Disclosures

• No conflicts of interest to declare
• ORBCoN is funded by the Ministry of Health and long Term Care
Objectives

1. List the three major manifestations of acute transfusion reactions
2. Describe the investigation and management of acute transfusion reactions
3. Explain the rationale for restrictive transfusion policies
Restrictive vs. Liberal Red Cell Transfusion

Restrictive
- the transfusion threshold is lower; Hb 70 or 80
- routine order is for 1 unit
- LESS blood is transfused

Liberal
- the transfusion threshold is higher; Hb 90 or 100
- routine order may be for 2 units
- MORE blood is transfused
Why Restrictive Transfusion?

- Evidence supports the safety of restrictive practice
- Blood supply is limited (volunteer donors)
- Risk of adverse events is often dose dependent
- Costs:
  - blood products
  - transfusing them
  - adverse events
Ontario hospitals: % pre-Tx Hb < 80
Ontario hospitals: % Single Unit

- 2013
  - 1: 25
  - 2: 37
  - 3: 35
  - 4: 33
  - 5: 32
  - 6: 78
  - 7: 56
  - 8: 40
  - 9: 27
  - 10: 19
  - 11: 25
  - 12: 29
  - 13: 42
  - 14: 46
  - 15: 44
  - 16: 40
  - 17: 53
  - 18: 64
  - 19: 69
  - 20: 78
  - 21: 64
  - 22: 69
  - 23: 32
  - 24: 19

- 2016
  - 1: 6
  - 2: 3.5
  - 3: 10
  - 4: 15
  - 5: 18
  - 6: 19
  - 7: 20
  - 8: 21

- 2017
  - 1: 88
  - 2: 90

Years: 2013, 2016, 2017
Red Blood Cell Consumption per 100 Adult Active Treatment Patient Days for Ontario Community Hospitals 2016-2017

Huntsville 5.64
Last year 7.66
Adverse Transfusion-related Events

• Any adverse event occurring as a result of transfusion/infusion of a blood component or blood product
• May be immediate or delayed
• Maintain a **high index of suspicion** when adverse events are temporally related to a blood transfusion
• **Report all events** to the blood bank
First thing an MD does if a nurse calls about a suspected transfusion reaction?

1. Attend at the patient’s bedside
2. Ask about fever and, if present, order acetaminophen
3. Ask about dyspnea and, if present, order a chest x-ray
4. Ensure that the transfusion has been stopped
5. Ask about urticaria and, if present, order diphenhydramine
<table>
<thead>
<tr>
<th>Reaction type</th>
<th>Skin</th>
<th>Inflammatory (fever, chills)</th>
<th>Pain</th>
<th>Respiratory</th>
<th>Cardiovascular Hypotension</th>
<th>Cardiovascular Hypertension</th>
<th>GI/ jaundice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergic (mild)</td>
<td>X!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allergic (severe)*</td>
<td>X</td>
<td></td>
<td></td>
<td>X!</td>
<td>X!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemolytic (acute)</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hemolytic (delayed)</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypotensive*</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>FNHTR*</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>TACO</td>
<td></td>
<td></td>
<td></td>
<td>X!</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>TAD*</td>
<td></td>
<td></td>
<td></td>
<td>X!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TA-GVHD</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>TRALI</td>
<td></td>
<td>X</td>
<td></td>
<td>X!</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Bacterial Contamination</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**X!** = required or essential component of diagnosis  
**X** = commonly associated with diagnosis  
* = diagnosis of exclusion. Other possible reaction types with overlapping signs and symptoms should be excluded first.

Source: [www.bbguy.org](http://www.bbguy.org) podcast 017 Transfusion Reactions with Dr. Mark Fung
<table>
<thead>
<tr>
<th>Possible tests, and evaluations to consider</th>
<th>Signs and Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skin</strong></td>
<td>Inflammatory (fever, chills)</td>
</tr>
<tr>
<td>ABO type, DAT, Hemolysis check Clerical Check</td>
<td></td>
</tr>
<tr>
<td>Repeat antibody screen</td>
<td></td>
</tr>
<tr>
<td>Chest X-ray</td>
<td></td>
</tr>
<tr>
<td>B-natriuretic Peptide (BNP)</td>
<td></td>
</tr>
<tr>
<td>Bacterial culture of patient and product</td>
<td><strong>X</strong></td>
</tr>
<tr>
<td>Review of patient fluid balance</td>
<td></td>
</tr>
<tr>
<td>Repeat CBC (rule out bleeding)</td>
<td></td>
</tr>
<tr>
<td>IgA level, Anti-IgA</td>
<td></td>
</tr>
</tbody>
</table>
ISTARE - International Surveillance of Transfusion-Associated Reactions and Events

