medicine Policies

Prepared by Jenna Williams, LGH Transfusion Safety Officer

Last updated February 1, 2018

Module 1: Transfusing the patient

Learning Objectives

- Identify the importance of informed consent
- Discuss the process for verifying the transfusion order
- List the steps required to prepare the patient
- Describe the importance of accurate identification of patient, blood samples and blood components/products
- Review the process for safe blood administration including appropriate monitoring and assessments
- Indicate what documentation is required with transfusion

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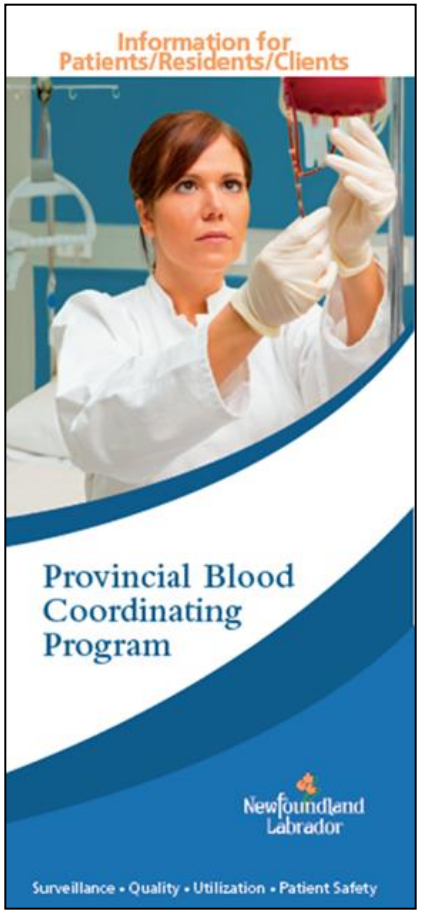
Pre-Transfusion Process

- Informed consent
- Transfusion orders
- Requesting the blood component/product
- Pre-transfusion sample
- Preparing the patient
- Blood tubing



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Informed Consent

- Obtained by the health care professional prescribing the treatment
- Must be documented on the patient's chart prior to transfusion of any blood or blood product
- Remains in effect for the entire admission or course of treatment, to a maximum of 180 days (6 months)
- The health care professional starting the transfusion must verify that consent has been obtained

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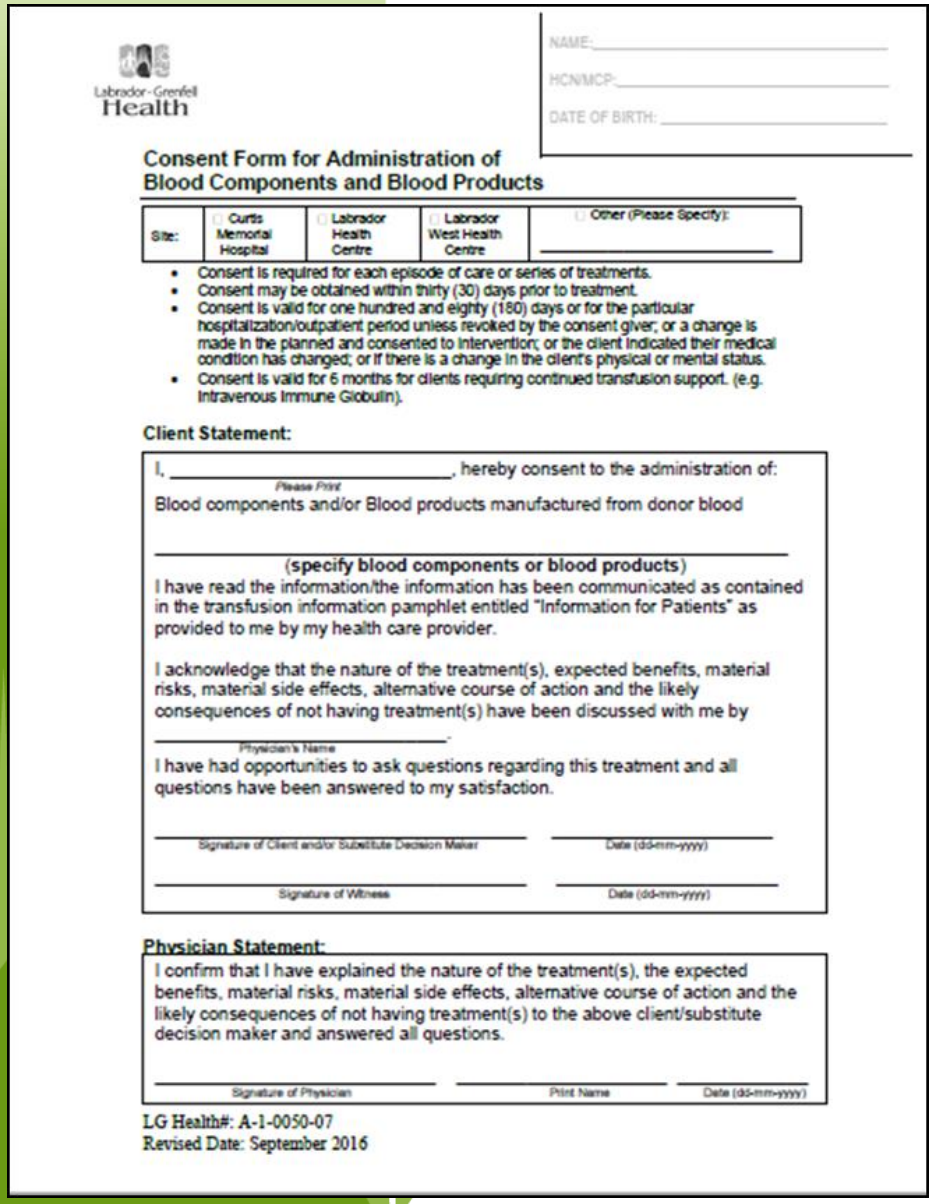
Consent/Refusal Form



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NAME:
HCN/MCP:
DATE OF BIRTH:

Consent Form for Administration of Blood Components and Blood Products

Site:	☐ Curtis Memorial Hospital	☐ Labrador Health Centre	☐ Labrador West Health Centre	☐ Other (Please Specify):

- Consent is required for each episode of care or series of treatments.
- Consent may be obtained within thirty (30) days prior to treatment.
- Consent is valid for one hundred and eighty (180) days or for the particular hospitalization/outpatient period unless revoked by the consent giver; or a change is made in the planned and consented to intervention; or the client indicated their medical condition has changed; or if there is a change in the client's physical or mental status.
- Consent is valid for 6 months for clients requiring continued transfusion support. (e.g. Intravenous Immune Globulin).

Client Statement:

I, _____, hereby consent to the administration of:
Please Print

Blood components and/or Blood products manufactured from donor blood

_____
(specify blood components or blood products)

I have read the information/the information has been communicated as contained in the transfusion information pamphlet entitled "Information for Patients" as provided to me by my health care provider.

I acknowledge that the nature of the treatment(s), expected benefits, material risks, material side effects, alternative course of action and the likely consequences of not having treatment(s) have been discussed with me by

_____.
Physician's Name

I have had opportunities to ask questions regarding this treatment and all questions have been answered to my satisfaction.

_____ _____
Signature of Client and/or Substitute Decision Maker — Date (dd-mm-yyyy)

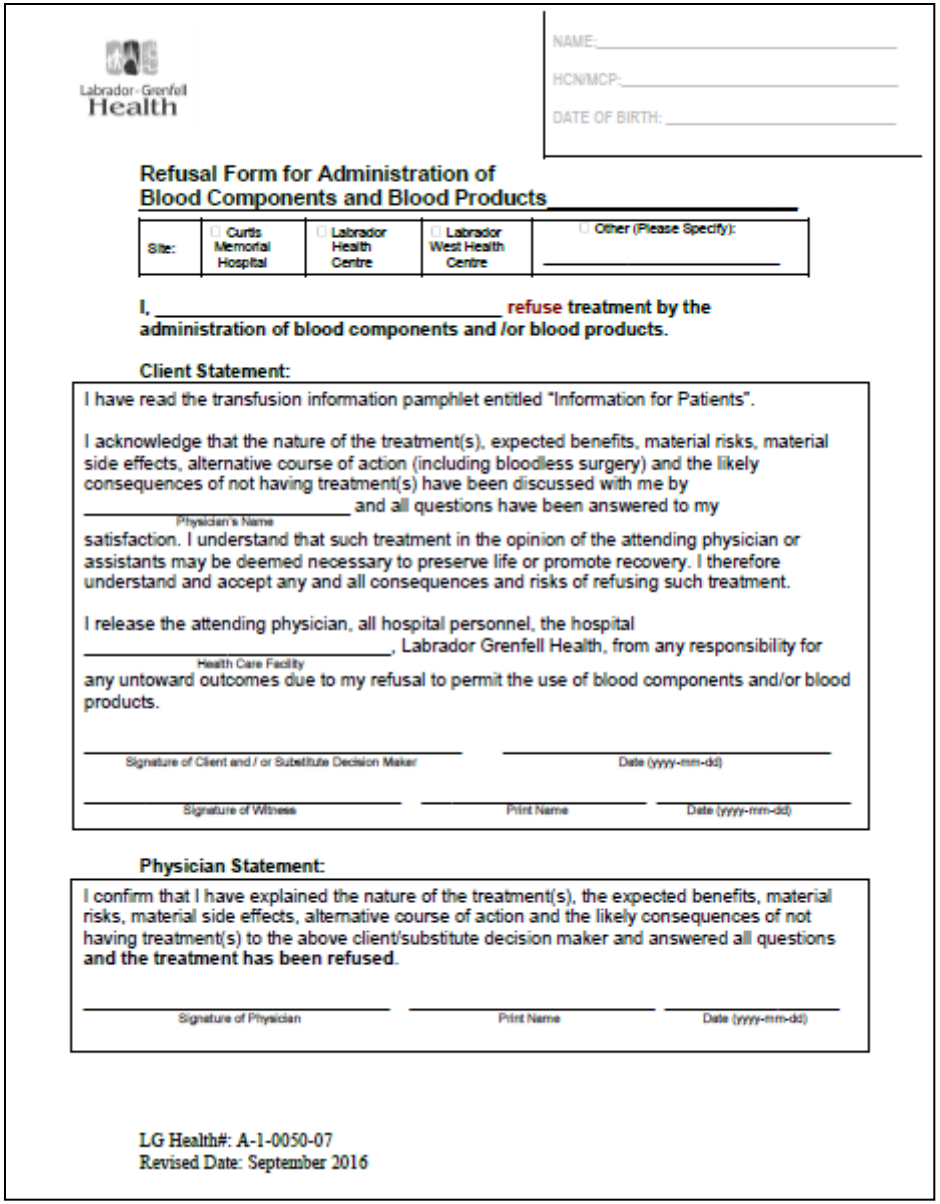
_____ _____
Signature of Witness — Date (dd-mm-yyyy)

Physician Statement:

I confirm that I have explained the nature of the treatment(s), the expected benefits, material risks, material side effects, alternative course of action and the likely consequences of not having treatment(s) to the above client/substitute decision maker and answered all questions.

_____ _____ _____
Signature of Physician — Print Name — Date (dd-mm-yyyy)

LG Health#: A-1-0050-07
Revised Date: September 2016



Labrador-Grenfell Health

NAME:
HCN/MCP:
DATE OF BIRTH:

Refusal Form for Administration of Blood Components and Blood Products

Site:	☐ Curtis Memorial Hospital	☐ Labrador Health Centre	☐ Labrador West Health Centre	☐ Other (Please Specify):

I, _____ refuse treatment by the administration of blood components and /or blood products.

Client Statement:

I have read the transfusion information pamphlet entitled "Information for Patients".

I acknowledge that the nature of the treatment(s), expected benefits, material risks, material side effects, alternative course of action (including bloodless surgery) and the likely consequences of not having treatment(s) have been discussed with me by _____ and all questions have been answered to my satisfaction. I understand that such treatment in the opinion of the attending physician or assistants may be deemed necessary to preserve life or promote recovery. I therefore understand and accept any and all consequences and risks of refusing such treatment.
Physician's Name

I release the attending physician, all hospital personnel, the hospital _____, Labrador Grenfell Health, from any responsibility for any untoward outcomes due to my refusal to permit the use of blood components and/or blood products.
Health Care Facility

_____ _____
Signature of Client and / or Substitute Decision Maker — Date (yyyy-mm-dd)

_____ _____ _____
Signature of Witness — Print Name — Date (yyyy-mm-dd)

Physician Statement:

I confirm that I have explained the nature of the treatment(s), the expected benefits, material risks, material side effects, alternative course of action and the likely consequences of not having treatment(s) to the above client/substitute decision maker and answered all questions **and the treatment has been refused.**

_____ _____ _____
Signature of Physician — Print Name — Date (yyyy-mm-dd)

LG Health#: A-1-0050-07
Revised Date: September 2016

John Doe
Hospital number 2345678

March 10, 2015
21:30

In AM transfuse 1 unit irradiated red blood cells over 3 hours.

Furosemide 20mg IV pre-transfusion

Repeat CBC and contact physician to assess for further transfusion needs.

