Postpartum Hemorrhage

Why it is important?

- **PPH remained one of the top 3 causes of direct maternal deaths.**

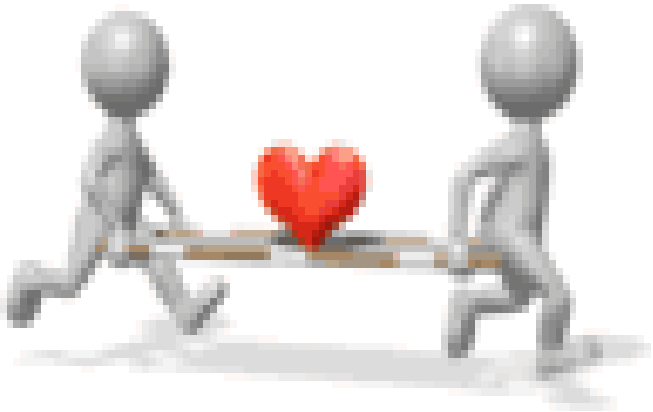
- **Incidence**
  - **4% after vaginal delivery**
  - **6,5% after CS delivery**

Severe PPH has also shown an increase of 8.9% per year, unrelated to temporal trends in the known risk factors;

- ❑Advanced maternal age
- ❑Grand multi parity
- ❑Previous cesarean birth
- ❑Fibroids
- ❑ Multiple gestation
- ❑polyhydramnios
- ❑placenta previa
- ❑Abruption
- ❑Induction of labor

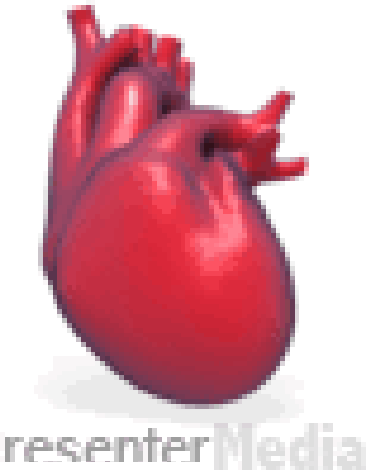
Definition

Blood loss > 500 ml at vaginal delivery
> 1000 ml at Cesarean



ACOG 10% drop in hematocrit
Need for blood transfusion

Severe PPH > 1000 ml loss at vaginal delivery



Any amount of blood loss causes

S/O Hypovolemic Hemorrhagic Shock

- Tachycardia - Hypotension - Reduced urine out put

We have 4 problems

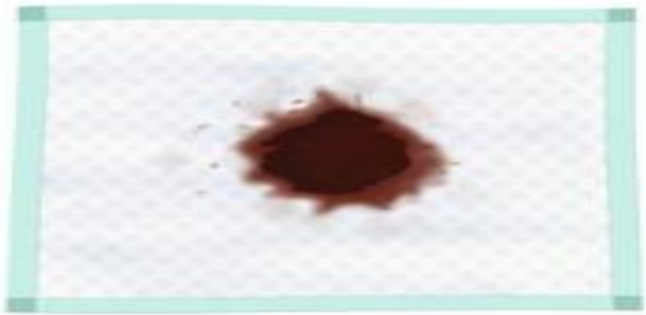
- **Problem 1: almost 50% of deliveries lose >500 ml of blood.**
- **Problem 2: estimated blood loss is often less than half the actual blood loss.**
- ***Problem 3:*** **Most of the serious causes of "PPH" have origins prior to the end of the 3rd Stage of labor**
- **Problem 4: PPH, as defined, is technically misdiagnosed and clinically irrelevant.**

100 ml

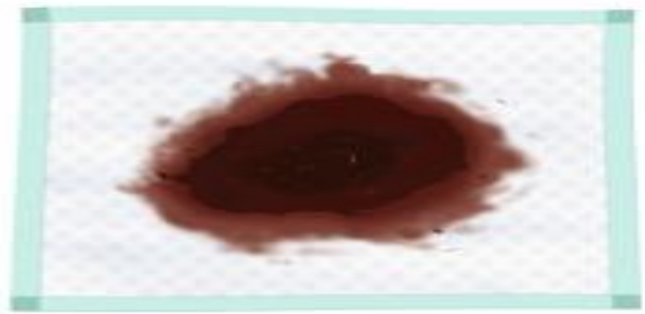
300 ml

30 ml

1000 ml



50 ml



200 ml

Measuring Blood Loss in PPH

___THE BRASSS-V DRAPE

Classified of post partum hemorrhage

Primary (first 24 h)

- Uterine atony
- Retained placenta
- Defect in coagulation
- Uterine invertion

Secondary (between 24 h until 12week)

- Sub involution
- Retained product
- Infection
- Inherited coagulation defect

Prediction and prevention

Most cases of PPH have **no** identifiable risk factors

Risk factors for PPH

Antenatally

- suspected or proven placental abruption
- Known placenta preavia
- Multiple pregnancy
- gestational hypertension

antenatally and associated with a significant

- previous PPH.
- Asian ethnicity
- Obesity (BMI >35)
- Anemia (<9 g/dl) –

during labour and delivery; these factors should prompt extra vigilance:

- Delivery by emergency caesarean section
- Delivery by elective caesarean section
- Induction of labour
- Retained placenta
- Mediolateral episiotomy
- Operative vaginal delivery
- Prolonged labour (> 12 hours)
- Big baby (> 4 kg)

How should PPH be managed?

management involves four components, all of which must be undertaken

SIMULTANEOUSLY:

1)communication,

2)resuscitation,

3)monitoring and investigation,

4)arresting the bleeding

CAUSES OF PPH FOUR " T"s

T ONE – UTERINE ATONY

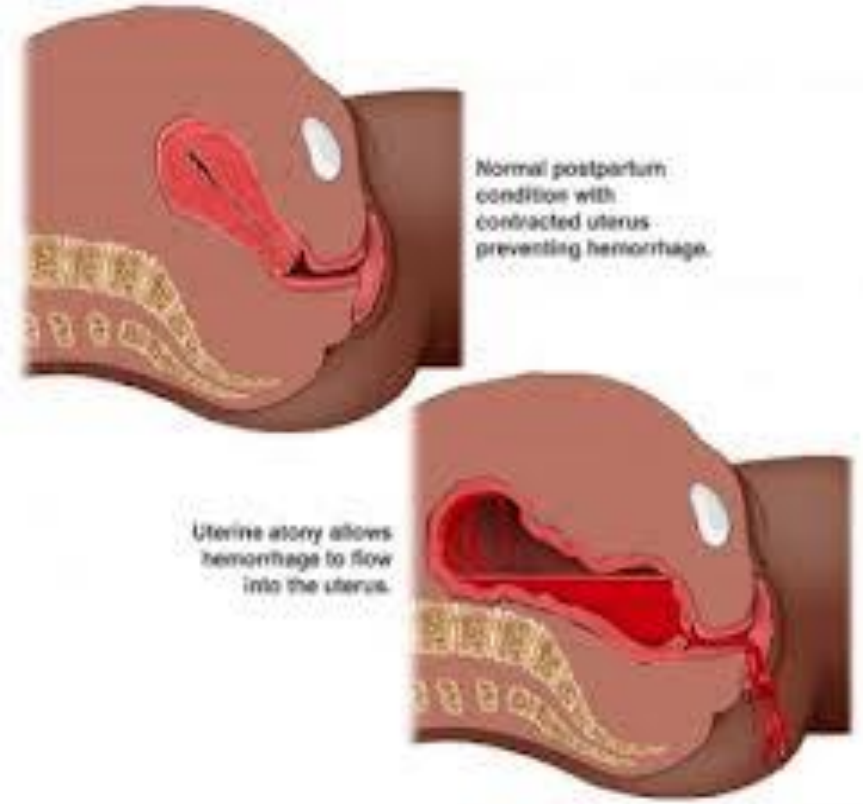
T ISSUE – RETAINED PLACENTA

T RAUMA – LACERATIONS

T HROMBIN – COAGULATION

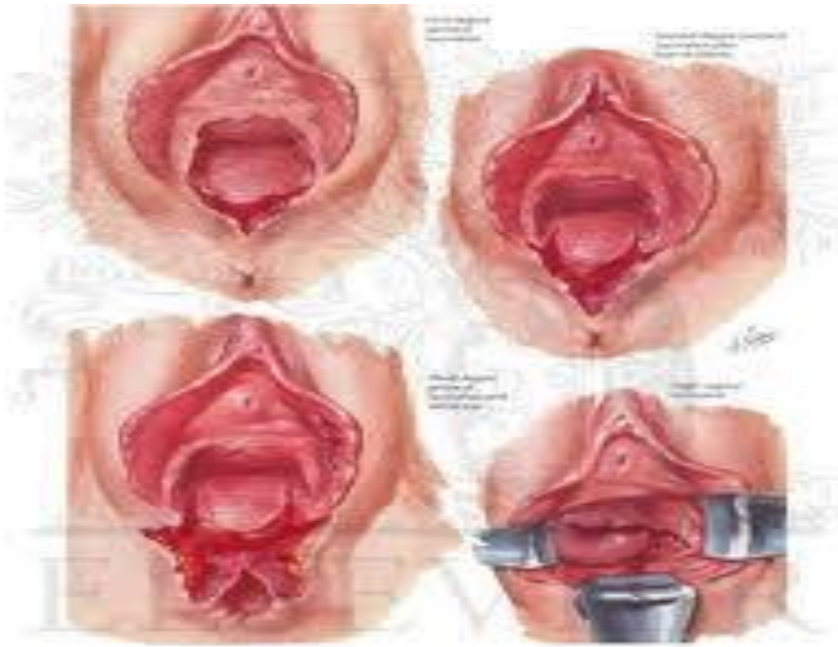
Tone”Uterine Atony”90%of causes

- - Uterine over distension
  - Polyhydramnios, Multiple gestations, Macrosomia
- Prolonged labor: “uterine fatigue”
- Precipitated labor
- High parity
- Chorio amnionitis
- Retained product of conception
- Halogenated anesthetic



