Postpartum Complications

• Hemorrhage
• Hypertensive disorders
• Pulmonary embolism
• Amniotic Fluid embolism
• Infection

Preventable Errors

• Failure to Control BP
• Failure to diagnose and treat Pulmonary edema
• Failure to pay attention to VS
• Hemorrhage following C/S
How Errors Occur

Be Prepared!

• Readiness
• Recognition
• Response

Readiness

• OB Hemorrhage Cart
  – Quick access to emergency supplies
  – Meds easily accessible
  – Easy to find items
  – Include checklists
  – Visible Protocols
Recognition-MEWS Criteria

- BP >160 systolic or >100 diastolic
- BP <90 systolic
- HR >120 or <50
- RR >30 or <10
- O2 sat <95%
- Maternal confusion, agitation, or unresponsiveness
- Oliguria <35 ml/hr over 2 hr period

STOP, LOOK and LISTEN

- Stop—If a woman does not feel well or believes something is wrong, stop and don’t assume these are typical complaints
- Look—Conduct and examination
- Listen—Hear the woman’s concerns

Response

- Activate emergency response (CODE OB)
- Simulation Drills—interdisciplinary
- Massive transfusion protocols
- SBAR communication
Postpartum Assessment

• Immediate Postpartum Maternal Care/Recovery Room
  – Dependent on many factors including delivery type, complications, type of anesthesia, and other conditions
  – Blood pressure, respirations, and pulse monitored every 15 minutes for 2 hours
    • Longer or more frequently if indicated and per facility policy
  – Monitor fundal height, bleeding, incision/dressing
  – One on one care for mother and baby until both are considered stable

Postpartum Assessment

• Ongoing postpartum care includes comprehensive head to toe assessments every 4-8 hours
• Patient Education is one of the most important postpartum care activities

BUBBLE-EE

- Uterus
- Height
- Bladder
- Position
- Consistency
- Tone
- Nipples
- Britches
- Hemorrhoids
- Edema
- Shin
- Tenderness
- Warmth
- Odor
- Type/Amount
- Clots
- Lochia
Postpartum Hemorrhage

- Leading cause of maternal morbidity and mortality during the postpartum period
- In most extreme cases, complete exsanguination may occur within 10 minutes following delivery

Admission Risk Assessment

**Low Risk**
- No previous uterine surgery
- Singleton pregnancy
- Less than or equal to 4 previous births
- No known bleeding disorder
- No history of PPH
- Uncomplicated delivery
- No vaginal trauma

**Medium Risk**
- Prior C/S or uterine surgery
- Overdistended uterus (Multiple gest, polyhydramnios)
- Greater than 4 previous vaginal births
- Chorioamnionitis
- History of previous PPH
- Large uterine fibroids
- Prolonged 2nd stage
- Prolonged oxytocin use
- Rapid labor
- Operative vaginal delivery
- Genital tract trauma
- Shoulder dystocia
- Magnesium sulfate treatment

**High Risk**
- Placenta previa, low lying placenta
- Suspected placenta accreta
- Hematocrit <30% and other risk factors
- Platelets <100,000
- Anticoagulant therapy
- Known coagulopathy
- Active bleeding
- Hematocrit less than 30% and other risk factors present
Quantifying blood loss

- https://www.youtube.com/watch?v=F_acL2kEv8k&list=UUPrOhL3Od7ZeFDq27ycS00g
- Normal Vaginal delivery blood loss-500 ml
- Normal Cesarean delivery blood loss-1000 ml

QBL Measurement

- Tips for QBL
  - Calibrated under-buttocks drape
  - Dry weight list of commonly used items
  - Scale to weigh blood soaked items
  - Easy documentation
Treat the Problem

• Tone-Uterine atony
• Tissue-Retained Placenta
• Trauma-Lacerations
• Thrombin-Maternal blood disorder

Uterine Involution

Interventions

• Assess and weigh blood loss
• Monitor vital signs closely
• Place a foley catheter and monitor output
• Keep patient warm
• Notify charge nurse, physician, anesthesia, others as appropriate
• Assess and treat cause
• Large bore IV access (possibly 2)
• Elevate patient legs, HOB flat (not trendelenberg)
• Labwork-CBC, Platelets, Chemistry, Coag panel
• Medications as ordered
• Type and Cross for 2 units PRBC
### Drugs used in Postpartum Hemorrhage