25 countries
133 million components
125 national sets of aggregated data
2006 – 2012

3 per million = chance of transfusion-related death

20 per 100,000 (25% of total) = serious reaction rate

80 per 100,000

### Risks of Transfusion (non-viral)

<table>
<thead>
<tr>
<th>RISK OF EVENT</th>
<th>EVENT</th>
<th>The serious ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 in 13</td>
<td>RBC sensitization (↑ risk hemolytic reaction, HDFN)</td>
<td></td>
</tr>
<tr>
<td>1 in 100</td>
<td>Transfusion-associated circulatory overload (TACO)</td>
<td></td>
</tr>
<tr>
<td>1 in 7,000</td>
<td>Delayed hemolytic transfusion reaction</td>
<td></td>
</tr>
<tr>
<td>1 in 10,000</td>
<td>Transfusion related acute lung injury (TRALI)</td>
<td></td>
</tr>
<tr>
<td>1 in 10,000</td>
<td>Symptomatic bacterial sepsis per pool of platelets</td>
<td></td>
</tr>
<tr>
<td>1 in 40,000</td>
<td>ABO-incompatible transfusion per RBC transfusion</td>
<td></td>
</tr>
<tr>
<td>1 in 40,000</td>
<td>Serious allergic reaction per unit of component</td>
<td></td>
</tr>
<tr>
<td>1 in 200,000</td>
<td>Death from bacterial sepsis per pool of platelets</td>
<td></td>
</tr>
</tbody>
</table>
Acute Transfusion Reactions

- fever
- rash
- dyspnea
Suspected Transfusion Reaction?

STOP THE TRANSFUSION
Keep IV access line open with normal saline (0.9% NaCl)

Assess the patient clinically

Verify patient and blood component identifiers

Fever? Rash? Dyspnea? Other?

Disconnect blood bag and tubing, and return bag to blood bank (with exceptions)

Obtain post-transfusion blood samples and send to the blood bank
Case 1

• 50 year old woman with leukemia, on chemotherapy, platelet count 7
• Platelet transfusion is started
• After 20 minutes she develops chills and rigors
• Temperature increases from 37.2 ºC to 38.4 ºC, other vital signs are stable
Febrile Transfusion Reactions

- Definition: ≥ 1°C increase in temperature
- AND temperature ≥ 38°C during or within 4 hours of transfusion
- Incidence 1:300 RBC, 1:20 platelet pools
- Fever may not always be present, may have cytokine-induced chills/rigors only
- All components provided by CBS are pre-storage leukoreduced (reduces leukocytes and cytokine levels)

Heddle. NEJM 1994;331:625
Febrile Transfusion Reactions

Stop the transfusion, check patient and product ID and assess for serious symptoms:

- temperature > 39°C, hypotension/shock, tachycardia, severe shaking rigors/chills,
- anxiety, dyspnea, back/chest pain, hemoglobinuria, oliguria, bleeding from IV sites, nausea/vomiting
- symptoms within the first 15 minutes
Febrile Transfusion Reaction

• if no serious symptoms: consider febrile non-hemolytic transfusion reaction (FNHTR)
  – acetaminophen 325 mg and re-start transfusion slowly (50 mL/hr) with close monitoring for the first 15 minutes
  – acetaminophen may mask the fever associated with something more sinister
  – consider meperidine (Demerol®) 25-50 mg IV for severe rigors if no contraindications
• no evidence that premedication reduces FNHTR
Febrile Transfusion Reaction

• If serious symptoms: consider hemolytic transfusion reaction or bacterial contamination of the product (sepsis)
  – collect blood sample to re-check ABO
  – clamp tubing and send with attached IV solutions to blood bank for gram stain and culture
  – send first voided urine to lab (hemoglobinuria)
  – send blood culture from a different IV site
Acute Hemolytic Transfusion Reaction

- intravascular lysis of red cells
- 20-30 mL of incompatible RBC is enough to initiate hemolysis
- ABO incompatibility
  - almost always due to an error
- other blood group system incompatibility
  - previous pregnancy or transfusion
- or mechanical hemolysis of compatible red cells due to freezing, pressure infusion pumps, osmotic hemolysis
Immune-Mediated Hemolysis