TRUMA "Obstetric OR OPERATIVE" "7% of causes"

- 7% of causes
- Obstetric Trauma
  - Uterine Rupture
  - Lacerations of the Birth Canal
  - Operative Trauma
    - Cesarean sections
    - Episiotomies
    - Forceps, Vacuums, Rotations



Tissue retension “Abnormal placentaion

Thrombin "Coagulation Defects

- Sepsis
- Amniotic Fluid Embolism
- Abruptio Placenta associated coagulopathy
- HELLP Syndrome
- Dilutional Coagulopathy
- Inherited Clotting Disorders
- Anticoagulant Therapy

Postpartum Hemorrhage Prevention: Active Management of Third Stage (AMTSL)

- Oxytocin
  - With or soon after delivery
- Cord traction
  - Continuous tension
  - Gentle pull with contraction
- Uterine massage after placenta delivers

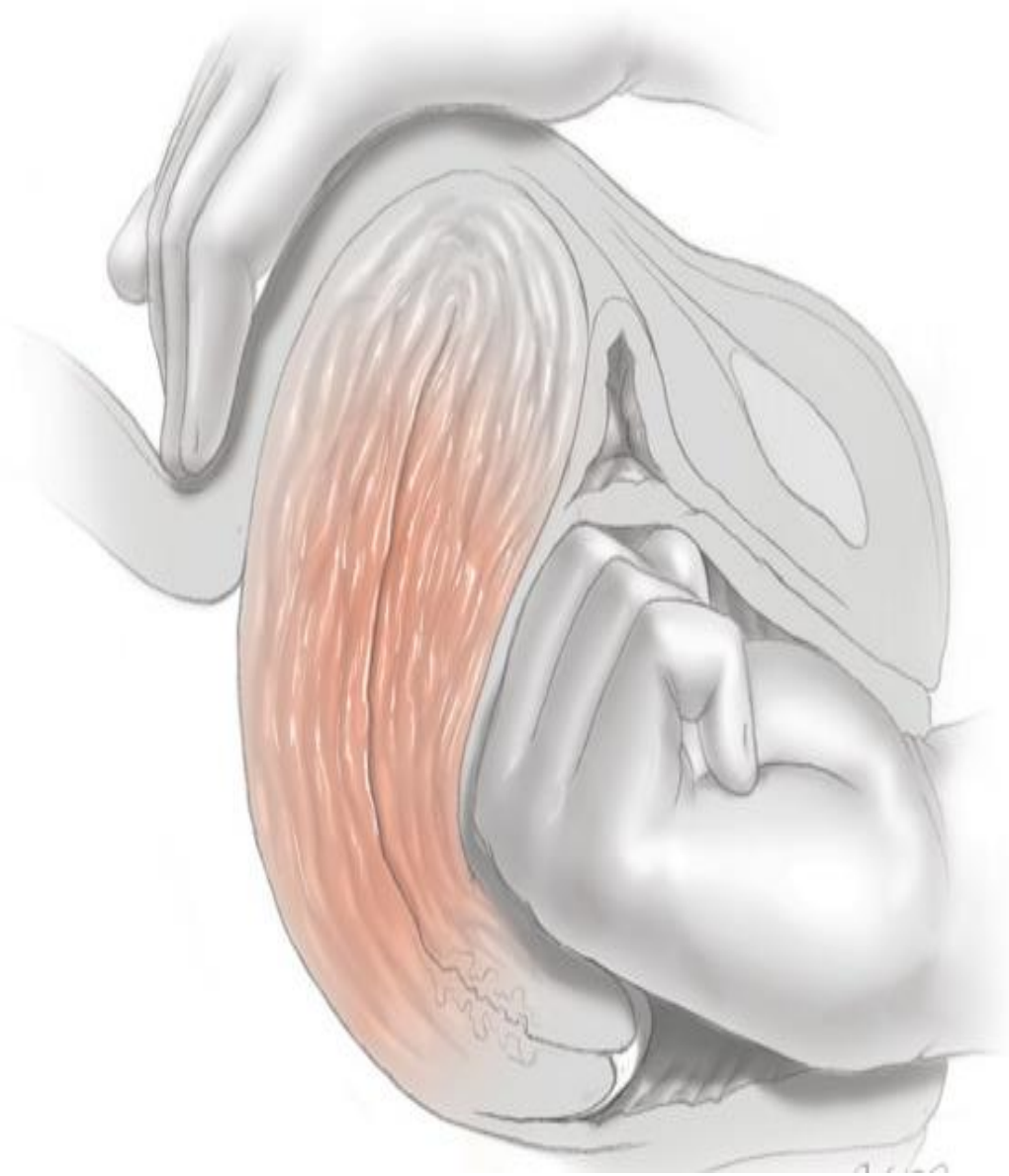
Table 1. Medical Management of Postpartum Hemorrhage

Drug*	Dose/Route	Frequency	Comment
Oxytocin (Pitocin)	IV: 10–40 units in 1 liter normal saline or lactated Ringer's solution IM: 10 units	Continuous	Avoid undiluted rapid IV infusion, which causes hypotension.
Methylergonovine (Methergine)	IM: 0.2 mg	Every 2–4 h	Avoid if patient is hypertensive.
15-methyl $PGF_{2\alpha}$ (Carboprost) (Hemabate)	IM: 0.25 mg	Every 15–90 min, 8 doses maximum	Avoid in asthmatic patients; relative contraindication if hepatic, renal, and cardiac disease. Diarrhea, fever, tachycardia can occur.
Dinoprostone (Prostin E_2)	Suppository: vaginal or rectal 20 mg	Every 2 h	Avoid if patient is hypotensive. Fever is common. Stored frozen, it must be thawed to room temperature.
Misoprostol (Cytotec, PGE_1)	800–1,000 mcg rectally		

Abbreviations: IV, intravenously; IM, intramuscularly; PG, prostaglandin.

*All agents can cause nausea and vomiting.

Modified from Dildy GA, Clark SL. Postpartum hemorrhage. Contemp Ob/Gyn 1993;38(8):21–9.



