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Introduction
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The New York State Department of Health's (NYSDOH) New York State Perinatal Quality Collaborative (NYSPQC) led the New York State (NYS) Obstetric Hemorrhage Project from November 2017 through June 2021.

### Purpose and Focus of the Project

The goal of the NYS Obstetric Hemorrhage Project was to reduce maternal morbidity and mortality statewide by translating evidence-based guidelines into clinical practice to improve the assessment for and management of obstetric hemorrhage. This quality improvement collaborative engaged teams from 83 NYS birthing hospitals from diverse geographic areas and included: 17 Regional Perinatal Centers (RPCs); 23 Level III birthing hospitals; 18 Level II birthing hospitals; and 25 Level I birthing hospitals. These teams, in partnership with the American College of Obstetricians and Gynecologists (ACOG) District II's Safe Motherhood Initiative (SMI), Healthcare Association of New York State (HANYS) and Greater New York Hospital Association (GNYHA), with support from the National Institute for Children's Health Quality (NICHQ) and other stakeholders, worked together to implement interventions to improve obstetric outcomes. This was accomplished by:

- Implementing a learning collaborative among participating birthing hospital teams to share and learn from one another;
- Implementing evidence-based strategies for the assessment and management of obstetric hemorrhage;
- Providing tailored clinical and quality improvement education and technical assistance; and
- Collecting monthly data, regular analysis of the data and feedback provided monthly to birthing hospital teams on relevant measures.

The NYS Obstetric Hemorrhage Project focused on the following:

1. **Readiness** to respond to an obstetric hemorrhage by implementing standardized policies and procedures and developing rapid response teams.
2. **Recognition** of obstetric hemorrhage by performing ongoing quantification of actual blood loss and triggers of maternal deterioration during and after all births.
3. **Response** to hemorrhage by performing regular on-site, multidisciplinary hemorrhage drills.
4. **Reporting** of obstetric hemorrhage by using standardized definitions resulting in consistent coding.

Evidence-based interventions related to these areas build upon work previously done by NYS birthing hospitals through the NYSDOH's NYSPQC / New York State Partnership for Patients' Maternal Hemorrhage and Hypertension Initiative and ACOG District II's SMI.
Methods for Learning

The NYS Obstetric Hemorrhage Project used the Institute for Healthcare Improvement’s (IHI) Breakthrough Series (BTS) learning model modified to meet the requirements and unique needs of this topic and context, and a quality improvement change model, the Model for Improvement, that have demonstrated effectiveness in previous healthcare quality improvement projects. As part of the improvement process, teams learned quality improvement strategies, and collected data sensitive to the changes they tested and implemented, and tracked performance and results over their participation in the collaborative.

New York State Obstetric Hemorrhage Project Toolkit

The NYSPQC developed this toolkit to assist with improving hospital team readiness, assessment and response to obstetric hemorrhage. This toolkit will allow users to learn from hospital teams that participated in the NYS Obstetric Hemorrhage Project by sharing relevant educational presentations from expert faculty, hospitals’ policies and protocols, professional education materials, data and quality improvement tools, web links, and references. All information, presentations, policies, tools, and forms contained in this toolkit are provided for informational purposes only. The toolkit is not meant to provide medical advice nor is it a substitute for professional medical or clinical judgment.
Acknowledgments

Staff at the following organizations provided integral contributions to the development of this toolkit:

New York State Department of Health Division of Family Health
New York State Perinatal Quality Collaborative (NYSPQC)
National Institute for Children's Health Quality (NICHQ)

**NYSPQC Obstetric Hemorrhage Project hospital teams:**

Adirondack Medical Center - Saranac Lake Site
Albany Medical Center Hospital
Arnot Ogden Medical Center
BronxCare Hospital Center
Canton-Potsdam Hospital
Chenango Memorial Hospital Inc
Crouse Health
Ellis Hospital - Bellevue Woman's Care Center Division
Flushing Hospital Medical Center
Garnet Health Medical Center
Glens Falls Hospital
Guthrie Cortland Medical Center
HealthAlliance Hospital Broadway Campus Highland Hospital
Huntington Hospital
John R. Oishei Children's Hospital
Lenox Hill Hospital
Long Island Jewish Forest Hills
Maimonides Medical Center
Mercy Hospital
Montefiore Medical Center
Montefiore Medical Center - Wakefield Hospital
Mount Sinai Hospital
Mount Sinai South Nassau
Mount Sinai West
Mount St. Mary's Hospital and Health Center
Nassau University Medical Center
Nathan Littauer Hospital
Newark-Wayne Community Hospital
NewYork-Presbyterian Allen Hospital
NewYork-Presbyterian Brooklyn Methodist Hospital
NewYork-Presbyterian/Columbia University Irving Medical Center
NewYork-Presbyterian Hudson Valley Hospital
NewYork-Presbyterian Lawrence Hospital
NewYork-Presbyterian Queens
NewYork-Presbyterian/Weill Cornell Medical Center
NYC Health + Hospitals/Bellevue
NYC Health + Hospitals/Coney Island
NYC Health + Hospitals/Elmhurst
NYC Health + Hospitals/Lincoln
NYC Health + Hospitals/Metropolitan
NYC Health + Hospitals/Kings County
NYC Health + Hospitals/North Central Bronx
Nicholas H Noyes Memorial Hospital
North Shore University Hospital
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NYSPQC Obstetric Hemorrhage hospital teams

Northern Dutchess Hospital
Northern Westchester Hospital Association
NYU Langone Hospital-Brooklyn
NYU Langone Hospital-Long Island
NYU Langone Hospitals
Oswego Hospital
Peconic Bay Medical Center
Phelps Hospital
Rochester General Hospital
Samaritan Medical Center Elmhurst Hospital Center
Saratoga Hospital
Sisters of Charity Hospital
South Shore University Hospital
St. Catherine of Siena Medical Center
St. Joseph's Hospital Health Center
St. Luke's Cornwall Hospital Newburgh
St. Mary's Healthcare
St. Peters Hospital
Staten Island University Hospital - North
Strong Memorial Hospital
The Burdett Care Center
The Unity Hospital of Rochester
The University of Vermont Health Network - Alice Hyde Medical Center
The University of Vermont Health Network - Champlain Valley Physicians Hospital
University Hospital - Stony Brook Southampton Hospital
University Hospital of Brooklyn
University Hospital of Stony Brook
Upstate University Hospital at Community General
Vassar Brothers Medical Center
Westchester Medical Center
White Plains Hospital Center

Collaborating Organizations:

American College of Obstetricians & Gynecologists (ACOG) – District II
Centers for Disease Control & Prevention (CDC)
Greater New York Hospital Association (GNYHA)
Healthcare Association of New York State (HANYS)

The NYSDOH provided financial support to the NYS Obstetric Hemorrhage Project and the NYSPQC activities detailed in this toolkit. Funding was also made possible by CDC grant NU58DP006375.

All information, presentations, policies, tools and forms contained in this toolkit are provided for informational purposes only. The toolkit is not meant to provide medical advice nor is it a substitute for professional medical or clinical judgment.

If you have questions about this toolkit, contact NYSPQC@health.ny.gov.
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Quality Improvement
Introduction

Data and quality improvement tools are important components of the NYSPQC model. The NYSPQC Obstetric Hemorrhage Project used the Institute for Healthcare Improvement’s (IHI) Breakthrough Series (BTS), a learning model that has been modified to meet the requirements and unique needs of this topic and context. Additionally, the project uses the Model for Improvement, a change model developed by the Associates in Process Improvement. Both the BTS and Model for Improvement have demonstrated effectiveness in this and previous NYSDOH projects. By using these models, the NYSPQC assists participating teams with embedding strategies to measure and address disparities in care and outcomes throughout the process. A BTS Collaborative is a vehicle for identifying, testing, and spreading changes that are effective for improving care and outcomes for defined populations. The quality improvement tools in this section are key tools used by participating hospitals and organizations to achieve desired goals. Additional data collection and quality improvement tools can be found on the NYSPQC website: www.nyspqc.org.

Driver Diagrams


The Driver Diagram is a graphic prediction of the changes that need to be accomplished to achieve the AIM within your system. These changes are grouped together in categories labeled “Drivers” because they “drive’ the achievement of your main goal.
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c. SMARTIE AIM Statement Worksheet

d. New York State Obstetric Hemorrhage Project – Key Driver Diagram

e. PDSA Tutorial

f. PDSA Cycle Worksheet

g. PDSA Cycle Feedback Sheet

h. Quality Improvement Framework: Holding the Gains
   i. Presenter: Patricia Heinrich, RN, MSN
Quality Improvement Training for New York State Obstetric Hemorrhage Project

Presenter: Patricia Heinrich, RN, MSN
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Presenter: Patricia Heinrich, RN, MSN

Measurement for Improvement
- Measure are an indicator of how the system is working at any given time — important feedback
- Shows whether changes are working
  - Make decisions
  - Guide progress towards aim
- The purpose of measurement in improvement work is for learning not judgment

Measurement in Three Worlds

Three Types of Measures
- Outcome measures:
  - System level performance, or the clinical outcome
  - "The what"
  - Did we achieve what we set out to?
- Process measures:
  - Relate to how this happens, the processes that change to bring about improvement
  - "The how" it is done
  - Are we going in the right direction?
- Balancing measures:
  - Relate to unintended consequences of improvement

Measurement Checklist

Methods of Measurement
- Clinical measures of patients’ health
- Documentation of behaviors
- Questionnaires
- Assessments
- Summary of databases
- Chart audits
- Observations
Quality Improvement Training for New York State Obstetric Hemorrhage Project
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Why Test?
- Increase the belief that the change will result in improvement
- Learn how to adapt the change to conditions in the local environment
- Evaluate costs and side-effects of the change
- Minimize resistance upon implementation
- Give individuals a chance to experience the change prior to implementation

Improving Safe Sleep in Hospitals
Potential Changes
- Test discharge education with new parents on recommended AAP Infant Sleep Practices for one shift.
- Test process to include infant safe sleep training as part of one new staff orientation.
- Test use of safe sleep bassinet cards as visual reminders for nursery staff for one shift.
- Test a graduation certificate to explain the rationale for the change from prone to supine position for one family.

Hip, Hip, Hooray!!
Graduated to Safe Sleep Today!
York Hospital NICU

PDSA Cycle Example
Change Idea: Use a graduation certificate to explain to families the rationale for the change from prone to supine position.

Question: Will using a graduation certificate result in more families receiving education on safe sleep practices and more families reporting that they intend to practice safe sleep?

Prediction:
- The certificate will serve as a prompt for educating parents on safe sleep and all 5 families will receive education on safe sleep.
- 4 out of 5 parents will report that they intend to use safe sleep practices.
Quality Improvement Training for New York State Obstetric Hemorrhage Project
Presenter: Patricia Heinrich, RN, MSN
Quality Improvement Training for New York State Obstetric Hemorrhage Project
Presenter: Patricia Heinrich, RN, MSN

Tip: Start Small
- Scale down size of test (or patients, location, time)
- Do initial PDSA on smallest scale possible (n=1)
- The next step:
  - One staff member
  - One area
- Start with volunteers
- “Pilot” cycles are good learning opportunities, particularly when small

The Scale of the Next PDSA Cycle
- Staff, scarce resources, constituents, stakeholders needs to change or current commitment

Tip: Collect useful data during each test
- Use a measure specific to the PDSA
  - Usually not one of the project measures
  - Usually not collected beyond the PDSA cycle
- Simply data collection
  - Collect useful data not perfect data
  - “Paper and pencil” data collection
  - What can you collect during the test?
  - Qualitative results are very valuable in early PDSAs:
    - Talk to staff carrying out test
    - Talk to families

PDSA vs Project Measures
- Project Measures vs PDSA Measures
  - Used to answer the question: Were we meeting our Aim?
  - Used to answer the question: Did this one PDSA (small test) work?
  - Outlined in months or weeks
  - Used to outline in a set of measures: Process, Outcome, Balancing
  - Measured for a period of several weeks or months, for life of project and after
  - Measured for only as long as it evaluates this and other similar tests

Tip: Don’t confuse a task with a test
- Activity = change
- May have many tasks that need to be completed in order to run a PDSA
- Examples of tasks:
  - Scheduling a meeting
  - Collecting data
  - Creating a form
  - Developing an implementation education program
  - Writing a policy

Tip: Test under as many conditions as possible
- Think about factors that could lead to breakdowns, supports needed, “test driving” shift
  - Day shift/night shift
  - Unit based
  - Cultural differences
  - Weekdays/weekends
  - Regular staffing/short staffing
  - Experienced/inexperienced staff
  - English speaking families vs non-English speaking
  - Patients/families vs other family

NICHQ
Quality Improvement Training for New York State Obstetric Hemorrhage Project
Presenter: Patricia Heinrich, RN, MSN
Quality Improvement Training for New York State Obstetric Hemorrhage Project

Presenter: Patricia Heinrich, RN, MSN
Psychology of Change

Presenter: Jane Taylor, EdD, MBA, MHA

System of Profound Knowledge: Deming

Deming’s System of Profound Knowledge

“Every system is perfectly designed to achieve the results it gets.” Dr. Paul Batalden

Many Models of Change

Please text in your favorite model or one(s) you have used.

- Kubler Ross
- Kanter
- Kotter
- Bridges
- Senge
- Prochaska
- Ashkenas

“One common mistake is to think of change as only a technical issue... For every technical change in the system, there are usually social and economic changes as well.”

The Improvement Guide, pg 187

Since then my colleague, Neil Baker, MD has asked over 2000 improvers the hardest part of improvement work and the answer is...
Psychology of Change
Presenter: Jane Taylor, EdD, MBA, MHA
Psychology of Change
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Psychology of Change

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Psychology of Change
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Distribute Power

Recommended Practices
1. Create a Shared Purpose
2. Develop Distributed Leadership
3. Establish Working-Agreements
4. Cede Power

Adapt in Action

Recommended Practices
1. Coach and Be Coached
2. Adapt a Growth Mindset
3. Fail Forward
4. Embrace Emergence

Improvement Measures
Primary Measures
- Higher (and potentially faster) change adoption rates
- Increased sustainability of change

Secondary Measures
- Sustained integration of psychology of change methods over time
- Increased joy and satisfaction
- Higher discretionary effort
- Higher resiliency, lower burnout and “dropout”

Download the Free IHI White Paper

Download the free IHI White Paper:
www.ihi.org/psychology
Psychology of Change
Presenter: Jane Taylor, EdD, MBA, MHA
SMARTIE AIM Statement Worksheet

1. AIM Statement (include your Team AIM Statement (reflecting the project AIM) and also any specific individual goals your team intends to work toward, based on your organizational strategic objectives and/or your specific patient. Population’s needs. Edit as you work through the criteria in #2 below).

2. Review the AIM Statement again for the components of a SMARTIE objectives (Specific, Measurable, Actionable, Achievable, Realistic, Timely, Inclusive, and Equitable).
   - **SPECIFIC** – Is the statement precise about what you hope to achieve?
   - **MEASURABLE** – Are the objectives measurable? Will you know if the change resulted in improvement?
   - **ACTIONABLE** – Are “who”, “what”, “when”, and “where” defined?
   - **ACHIEVABLE** – Is this doable in the time you have? Are you attempting too much? Could you do more?
   - **REALISTIC** – Do you have the necessary resources (people, time, support)?
   - **TIMELY** – Do you identify the timeline? When will you accomplish each part?
   - **INCLUSIVE** – Do you identify the disparities and plan to provide care for all patient populations in order to reduce those?
   - **EQUITABLE** – How will you reduce disparities and assure all patients receive equitable care (care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status)?

Questions?
E-mail NYSPOQC@health.ny.gov, or call (518) 473-9883.
New York State Obstetric Hemorrhage Project – Key Driver Diagram

GLOBAL AIM:
Reduce maternal morbidity and mortality associated with obstetric hemorrhage in NYS.

SMART AIM:
Increase hemorrhage risk assessment on admission & postpartum to 85% of maternity patients.

For more information:
Council On Patient Safety in Women’s Healthcare
ACOG District II Safe Motherhood Initiative (SMI)

NEW YORK STATE OBSTETRIC HEMORRHAGE PROJECT – KEY DRIVER DIAGRAM

PRIMARY DRIVERS

RECOGNITION & PREVENTION (EVERY PATIENT)

- Have a hemorrhage cart readily available
- Ensure rapid access to medication
- Establish a response team
- Establish massive transfusion and emergency release protocols
- Develop and implement unit education on protocols and unit-based drills with post-event debriefs
- Place copies of the hemorrhage protocols in prominent places in each patient room & OR
- Conduct drills** regularly and ensure all responders participate

READINESS (EVERY UNIT)

- Assess hemorrhage risk and prepare based on risk level
- Perform on-going measurement of blood loss, estimated or quantified
- Manage 3rd stage of labor
- Educate patient and family on signs and symptoms and when to call staff/provider

RESPONSE (EVERY HEMORRHAGE)

- Adopt a standard, stage-based, hemorrhage management plan with checklists
- Develop a support program for patients, families and staff for all significant hemorrhages

REPORTING/ SYSTEMS LEARNING (EVERY UNIT)

- Huddle for high risk patients to prepare throughout care
- Debrief to identify successes and opportunities.
- Review of serious hemorrhages* by a multidisciplinary team
- Identify and utilize data collection plan to capture OB hemorrhage events

*Blood loss greater than ≥500 ml with a vaginal delivery and ≥1000 ml with a cesarean section.
** Drills = Right participants, scenarios, demonstration of competency in roles and responsibilities.

October 18, 2021
PDSA Tutorial

1. Gather ideas about what changes will lead to improvement
You need to understand some basic information about what are the existing challenges to improving care to achieve your aim (to increase early assessment and identification of patients at risk for obstetric hemorrhage, to increase early diagnosis and appropriate management, to reduce morbidity associated with obstetric hemorrhage). For example, are the challenges you are facing related to role clarification, delegation, staff education, lack of leadership support, or tools and prompts? Consider who could offer insight into the area and ideas for improving it.

This is a “thinking” step that will help to explore the reasons why areas of practice have become less than optimal. Understanding barriers that prevent change will help you plan initiatives that anticipate and overcome barriers.

PDSA cycles are small tests designed to help you make progress toward a goal. Small tests do not necessarily mean small changes; rather, small tests represent small steps needed to achieve significant improvement.

2. Plan the PDSA Cycle
It is important to develop a detailed plan for your PDSA so that you know exactly what needs to occur in your DO phase (who will do it, which patients it will involve, and how you will track your progress). When planning, ask yourself the following questions:

- What are we testing?
- Who are we testing the change on?
- When are we testing?
- Where are we testing?
- Who will implement the cycle?
PDSA Tutorial

- What is our measurement plan?

Don’t forget to make a prediction.
Anticipating the impact of your cycle will help you to focus on
- Planning
- Areas for improvement
- Clarifying measures
- Being creative

When predicting, ask yourself, “What do you expect to happen?” Making a prediction will assist in anticipating what might come next and whether the cycle was a success or failure. If it was a failure, it is important to take the time to understand why (Study).

Don’t forget to include measurement plan.
Integrate the study part of the PDSA into the daily routine as much as possible. What you measure to show if your PDSA resulted in an improvement may or may not be the same as the measures you use for the Collaborative reports. Usually the study part of the PDSA cycle can be an observation, or asking one of the team members their impression of how the test of change went. Build on existing systems when re-designing. What examples of success within your office can you learn from?

Example:
Goal: Increase early diagnosis and appropriate management of OB hemorrhage
What is being tested: Simulation Training
Prediction: Practice with simulation of hemorrhage event will help us identify areas we need to work on to increase appropriate diagnosis and management
When/Where/Who: Thursday Nov 30th 7 am multidisciplinary team will run 1 practice session
Measurement: Team will debrief event and plan for any changes needed for subsequent practice drills

3. Conduct the Cycle (DO)
Carry out the cycle, collect data and begin analysis. Don’t forget to seek opinions about changes tested in this cycle.

Example:
Nurses and OB attended, but anesthesia did not. Failure to invite them to be rectified next practice

4. Analyze the Results (STUDY)
Studying the results allows you to answer the questions:
- Was this change an improvement?
- If yes, do we need more information before implementing the change with others in the practice (e.g., Test again on different days with different staff)?
- If not, what have we learned from this test? What could we do differently next time to make it an improvement over the current system? What additional information do we need to achieve an improvement?
- Share your results: Plot data of key measures each week and display for others in the office to see. Seek input from everyone in your office.
5. Decide What to Do Next (ACT)
Identify what changes are to be made in the current cycle, from this, identify your next cycle. “The science in PDSA is in the act of reflection, learning from what one did. Those who want improvement to occur need to reserve specific times to ask, ‘What did we learn, and how can we build on it?’”

Learning: Feasible strategy for practice, but additional education and prompts are needed to ensure consistent and ongoing and counseling occur.

Potential Next Cycles: After we reach a point that the patients have been getting the brain cards reach the time to schedule their deliveries we will measure if the use of these cards resulted in fewer requests by patients for an early elective delivery.

PDSA Cycle

Plan
- What are we testing?
- Who are we testing the change on?
- When are we testing?
- Where are we testing?
- Who will implement the cycle?
- What is our measurement plan?

Do
- What was actually tested?
- What happened?
- Observations
- Problems

Act
- What changes should we make before the next test cycle?
- What will the next test cycle be?
- Are we ready to implement the change?

Study
- Was this change an improvement?
- If yes, do we need more information before implementing the change with others in the practice (e.g., Test again on different days with different staff)?
- If not, what have we learned from this test? What could we do differently next time to make it an improvement over the current system? What additional information do we need to achieve an improvement?
- Share your results: Plot data of key measures each week and display for others in the office to see. Seek input from everyone in your office.
PDSA Cycle Worksheet

**PLAN:**
Brief description of the test:

**DO:**
Test the change: Was the cycle carried out as planned?

- [ ] Yes
- [ ] No

What did you observe that was not part of the plan?

**STUDY:**
Did the results match your prediction?

- [ ] Yes
- [ ] No

Compare the results of your test to your previous performance:

**ACT:**
Decide to Abandon, Adapt, or Adopt.

- [ ] Abandon: Discard change idea and try a new one.
- [ ] Adapt: Improve the change and continue testing. Describe what you will change in your next PDSA cycle.
- [ ] Adapt: Select changes to implement on a large scale and develop an implementation plan for sustainability.

If you plan to adopt, what plans do you have for your next 2-3 PDSA cycles for follow-up tests and implementation:

List of Tasks Needed to Complete | Person Responsible (Who) | When | Where
--- | --- | --- | ---

Plan for collecting data:
## PDSA Cycle Feedback Sheet

**PURPOSE:** To provide helpful feedback to teams who have submitted a PDSA worksheet documenting tests of change designed to develop, test or implement a change.

**FULL Organization Name (do not use abbreviation):**

<table>
<thead>
<tr>
<th>PDSA #:</th>
<th>Date:</th>
<th>Reviewer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PLAN:

- **Review Question:**
  - Was the objective for this PDSA cycle clear?
  - Did the team state their predictions? Did the prediction identify how they thought test would result in an improvement?
  - Did the team address WHO, WHAT, WHERE, WHEN?
  - Did the team describe plan to collect the data required to answer questions? Will the team be able to evaluate the predictions using these data?
  - What was the scale/scope of the PDSA (Too large, small, complex, simple etc.)? Was there a more useful size/scope for this PDSA cycle?

