Transfusion Reactions

I. Immediate Reactions (immediately or up to 48 hrs after transfusion)

A) Immunologic (antigen-antibody rx from RBC, WBC or plasma proteins)

1. Acute Hemolytic  PREVENTABLE!

- RBCs destroyed in the recipient during transfusion, caused by incompatibility between recipient’s antibodies and donor’s RBCs
  - **Incompatibility in ABO blood groups responsible for most deaths in acute hemolytic reaction
  
  - S & S: increased capillary permeability, which leads to dilated vessels and hypotension; DIC, which leads to the formation of thrombi;
    - chills, fever, face flushing, burning sensation of vein used, lumbar/ flank pain, chest pain, shock
  
  - treatment: treat hypotension and promote renal blood flow (ie give volume or volume + Lasix (to increase renal blood flow)

2. Febrile Non-hemolytic

- transfusion of cellular components in the absence of hemolysis (rupture of red cells) where leukocyte antibodies in the recipient are directed against the donor white blood cells
  - patients sensitized by numerous transfusions or multiple pregnancies are more likely to develop it.
  - *if have this reaction, may not occur with the next.

  - S & S: *increase of temp. of 1degree within 1-6hour after starting the transfusion
    - flushing of face, palpitations, cough, tightness in chest, increased heart rate, chills

  - treatment: antipyretics

3. Anaphylactic

- occur in patients who are IgA deficient and who have developed anti-IgA antibodies (IgA = Immunoglobulin A, naturally occurring in blood)

  - S & S: Classic!
    - *after a few millimeters of blood or plasma has infused in the absence of fever
-bronchospasm, respiratory distress, abdominal cramps, vascular irritability, shock, LOC

treatment: resuscitation of patient, and give epinephrine, steroids, etc.

4. Urticaria

-hypersensitivity response.

treatment: stop the infusion, give antihistamines, then restart

B) Non-immunologic (no antigen-antibody reaction)
-caused by external factors in the administration of blood (ie bacterial infection of the patient, contamination of the donor blood, improper handling of blood)

1. Circulatory Overload PREVENTABLE!

-blood given too fast leading to hypervolemia
-those prone are the young, the elderly, cardiac/renal diseased

-S & S: headache, dyspnea, constriction of chest, cyanosis

treatment: stop transfusion, sit patient up, diuretics, O2. If severe, can do phlebotomy.

2. Air Embolism PREVENTABLE!

-problems greatly improved with plastic IV bags!
-problem caused by faulty changing of equipment

-S & S: cyanosis, dyspnea, shock, cardiac arrest

treatment: stop transfusion and turn patient on Left side with head down. (This traps air in the Right atrium, preventing it from entering the pulmonary artery.)

3. Hypothermia PREVENTABLE!

-caused by large volumes of cold blood given too quickly

-S & S: chills, peripheral vasoconstriction, ventricular arrhythmia, cardiac arrest

treatment: warm blood to 37 degrees
4. **Bacterial Contamination**  **PREVENTABLE!**

- contamination at the time of donation or in the preparation of the component for infusion
- from skin contaminants and cold-resistant Gram negative bacteria (ie Pseudomonas, E. Coli)
- ***CAN BE FATAL!***

- S & S: high fever, flushing, renal failure, DIC

- treatment: stop the infusion, manage the shock, do cultures, give antibiotics, steroids, etc.

II. **Delayed Reactions**

A. **Immunologic**

1. **Delayed Hemolytic**

   - seen 1 week or more after transfusions

   - S & S: fever, mild jaundice, lower hemoglobin

2. **Transfusion-associated Graft-vs-Host Disease**

   - rare, but FATAL (75-90% mortality)
   - transfer of immunocompetent T-lymphocytes to severely immunocompromised patients. (can also get it from 1st degree family member)
   - occurs 4-30 days after transfusion

   - S & S: starts with high fever, nausea & vomiting, profuse diarrhea

B. **Non-immunologic**

1. **Hepatitis**

   - caused by Hep. B & C virus
   - usually resolves in 4-6 weeks

   - S & S: fever, fatigue, anorexia, dark urine, jaundice….leads to increased liver enzymes and progresses to inflammation of liver, and possibly cirrhosis and cancer of the liver

   - **FYI**- Hep B virus incubates for 30-180 days!
2. **Malaria**

- almost none in the US or Canada (yeah Canada!)
- increased in the 1980s due to travelers (going to endemic countries to 'find themselves'). It is much lower today.

- diagnosis: organism seen on blood smear, and symptomatic hx

- S & S: biggest symptom is fever!

- treatment: antimalarial prophylaxis
  - **immigrants, refugees and citizens from endemic countries can be blood donors if there are asymptomatic in the US for 3 years**

3. **AIDS**

- from the HIV virus
- incubation period > 10 years

- S & S: severely immunodeficient, weight loss, diarrhea, fever, lymphadenopathy, Karposi Sarcoma

4. **Syphilis**

- almost eradicated in blood by the advent of refrigeration.

**FYI*** Autologous Transfusion

- collection, filtration & reinfusion of one’s own blood
  - pre-op: pre-deposit donation
  - peri-op: hemodilution
  - intra-op: salvage (from suction)
  - post-op: salvage (from suction)