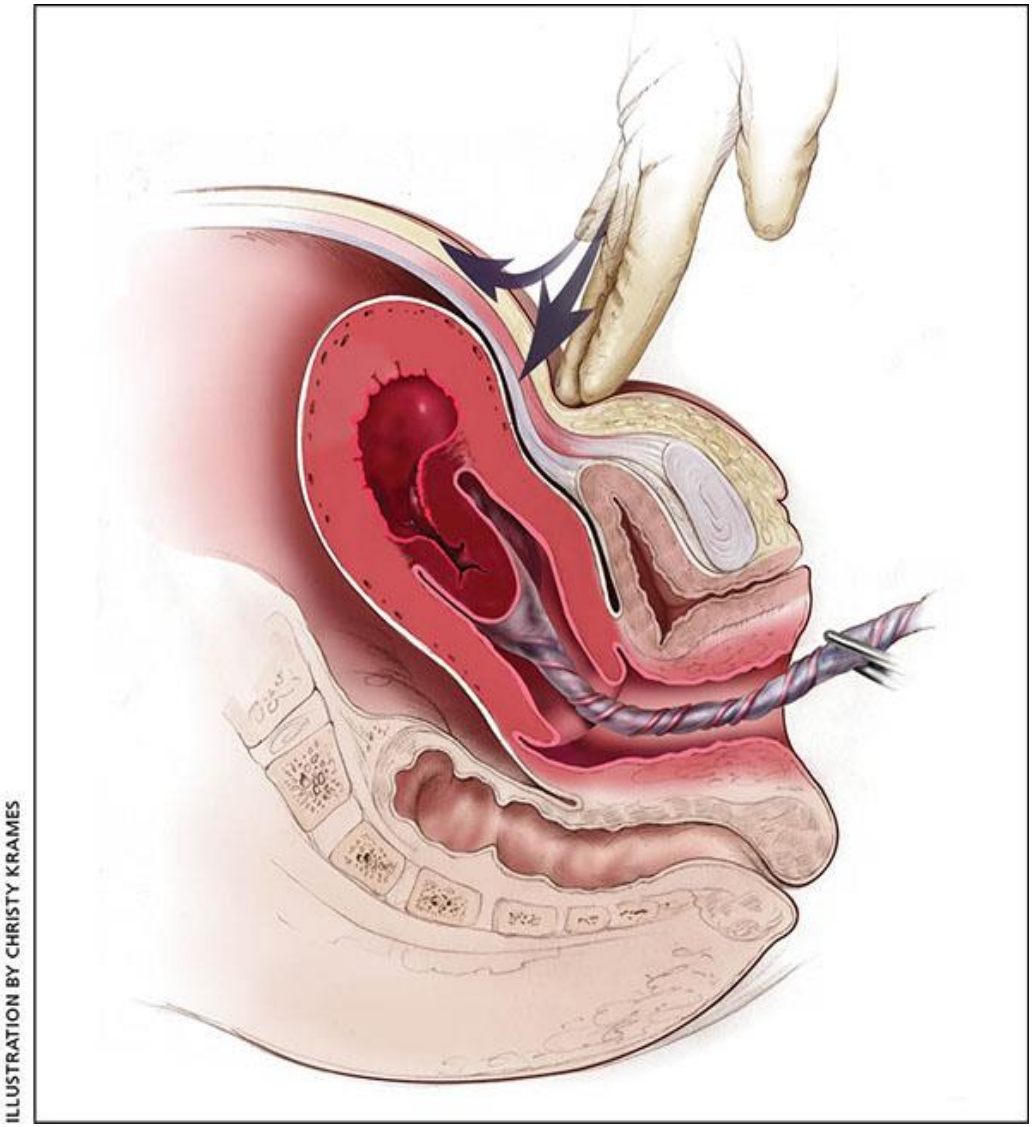


ILLUSTRATION BY CHRISTY KRAMES

Full protocol for MAJOR PPH (blood loss > 1000 ml and continuing to bleed OR clinical shock):

Assess airway.

Assess breathing.

Evaluate circulation

Oxygen by mask at 10–15 litres/minute.

Intravenous access (14-gauge cannula x 2, orange cannulae).

Position flat.

Keep the woman warm using appropriate available measures.

Transfuse blood as soon as possible.

Until blood is available, infuse up to 3.5 litres of warmed crystalloid

and/or colloid (1–2 litres) as rapidly as required.

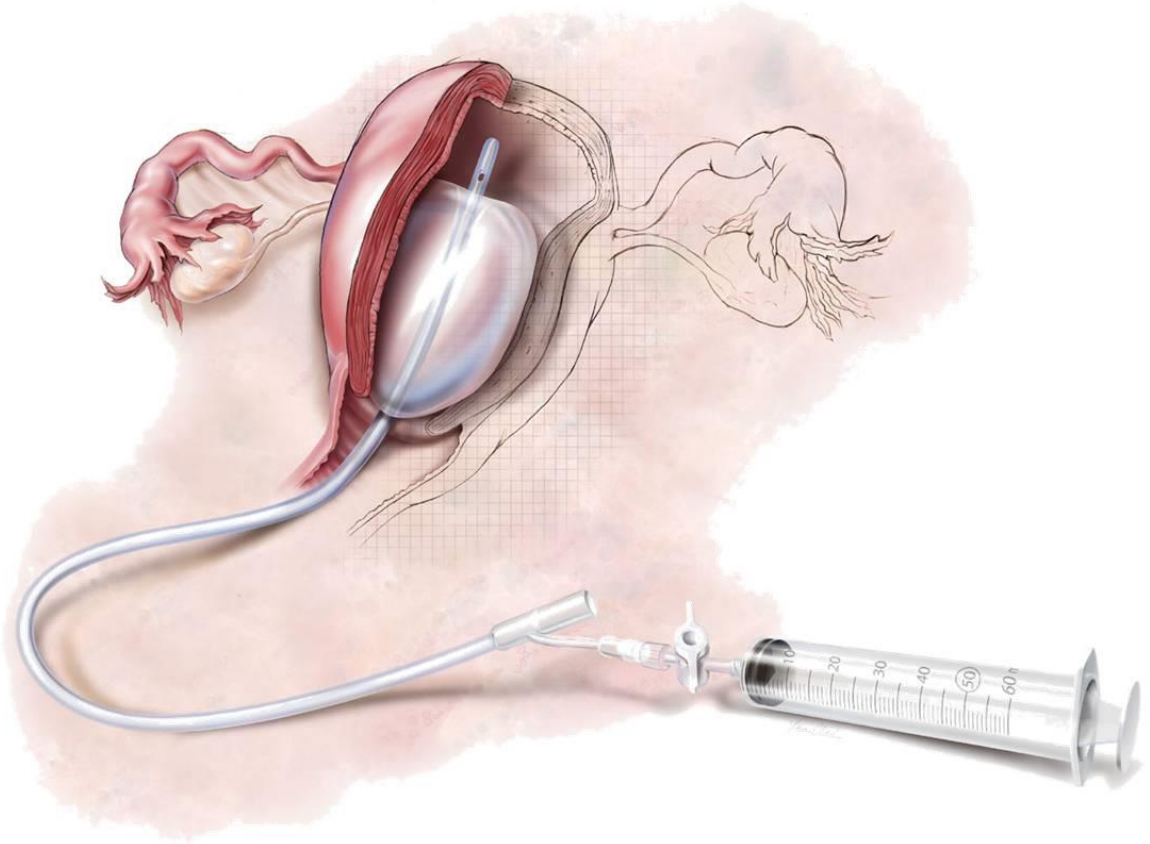
The best equipment available should be used to achieve RAPID WARMED infusion of fluids.

Special blood filters should NOT be used, as they slow infusions.

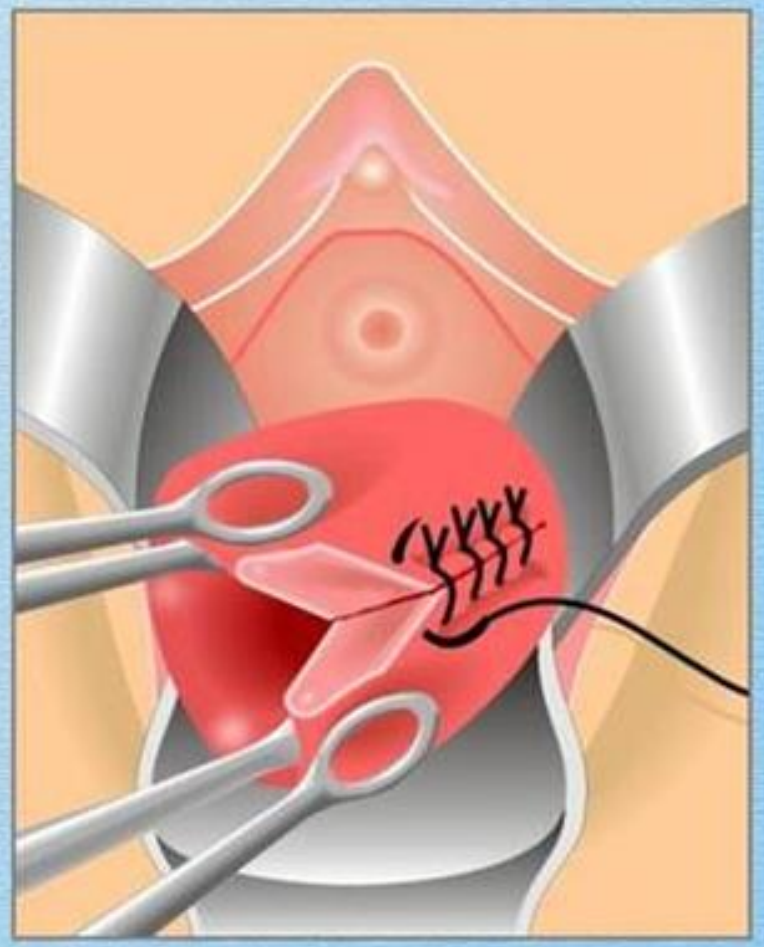
Table 2. Tamponade Techniques for Postpartum Hemorrhage

Technique	Comment
Uterine tamponade	
—Packing	—4-inch gauze; can soak with 5,000 units of thrombin in 5 mL of sterile saline
—Foley catheter	—Insert one or more bulbs; instill 60–80 mL of saline
—Sengstaken–Blakemore tube	
—SOS Bakri tamponade balloon	—Insert balloon; instill 300–500 mL of saline

