



DIAGNOSTIC SERVICES  
OF MANITOBA



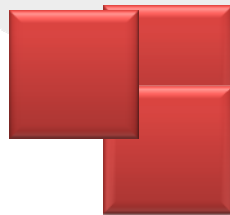
WRHA Blood Conservation Service  
WRHA Transfusion Practice Committee

Manitoba

Health and Healthy Living



Canadian Blood Services  
*it's in you to give*



## TEAM TRANSFUSION

### Differential Diagnosis of Adverse Events



# MANITOBA ADVERSE EVENT REPORTING SYSTEM DATA FLOW

**REACTION**

- *Physician* orders transfusion reaction investigation
- *Nursing* initiates CM105 form

- *Blood Banks* verify forms and send to Crossmatch Labs
- *Crossmatch Lab* completes investigation
- *Medical Director* completes conclusions

*Provincial Blood Programs Office*

**Public Health Agency of Canada, TTISS**

# Transfusion Reactions

## Reportable for all blood components :

- Red cells,
- Platelets
- cryoprecipitate
- Plasma (FFP, AFFF, FP24, FP, CSP)

## or derivatives (derived from blood or by RC technology)

- albumin
- WinRho
- IVIG
- Factors VIII and IX
- Fibrinogen
- Niastase, Octoplex

# Transfusion Reactions: Symptoms

- Hypotension/shock
- Rigors
- Anxiety
- Back/chest pain
- Dyspnea/SOB
- Bleeding/pain at IV site
- Nausea/vomiting
- Hemoglobinuria
- Febrile and 1°C over baseline
- Tachycardia/arrhythmias
- Generalized flushing
- Hives/rash

How often do these occur?

# Transfusion Reactions: Risk

Source: Bloody Easy 2

<b>Risk</b>	<b>Frequency per unit transfused</b>
<b>Minor Allergic reaction (urticaria)</b>	<b>1:100</b>
<b>Febrile Non-hemolytic Reaction</b>	<b>1:300 RBC units</b>
<b>Circulatory Overload (TACO)</b>	<b>1:700 per transfusion episode</b>
<b>Acute Lung Injury (TRALI)</b>	<b>1:5,000</b>
<b>ABO-incompatible transfusion</b>	<b>1:40,000 per RBC transfusion episode</b>
<b>Hepatitis B</b>	<b>1:82,000</b>
<b>HIV</b>	<b>1:4,700,000</b>
<b>Hepatitis C</b>	<b>1:3,100,000</b>
<b>Symptomatic sepsis per unit of RBC</b>	<b>1:100,000</b>
<b>West Nile Virus, vCJD, new pathogens</b>	<b>WNV: 1:1,000,000 Other: unknown</b>
<b>Transfusion Related Immunosuppression</b>	<b>unknown</b>