Dr. J. Stevens

Transfusion Orders

- Transfusions must be ordered by a physician or authorized practitioner

- All orders must include:
  - Patients first and last name and at least one unique identifier
  - Type of blood component or product
  - Number of units or amount
  - Rate of infusion
  - Special requirements if any (e.g. irradiated)
  - Premedication or diuretic, if required

- Non-urgent transfusions should occur during daytime hours for increased patient safety

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Requesting Blood Component/Product

- Before requesting the blood component/product:
  - Review the most recent appropriate laboratory values
  - Assess the patient's symptoms
  - Know the indications and appropriate dosage to verify that the transfusion is appropriate - Refer to Module 2

Blood Component/Product	Laboratory Blood Test
Red Blood Cells (RBC)	Hemoglobin
Platelets	Platelet count
Frozen Plasma (FP) and Prothrombin Complex Concentrate (PCC)	INR (International Normalized Ratio)
Cryoprecipitate	Fibrinogen

Requesting Blood Component/Product

- When ordering blood components/products, additional information that is required:
  - History of recent blood transfusion or pregnancy (within the last 3 months)
  - Indication or reason for transfusion

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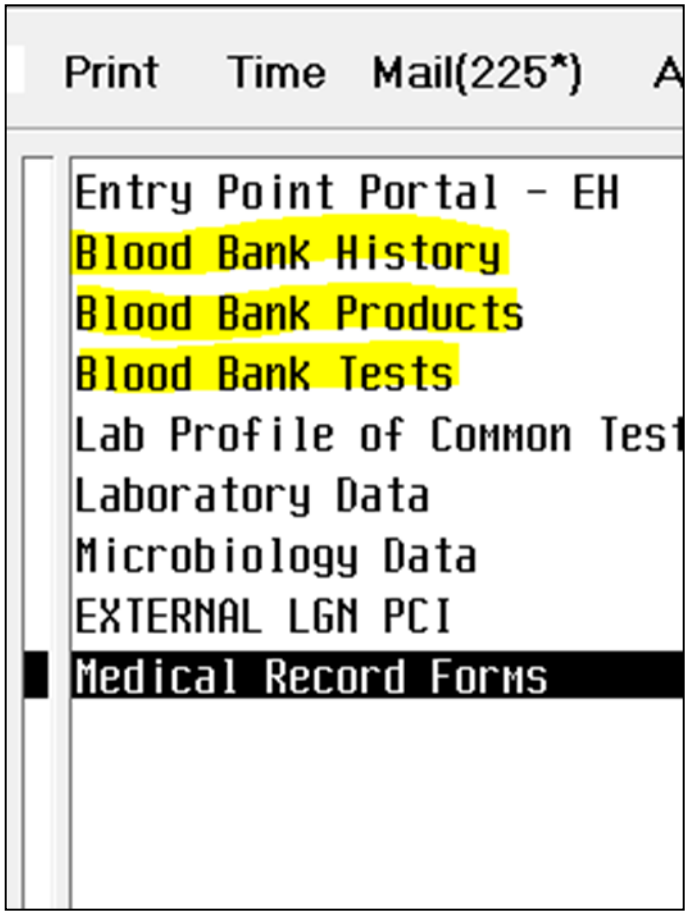
PCI (Patient Care Inquiry)

Patient History Check



- **Blood Bank History** will show you any history of previous transfusions or any history of transfusion reactions
- **Blood Banks Products** is where you can see the status of a crossmatch
- **Blood Bank Tests** is where you can see if a Type and Screen is done

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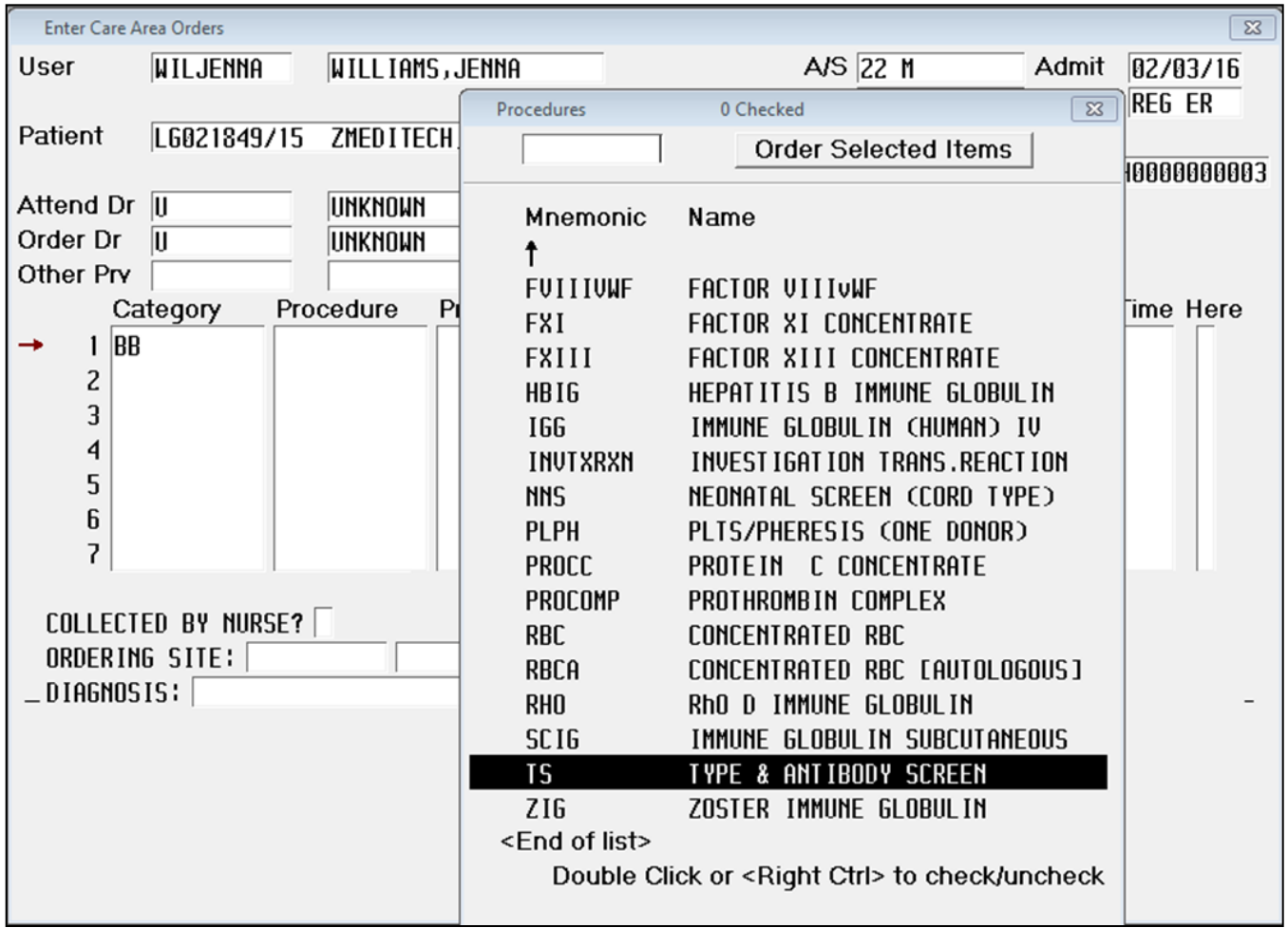
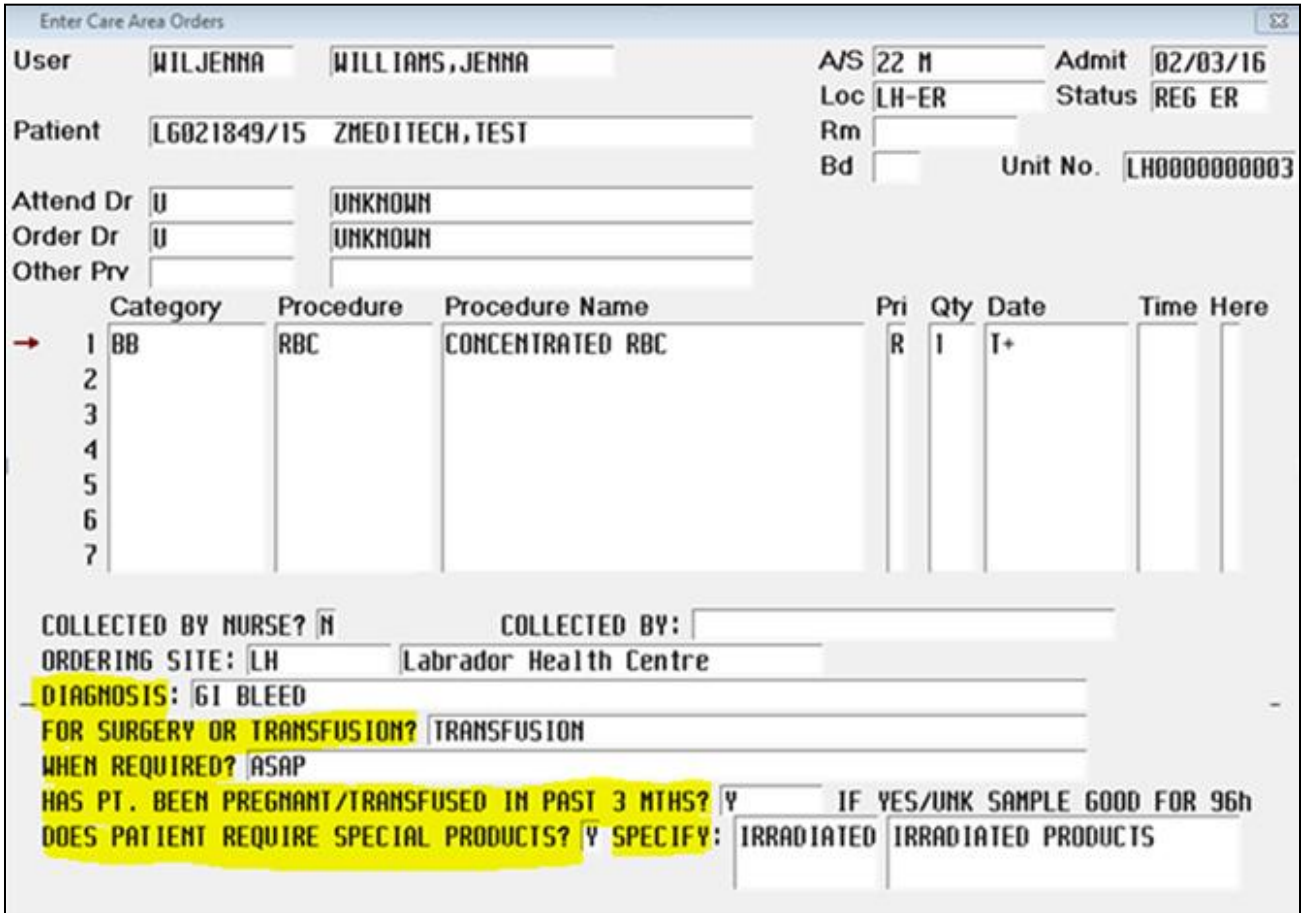
Order Entry

- Category: BB (blood bank)
- Under “Procedure” press F9 to search for the requested testing and/or blood products

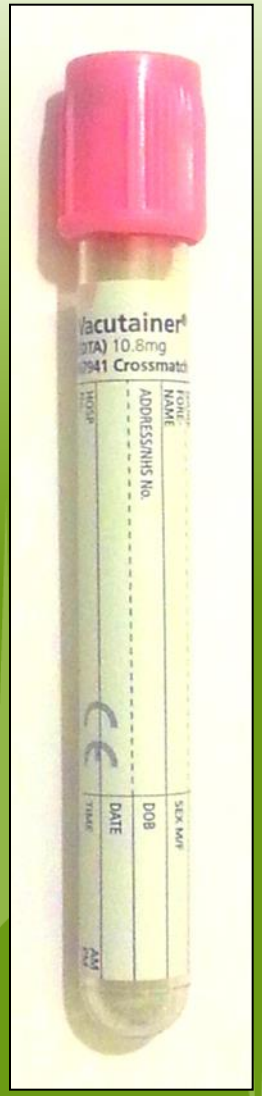


Order Entry (cont'd)

- Please answer all of the questions correctly. The answers determine:
  - Specific testing requirements
  - Selection of blood components/products



Pre-Transfusion Samples



- Pre-transfusion samples are used to:
  - Determine ABO and Rh blood groups
  - Detect and identify antibodies acquired from previous blood exposure or pregnancy
  - Crossmatch suitable units of blood when a transfusion is ordered
- Once collected, sample needs inverting 8 times to mix the sample with the EDTA
- It should contain at least 1ml of blood, but more is preferred by the lab, if possible

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Pre-Transfusion Samples

4 Steps for labeling samples:

1. ALWAYS print sample labels first and take with you to the patient's bedside
2. Verify that the labels match the patient's armband/identification and any accompanying paperwork
3. After collecting the sample(s), label the tubes **before** leaving the patient's bedside
   Never label samples away from the patient as this greatly increases the risk of mislabelling
4. Write the collection date and time, and initial the label of any blood samples collected

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Preparing the Patient

- Explain the purpose and procedure for the transfusion
- Ensure patient's questions are addressed
- Ask your patient if they have had any problems or reactions with previous transfusions. If so, orders from a physician for premedication may be required.
  - IV route: administer immediately pre-transfusion
  - PO route: administer 30 min pre-transfusion

Indication	Premedication
Repeated febrile reactions	antipyretic
Repeated allergic reactions	antihistamine and/or steroid

IV Access

Component/ Product	Category	IV Access
Red Blood Cells	Adult	18-22G
Other Blood Components/ Products		Any size adequate
All Blood Components/Products	Pediatrics	22-25G

- Transfusing rapidly and under pressure through too small an IV access can cause hemolysis of red blood cells
- Ensure that the IV access is dedicated to the transfusion
- Medications and solutions other than normal saline can cause hemolysis or clotting of the blood component
- IV pumps and blood warmers must be suitable for transfusion and not damage the blood component/product