Bakri Balloon is a tamponade technique that can be used for PPH



Cervical Laceration



Vulvar Hematoma

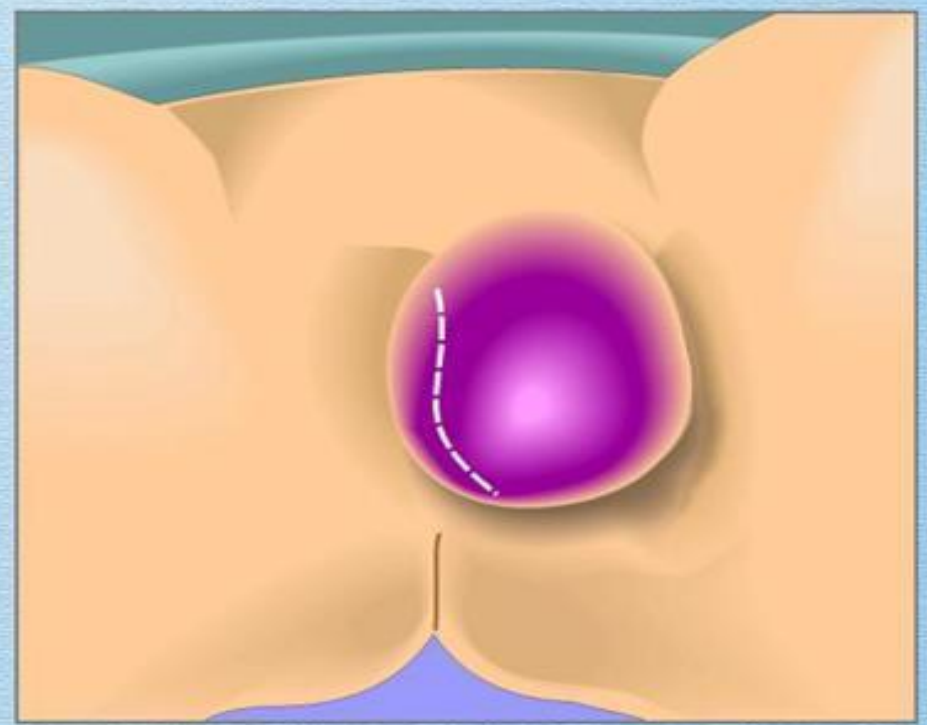
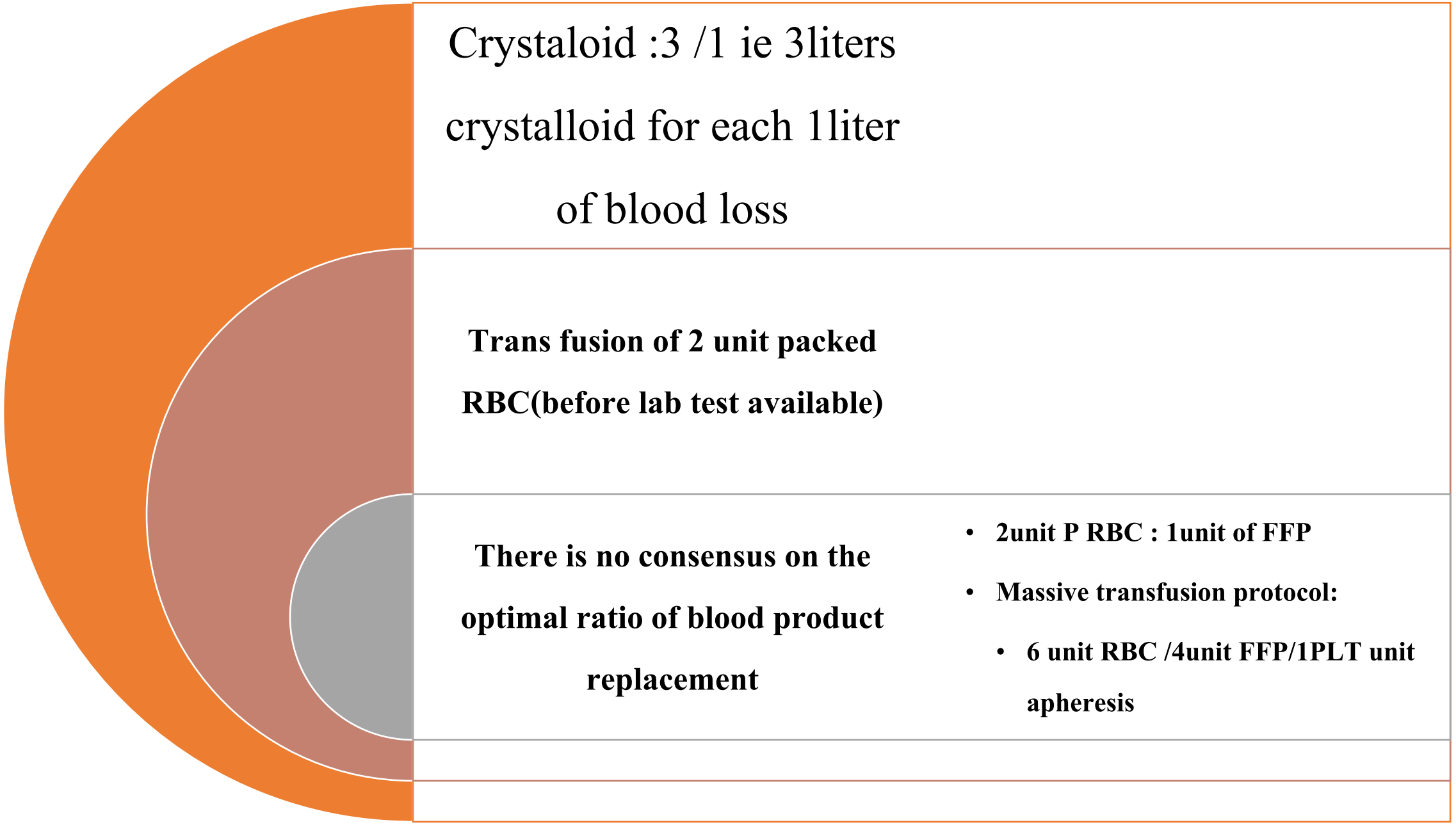


Table 4. Blood Component Therapy

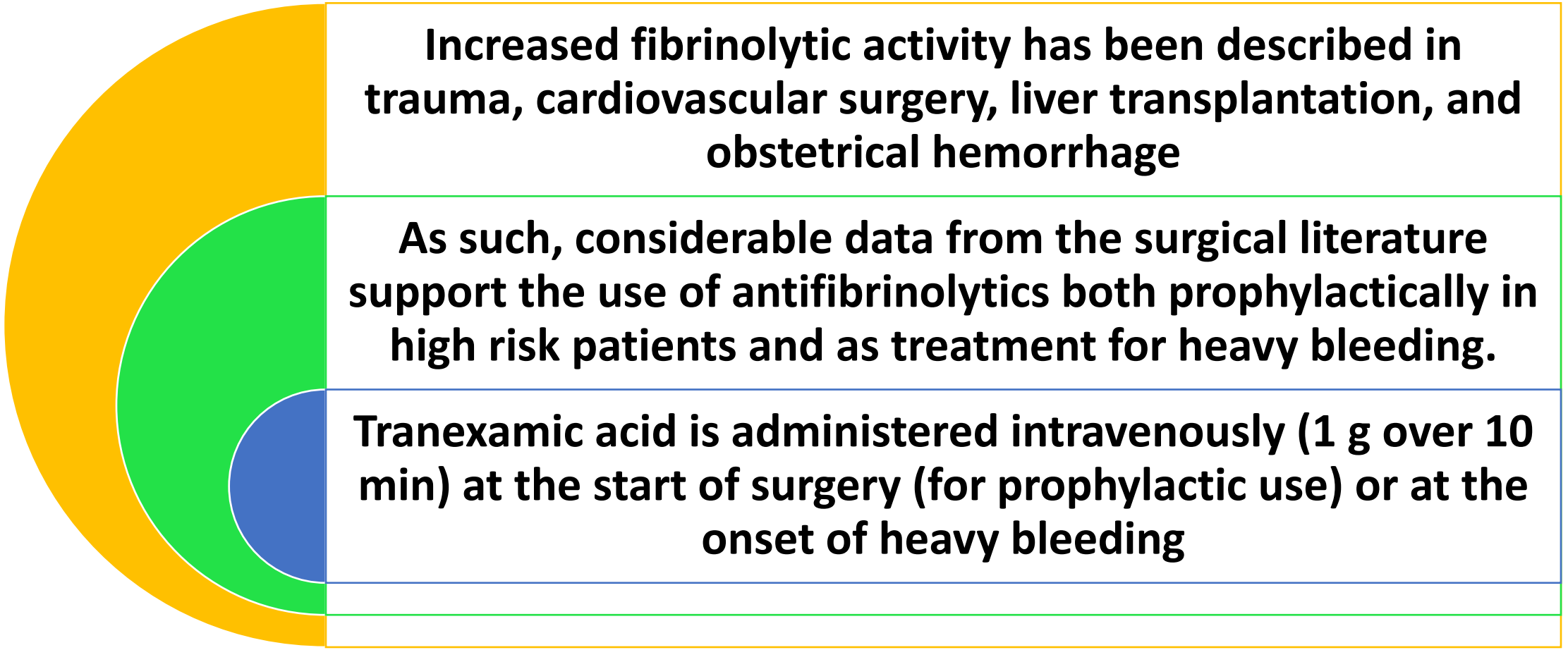
Product	Volume (mL)	Contents	Effect (per unit)
Packed red cells	240	Red blood cells, white blood cells, plasma	Increase hematocrit 3 percentage points, hemoglobin by 1 g/dL
Platelets	50	Platelets, red blood cells, white blood cells, plasma	Increase platelet count 5,000–10,000/mm^3 per unit
Fresh frozen plasma	250	Fibrinogen, antithrombin III, factors V and VIII	Increase fibrinogen by 10 mg/dL
Cryoprecipitate	40	Fibrinogen, factors VIII and XIII, von Willebrand factor	Increase fibrinogen by 10 mg/dL