Blood vessel

Complement cascade

IgM

IgG

Intravascular

Branch. Transfusion 2015;55:2S cover
What hemolysis looks like

normal

hemolysis

plasma

normal

spherocytess
Laboratory tests for hemolysis

- repeat blood group and antibody screen
- direct antiglobulin test (DAT)
- CBC with blood film (spherocytes)
- reticulocyte count
- LDH
- bilirubin
- (haptoglobin)
- urinalysis first post-transfusion urine

Image: hematuria vs hemoglobinuria

Image: medscape.com
Acute Hemolytic Transfusion Reaction

Management:
• supportive care
• maintain urine output with crystalloids, diuretics
• manage DIC and hemorrhage
• <10% of ABO incompatible transfusions are fatal
Bacterial Contamination

- from: donor skin contaminants, donor bacteremia, contamination during handling
- accounts for at least 10% of transfusion-related deaths
- more common in platelets due to their room temperature storage
- gram positive and gram negative organisms have been implicated
Bacterial Contamination

Management:
• aggressive supportive therapy
• broad spectrum antibiotics e.g. vancomycin plus beta-lactam or aminoglycoside
• don’t wait for blood culture results
• report to blood bank so that other components from this donation can be quarantined
## Differential Diagnosis: Fever

<table>
<thead>
<tr>
<th>Condition</th>
<th>Other Symptoms</th>
<th>Timing of Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Febrile non-hemolytic transfusion reaction</td>
<td>Usually temperature &lt; 39°C</td>
<td>During transfusion, usually near the end</td>
</tr>
<tr>
<td>Bacterial contamination</td>
<td>Hypotension, shock, DIC</td>
<td>Usually within the first 15 minutes of transfusion</td>
</tr>
<tr>
<td>Acute hemolytic transfusion reaction</td>
<td>Flank pain, DIC, hypotension</td>
<td>Usually within the first 15 minutes of transfusion</td>
</tr>
<tr>
<td>Fever unrelated to transfusion</td>
<td>Variable depending on underlying condition e.g. pneumonia, UTI, sepsis</td>
<td></td>
</tr>
</tbody>
</table>

Webert 2014

www.transfusionontario.org
Case 1

- 50 year old woman with leukemia, on chemotherapy, platelet count 7
- Platelet transfusion is started
- After 20 minutes she develops chills and rigors
- Temperature increases from 37.2 °C to 38.4 °C, other vital signs are stable
- What do you do?
Case 1

- stop the transfusion
- maintain IV access
- assess patient’s vital signs
- re-check patient and product identification labels/tags
- if ID correct and no serious symptoms (hypotension, dyspnea, pain, bleeding, temperature > 39, hemoglobinuria): possible FNHTR
- treat with acetaminophen, re-start transfusion slowly (50 mL/hr) with close monitoring for the first 15 minutes
- report the event to the blood bank
Febrile Non-hemolytic Transfusion Reactions
(more serious than we thought?)

**Feeling the burn: the significant burden of febrile nonhemolytic transfusion reactions**

- looked at febrile non-hemolytic transfusion reactions (FNHTR) and their consequences: investigations, drugs, admission or escalation of care
- made a conservative estimate of the cost of investigations

Cohen. Transfusion 2017;57:1674
Febrile Non-hemolytic Transfusion Reactions
(more serious than we thought?)

- **Investigations**: CXR, culture of patient/product, serologic investigation, CBC, retics, blood film, bili, LDH etc.
- **Drugs**: acetaminophen, meperidine, antibiotics etc.
- **Escalation of care**: unplanned admission of an outpatient, admitted patient with a longer length of stay
- **Review**: by transfusion safety officer, physician
Febrile Non-hemolytic Transfusion Reactions

(more serious than we thought?)

- About 50% occurred during transfusion and in these more than 40% of products incompletely infused
- 2/3 of 437 patients had fever requiring further investigation
- 105 CXRs, 344 patient cultures, 258 product cultures, 254+ serologic tests
- Conservative estimate of cost of investigations $160
  - 1 CXR, 1 patient blood culture, 1 product culture
  - $70,000 for 437 patients
- One US study estimated the cost of a FNHTR at $8600
  (tests, wasted components, blood bank MD time)
Febrile Non-hemolytic Transfusion Reactions
(more serious than we thought?)