### DO:

- **Review Question:**
  - Did the team attempt to carry out their plan?
  - Did the team document any problems or unexpected events?
  - Did the team collect the data they planned to collect?

### STUDY:

- **Review Question:**
  - Did the team compare the data and feedback or observations to their prediction and summarize what they learned?
  - Did the team update their theories about the objective of the cycle?
  - Any suggestions?

### ACT:

- **Review Question:**
  - Did the team say what will happen in the next PDSA cycle (develop change further, test, implement)?
  - Suggestions for the next PDSA cycle(s)?

**Additional Comments:** Please update on your PDSA progress and return completed form. Note - you are using a different reporting tool (PDSA FORM) which is fine but please add the date at the top.

For more information about the Model for Improvement and PDSSAs go to:

1. [NYSPOC PDSA Tutorial](#)
2. [E-module CI 101](#) (review of the Model for Improvement)
3. [E-module CI 102](#) (focus on PDSA)
Quality Improvement Framework: Holding the Gains

Presenter: Patricia Heinrich, RN, MSN
Quality Improvement Framework: Holding the Gains
Presenter: Patricia Heinrich, RN, MSN

Holding the Gains: “pull to new”
- Old System
- New System
  - Success of collaborative team
  - Intention to hold gains and knowledgeable about how
  - Organizational priority
  - Leadership makes responsibilities clear

Holding the gain starts with PDSA cycles which are used for:
- Testing—“Will this change result in improvement and, if so, how?”
- Implementing—“Now that we know this change works, how do we make it permanent?”

Repeated Use of the PDSA Cycle
- Learning from DATA
  - Changes that result in improvement
- Implementation of Change
  - Wide-Scale Tests of Change
  - Follow-up Tests
  - Very Small Scale Tests

Strategies to Hold the Gains
- PDCA cycles for testing and implementation
- Hold Gains
  - Leadership, Infrastructure, Effective control systems
  - After implementation

Exercise
- Describe a specific change you have implemented related to the collaborative
- Now assume you/your collaborative team all leave/retract. Will this change continue to be used?
  - Why or why not?
  - What could make your practice/organization revert to the old way?
  - What supports are in place to hold the new process?
- Pairshare

Plan to Hold the Gains after Implementation: Three Key Components
- Leadership
- Infrastructure
- Effective Control System

NEW YORK STATE Department of Health
New York State Perinatal Quality Collaborative 41
Quality Improvement Framework: Holding the Gains
Presenter: Patricia Heinrich, RN, MSN
Quality Improvement Framework: Holding the Gains
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- **Sustainability requires data**
  - Data driven care improves outcomes
  - It can be measured
  - It can be shared and discussed
  - It can be reliably applied
  - The importance lies in choosing the right data to measure

- **Intuition vs. Data**
  - Rules for professionals
    - Just because everyone agrees with you, it doesn’t make you right. The facts (science) of the matter dictate correctness.
  - Why does DATA matter?
    - Simple, non-weighted algorithms consistently outperform professional intuition.

- **The final “S” = Time to Celebrate!**
  - The change is implemented and sustained
  - New requirements are reflected in performance scorecards, metrics and dashboards to monitor and sustain the target environment.
  - Process changes are transitioned to business and process owners. The target environment is considered “business as usual” and the project is closed out.

- **The “Human Side” of Holding the Gains**
  - A key component of sustaining change is the recognition and reward of contributors and the celebration of successes.
  - Continue to celebrate successes
  - Thank people for their work
  - Keep listening to your patients

- **Next Steps: Is your team well positioned to SUSTAIN your improvements?**
  - As a team, review the sustainability checklist making any notes about gaps.
  - We will send this tool after the LS via email
  - Use your results to identify anything you still need to work on to be sure your team will sustain the improvements you have made

- **Questions**
Quality Improvement Framework: Holding the Gains
Presenter: Patricia Heinrich, RN, MSN

References
3
Data Collection Tools
Introduction

Data and quality improvement tools are important components of the NYSPQC model. The tools provided in this section allow data to be consistently collected and analyzed across hospitals and organizations to help facilitate each team’s learning. The NYS Obstetric Hemorrhage Project collected monthly aggregate and patient specific data, and quarterly structure measures to evaluate the improvements teams made, and to help identify changes that result in progress towards the project’s goal and aim.

The data and quality improvement tools in this section were used by participating NYS birthing hospitals to achieve desired goals. Additional data collection and quality improvement tools can be found on the NYSPQC website at www.nyspqc.org.
Contents  Click on titles/page numbers to go to directly to each section

a. New York State Obstetric Hemorrhage Project – Aggregate Data Collection Tool  48
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c. New York State Obstetric Hemorrhage Project – Race/Ethnicity Patient Data Collection Tool  50
d. New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log  52
e. New York State Obstetric Hemorrhage Project – Structure Measures Data Collection Tool  56
# New York State Obstetric Hemorrhage Project - Aggregate Data Collection Tool

<table>
<thead>
<tr>
<th>Morbidity and Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Massive Transfusion</td>
</tr>
<tr>
<td>Number of maternity patients, ≥ 20 weeks completed gestation, admitted to labor and delivery for the birth hospitalization</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Morbidity and Mortality Associated with Obstetric Hemorrhage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of maternity patients, ≥ 20 weeks completed gestation, admitted to labor and delivery, diagnosed with obstetric hemorrhage², <strong>admitted to higher level of care</strong>³</td>
</tr>
</tbody>
</table>

| Number of maternity patients, admitted to labor and delivery ≥ 20 weeks completed gestation, diagnosed with obstetric hemorrhage² and **had a hysterectomy during the birth hospitalization** |

| Number of maternity patients, admitted to labor and delivery ≥ 20 weeks completed gestation, diagnosed with obstetric hemorrhage² and **died during the birth hospitalization** |

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**Questions?**
For questions, please e-mail [NYSPOC@health.ny.gov](mailto:NYSPOC@health.ny.gov) or call 518/473-9883.

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Revised: May 14, 2020
New York State Obstetric Hemorrhage Project – Patient Specific Data Collection Tool

<table>
<thead>
<tr>
<th>8. For patients who have experienced an obstetric hemorrhage (vaginal delivery with ≥ 500 ml blood loss, and cesarean section with ≥ 1,000 ml blood loss), answer the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Admitted to a higher level of care (check all that apply)</td>
</tr>
<tr>
<td>□ Yes, admitted to ICU (at your hospital)</td>
</tr>
<tr>
<td>□ Yes, transferred to another hospital</td>
</tr>
<tr>
<td>□ Yes, transferred from another hospital</td>
</tr>
<tr>
<td>□ No</td>
</tr>
<tr>
<td>b. Received a hysterectomy at your hospital</td>
</tr>
<tr>
<td>□ Yes □ No</td>
</tr>
<tr>
<td>c. Died at your hospital</td>
</tr>
<tr>
<td>□ Yes □ No</td>
</tr>
<tr>
<td>9. Volume of blood loss</td>
</tr>
<tr>
<td>____________ mL</td>
</tr>
<tr>
<td>a. Method of calculating blood loss</td>
</tr>
<tr>
<td>□ Formal quantification</td>
</tr>
<tr>
<td>□ Visual estimation</td>
</tr>
<tr>
<td>□ Mixed methods</td>
</tr>
<tr>
<td>10. Did the patient experience any of the following at your hospital during this delivery hospitalization (check all that apply)</td>
</tr>
<tr>
<td>□ Abnormally adherent placenta (accreta, increta, percreta)</td>
</tr>
<tr>
<td>□ Amniotic fluid embolism</td>
</tr>
<tr>
<td>□ Defects of coagulation (inherited and acquired)</td>
</tr>
<tr>
<td>□ Hematoma / Laceration (specify)</td>
</tr>
<tr>
<td>□ Other intraperitoneal bleeding (uterine rupture excluded)</td>
</tr>
<tr>
<td>□ Placenta previa</td>
</tr>
<tr>
<td>□ Placental abruption</td>
</tr>
<tr>
<td>□ Retained placenta or products of conception</td>
</tr>
<tr>
<td>□ Retro-peritoneal bleeding</td>
</tr>
<tr>
<td>□ Uterine anomalies</td>
</tr>
<tr>
<td>□ Uterine atony</td>
</tr>
<tr>
<td>□ Uterine inversion</td>
</tr>
<tr>
<td>□ Uterine rupture</td>
</tr>
<tr>
<td>□ Other (specify)</td>
</tr>
</tbody>
</table>

11. Clinical debrief conducted post-hemorrhage event?

| □ Yes □ No |
| 12a. Documentation of risk assessment on admission |
| □ Yes □ No |
| 12b. Documentation of risk assessment postpartum (between birth and discharge) |
| □ Yes □ No |

February 1, 2019

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*These include inherited coagulation defects (e.g. Factor deficiency such as von Willebrand) as well as acute coagulopathies (e.g. disseminated intravascular coagulation) that may develop from events such as amniotic fluid embolism, placental abruption, or severe preeclampsia.

* A formal post-event debrief is defined as a dialogue between two or more members of the multidisciplinary obstetric care team (present during the hemorrhage) conducted as soon as possible after the event, and focused on successes, opportunities and systems issues identified.
New York State Obstetric Hemorrhage Project - Race/Ethnicity Patient Data Collection Tool

Instructions: Each month, sample at least 20 maternity patients, ≥ 20 weeks completed gestation, who are admitted for the birth hospitalization. If fewer than 20 patients delivered that month, report on 100% of your hospital’s patient population. Patients should be included in the month which they were discharged from the birth hospitalization. Please check the appropriate boxes below for each patient.

Note: Only Regional Perinatal Centers are required to collect and submit this data.

Month: __________ Year: __________

<table>
<thead>
<tr>
<th>Patient #</th>
<th>Ethnicity</th>
<th>Race (check all that apply)</th>
<th>Documented risk assessment for OB hemorrhage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hispanic*</td>
<td>Non-Hispanic</td>
<td>Declined to answer</td>
</tr>
<tr>
<td>1</td>
<td>Not reported</td>
<td>Asian**</td>
<td>Black / African American</td>
</tr>
<tr>
<td>2</td>
<td>Declined to answer</td>
<td>Native Hawaiian / Pacific Islander***</td>
<td>White</td>
</tr>
<tr>
<td>3</td>
<td>Not reported</td>
<td>Other (specify)</td>
<td>Declined to answer</td>
</tr>
<tr>
<td>4</td>
<td>Not reported</td>
<td>Not reported</td>
<td>On admission to the birth hospitalization?</td>
</tr>
<tr>
<td>5</td>
<td>Not reported</td>
<td>At least once postpartum?</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Not reported</td>
<td>At least once postpartum?</td>
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<tr>
<td>7</td>
<td>Not reported</td>
<td>At least once postpartum?</td>
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<td>8</td>
<td>Not reported</td>
<td>At least once postpartum?</td>
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<td>9</td>
<td>Not reported</td>
<td>At least once postpartum?</td>
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<tr>
<td>10</td>
<td>Not reported</td>
<td>At least once postpartum?</td>
<td></td>
</tr>
</tbody>
</table>

January 6, 2020
New York State Obstetric Hemorrhage Project – Race/Ethnicity Patient Data Collection Tool

<table>
<thead>
<tr>
<th>Patient #</th>
<th>Ethnicity</th>
<th>Race (check all that apply)</th>
<th>Documented risk assessment for OB hemorrhage</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Hispanic*</td>
<td>Non-Hispanic</td>
<td>Declined to answer</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>Not reported</td>
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<td>13</td>
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</tbody>
</table>

* Hispanic includes, but is not limited to, Argentinean, Central American, Colombian, Costa Rican, Cuban, Dominican, Ecuadorian, Guatemalan, Honduran, Latin American, Mexican/Mexican American/Chicano/a, Nicaraguan, Panamanian, Puerto Rican, Salvadoran, South American, Venezuelan and Hispanic/Latino unspecified.

** Asian includes, but is not limited to, Asian Indian, Bangladeshi, Cambodian, Chinese, Filipino, Hmong, Indonesian, Japanese, Korean, Laotian, Pakistani, Sri Lankan, Taiwanese, Thai, Vietnamese, and Other Asian.

*** Pacific Islander includes, but is not limited to, Guamanian, Chamorro, Polynesian, Samoan, and Other Pacific Islander.

1. Performed when patient is first admitted to hospital, whether that is through the emergency department or antepartum clinic.
2. Assessments performed on admission to the hospital and during labor should not be included in the numerator. Only those performed after delivery and prior to discharge should be included.

Questions? For questions, please email NYSPQC@health.ny.gov or call 518/473-9883.

January 6, 2020
New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log

The purpose of this log is to assist with documentation of obstetric hemorrhage risk assessment completion. The total number of patients documented using this tool will be reported via the Aggregate Data Collection Tool. Patient level data from this tool will not be reported directly to NYSDOH.

If your hospital team chooses to obtain information for all maternity patients for one of the time periods (either on admission to the birth hospitalization or during the post-partum period), report on 100% of maternity patients on the Aggregate Data Collection Tool for that time period. If your hospital team chooses to sample to collect risk assessment data for all maternity patients for either or both of the time periods, use this tool to document completion for a sample of patients.

There are three log versions available, 1) on admission, 2) post-partum, and 3) both on admission and postpartum. Choose the version(s) that work best for your hospital.

Instructions: Each month sample at least 20 maternity patients, ≥ 20 weeks completed gestation, who were admitted for the birth hospitalization. If fewer than 20 patients delivered, report on 100% of your hospital’s patient population (every maternity patient, ≥ 20 weeks completed gestation, who were admitted for the birth hospitalization).

In the table, document obstetric hemorrhage risk assessment completion on admission to the birth hospitalization and/or at least once during the post-partum period for each patient. Total the number of patients with a completed risk assessment. Report this number via the Aggregate Data Collection Tool in the NYSDOH Health Commerce System, including patients in the month which they were discharged.

Questions? E-mail NYSPQC@health.ny.gov or call 518/473-9883.

Revised: May 14, 2020
### New York State Obstetric Hemorrhage Project
- Obstetric Hemorrhage Risk Assessment Log

<table>
<thead>
<tr>
<th>Month:</th>
<th>Year:</th>
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</table>

<table>
<thead>
<tr>
<th>Patient</th>
<th>Risk assessment for obstetric hemorrhage completed on admission to the birth hospitalization&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Risk assessment for obstetric hemorrhage completed at least once post-partum&lt;sup&gt;2&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td><strong>Total (enter into Aggregate Data Collection Tool)</strong></td>
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</tbody>
</table>

<sup>1</sup> Performed when patient is first admitted to hospital, whether that is through the emergency department or antepartum clinic.

<sup>2</sup> Only assessments performed after delivery and prior to discharge should be included. Assessments performed on admission to the hospital and during labor should not be included in the numerator.

Revised: May 14, 2020
New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log

<table>
<thead>
<tr>
<th>Patient</th>
<th>Risk assessment for obstetric hemorrhage completed on admission to the birth hospitalization*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<td>2</td>
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</tbody>
</table>

Total (enter into Aggregate Data Collection Tool)

* Performed when patient is first admitted to hospital, whether that is through the emergency department or antepartum clinic.

Revised: May 14, 2020
New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log

<table>
<thead>
<tr>
<th>Patient</th>
<th>Risk assessment for obstetric hemorrhage completed at least once post-partum*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
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</tr>
</tbody>
</table>

Total (enter into Aggregate Data Collection Tool)

*Only assessments performed after delivery and prior to discharge should be included. Assessments performed on admission to the hospital and during labor should not be included in the numerator.

Revised: May 14, 2020
New York State Obstetric Hemorrhage Project – Structure Measures Data Collection Tool

Instructions: Enter the status for each of the items listed below. Please review and update quarterly. Please report data into the Health Commerce System for time periods below as follows:

- "Monthly: 01/01/2019 12:00PM" is for 2019 Quarter 1 data; 01/2019 to 03/2019;
- "Monthly: 04/01/2019 12:00PM" is for 2019 Quarter 2 data; 04/2019 to 06/2019;
- "Monthly: 07/01/2019 12:00PM" is for 2019 Quarter 3 data; 07/2019 to 09/2019;
- "Monthly: 10/01/2019 12:00PM" is for 2019 Quarter 4 data; 10/2019 to 12/2019, etc.

For questions please email NYSPQc@health.ny.gov or call 518-473-9883.

Quarter: _______________

<table>
<thead>
<tr>
<th>Structure Measure</th>
<th>Completion Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition and Prevention</td>
<td></td>
</tr>
<tr>
<td>1. Unit policy &amp; procedure(s) on OB hemorrhage (updated in the last 2-3 years)</td>
<td>□ Haven’t started</td>
</tr>
<tr>
<td>2. Assessment of hemorrhage risk (on admission and postpartum, mechanism for documentation)</td>
<td>□ Working on it</td>
</tr>
<tr>
<td>3. Quantitative measurement of cumulative blood loss</td>
<td>□ In place</td>
</tr>
<tr>
<td>Readiness</td>
<td></td>
</tr>
<tr>
<td>4. Massive transfusion protocols established</td>
<td>□ Haven’t started</td>
</tr>
<tr>
<td>5. Emergency release protocol established (for O-negative and unconcross-matched units of RBC)</td>
<td>□ Working on it</td>
</tr>
<tr>
<td>6. Protocol for those who refuse blood products</td>
<td>□ In place</td>
</tr>
<tr>
<td>7. OB hemorrhage supplies readily available, typically in a cart or mobile box</td>
<td>□ Haven’t started</td>
</tr>
<tr>
<td>8. STAT (immediate) access to hemorrhage medications (kit or equivalent)</td>
<td>□ Working on it</td>
</tr>
<tr>
<td>9. Hemorrhage response team established, which may include staff from anesthesia, blood bank, advanced gynecological surgery and other services as appropriate</td>
<td>□ In place</td>
</tr>
<tr>
<td>10. Regular unit-based drills with debriefs for OB hemorrhage</td>
<td>□ Haven’t started</td>
</tr>
</tbody>
</table>

October 1, 2019
## New York State Obstetric Hemorrhage Project – Structure Measures Data Collection Tool

<table>
<thead>
<tr>
<th>Response</th>
<th>Haven’t started</th>
<th>Working on it</th>
<th>In place</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Unit-standard, stage-based OB hemorrhage emergency management plan with checklists available for use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OB specific resources and protocols to support patients, family and/or staff through major OB complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Family</td>
<td></td>
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<td></td>
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<tr>
<td>14. Staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reporting and Systems Learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Established a system to perform regular, formal debriefs after cases with severe maternal morbidity*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Multidisciplinary case reviews of all serious hemorrhages** for systems issues</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>OB Hemorrhage Bundle processes (order sets, tracking tools) readily accessible (e.g., in an EMR or on-line, binder/policy book in a central location, on an instrument cart, etc.)</td>
<td></td>
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</tr>
<tr>
<td>17. Staged checklist</td>
<td></td>
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</tr>
<tr>
<td>18. Recommended instrument checklist</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19. Risk assessment tables</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20. Massive transfusion protocol</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>21. Debriefing form</td>
<td></td>
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</tbody>
</table>

*Severe maternal morbidity is defined as the transfusion of 24 units of packed red blood cells (PRBCs) and/or admission to the intensive care unit (ICU) that occurs from the intrapartum through the immediate postpartum period (24 hours).

**Serious hemorrhage is defined as one or more of the following: admission to ICU, transfusion of 44 units of PRBCs, and/or use of uterine compression sutures, balloon tamponade, or non-scheduled hysterectomy for postpartum hemorrhage.

October 1, 2019
4
Educational Presentations
Introduction

The educational presentations in this section highlight events hosted to inform and provide resources to participating birthing hospitals in the NYS Obstetric Hemorrhage Project. These presentations focused on assisting project participants with improving the assessment, identification, and management of obstetric hemorrhage among pregnant people to reduce maternal mortality and morbidity statewide. The presentations featured national and NYS experts on obstetric hemorrhage-related topics. Moreover, the presentations can be used to educate hospital and community-based organization staff, public health professionals and others working to reduce the risk of obstetric hemorrhage.
Contents  
Click on titles/page numbers to go to directly to each section

a. Assessment of Hemorrhage  
   i. Presenter: Adiel Fleischer, MD, FACOG  
   ii. Driver: Recognition

b. Bedside Assessment of Maternal Stability: The Role of Vital Signs  
   i. Presenter: Adriann Combs, DNP, NNP-BC; Victor R. Klein, MD, MBA  
   ii. Drivers: Recognition and Response

c. Hemorrhage Checklists & Team Dynamics  
   i. Presenter: Dena Goffman, MD, FACOG  
   ii. Drivers: Response, Reporting and Systems Learning

d. Implementation of Quantification of Blood Loss (QBL) at an Academic Medical Center  
   i. Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA  
   ii. Drivers: Recognition and Prevention

e. Maternal Hemorrhage Drills University of Vermont Health Network Champlain Valley  
   i. Presenter: Maria Hayes, RN, BA, BSN, MaED  
   ii. Drivers: Recognition and Prevention

f. Obstetric Hemorrhage Drills and Simulations  
   i. Presenter: Dena Goffman, MD, FACOG  
   ii. Drivers: Recognition and Prevention

g. Obstetric Hemorrhage: Massive Transfusion Protocol & Patients Refusing Transfusion  
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   ii. Driver: Response
Assessment of Hemorrhage
Presenter: Adiel Fleischer, MD, FACOG

**DRIVER: RECOGNITION**
Assessment of Hemorrhage
Presenter: Adiel Fleischer, MD, FACOG

Driver: Recognition

Obstetrical Hemorrhage
- EBL -

Uncomplicated VD
vEBL x 2

Complicated VD
vEBL x 3


Obstetrical Hemorrhage
- EBL -

Type
n Accurate EBL

<1000cc 90 160000

<1500cc 35 10000


Peripartum Hemorrhage
- EBL -

A simulation model was used to assess the accuracy of EBL:
- After a 1000cc loss
- After a 2,000cc loss
- After a 3,500cc loss


Peripartum Hemorrhage
- EBL -

Actual loss
1000cc: 8000-10000
2000cc: 15000-20000
3500cc: 24000-35000

Estimated loss

Peripartum Hemorrhage
- EBL -

In a large epidemiological study (n=3,819.034)
the authors determined the incidence of PMH
based on the mortality of EBL (objectively vs
subjectively assessed)

Carnabuci et al Obstet Gynecol 2008

Peripartum Hemorrhage
- EBL -

BMI loss >5000cc BMI loss >10000cc
Subjective assessment 7.2% 1.0%
Objective assessment 0.8% 2.0%
Assessment of Hemorrhage
Presenter: Adiel Fleischer, MD, FACOG

**DRIVER: RECOGNITION**

**Peripartum Hemorrhage**
- EBL -

Failure to recognize excessive blood loss during childbirth is a leading cause of maternal morbidity and mortality.

The Joint Commission, 2010

**Peripartum Hemorrhage**
- EBL -

**Consequences:**
- Overestimation can lead to costly, unnecessary treatments like transfusions.
- Underestimation can lead to the delay of life-saving hemorrhage interventions.