Crystaloid :3 /1 ie 3liters crystalloid for each 1liter of blood loss
Trans fusion of 2 unit packed RBC(before lab test available)
There is no consensus on the optimal ratio of blood product replacement
2unit P RBC : 1unit of FFP
Massive transfusion protocol:
6 unit RBC /4unit FFP/1PLT unit apheresis

Goals of Therapy

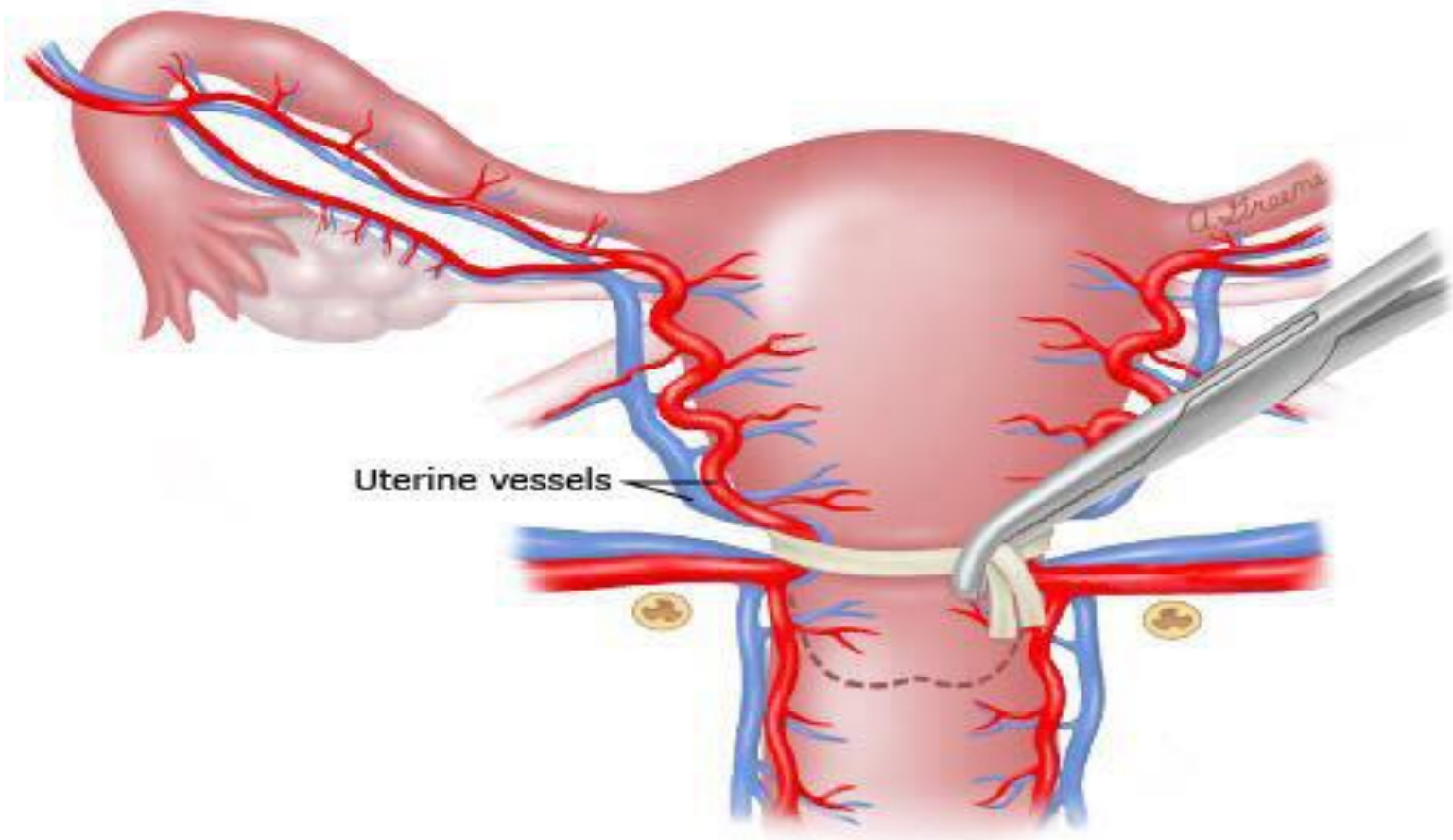
- **Maintain the following:**
  - Systolic pressure >90mm Hg
  - Urine output >0.5 mL/kg/hr
  - Normal mental status
- **Eliminate the source of hemorrhage**
  - haemoglobin > 8g/dl
  - platelet count >100000/dl
  - prothrombin < 1.5 x mean control
  - activated prothrombin times < 1.5 x mean control
  - fibrinogen > 200mg/dl.

