The California Partnership for Maternal Safety

QBL  Quantitative Blood Loss

the Why and the How

CMQCC  California Maternal Quality Care Collaborative
Objectives

• Summarize the benefit(s) to implementing the practice of quantitative blood loss
• Discuss strategies to begin quantification of blood loss
• Apply principles of quantitative blood loss for each birth
WHY
A challenge for us each day...

...everyone in healthcare really has two jobs when they come to work every day:

“to do their work and to improve it.”

“I did then what I knew how to do. Now that I know better, I do better.”

Maya Angelou
Why change the way we do things?

https://vimeo.com/83662045
Strong but WRONG
Provider Contributing Factors in Maternal Deaths (California)

From detailed chart reviews of maternal deaths
(CA-Pregnancy Associated Mortality Review Committee; CDPH-MCAH)
Could QBL have helped?

- Every case review from CA-PAMR maternal death from OB hemorrhage – blood loss significantly underestimated
  - Studies show we can get better, but remain poor at large volumes – when it really matters
  - Not related to experience of the provider

- DENIAL LEADS TO DELAY
We know we tend to underestimate blood loss – especially in large volumes - ~30%
  - When it really matters
QBL is more accurate than EBL
  - The goal is not a perfect, precise number
  - Inaccuracies come from:
    • Amniotic fluid contamination
    • Urine
    • Clots
    • Other
Low resource accuracy

- Visual estimation
- Quantitative drape
- Verified by photospectometry

- 33% underestimation for visual group
- Prompt detection of PPH may reduce maternal morbidity and mortality in low resource meetings
Moving from EBL to QBL

**Estimation – Subjective assessment**

- Subjective statements
  - “She’s bleeding a lot”
  - “She saturated a pad in one hour”
- Lack of clarity affects team response
- Terms like scant, moderate, small, minimal vary from clinician to clinician

**Quantification – Objective assessment**

- Objective statements
  - “She has a 1200 QBL”
  - “She is at a stage 2 hemorrhage”
- Basing care on objective information will likely improve communication, situational awareness, and prompt an earlier team response
- Team has a shared mental model
Estimated Blood Loss

Underestimation
- Delay in treatment

Overestimation
- Unnecessary procedures, interventions and costs
Standardized Care: QBL

• CMQCC Standard recommendation
  – All births
  – Reaffirmed in OB Hemorrhage toolkit 2.0

• AWHONN Standard recommendation
  – All births

• National Maternal Health Initiative 2013
AWHONN recommends that cumulative blood loss be formally measured or quantified after every birth.
Every birth? Every time?

• If it is not standard for all cases, we don’t know how to do it when we need it
• AND we don’t recognize WHEN we need it until late in the game
Stage assignment is driven by quantitative, cumulative blood loss.