The best way to avoid all of this is to transfuse only when necessary

- Conservative estimate of cost of investigations $160
  - 1 CXR, 1 patient blood culture, 1 product culture
  - $70,000 for 437 patients
- One US study estimated the cost of a FNHTR at $8600
  (tests, wasted components, blood bank MD time)

Ezediegwu. Arch Path Lab Med 2004;128:991
Case 2

- 45 year old man with cirrhosis and an INR of 2.5 requires an urgent surgical procedure
- Plasma is prescribed and the first unit is infusing
- After 20 minutes an itchy rash develops on his face, chest and arms, and his throat feels ‘tight’
- Blood pressure and temperature remain normal
Allergic Transfusion Reactions

- Definition: associated with urticaria (hives), facial edema, airway edema, lower respiratory tract symptoms, hypotension, shock.
- usually within 45 minutes of start of transfusion.

Stop the transfusion and assess for serious symptoms:
- dyspnea, wheezing, hypotension/shock, tachycardia, generalized flushing, anxiety, widespread rash over >2/3 of body, hypoxemia, stridor, cough, nausea, vomiting
So, our patient had a rash over 1/3 of his body
Allergic Transfusion Reactions

• if no serious symptoms: **mild** allergic reaction
  – diphenhydramine 25-50 mg PO or IV
  – re-start transfusion slowly (50 mL/hr) with close monitoring

• if the patient experiences recurrent allergic reactions with transfusion, consider pre-medication with diphenhydramine and/or corticosteroids (efficacy unknown)
Allergic Transfusion Reactions

- **Severe** urticarial reaction: rash over >2/3 of body
  - 25-50 mg diphenhydramine and do not re-start the transfusion
- **Anaphylaxis**: hypotension, airway edema
  - epinephrine*, corticosteroids
  - diphenhydramine
  - vasopressors, ventilatory and other supportive care as required
  - most are unexplained

*should be readily available at all transfusions
Severe Transfusion-related Events
Ontario TTISS 2012-2016 n=1,041

#3 severe allergic reaction
14.5% n=151
Case 2

• 45 year old man with cirrhosis and an INR of 2.5 requires an urgent surgical procedure
• Plasma is prescribed and the first unit is infusing
• After 20 minutes an itchy rash develops on his face, chest and arms, and his throat feels ‘tight’
• Blood pressure and temperature remain normal
• What do you do?
Case 2

- Stop the transfusion
- Report the event to the blood bank
- Assess the patient for serious symptoms
  - hypotension, dyspnea, cough, tachycardia, nausea, vomiting, generalised flushing or anxiety, rash over 2/3 of body
- If no serious symptoms: antihistamine e.g. diphenhydramine 25-50 mg PO/IV, re-start transfusion slowly (50mL/hr), and monitor the patient
- If serious symptoms: do not re-start transfusion, epinephrine, antihistamine, corticosteroids as needed
Case 3

- A 75 year old woman with congestive heart failure and a Hb of 72 g/L
- 1U of RBC is prescribed, to infuse over 90 minutes
- 30 minutes into the transfusion she develops dyspnea, tachypnea, and mild chest pain
Dyspnea

• Differential diagnosis includes:
  – transfusion-associated circulatory overload (TACO)
  – transfusion-related acute lung injury (TRALI)
  – transfusion-associated dyspnea (TAD)
  – anaphylaxis
  – acute hemolytic transfusion reaction
  – bacterial contamination (sepsis)
  – a cause other than transfusion
Transfusion Associated Circulatory Overload (TACO)

Within 12 hours of transfusion:

1. Acute or worsening pulmonary edema
2. Cardiovascular changes: tachycardia, hypertension, elevated JVP, enlarged cardiac silhouette and/or peripheral edema
3. Evidence of positive fluid balance
4. Elevated BNP to > 1.5 x pre-Tx

Mortality rate 5-15%
Incidence: 1:68 (Narick) 1:33 (Clifford)
Under-reported!

