

# Obstetrical Hemorrhage

The expected blood loss during routine delivery is 500ml during vaginal delivery and up to 1000ml during C-section. Blood loss in excess of expected loss is defined as obstetrical hemorrhage. Obstetrical hemorrhage is the cause of > 25% of maternal deaths in both developed and developing countries; blood loss can occur rapidly as the gravid uterine blood flow is 600 to 900 mL/min; resuscitation is often inadequate because maternal VS remain "normal" until > 30% of blood volume is lost while blood loss is usually partially or completely covert making EBL difficult to measure; causes of hemorrhage are classified by their timing of occurrence (antepartum and postpartum)

## ANESTHETIC CONSIDERATIONS:

- Emergency situation with potential for significant maternal and fetal morbidity and mortality.
- Anesthetic considerations of the pregnant patient.
  - 2 patients
  - potentially difficult airway
  - rapid desaturation due to increased O<sub>2</sub> consumption and decreased FRC
  - aspiration risk and rapid sequence induction
  - aortocaval compression
  - physiologic changes of pregnancy
- Potential for massive transfusion and associated complications.
- Optimization of uteroplacental perfusion.

## ANESTHETIC GOALS:

1. Restore maternal circulating volume and optimize hemodynamic stability
2. Optimize uteroplacental perfusion
3. Prevent coagulopathy
  - a. avoid hypothermia
  - b. restore depleted/diluted/consumed clotting factors with plasma
  - c. replace platelets
  - d. monitor fibrinogen/replace with cryoprecipitate
  - e. consider rFVIIa
  - f. consider hypocalcemia and citrate toxicity
  - g. correct acidosis
4. Consider alternative options for control of hemorrhage:
  - a. bilateral surgical ligation (uterine, ovarian, and internal iliac arteries)
  - b. intrauterine balloon tamponade
  - c. angiographic embolization
  - d. hysterectomy

## CLASSIFICATION

- **Antepartum** = 4% of pregnancies:
  - Placenta abruptio
  - Placenta previa
  - Uterine rupture (rare)
- **Intrapartum**:
  - Placenta previa
  - Uterine rupture
  - Placental abruption
- **Postpartum** = 10% of deliveries "Tone, Trauma, Tissue, Thrombosis, Turn out of uterus":
  - Uterine atony
  - Retained placenta
  - Placenta accreta
  - Uterine rupture (rare)
  - Uterine inversion (rare)