



# Peripartum haemorrhage

## Management of Postpartum Hemorrhage (PPH)

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### Diagnosis and Bleeding Localization

**Estimate of blood loss:**

- Less severe: 500 - 1000 ml
- Severe: more than 1000 ml

**Peripartum haemorrhage:** rapidly increasing blood loss, clinically estimated to be above 1500 ml or as any blood loss associated with the development of clinical and/or laboratory signs of tissue hypoperfusion.

**Organization of Care According to Estimated Blood Loss:**

- Less severe blood loss
- An obstetrician is always called
- Severe blood loss
- An anesthesiologist is always called in

**Peripartum haemorrhage:**

- A multidisciplinary crisis team is always activated

**Identification of the Source of Bleeding:**

- Palpation / bimanual examination
- Examination in mirrors
- Ultrasound examination

**Other Procedures:**

- Assessment and stabilization of basic vital signs
- Start monitoring of basic vital signs
- Initiation of oxygen therapy
- Securing/controlling vascular access
- Initiation of fluid replacement/fluid resuscitation
- Catheterization of the bladder
- Consider the following procedures:
  - Uterine massage
  - Manual compression of the uterus
  - External aortic compression

**Recommended Initial Laboratory Tests:**

- Blood count
- Coagulation tests (aPTT, PT, anti-thrombin III)
- Fibrinogen level
- Pretransfusion testing (blood group, screening for irregular erythrocyte antibodies, compatibility test)
- Consider viscoelastic examination

**Initial Requirements for Transfusion Products:**

- Flows in the initial phase ensure availability of at least 4 U/L
- Erythrocytes for the initial phase ensure the availability of at least 4 U/L

**Ensuring the Stability of the Intrauterine Environment:**

- Acid-base balance
- Temperature
- Level of ionized calcium (Ca<sup>2+</sup>)

Causal Management	Step 1	Step 2	Step 3
<b>Uterine Hypertony/Atony</b>	<ol style="list-style-type: none"> <li>Uterotonic administration                             <ul style="list-style-type: none"> <li>Oxytocin or carbocystin</li> <li>Methylergometrin (if hypertonus is not present)</li> </ul> </li> <li>Massage of a uterine carotid</li> <li>Uterine massage</li> <li>Manual or instrumental revision of the uterine cavity</li> <li>Prostaglandin administration</li> <li>Thrombolytic administration</li> </ol>	<ol style="list-style-type: none"> <li>Blood clot removal from the uterine cavity and the vagina</li> <li>Uterotonic and prostaglandin administration</li> <li>Pressure, vacuum, and hemostatic intrauterine device</li> <li>Balloon</li> <li>Uterine artery embolization (depending on relevant scenario)</li> </ol>	<ol style="list-style-type: none"> <li>Selective catheterization embolization as uterine (if interventional radiology is available)</li> <li>Surgical intervention (partial or total hysterectomy)</li> <li>External ligation of an uterine and an iliac vessel</li> <li>Uterine compression sutures</li> <li>Ligament as iliac vessel</li> </ol>
<b>Retention of the Placenta</b>	<ol style="list-style-type: none"> <li>Oxytocin, preferably carbocystin</li> <li>Manual removal</li> </ol>	<ol style="list-style-type: none"> <li>Manual removal under prophylactic ATB coverage</li> </ol>	
<b>Retention of Part of Placenta</b>	<ol style="list-style-type: none"> <li>Oxytocin, preferably carbocystin</li> <li>Manual removal</li> </ol>	<ol style="list-style-type: none"> <li>The same procedure as during uterine atony</li> </ol>	
<b>Uterine Rupture/Delirioses</b>	<ol style="list-style-type: none"> <li>Perform a laparotomy and the primary surgical treatment of the uterus</li> </ol>	<ol style="list-style-type: none"> <li>Perform hysterectomy if primary retained lobe</li> </ol>	
<b>Uterine Inversion</b>	<ol style="list-style-type: none"> <li>Perform manual revision of the uterus (Pitman under general anesthesia or wait for the effect of uterotonics to wear off)</li> </ol>	<ol style="list-style-type: none"> <li>Perform laparotomy - uterine inversion</li> </ol>	
<b>DIC, aPTT, PT, Fibrinogen, D-dimer, antithrombin III</b>	<ol style="list-style-type: none"> <li>Check diagnostics</li> <li>Search for the cause</li> <li>Substitution of coagulation factors and inhibitors (platelets, antithrombin III, fibrinogen)</li> </ol>	<ol style="list-style-type: none"> <li>In case of inhibition, consider anticoagulation prophylaxis in case of persistence of the condition, consult a hematologist</li> </ol>	
<b>Primary Hemostological Disorder</b>	<ol style="list-style-type: none"> <li>Consult a hematologist for further normalization of coagulation factor levels</li> </ol>		

### Medicines and Their Dosage

<b>Oxytocin (Dyloxin®)</b> Initiation of treatment: 1 U of oxytocin in 5-10 minutes (1 mg/ml) 10 ml solution in 100 ml saline solution.	<b>Carbocystin (Durocystin®)</b> Initiation of treatment: 1 mg in 100 ml saline solution.	<b>Tranexamic acid (Tranex)</b> Initiation of treatment: 1 g in 100 ml saline solution.
<b>Protargin (Protargin®)</b> Initiation of treatment: 0.2 mg in 100 ml saline solution.	<b>Carboxiprost (Carboxiprost®)</b> Initiation of treatment: 0.2 mg in 100 ml saline solution.	<b>Thrombolysis (Alteplase®)</b> Initiation of treatment: 100 mg in 100 ml saline solution.

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### Uterotonic prophylaxis

**Identification of PPH**

**Determining the cause (4T)**

**Uterine massage**

**Uterotonics**  
Tranexamic acid  
Fibrinogen

**Bakri balloon®, Celox PPH®, JADA®, NovoSeven®**

**RTG embolization**  
Vessel ligation  
Haemyn suture  
B-Lynch suture

**aa. Iliacae internae ligation**

**Hysterectomy**

### Peripartum hemorrhage (PPH)

**Bleeding during childbirth**

Vaginal delivery: < 500 ml    Cesarean section: < 1000 ml

**Hemostasis mechanism = combination of two factors**

**Mechanical hemostasis**  
Myometrial retraction - uterotonics, pressure and vacuum intrauterine devices

**Coagulation**  
Tranexamic acid  
Fibrinogen, rFVIIa

**Peripartum bleeding - definition (Czech Republic)**

- Physiological blood loss < 500 ml
- Less severe blood loss 500 - 1000 ml
- Severe blood loss > 1000 ml
- Peripartum hemorrhage (PPH) > 1500 ml (clinical and/or laboratory signs of tissue hypoperfusion)

**4T**

<b>Tonus</b> 80 % Uterine hypotony Uterine atony	<b>Trauma</b> 10 % Ruptures Lacerations	<b>Tissue</b> 5 % Placenta accreta spectrum	<b>Trombin</b> 5 % DIC enoxaparin
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**Organizational principles**

- 1 Physiological blood loss → midwife
- 2 Less severe blood loss → obstetrician called
- 3 Severe blood loss → anesthesiologist called
- 4 Peripartum hemorrhage (PPH) → Crisis plan (standardized formalized procedure)
- Crisis team (organizational & expert roles of individual members)

**Obstetrics 2025 in the Czech Republic**

Today, everything is available:

- Knowledge
- Advanced procedures
- Necessary medications
- Techniques - surgical, interventional

**Future**

- Simulations & drill techniques

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