– 3 of 176 cases reported to the TM service (Clifford)

Ontario TTISS 2012-2016 n=1041

TACO 29%  
N=302
TACO: Mortality

HR 3.2
95% CI 1.23 - 8.10

HR=Hazard Ratio
TACO – Patients at risk

- older patients (>70 yrs)
- renal insufficiency
- left ventricular dysfunction
- prior or current congestive heart failure
- severe euvolemic anemia (Hb < 50g/L)

- consider pre-transfusion furosemide in at-risk patients who are normovolemic and hemodynamically stable
- specify the infusion rate (max 4 hrs)
- transfuse on day shift if possible for safety (monitoring)
Review of 98 consecutive patients with TACO at 2 Toronto hospitals.

<table>
<thead>
<tr>
<th># RBC units transfused per order</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37 (45.7)</td>
</tr>
<tr>
<td>2</td>
<td>33 (40.7)</td>
</tr>
<tr>
<td>3</td>
<td>3 (3.7)</td>
</tr>
<tr>
<td>≥ 4</td>
<td>8 (9.9)</td>
</tr>
</tbody>
</table>
Effect of Furosemide on PCWP

Gupta. Angiology 1983;34:699
## Guidelines for furosemide administration for patients at risk for overload

<table>
<thead>
<tr>
<th>Patient classification</th>
<th>Route and dosage recommendation</th>
</tr>
</thead>
</table>
| **High Risk**          | • If not on daily furosemide, furosemide **20mg IV** prior to each unit (RBC unit/platelet pool); maximum dose 40mg  
• If already on daily furosemide, consider adding additional IV furosemide to maximum total IV dose of 80mg |
| • History of congestive heart failure  
• On daily furosemide  
• Diastolic/systolic LV dysfunction by imaging  
• Prior acute myocardial infarction  
• Renal dysfunction  
• Age greater than 70 years |
| **Lower Risk**          | • Furosemide **20mg PO** prior to each unit (RBC unit/platelet pool); total dose given prior to transfusion  
• Maximum dose 40mg |
| • Age greater than 60 years with no other high risk features |

In at-risk patients, order a slower infusion rate e.g. 1U RBC over 3-4 hours

Lakeridge Health Guideline 2016
Transfusion Related Acute Lung Injury (TRALI)

- sudden onset of acute lung injury occurring 1-2 hours post transfusion, may be delayed up to 6 hours
- hypoxemia: $\text{PaO}_2/\text{FiO}_2 \leq 300$, $\text{SpO}_2 < 90\%$ on room air
- dyspnea, fever, hypotension
- CXR shows bilateral interstitial and alveolar infiltrates
- may develop neutropenia
- no other cause for ALI, no TACO
WBC Antibody Hypothesis

Antigen-Antibody reaction triggers TRALI

Donor
-Anti-HNA
-Anti-HLA I
-Anti-HLA II

Recipient WBC
- Neutrophils
- Lymphocytes
- Monocytes

Activation
Lodged in pulmonary capillaries

Release of substances causing pulmonary endothelial damage and capillary leak

From Y. Lin
Two event hypothesis

1st event: Underlying clinical condition of patient (inflammation, infection, surgery)

Activation of pulmonary endothelium with increased adhesion molecules

2nd event: Transfusion of biologically active lipids or antibodies

Activation

Release of substances causing pulmonary endothelial damage and capillary leak

Kleinman et al. Transfusion 2004;44:1774-89
TRALI: Management

- supportive care, including mechanical ventilation if necessary
- usually (80%) resolves in 24-72 hours
- fatal in 5-10%
- report to the Blood Bank
- other patients may be affected
  - a donor unit is divided into RBC, plasma and platelets
- recipient and donor testing at CBS may be necessary, arrange with the Blood Bank
# TRALI or TACO?

<table>
<thead>
<tr>
<th></th>
<th>TRALI</th>
<th>TACO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td>Plasma, platelets</td>
<td>Any, volume dependent</td>
</tr>
<tr>
<td><strong>Fever</strong></td>
<td>Present or absent</td>
<td>Typically absent</td>
</tr>
<tr>
<td><strong>Blood pressure</strong></td>
<td>Hypotension</td>
<td>Hypertension</td>
</tr>
<tr>
<td><strong>Onset</strong></td>
<td>During or within 6 hrs of transfusion</td>
<td>Within 6 hrs of transfusion</td>
</tr>
<tr>
<td><strong>JVP</strong></td>
<td>Normal</td>
<td>Elevated</td>
</tr>
<tr>
<td><strong>Volume status</strong></td>
<td>Euvolemic</td>
<td>Hypervolemic</td>
</tr>
<tr>
<td><strong>CXR</strong></td>
<td>Non-cardiogenic pulmonary edema</td>
<td>Cardiomegaly, pulmonary edema, vascular redistribution</td>
</tr>
<tr>
<td><strong>Response to diuretic</strong></td>
<td>nil</td>
<td>Clinical improvement</td>
</tr>
</tbody>
</table>
“Possible TRALI (pTRALI)”