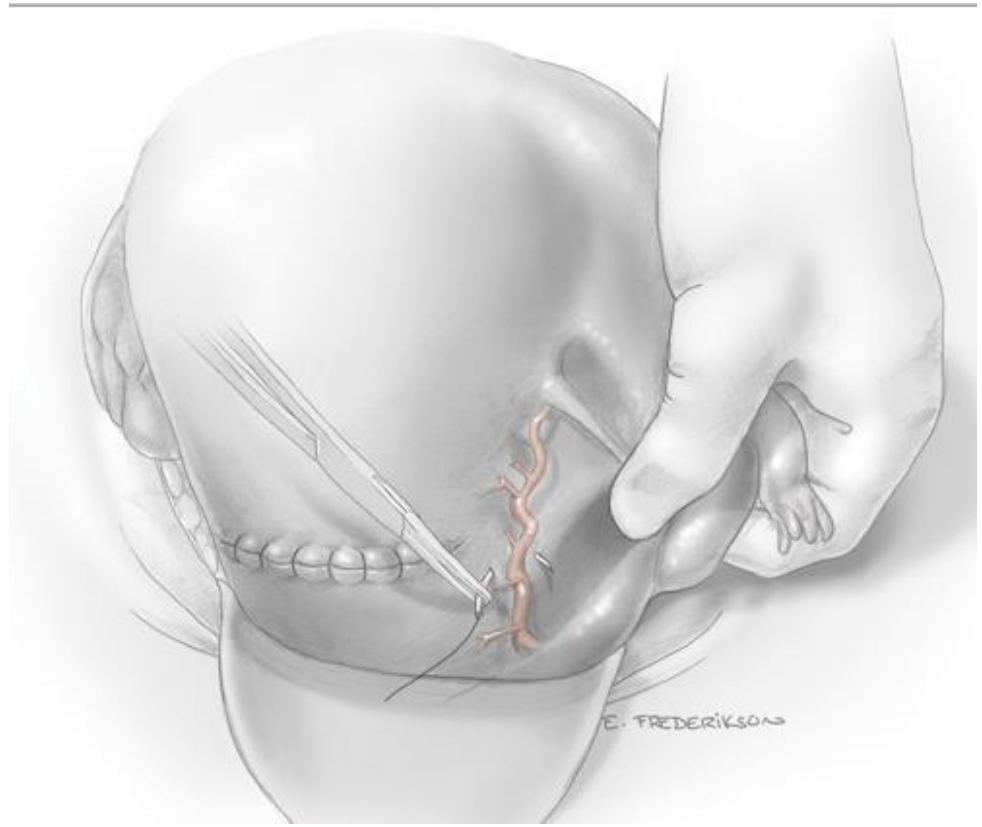
Tranexamic acid

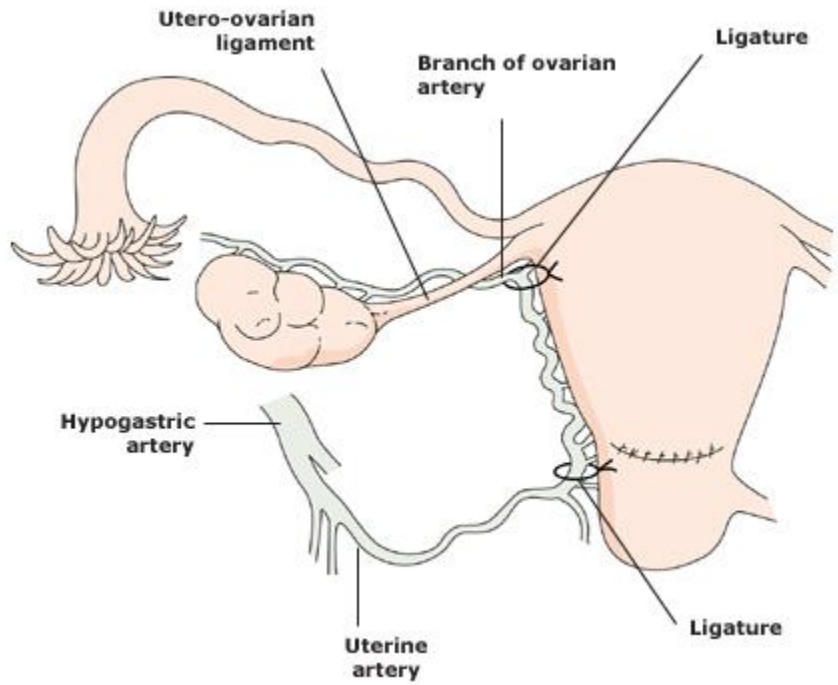


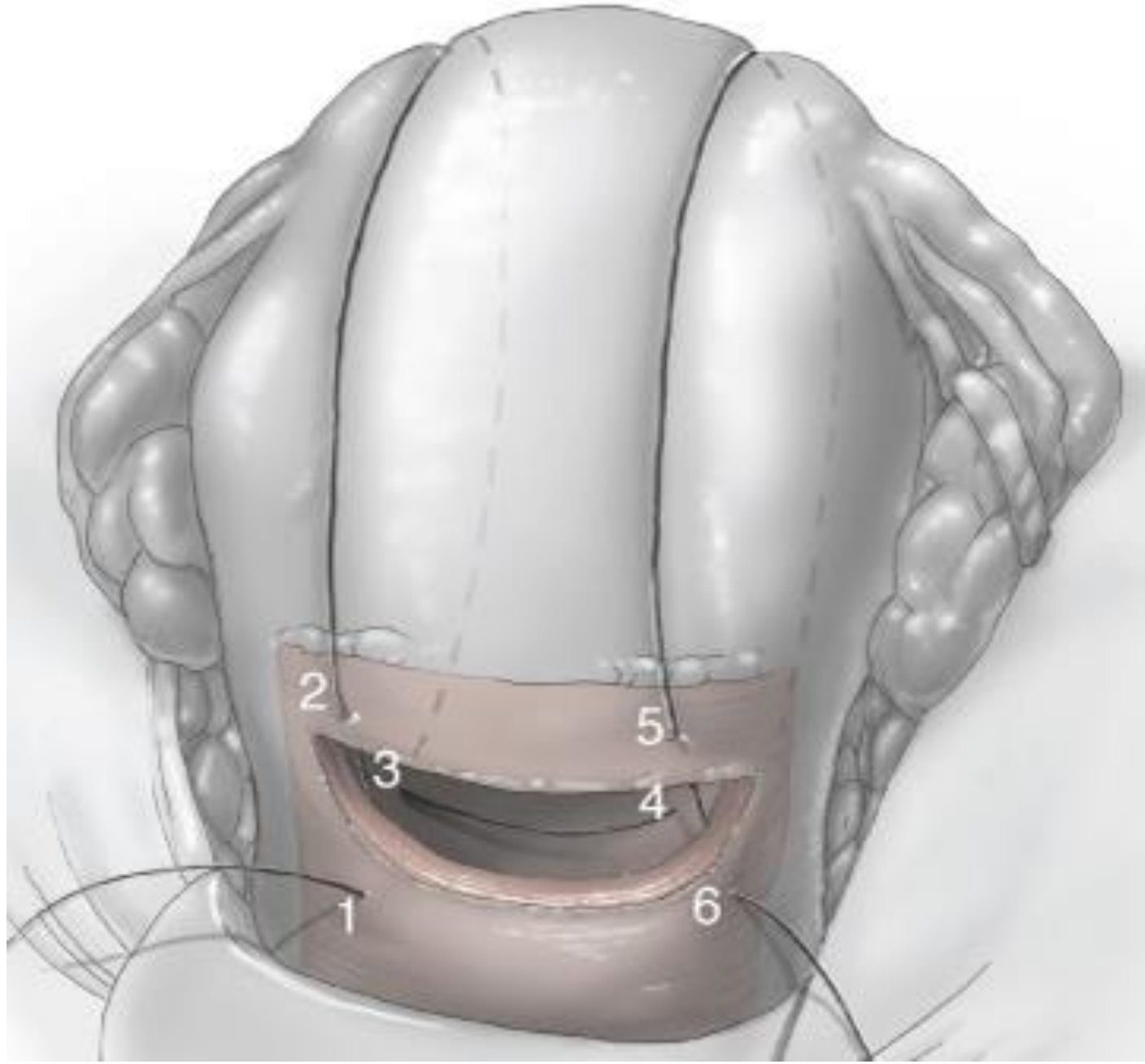
Electrolytes

hyperkalemia and low ionized calcium levels.


