

# Blood Products

## How fast can I get them?

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# Objectives

- Recognize what products are readily available
- Understand the process for routine vs urgent dispensing of blood products
- Be aware of delays when patient presents difficulties in testing

# What's in the Bank?

- Red blood cells
- Platelets
- Frozen plasma
- Cryoprecipitate



# But there's more...

- Immune globulins
  - IVIG
  - Rhlg
- Factor concentrates
  - rFVIIa
  - rVIII
- Prothrombin complex concentrates
  - Beriplex/octaplex
- Special access program – Health Canada



# Red Blood Cells

- 42-day expiry; 28-days if irradiated
- Stored at 2-6C
- Must be stored in temp-controlled, monitored fridge
- Unit is discarded if out of lab >30 minutes and not transported in cold box
- Transfuse usually over 2 hours, no longer than 4 hours
- Group O is “universal donor”
- Requires current Type and screen; repeat every 96 hours

# Question #1

Why are some blood products irradiated?

- A) If recipient is a Jehovah Witness
- B) If the recipient has a history of allergic reactions
- C) To prevent graft vs host disease
- D) For viral inactivation

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# Platelets

**Single donor/apheresis**

**Pooled buffy platelets (four donors)**

- Stored at RT; NEVER in fridge
- 5-day expiry date
- Risk of sepsis 1 per 10,000
- Should raise platelet count  $15 \times 10^9/L$
- Requires ABORh type (on record or current specimen)



# What is in a platelet concentrate?

**Platelets!** But there is more.....

- Red blood cells (0.5ml)
- Plasma (30-50ml)
- ABO/Rh compatible platelets are the preferred choice
- Incompatible platelets are often transfused due to availability and production
- Recommend RhIg to Rh negative patients that receive Rh positive platelets
- ?Plasma reduce ABO incompatible platelets or measure isohemagglutinins

## Question #2

A 26-year old group O Rh negative female patient received 2 apheresis group O Rh positive platelets. Select the best answer:

- A) She should receive one dose (300ug) of Rhlg for each platelet she received
- B) She should receive one dose (300ug) of Rhlg
- C) Nothing further should be done; she will most likely not form anti-D
- D) Nothing further should be done; the risk of female with anti-D is not significant

## Answer #2

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- A) She should receive one dose (300ug) of RhIg for each platelet she received
- B) She should receive one dose (300ug) of RhIg: covers 15 ml of RBCs or 30 ml of whole blood
- C) Nothing further should be done; she will most likely not form anti-D
- D) Nothing further should be done; the risk of female with anti-D is not significant



# Frozen Plasma (FP)

- Stored frozen for up to 1 year (-18C)
- Thawed on request; 15-30 minutes
- Once thawed may be kept at 4C for 5 days
- Requires recipient ABO type (on record or current specimen)
- Group AB is “universal plasma donor”

# How and When to Order Tests

- Group and Screen:
  - Transfusion may be needed during admission
  - Surgery with >10% risk of transfusion
- Group and Screen and Crossmatch
  - Transfusion planned
  - Surgery with >10% risk of transfusion

## Question #3

Which of the following are the proper steps for pre-transfusion specimen collection?

- A) Labelled at the bedside after confirming the patient identification with the patient's armband
- B) Labelled in the lab after verification with the requisition
- C) Labelled at the nursing station following confirmation with the physician's written order
- D) Labelled with the patient's last name and first initial and date of birth

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# Checking Identity of Patient

- When collecting a blood specimen
  - Accurately label each specimen BEFORE leaving the patient's bedside
  - Sign and Date TM requisition: electronic or handwritten
- Before beginning of the transfusion
  - Verify the patient's identity, by checking the name, MRN and DOB on wristband against the patient ID on the blood component and where possible, by verbal confirmation
  - Must be checked by 2 staff at the bedside



## Question #4

What is the risk of wrong ABO group per unit of red blood cells?