**Obstetrical Hemorrhage**
- EBL -

RN initiates the process
- L&D of Primary MH
- OR Circulator

Evaluates objective data:
- Blood lost/pads
- Inference
- Drapes, Floor

*Avoid having different EBL in i.e. Anesthesia, RN, Surgeon

**Establish a consensus**
- Realistic EBL

**Fully soaked through Peripad:**
- 700 ml

**Partially soaked peripad:**
- 500 ml

**One Full and dripping pad/soaked:**
- 350 ml

**12 fully soaked pads:**
- 1200 ml
Assessment of Hemorrhage
Presenter: Adiel Fleischer, MD, FACOG

DRIVER: RECOGNITION

Full lap (not soaked or dripping) - 75ml
Half a lap - 45ml

Small lap (NSVD) full - 60ml

(1) 12 ounce can - 15ml

Fist/ baseball or apple sized clot - 60ml

Peripartum Hemorrhage - EBL -

4x4 gauze pad = 5ml
Full & dripping chux = 800 ml
Fully soaked peripad = 70ml
Partially soaked peripad = 50 ml
Full & dripping lap pad = 100 ml
Full lap pad (not dripping) = 75 ml
Half a lap pad = 40 ml
12 ounce soda can = 355ml
Fist or baseball size clot = 60 ml

Peripartum Hemorrhage - EBL -

Quantification of blood loss (QBL) =

1. Weighing blood containing sponges/laps, using calibrated drapes, calibrated suction bottles and other blood collection devices to determine the actual amount of blood loss
2. For C/S start procedure by using two suction cannisters
   - One for amniotic fluid, the other for QBL (quantitate blood loss)
   - Switch suction tubing to QBL prior to delivery of placenta

NEW YORK STATE Department of Health
nyspQC Perinatal Quality Collaborative

BACK TO START OF TOOLKIT
BACK TO START OF SECTION
Assessment of Hemorrhage
Presenter: Adiel Fleischer, MD, FACOG

**DRIVER : RECOGNITION**

**Peripartum Hemorrhage**

**Quantification of blood loss (QBL)**
- An objective method to evaluate blood loss

2. Triton System (Goss Surgical)
- A relatively new iPad-based system with ability to scan laps and sponges to determine amount of blood loss
- Able to differentiate between blood and other fluids (amniotic fluid, irritation)

**Key Points**
- For every birth, begin QBL immediately after the infant's delivery and continue ongoing QBL measurement until bleeding is stable.
- Cumulative measurement of blood loss is key to early recognition of excessive blood loss for timely initiation of interventions.
- QBL for all births reduces the incidence of death of significant blood loss and delayed recognition and initiation of treatment.

**Transitioning from EBL to QBL**

- Estimation
  - Subjective assessment
  - Objective assessment

- Quantification
  - Subjective assessment
  - Objective assessment

- Food for Thought
- As healthcare professionals, we rely on scientific, objective data for other important practice issues.
- Why is the objective data that quantifying blood loss provides less important when a woman's life is at stake?
Bedside Assessment of Maternal Stability: The Role of Vital Signs
Presenter: Adriann Combs, DNP, NNP-BC; Victor R. Klein, MD, MBA

Objective:
- Describe the normal physiologic changes of pregnancy and the immediate postpartum period
- Discuss the consequences of Peripartum Hemorrhage
- Review the risk of peripartum hemorrhage
  - Provider/Agency
  - Patient
- Describe the vital sign changes that occur with the onset of severe hemorrhage and shock
- Discuss evidence based tools to maximize early intervention with hemorrhage (MEWS and Shock Index)

Why the focus on Hemorrhage?

Causes of Death by Maternal Mortality Review Cohort

Why the focus on Hemorrhage?

Countries Where the Parental Women Die While Pregnant or Shortly After Pregnancy
Bedside Assessment of Maternal Stability: The Role of Vital Signs
Presenter: Adriann Combs, DNP, NNP-BC; Victor R. Klein, MD, MBA

**DRIVER: RECOGNITION**

- Peripartum Hemorrhage (PPH)
  - Major cause of severe Maternal Morbidity (MM) and Mortality
  - Blood products
  - ICU admissions
  - Hysterectomy
  - Unrecognized and unattended PPH can lead to DEATH in 2 to 6 hours
  - Early recognition and treatment can lead to improved survival
  - Tremendous emotional and financial impacts

- Financial impact of Severe Maternal Morbidity

- Cardiovascular and Respiratory Physiology during Normal Pregnancy

- Hemorrhage Risk: Facility and Provider Resources
  - Clinical guidelines for when the patient needs to be transferred
  - Need for transfusions
  - Management of blood loss

- HEMORRHAGE RISK: PATIENT

- Significant Blood Loss
  - Blood loss >1000 mL, severe shock
  - Need for transfusions
  - Need for surgical intervention
  - Need for monitoring and support

- CMOCC

- BACK TO START OF TOOLKIT

- BACK TO START OF SECTION
Bedside Assessment of Maternal Stability: The Role of Vital Signs
Presenter: Adriann Combs, DNP, NNP-BC; Victor R. Klein, MD, MBA

**DRIVER: RECOGNITION**

- **WHY DOES THE PREGNANT STATE DISGUISE BLOOD LOSS?**
  - pregnant and immediate post partum women have an increased blood volume.
  - During massive hemorrhage there is a reduction in venous return.
  - There is a compensatory increase in maternal heart rate.
  - Blood pressure does not change until heart rate cannot increase further (CVD Work).
  - This leads to a 50% blood loss before BP changes.

- **Clinical Signs of Hypovolemia**
  - **Table of Blood Loss**
    - 0-500 mL: Slight change in blood pressure, heart rate normal, supine or sitting, distance, normal urine output.
    - 500-1000 mL: Heart rate over 100, respiratory rate 20-30, diaphoresis, weak, white veins, 10-15 mL urine output.
    - 1000-1500 mL: Hypotension, narrowed pulse pressure, heart rate over 120, respiratory rate 30-45, pale, cool, moist skin, few, small, white veins, urine output 0-15 mL urine output.
    - 1500 mL+:
  - **Clinical Signs**
    - Profound hypotension, heart rate over 120, respiratory rate over 40, weak, white veins, no urine output.

- **Shock Index**
  - **Heart Rate/Systolic Blood Pressure**
    - Used in non-pregnant trauma and non-trauma patients.
    - Assessment of hypovolemic and non-hypovolemic shock to aid in clinical management.
    - "Normal" Shock index 0.5-0.7.
    - Multiple recent papers that support the shock index as a strong indicator of adverse maternal outcomes.

- **Prevention of Coagulopathy**
  - Dilution from transfusion of blood products without clotting factors (ratio of PRBCs to plasma to platelets)
  - Hypothermia leads to platelet dysfunction (losses with normothermia)
  - Metabolic acids decrease clotting enzymes from functioning

- **SHOCK INDEX**
  - **Heart Rate/Systolic Blood Pressure**
    - Heart Rate
    - Systolic BP
    - Shock Index

- ** TOO FAR, TOO LITTLE, TOO LATE**
  - Readiness, recognition, response, reporting
  - Don't lead to delay
Bedside Assessment of Maternal Stability: The Role of Vital Signs
Presenter: Adriann Combs, DNP, NNP-BC; Victor R. Klein, MD, MBA

**DRIVER : RECOGNITION**

**MEWS: CRICO**

**Aim Safety/Quality Improvement Bundles**

**Maternal Early Warning Signs (MEWS) Protocol**

**Conclusions**

- Pregnant and postpartum women present unique challenges related to identifying emergencies.
- It is imperative that when an abnormal vital sign(s) is obtained and verified that this information is shared.
- Once shared, it is the bedside staff’s responsibility to complete the interventions and assess resolution of abnormality.
- If unsure, use the medical and nursing chain of command to express your concerns.
- Develop and utilize early warning systems and drills to promote collegiality and identification of system issues that can delay prompt responses.

**References**
Hemorrhage Checklists & Team Dynamics
Presenter: Dena Goffman, MD, FACOG

DRIVERS: RESPONSE, REPORTING AND SYSTEMS LEARNING
Hemorrhage Checklists & Team Dynamics
Presenter: Dena Goffman, MD, FACOG

Drivers: Response, Reporting and Systems Learning
Implementation of Quantification of Blood Loss (QBL) at an Academic Medical Center

Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

Objective:
To increase compliance of Quantification of Blood Loss (QBL) to 85% within six months

Implications of Inaccurate Estimation of Blood Loss
- Accurate and timely recognition of PPH by clinicians is crucial because it leads to timely initiation of maternal resuscitation such as blood transfusion
- Overestimation can lead to costly invasive and unnecessary treatments
- Underestimation can lead to delay in delivering lifesaving hemorrhage interventions

Incentive for change
- Multiparous patient with uncomplicated labor
- Second stage bradycardia
- Vacuum assisted vaginal delivery for bradycardia in the second stage
- Postpartum hemorrhage
- Torn cervical laceration
- Torn retained products
- Torn uterine atony
- ???AFE
- Discrepancies between staff in documentation of estimated blood loss (EBL)

We decided that we needed to implement...
Quantification of Blood Loss (QBL) at every delivery
Implementation of Quantification of Blood Loss (QBL) at an Academic Medical Center
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

Drivers: Recognition and Prevention
Implementation of Quantification of Blood Loss (QBL) at an Academic Medical Center
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Drivers: Recognition and Prevention

QBL Education
- Demonstrated the inaccuracies of EBL to staff by doing QBL after exercise
- AWHONN YouTube video on QBL
- All Doctors, PA’s, and Residents look at graduated under buttocks drape in all NSVDs and call out amount of amniotic fluid before placenta delivery

QBL Simulation

Social Motivation
- Peer pressure may be the most powerful of the six sources of influence
  - Engage leaders as champions
  - Use informal leaders
  - Then engage the rest of the team
  - Create new norms. Empower everyone to hold everyone accountable

Staff Input in Re-Design

Staff Input in Re-Design
Implementation of Quantification of Blood Loss (QBL) at an Academic Medical Center
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

<table>
<thead>
<tr>
<th>DRIVERS: RECOGNITION AND PREVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Ability</strong></td>
</tr>
<tr>
<td>- Create an environment of support</td>
</tr>
<tr>
<td>- Expect individuals to ask for help</td>
</tr>
<tr>
<td>- Expect others to offer help</td>
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<tr>
<td>- Empower coaches</td>
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<tr>
<td>- Maximize peer support</td>
</tr>
<tr>
<td><strong>Social Ability (cont.)</strong></td>
</tr>
<tr>
<td>- Everyone is doing it</td>
</tr>
<tr>
<td>- Everyone is expecting it</td>
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<tr>
<td>- Everyone is asking about it</td>
</tr>
<tr>
<td>- It is being documented on the White Board</td>
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<tr>
<td><strong>Structural Motivation</strong></td>
</tr>
<tr>
<td>Does the environment encourage the expected behavior?</td>
</tr>
<tr>
<td>- Use incentives wisely (less is more)</td>
</tr>
<tr>
<td>- Safety specialist available to demonstrate/assist in ORs and LDRs</td>
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<tr>
<td>- Physician champions also available to educate/assist with QBL at deliveries</td>
</tr>
<tr>
<td>- Posting results of QBL data</td>
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<tr>
<td><strong>Social Motivation (cont.)</strong></td>
</tr>
<tr>
<td>- Posting statistics on unit board on success at implementation</td>
</tr>
<tr>
<td>- Asked staff to participate in pictures to use at presentation for Montefiore</td>
</tr>
<tr>
<td>- Offer staff a party when target goal is reached</td>
</tr>
<tr>
<td><strong>Structural Ability</strong></td>
</tr>
<tr>
<td>Does the physical environment support the desired behavior?</td>
</tr>
<tr>
<td>- Scales were purchased for every room</td>
</tr>
<tr>
<td>- Calculators were purchased and available on unit</td>
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<tr>
<td>- All OB Techs standardized using only 1 Liter of NS (for irrigation) for all C-sections</td>
</tr>
<tr>
<td>- Postpartum used baby scales to weigh</td>
</tr>
<tr>
<td><strong>QBL IN LDR</strong></td>
</tr>
</tbody>
</table>

- A QBL scale was placed in each LDR room.
- A QBL calculator was available in each LDR room.
- All OB Techs were trained on how to use the QBL tool.
- Postpartum nurses were trained on how to use the QBL tool.

- QBL data was collected for each delivery.
- A QBL summary sheet was provided for each delivery.
- A QBL report was generated for each delivery.
- A QBL dashboard was developed for each delivery unit.

- QBL data was used to identify areas for improvement.
- QBL data was used to track progress over time.
Implementation of Quantification of Blood Loss (QBL) at an Academic Medical Center
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

DRIVERS: RECOGNITION AND PREVENTION
Maternal Hemorrhage Drills University of Vermont Health Network Champlain Valley
Presenter: Maria Hayes, RN, BA, BSN, MaED

DRIVER: READINESS

WHY DO WE DRILL?
- PPH is the leading cause of maternal mortality
- Reduce the incidents of women who hemorrhage during or after pregnancy and birth
- Improve clinicians recognition of readiness for, and response to postpartum hemorrhage

HOW DO YOU DRILL?
- Recognition & Prevention (every patient): Risk Assessments
- Readiness: Hemorrhage team with education, huddles, and drills for all stakeholders.
- Response: Support for patients/families/staff for all significant hemorrhages

TYPES OF DRILLS
- Mini Drills - Small Groups
- Table Top Drills
- Equipment Drills
- New Employee Orientation Drills
- Multidisciplinary Drills
Maternal Hemorrhage Drills University of Vermont Health Network Champlain Valley
Presenter: Maria Hayes, RN, BA, BSN, MaED

GUIDE: HOW TO MINI DRILL
- Small groups – (4-5)
- Choose one of the stages of Hemorrhage
- Duration – short (15 minutes)
- Debrief - Discuss next steps needed for further education

GUIDE: TABLE-TOP DRILLS
- Small groups – (4-5)
- Choose one of the stages of Hemorrhage, Medications, Massive Transfusion Protocol, and Emergency Release of Blood Protocol
- Duration – short (15 minutes)
- Debrief - Discuss next steps needed for further education

GUIDE: EQUIPMENT DRILLS
- Small groups/Individual – (4-5) done 3–4 times a month.
- Choose one type of equipment
  o Baker Balloon
  o Rapid Infuser
  o Hemorrhage Cart
  o Blood Warmer
  o IO demonstration
- Duration – 20-30 minutes
- Debrief - Discuss next steps needed for further education

GUIDE: NEW EMPLOYEE DRILLS
- Individual
- Equipment: Baker Balloon, Rapid Infuser, and Hemorrhage Cart, and Code White
- Duration – 2-3 hours
- Debriefing - Discuss next steps needed for further education

GUIDE: HOW TO MULTIDISCIPLINARY DRILL
Code White & Massive Hemorrhage protocols
- A single overhead page that brings all major departments and resources to the bedside in a timely manner. (Ex: Anesthesiologists, OR, RT, NICU, Blood Bank (BB), and support staff).
- Is indicated for Obstetrical Emergencies
- Checklists - used by observers to monitor drill
- Duration – 45 minutes
- Debriefing – 30 minutes discuss next steps needed and education

MEASURE THE EFFECTIVENESS OF DRILL PERFORMANCE
DEBRIEFING
Debriefs are short, informal feedback sessions that occur after events and are designed to identify opportunities to improve teamwork, skills, and outcomes.
- Goal: Define (determine if an adverse hemorrhage)
- Discuss what went well and what we can improve
  - Communication – one person to coordinate requests from team leader (i.e. Circulating RN vs. scrub nurse vs. circulating RN / emt / etc.)
  - Visual identification of key Staff members (i.e. resuscitation RN, emt / etc.)
- Don’t forget Family members – include them in debriefing when possible.
- MRI – process – did it go well? Did we get the blood delivered in a timely manner?
- Debriefing results reviewed at Department Meeting the following month.

BACK TO START OF TOOLKIT
BACK TO START OF SECTION
Maternal Hemorrhage Drills University of Vermont Health Network Champlain Valley
Presenter: Maria Hayes, RN, BA, BSN, MaED

**Huddles**
- Huddles are brief ad hoc team meetings designed to receive structural information, discuss critical issues and emerging patterns, anticipate outcomes and consequences, assign resources, and express any ambivalence.
- Huddle Example: High Risk Patient presented for a Scheduled Cesarean. Preoperative Hemorrhage Drill was called.
  - Blood Bank - 2 sets in OR
  - Hemorrhage Cart missing CR
  - Two IV lines
  - Extra Percussion
  - Pedilavus
  - Meds already in OR ready to available
  - Anesthesia - control line available
- As debriefing and huddles become more routine, staff will become more knowledgeable and comfortable of their roles and become more proficient in the use of available resources.

**Drills Lead To:**
- Continuous Quality Improvement:
  - Patient, Staff, and Provider re-education
  - Standardized Measures Monitoring
  - Improve patient outcomes
- Decrease rate Maternal Hemorrhage

---

**Thank You**
Obstetric Hemorrhage Drills and Simulations
Presenter: Dena Goffman, MD, FACOG

Drivers: Response, Reporting and Systems Learning

Benefits of Medical Simulation
- Safe environment – mistakes don’t have a cost
- Trainee focus
- Allow for controlled exposure to rare scenarios
- Provides “hands-on” experiential learning
- Unique opportunity for team-training
- Reproducible, standardized, and objective
- Allows for debriefing of practice
- Increases public trust
- Evaluation of systems

PPH Simulation Background
- Simulation and team training can significantly improve PPH response times (Marshall, Vanderhoeven, Eden, Gulse, 2015)
- Simulation effective in promoting use of a PPH checklist (Hilton 2016- Stanford)
- Simulation effective in validating OB Hemorrhage checklist (Bajaj et al. 2016)

Obstetric Simulation: Who?
- The Learner
  - ALL team members
  - MFM
  - OB Attending, Fellows, Residents
  - ON
  - PA, NP, CNM
  - Anesthesiology personnel
  - Neonatology personnel
  - OB techs
  - Unit support staff, clerks, NA
  - SYSTEMS

PPH Simulation: What?
- MD-SET
  - ALL team members
  - Practice communication and teamwork skills
  - Technical Skills
    - Basic stitches
    - Bi-Lynch suture
    - Blood loss assessment/CELS
    - Cesarean hysterectomy
Obstetric Hemorrhage Drills and Simulations
Presenter: Dena Goffman, MD, FACOG

**Drivers: Response, Reporting and Systems Learning**
Obstetric Hemorrhage Drills and Simulations
Presenter: Dena Goffman, MD, FACOG

DRIVERS: RESPONSE, REPORTING AND SYSTEMS LEARNING

PPH Simulation: How?
- Curriculum Development
- Basics
- Technical skills
- Team drills
- MD-SBTT
- Debriefing
  Important for bringing the lessons home
  Discovery of systems issues
  Ability to train team members to debrief in clinical setting

Considerations for Spreading OB Simulation
- Low cost simulators and models available
  - Pants
  - PROMPT FLEX
  - Actresses
  - Fake blood
- Bakri uterus
- B-Lynch
- QBL
- C-hyst instruments
- Scenarios and resources available

Training Opportunities
- ECO
  - ACOG annual meeting
  - Regional offerings
- ECO Train the Trainer
- SMFM COOB
- Leveraging existing relationships
  - RPC
  - AMC in health system

Collaborative Opportunities
- AMC/RPC outreach to community hospital within the system
  - Help delineate resource needs
  - Curriculum development
  - Train the trainer
  - On-site support
- Risk management advisors
  - FOJP
  - MCIC
  - HHC

Conclusions and Questions
- We know: Who? What? Why?
- Outstanding questions about: When? Where? How and How Often?
- Not one size fits all
Obstetric Hemorrhage: Massive Transfusion Protocol & Patients Refusing Transfusion

J. Christopher Glantz, MD, MPH, FACOG; Peter Cherouny, MD, FACOG

Drivers: Response, Reporting and Systems Learning
Obstetric Hemorrhage: Massive Transfusion Protocol & Patients Refusing Transfusion
J. Christopher Glantz, MD, MPH, FACOG; Peter Cherouny, MD, FACOG

Drivers: Response, Reporting and Systems Learning

Patients Who Decline Blood Products: Antepartum
- Proactively discuss patient’s refusal of blood products (without family involvement)
- Discuss the blood product fully
- Maximize hgb/transfusate
- Iron, folate acid
- For low hgb that anemia occurs (80-85g/L), increases seen <16-450mg or 20,000 units low for faster recovery
- Discuss necessity of additional surgery (including hysterectomy) in the event of PPH
- Obtain additional coagulation as necessary (MPH, hematology, anesthesiology)

Patients Who Decline Blood Products: L&D Admission
- Identify patient refusing blood products
- If blood product not available, provide form now
- Avoid rest of the team (attending, anesthesiologist)
- Alert hemorrhage team if additional PPH risk factors present, including:
  - Plasma products
  - Multiple gestational/donor-identified relatives
  - Large fissures

Patients Who Decline Blood Products: Delivery
- If other risk factors present, consider:
  - Pharmacologic administration of tranexamic acid (1g 2-3h)
  - Nonmaximal indomethacin (if not acceptable to patient)
  - Hysteroscopy hysteroscopy
  - For patients with PPH (any stage), contact hemorrhage team

Patients Who Decline Blood Products: Management of PPH
For those patients, the “safe zone” during which hemorrhage has to be achieved is significantly shorter when compared to those who accept blood products.

* Lower threshold for surgical intervention *
Patient & Family Engagement Following a Severe Maternal Event
Presenter: Dena Goffman, MD, FACOG

What Women & Families Expect When They’re Expecting

- They expect the birth to result in a live baby (and it usually does).
- For most women, the greatest fear around birth is potential harm to the baby, not themselves.
- Most women do NOT expect to experience a severe maternal event, even if they were high risk.

Research on Women’s Experiences

- Common Themes
  - Women wish to understand what happened to them, and to understand how it might have been prevented.
  - Women seek supportive frameworks through formal support groups or advocacy organizations.
  - Women share their experiences with others who share & understand their experiences.
  - Women consider short and long-term health implications as well as future childbearing.

Women’s Narrative

“I just never even thought that it existed, the possibility. And I felt like there should be none—not to scare people to death, but—that if we’re going out with these warnings about everything else, no matter how minor—the soft tissue and the blood loss and things like that, that we all hear countless times—but there’s no mention of the more serious things that do happen and you just don’t realize they do.”

- Jerrie Jones, MD

“I sought out the March of Dimes and the Preeclampsia Foundation, because I think that was my form of therapy, to find other women who had been through circumstances with the preeclampsia and the preterm birth. It normalized it a lot in a way so I could talk about it and I could figure out, “Oh boy! I wasn’t alone in this.”

- Jane Campbell, WA
Patient & Family Engagement Following a Severe Maternal Event
Presenter: Dena Goffman, MD, FACOG

Research on Women’s Experiences
- Women report:
  - not receiving adequate information about their condition and recovery
  - short & long-term physical & emotional issues
  - feeling grateful to healthcare professionals for the care given without asking for more or for extra help
  - few receive postpartum mental health referrals

After Significant Postpartum Hemorrhage
- 20% of women (n=263) had unexpected needs for additional treatment, support, and information while in the hospital and 15% believed their hemorrhage might have been prevented with different care.