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose/Route</th>
<th>Nursing Actions</th>
<th>Side Effects/Contradictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitocin® (Oxytocin)</td>
<td>10 units/ml</td>
<td>IV: 10-40 units per 1000 ml NS or RL, rate titrated to uterine tone</td>
<td>Avoid undiluted rapid IV infusion, monitor BP, can cause hypotension, monitor fluids to avoid water intoxication, monitor uterine bleeding, nausea, vomiting, uterine tetany, hypersensitivity, water intoxication, anaphylactic reaction</td>
</tr>
<tr>
<td>Methergine® (Methylergonivine)</td>
<td>0.2 mg/ml</td>
<td>IM: 0.2 mg every 2-4 hours</td>
<td>Closely monitor uterine contractions, monitor uterine bleeding, monitor BP, P and uterine response for 1-2 hours, patients are more sensitive to cold, nausea, vomiting, severe hypertensive episode, bradycardia, allergic reaction, shock</td>
</tr>
<tr>
<td>Hemabate® (Carboprost, 15-methyl PG F2a)</td>
<td>250 mcg/ml</td>
<td>IM: 250 mcg every 15-90 minutes, maximum 8 doses</td>
<td>Do not give IV, monitor VS and uterine response, nausea, vomiting, pyrexia, bradycardia, bronchospasm</td>
</tr>
<tr>
<td>Cytotec® (Misoprostol, PGE1)</td>
<td></td>
<td></td>
<td>Monitor VS and uterine response, nausea, vomiting, diarrhea, shivering, fever (transient), headache</td>
</tr>
<tr>
<td>Prostin E2 (Dinoprostone)</td>
<td></td>
<td></td>
<td>Monitor VS and uterine response, nausea, vomiting, diarrhea, shivering, fever (transient), headache, maternal hypotension</td>
</tr>
</tbody>
</table>

### Interventions

- Massive Transfusion Protocol in your facility
- Other interventions:
  - Intravuterine tamponade balloon
  - Compression suture
  - Uterine packing
  - Selective artery embolization
  - Hysterectomy

### Blood Component Therapy

<table>
<thead>
<tr>
<th>Product</th>
<th>Vol</th>
<th>Contents</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packed RBCs</td>
<td>24U</td>
<td>RBC, WBC, plasma</td>
<td>Increases hematocrit by 2-3 percentage points, hemoglobin by 1 g/dL</td>
</tr>
<tr>
<td>Platelets</td>
<td>50</td>
<td>Platelets, RBC, plasma</td>
<td>Increase platelet count 5000-10,000/μL per unit</td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td>20K</td>
<td>Factor VIII, von Willebrand factor, factor XIII</td>
<td>Increase fibrinogen by 10 mg/dL</td>
</tr>
<tr>
<td>Crossmatch</td>
<td>40</td>
<td>Factor VIII and von Willebrand factor</td>
<td>Increase fibrinogen by 10 mg/dL</td>
</tr>
</tbody>
</table>
Intrauterine Balloon

Hypertensive Disorders of Pregnancy

- Most common medical condition reported during pregnancy
- Second leading cause of maternal death and contributes to significant neonatal mortality
- Placenta is primary origin of pathology
Taking a Blood Pressure

- Correct Position!
- Sitting or Semi Fowlers
- Feet flat, not dangling
- If BP ≥ 160 systolic and/or ≥ 110 diastolic, take steps to initiate treatment for severe hypertension—notifying provider, procuring medication
- DO NOT REPOSITION PATIENT (yet)
- Retake BP after 15 minutes. If BP remains severe, obtain order for medication.
- Administer medication as ordered
- Treat ASAP—at least within 1 hour of 1st severe reading
- Correct Cuff

Blood Pressure

Figure 1: Recommended cuff sizes

<table>
<thead>
<tr>
<th>Arm Circumference (cm)</th>
<th>Cuff Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-26</td>
<td>&quot;Small Adult&quot;: 12x22cm</td>
</tr>
<tr>
<td>27-34</td>
<td>&quot;Adult&quot;: 16x30cm</td>
</tr>
<tr>
<td>35-44</td>
<td>&quot;Large Adult&quot;: 16x36cm</td>
</tr>
<tr>
<td>45-52</td>
<td>&quot;Adult Thigh&quot;: 16x42cm</td>
</tr>
</tbody>
</table>

Hypertension Definitions

- **Pre-eclampsia/eclampsia**—with or without severe features
- **Chronic Hypertension**—predates pregnancy
- **Chronic Hypertension with superimposed pre-eclampsia**
- **Gestational Hypertension**—BP elevation after 20 weeks gestation in absence of proteinuria

ACOG 2013
Risk Factors

- Primigravida or new partner
- Multiple gestation
- Previous history of hypertensive disorder in previous pregnancy
- Preexisting hypertension, vascular, or renal disease
- Diabetes
- Age under 17 or over 35
- Family history of preeclampsia (mother or sister)

Alteration in Systems Function

- Decreased renal blood flow and GFR
- Decreased hepatic blood flow
- Increased glomerular filtration rate
- Increased renal vascular resistance
- Decreased cardiac output
- Increased sympathetic nervous system activity
- Increased intravascular volume
- Reduced peripheral resistance

Med Therapy for Acute-onset, severe hypertension

- Standing order necessary
- ACOG Committee Opinion Feb, 2015
- Oral Nifedipine-first line therapy
- IV Labetalol or hydralazine
- MgSO4 for seizure prophylaxis
**During MgSO₄ Infusion Monitor**

**Q 15 minutes**
BP, P, R during loading dose, FHR baseline, and periodic patterns until stable, uterine contraction frequency, duration, intensity and resting tone until stable

**Q 1 hour**
BP, P, R (Antepartum/Intrapartum pts), FHR baseline, and periodic patterns until stable, uterine contraction frequency, duration, intensity and resting tone
DTRs, Level of Consciousness (LOC), SaO₂, I&O