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### CMQCC Algorithm

**Stage 2: OB Hemorrhage**

<table>
<thead>
<tr>
<th>MOBILIZE</th>
<th>ACT</th>
<th>THINK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary nurse (or charge nurse):</strong></td>
<td>Team leader (OB physician or midwife):</td>
<td>Sequentially advance through procedures and other interventions based on etiology:</td>
</tr>
<tr>
<td>□ Call obstetrician or midwife to bedside</td>
<td>□ Additional uterotonic medication: Hemabate 250 mcg IM [if not contraindicated] OR Misoprostol 600 mcg SQ</td>
<td>Vaginal birth:</td>
</tr>
<tr>
<td>□ Call Anesthesiologist</td>
<td>□ Can repeat Hemabate up to 3 times every 20 min; (note: 75% respond to first dose)</td>
<td>If trauma (vaginal, cervical or uterine):</td>
</tr>
<tr>
<td>□ Activate Response Team</td>
<td>□ Continue IV oxytocin and provide additional IV crystalloid solution</td>
<td>▪ Visualize and repair</td>
</tr>
<tr>
<td>PHONE #: ___________</td>
<td></td>
<td>▪ Retained placenta:</td>
</tr>
<tr>
<td>□ Notify Blood bank of hemorrhage: order products as directed</td>
<td>Do not delay other interventions (see right column) while waiting for</td>
<td>▪ D&amp;C</td>
</tr>
<tr>
<td></td>
<td>response to medications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Bimanual uterine massage</td>
<td>▪ If retained placenta:</td>
</tr>
<tr>
<td>Charge nurse:</td>
<td>□ Move to OR (if on postpartum unit, move to L&amp;D or OR)</td>
<td>▪ D&amp;C</td>
</tr>
<tr>
<td>□ Notify Perinatologist or 2nd OB</td>
<td>□ Order 2 units PRBCs and bring to the bedside</td>
<td>If retained placenta:</td>
</tr>
<tr>
<td>□ Bring hemorrhage cart to the patient’s location</td>
<td>□ Order labs STAT (CBC/PLT, Chem 12 panel, Coag Panel II, ABG)</td>
<td>▪ D&amp;C</td>
</tr>
<tr>
<td>□ Initiate OB Hemorrhage Record</td>
<td></td>
<td>If uterine atony or lower uterine segment bleeding:</td>
</tr>
<tr>
<td>□ If considering selective embolization, call in Interventional Radiology Team and second anesthesiologist</td>
<td>□ Transfuse PRBCs based on clinical signs and response, do not wait for lab results; consider emergency O-negative transfusion</td>
<td>▪ Intrauterine Balloon</td>
</tr>
<tr>
<td>□ Notify nursing supervisor</td>
<td></td>
<td>If above measures unproductive:</td>
</tr>
<tr>
<td>□ Assign single person to communicate with blood bank</td>
<td></td>
<td>▪ Selective embolization (Interventional Radiology if available &amp; adequate experience)</td>
</tr>
<tr>
<td>□ Assign second attending or clinical nurse specialist as family support person or call medical social worker</td>
<td></td>
<td>C-section:</td>
</tr>
<tr>
<td></td>
<td>□ Place Foley with urinometer (if not already done)</td>
<td>▪ B-Lynch Suture</td>
</tr>
<tr>
<td></td>
<td>□ Obtain portable light and OB procedure tray or Hemorrhage cart</td>
<td>▪ Intrauterine Balloon</td>
</tr>
<tr>
<td></td>
<td>□ Obtain blood products from the Blood Bank (or send designee)</td>
<td>If Uterine Inversion:</td>
</tr>
<tr>
<td></td>
<td>□ Assist with move to OR (if indicated)</td>
<td>▪ Anesthesia and uterine relaxation drugs for manual reduction</td>
</tr>
<tr>
<td><strong>Blood Bank:</strong></td>
<td></td>
<td>If Amniotic Fluid Embolism:</td>
</tr>
<tr>
<td>□ Determine availability of thawed plasma, fresh frozen plasma, and platelets; initiate delivery of platelets if not present on site</td>
<td>▪ Maximally aggressive respiratory, vasopressor and blood product support</td>
<td></td>
</tr>
<tr>
<td>□ Consider thawing 2-4 FFP (takes 30 min), use if transfusing &gt; 2 units PRBCs</td>
<td></td>
<td>If vital signs are worse than estimated or measured blood loss: possible uterine rupture or broad ligament tear with internal bleeding; move to laparotomy</td>
</tr>
<tr>
<td>□ Prepare for possibility of massive hemorrhage</td>
<td></td>
<td>Once stabilized: Modified Postpartum management with increased surveillance</td>
</tr>
</tbody>
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Re-Evaluate Bleeding and Vital Signs

If cumulative blood loss > 1500 mL, > 2 units PRBCs given, VS unstable or suspicion for DIC, proceed to STAGE 3.
HOW?
Announce the change

- Grand Rounds
- QBL fairs
- Skills days
- Points of emphasis in daily huddles
- Unit bulletin boards
- Newsletters
Post the process

- Unit bulletin boards
- Pocket cards
- Newsletters

Be open to suggestions

QBL is coming!
IHI – Make it easy to do the right thing

- Identify potential barriers
- Remove barriers
- Documentation
  - EMR QBL friendly
  - Calculators
Environment Prep

- Scales in every room
- Dry weight cards
- Products
- EMR
QBL Calculator in EMR Deliver Summary

CESAREAN SECTION BLOOD LOSS
- Cannister Volume (blood volume only)
- Total Weight: Laps + Sleeves
- Lap Slaeves Used
- # of Laps Used
- # of Chux Used
- Additional Source of Blood Loss Volume

Add "Total Blood Loss Calculated" below to "Total Delivery Blood Loss" section (for I&O)

TOTAL BLOOD LOSS CALCULATED

VAGINAL DELIVERY BLOOD LOSS

TOTAL DELIVERY BLOOD LOSS (Vaginal or C/S)

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Documentation prep

Sample found in CMQCC OB Hemorrhage toolkit 2.0

| A     | B       | C           | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
|-------|---------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6     |         | **QBL Calculator Cesarean Section**         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 7     |         | Cannister Volume cc |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 8     |         | Irrigation cc     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 9     |         | # of Lap Sleeves  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 10    |         | # of Lap Sponges  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 11    |         | Weight of Lap Sleeves plus Lap Sponges grams |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 12    |         | Weight of Kidney Basin + Blood grams |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 13    |         | Weight of Kidney Basin |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 14    |         | # of Blue Chux (30 X 30 cm) |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 15    |         | Weight of Bloody Chux grams |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 16    |         | Total QBL        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 17    |         | 0 cc            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
People Prep

- **Education**
  - Burning platform
  - Expectations
  - Cultural prep
  - Talking points in daily huddles
  - Unit newsletter

- **Skills fairs**

- **Simulation**

- **Hands on practice**
• Begin new process with champions
• Encourage small tests of change
  – With reporting accountability
• Seek feedback
  – Openly and often
  – Respond to each person’s feedback
• Evaluate process at designated time periods
  – Make changes as needed and re-evaluate
Vaginal Birth – two step process