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Blood Tubing

- **Blood components** must be transfused through blood tubing containing a 170-260 micron filter to capture any fibrin debris:
  - Red blood cells (RBCs), platelets, plasma, and cryoprecipitate
- Flush blood tubing with normal saline (0.9% NaCl) completely wetting filter
- Blood tubing must be changed every 4 hours and if it is greater than 60 minutes between units
- Platelets **must** be transfused through new blood tubing
  - Platelets will adhere to fibrin captured in the filter from previous blood components

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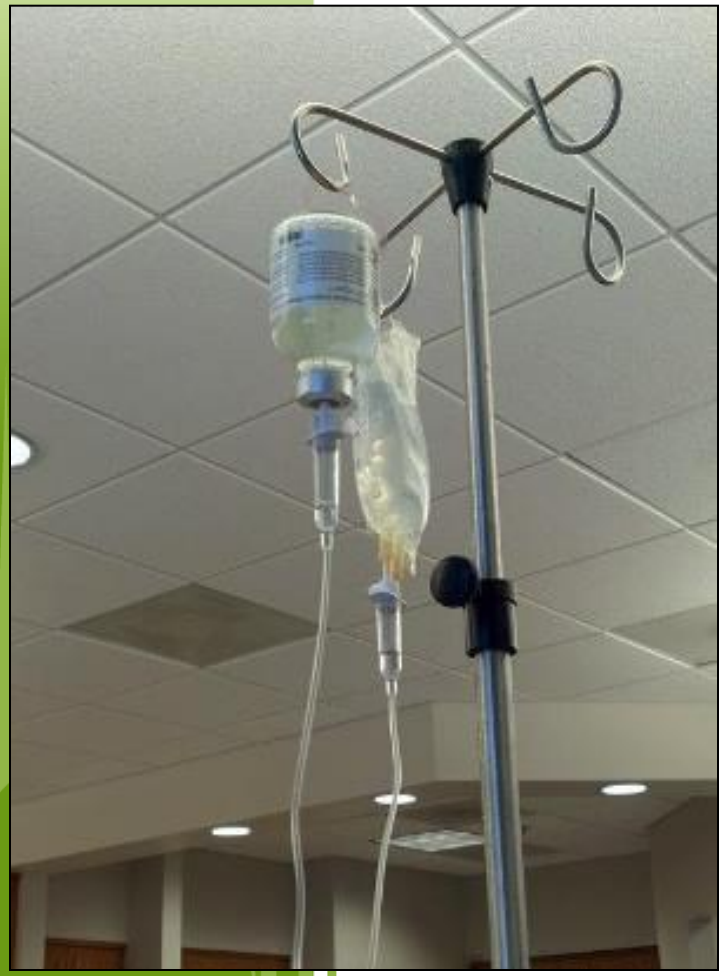
Blood Tubing



- **Blood products** (such as IVIG and albumin) do not require blood tubing or a filter. IV tubing that can be vented is required for infusions directly from glass bottles.

- IVIG is not compatible with normal saline
  - D5W solution

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Transfusion Process

- **Picking up blood**
- Checking blood
- Starting blood
- Monitoring
- Completing the transfusion
- Documentation

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Picking up Blood / Blood Products

- **BEFORE** picking up blood, ensure that the patient is ready:
  - Verify that consent for transfusion has been obtained
  - Connect the primed IV tubing to the patient's IV site to ensure patency
  - Administer any premedication that may be ordered
  - Arrange for pickup from the TML with appropriate documentation

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Picking up Blood / Blood Products

- The TML requires that the person picking up blood/product bring documentation to validate the identification of the patient
- This should include:
  - Patient's full name
  - UNIQUE Identification number (MCP, HCN, Unit number)
  - Location
  - Blood product requested

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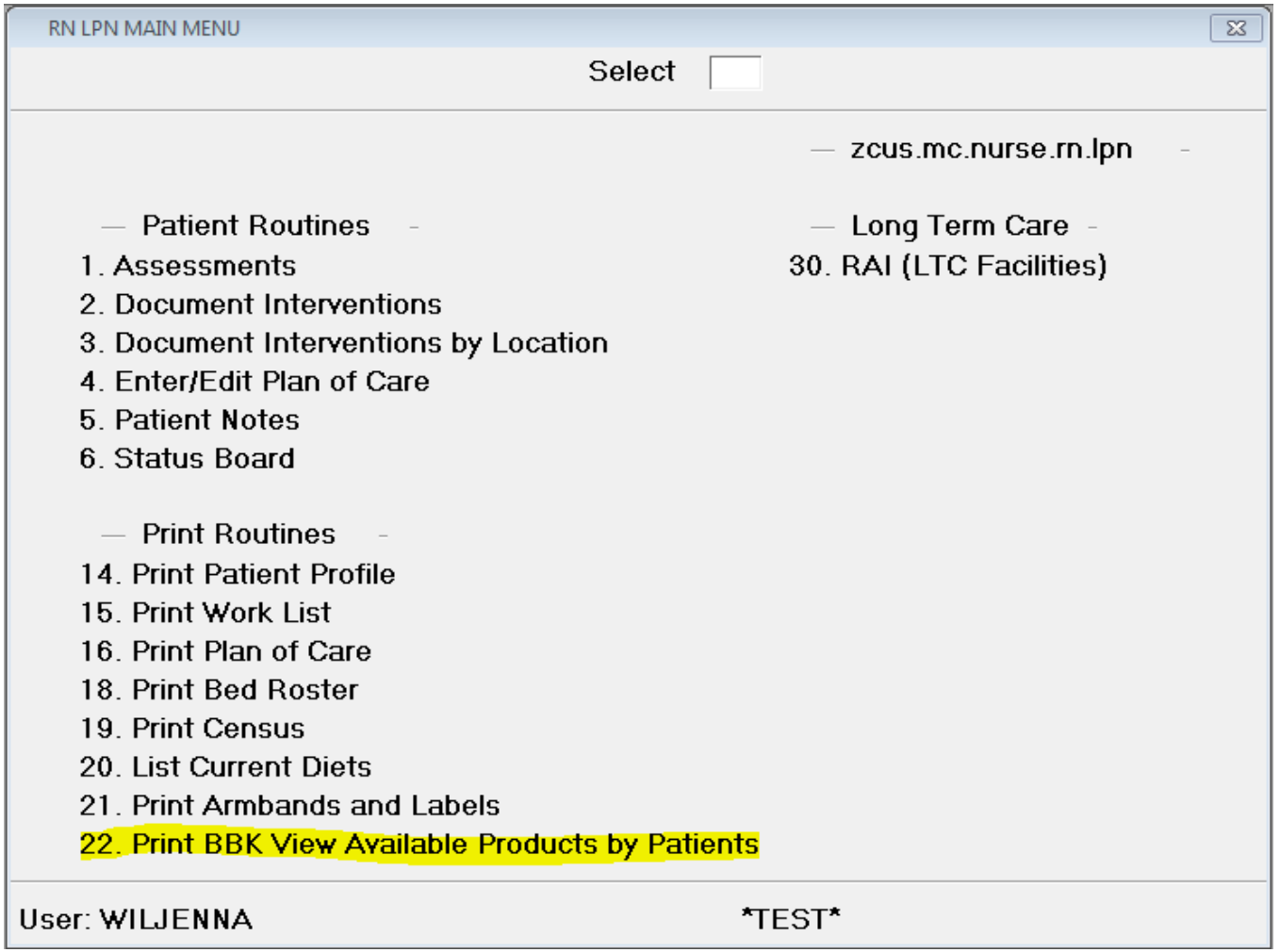
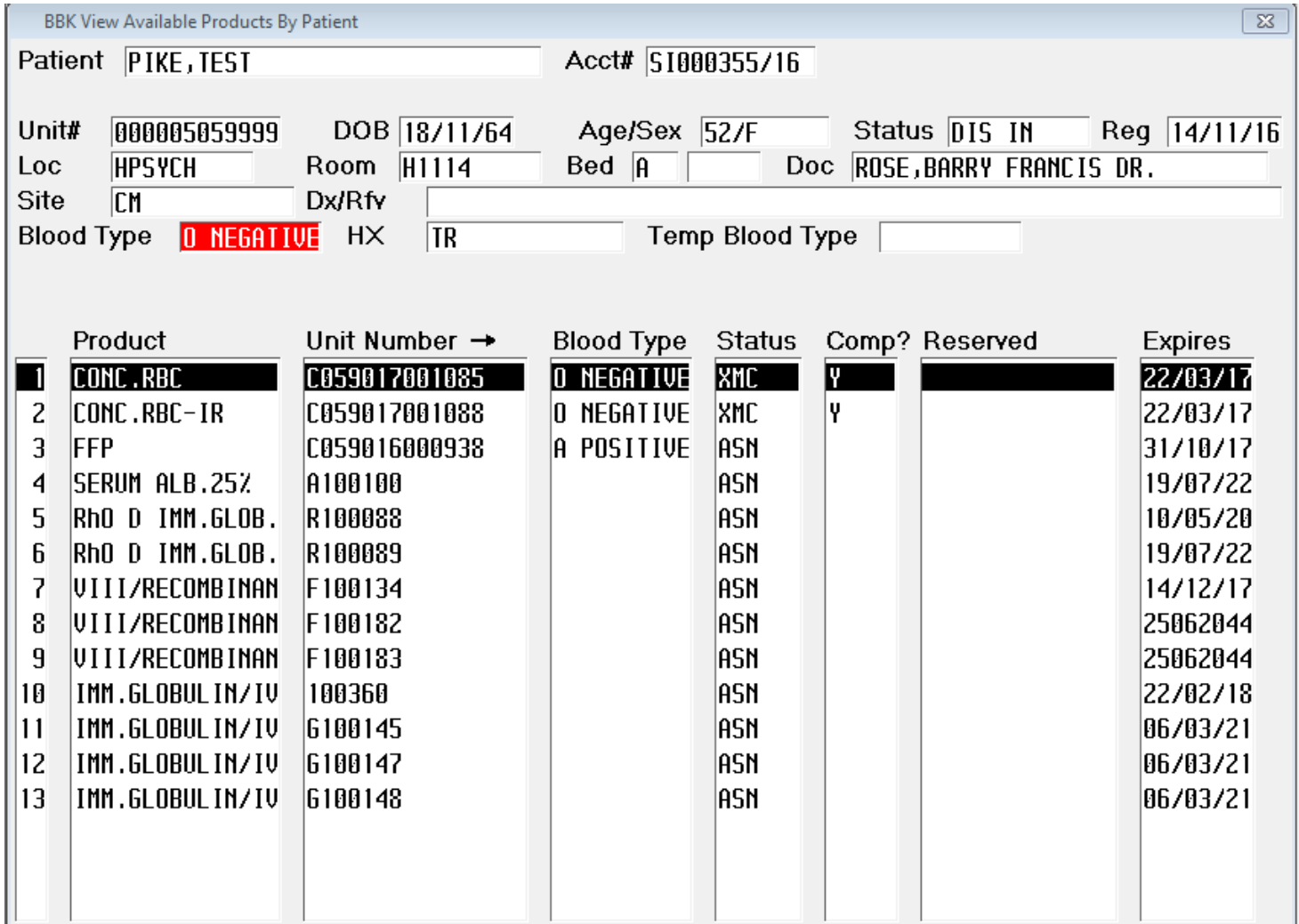
Picking up Blood / Blood Products

- How to view available blood products by patient



Picking up Blood / Blood Products

- To print this report, press F12



Picking up Blood / Blood Products

- Bring this report with you to retrieve any blood or blood product from the laboratory.