Note that this is an incomplete list and does change frequently

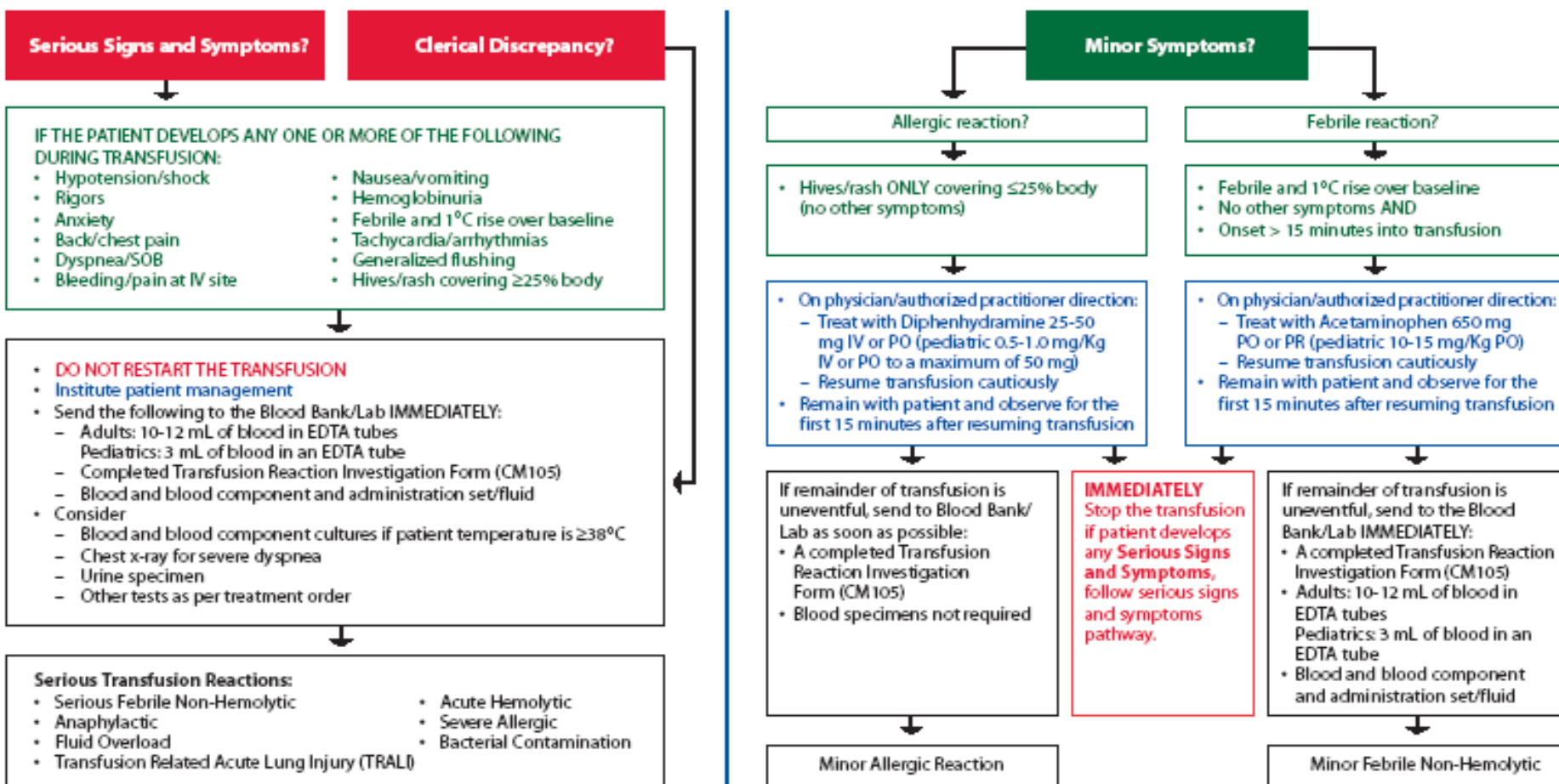


# TRANSFUSION REACTIONS ALGORITHM

Patient exhibits signs and symptoms of a transfusion reaction

1. **STOP THE TRANSFUSION IMMEDIATELY** and keep the IV line open with 0.9% saline
2. Contact the physician/authorized practitioner for medical assessment and document name of physician/authorized practitioner notified
3. Check vital signs at least every 15 minutes until stable
4. Check all labels, tags, treatment order, forms and the patient's identification band to determine if there is a **clerical discrepancy**
5. Notify the blood bank/lab
6. Complete Transfusion Reaction Investigation Form (CM105)

PHYSICIAN/AUTHORIZED PRACTITIONER WILL DETERMINE IF TRANSFUSION SHOULD CONTINUE  
**NOTE: REACTIONS IN A PATIENT TRANSFUSED FOR THE FIRST TIME MAY BE POTENTIALLY MORE SERIOUS**



# Case Studies



# Case 1- Mr. DY

- A 34 year old male with immunodeficiency syndrome was admitted to your hospital for sepsis 6 days ago. A transfusion order for 1 unit of red cells for symptomatic anemia was written. His last transfusion was 6 months ago.
  - PHIN is 999 888 777
  - Baseline VS:
    - BP 98/60
    - P 90
    - RR 18
    - T 36.9
  - RBC Donation Unit Number: C0 0540 09 7775453\$
- He was pre-medicated with acetaminophen 650mg and Benadryl 25mg
- During the administration of the first unit, his temperature rose  $>1^{\circ}\text{C}$