Part I
• QBL immediately after delivery. Provider finishes at the perineum
  – Look in the drape pouch
  – Recommend to evaluate fluid in the pouch at delivery of placenta – most blood loss occurs after delivery of placenta

Part II
• QBL at completion of recovery – typically 2 hours
  – Weight of standardized pack
    • Example
      Chux, peripad, cold pack

Part III –
Lap sponges
Multiple chux or bath blanket for floor spills
Dry weights of additional items posted by scales in each room
Weighing: Vaginal Birth

• Standardized “pack” with each delivery
• Save until the end
• Weigh as you go (if you have enough staff)
• Dry weights of other objects
Direct measurement – vaginal birth

- Under buttock drapes

Average amniotic fluid volume
- Normal 700 ml
- Oligohydramnios 300 ml
- Polyhydramnios 1400 ml
Timing

- For every birth, begin QBL immediately after infant’s birth and continue ongoing, cumulative measurement until bleeding is stable
- Usually 2-4 hours postpartum
- Utilize CMQCC algorithm for treatment recommendations
Cesarean Birth
Two step process

Part I  Suction

• Deliver infant, suction amniotic fluid
• Scrub tech signals circulator to change suction tubing to second canister before placenta delivery
• Record volume of second canister BEFORE irrigation after drapes suctioned of significant blood – if present
• Use single canister if AROM/SROM prior to cesarean

Part II Sponges

• Hang used sponges in sponge counter bag
• Weigh entire bundles (counting bags rolled up) as abdomen being closed

FINAL

• QBL reported to team before abdomen dressing applied
Cesarean Birth

• TIMING MATTERS
  – Report QBL so entire team knows the number
  – Done before staff time is needed for final patient care: i.e. wound dressing/cleaning patient etc
  – Record QBL/suctioned blood before irrigation used
  – Record QBL/bloody sponges while incision being closed (fascia)
Cesarean Birth

- Start with scheduled sections
  - Champions
  - Don’t expect immediate buy in from all physicians

- Make it easy!
  - Scale in every OR
  - Calculator with dry weights built in – EMR or excel program
Direct measurement – Cesarean birth

- Canisters
  - Trouble with irrigation numbers
    - Often leads to a negative blood loss value
  - Close out QBL prior to irrigation if possible
Weighing Cesarean Birth

Additional items may include: bath blanket, chux for any spills
In both modes of delivery – once process is established (meaning this team QBL’d all deliveries)

Average time to complete was **TWO** minutes...
BARRIERS AND STRATEGIES FOR SUCCESS

California Partnership for Maternal Safety
Barriers and Strategies

Clinician Issues
• The providers believe that their patients are unique; thus, the research does not apply to their specific group of patients

Strategies for Success
• Distribute key peer-reviewed literature related to the measurement of blood loss to every nurse and physician
Barriers and Strategies

Clinician Issues
• Many physicians and nurses have only performed EBL. They are not familiar with how to QBL

Strategies for Success
• The lack of experience indicates there is a need for more education with QBL
• Remember – just because it is new, doesn’t mean it isn’t worthwhile
Barriers and Strategies

Clinician Issues
- Performing QBL may increase the documented blood loss levels and are worried it may negatively reflect on their reputation.

Strategies for Success
- Track the number of births with QBL and their relationship to early recognition of PPH. Report and display facts and QBL trends to physicians and nurses.
Barriers and Strategies

Clinician Issues

• All: QBL is only needed for cases where a hemorrhage is identified

Strategies for Success

• Measurement of cumulative blood loss is the goal. Often it is too late when we recognize that the woman has lost too much blood. Perform regular quantification in non-emergency situations to prepare the team for the actual PPH event
Barriers and Strategies

Clinician Issues

• All: QBL is not exact and, therefore, it is not worth doing

Strategies for Success

• The goal is not a “perfect, precise number”. It is more accurate to measure than to rely solely on visually estimate blood loss
Barriers and Strategies

Clinician Issues

• RN: “With QBL, it is now my responsibility to get it right”
• Anesthesiology: “I used to be in charge and still want the responsibility”

Strategies for Success

• Shared responsibility and accountability is critical to quality patient outcomes. A shared team awareness is needed. It is not one person’s responsibility – it is the TEAM’s responsibility
Barriers and Strategies

Clinician Issues

• RN: QBL takes a lot of time doesn’t it?

Strategies for Success

• Teams that do QBL, report that it becomes routine and takes very little additional time
Barriers and Strategies

Clinician Issues
• The OR: It’s going to slow down OR room turnover

Strategies for Success
• Have scales and dry items list readily available in the OR. Develop quick methods for totaling/calculating QBL in the EMR
In summary...

• QBL is strongly recommended by:
  – CMQCC
  – AWHONN
  – National leadership

• Significant change in practice and culture

• Takes a good amount of time to implement

• Time and persistence pays off
So, what’s next?
Questions?

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