RUN DATE: 16/03/17 LABORATORY NPR - HCC **TEST** PAGE 1
RUN TIME: 1611 AVAILABLE PRODUCTS BY PATIENT
RUN USER: WILJENNA

PATIENT PIKE,TEST

ACCT# SI000355/16 **UNIT #** 0000050599 **AGE/SEX** 52/F **STATUS** DIS IN **EG** 14/11/16
LOC HPSYCH **ROOM** H1114 **BED** A **DOCTOR** ROSE,BARRY FRANCIS DR.
SITE CM **DX/RFV**
BLOOD TYPE O NEGATIVE **HX** TR

PRODUCT	UNIT NUMBER	BLOOD TYPE	STATUS	COMP?	RESERVED	EXPIRES
CONC.RBC	C059017001085	O NEGATIVE	XMC	Y		22/03/17
CONC.RBC-IR	C059017001088	O NEGATIVE	XMC	Y		22/03/17
FFP	C059016000938	A POSITIVE	ASN			31/10/17
SERUM ALB.25%	A100100		ASN			19/07/22
RhO D IMM.GLOB.	R100088		ASN			10/05/20
RhO D IMM.GLOB.	R100089		ASN			19/07/22
VIII/RECOMBINAN	F100134		ASN			14/12/17
VIII/RECOMBINAN	F100182		ASN			25062044
VIII/RECOMBINAN	F100183		ASN			25062044
IMM.GLOBULIN/IV	100360		ASN			22/02/18
IMM.GLOBULIN/IV	G100145		ASN			06/03/21
IMM.GLOBULIN/IV	G100147		ASN			06/03/21
IMM.GLOBULIN/IV	G100148		ASN			06/03/21

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Picking up Blood / Blood Products

- Locate the required blood product on the **“ASSIGNED BLOOD PRODUCTS”** Shelf in the designated Blood Bank Fridge.
- If it is a Room Temperature blood product, it will be located in the designated Blood Bank RT location
- Make sure the unit number and all patient identifiers match on the blood product and the patient record sheet

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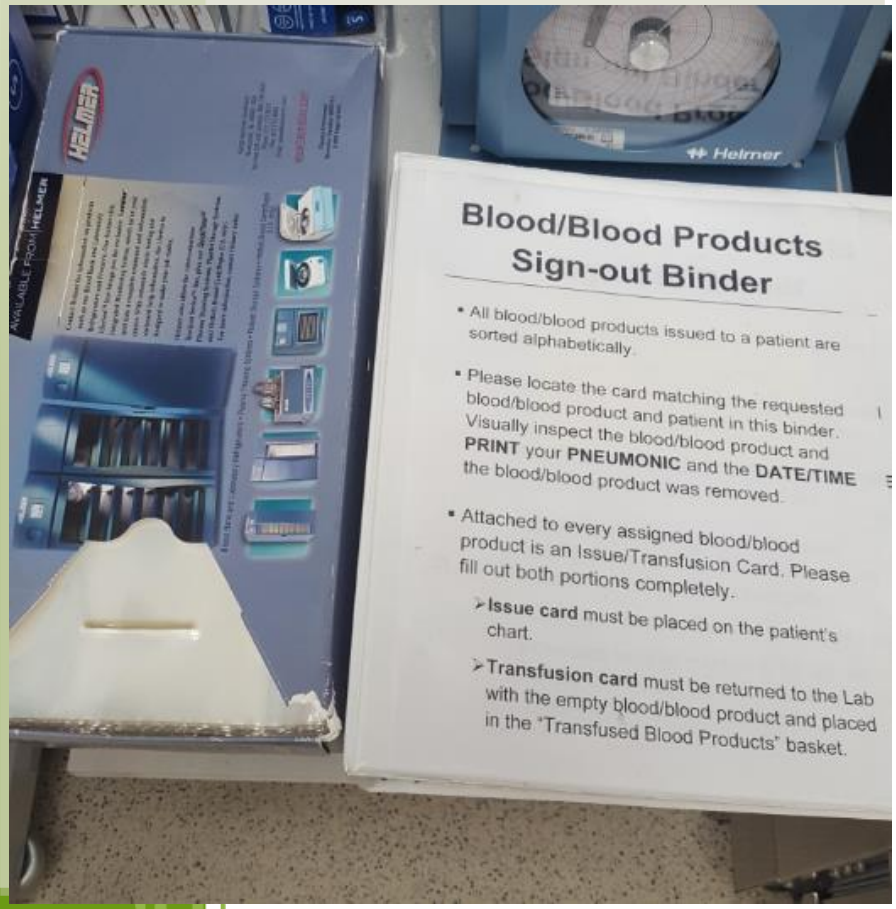
Picking up Blood / Blood Products



- An Issue (sign-out) card is located in the **"Blood/blood products sign-out binder"** in the Transfusion Medicine department
  - MUST be checked against the blood product/transfusion card attached to the blood product
  - MUST be completely and legibly filled out prior to leaving the laboratory
- Before removing the blood product from the laboratory, place in a clear plastic bag for protection

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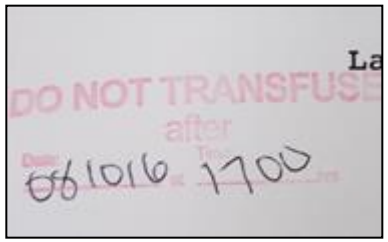
Picking up Blood / Blood Products

Blood Bank Stamp



NOTE: Please print your Mnemonic. Lab staff need to be able to easily identify the people signing out blood components/products.

Assignment / Issue Card

LABRADOR HEALTH CENTRE
Transfusion Service
Assignment/Issue Card

Name: GIRL,BARBIE

Unit#: LW0000000086 HCN: 0

Blood Type: [A POSITIVE] Age/Sex: 35 F DOB: 12/05/79

Specimen #: 1110:BB00001R Location: LW-EAD Acct#: W0000039/14

Product: CONC.RBC Donor #: C059016000012
BC:

Donor Blood Type: [A POSITIVE] Expiry Date: 22/11/16-2359

Compatible: Y 11/10/16 1325 <HAYRU>

Visual Inspection Performed at Retrieval: YES ✓ NO ___

Date and Time Removed: 03/16/2017 @ 1430

Taken By: WILJENNA
Print Mnemonic/Name

Verified By: MCLNAT
Print Mnemonic/Name

Date And Time Returned: _____

Returned By: _____
Print Mnemonic/Name

Comments:

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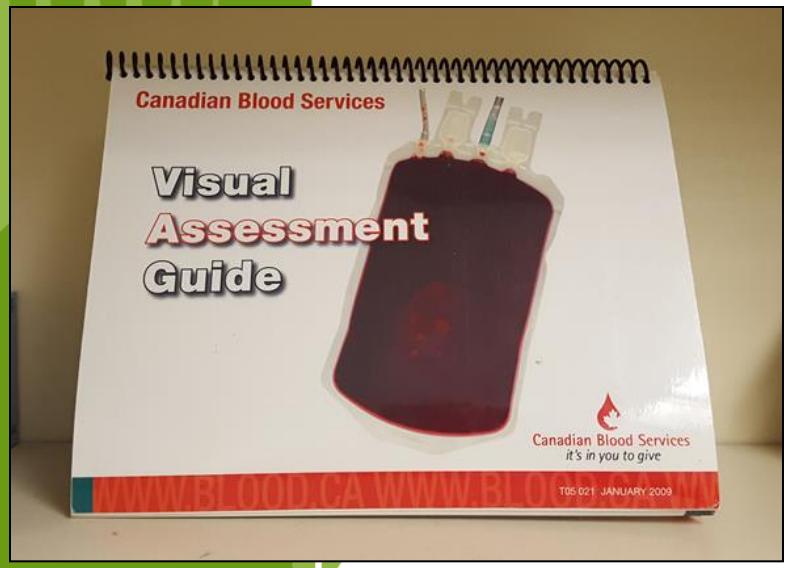
Visual Inspection

- All blood components and blood products must be visually inspected before being removed from the TML
- Things to look for:
  - Discolouration – refer to Visual Assessment Guide
  - Contamination
  - Leakage
  - Expiry dates
  - Integrity of unit and tamper proof seals



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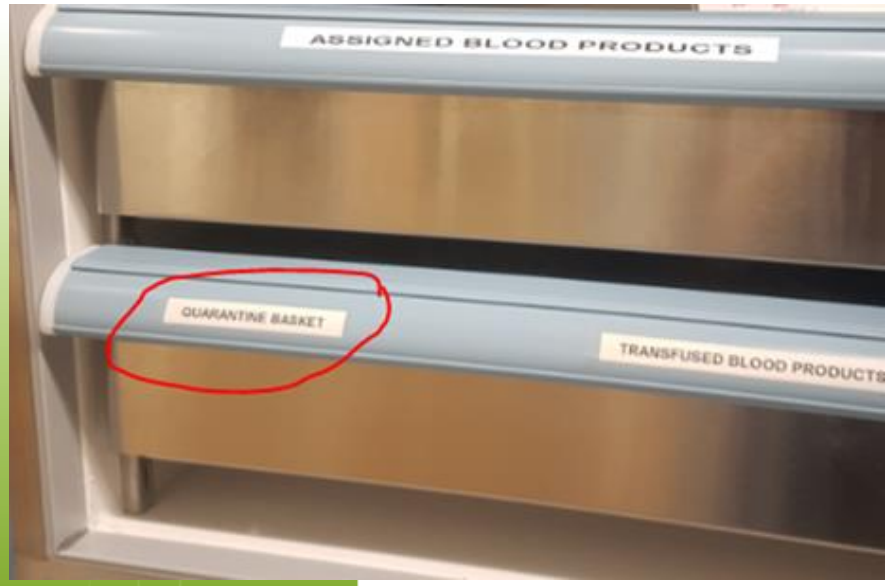

LABRADOR HEALTH CENTRE
Transfusion Service
Assignment/Issue Card

Name: GIRL,BARBIE
Unit#: LW0000000086 HCN: 0
Blood Type: [A POSITIVE] Age/Sex: 35 F DOB: 12/05/79
Specimen #: 1110:BB00001R Location: LW-EAD Acct#: W0000039/14
Product: CONC.RBC Donor #: C059016000012
BC:
Donor Blood Type: [A POSITIVE] Expiry Date: 22/11/16 2359
Compatible: Y 11/10/16 1325 <HAYRU>
Visual Inspection Performed at Retrieval: YES ✓ NO
Date and Time Removed: 03/16/2017 @ 1430
Taken By: WILJENNA
Print Mnemonic/Name
Verified By: MCLNAT
Print Mnemonic/Name
Date And Time Returned: 03/16/2017 @ 1450
Returned By: WILJENNA
Print Mnemonic/Name
Comments:

Returning Blood/Blood Products

- If the transfusion cannot be started immediately, return blood/product to the laboratory **ASAP**
- If there is no technologist in the laboratory, you must place the blood in the **quarantine basket** in the blood bank fridge
- **Never** store blood in unapproved fridges such as ward fridges

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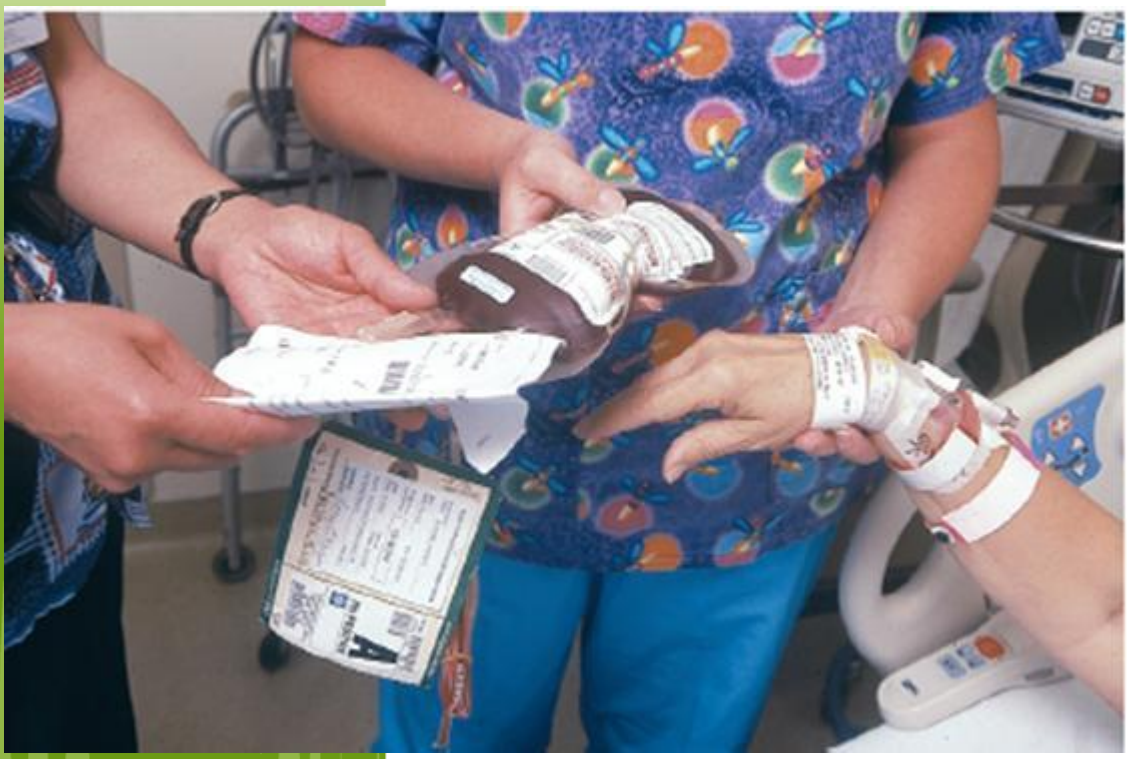
Checking Blood



- To avoid errors, **<u>two</u>** qualified individuals must complete the pre-transfusion check
  - **ALWAYS do the check together at the patient's bedside**
  - Last opportunity to catch any errors
- Transfusion Card must remain attached to the blood throughout the entire transfusion

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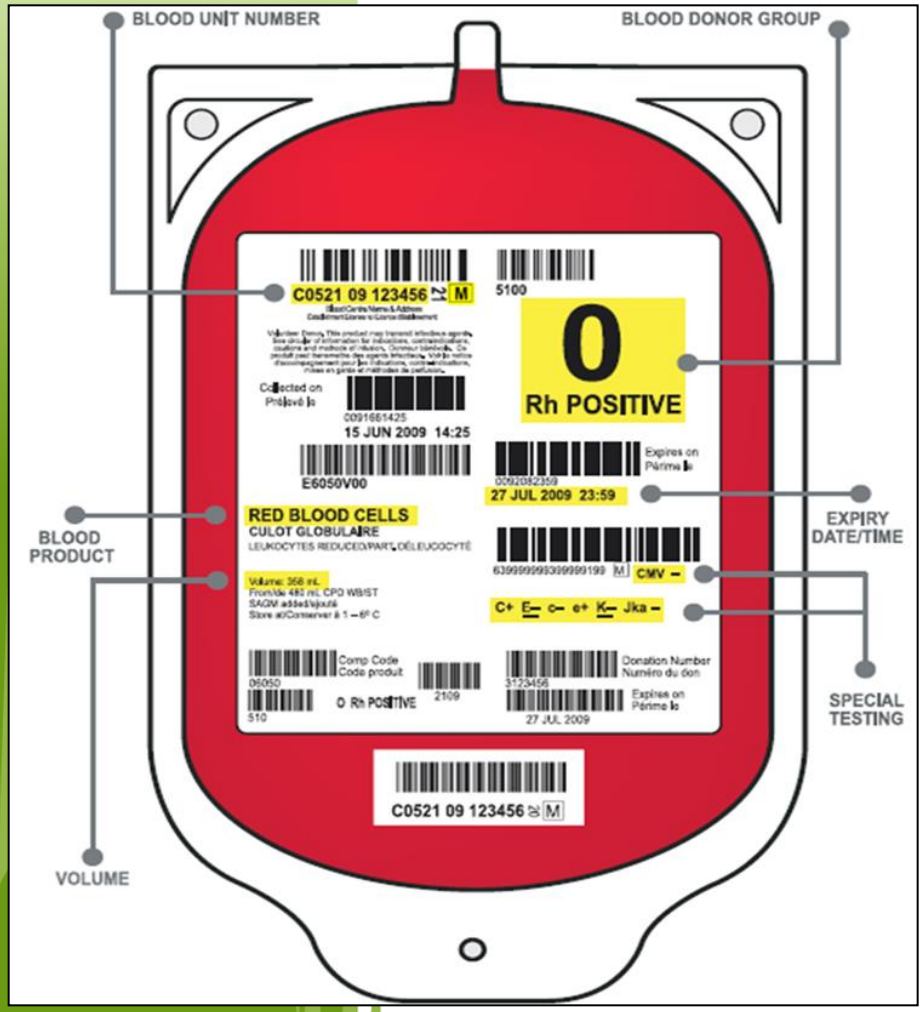
Checking Blood