Women’s Narrative
"I must have used the toilet three-four times in that emergency room. The nurse never weighed that blood. And what's the common thing, people don't realize they're hemorrhaging because they don't even keep track."
- Beth Plummer, MD

Patient & Family Needs
- Women and families need information and emotional support before, during, and after severe maternal events.
- Women need to be listened to and have their experience acknowledged from their own, rather than the clinicians’ perspective.
- Women need to know what happened to them, and why, if the content and timeline will vary. Formal details and guidelines about their experience and progress should occur throughout their hospitalization and during postpartum follow-up visits.

Clinical Assessment of Traumatic Stress Response in Women Following a Severe Event
- Clinicians should be aware of traumatic stress in women and the evidence of the stress and recovery phases.
- Recognize the signs of stress (i.e., anxiety, depression, post-traumatic stress disorder, etc.) and not affect women’s emotional and psychological healing.
- Clinicians can provide women (and families) with validated, self-assessment tools (e.g., short screening scale for PTSD).
- Clinicians should know how and where to make a mental health referral within the hospital and have local resources for postpartum referrals.

Resources for Women & Families
- For Women Specific with Experience:
  - New York State’s "Women Surviving Traumatic Stress: A Guide for Women Survivors and Their Families"
- For Women Surviving Traumatic Stress:
  - "Women Surviving Traumatic Stress: A Guide for Women Survivors and Their Families" by the New York State Department of Health

BACK TO START OF TOOLKIT
BACK TO START OF SECTION
Patient & Family Engagement Following a Severe Maternal Event
Presenter: Dena Goffman, MD, FACOG

Resources for Women & Families
For Traumatic Childbirth Experiences:
- PATH: http://www.path.org
- Nursing: Marlene Meade, MA, RN, MEd (C)
- Obstetrics/Psychology (Shaw-Asante, Ph.D.)
- Patient Services (Patricia Goff, MA, BSN, RN, NNP & Anissa Wang, MPN, BSN, RN)

For Traumatic Medical Experiences (birth specific): and for clinicians and providers:
-为其提供支持的资源：https://www.teamhealth.com/for-the-clinicians-and-providers

Patient & Family Support During and After Obstetric Hemorrhage: A Multidisciplinary and Collaborative Approach
- Our team extends well beyond this group:
  - Provider (Dena Goffman, MD, FACOG)
  - Nursing (Marlene Meade, MA, RN, MEd (C))
  - Social Work (Linda Sens(vm), LMSW)
  - Psychology/Psychology (Shaw-Asante, Ph.D.)
  - Patient Services (Patricia Goff, MA, BSN, RN, NNP & Anissa Wang, MPN, BSN, RN)

OB Hemorrhage: The Role of Social Work
- During crisis:
  - Provide emotional support to family members who may not fully understand the situation.
  - Serve as facilitator between the medical team and family to provide updates on patient's status.
  - When needed, collaborate with other disciplines such as pastoral care for spiritual support and child life specialist who can work with patient's children who may have been exposed to this event.

OB Hemorrhage: The Role of Social Work
- After crisis:
  - Conduct full psychosocial assessment to explore any emotional disturbance, such as signs/symptoms of post-partum depression (PPD).
  - If needed, refer to department of psychology/psychiatry for further psychological evaluation.

OB Hemorrhage: The Role of Patient Services Administration
- Potential Concerns/Outcomes:
  - Trauma from the urgency of interventions.
  - Potential admission to an ICU.

OB Hemorrhage: The Role of Patient Services Administration
- Supportive care with clinical teams or support services:
  - Facilitate isolation, (ICU/NICU)
  - Support.
  - Discharge follow-up.
  - Risk management referrals.
Quantification of Blood Loss "Stop Guessing"
Presenter: Laura Braithwaite, MSN, RNC-OB, C-EFM; Genevieve B. Sicuranza, MD, FACOG; Rosanne Vertichio, MS, RN

DRIVERS: RECOGNITION AND PREVENTION

Problem
- Maternal morbidity and mortality has been steadily increasing in recent years
- Most of these maternal deaths are associated with hemorrhage and about half of all maternal deaths in the United States are preventable
- The method most often used to evaluate maternal blood loss during childbirth is visual estimation
- The inaccuracy of visual estimation of blood loss (EBL) has been well established and can lead to increased risk of maternal complications from both over- and underestimation

Purpose
- To improve evaluation of large blood losses compared to estimation techniques, which are known to be inaccurate
- Identify QIBL as one component of an overall strategy to improve recognition and response to hemorrhage
- Recognize that QIBL is not to obtain an exact number, however, it is more accurate than EBL

Stakeholders
- Childbearing women, their children, and their families
- Obstetrical care providers (Physicians, Nurses)
- Health care organizations

Project Implementation
- PHH identifying identified for implementation
- Investigators from the interprofessional team could improve the overall management of large-volume blood losses and ensure nursing care practices promote patient safety and quality care
- There was an opportunity for quality improvement in the implementation phase
- Current evidence and best practice recommendations were translated, and an educational plan was developed to support implementation as the standard of care
- Bring awareness of the evidence to the interprofessional team, influence their behaviors, provide the education, and improve quality and safety for patients
- Teamwork and collaboration, although commonly used phrases, are often not realized
Quantification of Blood Loss "Stop Guessing"
Presenter: Laura Braithwaite, MSN, RNC-OB, C-EFM; Genevieve B. Sicuranza, MD, FACOG; Rosanne Vertichio, MS, RN

DRIVERS: RECOGNITION AND PREVENTION

Barriers
- Having enough hands-on tools to accomplish the task.
- Tools for calculating
- Sometimes the information was not readily available, and it became a game of estimation.

Process
- The project leader met with members of the QBL committee and L&D unit-based nursing council to secure participation in the QBL pilot.
- Council members worked collaboratively with the project leader to seek out resources to help integrate QBL into practice.
- Identify strategies and tools that were important to the team and how to stratify the behaviors needed to complete the tasks.
- Theories of transformative learning theory and concepts of advocacy were integrated to facilitate the interdisciplinary team in incorporating QBL into practice.

Tools for Success
- AVMeX and the CMQCC had innovative resources and tools at their disposal.
- Equipment to quantify was readily available on the L&D unit.
- Members of the unit-based nursing council helped by discussing workflow and gathering information to create a QBL worksheet.
- Worksheet had three revisions and was tested during the pilot for ease of use.

Keep it simple
- Weigh
  - Weigh blood soaked materials with known dry weight.
  - Subtract the gross weight and convert to milliliters.
- Add
  - Add the measured blood volume collected or graduated measurement container and/or under bed sheet
  - Account for other fluids
  - i.e., amniotic fluid, irrigates

Dry Weight Measurements
- weights
- Add the measured blood volume collected or graduated measurement container and/or under bed sheet
- Account for other fluids
- i.e., amniotic fluid, irrigates
Quantification of Blood Loss "Stop Guessing"
Presenter: Laura Braithwaite, MSN, RNC-OB, C-EFM; Genevieve B. Sicuranza, MD, FACOG; Rosanne Vertichio, MS, RN

**DRIVERS: RECOGNITION AND PREVENTION**

**Cesarean Births**
- Begin the process of QBL while the patient is still under anesthesia
- Measure the amount of blood in the suction devices
- Subtract the volume of blood that is sucked out of the uterus

**Vaginal Births**
- Begin right after the infant’s birth
- Note the amount of blood in the outer suction tube
- Look at the bag when the delivery is complete
- Subtract the pre-existing fluid volume from the post-delivery measurement to determine the actual blood loss

**Pilot results**
- Data from 40 cases was presented at the OB department leadership meeting
- QBL process was approved for implementation

**Education**
- Online learning module on QBL, which included:
  - The most current statistics on maternal morbidity and mortality
  - Evidence from studies on the accuracy of visual estimation of blood loss
  - Practice recommendations for QBL, with instructions on methods to accomplish accurate measurements with all deliveries
  - Simulated QBL skills sessions
  - Postpartum hemorrhage (PPH) simulations attended by the interdisciplinary OB team

**Skills stations**
- Three stations with items typically used during the birthing process were prepared with predetermined measured amounts of false blood quantities
- The objective was to allow learners to realize the discrepancies with QBL and develop skills for QBL to improve accuracy
- Participants first did visual estimations of blood, and then actual measurements for QBL
- This teaching and learning strategy involved the learners to question and see the variations from what they believed to be true and compare the true values

**QBL calculations within 50mL of the true value**
Quantification of Blood Loss "Stop Guessing"
Presenter: Laura Braithwaite, MSN, RNC-OB, C-EFM; Genevieve B. Sicuranza, MD, FACOG; Rosanne Vertichio, MS, RN

Drivers: Recognition and Prevention

PPH simulations
- Case scenarios where the objective was to recognize and respond to an obstetric hemorrhage.
- Integrate QBL into workflow and team communication.
- Opportunity to improve skills and build confidence in management of obstetric hemorrhage.
- Improve obstetric team performance in the clinical environment and impact patient outcomes.

Results
- Participants distinguished between estimation and quantification.
- Aims to demonstrate consistent accuracy using available measurement tools.
- The project reinforces the importance of collaborative practice and empowers the OB care team to incorporate evidence-based practice, teamwork, and communication skills to improve patient safety.

Timeline

Change the communication
- Subjective statements: "She's bleeding a lot.”
- Objective statements: "She has saturated 2 pads in 1 hour.”

Follow up
- Practice change reinforced on unit with OB staff.
- Nurse use worksheet for QBL calculations and shared with project leader to audit.
- QBL education incorporated into orientation of new hires and annual training.

Food for thought
- As healthcare providers we rely on scientific, objective data for other important practice issues.
- Why is the objective data that quantifying blood loss provides more important when a woman's life is at stake?

New York State Department of Health Perinatal Quality Collaborative
Quantification of Blood Loss "Stop Guessing"
Presenter: Laura Braithwaite, MSN, RNC-OB, C-EFM; Genevieve B. Sicuranza, MD, FACOG; Rosanne Vertichio, MS, RN

DRIVERS: RECOGNITION AND PREVENTION

Thank You Team!

Thank You

References

THANK YOU
Resources for Patients, Families & Hospital Teams
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

DRIVER: RESPONSE

Resources for Patients, Families, & Hospital Teams

What women & their families expect when they’re expecting
- They expect the birth to result in a live baby (and it usually does).
- For most women, the greatest fear around birth is potential harm to the baby, not themselves.
- Most women do NOT expect to experience a severe maternal event, even if they were high risk.

Resources for the Pregnant/Postpartum Person and Family

Variation in Use of Terminology
- Some capture the totality of a woman’s experience:
  - Near miss
  - Near death
  - Severe complication
  - Severe maternal morbidity
- Some capture how women label their experience:
  - Traumatic
  - Unintended
  - Normal

Research on Women’s Experience
- Common themes:
  - Women seek to understand what happened to them, and to understand how it might have been prevented
  - Women seek to connect with others who share and understand their experience
  - Women consider short- and long-term health implications as well as future childbirth
Resources for Patients, Families & Hospital Teams
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

**DRIVER: RESPONSE**

**Women's Narrative**

I just never even thought that it existed, the possibility. And I feel like there should be some—not to scare people to death, but—that if we’re going out all those warnings about everything else, no matter how minor—the soft cheese and the lunch meat and things like that, that we all hear countless times—but there’s no mention of the more serious things that do happen and you just don’t realize they do.

(Teri Amity, WIA)

**Women's Narrative**

I sought out the March of Dimes and the Preecclampsia Foundation, because I think that was my form of therapy, to find other women who had been through circumstances with the preterm delivery and the preecclampsia. It normalized it in a lot of ways so I could talk about it and I could figure out, “Oh hey! I wasn’t alone in this.”

(Jane Campbell, WIA)

**Research on Women's Experiences**

- Women report:
  - Not receiving adequate information about their condition and recovery (short & long-term, physical & emotional)
  - Feeling grateful to healthcare professionals for the life-saving care provided to them & their babies
  - Few receive postpartum mental health referrals

**After a Significant Hemorrhage**

- 30% of women (n=106) did not receive care that consistently met their needs for acknowledgment, reassurance, and information while in the hospital, and
- 37% believed the hemorrhage might have been prevented with different care.

**Patient & Family Needs**

- Women and families need information and emotional support before, during and after severe maternal events:
  - Women need to be listened to and have their experiences acknowledged from their own, rather than the clinicians’ perspective.
  - Women need to know what happened to them, and why, but the content and timeline will vary.
  - Formal discussions about their experiences and progress should occur throughout their hospitalization and during postpartum follow-up visits.

**Family Needs**

- Families & support persons should be given the opportunity to remain present during treatment and/or reevaluation efforts and be given information and emotional support.
Resources for Patients, Families & Hospital Teams
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

DRIVER: RESPONSE

Resources for Patients & Families

For Traumatic Childbirth Experiences:
- INTECH: http://inttech.org/
  - INTECH is a collective of birth and mental health experts dedicated to the prevention and treatment of traumatic childbirth. Resources for women, families, and health care providers, including a comprehensive Traumatic Birth Prevention & Resource Guide.
- Sdboe for Mothers: http://www.sboeformothers.org/
  - Sdboe for Mothers is an organization designed for the sole purpose of providing and creating support for women who have experienced childbirth trauma.

Resources for Patients & Families

For Condition-Specific Birth Experiences:
- The Prevention Foundation: http://www.preventon.org/
  - The Prevention Foundation is an esteemed community of prevention advocates dedicated to educating and supporting families through intervention and education.
- My Heart Beats (Cardiomyopathy): http://www.myheartbeats.org/
  - My Heart Beats provides information about heart failure in pregnancy and provides support for those affected by this condition.
- The Anemia Fluid Embolism Foundation: http://www.afefoundation.org/
  - The Anemia Fluid Embolism Foundation provides resources and support for women and their families affected by this condition.

Resources for the Hospital Team

Test for Staff after Severe Maternal Mortality or Maternal Death

- http://www.nyshpo.org/
  - The New York State Health Department offers resources and support for hospitals and healthcare providers as they work to prevent and address severe maternal morbidity and mortality.
Resources for Patients, Families & Hospital Teams
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

Healing Ourselves: What is the Second Victim?
- Defined as healthcare provider victimization
- Unintended adverse event
- Medical error
- Patient-related injury
- NOP becomes second to the one that happens to a patient
- Second victim feels
- Personally responsible for unexpected patient outcomes
- They have failed their patient
- Second-guessing their clinical skills and knowledge base

Resources for Healthcare Providers
- University of Missouri second victim provider support program:
  - Resources from AHRQ website:
  - Canadian Disclosure Guidelines published in 2008
  - Harvard Risk Management Foundation “When Things Go Wrong: Responding to Adverse Events”

Challenges for Ob-Gyns in Engaging Families
- All expected good outcomes - doctors, patients and families
- Obstetric emergencies often occur suddenly
- Need for urgent, quick decision making
- “On-call” MD may not have an established relationship with the patient, let alone the family

QI/IM Resource
- Resource Guide

UVM Provider Checklist
- Medical care rendered or recommended by provider
- Medical care rendered or recommended by provider
- Medical care rendered or recommended by provider
- Medical care rendered or recommended by provider
Resources for Patients, Families & Hospital Teams
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

DRIVER: RESPONSE
Structural Preparedness in Obstetrical Hemorrhage: don’t you want to be the BEST?
Presenter: Fouad Atallah, MD, FACOG

Structural Preparedness in Obstetrical Hemorrhage

Objectives
• Identify the two types of structural preparedness
• Identify the 4 broad categories of structural preparedness for Obstetrical hemorrhage (OH)
• Learn how to identify the gaps in structural preparedness for OH

Structural Preparedness in Obstetrical Hemorrhage

Military adage
Prior
Proper
Planning and Preparation Prevents Poor Performance

Structural Preparedness in Obstetrical Hemorrhage

Structure (concrete)
A building or other object constructed from several parts

Structure (abstract)
The arrangement of and relations between the parts or elements of something complex

Patient Safety Management
The process of care occurs within the structure of the healthcare system!
Structural Preparedness in Obstetrical Hemorrhage: don't you want to be the BEST?
Presenter: Fouad Atallah, MD, FACOG

DRIVERS: READINESS, REPORTING AND SYSTEMS LEARNING
Structural Preparedness in Obstetrical Hemorrhage: don't you want to be the BEST?
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DRIVERS: READINESS, REPORTING AND SYSTEMS LEARNING
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Drivers: Readiness, Reporting and Systems Learning
Structural Preparedness in Obstetrical Hemorrhage: don't you want to be the BEST?
Presenter: Fouad Atallah, MD, FACOG

DRIVERS: READINESS, REPORTING AND SYSTEMS LEARNING
Surgical Management of Uterine Atony

Presenter: J. Christopher Glantz, MD, MPH, FACOG

**DRIVER: RESPONSE**

- **Surgical Management of Uterine Atony**
  - J. Christopher Glantz, MD, MPH, FACOG
  - Professor of Obstetrics and Public Health Sciences
  - Division of Maternal-Fetal Medicine
  - University of Rochester Medical Center

- **Postpartum Uterine Atony**
  - The most common cause of postpartum hemorrhage
  - Many risk factors: multiparity, prolonged or stimulated labor, uterine overdistention, chorioamnionitis, general anesthesia, etc.
  - Mild moderate cases usually managed with massage and uterotonics
  - Oxytocin, prostaglandin, methylergonovine

- **Postpartum Uterine Atony**
  - When response to uterotonics is inadequate and other causes of bleeding have been ruled out, surgical options include:
    - Uterine artery ligation
    - Compression sutures
    - Packing or balloon tamponade
    - Hysterectomy
    - Means laparotomy if delivery was vaginal

- **Postpartum Uterine Atony**
  - In operating room:
    - Call for help and hemorrhage cart / instruments
    - Blood Bank / MTI?
    - Tamponade bleeding with lap pad and take a breath:
    - What is the cumulative blood loss?
    - What should you do next?
    - What do you need to do it?

- **Oversewing**
  - Limited use in atony, but may help when localized lower segment atony (e.g., previa)
  - Should have low threshold to proceed to other procedures if it does progress

- **Uterine Artery Ligation**
  - (O’Leary Suture)
  - Decreases pulse pressure
  - Does not devascularize (too many anastomoses)
  - Not the main uterine artery → ascending (ascending branch(es))
  - Must stay close to uterus to avoid uterus!!!
  - Complications: hematoma, urethral injury
  - Efficacy unclear, but may be additive
  - Probably most effective for lacerations
Surgical Management of Uterine Atony
Presenter: J. Christopher Glantz, MD, MPH, FACOG

DRIVER: RESPONSE

Pelvic Anatomy

Technique of Uterine Artery Ligation

Hypogastric (Internal Iliac) Artery Ligation
- Rarely done: most OBs are not trained to dissect the retroperitoneal sidewall vessels
- Risks of complications (hypogastric vein laceration, gluteal ischemia, ureteral ligation, ligating external iliac) generally outweigh the benefits of other techniques

Uterine Compression Sutures (B-Lynch and others)
- Sutures around/through the uterus to compress or tamponade bleeding vessels
- B-Lynch most common
  - First reported in 1997: successful in 5 of 5 women
  - Reported success varies from 75% to 95%
  - Many variations on the theme
    - Complications: failure, necrosis, infection, sewing the cervix shut, scarring, impaired fertility
- Limited data that fertility usually preserved

B-Lynch

Theme and Variations:
Surgical Management of Uterine Atony
Presenter: J. Christopher Glantz, MD, MPH, FACOG

Balloon Tamponade
- Not “surgery” per se
- Has replaced uterine packing
- Inserted into uterine cavity and inflated with saline
- Separates horns for drainage
- Early versions used Foleys, but most common current version is the Ballir
- Also vials and IIT-Cath systems

Balloon Insertion
- Transvaginally, pull hub out through the cervix and vagina to draw the balloon through incision into uterus, inflate once the uterus closed

Balloon Placement
- Leave in place up to 24 hours; deflate gradually or all at once
- Often effective (70-90%), but few data
- Complications: trauma, infection, falling out
- Does not require laparotomy

Miscellaneous Issues
- When to close uterine incision after CS?
- Often multiple procedures are employed during a PPH
  - Uterotonic → Uterine artery ligation → Balloon
  - Difficult to separate individual contributions to efficacy, as well as the effect of time
- “Uterine sandwich”: compression sutures plus balloon
  - Insert balloon, then tie sutures, then inflate balloon with small amount of fluid (≤500 cc)
- Uncertain efficacy: only a few small case-series

Hysterectomy
- Fortunately rare, but thus skill levels often low
- Problems:
  - Large uterus difficult to manipulate (enlarged?)
  - Limited exposure (esp. deep in pelvis)
  - Edema → fragile tissue, tears easily
  - Engorged vessels → hemorrhage
  - Bladder and ureter susceptible to injury
- End of effaced cervix may be difficult to identify
- Decisions:
  - When to move to hysterectomy?
  - Subtotal or total?
Surgical Management of Uterine Atony

Presenter: J. Christopher Glantz, MD, MPH, FACOG
5
Hospital Policies, Tools and Forms
Introduction

Participants of the NYS Obstetric Hemorrhage Project developed resources at the hospital-level to improve the assessment, identification, and management of obstetric hemorrhage. These tools are included in this section. They may be used to guide facilities in developing their own policies, tools and forms, or updating existing materials. The sample hospital policies, tools and forms provided in this toolkit are not intended to provide medical advice, and should not be relied upon as such, nor should the information be used as a substitute for clinical or medical judgment.
a. Massive Transfusion Protocol
   i. Crouse Hospital: Blood: Massive Transfusion Protocol (MTP) 113
   ii. John R. Oishei Children’s Hospital of Buffalo: Massive Blood Transfusion Policy (MBTP) 117
   iii. Saratoga Hospital: Massive Transfusion Protocol (MTP) 124
   iv. South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines 130

b. Refusal Blood Protocol
   i. Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women) 138
   ii. White Plains Hospital: Patient who decline Blood Products 155

c. OB Hemorrhage Supplies
   i. Strong Memorial Hospital: OH Medication 159

d. STAT
   i. Arnot Ogden Hospital: Obstetrical Alert 160
   ii. Westchester Medical Center: Code Noel: Obstetrical Hemorrhage 162

e. Response Team
   i. NYU Langone Health: Obstetric Hemorrhage, Management of the Patient Experience 175

f. Drills/Debriefs
   i. Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form) 187
   ii. Newark-Wayne Community Hospital: OB Hemorrhage Clinical Event Debrief Form 201
   iii. Northern Westchester Hospital: Obstetric Team Debriefing Form 203
   iv. NYU Langone Health: Stat Huddle Debrief 205
   v. Southside Hospital: OB Hemorrhage Flowsheet 206
## DRIVER
### Recognition and Prevention

#### f. Policy
- Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments  
- Crouse Hospital: Hemorrhage Guidelines
- Huntington Hospital: Guideline OB Hemorrhage Guideline
- LIJ Forest Hills: Maternal Early Warning Signs Protocol
- NYP Brooklyn Methodist Hospital: Management of Obstetric Hemorrhage Policy
- Southside Hospital: Hemorrhage Guidelines
- Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

#### g. Risk Assessment
- South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

#### h. Quantitative Blood Loss (QBL)
- NYP Brooklyn Methodist Hospital: Caesarean Delivery QBL Worksheet

#### i. Checklists
- NYP Brooklyn Methodist Hospital: Hemorrhage Recorder Checklist (2 pages)
- NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage 2020 Checklist
- NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox
- John R. Oishei Children’s Hospital of Buffalo: Obstetric Hemorrhage Checklist ACOG
- Stony Brook Medical Center: Hemorrhage Sim L and D

#### ii. Resources for Patients, Families, and Staff
- Patient and Family Support
- Patient Feedback Questions OB Hemorrhage
- White Plains Hospital: Patients Who Decline Blood Products
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k. Obstetric Hemorrhage Bundle
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   ii. QBL Worksheets for VD
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   iv. Strong Memorial Hospital: QBL Calculation Worksheet

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Crouse Hospital: Blood: Massive Transfusion Protocol (MTP)

General Information

Policy Name: Blood: Massive Transfusion Protocol (MTP)
PPPG Category: Clinical Practice
Applies To: All Units
Key Words: Blood, Transfusion, MTP, Massive
Associated Forms & PPPGs:
- Massive Transfusion Protocol Guide (Doc #6672)
- Lab Requisition during Massive Transfusional Final (Doc #6673)

Original Effective Date: 06/01/07
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This Version’s Effective Date: 02/11/19

Policy

This policy is to provide a hospital wide standard for facilitating the rapid acquisition of appropriate blood and blood components safely during a massive hemorrhagic event while limiting the untoward effects of stored blood (hypothermia, metabolic effects, and dilutional coagulopathy) through effective communication between clinical and laboratory staff. This policy outlines the responsibilities of both areas to provide blood component support to the patient. If possible, one contact (or point person) will be identified in both the clinical area and in Transfusion Services to facilitate effective communication.