- A) 1 in 100
- B) 1 in 10,000
- C) 1 in 40,000
- D) 1 in 2,300,000
- E) 1 in 7,800,000

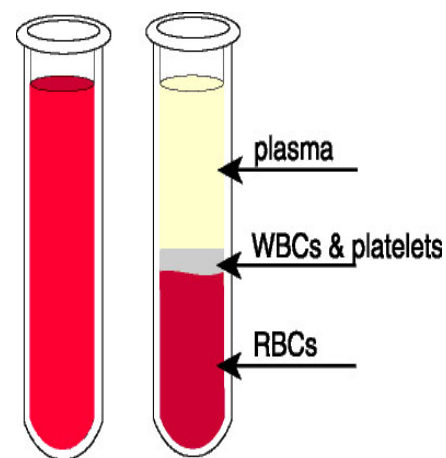
## Answer #4

What is the risk of wrong ABO group, per unit of red blood cells?

- A) 1 in 100      hives
- B) 1 in 10,000      bacterial sepsis-platelets
- C) 1 in 40,000      **wrong ABO****
- D) 1 in 2,300,000      HCV transmission
- E) 1 in 7,800,000      HIV transmission

# Transfusion Medicine Tests

- Centrifuge specimen for 5-10 min
- ABO group
  - Patient's RBC tested for A and B antigens
  - corresponding antibodies in plasma
  - 5 minutes
- Rh (D) group
  - Patient's RBC tested for D antigen
  - 5 minutes
- Antibody Screen
  - Patient's plasma tested for RBC alloantibodies formed as a result of previous transfusion or pregnancy
  - STAT: 45 minutes
  - Must be repeated within every 96 hours



# STAT vs Routine

- STAT requests are processed immediately
  - Bleeding patients
- Routine requests are usually batched
  - Type and screen; crossmatch on hold
  - Prenatal, pre-admit
  - Rhlg



# STAT

- STAT should be used for life threatening urgent requirement
- STAT does not mean:
  - “Requests from my ward are always considered stat”
  - “Patient wants to go home”
  - “If all are ordered STAT at least some will be processed as such”
- If everything is ordered STAT
  - the process slows down
  - true STAT are not processed as needed
  - techs become desensitized to STAT

# Getting Blood to the Patient



## Question #5

A 23-year old male MVA. Requires uncrossmatched blood. What would you select?

- A) Group O Rh negative red cells, group AB plasma
- B) Group O Rh negative red cells, group O plasma
- C) Group O Rh positive red cells, group AB plasma
- D) Group O Rh positive red cells, group O plasma

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# Blood required immediately – no specimen submitted:

- O neg red cells for females < 50 years
- O pos red cells for all males and females >50 years
- Red cells ready in <10 minutes
- Considered uncrossed: “Uncrossed blood. To be given under the authorization of physician”
- Requires signed requisition from ordering physician

# Blood required immediately – specimen submitted:

- A quick ABO and Rh is performed
- Group specific blood is made available
- **Red cells ready in 10 minutes**
- Considered uncrossed – screen test not ready at this time
- Requires signed requisition from ordering physician

# Blood required ASAP

- ABO and Rh performed
- Antibody screen test performed
  - Set up 10 minutes: labelling, centrifuging
  - 5 min for ABORh
  - 15 min incubation
  - Washing/Interpretation 10 minutes
- **Crossmatched RBCs ready <45 minutes**  
(no antibodies detected)

# Possible Delays

- Patient with antibody/ies
  - One antibody vs multiple
  - Incident of antigen for donor selection
- Staffing levels vs workload
  - One tech on nights covering all areas
- Inventory
  - Summer/Christmas shortages
  - Remote labs farther from CBS



DELAYS  
EXPECTED

## Question #6

50-year old male MVA requires blood ASAP. Antibody screen test is positive. One out of 4 RBC units is positive. What would you do?

- A) Issue all 4 units in a cold box with the incompatible unit labelled as “incompatible”
- B) Inform the ER that there is no blood available until you complete a full antibody investigation
- C) In consultation with Hematopathologist issue those units that are compatible
- D) Issue group O negative units

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# Dealing with Delays

- Patient with antibody/ies
  - Consult with Hematopathologist
- Staffing levels vs workload
  - Prioritize work
  - On call stand by tech
- Inventory
  - Review inventory levels regularly and adjust as needed based on historical peak usage and distance from CBS



# Transfusion Medicine Team

- Attention to detail
- Flexibility
- Problem solving
- Resilient to stressful situations
- Supportive management





Thank you