- Visually check the blood unit for clots, unusual colour, and any leaks in the bag
- Check the expiration date on the Canadian Blood Services (CBS) label
- Check the patient's ABO and Rh to ensure the donor's blood group is compatible with the patient

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Checking Blood

Armband

CBS Label

Transfusion Card

LABRADOR HEALTH CENTRE
Transfusion Service
Assignment/Transfusion Card

Name: GIRL,BARBIE
Blood Type: [A POSITIVE]
Specimen #: 1110:BB00001R

Unit #: LW0000000086 HCN #: 0
Age/Sex: 35/F DOB: 12/05/79
Location: LW-RAD Acct #: WD000039/14

Product: CONC.RBC

Donor #: C059016000012

Donor Blood Type: [A POSITIVE]
Compatible: Y 11/10/16 1325 <HAYRU>

Expiry Date: 22/11/16-2359

Visual Inspection Performed: YES_____ NO_____

Unit Verified By:_____ Unit administered By: _____
Print Mnemonic/Name Print Mnemonic/Name

Transfusion Began: _____ _____ Transfusion Ended: _____ _____
date time date time

Transfused Volume:_____ Reaction:_____

Blood Warmer Used: Yes____ No____ Temperature of Blood Warmer: _____ Initial: ____

Comments:

COMPLETE THIS PORTION AND ATTACH TO PATIENT CHART

- Check your patient's armband. When possible, include your patient in the identification process by asking specific questions:
  - 'How do you spell your name?'
  - 'What is your date of birth?'
- Check that your patient's name and unique identifier matches on:
  - ID armband
  - Transfusion card
- Check that the blood unit number and donor blood group matches on:
  - CBS label
  - Transfusion card

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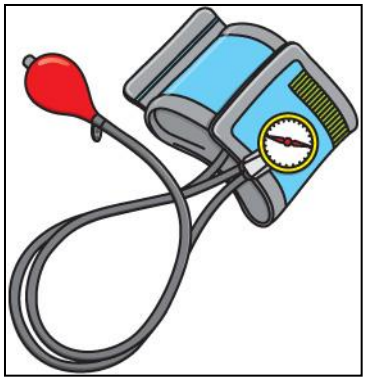
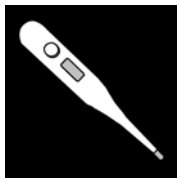
Starting Blood





- **Before starting blood:**
  - Record baseline vital signs:
    - Temperature
    - Blood pressure
    - Pulse
    - Respiration
    - Oxygen saturation
    - Auscultation for patients at risk for overload (elderly, pediatric, cardiovascular disease)
  - When possible instruct your patient to notify you if they experience any new/unusual symptoms:
    - Hives/itching, feeling feverish or chills, difficulty breathing, back pain/pain at the infusion site, any feeling different from usual

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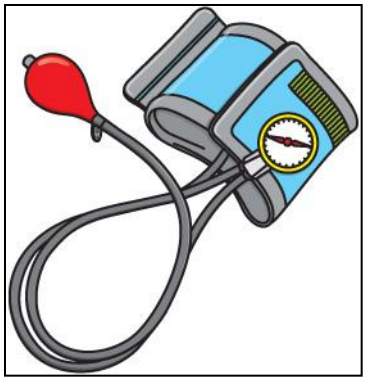
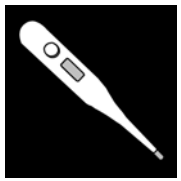
Starting Blood





- **After starting blood:**
  - For the first 15 minutes:
    - Start with a slow rate unless transfusion is extremely urgent
    - Monitor your patient closely
    - Most severe acute reactions will occur within the first 15 minutes of a transfusion
  - After the first 15 minutes:
    - Reassess your patient and repeat vital signs
    - Increase flow to prescribed rate if no reaction observed

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Monitoring

Monitor, Monitor, Monitor!

- Monitor the patient closely and document vital signs:
  - Within 30 minutes before transfusion
  - After the first 15 minutes
  - At 60 minute intervals
  - Post transfusion
  - If there is a suspected reaction
  - Repeat with each subsequent unit

- Repeat assessment of vital signs more often for patients:
  - At greater risk for circulatory overload
  - Who have experienced previous reactions
  - Who are already unstable

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Monitoring
Massive Transfusions

- Defined as transfusing more than 10 units of blood components or transfusing more than one blood volume in a 24-hour period
- Recommendations for the management of patients during a massive hemorrhage event (MHE) include:
  - Monitor core temperature
  - Prompt use of measures to prevent hypothermia, including use of a blood warmer for all IV fluids, RBC, and plasma
  - Monitor for secondary conditions (hypocalcemia, acidosis, hyperkalemia, dilutional coagulopathy)
- Refer to our Massive Hemorrhage Protocol for further information (Intranet)

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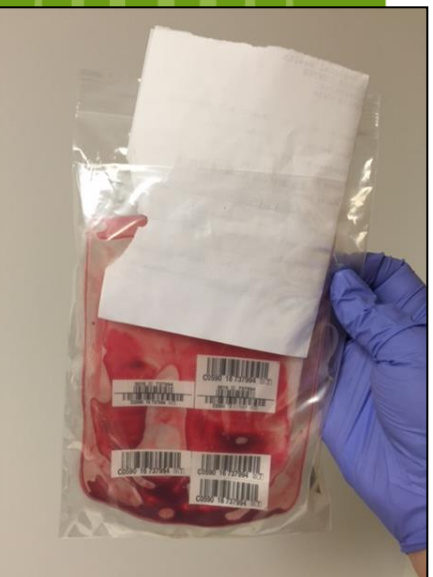
Completing a Transfusion

1. Complete transfusion within **4 hours of removal from controlled storage**
   - In order to decrease the risk of bacterial growth
2. If desired flush the blood tubing with normal saline
3. Check end of transfusion vital signs
4. Disconnect blood tubing when transfusion is completed
   - Insert empty blood bag into a biohazard bag
   - Insert completed transfusion card in the front pouch of the biohazard bag
   - Return to TML. Place in the **"TRANSFUSED BLOOD PRODUCTS"** basket



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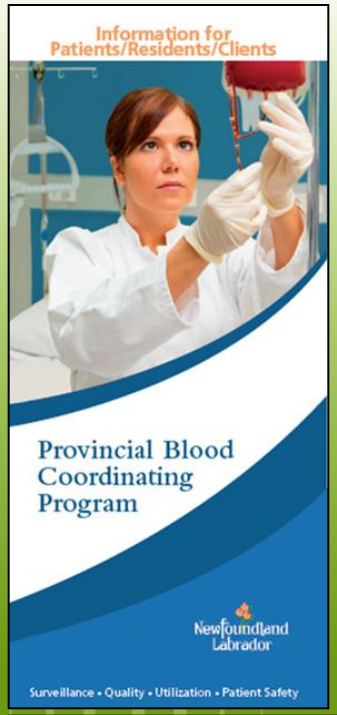

Completing a Transfusion

- Continue to assess the patient for symptoms of transfusion reactions that might occur up to **<u>6 hours post transfusion</u>**

- Out-patients or their care givers should be provided with information detailing:
  - Signs and symptoms of transfusion reactions
  - Information on what to do if they experience a reaction
  - Contact information for reporting reactions

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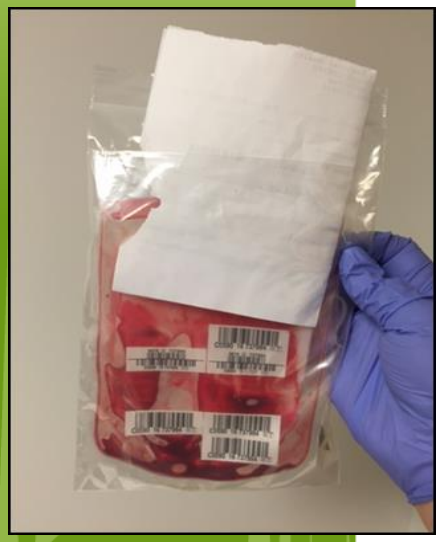
Documentation



- Document each blood transfusion by:
  1. Placing one Transfusion Card on the patient's chart.
  2. Returning one Transfusion Card to the TML with empty blood bag.
- Transfusion Cards MUST include:
  - Date
  - Start and finish times
  - Volume transfused
  - Visual inspection performed and any special instructions (use and temp of the blood warmer)
  - Name of persons checking and administering blood

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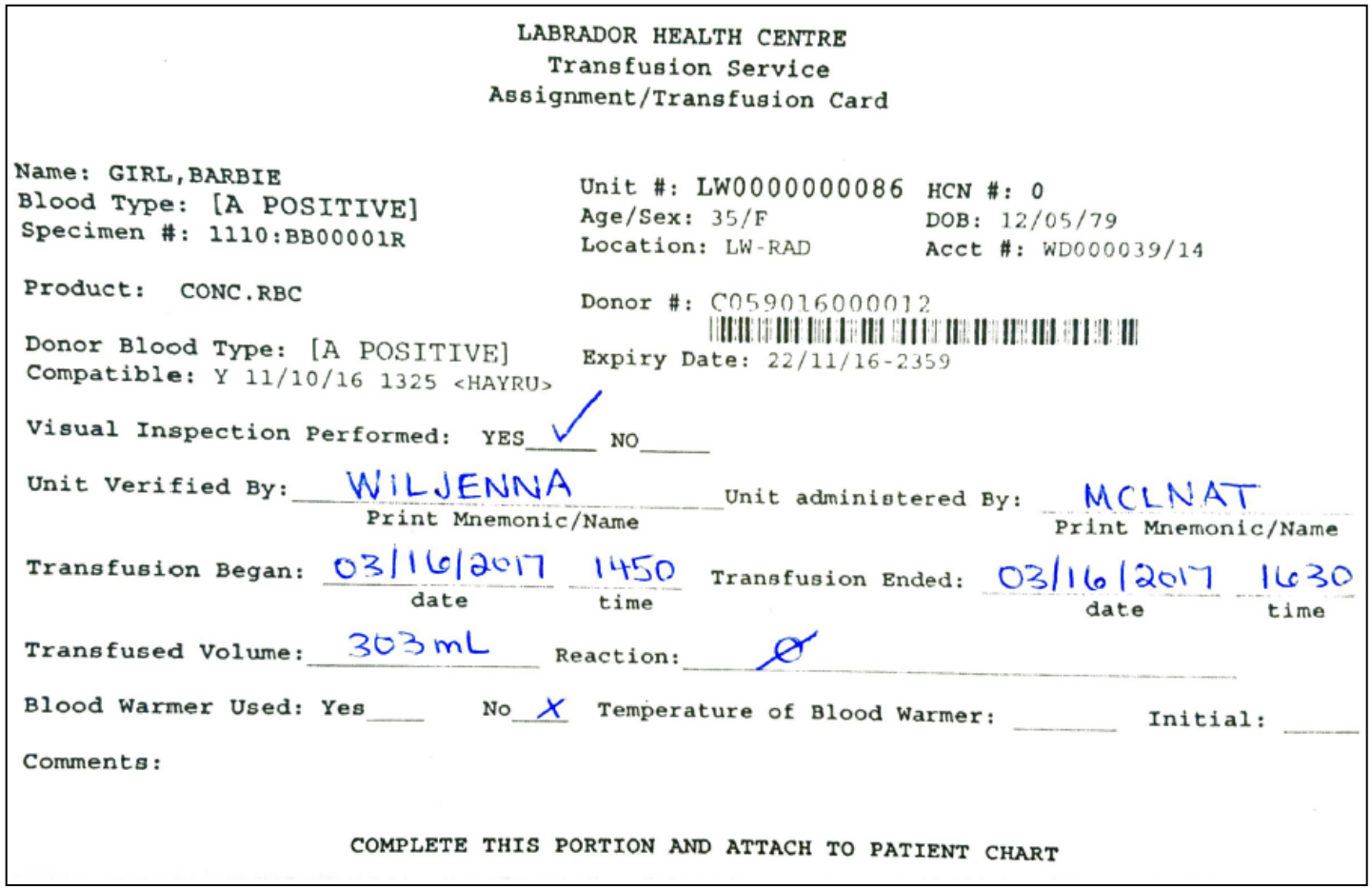
Documentation

