Recognizing and Treating Blood Transfusion Reactions

On completion of this document review, non-employee clinical staff will be able to:

1. Recognize the signs and symptoms of various hemolytic and non-hemolytic reactions
2. Respond quickly to those signs
3. Seek the appropriate assistance to treat reactions quickly and properly

Blood is Safe but not Risk-Free!

1. Risks of transfusions in order of likelihood & examples:
    a. Non-hemolytic transfusion reactions (e.g. allergic, febrile, lung injury, circulatory overload)
    b. Hemolytic transfusion reactions (ABO and other red blood cell antibodies)
    c. Disease transmission (HIV, hepatitis, & other viruses, bacteria, parasites)
2. Reactions can be acute (≤ 24 hours of transfusion) or delayed (> 24 hours of transfusion)
3. Some reactions can be fatal if not recognized and treated promptly

Disease Transmission Risks

1. The most feared but least likely reaction is disease transmission. Risks per unit transfused are (m = million):
    a. HIV-1: 1 in 2m
    b. HTLV-I,-II: 1 in 256,000 – 1 in 2m
    c. Hepatitis A: 1 in 1m
    d. Hepatitis B: 1 in 1m
    e. Hepatitis C: 1 in 1.5m
    f. Bacteria: 1 in 1m (RBCs) – 1 in 3,000 for platelets

Hemolytic Transfusion Reactions

1. Due to antibodies against red cell antigens (e.g., ABO, Rh, others)
2. **Incidence**: Occurs in 1 in 38,000 – 1 in 70,000 transfusions
3. **Symptoms**: chills, fever, hemoglobinuria, hypotension, diffuse bleeding, pain in back and along flanks, anxiety and sense of “impending doom,” renal failure
4. **Treatment**: fluids, diuretics, analgesics, pressors, and additional supportive care depending on the severity of the incompatibility
5. In the US between 2016 and 2020, there have been 37 reported fatalities due to hemolytic transfusion reactions. Hemolytic transfusion reactions involving ABO incompatibility often occur due to errors in identification of patients receiving blood:
    a. Errors at the time of type and screen specimen collection
    b. Errors during laboratory testing
    c. Errors at the time of issuing blood
    d. Errors at the bedside

NON-Hemolytic Transfusion Reactions

1. Transfusion Associated Circulatory Overload (TACO) was the **leading cause** of transfusion fatalities between 2016 and 2020
    a. **Incidence**: < 1% of transfusions
    b. **Symptoms**: dyspnea, hypertension, high output circulatory failure, tachycardia, cough, headache
    c. **Risk factors**: children, elderly, existing cardiovascular or kidney disease, fast rate of transfusion, large volume of transfusion, additional intravenous fluids
    d. **Treatment**: upright position, oxygen, diuretics

2. Transfusion Related Acute Lung Injury (TRALI)
    a. Cause is not always known but can be due to antibodies in the donor reacting with recipient WBCs resulting in pulmonary inflammation and edema
    b. **Incidence**: 1 in 5,000 – 1 in 190,000 transfusions
    c. **Symptoms**: hypoxemia, respiratory failure, hypotension &/or SOB, fever, bilateral pulmonary infiltrates, typically within 6 hours of transfusion
    d. **Treatment**: supportive

3. Febrile Reactions
    a. **Incidence**: 0.1% – 1%
    b. **Symptoms**: ≥ 1°C (1.8°F) rise from baseline temperature and temperature ≥ 38°C (100.4°F) during or within 4 hours of completion of transfusion. **Or** chills/rigors during or within 4 hours of completion of transfusion.
    c. **Treatment**: supportive care, antipyretics

4. Allergic Reactions
    a. Mild (urticarial)
        i. **Incidence**: 1% – 3%
        ii. **Symptoms**: hives, itching, flushing
        iii. **Treatment**: antihistamines, slowing down transfusion rate
    b. Moderate
        i. **Symptoms**: wheezing, itchy throat
        ii. **Treatment**: antihistamines, steroids
    c. Anaphylactic
        i. **Incidence**: 1 in 20,000 – 1 in 50,000
        ii. **Symptoms**: hypotension, respiratory distress, local edema
        iii. **Treatment**: epinephrine, antihistamines, corticosteroids