Procedure

Nursing/Provider Responsibilities:
To activate the massive transfusion protocol when a large blood loss is anticipated:

1. Call Transfusion Services (ext. 47404) to declare a hemorrhage (or possible hemorrhage) as early in the process as possible.
2. Provide Transfusion Services staff with:
   - patient name
   - medical record/patient number
   - diagnosis
   - location (notify Transfusion Services each time the location changes)
   - phone extension (include on all "stat stickers" for lab result reporting)
   - name of a contact person (notify Transfusion Services if this changes i.e. shift change)
3. Obtain a patient blood sample if requested by Transfusion Services and send STAT to the lab. Use the appropriate STAT stickers (green for OR, pink for L&D). Write the phone extension or the OR room number on the requisition to aid in quick reporting of the lab testing.
4. A charge slip complete with the patient name and medical record/patient number is required to pick up all blood components from Transfusion Services. The charge slip must specify what components and how many are requested. Take components as they are available. Do NOT delay transport of components to patient to wait for components still being processed by Transfusion Services.
5. Blood warmer usage is required during a massive transfusion event. A rapid infuser/pressure bag should be utilized, if available.
6. Regular monitoring of hemoglobin, platelet count, coagulation tests, electrolytes, and ABG’s should be used to guide therapy.
7. Consider redosing antibiotics following massive fluid/blood infusions.
Crouse Hospital: Blood: Massive Transfusion Protocol (MTP)

8. The pharmacy is contacted (ext 17631, option 1) for questions regarding anticoagulant reversals and TXA (Tranexamic Acid for prevention or reduction of bleeding).
9. Notify Transfusion Services each time the patient location or status changes (i.e. OR to ICU).

Notes:
1. Emergency Release of Uncrossmatched Red Cells is available when there is no patient sample available or no time to complete the testing on the patient sample. The ordering provider can request the emergency release of uncrossmatched red cells by calling Transfusion Services. Transfusion Services will issue the 2 units of Uncrossmatched Red Cells with an Emergency Release form that needs to be signed by the ordering provider and returned to the Transfusion Services department ASAP (within 23 hours).
2. Red cell and plasma components must be stored at 1-6°C until transfused. The PACU refrigerator will be utilized for monitored storage if the event is handled in the main OR. Coolers can be utilized for other patient care areas if necessary.
3. Platelet components MUST NEVER BE REFRIGERATED and will be stored in Transfusion Services until requested by the clinician. If the platelets are not infused within 30 minutes of arrival to the patient, return the platelets to Transfusion Services for reissue at a later time.
4. Transfusion Services will automatically "stay ahead" on red cells (4 units), thawed plasma (2 units), and platelets (1pheresis) during the event. Do not call Transfusion Services to "add units on." The transfusion ratio is determined by the ordering provider based upon lab values and clinical indicators.
5. Cryoprecipitate is indicated when fibrinogen is less than 100 mg/dL, and will be prepared only if ordered by a clinician. One pre-pooled cryoprecipitate is equivalent to 5 single units.

Transfusion Services Responsibilities:
1. Transfusion Services will activate the massive transfusion protocol (MTP) when:
   a. requested by physician and/or nursing personnel
   b. a patient has used ≥ 4 units red cells in 2 hours (or ≥ 10 units red cells in 12 hours)
2. Notify supervisory personnel, the Pathologist, and other laboratory departments that the MTP has been initiated. Assess staffing and call in additional staff if necessary.
3. Review the patient history in the LIS to determine if a type and screen (TYSC) has been tested in the last 3 days, and if crossmatched units are available. Request a patient sample if needed.
4. Transfusion Services will automatically "stay ahead" on red cells (4 units), thawed plasma (2 units), and platelets (1pheresis) during the event. Keep the Pathologist apprised of the number of units issued, if emergency release is required, and any lab tests ordered throughout the event.
5. Recommend testing to include ABG, PT, PTT, fibrinogen, BMP, ionized calcium, and CBC.
6. Suggest ordering cryoprecipitate if fibrinogen is less than 100 mg/dL.

Laboratory Supervisory Staff Responsibilities:
1. Assess staffing and reallocate technical resources where needed.
2. Ensure that all testing requested on the MTP patient is prioritized and results are communicated ASAP.

Conclusion of MTP:
1. The point person will notify Transfusion Services when the MTP is no longer in effect.
2. All unused blood components will be returned to Transfusion Services for controlled storage.
3. Transfusion Services staff will collate information regarding the number of MTP's occurring in the hospital and will present data to the Transfusion Performance Improvement Council.
Crouse Hospital: Blood: Massive Transfusion Protocol (MTP)

Crouse Hospital Policy & Procedure
Blood: Massive Transfusion Protocol (MTP)
Responsible Party: Jill Hauswirth, Rachel Elder, MD
Lead Author: Diane Lloyd

Effective Date: 02/11/19
Page 3 of 4

Primary Sources

Definitions
Massive Transfusion: The replacement of at least one blood volume within 12 hours.

Addendums, Diagrams & Illustrations
Appendix A: Massive Transfusion Protocol Guidelines
Transfusion Services Phone # 47404 / Fax # 7138

Activated:
- By practitioner or nursing personnel when a large blood loss is anticipated.
  OR
- By Transfusion Services automatically when a patient uses > 4 red cells in 2 hours or >10 red cells in 12 hours

Nursing will:
- Establish point person and phone extension to use to communicate with Transfusion Services/Laboratory.
- Send appropriate patient samples. Use area-specific "stat" labels for OB or OR.
- Keep Transfusion Services apprised of changes to patient location and status.
- Expedite blood component pick up by calling Transfusion Services prior to arrival and bringing patient identification with them (i.e. charge slip).
- Take components as they are available. Do NOT delay transport of components to patient to wait for components still being processed by Transfusion Services.

Key points:
- Transfuse blood products using a blood warmer to prevent hypothermia. Keep patient warm, consider use of warming blanket.
- Use rapid infuser/pressure bag when patient condition deems necessary.
- Check lab values periodically throughout the event, including pH.
- Packed cells contain citrate that binds calcium; check ionized calcium periodically and replace as needed.
- Consider redosing antibiotics following massive fluid/blood infusions.
- The transfusion ratio should be determined by the ordering provider based upon lab values and clinical indicators.
- Consider the use of Tranexamic Acid (TXA).

Once activated Transfusion Services will:
- Crossmatch 4 units of red cells and stay 4 units ahead until the bleeding is under control.
- Thaw 2 units of plasma and stay 2 units ahead.
- Maintain platelet inventory, assess blood inventory and order additional units STAT, if needed.
- Communicate with other lab departments to ensure priority handling of patient samples.
- Notify the Pathologist (470-7396).
## Appendix B: Massive Transfusion Protocol Guide - See form # 8672

### SUGGESTED BASELINE TESTING (IN ORDER OF DRAW):
Underlying acidosis and coagulopathy, such as DIC or low fibrinogen should be evaluated.

<table>
<thead>
<tr>
<th>Suggested Baseline Testing - In Order of Draw</th>
<th>Order at start of hemorrhage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Arterial blood gas (ABG)</td>
<td>Syringe on ice</td>
</tr>
<tr>
<td>2. PT, PTT, fibrinogen</td>
<td>1 blue tube, completely full</td>
</tr>
<tr>
<td>3. Lyles, ionized calcium, and glucose</td>
<td>1 dark green tube-lithium heparin or may use ABG syringe</td>
</tr>
<tr>
<td>4. CBC</td>
<td>1 lavender tube</td>
</tr>
<tr>
<td>5. Blood type and crossmatch</td>
<td>If not done previously: 1 pink top tube</td>
</tr>
</tbody>
</table>

### Testing During Event - in Order of Draw
Consider this every 30-60 minutes.

<table>
<thead>
<tr>
<th>Testing During Event - In Order of Draw</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Arterial blood gas (ABG)</td>
</tr>
<tr>
<td>2. PT, PTT, fibrinogen</td>
</tr>
<tr>
<td>3. Lyles, ionized calcium, and glucose</td>
</tr>
<tr>
<td>4. CBC</td>
</tr>
<tr>
<td>5. D-dimer if DIC is suspected</td>
</tr>
</tbody>
</table>

### SUGGEST REPEAT LABORATORY TESTING AFTER 5-7 UNITS OF RBCS
Component Usage Guidelines

<table>
<thead>
<tr>
<th>Consider When</th>
<th>Component</th>
<th>Dose</th>
<th>Expected Increase in Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncontrolled bleeding (&gt;1500 ml loss) regardless of initial Hgb/Hct</td>
<td>Red cells</td>
<td>Use a blood warmer for infusion &gt; 100 ml/min</td>
<td>As needed to maintain adequate oxygenation and Hgb &gt; 7</td>
</tr>
<tr>
<td>Continued Bleeding and an INR &gt; 1.5</td>
<td>Plasma</td>
<td>2-4 units (10-15 ml/kg)</td>
<td>25% of factors</td>
</tr>
<tr>
<td>Continued Bleeding and a Platelet count &lt; 80,000 or microvascular bleeding</td>
<td>Platelets</td>
<td>1 dose is one pheresis</td>
<td>30,000 to 60,000 per dose</td>
</tr>
<tr>
<td>Bleeding and Fibrinogen &lt; 100 mg/dL</td>
<td>Cryoprecipitate</td>
<td>1-2 units/10 Kg. Delivered in pool of 5 units</td>
<td>50 mg/dL</td>
</tr>
<tr>
<td>Uncontrolled Bleeding</td>
<td>Tranexamic Acid (TXA)</td>
<td>1 gm IV over 10 minutes - followed by a maintenance dose of 1 gm infused over 8 hours</td>
<td>Call Pharmacy at 7631 for consultation</td>
</tr>
<tr>
<td>Anticoagulant Reversals and TXA</td>
<td>Contact the pharmacy (ext 17631, option 1) for questions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
John R. Oishei Children's Hospital of Buffalo: Massive Blood Transfusion Policy (MBTP)

I. Statement of Purpose
This document defines an adult massive blood transfusion protocol (MBTP) that can be activated by a physician when an adult patient is experiencing a surgical or medical emergency with life threatening hemorrhage.

Ratio-based blood product support using multiple fluids, blood and blood components will promote hemodynamic stability, with the opportunity to prevent or control coagulopathy.

For pediatric MBTP see PED.31 – Massive Blood Transfusion Policy (MBTP) Pediatric Trauma Patients

II. Audience
B. Physicians, Registered Nurses (RN), Clinical Laboratory Technologists, Blood Bank, Operating Room (OR), Critical Care Units.
C. Graduate Nurses (GNs) may transfuse, check, and administer blood only with an RN

III. Instructions
The Massive Blood Transfusion Policy (MBTP) is utilized in emergent situations.

A. Clinical situations that may lead to massive blood loss would include trauma, postpartum hemorrhage and large intraoperative hemorrhage.
   1. The MBTP may be activated before massive blood loss has occurred based on the patient's condition and expected active blood loss.
   2. Clinical situations that would warrant activation of the MBTP would include conditions that would be expected to lead to transfusion of greater than or equal to (≥) 10 units red blood cells (RBC) in 24 hours, or replacement of a patient's blood volume in 24 hours.
   3. Additional situations that can be considered when deciding to activate the MBTP would include replacement of 50% of a patient's blood volume in 3 hours or an ongoing rate of blood loss greater than (> ) 150 mL/hour. According to the ASA Committee on Blood Management, the requirement for greater than (> ) 4 units RBC in 1 hour with an ongoing need for transfusion with hemodynamic instability is another way to describe the same clinical situation.

B. In life threatening situations requiring immediate blood transfusion, product selection and crossmatch procedures may be abbreviated. Uncrossmatched or partially crossmatched blood may be provided. Specialized product requirements such as irradiation or antigen negative products may be suspended for the duration of the emergency if such products are in limited supply. Physician will assume responsibility for the potential complications
John R. Oishei Children's Hospital of Buffalo: Massive Blood Transfusion Policy (MBTP)

h. Determination of whether emergency release / uncrossmatched blood is needed
i. Delivery plan (pneumatic tube delivery is an option at BGMC)
j. The name of the Blood Bank contact that receives the call should be recorded for future contacts.
k. The time at which the protocol is activated should also be recorded in the clinical area.

**Keypoint:** Based on blood product dispense records, the Transfusion Service may note rapid blood loss greater than or equal to (≥) 10 units RBC within 24 hours and may contact the clinical service and the transfusion service physician on-call to propose activation of the MBTP.

G. Crossmatch Sample
The physician in charge will ensure that the appropriate blood specimens are drawn by nursing/anesthesia and sent to the Blood Bank for STAT Type and Screen testing.

**Keypoint:** The EDTA pink or purple top tube is to be used and MUST be labeled with two patient identifiers i.e. name, medical record number (MR), or date of birth (DOB). In addition, the type and screen tube MUST contain handwritten documentation of the collector's initials, date and time of collection. If any of the above listed items are missing from the specimen a delay in testing may occur and a new sample will need to be obtained.

Additional blood work at this time should include: CBC, PT/APTT/INR, fibrinogen, electrolytes, serum creatinine, calcium, magnesium, lactate levels, and an ABG (as needed).

H. Vascular Access
Vascular access should include at least two large bore intravenous (IV) lines. As soon as possible and at the discretion of the physician in charge, central venous access needs to be established in the form of either an introducer sheath or a triple lumen catheter. An arterial line should also be placed, if possible, for more accurate blood pressure determination and in anticipation of surgical intervention. The site of arterial access is at the discretion of the physician but can include radial, brachial, femoral, or pedal.

I. Initial Units
Upon activation of the MBTP, Blood Bank will notify additional technologists as needed to assist with rapid preparation of blood products. The blood bank will:
1. Provide 2 uncrossmatched O negative blood packs until crossmatched blood becomes available.
2. Once a sample is received a type and screen will be performed and type specific blood will be made available to preserve uncrossmatched O negative for additional MBTP requests and emergencies.
3. Rh positive blood products may be provided initially and in subsequent MBTP packs, regardless of patient's Rh phenotype, based on inventory, with priority of Rh negative product determined by patient age and gender. Women of potential childbearing age will have highest priority for available Rh negative RBC
4. Group A fresh frozen plasma (FFP) may be provided initially and in subsequent MBTP Packs, regardless of patient's ABO blood group, based on availability of group AB FFP.
John R. Oishei Children's Hospital of Buffalo:  
Massive Blood Transfusion Policy (MBTP)

Title: Massive Blood Transfusion Policy (MBTP) - Adult  
# CL.31

h. Determination of whether emergency release / uncrossmatched blood is needed
i. Delivery plan (pneumatic tube delivery is an option at RCMC)
j. The name of the Blood Bank contact that receives the call should be recorded for future contacts
k. The time at which the protocol is activated should also be recorded in the clinical area.

**Keypoint:** Based on blood product dispense records, the Transfusion Service may note rapid blood loss greater than or equal to (≥) 10 units RBC within 24 hours and may contact the clinical service and the transfusion service physician on-call to propose activation of the MBTP.

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John R. Oishei Children's Hospital of Buffalo: Massive Blood Transfusion Policy (MBTP)

Title: Massive Blood Transfusion Policy (MBTP) - Adult

5. The Blood Bank will notify physician and/or designee in the designated location of the availability of blood products.

6. Physician and/or designee will delegate a representative from the Operating Room or other location to obtain the blood products from the blood bank. The Emergency Release Form must be presented at this time and will act as a pick-up slip when dispensing the initial products. If pneumatic tube connectivity exists, the release of un-crossmatched O negative blood may be utilized.

7. Upon activation of the MBTP, the Blood Bank will begin thawing fresh frozen plasma (FFP). Thawed plasma (if available) will be used to fill FFP orders until FFP is ready for dispensing.

8. MBTP packs will be obtained from the Blood Bank by a representative from the Operating Room or designated location every 15-30 minutes (15 minutes for components that do not need to be thawed and 30 minutes for those that require thawing).

9. When the Blood Bank personnel notify physician and/or designee of the blood availability, they will ask specifically if they need to start another round of the MBTP packs. Physician will communicate with the designee to request a verbal order for the next consecutive MBTP pack, or order to terminate the MBTP protocol.

10. Laboratory testing should be done continuously once the MBTP has been initiated and the patient continues massively bleeding. A CBC, PT/PTT/INR, fibrinogen, and ABG should be performed every 30 minutes. It is also advisable to obtain electrolytes, serum creatinine, ionized calcium, magnesium and lactate levels (serum lactate or whole blood lactate) every one (1) hour.

J. MBTP Packages:
MBTP packs containing the necessary products should be obtained from the Blood Bank as soon as they are available.

Pack 1: Contains 3 units of RBC, 3 FFP, and 1 plateletpheresis

Pack 2: Contains 3 units of RBC, 3 FFP, and 1 cryoprecipitate

Subsequent Packs: Alternating as above; note that platelet supply may be limited

**Keypoint:** The contents of additional massive transfusion packs can be adjusted by the physician in charge based upon the results of the blood work obtained.

Checking Blood Products – See CL 53 • Adult/Pediatric Transfusion Therapy

**Keypoint:** An ongoing MBTP does not exempt the involved staff from the need to check the product, the intended recipient (on the tag) and the recipient identification at the bedside. This check is the last opportunity to ensure that the right product is being provided to the right patient.

K. Termination of MBTP
Upon achieving hemostasis and the resolution of coagulopathy, the MBTP can be terminated. The Blood Bank should be notified immediately by phone to stop blood and blood product preparation. Any unused blood products must be returned to the blood bank as soon as possible via the cooler.

L. Case Review
Initiation of the use of this MBTP protocol and the designation of patients to the protocol should be monitored and reviewed periodically to ensure proper use of the protocol.
John R. Oishei Children's Hospital of Buffalo: Massive Blood Transfusion Policy (MBTP)

MBTP activation events will be reviewed by the transfusion service and by the site Chief Medical Officer (CMO) (or designee).

M. Care and Management:
Other points to consider during a MBTP
1. Discontinue anticoagulant medications
2. If there is a history of the patient receiving an anticoagulant medication, consider specific reversal or appropriate supplementation (eg. protamine, Vitamin K)
3. If patient history or specific laboratory testing warrants, utilize factor replacement or antifibrinolytic therapy (tranexamic acid)
4. In cases where clinically suitable (clean cases), consider use of a CellSaver for collection and re-administration of shed blood.
5. Maintenance of patient temperature through use of warming blankets and/or blood warming infusion devices is helpful in maintaining full function of the clotting cascade.
6. Stored blood contains citrate (3 g / RBC unit) and citrate will bind circulating calcium. In large volume resuscitation events, there may be distortions in calcium, lactate and/or acid-base status. These changes may affect the patient and may warrant directed medical support.
7. When active bleeding is controlled, transition to a more restrictive transfusion strategy, to limit the potential for volume overload.
8. Evaluate the need for specialized products if hemorrhage remains uncontrolled (recombinant factor VII, activated prothrombin complex products).

N. Safety
1. Only normal saline (0.9% sodium chloride) is allowed to be added to blood or blood products or administered into IV lines containing such products. Medications shall not be added or infused through the same venous access line.
2. The healthcare professionals responsible for checking and/or administering the blood products shall ensure in the presence of the patient their identification, the Blood Transfusion Record and the product according to CL 53 - Adult/Pediatric Transfusion Therapy policy.
3. Use only blood warming devices that are specifically designed and approved for this purpose, following manufacturer’s instructions for the use of the blood warmer (See SS 58 – Blood/Blood Products: Warming Devices)
4. Blood warmer temperature shall be monitored and recorded.

O. Infection Control
Handle all blood product bags and tubing with gloved hands.

Dispose of empty blood packs and administration sets in biohazard bags accordingly.

Return all units that have not been opened and units from patients having a transfusion reaction to the Blood Bank in a closed biohazard plastic bag. Do NOT remove associated bag tag if patient has a transfusion reaction.

P. Complications and Reportable Incidents
Specific signs and symptoms of transfusion reaction/massive blood transfusion reactions are assessed as periodic monitoring of the patient undergoing resuscitation. Recognition
John R. Oishei Children's Hospital of Buffalo: Massive Blood Transfusion Policy (MBTP)

Title: Massive Blood Transfusion Policy (MBTP) - Adult

and reporting of adverse events during transfusion are described in policy CL.53, with reporting of suspected transfusion reactions to the physician and blood bank.

Q. Adult patients requiring massive blood transfusion should have the following documentation:
1. The blood product identification check must be documented on the Transfusion Record (bag tag) with the required two signatures.
2. The patient’s vitals are continuously monitored and documented on the Anesthesia Record if in the Operating Room/procedural area or on the Transfusion Record in an ICU area.
3. The time at which each individual unit is initiated and completed must be specifically indicated on the Anesthesia Record if patient is in an Operating Room. If this level of documentation detail cannot be ensured, the Transfusion Record (bag tag) should be used to document transfusion times and vital signs.
4. A notation must be placed on the Transfusion Record (bag tag) to indicate that documentation of the vital signs will be found on the Anesthesia Record.
5. Emergency Release of Blood form – DTKH0533

IV. Approved by (Include date)
Clinical Interdisciplinary Approval Committee 10/19/17
Medical Executive Committee 6/15/16, 10/17
Surgical Services 3/16, N/A
Anesthesia 3/16, N/A
Infection Control 4/7/16, N/A
Nurse Policy Council 5/11/16, N/A
Nurse Executive Committee 5/18/16, N/A

V. References


CL 53 – Adult/Pediatric Transfusion Therapy
PED.31 – Massive Blood Transfusion Policy Pediatric Trauma Patients
PT.1 – Informed Consent for Blood Product Transfusion
SS.68 – Blood/ Blood Products: Warming Devices

Version History:

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</tr>
</tbody>
</table>

Page 6 of 7
John R. Oishei Children's Hospital of Buffalo: Massive Blood Transfusion Policy (MBTP)

Title: Massive Blood Transfusion Policy (MBTP) - Adult

Kalida Health developed these Policies, Standards of Practice, and Process Maps in conjunction with administrative and clinical departments. These documents were designed to aid the qualified health care team, hospital administration and staff in making clinical and non-clinical decisions about our patients' care and the environment and services we provide for our patients. These documents should not be construed as dictating exclusive courses of treatment and/or procedures. No one should view these documents and their bibliographic references as a final authority on patient care. Variations of these documents in practice may be warranted based on individual patient characteristics and unique clinical and non-clinical circumstances. Upon printing, this document will be valid for 2/15/2018 only. Please contact Taylor Healthcare regarding any associated forms.
Saratoga Hospital: Massive Transfusion Protocol (MTP)

Purpose: This protocol outlines the process for using a massive transfusion protocol (MTP) to manage a massive hemorrhage.