- Example of a completed Transfusion Card

NOTE:
Please print your Mnemonic. Lab staff need to be able to easily identify the person(s) performing transfusion



LABRADOR HEALTH CENTRE
Transfusion Service
Assignment/Transfusion Card

Name: GIRL,BARBIE
Blood Type: [A POSITIVE]
Specimen #: 1110:BB00001R

Unit #: LW0000000086 HCN #: 0
Age/Sex: 35/F DOB: 12/05/79
Location: LW-RAD Acct #: WD000039/14

Product: CONC.RBC

Donor #: C059016000012

Donor Blood Type: [A POSITIVE]
Compatible: Y 11/10/16 1325 <HAYRU>

Expiry Date: 22/11/16-2359

Visual Inspection Performed: YES ✓ NO ____

Unit Verified By: WILJENNA (Print Mnemonic/Name) Unit administered By: MCLNAT (Print Mnemonic/Name)

Transfusion Began: 03/16/2017 (date) 1450 (time) Transfusion Ended: 03/16/2017 (date) 1630 (time)

Transfused Volume: 303 mL Reaction: Ø

Blood Warmer Used: Yes ____ No X Temperature of Blood Warmer: ____ Initial: ____

Comments:

COMPLETE THIS PORTION AND ATTACH TO PATIENT CHART

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Documentation

- Additional information should be documented in the patient's chart:
  - Vital signs and patient assessments
  - Follow-up testing done
  - Patient teaching
  - Any reactions and treatment provided

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8 Rights of Transfusion Administration

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Module 2: Indications

Learning Objectives

- Describe blood components and blood products
- Define the major uses, appropriate storage and expiration of blood components and products
- Recognize IV tubing requirements and appropriate infusion times
- Review ABO and Rh blood group compatibility

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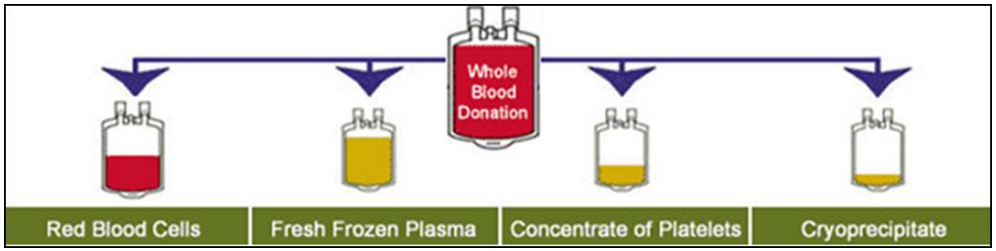
Blood Components and Blood Products

- **Blood Components** are separated from the whole blood donation:
  - Red blood cells
  - Plasma
  - Platelets
  - Cryoprecipitate



- **Blood Products** are therapeutic products derived from human blood or plasma and produced by a manufacturing process.
(e.g. albumin, immunoglobulins, coagulation products).

- Blood components and products are distributed by CBS.

Canadian Blood Services
it's in you to give

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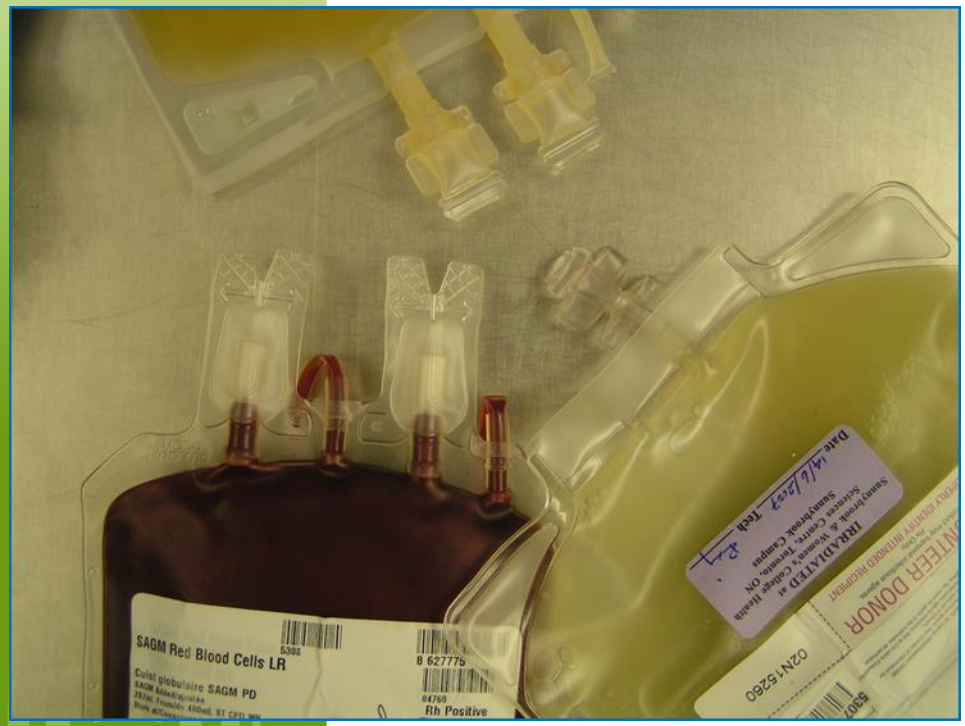
Blood Components



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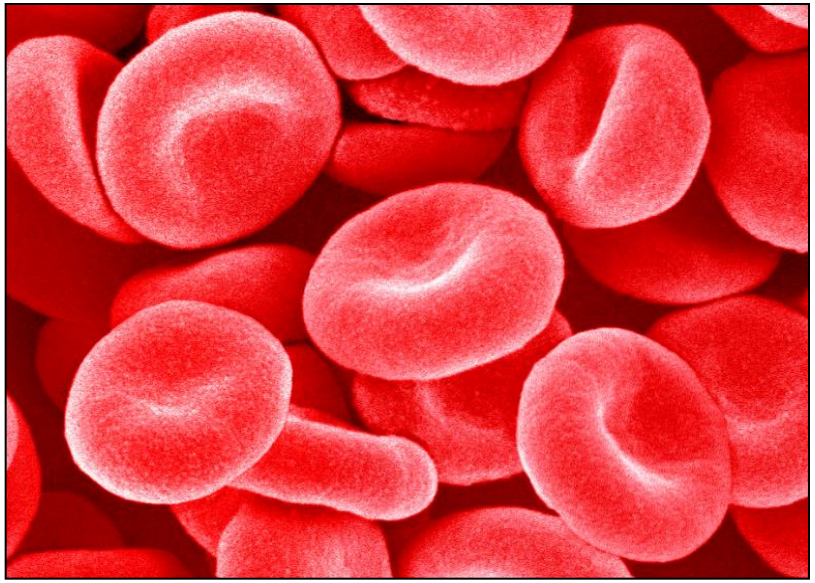
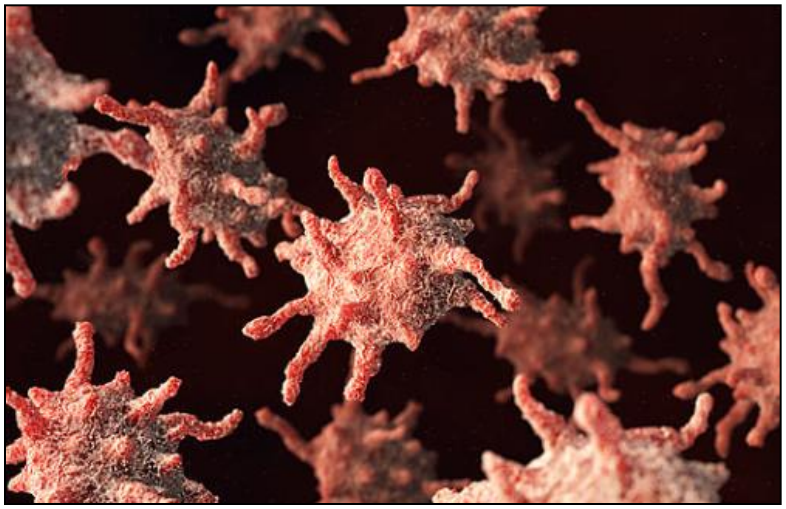
Red Blood Cells

Major Uses	Storage and Expiration	Administration
Bleeding or anemic non-bleeding patients with signs and symptoms of impaired tissue oxygen delivery	2-6° C in approved fridge only Up to 42 days	• Blood tubing required • Initiate transfusion slowly for first 15 minutes • Transfuse over no more than 4 hours • Typically over 1 ½ - 2 hours with slower rates for patients at risk for circulatory overload



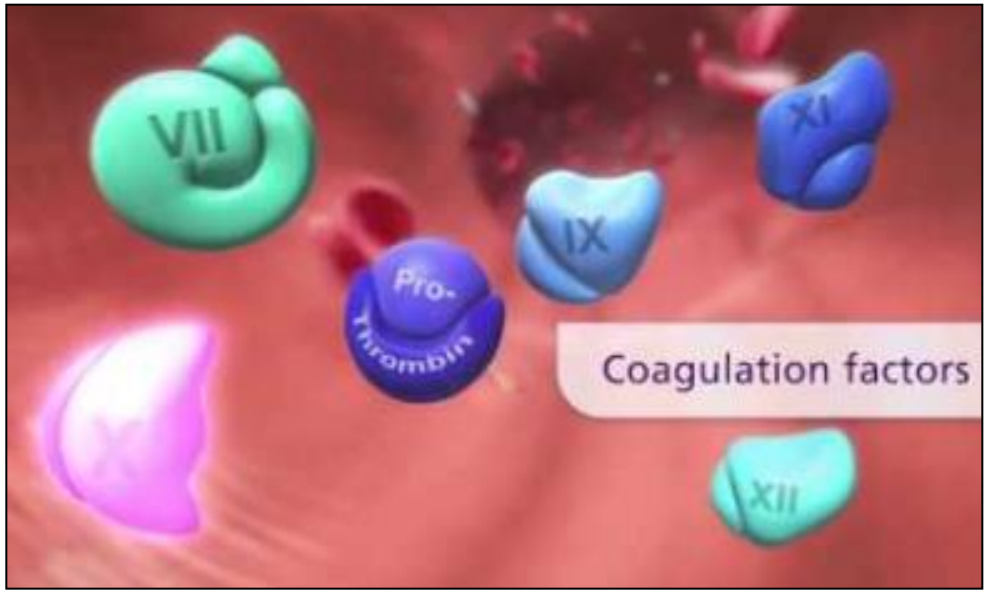
Platelets

Major Uses	Storage and Expiration	Administration
Control or prevent bleeding in patients with: • Low platelet counts • Platelet dysfunction	20-24° C on an agitator to prevent clumping 5 days	• New blood tubing required • Initiate transfusion slowly for first 15 min • Transfuse over no more than 4 hours • Typically over 60 minutes



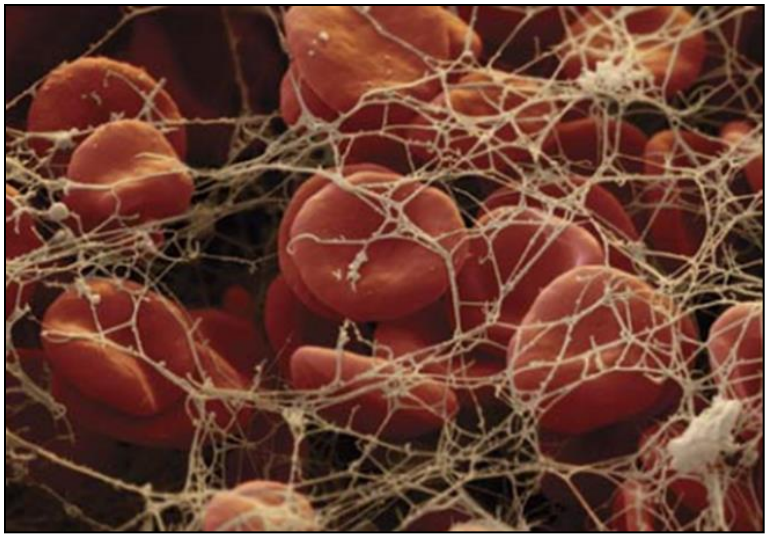
Plasma

Major Uses	Storage and Expiration	Administration
• Factor replacement • Massive transfusion	Frozen: 1 year Once thawed expires after 24 hours stored at 2-6°C	• Blood tubing required • Initiate transfusion slowly for first 15 minutes • Transfuse over no more than 4 hours • Typically over 30 minutes – 2 hours



Cryoprecipitate

Major Uses	Storage and Expiration	Administration
To replace: • Fibrinogen in patients actively bleeding who have a low fibrinogen level	Frozen: 1 year Once thawed expires after 4 hours stored at 20-24° C	• Blood tubing required • Transfuse as rapidly as tolerated



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ABO/Rh Blood Group Compatibility

IMPORTANT: An ABO incompatible blood transfusion will result in a potentially fatal **Hemolytic Transfusion Reaction**

Appendix A: ABO/Rh Compatibility Table

Patient's Group	Packed Cells[1]	Plasma[2]	Platelets[3] (listed in order of preference)	Cryoprecipitate[2]
O Pos	O+, O-	All groups	O, B, A, AB	Any group is safe to transfuse.
O Neg	O-			
A Pos	A+, A-, O+, O-	A, AB	A, AB, B*, O*	
A Neg	A-, O-			
B Pos	B+, B-, O+, O-	B, AB	B, AB, A*, O*	
B Neg	B-, O-			
AB Pos	All groups	Only AB	AB, B*, A*, O*	
AB Neg	AB-, B-, A-, O-			
UNKNOWN	O+ All males, Females>50yrs O- Females<50yrs	Only AB	Any group	

Rh Comments

1 Rh Positive red cells may be given to Rh Negative patient when Rh negative red cells are of diminished supply

2 Rh is not taken into consideration when transfusing plasma or cryoprecipitate

3 If Rh Positive platelets are issued to an Rh Negative patient, RhIg is recommended. One vial of 300 µg (1500 IU) RhIg is required to counteract the immunizing effects of approximately 15-17 mL of Rh positive red cells.