**Q 2 hours**
Breath sounds

**Q 4 hour**
Temperature (if ROM, monitor Q 2 hour)

**Q 8 hour**
Bowel function – consistency, constipation, nausea, diarrhea

All IV fluids must be on infusion pump including MgSO₄. Strict bedrest, side rails up, position to optimize cardiac output and prevent vena cava syndrome

**Notify physician:**
- Sustained systolic BP > 140 or < 90
- Sustained diastolic BP > 90 or < 50
- Respirations < 12 or > 24
- Unilateral or bilateral absence of DTRs
- Respirations < 14 or > 26
- SaO₂ < 95%
- Urine output < 30 cc/hr or < 240 cc in 8 hour
- Changes in neurologic status
- Significant change in maternal condition
- Significant change in FHR patterns
- Maternal side effects of MgSO₄ during loading dose include nausea, vomiting and vasodilation. Overdose of MgSO₄ may lead to both central nervous system and respiratory depression/arrest.

**S & S of pulmonary edema**
- Cough, shortness of breath, tachypnea, tachycardia, adventitious breath sounds

**S & S of MgSO₄ toxicity**
- Absent DTRs, decreasing LOC, decreasing respiratory rate

If toxicity suspected, discontinue MgSO₄ infusion, provide respiratory support (if indicated), notify physician, monitor BP, P, R, LOC, and DTRs every 15 minutes until stable, consider obtaining order for MgSO₄ level

**For reversal of MgSO₄ effect**
- Intravenous normal saline
- Intravenous calcium gluconate over 1-2 minutes IV push

**Hypertension Education**

- Educate patients during pregnancy
- Educate patients during hospital stay
- Educate patients upon discharge
Thrombophlebitis

- Painful, hard, warm, calf tenderness
- Superficial vein thrombophlebitis (SVT)
  - Unlikely to lead to pulmonary embolism
- Deep vein thrombophlebitis (DVT)
  - Calf, thigh, pelvis
  - Potential for clot fragmentation and, later, a clot becoming lodged in the lungs (pulmonary embolism)
  - Diagnosed with doppler studies
Thrombophlebitis

Risk Factors

• Normal changes in coagulation status during pregnancy
• Immobility or inactivity
• History of thromboembolic disease or varicosities
• Increased parity
• Obesity
• Advanced maternal age >35 years
• Cesarean birth
• Diabetes
• Smoking
• Prolonged labor with multiple exams, use of forceps, Cesarean birth, PPH, Infection, Immobilization

DVT Prevention

Tips to Help Prevent Deep Vein Thrombosis (DVT)

• Move around as soon as possible after having been confined to bed, such as after surgery, illness, or injury.
• If you’re at risk for DVT, talk to your doctor about
• Graduated compression stockings (sometimes called “support hose” or “medical compression stockings”).
• Medication (anticoagulants) to prevent or treat DVT.
• When sitting for long periods of time, such as when traveling for more than four hours, get up and walk around every 2 to 3 hours.
• Exercise your legs while you’re sitting by: Raising and lowering your heels while keeping your toes on the floor. Raising and lowering your toes while keeping your heels on the floor.
• Tightening and releasing your leg muscles
• Wear loose-fitting clothes
• Drink plenty of water, and avoid drinking anything with alcohol or caffeine in it.
• Exercise regularly, maintain a healthy weight, and don’t smoke.

For more information, please visit www.cdc.gov/ncbddd/dvt

Thrombophlebitis

Assessment/Interventions

• Assess for tenderness, pain, and heat, low-grade fever and chills, bilateral pulses, pain, serial calf and thigh measurements
• Vital Signs, Respiratory assessment
• Administer analgesics
• Warm packs to affected area
• Bed rest with involved leg elevated
• Anticoagulation therapy
VTE Key points

- All patients require VTE assessment multiple times during pregnancy and postpartum
- All C-section patients require mechanical prophylaxis, early ambulation and hydration
- Patients with risk factors will benefit from pharmacologic prophylaxis

Septic Pelvic Thrombophlebitis

- 0.5%-2% of postpartum women, more common in C/S
- Presentation
  - Fever not responsive to antibiotic course
- Treatment
  - IV Heparin adjusted to maintain patient’s PTT at approximately 2 times the normal value

Pulmonary Emboli

S/S

Most common signs
- Dyspnea
- Chest pain
- Hemoptysis
- Abdominal pain

Most serious signs
- Sudden collapse
- Cyanosis
- Hypotension
Pulmonary Emboli Assessment/Intervention

• Assessment
  – VS
  – Respiratory status
  – Heart sounds
  – Pain
  – Mental Status
  – Neck vein distention

• Semi-Fowlers with ↑ HOB
• Oxygen (Non-rebreather)
• Monitor blood gas
• IV Fluids
• Medications
  – IV Heparin
  – Morphine
  – Dopamine

Infection

• Most effective method of prevention of infection - Hand washing.
• “At Risk”
• Cardinal Signs
  – Elevated temperature
  – Tachycardia
  – Pain
• Treatment
  – VS, Antibiotics, Pain Management