Massive transfusion is defined as transfusion within a 24 hour period of a volume of blood approximate to or exceeding the recipient's total blood volume. The goal of the MTP is to provide blood products in a timely manner and to standardize blood product ordering. It requires a cooperative effort between physicians, clinical services, blood bank and the laboratory to ensure that products are readily available in emergency situations.

General Management of Massive Transfusion:
The Massive Transfusion Protocol (MTP) is initiated at the request of the patient’s physician or consulting physician when it is anticipated that the patient will need 8 or more units of red cells in two hours.

Organization:
1. Activate massive transfusion protocol.
2. Call the blood bank to inform them that the MTP has been activated. Assign contact person for the blood bank to facilitate communication during the protocol.
3. Notify additional support staff as needed (i.e. nursing supervisor, transportation, pharmacy, respiratory therapy, rapid response team).
4. Assign one nurse to record vital signs, urinary output, fluids and administered drugs.

Infusions/Restoration of Blood Volume:
Use fluid resuscitation and transfusion based on estimation of current blood loss and expectation of continued bleeding (Appendix #1).

1. If specimens have not been previously collected, draw laboratory specimens and order MTP panel (ensure appropriate sample identification):
   • Type and crossmatch (1 tall lavender top)
   • CBC with platelet (1 small lavender)
   • PT, PTT, Fibrinogen (1 blue top)
   • Basic Profile, Calcium (1 green top)

2. Insert indwelling urine catheter.
3. Start second large-bore 18 gauge intravenous line.
4. Ringer’s lactate or Normal saline replaces blood loss at 3:1.
5. Warm blood products and infusions to prevent hypothermia, coagulopathy and arrhythmias. Begin warming when adults receive an infusion of blood at a rate of 50mL/kg/hr (i.e. 3500mL/70kg patient).
6. Initially, product can be released using the “Emergency Release” procedure (Appendix 2) and transported through the tube system.
7. If there is not enough time to obtain type specific products, transfuse uncrossmatched O red cells and Group A plasma.

8. Recommended standard MTP Sets:

<table>
<thead>
<tr>
<th>Product</th>
<th>Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC-1R</td>
<td>4</td>
</tr>
<tr>
<td>Plasma</td>
<td>2</td>
</tr>
<tr>
<td>Plateletpheresis</td>
<td>1</td>
</tr>
<tr>
<td>Pooled Cryo</td>
<td>2</td>
</tr>
</tbody>
</table>

9. Provider may make modifications to the MTP set. Blood Bank will confirm the need for plateletpheresis and pooled cryo prior to shipment.
10. RBC-1R and plasma products are packed in an appropriate cooler for transport. Plateletpheresis and pooled cryo are maintained at room temperature.
11. Calcium gluconate 10%, (1 gram in 10 ml) is given slow IV push after transfusion of each MTP set.
12. Repeat laboratory tests after transfusion of each MTP set (four red cells and two plasmas).
13. Manage coagulopathy with appropriate blood products (Appendix 1).

**Evaluation of Response:**

1. Monitor pulse, blood pressure, blood gases, and acid base status.
2. Urine output, measured by indwelling catheter.
3. Monitor calcium, hemoglobin/hematocrit, platelet count and coagulation tests to guide use of blood components.

**References:**

- “Massive Transfusion in Trauma: Process and Outcomes; Journal of Trauma Nursing”; Volume 11, N0.2; April-June 2004.
- “Fresh Frozen Plasma Should be Given Earlier to Patients Requiring Massive Transfusion”; J Trauma 2007:62
- Managing Massive Transfusion: Clinical Perspective: John R. Hess, MD, MPH, FACP, FAAAS; American Red Cross Presentation; 9/10/08
- Massive Transfusion Protocol; Parkland Memorial Hospital, Dallas, TX
- “Health Advisory: Prevention of Maternal Deaths through Improved Management of Hemorrhage”. NYS DOH Health Advisory 8/12/04
- “Obstetric Hemorrhage Presentation”; Cheryl De Simone, MD Albany Medical College.
- “How we treat: management of life-threatening primary postpartum hemorrhage with a standardized massive transfusion protocol”; Transfusion Volume 47, 2007
Saratoga Hospital: Massive Transfusion Protocol (MTP)
Saratoga Hospital: Massive Transfusion Protocol (MTP)

Emergency Release of Blood

Blood is to be transfused immediately:

- Contact Blood Bank (8458) directly or Vasera and request emergency release.
- Provide patient name, DOB and H00 (if available).
- Blood Bank will issue two units of uncrossmatched Type O RBCs in a cooler, you can request to send the blood through the pneumatic tube system (please specify the location).
- Only a provider may initiate an Emergency Release order in Meditech. This may occur after the event. This order cannot be placed via an RN.

Massive Transfusion Protocol (MTP)

Activated by provider when a massive bleed requiring large volumes of blood is expected.

- Contact Blood Bank (8458) directly to activate MTP. Please specify the diagnosis of the patient.
- If blood is needed immediately, request emergency release for first two units of RBC.
- Unless otherwise directed by the ED, blood bank tech will:
  - Order 1 unit of plateletpheresis from the Red Cross
  - Pack cooler with 4 RBCs and 2 FFPs (if thawed).
  - After issuing the initial package, tech will prepare second cooler of 4 RBCs and 2 FFPs.
  - Tech will continue preparing coolers - product packages will be based on ED orders.
  - Please call blood bank to cancel MTP.
Saratoga Hospital: Massive Transfusion Protocol (MTP)

Appendix 3: Blood Bank Protocol

Initiation of the MTP:
1. The Massive Transfusion Protocol (MTP) is initiated at the request of the patient’s physician, provider, consulting physician or anesthesiologist.
2. Communication between the blood bank and the clinical service is crucial to the success of the protocol. The blood bank is notified by phone or Vocera that the MTP is being activated. Obtain the patient’s name, DOB, medical record number, diagnosis and the name of the physician.
3. The patient care unit will designate a coordinator to be the main contact with the blood bank. A phone number or Vocera contact must be provided to the blood bank.
5. Notify the appropriate laboratory sections that the MTP protocol has been activated and to prepare for stat requests.
6. If a sample is not available in the blood bank, the patient care unit will ensure that adequate blood samples are collected, labeled and delivered to the blood bank.
7. Notify the Red Cross distribution center that an MTP is in progress and order 1 stat plateletpheresis product. Assess the available inventory and order additional products if needed.
8. The blood bank will ensure that an adequate amount of product is available to support the event. The following should be available in inventory for the duration of the event:
   • 20 units of ABO compatible red cells
   • 10 units of ABO compatible plasma; ensure that two units of thawed plasma are available.
   • 1 units of platelethpheresis
   • 4 pooled cryoprecipitate products (thaw only when requested).
9. Order MTPR in the computer system to document request for MTP. Use canned comment “BMTTPR” to complete documentation.

Issuing Blood Products:
1. ABO compatible blood must be issued without delay regardless of the status of testing. Do not delay issue to complete testing. Blood may be issued before completion of routine testing using the “Emergency Release” protocol. NOTE: The request for emergency release does not initiate an MTP.
2. Initial request for blood products that will be immediately transfused can be transported through the tube system. Coordinate delivery with the designated contact.
3. Standard MTP Sets:

<table>
<thead>
<tr>
<th>Product</th>
<th>Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC-LR</td>
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<tr>
<td>Plasma</td>
<td>2 2 2 2 2 2</td>
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<tr>
<td>Platelethpheres</td>
<td>1 1 1</td>
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<tr>
<td>Pooled Cryo</td>
<td>2 2</td>
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</tbody>
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Saratoga Hospital: Massive Transfusion Protocol (MTP)

4. After issuing the initial package, immediately begin preparation of the second set. Each subsequent package will consist of four RBCs and two units of plasma. Notify the designated contact person when the next set is ready.

NOTES:
- Packages should be ready to deliver in 15 minutes increments.
- Verify that the plateletpheresis or cryoprecipitate product will be transfused before shipping.
- Do not thaw cryoprecipitate until you have confirmed it will be transfused.
- Outdate is only 6 hours after thawing.
- Platelets and cryoprecipitate are stored at room temperature. Do not place in cooler.

5. Check on the status with the patient care unit if MTP has not been deactivated and no products have been sent for > 60 minutes.

Testing:
1. If testing is incomplete, use the Meditech "Emergency Issue Units" routine to issue the red cells. Do not delay release of blood to complete testing.

2. With the approval of the blood bank director, the crossmatch test is discontinued after transfusions of more than 10 units of red cells during a 24-hour period. This only applies to patients who are not eligible for electronic crossmatch.

3. In the event the patient has a previous antibody or an antibody is detected, notify the blood bank director and the physician.
   a. An emergency release request must be obtained from the provider to issue units that have not been screened for antigens.
   b. Issue unscreened, antigen untested units. Provision of blood to the patient during the MTP is a priority.
   c. Attempt to locate antigen negative units, when time permits, by screening or ordering product from the Red Cross.
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

Mount Sinai South Nassau

POLICY TITLE: Massive Transfusion Protocol (MTP) Guideline
POLICY NUMBER: PF-ER-279  LAST REVIEWED DATE: 01/2020
POLICY CATEGORY/MANUAL: Trauma Hospital-wide Policies
CROSS REFERENCE: Initial Trauma Activation and Rapid Registration Process PF-ER-287
Blood Transfusion: Administration of PRBC, FP, and Blood Components, and Procedure for Warning Blood OF-ADM-000
Laboratory Policy & Procedure TRM2 1.31 Emergency Transfusion
Rapid Infuser Policy PF-PCS-249
Code H: Obstetric Hemorrhage PF-OB-313

PURPOSE:
1) To provide guidelines and a standard process for facilitating and coordinating the timely and adequate hemostasis/cessation of massive blood loss using appropriate blood components in patients requiring rapid and massive transfusion
2) To allow treating physicians to better focus on the underlying problem (i.e. Trauma and/or underlying pathophysiology)
3) To prevent hypothermia, coagulopathy, and restore blood volume with appropriate blood components
4) To ensure that both the patient care area and the laboratory are allocating staffing resources appropriate to the management of the massive transfusion episode
5) To ensure that the Blood Bank (BB) has appropriate inventory and/or enough information about the situation to issue the needed blood components in a timely fashion
6) To adopt and implement a psychologically-based approach to the use of specialized blood components such as platelets, frozen plasma (FP), and cryoprecipitate.
7) To decrease turn-around time for receiving blood components, avoid wastage of blood components, and to reduce unnecessary anticipatory ordering of blood components, through better communication.
8) To assure the MTP procedure has built in redundancies to eliminate communication or process delays.

DEFINITIONS:
Life-threatening Hemorrhage: Any bleeding which results in signs and symptoms of hemodynamic instability or bleeding that could result in hemodynamic instability if left untreated.
Massive Transfusion:
- Total blood volume is replaced within 24 hours
- 50% of total blood volume is replaced within 3 hours,
  OR
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

1. Rapid bleeding rate is documented or observed. Rapid bleeding rate in adults can be defined as more than 4 units of red blood cells (RBCs) transfused within 4 hours with active major bleeding or more than 150 ml/m² minute of blood loss.

Massive Transfusion Protocol (MTP): Process by which the blood bank will continuously release blood and blood products in a predetermined ratio until discontinued

**Blood Products:**

**Packed RBC**
- Oxygen carrying capacity
- Volume expansion: 200-250 ml
- 4 units RBC’s increase Hct 3% 1 unit Hct does not reflect acute hemorrhage for 4 hours full equilibration may take 24-48 hours.

**Platelets**
- Less than 50,000 perioperative consider replacing
- Apheresis platelets (one bag: Apheresis, depleted would be expected to increase the platelet count of a 70 kg adult by 20-40 20–40 x 10⁹/l).
- Single donor product (SDP) will increase platelet count 5,000 – 10,000 platelets

**Fresh Frozen Plasma**
- Replaces clotting factor
- Increases fibrinogen 10mg/dl per 100 ml of FP

**Cryoprecipitate**
- Increase fibrinogen 10mg/dl per unit of cryoprecipitate
- Replaces clotting factors (VII, VIII, XII) with minimal volume

**Additional Agents:**

**Transaxenol (TXA)**
- An antifibrinolytic that competitively inhibits activation of plasminogen; used as a haemostatic in the prophylaxis and treatment of severe hemorrhage associated with excessive fibrinolysis.
- TXA administration in adult trauma patients should be limited to severe hemorrhagic shock with systolic blood pressure less than or equal to 75 or known hypofibrinogenemia on TEG (Thromboelastography) or predictors of fibrinolysis such as hypothermia (T less than 36°C), acidosis (pH less than 7.2), thrombocytopения (plt’s less than 200) or coagulopathy (INR greater than 1.3 or PT greater than 30)
- TXA should be administered 1000mg in 100ml NS intravenous over 10 minutes then 1000 mg in 250ml of NS intravenous over 8 hours

**Prothrombin complex concentrates (PCC)**
- PCC (trade names Beriplex, Octaplex, Kcentra, Coagfact, among others) is a combination of blood clotting factors II, VII, IX and X, as well as protein C and S, prepared from fresh-frozen human blood plasma.
- To reverse bleeding caused by anticoagulants

**Policy:**
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

Mount Sinai South Nassau ("MSSN") will maintain a protocol to support those patients who clinically exhibit massive blood loss and require immediate supportive therapy. The Massive Transfusion Protocol ("MTP") is a multidisciplinary process whereby blood and blood products are prepared and obtained rapidly for use in the patient with known or suspected exsanguinating or massive hemorrhage. Blood and blood components will be made available by the initiation of specific procedures to initiate the massive transfusion protocol on an automatic basis and in coordination between multiple MSSN departments and facilities. MTP can be activated and facilitated in any unit or procedural area outside labor and delivery who utilize the Code H process.

**CRITERIA FOR MTP:**

**Indications for MTP:** Patient must meet the following criteria:

Physician determines that patient with active bleeding meet criteria for MTP activation:

- Must meet at least 2 criteria below:
  - ABC Score of 2 or more (Pulse greater than 120, Systolic Blood Pressure (SBP) less than 90, a positive FAST exam, Penetrating Torso Trauma)
  - Shock Index score of greater than 1.0 (Pulse Systolic BP)
  - Manifest persistent signs of hypoperfusion:
    - Base Deficit less than or equal to -8 and or Lactate greater than 4.0
    - SBP less than 90 or less than 100 in age 65 or greater

OR

Obstetrical hemorrhage

**MTP PROCEDURE:**

1. The Physician Team Leader requests MTP activation. MTP can be activated by the Emergency Department Attending, Trauma Surgeon, Surgical or Medical Intensivist, Anesthesiologist, and Rapid Response Team Leader. The ordering provider (Team Leader) is responsible for the MTP until care is transitioned to another provider or MTP is deactivated.
2. The nurse will notify the blood bank (X4633) and provide: Patient name (actual or Trauma designated alias), medical record number, age (approximate if unknown), and sex.
3. The switchboard is called (extension 222) and caller states: "Activate MTP (and location)"
4. Switchboard will override page and utilize paging distribution system
5. Upon activation of the MTP the following additional members will respond to the MTP location and report to team leader:
   a. Anesthesiologist (Present in OR. Will be notified if needed in other areas.)
   b. Rapid Response Nurse (Responds to all locations outside OR)
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

c. Dedicated trained blood runners (2) (ED unit clerk and IT nurse’s aide) Respond to all patient locations

d. Administrative Nursing Supervisor, DON or Nurse Manager (Maintains oversight of team member response. Responds to all locations)

6. Nursing:
   a. Call admitting ED registration and request patient labels be delivered to patient location (if not already present) Obtain and send specimens for cross-matching per hospital policy.
   c. Select MTP or “Emergency Transfusion Request” form

7. Blood Runner brings pink request form with provider’s signature. 1 sheet of patient labels to blood bank and waits for initial release of blood products
   a. For each additional pickup the Blood Runner will bring the patient labels to the blood bank (no additional forms are needed)
   b. Prior to blood release the Blood Runner will confirm patient identity with the blood bank technician for products by checking the name and medical record number
   c. Runner will expeditiously bring blood products directly back to patient’s nurse

8. Other:
   a. Assist and/or obtain IV access (2 large bore IV’s 16 or 8 gauge)
   b. Monitor and record vital signs every 15 min or more frequently if required
   c. Page surgery 800 or 141 if emergent vascular access is needed
   d. The Runner will transport the cooler from Blood Bank. As coolers are emptied, it is necessary for the runner to continually return empty coolers from the MTP site to the Blood Bank.
   e. Packed red blood cells and plasma units may be transported in the same cooler during MTP. Blood products issued during MTP are transported in blood bank coolers with ice packs allowing a 8-hour grace period. Products should not be removed from cooler until time for transfusion.
   f. All blood products that DO NOT require refrigeration such as Platelets and or Cryoprecipitate are issued using a container under room temperature. Platelets must be thawed in 30 minutes.
   g. The Blood Bank will continue to stay one cooler ahead until notice of MTP deactivation is received. Blood Bank will not release more than two coolers at a time.Units of blood must be returned within two hours of issuance if not infused. Never place Platelets or Cryoprecipitate inside the cooler.
   h. If a shipment has been prepared and the runner/communicator has not picked up the filled cooler within an hour, the Blood Bank will call the MTP area and inquire about the status of the patient and MTP.
   i. Two licensed staff members will check each unit and it is recommended that both will sign the transfusion slip and record products given on the MTP Flow Sheet and subsequently record it in the EMR. Start time will be recorded on the transfusion slip. Original slip will be kept with medical record.
   j. A copy of the completed transfusion slip for the units that were transfused will be kept on the patient’s medical until discharge at which time they will be scanned into the electronic medical record by HIM.
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

k. Nurse will continue to administer products as rapidly as possible or as indicated by the “Team Leader” until the MTP is discontinued
l. Nurse documenter will ensure that the appropriate paper and electronic documents are completed.
m. Team Leader:
  a. The team leader will place order for the MTP in the EMR,
  b. Team leader is responsible for running the resuscitation until the MTP is terminated or until care is transferred to another qualified physician.
  c. The team leader will remain in contact with the blood bank
d. Team leader will consider ordering lab studies as follows: Hemoglobin and hematocrit, platelet count, (no WBC or differential necessary), electrolytes, PT/PTT, INR, ABG, Fibrinogen levels, and any other relevant tests.
e. Tranexamic Acid (TXA) should be administered 1 gram in 100ml of NS over 10 minutes, then repeat 1 gram over 8 hours in 250ml of NS

TVI will only be administered if less than 3 hours from time of injury

t. ABG, Ionized Calcium, CBC, BMP, PT/PTT/Fibrinogen hourly until MTP discontinued.
g. Consider Kcentra if PT remains abnormal.

i. Team leader may consider using:
  a. Rapid Infuser per Rapid Infuser Policy
    1. When the team leader requests use of the Level I Rapid Infuser, a dedicated, competent person must be available to operate it (Anesthesiologist, ED RN, CC RN, RRT RN) as per Rapid Infuser Policy.
    2. When the rapid infuser is utilized, a dedicated, nurse with documented competencies will be assigned to monitor only the rapid infuser. (See Rapid Infuser Policy)

THIS PROCESS CONTINUES WITHOUT INTERRUPTION UNTIL THE MTP IS DISCONTINUED BY THE “TEAM LEADER”

h. Blood Bank technologist will take the emergency release of un-crossmatched blood from the nursery and release blood product as quickly as possible

i. First Pick up: 4 Units PRBC; 2 Units thawed A Low titer FP or AB FP; 1 Unit Platelets + PRBC (Unless patient is previously typed or cross matched). If crossmatched blood is not available, type O blood will be issued. In the event of O negative shortage, O positive RBC may be utilized in males or in females beyond child bearing age.

j. Second Pick up: 2 Units PRBC; 4 Units thawed FP (this will be the first pickup when MTP is activated following Code H Activation)

k. Subsequent Pick up: 6 Units PRBC; 6 Units thawed FP; 1 Unit Platelets continuously prepared and released until discontinued by Team Leader Physician.

1. TERMINATION OF MTP PROTOCOL
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

a. The team leader determines that the MTP is no longer necessary based on the clinical condition of the patient.
b. The blood bank is immediately notified by the team leader or nurse.
c. Upon termination, the Blood Bank will be immediately notified in order to minimize wastage of blood products.
d. Unused blood products should be returned to blood bank by the nurse when no further transfusion is indicated as soon as possible.
e. The blood bank must return to Blood Bank less than 30 minutes if not stored in a cooler or designated blood refrigerator.
f. Cancel MTP order in EMR.
g. RN will document in EMR total amount of blood and blood products infused.

m. Hypothermia Considerations:
   1. Providers are to monitor hypothermia that should be aggressively controlled using any or all of the following methods:
      i. High flow replacement systems
      ii. All fluids administered are to be warmed at 40 degrees C, but no higher
      iii. Bair Hugger
      iv. Ventilator Humidifier to be heated as necessary
      v. Hyperthermia Blanket
      vi. Consideration of central line placement if necessary

n. Pediatric Considerations:
   2. Pediatric patients that are 50 kg or greater requiring massive transfusion should be resuscitated following the adult guidelines with the goal of stabilizing and transferring to a pediatric center.
      i. Pediatric patients that are less than 2 year old requiring massive transfusion should be transfused O- neg, Irradiated HBS neg, CMV neg blood at 15mL/kg
      And only ABO fresh frozen plasma or ABO cryoprecipitate if necessary.

o. Post MTP Clinical Considerations:
   2. Note trends in Hgb and Hct in comparison to baseline values
   b. As warranted by patient condition, collaborate with health care team members to determine the appropriate site for continuing care of patient (PACU, ICU, or CCU)
   c. Communicate with the physician and other members of the health care team
   d. Monitor patient for acute complications following massive transfusion, including but not limited to:
      i. Acute hemolytic transfusion reaction
      ii. Acidosis, Alkalosis
      iii. Hypothermia
      iv. Hypo/hyperkalemia
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

- Hypocalcaemia
- Hypomagnesaemia
- Transfusion-associated circulatory overload (TACO)
- Monitor the patient for signs of delayed complications following massive transfusion, including but not limited to:
  - Systemic Inflammatory Response Syndrome (SIRS)
  - Bacterial Sepsis
- Transfusion related acute lung injury (TRALI)
- Laboratory tests are to be considered stat after each MTP. Although lab results may not reflect actual clinical situation, their measurements are crucial in intermediate within a few hours to long-term (greater than 24hrs) blood product utilization planning.
- Obtain blood work as ordered
- Monitor input and output status
  - Note particular focus in patients with known history or strong potential for cardiac disease.
- Monitor patient’s temperature and institute warming measures as ordered by team leader.
- Notify team leader of changes in vital signs (including temperature) or arrhythmias.

