RECOGNITION AND ESTIMATION OF BLOOD LOSS (EBL)

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The blood loss at a vaginal delivery is given as 350 ml. To estimate this amount correctly, the blood volume in the collection drape would fill a:

A. Standard soda can
B. Half gallon of milk
C. Pint of milk
D. Quart of milk
Estimating Blood Loss

Familiar Objects

- 1 cup = 250ml
  = 5 cm clot (orange)
  = 1 unit PRBCs

- 12 oz soda can = 355 ml

- 2 cups = ~ 500 ml
  = 10 cm clot (softball)
  = 2 unit PRBCs

Floor Spills

- 23 inches (50 cm) : 500 ml
- 34 inches (75 cm) : 1000 ml
- 45 inches (100 cm) : 1500 ml

Remember 1 gm = 1 ml
3 hrs postpartum in the Recovery Room

- 3 orange size clots passed
- 500 ml fluid bolus given
- Post infusion BP 108/70; HR 115

5. The first fluid bolus ordered at this time was 500 ml. This amount is:
   A. Adequate
   B. Adequate if vitals checked q 5 minutes & bleeding slows
   C. Adequate if blood replacement is ordered
   D. Inadequate ✗
# Obstetric Hemorrhage: RECOGNITION

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scant</td>
<td>Less than 2.5 cm (1 inch) / hour</td>
</tr>
<tr>
<td>Light</td>
<td>Less than 10 cm (4 inches)/hour</td>
</tr>
<tr>
<td>Moderate</td>
<td>Less than 15 cm(6 inches)/hour</td>
</tr>
<tr>
<td>Heavy</td>
<td>1 pad saturated within 2 hours</td>
</tr>
</tbody>
</table>


- **Visual EBL**
  - Inaccurate

- **Weighing**
  - Most accurate method

Bose, BJOG 2006
A standard 18in x 18in lap that is 75% saturated with blood represents an estimated blood loss of approximately:

A. 25 ml
B. 50 ml
C. 75 ml
D. 100 ml

Correct answer: B. 50 ml
Estimating Blood Loss

Blood absorption characteristics of a Standard laparotomy sponges (18in X 18in)

25 ml 50 ml 75 ml 100 ml

50% sat. 75% sat. 100% sat. no dripping 100% sat. dripping

Estimating Blood Loss

Estimating Blood Loss

Hemorrhage on bed only
(1000 ml)

Hemorrhage spilling to floor
(2000 ml)

Recognition and Management of Hemorrhage

ANTEPARTUM    INTRAPARTUM    POSTPARTUM

CONCEALED
Signs & Symptoms of Hypovolemia

OVERT
Objective measurement of blood loss

Blood Loss Recognized
Question

Which of the following is the *earliest* sign of compensatory change that occurs with hypovolemia?

A. Tachycardia  ✓
B. Hypotension
C. Hyperventilation
D. Pallor
Signs and Symptoms of Hemorrhage

Look for trends in…….

Vital Signs and Patient Status

- ↑ Pulse
- ↑ Respirations
- ↑ Pallor
- Change in Mental Status

- ↓ Output
- Delayed Capillary Refill
- ↓ Blood Pressure
In cases of severe hemorrhage, the minimum rate of urine output per hour needed to prevent renal tubular necrosis is

6. 10 ml/hr
7. 30 ml/hr ☑
8. 100 ml/hr
9. 300 ml/hr
Delayed Recognition of Hypovolemia

- Maternal Physiology -

- Pregnancy - Hypervolemic State
  - Nearly 50% increase in blood volume
  - Up to 30% loss of volume (1500 to 2000ml) to alter vitals
    - (vasoconstriction/↑SVR)
  - Need earlier replacement of higher volumes for adequate resuscitation!

Blackburn, 2007 Maternal, Fetal and Neonatal Physiology: A clinical Perspective
BP remains stable until 25 – 30% (1500 – 2000 ml) of volume is lost.

Fig. 17-1 Relationships among systemic vascular pressure, cardiac output, and blood pressure in the face of progressive blood volume deficit.

CASE #2 - Outcome

4 hrs postpartum in Postpartum Room

- Urine output 20 ml/hr
- 1 liter D5LR given over 2 hours
- HGB ordered – Result of 5.9 mg/dL reported back

14 hrs postpartum

- 1st unit PRBC’s started
- BP 90/50, P128
- Patient combative
- Pelvic exam: two 5cm clots, blood oozing from IV site
- An additional estimated blood loss of 1600 ml
- Patient coded five minutes after pelvic exam
CASE #2 Summary of Issues

- **No/Inadequate identification of risk factors**
  - 4th C/S → 4th C/S → Risk of Accreta
  - Previa →
  - High Parity

- **Delayed/Wrong Diagnosis**
  - Unrecognized abnormal vitals (s/s hypovolemia)
  - Inadequate assessment of vitals and physical findings

- **Underestimation of blood loss in the OR and postpartum**
  - Pre-op hgb 14.6
  - Post-op hgb 5.9

- **Delayed/Inadequate Treatment**
  - Inadequate volume replacement
  - 1st unit of PRBCs started 14 hours post-cesarean
Lack of documentation has been identified by the MMRC as a major problem!

- Documentation must include:
  - Date/time, name of provider for each entry
  - Ongoing vital signs
  - Signs of blood loss/hypovolemia
  - Estimated blood loss (visual and objective)
  - Interventions
  - Patient response
# Blood Loss Classifications and Replacement

<table>
<thead>
<tr>
<th></th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Est. Blood Loss (EBL)</strong></td>
<td>900 ml≈</td>
<td>1200-1500 ml ≈</td>
<td>1800-2100 ml ≈</td>
<td>&gt;2400 ml ≈</td>
</tr>
<tr>
<td><strong>Pulse</strong></td>
<td>&lt;100 bpm</td>
<td>&gt; 100 bpm</td>
<td>&gt; 120 bpm</td>
<td>&gt;140 bpm</td>
</tr>
<tr>
<td><strong>Respirations</strong></td>
<td>14-20 bpm</td>
<td>20-30 bpm</td>
<td>30-40 bpm</td>
<td>&gt; 35 bpm</td>
</tr>
<tr>
<td><strong>Blood Pressure</strong></td>
<td>Normal</td>
<td>Orthostatic changes</td>
<td>Overt hypotension</td>
<td>Overt hypotension</td>
</tr>
<tr>
<td><strong>Mental Status</strong></td>
<td>+Anxious</td>
<td>+Anxious</td>
<td>Anxious and Confused</td>
<td>Confused and Lethargic</td>
</tr>
<tr>
<td><strong>Urine Output</strong></td>
<td>&gt;30 cc/hr</td>
<td>20-30 cc/hr</td>
<td>5-15 cc/hr</td>
<td>Anuria</td>
</tr>
<tr>
<td><strong>Cap Refill</strong></td>
<td>Normal</td>
<td>(&gt;2 seconds)</td>
<td>(&gt;2 seconds)</td>
<td>(&gt;2 seconds)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Cold &amp; clammy)</td>
<td>(Cold &amp; clammy)</td>
<td></td>
</tr>
<tr>
<td><strong>Fluid Replacement (3:1 Rule)</strong></td>
<td>Crystalloids</td>
<td>Crystalloids</td>
<td>Crystalloids &amp; Blood</td>
<td>Crystalloids &amp; Blood</td>
</tr>
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