Uterine vessels


E. FREDERIKSON


Utero-ovarian ligament
Branch of ovarian artery
Ligature
Hypogastric artery
Uterine artery
Ligature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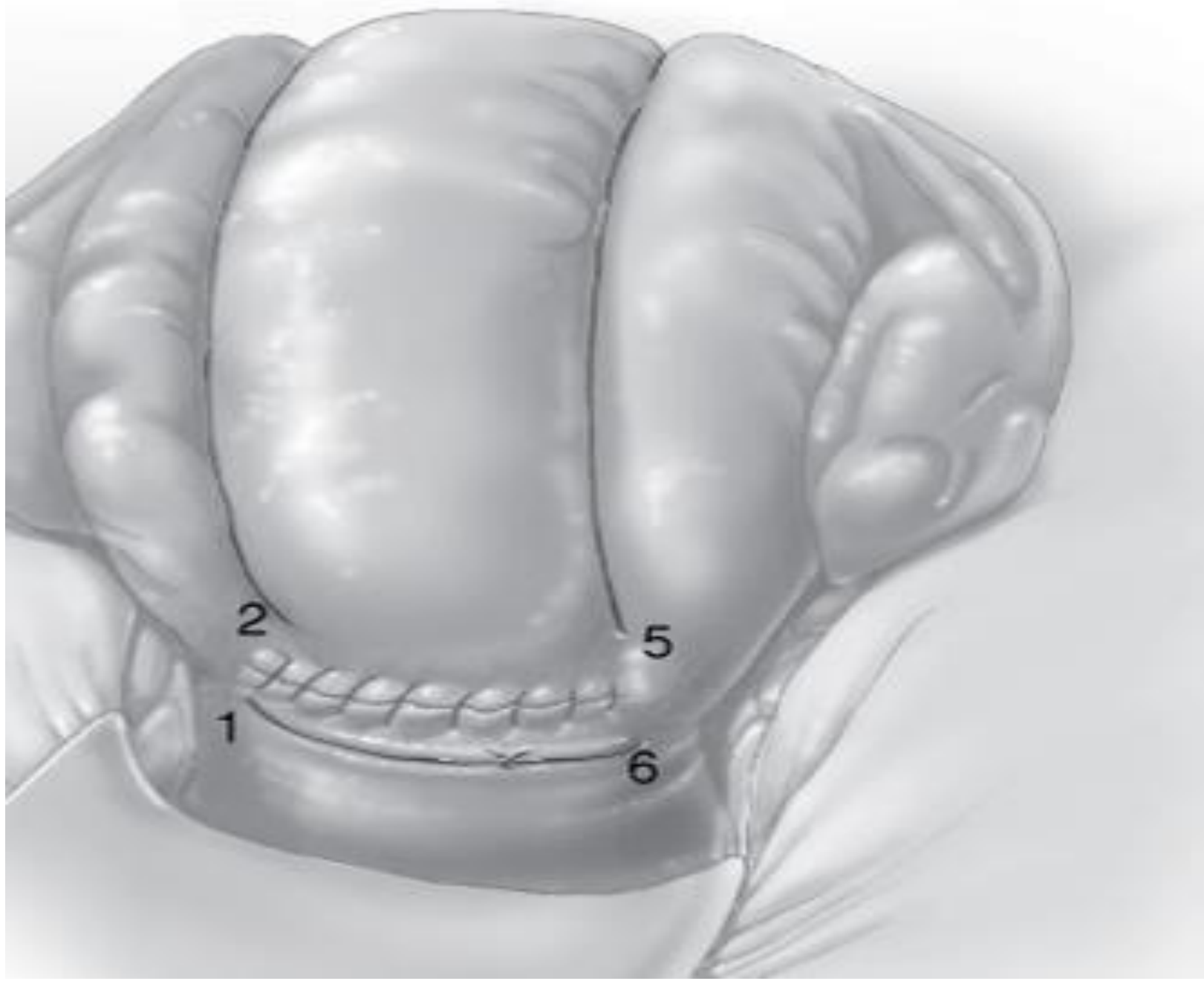
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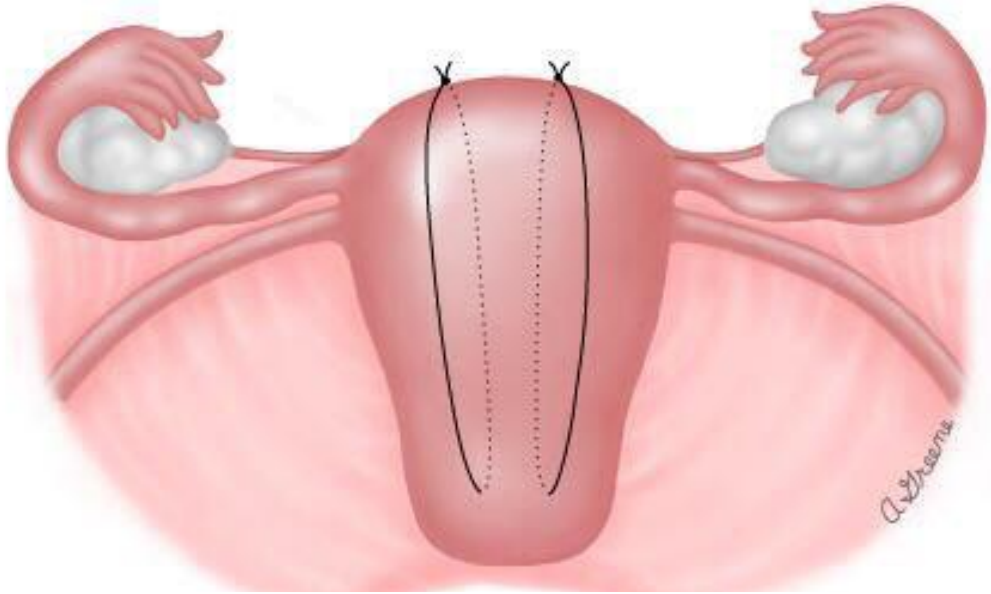
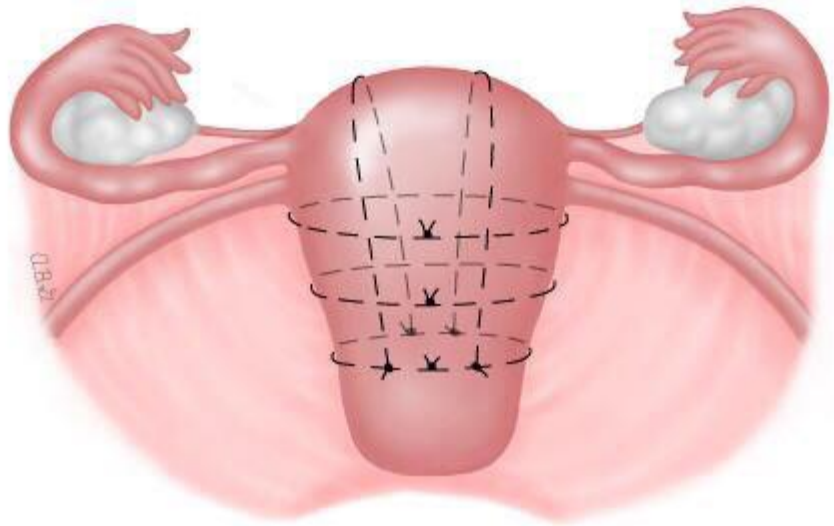
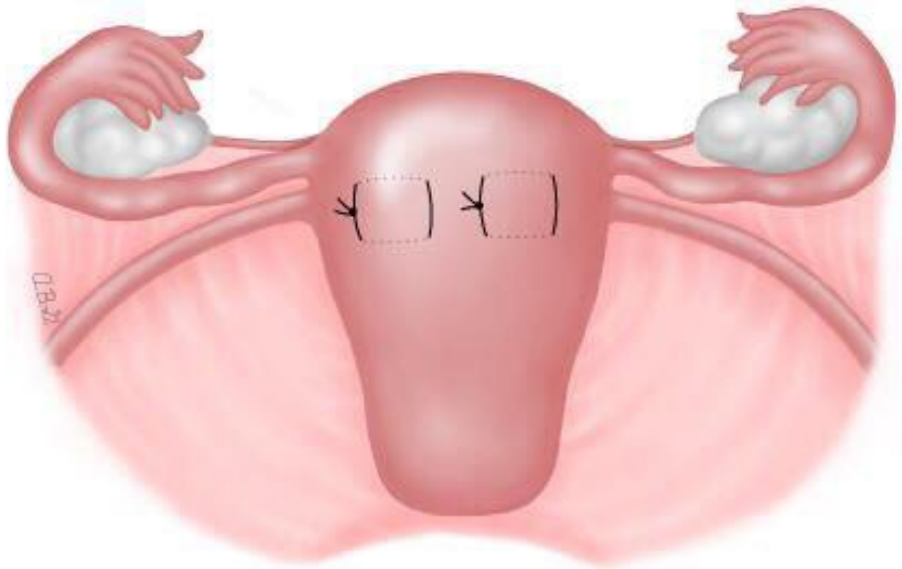
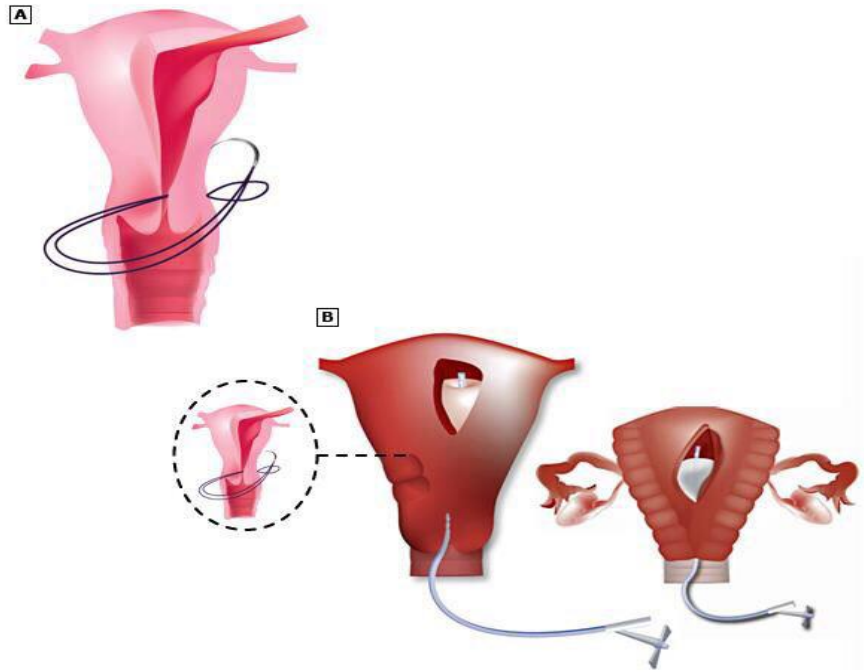
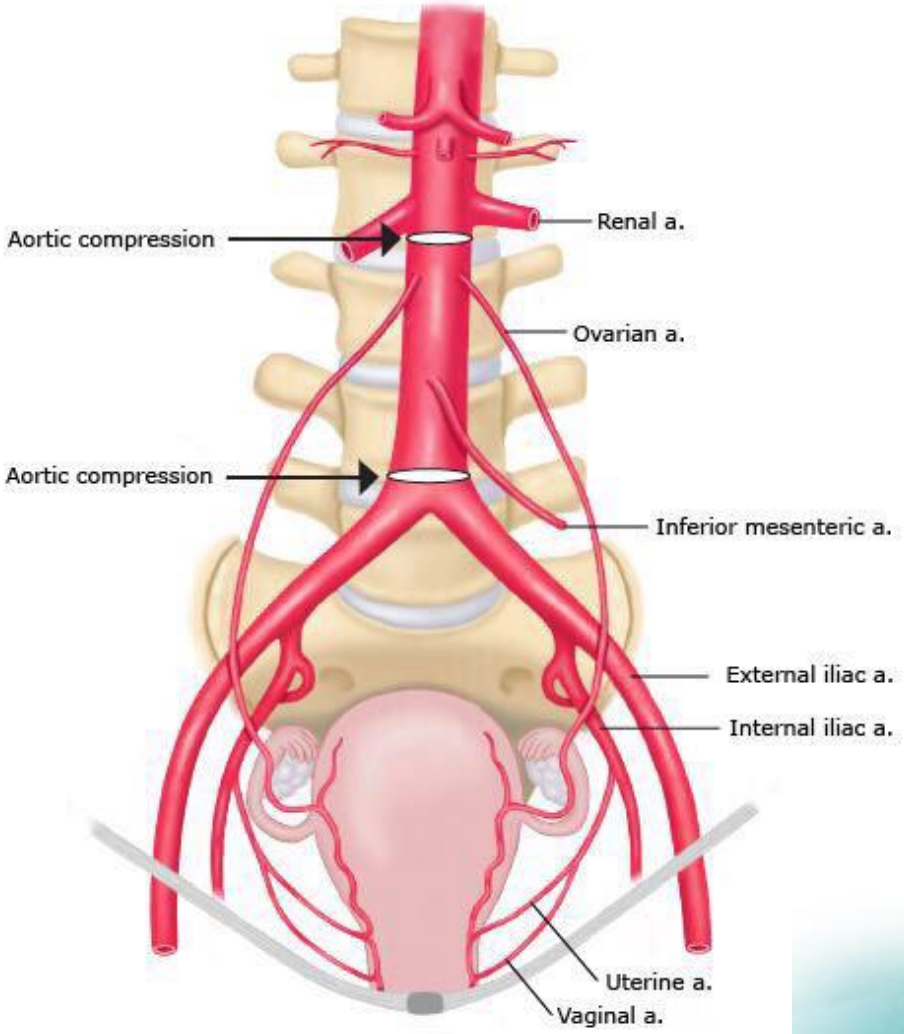