Performance Improvement and Patient Safety:
Within 48 hours, an after-action review will be performed by 1) Blood Bank member. 2) Trauma team member (if a trauma patient) or Performance Improvement department for medical/surgical patients, and 3) the ordering service unit. All MTP paperwork for each patient will be reviewed for protocol compliance. Cases will then be reviewed by the Laboratory Medical Director and the Trauma Medical Director. Each MTP activation will have the following monitored: (see attached PI Form)

1. Timeliness of activation and deactivation as well as order entry (Y/N) Explain
2. Appropriate MTP trigger realized (Y/N) Explain if NO
3. Timely availability of products (Y/N) Explain
4. Who activated MTP
5. Blood Bank appropriately informed of MTP (Y/N) Explain
6. Proper Type and Screen sent (Y/N) explain
7. Time from activation of MTP to first unit being infused
8. Patient outcome
9. Blood Product wastage (Y/N) Explain
10. RHIOMAC administered if indicated? (Y/N) Explain
11. TXA, K-CONTRA, NovoSeven or DIAVIP Administered? (Y/N) Explain
12. Were labs ordered as recommended and results followed? (Y/N)
13. Complications: TACO, TRALI, HEMOLYSIS, OVER TRANSFUSION: 1)THROMBOSIS RELATED- V/IMV/VTIA
14. Ratio of PRBC:PLT:PLT:PLTST; Totals of EACH
15. Amount of Crystalline, other fluids
South Nassau Communities Hospital: Massive Transfusion Protocol (MTP) Guidelines

Cases will be presented at Transfusion Committee meetings and Trauma Operations Meetings where opportunities for improvement will be identified and referred to individual departments for review as necessary by the Performance Improvement Department.

REFERENCES:
1. ACS/TQIP Massive Transfusion in Trauma Guidelines 10/2014

REPLACES: MTP portion of Code II: Life Threatening Hemorrhage and Massive Transfusion Protocol for Adults PF-PCS-147

REVISIONS/APPROVALS:

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Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

DEFINITIONS

Attending Physician
A physician selected by or assigned to the patient, who has primary responsibility for the patient’s care and treatment. Where more than one physician shares this responsibility, or where a physician is acting on the attending physician’s behalf, any such physician can act as the attending physician to carry out responsibilities under this policy.

Blood Avoidance Consult Team
Designated group of medical personnel with knowledge and education specific to blood avoidance treatment modalities. Also tasked with coordinating care for the blood avoidant patient when requested or where applicable. If facility does not have a local Blood Avoidance Consult Team, contact the local Blood Bank Director or designee. Pharmacy and/or Hematology services who in turn will escalate up through the appropriate service lines for consultation as necessary.

Blood Avoidant Patient
A patient who elects to be treated without blood or blood products.

Capacity
The ability to understand and appreciate the risks, benefits, alternatives and consequences of proposed health care decisions and to reach an informed decision. (See Administrative Policy 100.23 Informed Consent (Including Medical Decision Making for Patients who Lack Capacity and Minors))

Category I
Minor blood fractions (contain specific elements from the four elements of blood.)

Category II
Synthetic protein elements of blood. (Does not contain human plasma).

Category III
Does not contain human blood products therefore will be intentionally removed from consent.

Category IV
Procedures involving patient’s own blood.

Emancipated Minor
A minor whose parent or guardian has determined to treat the patient as an adult.

Health Care Agent
A person appointed by the patient (either verbally or in writing) to make health care decisions on his or her behalf and is documented on Health Care Proxy form, or another document containing the required components.

Jewish’s Witnesses Regional Liaisons (remains same)
Clarifies ethical issues for Witness patients or clinicians related to medical care. Arranges for pastoral care and practical assistance to hospitalized Witness patients.

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Minor
A minor is a person under the age of eighteen.

Health Care Surrogate
The person selected to make health care decisions for a patient who lacks Capacity and who has not been appointed a Health Care Agent which includes in order of priority: (a) legal guardian; (b) spouse (if not separated) or Domestic Partner; (c) adult child; (d) parent; (e) adult sibling or (f) Patient Representative; (g) Close Friend or relative not listed above.

PROCEDURE/GUIDELINES
See attachment A - Guidelines for Northwell Health Blood Avoidance Program.

REFERENCES & REGULATIONS and/or OTHER RELATED POLICIES
- NY Public Health Law Article 25-CC
- Administrative Policy #100.23 Informed Consent (Including Medical Decision Making for Patients who Lack Capacity and Minors).
- Administrative Policy #100.31 Patient Spiritual and Cultural Needs

CLINICAL REFERENCES/PROFESSIONAL SOCIETY GUIDELINES

ATTACHMENTS
- Flowchart for Cardiac/Coronary Surgery
- Flowchart for Orthopedic Surgery
- Blood Education Form
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

FORMS
- X13093 Informed Consent for Blood Avoidance, Blood Refusal and Blood Management

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Standardized Version History:
- ** Northwell Health Policy Committee Approval
- ** PICU Clinical Operations Committee Approval
  - 9/12/06*
  - 11/10/12*
  - 11/5/11*
  - 12/16 Hypersensitive*
  - 02/21/13** - Specified Approval
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

Guidelines for the Northwell Health Blood Avoidance Program

Patients who elect to be Blood Avoidant are not refusing care but choosing to be cared for differently which requires a proactive plan of care. Any Blood Avoidant Patient who wishes to accept a blood transfusion may change consent to blood and/or blood products at any time.

The Attending Physician and Blood Avoidance Consult Team will be notified of patients who elect to avoid blood or blood products. In addition, the Blood Bank shall receive a report of all patients identified as Blood Avoidant. The Blood Bank will immediately notify the Attending Physician of any orders for blood or blood products. The Attending Physician shall change or confirm such orders.

1. Identify patients who elect to be treated without blood or blood products and communicate to the treatment team and the Blood Avoidance Coordinator
   a. Patients who identify as Blood Avoidant and/or who notify a clinician that they refuse or wish to avoid blood and/or blood products will be identified by the clinical or admitting team.
   b. If necessary, the identifying clinician will notify the Attending Physician and the Blood Avoidance Consult team.

2. Plan of Care and Notifications
   a. For patients with capacity or who lack capacity, the Attending Physician will meet with the patient, Health Care Proxy or Surrogate, as applicable, to discuss the risks, consequences and benefits of avoiding blood as well as alternative treatments.
   b. The patient, Health Care Proxy or Surrogate will be asked to complete sVD003 Informed Consent for Blood Avoidance, Blood Refusal and Blood Management form and Blood and Non Blood Preferences regarding treatment including Category I-IV Products will be noted.
   c. The Attending Physician will develop a plan of care with input from the Blood Avoidance Consult Team.
   d. The preferences of the patient will be sent to the Blood Bank and Pharmacy as well as documented on the medical record.
   e. If a patient identifies his or her religion as one of Jehovah’s Witnesses, such identification will be placed on the respective hospital census and the applicable representative from the Jehovah’s Witnesses Regional Liaisons will be notified if
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and PatientsWishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

requested by the patient in accordance with Administrative Policy 100.31, Patient Spiritual and Cultural Needs.

f. The Attending Physician will meet with the patient to discuss the patient's plan of care. The members of the Blood Avoidance Consult Team and or representative from the Jehovah’s Witness Regional Liaisons may be included in discussions with the patient’s consent.

The Attending Physician and the Blood Avoidance Consult Team should be notified if ANY of the following events occur:

1. Patient’s status changes (i.e. patient becomes unstable, blood count drops (including hemoglobin, hematocrit, and or platelet counts))
2. Patient requires transfer to a higher level of care.
3. Patient is scheduled for a surgical procedure.
4. Patient or family crisis intervention needed;
5. Patient, family or clinician has questions about blood avoidance;
6. Patient wishes to be removed from the program.

h. A physician who does not wish to treat a patient who refuses blood or blood products should notify the patient and transfer the patient to an accepting physician. A member of the Blood Avoidance Consult Team shall maintain a list of medical and surgical physicians who are willing to treat a Blood Avoider Patient.

3. Minors
   a. A parent or legal guardian may consent to blood or request blood avoidance on behalf of a Minor. An emancipated Minor with Capacity does not need parental consent.

b. If a parent(s)/guardian(s) choose blood avoidance for a Minor, blood may still be given if needed to prevent the Minor's death or to prevent serious harm to the Minor's health. If the parent(s)/guardian(s) object, the Attending Physician must consult with the parent/guardian and discuss options, including but not limited to:

1. The seriousness of the Minor’s condition and the treatment needs of the Minor;
2. The medical need for blood or blood products immediately or during the course of a hospitalization;
3. Parents who refuse blood or blood products for a Minor should be advised that blood or blood products will be given over the objections of the parent or legal guardian if such avoidance could lead to a Minor’s death or seriously jeopardize the Minor’s health.

c. If parent/guardian objects to transfusion because he or she is one of Jehovah’s Witnesses, a member of the Blood Avoidance Consult Team and Jehovah’s Witnesses Regional Liaisons should be called. Parent/Guardians who are Jehovah’s Witnesses will be notified that blood will be given to a Minor if the Attending Physician or designee determines that failure to give blood could lead to
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the Minor’s death or seriously jeopardize the Minor’s health. The parent or guardian shall not be required to sign the consent for blood transfusion and shall be consulted before any blood is transfused.

d. If blood is given over the objection of the parent or guardian, the Attending Physician shall order the blood and the Attending Physician and another physician not directly involved in the patient’s care must document that blood, blood products or blood transfusion is necessary to save the Minor’s life or prevent serious harm to the Minor’s health.

e. If the Minor’s condition requires intervention by a third party vendor (e.g. New York Blood Center “NYBC”), the attending or designee shall provide the third party vendor with a copy of the order and the reason for the order and documentation that blood or a blood transfusion procedure is necessary to save the Minor’s life or prevent serious harm to the Minor’s health.

f. If the patient, legal guardian and the Minor disagree on the course of treatment, the Minor’s wishes should be given due consideration. An ethics consult can be called to help and aid in resolution.

4. Pregnant Patients

a. The Attending Physician must determine whether failure to administer blood therapy could result in serious harm to the patient and/or the fetus.

b. The Attending Physician or designee must fully explain the refusal options and offer the patient the opportunity to choose alternative treatments. Patient preferences will be documented on an A2003 Inform Consent for Blood Avoidance, Blood Refusal and Blood Management Form. The Attending Physician shall develop a plan of care and communicate it to the treatment team.

c. If it is determined that a pregnant patient requires blood products to avoid harm to herself or fetus, the Attending Physician and the neonatologist must ensure that the patient is fully informed of the specific risks that her refusal may create for her fetus and her self.

d. If the patient is judged to lack decisional capacity, the Attending Physician shall seek informed consent from the patient’s surrogate in accordance with the Administrative Policy #06/23 Inform Consent (Including Medical Decisions Making for Patients who Lack Capacity and Minors), and if the patient is one of Jehovah’s Witnesses, contact a member from Jehovah’s Witnesses Regional Liaisons.

e. If the patient with capacity or her Surrogate continues to refuse the treatment, the patient should be fully informed of the change in clinical condition and any indications that her health or that the fetus is at risk. If the patient continues to avoid
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

If the patient lacks capacity, treatment should be administered in alignment with guidelines outlined in Administrative Policy #100.23 Informed Consent (Including Medical Decision Making for Patients Who Lack Capacity and Minors).
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Orthopedic (Elective) and CT Surgery Blood Avoidance Process Flowchart

SDA/PACU Perioperative Huddle
Occurs in SDA PRIOR to patient going to the Operating Room.
Involves:
1) Patient
2) Anesthesia provider for the given case.
3) Primary SDA RN or Primary OR RN (if patient is in PACU as over-flow)
4) Perioperative Manager

Process:
1. Anesthesia Provider review patient’s preferences as documented on the Informed Consent for Blood Avoidance form.
3. SDA/OR RN confirm signatures and completion of Informed Consent for Blood Avoidance form.
4. SDA/OR RN notify Blood Bank at (516-562-4200) of patient and confirm form has been received by Blood Bank.
5. SDA/OR RN complete Perioperative checklist and document that huddle has occurred and by whom.
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

Blood Avoidance Program Frequently Asked Questions (FAQ):

- **What is blood avoidance care?**
  The term blood avoidance indicates “transfusion free” medicine, but does not mean that there will be no bleeding during an operative procedure. Our Program provides you with the best possible medical and surgical care without the use of blood or its derivatives. This is accomplished by way of non-blood management through alternatives that your health care team will follow respecting your beliefs and convictions.

- **How does blood avoidance care differ from other types of care?**
  In general, blood avoidance care does not mean instituting new medical procedures. Blood avoidance care means optimizing the oxygen-carrying capability of the blood. Blood avoidance therapies utilized are accepted standard protocols of care for minimizing blood loss. All interested patients will receive information and counseling on the risks of refusing blood and blood products.

- **Who is a candidate for blood avoidance medical or surgical care?**
  Every patient who chooses to refuse or avoid blood or blood products is a potential candidate for blood avoidance medical or surgical care. Each patient’s situation is reviewed with his or her physician to ensure an appropriate final decision.

- **Why should you go into the blood avoidance Medicine and Surgery Program?**
  The Blood Avoidance program provides you an alternative method of treatment with implementation of non-blood management. At Northwell Health our staff is continually perfecting its knowledge and skills in limiting the loss of blood while providing state-of-the-art medical care. As a patient in our Program you can be confident that you will have access to the full range of blood avoidance therapies and that your caregivers are committed to upholding your wishes to the fullest extent possible.

- **What are the benefits of a blood avoidance approach?**
  Patients who opt for a blood avoidance approach avoid a variety of risks such as contamination, disease transmissions, and allergic reactions. Research has also indicated that patients who opt out of receiving a blood transfusion may have shorter hospital stays, recover faster, have fewer heart attacks and strokes after surgery, and experience fewer infections often associated with blood transfusions.

- **What are the risks of blood transfusion?**
  Patients undergoing a blood transfusion are at risk of contracting hepatitis B, hepatitis C, HIV, malaria, parasites, syphilis, and other diseases or viruses. Patients receiving blood transfusions are also at an increased risk of contracting hospital-acquired infections. Your doctor will discuss the options with you and explain all the risks before any procedure.

- **How is blood avoidance surgery performed?**
  Since almost every surgery results in some amount of blood loss, doctors can administer medications and nutritional supplements prior to surgery that will allow your body to produce more red blood cells, which will allow your body to better handle blood loss during surgery. During surgery, specific tools and techniques can be administered that minimize tissue disruption, stop bleeding, and recycle lost blood back into your body. After surgery, advanced techniques can be used to further minimize bleeding.

- **Will My Insurance Cover blood avoidance Techniques?**
  Blood avoidance medicine and surgery is an accepted form of healthcare. There are usually no additional costs for blood avoidance care.
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

- What effect can nutritional supplements have on my surgery?
  Research indicates that many nutritional supplements and medications can lead to severe complications involving blood loss. Some of these supplements, herbs, and medications include garlic, ginger, ginseng, feverfew, flax seed, fish oil, dong quai, kava, licorice, saw palmetto, St. John’s wort, omega 3, and valerian. It is essential for every patient to inform their doctor of any supplement, herb, or medication they have or currently are taking.

- Can I change my mind about the blood avoidance program at a later date?
  Yes, the blood avoidance program is voluntary so patients can withdraw from the program or join in as they wish.

- Can doctors perform high-risk/invasive procedures without blood transfusions?
  Yes, many procedures such as cancer surgeries, heart surgeries, joint surgeries, and organ transplants can all be done without a blood transfusion.

- Why do some patients accept blood fractions?
  Some patients believe that blood fractions are no longer whole blood or even one of the primary components of blood, and this choice according to certain religious groups can be determined by individual conscience. MINOR BLOOD FRACTIONS include the following: Albumin, Clotting Factors, Colony Stimulating Factors, Erythropoietin (EPO), Factor I, Factor II, Plasmanate, Fibrinogen/Fibrin, Immunoglobulins, Interferon, Rh Factor, Thrombin.

- Why do some patients refuse blood transfusions?
  Patients may refuse blood transfusions due to religious beliefs, particularly Jehovah’s Witnesses, whose basis of refusal is found in Biblical commandments. Other patients who are non-Witnesses refuse blood transfusions for reasons such as fear of blood-borne disease, or prior negative experience with transfusion, such as hemolytic or anaphylactic reactions. To others, it may be culturally distasteful.

- Is there someone I can contact for more information regarding the Blood Avoidance Program?
  Yes, Jehovah’s Witnesses should contact their local congregation elder. The elder will reach out to the Hospital Liaison Committee. The Hospital Liaison Committee is comprised of a group of individuals who volunteer and interact between the hospital and patient to effectuate better communication. Below is a list of telephone numbers for sites with dedicated coordinators who work with patients to ensure they understand and receive adequate blood avoidance care in various Northwell Health locations. If you do not see your location, please contact xxx-xxx-xxx.

  - Cohen’s Children Medical Center (718)-470-3757
  - Long Island Jewish Forest Hills Hospital (718)-830-1180
  - Southside Hospital (631)-969-4544
  - Staten Island University Hospital (888)-682-5663
  - Nassau County HLC - Robert J. Goebert – 516-445-0098(C) 516-742-1693(H)
  - Suffolk County HLC - Gerald Renner – 631-495-7749(C) 631-583-3196(H)
  - NYC HLC (5 boroughs) - Paul Peterson – 917-915-2399(C) 718-776-2399(H)
  - Mid-Hudson Region - William Woods – 917-592-5667(C) 631-926-3309(H)

References/Resources:
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

Informed Consent for Blood Avoidance, Blood Refusal and Blood Management

1. Refusal of Consent to Blood or Blood Products. I have discussed with my Attending Physician, his/her associates or assistants and possible residents at this healthcare facility regarding my blood and non-blood preferences. I have carefully considered and clearly expressed my unconditional opposition to receiving blood or blood products except as noted in Section 3 below even if these products are necessary to prevent death or serious injury.

2. Explanation of procedure(s), risks, benefits and alternatives. My doctor(s) has explained and answered all my questions about the risks and benefits of timely blood transfusions, risks of delayed blood transfusions, and alternatives to blood transfusions. I understand that refusing blood transfusions and blood products may hinder my ability to receive generally accepted medical care and refusing blood or blood products may endanger my health and life or require alternative invasive treatments.
   a. All Patients. I am aware that a situation may arise where I could die without a blood transfusion and where there would be no substitute for blood. Nevertheless, should death result because of my refusal I accept that eventuality and will not accept blood. I have been given the opportunity to ask questions and my questions have been answered satisfactorily.
   b. Obstetrical Patients. I have been informed and understand that the physicians and staff are committed to employing every means possible to arrive at a positive outcome for me and my fetus without compromising my beliefs concerning the use of blood. However, I am aware that a situation may arise where I or my fetus could die or suffer significant disability without blood or blood products and where there would be no substitute for blood.

3. Patient Preferences. The following are my preferences regarding certain procedures, treatments, and blood fractions (INITIAL all that apply):

<table>
<thead>
<tr>
<th>Whole elements of blood (components that make up whole blood):</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red blood cells - Blood cells that transport oxygen throughout the body.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Blood Cells - Cells produced by the body to fight infection.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autologous-Banked Blood - Patient’s own blood collected and stored prior to procedure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelets - Component of blood designed to stop bleeding by clumping together.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma - The fluid component of blood.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category I - Minor blood fractions (contain specific elements from the four elements of blood):</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin - Protein made in the liver that makes up approximately 4% of plasma volume. Used for situations including burns, massive bleeding and liver failure. It helps maintain appropriate volume inside blood vessels, as well as adequate blood pressure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythropoietin (except Aranesp) - stimulates bone marrow to produce red blood cells.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

<table>
<thead>
<tr>
<th>Category II-Synthetic protein elements of blood: (Does not contain human plasma)</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor VIII (NOVASEVEN)- This is the recombinant or synthetic form of Factor VIII (protein that causes blood to clot)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor VIII Recombinant- Used to control and prevent bleeding episodes in people with low levels of factor VIII (protein in blood that is essential for blood clotting). This product contains a man-made form of factor VIII, also called antihemophilic factor. This product is used to temporarily replace the missing factor VIII.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor IX Recombinant- A protein substance in blood plasma that is essential for the clotting of blood.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor XII Recombinant (Berlin)- Product that routinely prevents bleeding in patients with rare genetic clotting disorder (also known as congenital Factor XII-a subunit deficiency).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Category III-Intentionally Removed From This List - Does not contain human blood products

<table>
<thead>
<tr>
<th>Category IV-Procedures involving patient’s own blood</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Saver- continually processes and reinfuses the patient’s own blood during surgery. Shed blood is suctioned from the wound, centrifuged, washed, mixed with an additive/coagulant solution and then re-infused via a filter (leucocyte depleted) as required.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Informed Consent for Blood Avoidance, Blood Refusal and Blood Management

4. I understand that the following products contain no elements of blood and may be used as determined medically appropriate:
   • Enzyme preparations (e.g. Amtespi, EDA/P, Vitrase, K, Amicar, and Thrombin)

5. Understanding of this form: I confirm that I have read this form. I fully understand its contents and that all the blank spaces have been completed prior to my signing.

6. Right to revoke: I have the right to revoke this consent at any time. I understand that I may revoke this consent except to the extent that action has already been taken based on this consent.

| Patient/Guardian’s Name (Signature) | Date / Time | Print Name | Relationship to either patient
|-------------------------------------|-------------|------------|-----------------------------|

Telephone Interpreter 

| Signature Interpreter | Date / Time | Print Interpreter’s Name and Relationship to Patient
|------------------------|-------------|-----------------------------------|

Witness to signature (Signature) 

| Date / Time | Print Witness Name
|-------------|---------------------|

* The signature of the patient must be obtained unless the patient is an incompetent individual under the age of 18 or a competent individual age 18 and over.

Attending Physician’s Certification: I certify that I have explained the nature, purpose, benefits, complications from, risks of, alternatives (including no treatment and attendant risks), likelihood of achieving goals of care and potential problems that might occur due to the patient’s decision to avoid blood and blood products. I have offered to answer any questions and have fully answered all such questions. I believe that the patient/parent/legal guardian fully understands what I have explained and answered. In the event that I was not present when the patient signed this form, I understand that the form is only documentation that the informed consent process took place. I remain responsible for having obtained the consent from the patient.