• no acute lung injury (ALI) prior to transfusion
• ALI develops during or within 6 hours of transfusion
• Other possible causes of ALI
  – aspiration, pneumonia, toxic inhalation, lung contusion, near-drowning
  – severe sepsis, shock, multiple trauma, burn injury, acute pancreatitis, cardiopulmonary bypass, drug overdose
Case 3

- A 75 year old woman with congestive heart failure and a Hb of 72 g/L
- 1U of RBC is prescribed, to infuse over 90 minutes
- 30 minutes into the transfusion she develops dyspnea, tachypnea, and mild chest pain
- What do you do?
Case 3

- Stop the transfusion
- If suspect TACO or TRALI:
  - do not restart the transfusion
  - maintain IV access
  - CXR
  - assess the patient
- If elevated JVP, pulmonary edema: suspect TACO and treat with diuretics and supportive therapy
- If normal JVP, CXR suggests ALI: suspect TRALI and provide supportive therapy
- Report the event to the blood bank
TTISS Fatalities 2012-2016 n=17

- Acute hemolytic: 4
- Delayed hemolytic: 1
- Bacterial contamination: 1
- Possible TRALI: 5
- TACO: 1
- Other: 4

www.transfusionontario.org
# Differential Diagnosis by Presentation

<table>
<thead>
<tr>
<th>Signs/symptoms</th>
<th>Most Common Causes</th>
<th>Less Common Causes</th>
</tr>
</thead>
</table>
| Fever +/- chills and rigours | • Patient’s underlying condition  
• Febrile nonhemolytic transfusion reaction | • Acute hemolytic transfusion reaction  
• Sepsis  
• TRALI |
| Rash | • Mild allergic reaction, to transfused blood product or recently-administered drug | • Severe allergic reaction  
• Anaphylaxis |
| Dyspnea | • Patient’s underlying condition  
• Volume overload (TACO) | • Acute hemolytic transfusion reaction  
• Severe allergic reaction or anaphylaxis  
• TRALI  
• Severe rigors  
• Patient anxiety |
Suspected Transfusion Reaction?

**STOP THE TRANSFUSION**
Keep IV access line open with normal saline (0.9% NaCl)

- **Assess the patient clinically**
  - Fever?
  - Rash?
  - Dyspnea?
  - Other?

- **Verify patient and blood component identifiers**

- **Disconnect blood bag and tubing, and return bag to blood bank (with exceptions)**

- **Obtain post-transfusion blood samples and send to the blood bank**
Podcasts and App

- **Blood Bank Guy**
  - [www.bbguy.org](http://www.bbguy.org)
    - Episode 017 Transfusion reactions
    - Episode 039 Underestimating Febrile Reactions

- **App at** [www.ttddx.com](http://www.ttddx.com)
  - walks you through the differential Dx of a transfusion reaction
It’s all in here...

Bloody Easy Lite Module 2:
Transfusion Reactions

…and watch for “Pumping Iron”
the annual CBS/ORBCoN videoconference
April 11, 2018
First thing an MD does if a nurse calls about a suspected transfusion reaction?

1. Attend at the patient’s bedside
2. Ask about fever and, if present, order acetaminophen
3. Ask about dyspnea and, if present, order a chest x-ray
4. Ensure that the transfusion has been stopped
5. Ask about urticaria and, if present, order diphenhydramine
First thing an MD does if a nurse calls about a suspected transfusion reaction?

1. Attend at the patient’s bedside
2. Ask about fever and, if present, order acetaminophen
3. Ask about dyspnea and, if present, order a chest x-ray
4. Ensure that the transfusion has been stopped
5. Ask about urticaria and, if present, order diphenhydramine
Summary

1. Three major presentations of acute transfusion reactions are fever, rash, shortness of breath.

2. If a transfusion reaction is suspected:
   - stop the transfusion
   - check the patient and blood product ID
   - assess the patient, including vital signs
   - inform the blood bank

3. The best way to avoid transfusion reactions is to use a restrictive approach to transfusion.
Questions?

Please consider donating blood or bone marrow

www.blood.ca

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