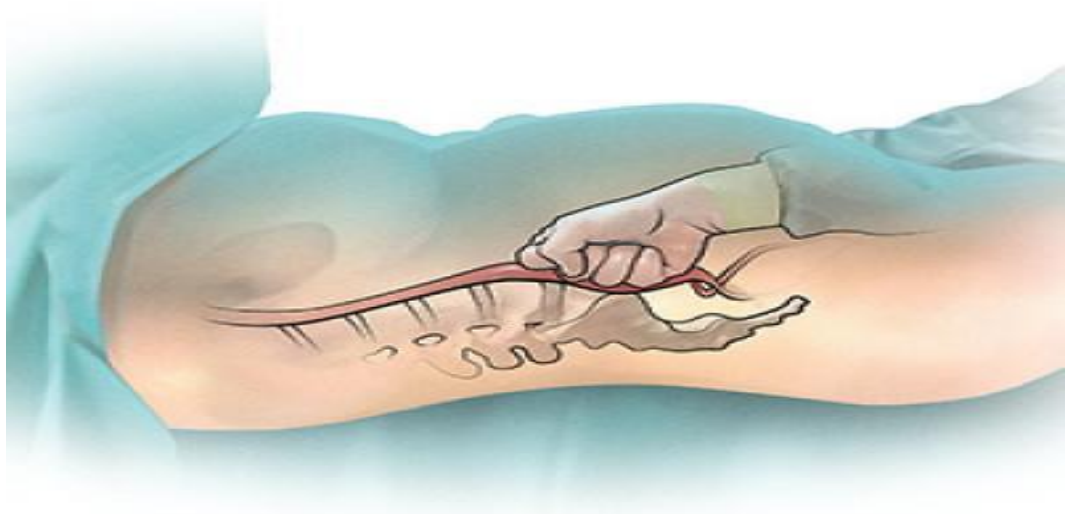



A
B

Compression of Abdominal Aorta

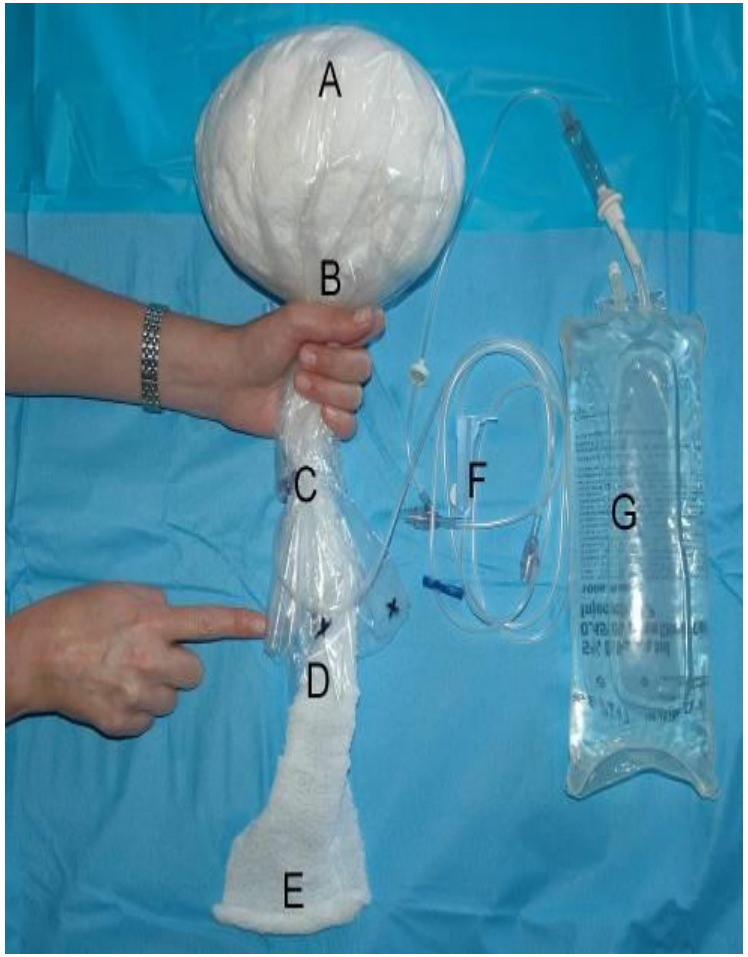


- Apply downward pressure with closed fist over abdominal aorta through abdominal wall (just above umbilicus slightly to patient's left)
- With other hand, palpate femoral pulse to check adequacy of compression
  - Pulse palpable = inadequate
  - Pulse not palpable = adequate
- Maintain compression until bleeding is controlled or until she reaches the operation theatre



Hysterectomy

Hysterectomy is done BUT she's still bleeding! Do not Panic….its the enemy of logical thought



Management of persistent bleeding after hysterectomy

- **hypothermia,**
- **coagulopathy, and**
- **metabolic acidosis** :Criteria proposed for this "in extremis" state include pH
- <7.30, temperature <35°C, combined resuscitation and procedural time >90 minutes,
- ***non mechanical bleeding, and transfusion requirement >10 units packed red blood cells (RBCs)***

Secondary PPH

Defined as excessive bleeding 24 hrs to 12 weeks postpartum.

Incidence is about 1 percent of women.

Theory is that thought to be atony or subinvolution of placental site from retained products or infection.

Management of Secondary PPH

Evaluate for underlying disorders (coagulopathies).

For atony give uterotonics.

If large amount of bleeding, fever uterine tenderness, or foul smelling discharge treat for endometritis.

Consider suction currettage.

POSTPARTUM

- — Postpartum management is largely based on expert opinion and clinical experience; there are few major randomized trials to guide screening for anemia or iron deficiency after delivery.
- It is not routine practice to obtain a complete blood count (CBC) or ferritin level at a four- to six-week postpartum visit, but there may be circumstances in which one or both of these tests are appropriate.

- We advise most individuals to continue their prenatal vitamin and/or supplemental iron for six to eight weeks following delivery, to increase iron stores following blood loss after delivery.
- Routine testing for anemia after delivery has been suggested because anemia is prevalent and iron deficiency (the most common cause) is readily treatable .
- Following postpartum discharge from the hospital, anemia may be suspected based on symptoms such as fatigue, depressed mood, or exercise intolerance, although these symptoms may have other causes associated with delivery and/or caring for a newborn.
- Those with iron deficiency anemia postpartum are treated with iron; choice of iron product, route of administration, and dosing are the same as in the antepartum period.

- A protocol for screening and management may help in the decision to start with oral or intravenous iron.
- One such protocol screened for iron deficiency in the second and third trimesters and treated with oral iron for hemoglobin 9.5 to 11 g/dL or intravenous iron for hemoglobin <9.5 g/dL .

Dosing

- Recommended doses of oral iron range from 40 to 200 mg elemental iron per day .
- There has been a trend towards using doses on the lower end of this range as well as alternate day dosing due to recognition that higher and more frequent doses may increase adverse effects without improving iron uptake .
- We agree with this dose range and often administer 60 mg of elemental iron.
- we provide the dose every other day (or, on Monday, Wednesday, and Friday) rather than daily, based on evidence that alternate-day dosing results in improved absorption of oral iron as well as improved tolerability.
- Absorption may be improved by avoiding coffee, tea, and milk at the time the iron supplement is taken