Dr. Yulia Lin, Pre-operative Patient Blood Management

What is patient blood management?

- Patient-centered and organized approach in which the entire health care team coordinates efforts to improve results by managing and preserving a patient's own blood
    1. Treat Anemia
    2. Minimize blood loss
    3. Appropriate use of blood

Why is treating preoperative anemia so important?

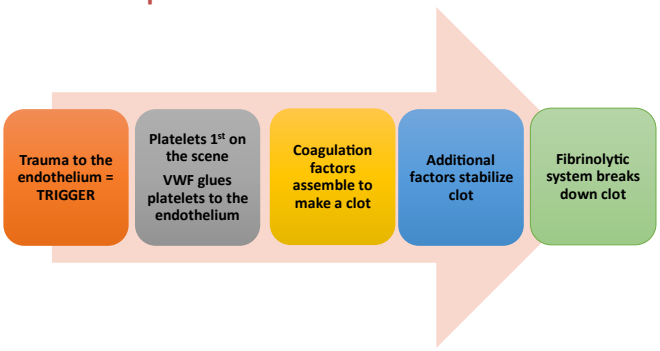
1. Preop anemia is associated with increased mortality
2. Preop anemia is potentially modifiable (both as a risk factor and a treatable condition)
3. Preop anemia is common ~ 1/3 of pts going for surgery have anemia!
4. Preop anemia is associated with transfusion
5. Transfusion is a bad outcome
6. The donor supply is precious resource

How to treat preoperative anemia?

- Autologous blood
    - Only to be used for patients with very rare blood type, for whom blood donors cannot be easily found
- Diagnose iron deficiency anemia
    - Check the CBC 4-6 weeks preop.
    - For high blood loss major surgery, the target is preop Hb if 130 g/L in both males and females
    - Iron deficiency anemia is defined as:
        - Ferritin < 30 mcg/L; or
        - Ferritin < 100 mcg/L AND transferrin saturation < 20%
    - Low iron stores defined as:
        - Ferritin < 100 mcg/L
- Treat iron deficiency anemia
    - Always remember to identify the cause (Bleeding is the most common source)
    - Start with oral iron salts when possible
    - Consider iv iron when
        - Oral iron is not tolerated or ineffective
        - Short time to surgery < 4-6 weeks
        - Severe anemia, e.g. Hb < 100 g/L
        - Active bleeding
- Consider the role of erythropoiesis stimulating agents in
    - Patients with religious objections to blood
    - Patients with multiple alloantibodies where it is difficult to find blood
    - Patients with high blood loss surgery (although cost-effectiveness less clear here)

Dr. Natasha Rupani, Dr. Michelle Sholzberg - Congenital Coag – VWD, Hemophilia

Hemostasis Simplified



The bleeding history if the most important TEST of hemostasis, using a validated bleeding assessment tool (BAT).

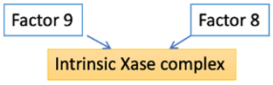
A normal PT and aPTT does not rule out a bleeding disorder.

Von Willebrand Disease

Diagnosis: 1) Bleeding Symptoms, 2) Family History, 3) Laboratory Results

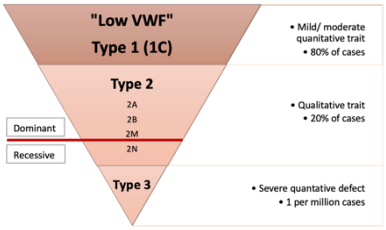
Bleeding Symptoms		Treatment
Mucocutaneous ▪ Heavy menstrual bleeding ▪ Epistaxis ▪ Bruising ▪ Excessive bleeding from minor wounds ▪ GI bleeding ▪ Oral cavity/post-dental procedure ▪ Post-operative ▪ Post-partum	**Musculoskeletal** (Type 2N, 3) ▪ Hemarthrosis ▪ Soft tissue, muscle hematomas	**Call Hematology/Transfusion Medicine** Principle of treatment: Increase or replace VWF ▪ DDAVP (Desmopressin) ▪ VWF:FVIII Concentrate (Humate P, Wilate) ▪ Adjunctive anti-fibrinolytic agent (TXA)

Hemophilias:



Hemophilia B
- Factor IX deficiency
- 1 in 30,000 males

Hemophilia A
- Factor VIII deficiency
- 1 in 5,000 males



Bleeding Symptoms	Treatment	
▪ Musculoskeletal bleeding o Hemarthrosis o Intra-muscular hematoma ▪ Mouth bleeding, epistaxis ▪ Intracranial bleeding ▪ Bleeding with trauma, procedures, surgery ▪ Heavy menstrual bleeding (symptomatic carriers)	**Call Hematology/Transfusion Medicine** Principle of treatment: Replace deficient factor	
	▪ Factor VIII: Xyntha, Kovaltry, Nuwiq, Adynovate, Jivi, ▪ Factor IX: Benefix, Rebinyn ▪ DDAVP (Desmopressin) – mild hemophilia (FVIII>10%)	Non-factor therapies: Emicizumab ▪ Avoid PCC – risk of thrombosis ▪ Inhibitor present - rVIIa ▪ No inhibitor – FVIII concentrate
	Adjunctive anti-fibrinolytic agent (TXA)	

Resources

- "Principles of Management of Urgent Bleeding in Hemophilia" - developed by Dr. Jerry Teitel
- Blood Easy: Coagulation Simplified – developed by ORBCoN
- Illustrated Review of Bleeding Assessment Tools and Coagulation tests (Elbaz, Sholzberg)