Preventing Transfusion Reactions

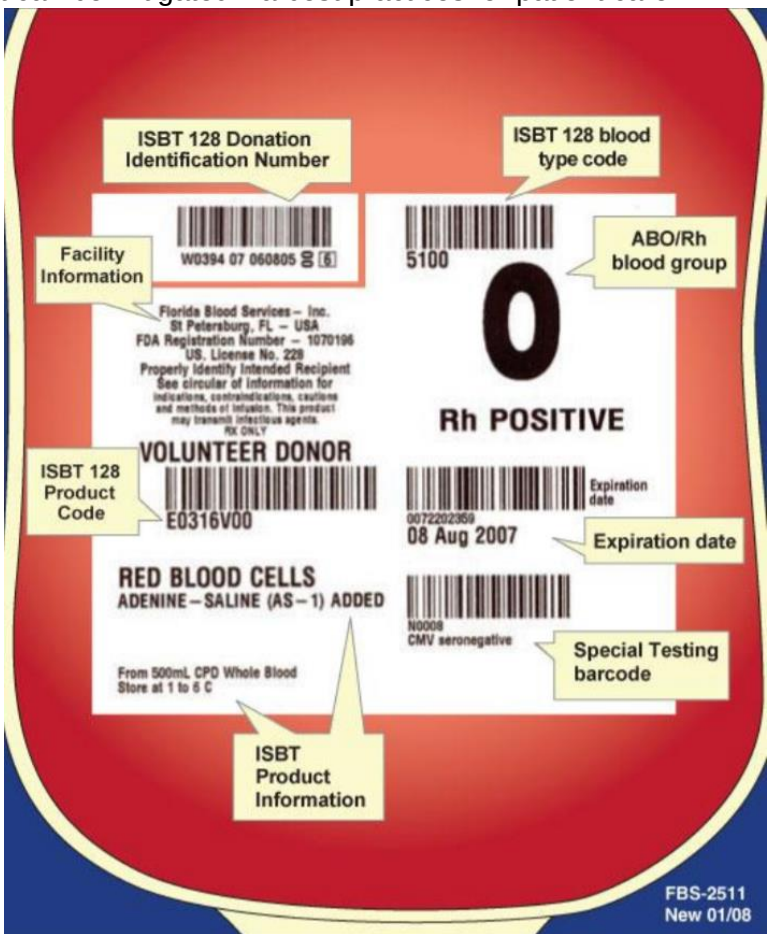
Every blood transfusion has risks that can be mitigated via best practices for patient care

1. First step – have a 2 person check on all information on the unit tag against the patient armband and the unit of blood.

2. Unit numbers, also known as the Donation Identification Number (DIN), are 16 digits long – it is critical that all digits of the unit number be confirmed.

3. On the ISBT Label, the UNIT NUMBER is in the upper left corner.

4. Take and record vital signs throughout the transfusion:
    a. Within 15 minutes before starting the transfusion
    b. 15 minutes after starting the transfusion
    c. Hourly thereafter after starting the transfusion
    d. At end of transfusion



Source: https://www.iccbba.org/isbt-128-basics/basic-educational-materials/sample-labels2

5. Other things to record:
    a. Starting volume and volume transfused
    b. Was a reaction suspected? If Yes, what signs and symptoms?

6. I suspect my patient is having a transfusion reaction – Now What?
    a. **STOP THE TRANSFUSION** and keep the line open with normal saline
    b. Call the Blood Bank and the patient's physician
    c. Order a Transfusion Reaction Evaluation in EPIC
    d. Complete the Transfusion Reaction Investigation Form
    e. Perform a bedside clerical check, verifying the correct unit was given to the correct patient
    f. Document all symptoms and vitals, etc.
    g. Obtain a post-transfusion sample if indicated. This will be collected either by Nursing or Phlebotomy department depending on patient location.
    h. Bring the blood product(s) and completed form (and post-transfusion sample if indicated) to the Blood Bank

7. Can the transfusion ever be restarted?
    a. If the only symptoms are consistent with a mild allergic reaction (urticaria, hives), the physician may elect to treat and resume transfusion after symptoms subside
    b. Even so, call the Blood Bank to report for consistency and to help track rates of reactions throughout the organization

8. Preventing Reactions Summary
    a. Not always possible, but the first line of defense against an avoidable reaction is positive patient and blood unit identification.
    b. And if there is a reaction, immediate recognition and action are key to preventing or reducing serious sequelae
    c. If you don't know whether or not to call it a reaction, be on the safe side and call the Blood Bank (505-841-1344)! There is always a pathologist on call.

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