Platelet Comments

ABO identical platelets are preferred, but frequent platelet shortages limit availability. If ABO identical platelets cannot be issued, order of preference for non-identical is listed for each blood group.

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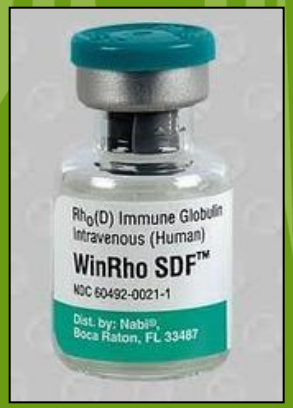
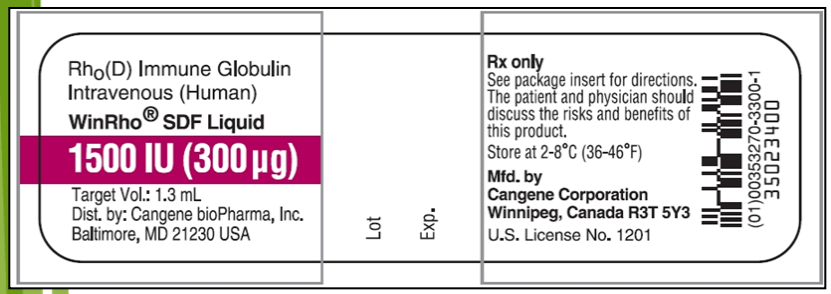
Blood Products

Rh Immune Globulin (WinRho)

Major Uses	Storage and Expiration	Administration
Used for Rh negative patients: • Following exposure or possible exposure to Rh positive blood • To prevent sensitization to Rh(D) antigen during pregnancy and delivery	2-8° C Expires as indicated on packaging	• Administered usually IM • There must be an antibody screen performed within the last 30 days prior to administering RhIg (WinRho) • Post-partum patients have up to 72 hours after delivery to receive WinRho. It is required that the newborn have a cord group typing performed before WinRho is issued.





Intravenous Immune Globulin (IVIG)

Major Uses	Storage and Expiration	Administration
• Replacement of immunoglobulins • Control of some infections and autoimmune diseases	Storage variable by brand Expires as indicated on packaging	• Standard IV set with vent • No blood tubing or filtering required • Infusion pump required • Begin infusion slowly and increase as tolerated (see infusion charts) • Frequent vital sign monitoring required • Requires a special request form filled out by the physician

Albumin 5% and 25%

Major Uses	Storage and Expiration	Administration
5% Albumin: Plasma exchange procedures **25% Albumin:** Ascites patients undergoing large volume paracentesis	Room temperature < 30° C Expires as indicated on packaging	• Standard IV set with vent • No blood tubing or filtering required • Begin infusion slowly then as tolerated • See package insert for maximum infusion rates

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Prothrombin Complex Concentrate (PCCs)

Major Uses	Storage and Expiration	Administration
• Urgent reversal of warfarin in bleeding patients and those requiring emergency surgery	2-25° C Expires as indicated on packaging Use immediately once reconstituted	• Standard IV set with vent • See pamphlet insert for infusion rates • Dosage based on patient weight and INR value – usually 2 - 4 vials • Effect is immediate and lasts 6 - 12 hours • For complete reversal, Vitamin K 10 mg IV must also be given • Requires a special form filled out by the physician

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Blood Components and Product Storage

- **Blood Bank Refrigerators:**
  - 24 hour temperature monitoring (2 - 6ºC)
  - Audible alarms
  - Designated crossmatch and assigned areas
- **Blood Bank Freezers:**
  - 24 hour temperature monitoring (-45 to -25ºC)
  - Audible alarms
- **Room Temperature storage:**
  - 24 hour temperature monitoring (18º - 25ºC)
  - Designated assigned areas
- **Platelet Incubator/Agitator:**
  - 24 hour temperature monitoring (18º - 25ºC)
  - Audible alarms
  - Continuous agitation

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Blood Wastage

Product Name		Cost
Platelets		492.00
Fresh Frozen Plasma		376.00
Red Blood Cells		411.00
Albumin 25%	100 ml	57.33
IVIG	per gram	64.83
Anti-D (WinRho)	300 mcg vial	87.43
Prothrombin Complex (PCC)	per IU	0.71

To reduce waste, please make sure:

- ✓ Consent has been signed and IV access is ok **before** retrieving the blood/blood product
- ✓ Do NOT delay in taking vital signs
- ✓ Transfusion is **started within 60 minutes** of removal from designated storage

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Health

Module 3: Transfusion Reactions

Learning Objectives

- Identify the signs and symptoms of an acute transfusion reaction
- List the different types of acute transfusion reactions
- Describe the clinical management, reaction investigation and reporting required
- Utilize the transfusion reaction algorithm and chart provided by the NL Provincial Blood Coordinating Program

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Recognizing Reactions

- Acute reactions usually occur **during and up to 6 hours** following the end of a transfusion and may present with:
  - Fever
  - Shaking chills or rigors with or without fever
  - Hives or rash, itchiness, swelling
  - Dyspnea, shortness of breath, or wheezing
  - Hypotension or hypertension
  - Tachycardia
  - Red urine, diffuse bleeding or oozing
  - Lumbar pain, anxiety, pain at the IV site
  - Nausea and vomiting
  - Headache
  - Irritability (pediatric patients)

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Recognizing Reactions

- Initially it can be challenging to distinguish a minor reaction from a serious reaction based solely on the presenting signs and symptoms.
- Any unexpected or suspicious symptom **MUST** be reported to the TML for investigation of a possible transfusion reaction.
- Delayed transfusion reactions do not present with symptoms until days or weeks following a transfusion.

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Recognizing Reactions

Signs and Symptoms	Possible Transfusion Reaction
Fever, shaking chills, or rigors	• Bacterial contamination • Acute hemolytic transfusion reaction • Transfusion related acute lung injury (TRALI) • Febrile non-hemolytic transfusion reaction
Urticaria and other allergic symptoms	• Anaphylaxis • Minor allergic reaction
Dyspnea	• TRALI • Transfusion associated circulatory overload (TACO) • Anaphylaxis • Bacterial contamination • Acute hemolytic transfusion reaction
Hypertension	• TACO
Hypotension	• Bradykinin mediated hypotension • Bacterial contamination • Acute hemolytic transfusion reaction • TRALI • Anaphylaxis
Hemolysis, hemoglobinuria	• Acute hemolytic transfusion reaction

Pain	• Acute hemolytic transfusion reaction
	  ○ IV site
	  ○ lumbar
	• TACO
	  ○ Chest

Nausea and vomiting	• Acute hemolytic transfusion reaction • Anaphylaxis • Febrile non hemolytic transfusion reaction

Transfusion Reactions

Type of Reaction	Suspected Transfusion Reaction Signs & Symptoms	Timing of Symptoms	Actions & Suggested Treatment / Investigations
ACUTE (< 24 hours)			
Minor Allergic Reaction	Intensely pruritic localized/or widespread urticaria less than 2/3 of the body; generalized erythema or flushing	During transfusion up to 2-3 hours from start	Consult with Physician–diphenhydramine hydrochloride 25-50 mg PO/IM or IV; proceed with **CAUTION**
Anaphylactic	Angioedema–localized non-pitting deep edema; upper airway obstruction–laryngeal edema, hoarseness, stridor, 'lump in the throat;' lower airway obstruction –bronchospasm, wheeze, chest tightness, dyspnea, cyanosis; profound hypotension	1-45 minutes after start of infusion; majority within 5 minutes	Epinephrine 0.3 - 0.5mg S/C or IV (up to 3 doses); fluid bolus; vasopressors if intractable hypotension; **DO NOT RESTART TRANSFUSION**
Hypotension	Abrupt onset of clinically significant hypotension–facial flushing with or without mild respiratory symptoms	Within 5 minutes after start of infusion	Supportive therapy; **DO NOT RESTART TRANSFUSION**
Febrile Non-Hemolytic	Cold sensation, rigors, nausea, vomiting with/without temperature greater than 1°C above baseline.	Usually within 30 minutes after start of infusion; up to one (1) hour after completed	Consult with Physician–Acetaminophen 325-500 mg PO; proceed with **CAUTION**
Acute Hemolytic (AHTR)	Temperature ≥ 39°C, hypotension, tachycardia, rigors/chills, anxiety, dyspnea, anemia, hyperbilirubinemia, hemoglobinuria/oliguria, bleeding at IV site, nausea/vomiting, DIC, pain –back/chest/head/flank/abdomen/groin/IV site	Usually within first 15 minutes; up to 24 hours following transfusion.	Usually within first 15 minutes; up to 24 hours following transfusion. Serologic testing: group and screen, cross-match, DAT, LDH, BUN, creatinine, TB; IV Fluids **DO NOT RESTART TRANSFUSION**

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Transfusion Reactions

Type of Reaction	Suspected Transfusion Reaction Signs & Symptoms	Timing of Symptoms	Actions & Suggested Treatment / Investigations
ACUTE (< 24 hours)			
TACO	Dyspnea, orthopnea, cyanosis, hypoxemia, tachycardia, hypertension, pulmonary/pedal edema, elevated JVP	Within 1-2, up to 6 hours following start of transfusion	Oxygen, diuretics, elevate head of bed, chest x-ray DO NOT RESTART TRANSFUSION
Transfusion Related Acute Lung Injury (TRALI)	Acute respiratory distress, dyspnea, cyanosis, severe hypoxemia, severe bilateral pulmonary edema, bilateral infiltrates on chest x-ray, hypotension unresponsive to fluid bolus	Within 1-2 hours during transfusion or within 6 hours post-transfusion	Oxygen, chest x-ray, intubation and ventilation, vasopressors DO NOT RESTART TRANSFUSION
Bacterial Contamination	Temperature ≥ 38.5°C, chills, hypotension, shock, nausea/vomiting, tachycardia, hypotension	During or within 4 hours of transfusion	Treatment of shock, DIC, renal failure, product and recipient cultures, antibiotics–broad spectrum initially; anti-pseudomonas if red cells implicated DO NOT RESTART TRANSFUSION
DELAYED (> 24 hours)			
Delayed Hemolytic	Weakness, unexplained fall in post-transfusion hemoglobin, elevated serum bilirubin	Within 3-7 days post-transfusion and up to 21 days post-transfusion	Provide antigen negative blood products for subsequent transfusions
Transfusion Associated Graft Versus Host Disease	Fever, erythematous cutaneous pruritic rash which progresses to generalized erythroderma, watery/bloody diarrhea, pancytopenia, liver dysfunction, anorexia, nausea/vomiting	Within 2-50 days of transfusion (usually 1-2 weeks)	Largely ineffective–Immunosuppressive therapy, cyclosporine/OKT3, cyclophosphamide/antithymocyte, T cell monoclonal antibodies, HPC transplants, irradiated components. Mortality is greater than 90%
Post Transfusion Purpura	Purpura, bleeding, platelet count less than $10X10^9/L$	1-24 days post transfusion	IVIG

Acute Reaction Management

If the patient experiences any signs and symptoms of an adverse reaction:

1. STOP THE TRANSFUSION IMMEDIATELY and clamp the tubing as close to the IV site as possible
2. Maintain IV access with appropriate solution (i.e. 0.9%NaCl), if applicable
3. Contact physician for medical assessment and notify laboratory of transfusion reaction
4. Assess vital signs every 15 minutes until stable
5. Confirm positive patient identification on all labels, tags, forms, blood orders, and identification armband to rule out clerical discrepancy
6. When transfusion is terminated, DO NOT disconnect the infusion set from the blood component/product. Send the implicated blood component/product with the infusion set attached immediately to the Transfusion Medicine Laboratory.
7. Fill out the **Transfusion Incident Adverse Reaction form** completely and bring to the TML immediately
8. Order lab tests/chest x-ray as required by physician
9. Document intervention and management of clinical symptoms