## Case 1 – Mr. DY

- The RN stopped the transfusion, initiated the clerical check and contacted the MD according to the protocol.
- The decision was made to continue the transfusion b/c the patient was comfortable with stable VS, the patient had already been pre-medicated with acetaminophen and the clerical check demonstrated no discrepancy.

## Case 1 – Mr. DY

- The transfusion continued.
- After 139 mL of red blood cells, the patient experienced severe shivering and myalgia
- Baseline VS: BP 98/60 P 90 RR 18 T 36.9  
>37.9  
VS now: BP 160/80 P 120 RR 24 T 38.4
- What is your DDX?

# Differential Diagnosis

1. Mechanically traumatized red cells
2. TRALI
3. Febrile Transfusion Reaction
4. Bacterially Contaminated Red cells

## Case 2- Mr. HH

- A 50 year old male, weighing 50 kg with a history of alcoholic liver disease is admitted for a femoral peroneal bypass.
- PHIN is 777 888 999
- Baseline VS:
  - BP 135/90
  - P 87 RR15
  - T 37.1
- Pre-op
  - Hemoglobin 140 g/L
  - INR 3.0
  - PTT 45
  - Albumin 11
- Chest Xray normal

## Case 2 – Mr. HH

- During surgery Mr. HH has a large volume blood loss
- Vitals done Pre transfusion
  - BP 120/75
  - RR23
  - HR 100
  - T 37.5°
- He is transfused with two units of apheresis FFP 500 mL each
- Donor unit numbers:
  - C0 540 09 12345620\*
  - C0 540 09 12345720%

## Case 2 – Mr. HH

- Two units of red blood cell units were transfused
- Donation unit numbers:
  - C0 0540 09 5555720\$
  - C0 0540 09 5555820#
- Then two units 100 ml each of 25% albumin lot numbers:
  - 26NCNt1
  - 26NCNT1

## Case 2 – Mr. HH

- Mr. HH now becomes short of breath
- The RN has done the VS:
  - BP 140/95
  - HR 100
  - RR 25
  - T 37.8
  - Room air saturation is 75%
- The RN indicates the patient is distressed
- The MD is called to assess the patient.
- What is your DDX?

# Differential Diagnosis

1. Transfusion Associated Circulatory Overload (TACO)
2. Transfusion Associated Acute Lung Injury
3. Anaphylactoid reaction
4. Allergic reaction

## Case 3 – Ms. KZ

- A 56 year old female with a 20 year hx of SLE, DVT, a recent MI and has never been pregnant.
- She is in the Same Day procedure area with symptomatic anemia and a transfusion order for two units of red cells.
- Her PHIN is 123 456 789
- Baseline Vitals:
  - BP 120/72
  - RR 18
  - P 72
  - Temp 37.3

## Case 3 – Ms. KZ

- Two units of red blood cells are transfused
- Donation unit numbers:
  - C0 0540 09 5551212\$
  - C0 0540 09 5551413#

## Case 3- Ms. KZ

- During the infusion of the second unit of red blood cells, Ms. KZ goes to the washroom
- Upon return she is complaining of back pain, feeling 'funny' and red urine.
- VS are now:
  - BP 98/50
  - RR 24
  - P 110
  - T 37.5
- The SD unit calls the MD for assistance
- What is your DDX?

# Differential Diagnosis

1. Delayed Transfusion reaction
2. Immediate Transfusion reaction
3. Mechanically traumatized red cells
4. Bacterially contaminated red cells

# Case Studies – Summary DDX

- Case 1 – Mr. DY
  - DDX –
- Case 2 – Mr. HH
  - DDX –
- Case 3 – Ms. KZ
  - DDX -

**Thank you**

**Questions?**