

# 8 Hemorrhage

Acute massive bleeding

## START

- 1 **Call for help and a code cart**
  - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Open IV fluids and assess for adequate IV access**
- 3 **Turn FiO<sub>2</sub> to 100% and turn down volatile anesthetics**
- 4 **Call blood bank**
  - ▶ Activate massive transfusion protocol
  - ▶ Assign 1 person as primary contact for blood bank
  - ▶ Order blood products (in addition to PRBCs)
    - 1 FFP : 1 PRBC
    - If indicated, 6 units of platelets
- 5 **Request rapid infuser** (or pressure bags)
- 6 **Discuss management plan** between surgical, anesthesiology, and nursing teams
- 7 **Call for surgery consultation**
- 8 **Keep patient warm**
- 9 **Send labs**

CBC, PT/PTT/INR, fibrinogen, lactate, arterial blood gas, potassium, and ionized calcium

- 10 **Consider...**
  - ▶ Electrolyte disturbances (hypocalcemia and hyperkalemia)
  - ▶ Uncrossmatched type O blood if crossmatched blood not available
  - ▶ Damage control surgery (pack, close, resuscitate)
  - ▶ Special patient populations (see considerations below)

## DRUG DOSES and treatments

### HYPOCALCEMIA treatment

Give calcium to replace deficit (calcium chloride or calcium gluconate)

### HYPERKALEMIA treatment

- |                                   |  |
|-----------------------------------|--|
| 1. Calcium gluconate              | • 30 mg/kg IV                                      |
| - or -                            |  |
| Calcium chloride                  | • 10 mg/kg IV                                      |
| <hr/>                             |  |
| 2. Insulin                        | • 10 units regular IV with 1–2 amps D50W as needed |
| <hr/>                             |  |
| 3. Sodium bicarbonate if pH < 7.2 | • 1–2 mEq/kg slow IV push                          |

## SPECIAL PATIENT POPULATIONS

### OBSTETRIC:

- Empirical administration of 1 pool of cryoprecipitate (10 cryo units)
- Check fibrinogen (goal is > 100 mg/dL)  
If first fibrinogen level < 100 mg/dL, order 2 more pools of cryoprecipitate

### TRAUMA:

- Give either...
- Antifibrinolytic tranexamic acid: 1000 mg IV over 10 minutes followed by 1000 mg over the next 8 hours  
– or –
  - Aminocaproic acid: 4–5 g in 250 mL NS/RL IV over first hour followed by a continuing infusion of 1 g in 50 mL NS/RL IV per hour over 8 hours

### NON-SURGICAL UNCONTROLLED BLEEDING despite massive transfusion of PRBC, FFP, platelets and cryo:

- Consider giving Recombinant Factor VIIa: 40 mcg/kg IV
  - Surgical bleeding must first be controlled
  - **use with CAUTION** in patients at risk for thrombosis
  - **DO NOT use** when PH is < 7.2