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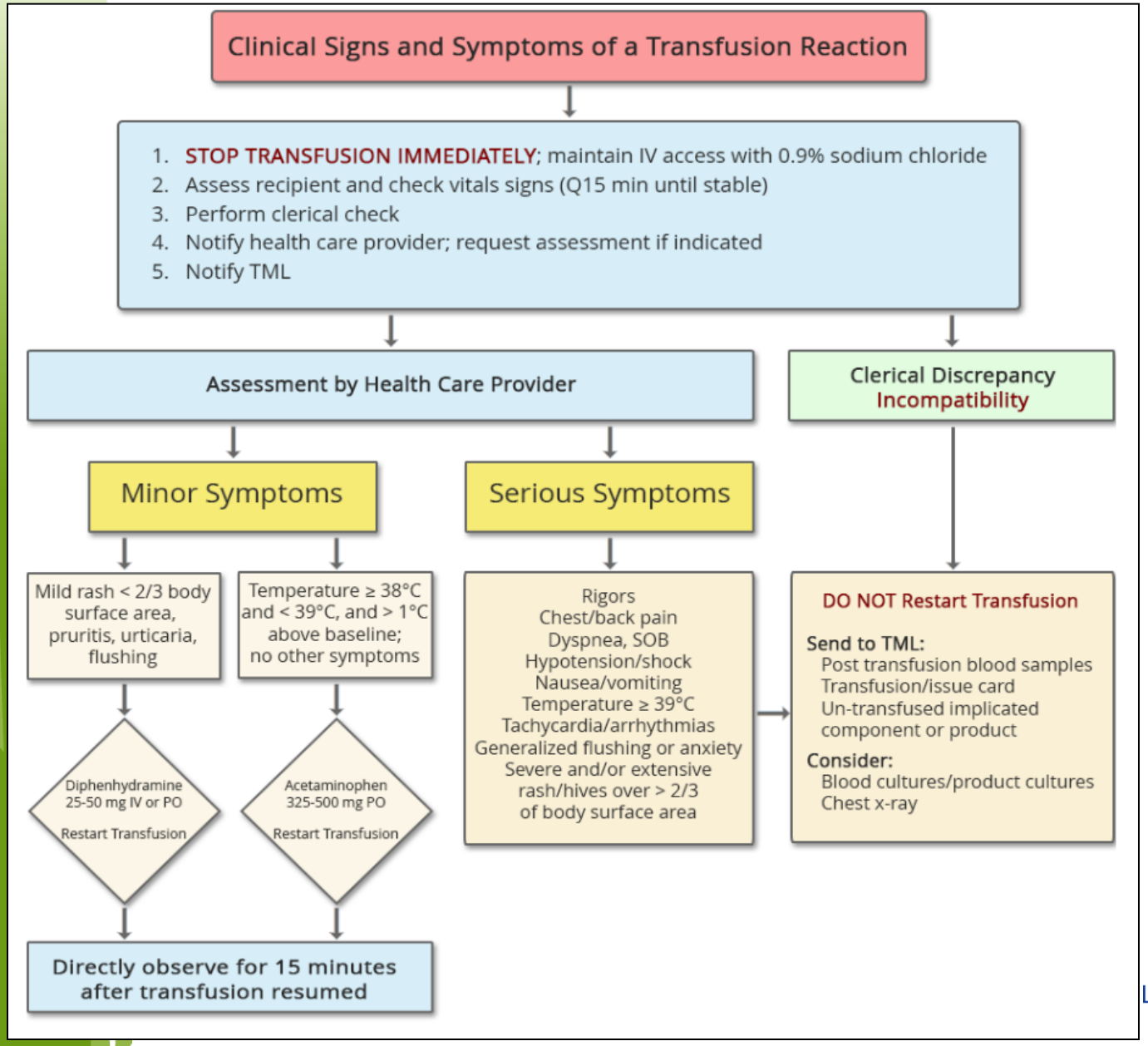
Algorithm Suspected Transfusion Reaction



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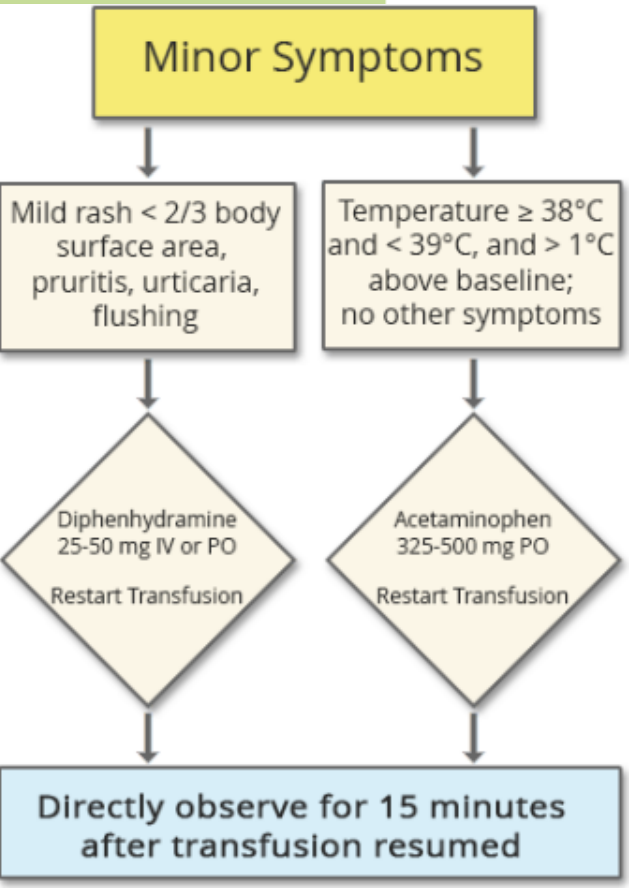
Restarting a Transfusion



- If the patient experiences only very minor symptoms, restarting the transfusion may be possible. (Mild fever with no other symptoms, and minor allergic **only**)
- General guidelines for continuing a transfusion:
  - Initially **STOP** the transfusion and assess patient
  - Consult physician
  - Medicate patient as ordered
  - Proceed cautiously with more frequent patient assessments
  - Remember 4 hour limit
- Laboratory Serological Investigation not required, unless requested by the physician.
- ALL TRANSFUSION REACTIONS must still be documented on the **Transfusion Incident Adverse Reaction Form** and sent to the TML.

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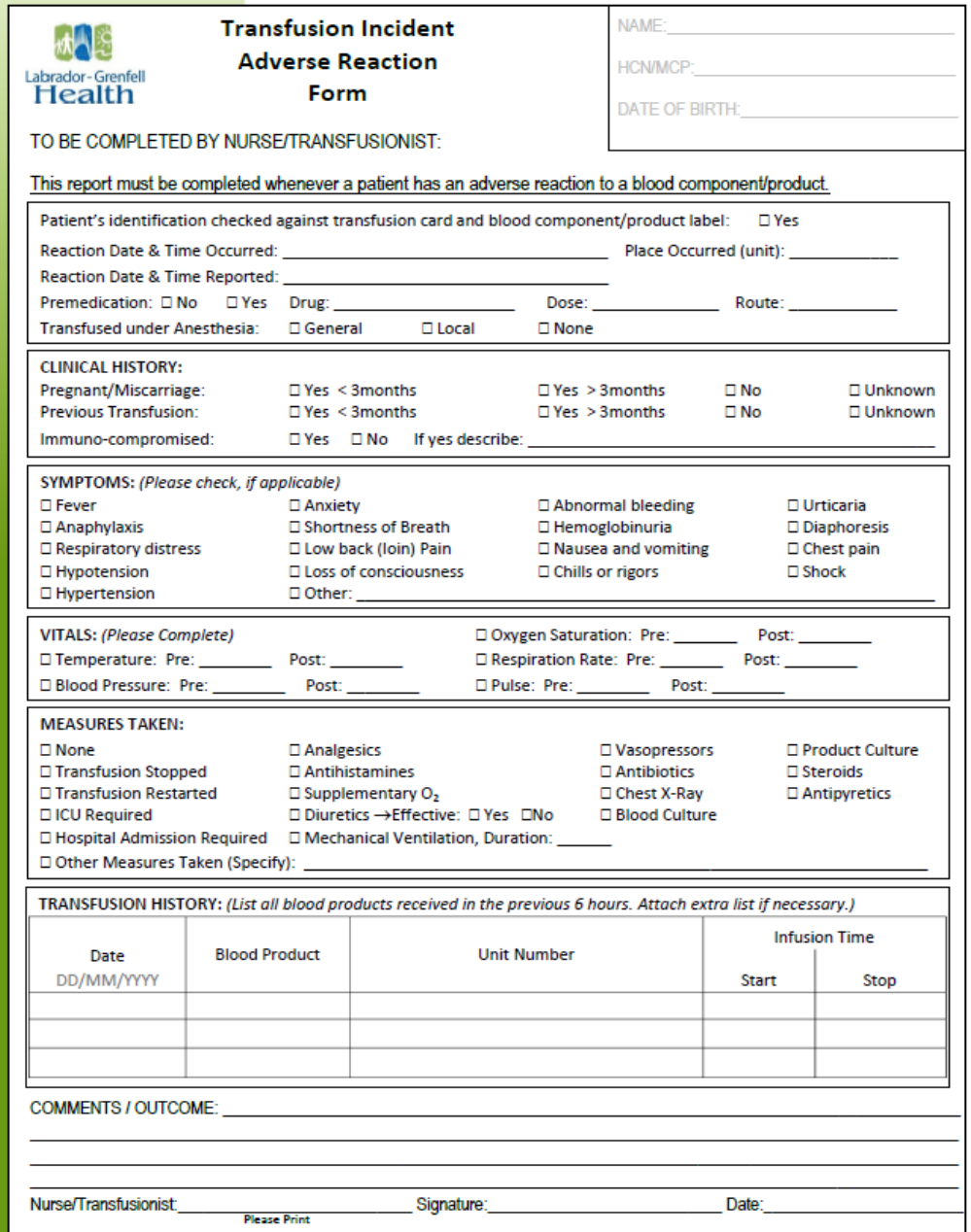
Transfusion Incident Adverse Reaction Form



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Transfusion Incident Adverse Reaction Form

NAME:_____

HCN/MCP:_____

DATE OF BIRTH:_____

TO BE COMPLETED BY NURSE/TRANSFUSIONIST:

This report must be completed whenever a patient has an adverse reaction to a blood component/product.

Patient's identification checked against transfusion card and blood component/product label: ☐ Yes

Reaction Date & Time Occurred: _____ Place Occurred (unit): _____

Reaction Date & Time Reported: _____

Premedication: ☐ No ☐ Yes Drug: _____ Dose: _____ Route: _____

Transfused under Anesthesia: ☐ General ☐ Local ☐ None

CLINICAL HISTORY:

Pregnant/Miscarriage:	☐ Yes < 3months	☐ Yes > 3months	☐ No	☐ Unknown
Previous Transfusion:	☐ Yes < 3months	☐ Yes > 3months	☐ No	☐ Unknown

Immuno-compromised: ☐ Yes ☐ No If yes describe: _____

SYMPTOMS: *(Please check, if applicable)*

☐ Fever	☐ Anxiety	☐ Abnormal bleeding	☐ Urticaria
☐ Anaphylaxis	☐ Shortness of Breath	☐ Hemoglobinuria	☐ Diaphoresis
☐ Respiratory distress	☐ Low back (loin) Pain	☐ Nausea and vomiting	☐ Chest pain
☐ Hypotension	☐ Loss of consciousness	☐ Chills or rigors	☐ Shock
☐ Hypertension	☐ Other: _____		

VITALS: *(Please Complete)*

☐ Temperature: Pre: _____ Post: _____ ☐ Oxygen Saturation: Pre: _____ Post: _____

☐ Blood Pressure: Pre: _____ Post: _____ ☐ Respiration Rate: Pre: _____ Post: _____

☐ Pulse: Pre: _____ Post: _____

MEASURES TAKEN:

☐ None	☐ Analgesics	☐ Vasopressors	☐ Product Culture
☐ Transfusion Stopped	☐ Antihistamines	☐ Antibiotics	☐ Steroids
☐ Transfusion Restarted	☐ Supplementary O_2	☐ Chest X-Ray	☐ Antipyretics
☐ ICU Required	☐ Diuretics →Effective: ☐ Yes ☐No	☐ Blood Culture	
☐ Hospital Admission Required	☐ Mechanical Ventilation, Duration: _____		

☐ Other Measures Taken (Specify): _____

TRANSFUSION HISTORY: *(List all blood products received in the previous 6 hours. Attach extra list if necessary.)*

Date DD/MM/YYYY	Blood Product	Unit Number	Infusion Time Start	Infusion Time Stop

COMMENTS / OUTCOME: _____

Nurse/Transfusionist: _____ Signature: _____ Date: _____

Please Print

- The completed form must be sent to the TML following any signs or symptoms of an adverse reaction to blood components or blood products

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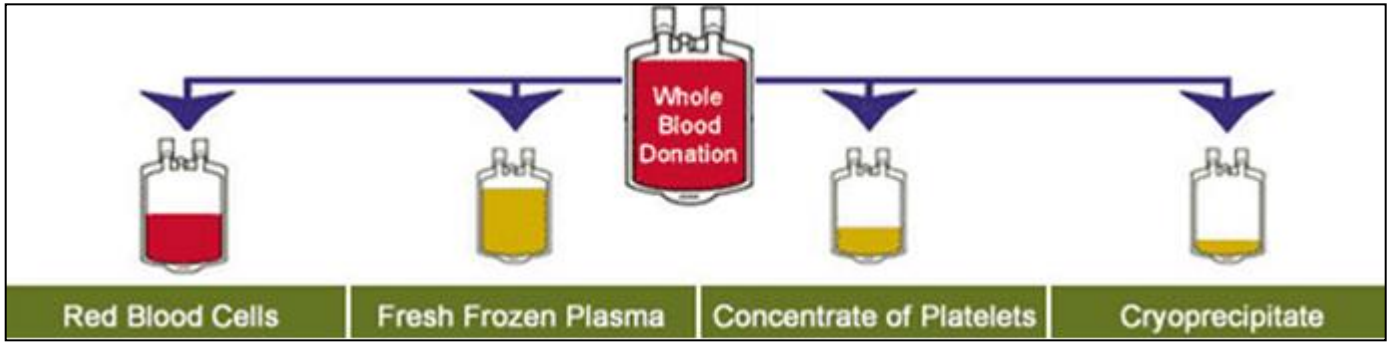
Reaction Investigation

- The TML must report serious reactions to blood components/products to the manufacturer.

- **Other components/products may be implicated and need to be recalled.**



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My Contact Information:

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Labrador Grenfell Health
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Email: jenna.williams@lghealth.ca

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