Responsible Practitioner’s Signature 

| Date / Time | Print Responsible Practitioner’s Name | Contact Information
|-------------|--------------------------------------|-----------------------------|

Page 3 of 3
White Plains Hospital: Patient who decline Blood Products

PATIENTS WHO DECLINE BLOOD PRODUCTS

In The Office

Antepartum Discussions and Documentation:

1. Screen all patients regarding potential to refuse some/all blood products
2. Discuss and document the risks of hemorrhage and the increased risk of death and morbidity
3. Discuss possibility of additional surgery, including hysterectomy, in the event of a PPH
4. Privately discuss patient’s refusal of blood products (without family members) to understand patient’s autonomous decisions in the event of a PPH
5. Present and complete the blood product acceptance form (see attached)
6. Document the patient’s understanding of the consequences of refusing blood products in a detailed informed consent form (see attached)
7. Complete a health care proxy form. This should be completed with a health care agent designated, clarifying the agent’s ability to make decisions regarding blood products if the patient’s capacity is lost due to anesthesia or hypotension/shock
8. Send the documents and documented discussions to the delivering hospital

Antepartum Preparation:

1. Maximize Hct/Hgb
   - Iron, Vitamin C and folic acid (oral or IV as indicated)
   - For low Hct/Hgb consider hematology consult and/or Erythropoietin 40,000 units/week or 20,000 units/day for faster response (recombinant erythropoietin contains albumin and may not be acceptable to all patients)
2. Obtain consultations from MFM and anesthesia as indicated
3. Identify hemorrhage risk factors and consider delivery at hospital with higher level surgical/intensive care (ex: placenta increta)

In The Hospital

Labor & Delivery Admission:

1. On admission, identify all patients who refuse blood products
2. If blood product form is not available, complete the form on L&D
3. Alert the OB team (attending, hospitalist, anesthesia)
4. Identify risk factors for hemorrhage
5. Prophylactic administration of tranexamic acid (1 g/10 ml) immediately prior to delivery and normovolemic hemodilution (if acceptable to the patient) should be done
White Plains Hospital: Patient who decline Blood Products

**BLOOD PRODUCT ACCEPTANCE LIST**

My signature below indicates that I request no blood derivatives other than the ones which I have designated in this consent to be administered to me during my hospitalization.

My attending physician, __________________________ MD has reviewed and fully explained to me the risks and benefits of the following blood products and methods for alternative non-blood medical management and blood conservation available to me.

My attending physician, __________________________ MD has also fully explained to me the potential risk associated with not authorizing blood or non-blood management during my hospitalization.

<table>
<thead>
<tr>
<th>Category I</th>
<th>WILL ACCEPT</th>
<th>WILL NOT ACCEPT</th>
<th>MAY ACCEPT UNDER CERTAIN CIRCUMSTANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Blood Cells</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh Frozen Plasma</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Platelets</td>
<td></td>
<td></td>
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<tr>
<td>Autologous Banked Blood</td>
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<td></td>
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<tr>
<td>Cryoprecipitate</td>
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<td></td>
</tr>
<tr>
<td>Category II (Contains human plasma)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Albumin</td>
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<td></td>
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<tr>
<td>Fibrin Glue</td>
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<tr>
<td>Fibrinogen Concentrate (RiaSTAP)</td>
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<tr>
<td>RhoGAM</td>
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<tr>
<td>Plasma Protein Fractions/Plasmanate</td>
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<tr>
<td>Human Immunoglobulin</td>
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<tr>
<td>Factor II-VW Concentrate (Humate-P and Wilate)</td>
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<tr>
<td>Prothrombin Complex Concentrate</td>
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<tr>
<td>Bebulin (3 Factors)</td>
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<tr>
<td>Kcentra (4 Factors)</td>
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</tr>
<tr>
<td>Category III (Does not contain human plasma)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 7A (Novo 7)</td>
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<tr>
<td>Factor 8 Recombinant</td>
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<tr>
<td>Factor 9 Recombinant</td>
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<td></td>
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<tr>
<td>Factor 13 Recombinant (Tretten)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Category IV (No blood component)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tranexamic Acid</td>
<td></td>
<td></td>
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<tr>
<td>Amicar</td>
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<tr>
<td>DOAVP</td>
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<td></td>
<td></td>
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<tr>
<td>Erythropoietin — recombinant</td>
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<td></td>
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<tr>
<td>Hextend</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Balanced Salt Solutions</td>
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</tr>
</tbody>
</table>

Signature: __________________________ Date: ____________ Time: ____________

**Safe Motherhood Initiative**

Revised February 2019
## White Plains Hospital: Patient who decline Blood Products

<table>
<thead>
<tr>
<th>BLOOD PRODUCT EDUCATION FORM</th>
<th>WHERE TO ORDER</th>
<th>COMPONENT</th>
<th>CONTENT</th>
<th>EXPECTED EFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood Bank</strong></td>
<td>Packed Red Blood Cells</td>
<td>Contains red blood cells and a small amount of plasma</td>
<td>250 ml: increases hematocrit by 3-4% and hemoglobin by 1 g/dL</td>
<td></td>
</tr>
<tr>
<td><strong>Blood Bank</strong></td>
<td>Fresh frozen Plasma (FFP)</td>
<td>Plasma which contains clotting factors, albumin and immunoglobulins</td>
<td>250 ml: increases fibrinogen, normalization of PT, PTT</td>
<td></td>
</tr>
<tr>
<td><strong>Blood Bank</strong></td>
<td>Platelets</td>
<td>Platelets and plasma</td>
<td>250 ml: increases platelets</td>
<td></td>
</tr>
<tr>
<td><strong>Blood Bank</strong></td>
<td>Autologous Blood</td>
<td>Donated by patient for self-use</td>
<td>Need a high/normal hematocrit and usually is not used in emergencies</td>
<td></td>
</tr>
</tbody>
</table>

**Minor Blood fractions**

| **Blood Bank** | Albumin | A protein in human serum, highly processed/treated plasma derivative | Reverse hypovolemia (draws interstitial fluid into circulation) |
| **Blood Bank** | Factor VII NovoSeven | Concentrated preparation of clotting factor VII | Initiates thrombosis by activating platelets and the clotting cascade improving coagulation. Only effective after major sources of bleeding have been repaired. |
| **OR** | Fibrin Glue | Fibrinogen and thrombin | Create a fibrin clot to achieve hemostasis |
| **Pharmacy** | Erythropoietin | A hormone produced in the kidney; may contain albumin. | Controls RBC production |
| **Blood Bank** | RhoGAM | Medicine containing antibodies | Removes fetal cells that entered maternal circulation to prevent sensitization |
| **Blood Bank** | Human Immunoglobulin | Human protein antibodies | Immune antibodies to protect from infection |
| **Blood Bank** | Cryoprecipitate | Fibrinogen, Factors VIII, vWF, XIII, Fibronectin | Increases fibrinogen |
| **Blood Bank** | Humate-P (vWF/P VIII) | Protein factors; vWF, Factor VIII — human derived | May stop excessive bleeding, plays a role in clotting |
| **Blood Bank** | Prothrombin Complex Concentrate | Blood clotting factors II, VII, IX, X, and protein C and S; human derived | Reverses anticoagulation therapy; accelerates coagulation |
| **No Blood Component** | Tranexamic Acid | Antifibrinolytic | Potentially decreases amount and duration of blood loss by preventing breakdown of fibrin, preserving clots. May reduce progression to a more severe bleed. 1 gram 8 hours later. |
| **Pharmacy** | Amicar | Derivative amino acid lysine; antifibrinolytic | Aides in fibrinolysis |
| **Pharmacy** | Hetastarch | Non-ionic starch derivative | Volume expander (Hespan) prevents shock |

**Category IV**

| **Anesthesiology** | Isovolemic Hemodilution | Autologous blood removed from patient | Limits the use of banked blood |
| **Anesthesiology** | Hypervolemic Hemodilution | Administering a large volume of fluid before surgery so that when you lose volume during surgery you lose fewer RBCs |
| **Cell Saver – closed circuit** | Autologous blood – Blood lost during procedure | Can return up to 250 ml IV in 3 minutes, devoid of plasma and platelets |

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**Safe Motherhood Initiative**

Revised February 2019
White Plains Hospital: Patient who decline Blood Products

Informed Consent White Plains Hospital (Refusal to Permit Blood Transfusion)
Strong Memorial Hospital: OH Medication

**OH Medications**

**Misoprostol (cytotec)**
800 mcg given PR or 800 mcg buccal
(Buccal admin- pt. to hold between cheek and gum approx. 30 minutes before swallowing remaining fragments.)

**Methergine (methylergonovine)**
0.2 milligram = 1 mL administered IM
*Check BP prior to administration*  *NO methergine for HTN/Raynauds*
*Dose may be administered every 2-4 hours, max of 5 doses*

**Hemabate (carboprost)**
250 mcg = mL administered IM
*NO Hemabate for ASTHMA*  *May be given every 15 minutes, max 8 doses*

**Pitocin (oxytocin)**
10 U = 1 mL administered IM

**Tranexamic Acid (TXA)**
1 gram IV infusion over 10 minutes within 3 hours of delivery
*May be given again 30 minutes later if needed, up to 24 hours after initial dose*
Arnot Ogden Hospital: Obstetrical Alert

ArnotHealth
POLICY & PROCEDURE

POLICY #: OB.021
TITLE: OBSTETRICAL ALERT

DATE OF ISSUE: 2/15
LAST REVIEW/REVISED: 3/20
NEXT REVIEW: 3/22

APPROVAL: Sandra McCarthy, MSOL, MSN, DNP, CNM
APPROVAL: Marianne Zlotek, BSN, RN, Perinatal Unit Director

FACILITIES COVERED: ☑️ AOMC ☑️ AMS ☐ SJH ☐ IDMH

OWNERS: OBSTETRICS, LABOR & DELIVERY

POLICY: To improve situational awareness of the Perinatal Staff and leadership to an urgent or emergent event occurring on the Perinatal Unit.

SUPPORTIVE DATA: The Obstetrical arena is an area where emergencies are going to occur. Inpatient emergencies can be reduced by activating an Obstetrical Alert to bring clinicians to the bedside to help allocate resources and supplies.

**Rapid Response and Code blue team Alerts will continue to be utilized as needed.**

INDICATIONS:

Events that may require an Obstetrical Alert are but not limited to:

- Suspected uterine rupture
- Suspected placental abruption
- Umbilical cord prolapsed
- Obstetrical hemorrhage
- Prolonged Fetal heart rate deceleration
- Precipitous delivery if no provider on unit or immediately available

RESPONDERS:

- Perinatal Unit Director
- Nursing Supervisor
- Clinical Coordinators
- Charge Nurse from L&D and Postpartum
- NICU team
- OB Provider
- ICU Team
- Anesthesia

CALLING THE ALERT:

- Patient’s nurse or designee: Call x5000 and ask for an Obstetric Alert to the unit you are on. (Ex., “Labor and Delivery” OR “Maternity”).
- Press NICU button: Continue to use the NICU button to notify NICU.

ROLES AND RESPONSIBILITIES:

- Unit Clerk: Call patient’s provider and Anesthesia. Call NICU if not needed.

“This document, once printed, is not controlled. Refer to the A2Net for the most up to date version.”
Arnot Ogden Hospital: Obstetrical Alert

POLICY #: OB.021
TITLE: OBSTETRICAL ALERT

- Provider:
  - On Perinatal Unit: Respond to the unit where the event is taking place.
  - In OR: Please have someone call the unit where the alert is taking place to see if you are needed.
  - In Medical Center: Please call the unit mentioned in the alert to see if you are needed.

- Charge Nurse:
  - On the unit where event is occurring: Go to the room where the event is taking place.
  - Other Unit: Go to unit where event is occurring.

- Unit Director, Clinical Coordinator: Go to unit where event is occurring OR if off-site, call Unit Director or covering designee immediately.
  - Direct traffic
  - Assign scribe
  - Clear room of family members
  - Delegate additional roles

- NICU Team: Send DR team (one nurse and one provider) as if going to a STAT C.S.

- ICU Team: Send ICU team as if going to a Rapid Response.

ATTACHMENT(S):

REFERENCE(S):


FORM(S):

"This document, once printed, is not controlled. Refer to the A2Net for the most up to date version."
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

WESTCHESTER MEDICAL CENTER
Clinical Care: Policy and Procedure

<table>
<thead>
<tr>
<th>SUBJECT:</th>
<th>Code Noelie: Obstetrical Hemorrhage</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFFECTIVE:</td>
<td>01/2018</td>
</tr>
<tr>
<td><em>X</em> Reviewed or <em>X</em> Revised:</td>
<td><em>X</em> Revised date: 09/2020</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applicable Campus:</th>
<th>Patient population:</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>X</em> Poughkeepsie</td>
<td><em>X</em> Neonate</td>
</tr>
<tr>
<td><em>X</em> Valhalla</td>
<td><em>X</em> Adult</td>
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</table>

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PURPOSE
This guideline outlines the responsibilities of the Westchester Medical Center's (WMC) Maternal Hemorrhage Team (MHT), including communication, assessment, diagnosis, and rapid treatment of a patient during an obstetrical hemorrhage emergency.

SCOPE
Patients who meet the criteria for an obstetrical hemorrhage.

RESPONSIBILITY
Maternal Hemorrhage Team (MHT): Obstetrics (OB) Attending, OB Resident, Physician Assistant (PA), Nurse Practitioner (NP), Anesthesiology Team, Charge RN, Labor and Delivery (L&D), Scrub Technician, Charge RN from Antepartum/Postpartum Unit, Primary RN, Recorder RN, Nursing Supervisor, Respiratory Therapy.

In addition to the MHT team: Operating Room, Emergency Room, Pharmacy, Blood Bank, Laboratory, Courier.

Postpartum Hemorrhage (PPH):
Cumulative 24 hour blood loss of 1000ml or signs/symptoms of hypovolemia
- Primary: PPH occurs within 24 hours after delivery (also called Early PPH)
  Vaginal delivery greater than 500ml and Cesarean Delivery greater than 1000ml should be a signal for investigation.
- Secondary: PPH occurs 24 hours to 12 weeks after delivery (also called Late PPH)

Risk Factors for Obstetrical Hemorrhage:
Prenatal/Antepartum:
- Suspected previa, accreta, increta, percreta
- Pre-pregnancy BMI >50
- Clinically significant bleeding disorder
- Other significant medical/surgical risk
- Abnormal placenta
- Prior classical cesarean
- Prior myomectomy
- Uterine anomalies

Labor & Delivery (L&D) Admission:
- Prior cesarean, uterine surgery or multiple laparotomies
- Multiple gestation
- Grand multip
e - Prior Postpartum Hemorrhage (PPH)
- Estimated Fetal Weight (EFW) > 4000 grams
- Obesity Body Mass Index (BMI) > 40
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

WESTCHESTER MEDICAL CENTER
Clinical Care: Policy and Procedure

SUBJECT: Code Noelie: Obstetrical Hemorrhage

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- Hematocrit < 30% and other risk factors
- Platelet count < 70,000
- Active bleeding
- Known coagulopathy

Intrapartum:
- Chorioamnionitis
- Prolonged oxytocin use > 24 hours
- Prolonged 2nd stage
- Magnesium sulfate use
- New active bleeding

Etiology for Obstetrical Hemorrhage: Atony, may be related to:
- Over distension (multiple gestation, polyhydramnios, macrosomia)
- chorioamnionitis
- Drug: terbutaline, magnesium sulfate, prolonged oxytocin use, general anesthesia
- Uterine inversion
- Fibrinoid uterus

Genital Tract Trauma, may be due to:
- Lacerations (perineal, vaginal, cervical).
- Episiotomy
- Operative vaginal delivery
- Precipitous delivery
- Uterine rupture

Retained Placental Tissue:
- abnormal placentation
- retained placental tissue

Coagulation Defects, may be due to:
- Preeclampsia
- Inherited clotting factor deficiency
- Severe infection
- Amniotic fluid embolism
- Excessive crystalloid replacement
- Therapeutic anticoagulation

POLICY STATEMENTS
1. Staff shall be trained on the risk factors, etiology and identification of Obstetrical Hemorrhage and their roles on the MHT.
2. The OB Attending / designee shall complete an assessment determining maternal hemorrhage risk on admission to labor and delivery and postpartum, following ACOG OB hemorrhage risk assessment (Attachment 1).
3. Identification and treatment of OB hemorrhage is conducted in accordance with the ACOG OB Hemorrhage Stages 1 through 4 algorithms (Attachment 2).
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

WESTCHESTER MEDICAL CENTER
Clinical Care: Policy and Procedure
Manual Code: C83-001A

SUBJECT: Code Noel: Obstetrical Hemorrhage

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4. Quantification of blood loss (QBL), such as weighing, are significantly more accurate than estimate blood losses (EBL). QBL reduces the likelihood that clinicians will underestimate the volume of blood lost and delay early recognition and treatment.
5. A Code Noel should be initiated when a patient meets criteria for PPH.
6. The OB or Anesthesiology Attending MD/designee may activate the Massive Transfusion Protocol (MTP).
7. Only the OB Attending/designee may terminate the MTP.
8. During a Code Noel, the patient shall be on a continuous cardiac/respiratory monitor.
9. During a Code Noel, vital signs shall be assessed and documented, including Pulse, Respiration, Blood Pressure, and O2 Saturation.
10. If applicable, Fetal Heart Rate (FHR) and Uterine Activity (UA) shall be continuously monitored.
11. OB Hemorrhage kits shall always be available on Labor & Delivery (L&D) and the Antepartum/Postpartum Unit and shall be used to manage postpartum hemorrhage (Attachment 3).

GUIDELINE:
Each Team member shall follow the OB algorithm (Attachment 4):
1. Call 7911 stating “Code Noel”, give location and extension. This begins the activation of the MHT.
2. The following MHT ancillary services shall be notified according to the algorithm:
   a. Blood Bank
   b. Main OR
   c. NICU
   d. Courier
   e. Pharmacy
   f. Laboratory
   g. Cell Saver Basper (7am-8pm)
   and Quick response/OR desk (6pm-7am)
   NOTE: It can take the Cell Saver team approximately 1 hour to come into the hospital.
3. The MHT will huddle and discuss plan of action.
4. The OB Attending/designee shall direct MHT when deemed appropriate to call the Code Noel Clear.
5. Debriefing with the MHT is advised after the Code Noel has been cleared for quality purposes.

Role Delineation:
A. OB Attending:
   1. Reviews assessment of patient with MHT
   2. Formulates and executes the plan of care with the Team.
   3. Activates Massive Transfusion Protocol as necessary / directs designee to activate.
   4. Requests call for back-up Attending as needed.
   5. Identifies the need for Cell Saver.
   6. Implements the use of the Baldr Balloon/tamponade if indicated.
   7. OB Attending shall conduct a team debrief following a Code Noel
   8. Sign all verbal orders given during the emergency.
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

WESTCHESTER MEDICAL CENTER
Clinical Care: Policy and Procedure

SUBJECT: Code Noel: Obstetrical Hemorrhage

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B. OB Resident:
1. Assess patient condition:
   a. Vital signs
   b. Urine output
   c. Identify hemorrhage stage, document estimated blood loss
   d. Interpretation of FHR tracing if indicated
   e. Rule out lacerations (exam) if indicated
2. Administer bimanual compression of uterus if indicated
3. Communicates with OB Attending
4. Initiates MTP protocol when designated by attending
5. Places Orders for:
   a. IV fluids (crystalloid: estimated blood loss in 2:1 ratio with oxytocin)
   b. Laboratory tests: CBC with platelets, coagulation profile, type and cross. Will use the STAT Code Noel: OB Hemorrhage Lab Form
   c. Medications
   d. Blood products (per WMC Transfusion Policy)
   e. Foley catheter
   f. Bakri Balloon tamponade if indicated
   g. Oxygen as required
6. Accompanies patient to OR as indicated

C. Anesthesiology Team:
1. Secures IV access as necessary
2. Attending/designee activates MTP as needed
3. Identifies the need for RCTEM. (Needs one Blue top tube with yellow Type and Screen slip RCTEM written on it to be hand delivered to Blood Bank by courier)
4. Implements Bair Hugger Therapy, if necessary
5. Accompanies patient to OR as indicated

D. L&D Charge RN:
1. If Primary RN of affected patient is also shift Charge RN, the decision to reassign Charge or Primary RN will be determined at the initial huddle
2. Assign patient to a Primary RN, and Recorder RN
3. Communicate with Supervisor and Charge RN from Antepartum/Postpartum Unit, for collate start notification of MHT ancillary services needed during the OB Hemorrhage
4. Obtain OB Hemorrhage Cart and Code cart to bedside
5. Place sign-in sheet on patient door to keep track of who responded to the OB Hemorrhage for documentation purposes
6. Obtain medications from Pyxis, OB Hemorrhage Med Kit
7. Communicate with Scrub Technician

E. Scrub Technician:
1. Prepares the OR for delivery/D&C/postpartum hemorrhage
2. Makes additional instruments available in OR to include: D&C tray, Hysterectomy tray, Bookwalter retractor, Cystoscopy tray, and Cystoscopy
3. Calls Main OR for cystoscopy tower
4. Calls Central Sterile Processing for additional instruments
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

WESTCHESTER MEDICAL CENTER
Clinical Care: Policy and Procedure

SUBJECT: Code Noel: Obstetrical Hemorrhage

F. 2 South Charge RN:
1. Assists with other patients on affected unit.
2. Coordinates with Unit Clerk regarding notifications and need for MD back-up.

G. Primary RN:
1. Identify patient per WMC policy and procedure.
2. Identify allergies
3. Place on continuous cardiorespiratory monitor
5. Fetal Heart Rate (FHR) and uterine activity (UA) should be continuously monitored, if indicated.
6. Ensure IV access with 2 large bore (16-18 gauge) lines.
7. Obtain baseline laboratory tests: CBC with platelets, coagulation profile, and PRN labs as ordered using the STAT Code Noel OB Hemorrhage Lab Form. (Can be sent through the tube).
8. Obtain type and cross according to WMC policy and procedure.
9. Provide oxygen 8-10 liters per minute by mask if oxygen saturation less than 92%, as ordered.
10. Insert Foley catheter as ordered.
11. Assess urinary output.
12. Ensure OB Hemorrhage cart is present.
13. Ensure Code Cart is present.
15. Administer medications as ordered by MD.
16. Administer blood products as ordered by MD and per WMC transfusion policy.
17. Assist MD with Balik Balloon if necessary.
18. Transport patient to OR.
19. Measure soaked chux, and weigh for blood loss estimation (1 gm = 1 ml blood)

H. Recorder RN:
1. Communicate with Primary RN.
2. Document on OB Hemorrhage Flow Sheet, including all events and time of events.
3. Ensure sign in sheet is on patient door to keep track of who has responded to the OB Hemorrhage for documentation purposes.
4. Code Cart is present.
5. Document:
   a. Vital signs, oxygen saturation levels.
   b. FHR tracing and UA, if indicated
   c. IV catheter: location, time/date placed, gauge, number of attempts, and the type and amount of fluids infused.
   d. Indwelling urinary catheter insertion time and date, and the amount, color, and appearance of urine returned as well as accurate intake and output measurements.
   e. Medications given, route of administration, dosages, effectiveness, any adverse effects.
   f. Record all verbal orders given by MD during emergency.
   g. All interventions and patient’s response to intervention.
   h. Record all staff present, and all persons notified.
6. Assist in transferring patient to OR.
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

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Clinical Care: Policy and Procedure

Manual Code: OB-001A

SUBJECT: Code Noelie: Obstetrical Hemorrhage

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7. Function as the second RN to circulate in the OR.

I. Nursing Supervisor:
   1. Assist with family of affected patient.
   2. Call Social Work if necessary.
   3. Mobilize additional team members as needed.

J. Respiratory Therapy:
   1. Supply oxygen as ordered.
   2. Assess and document breath sounds and oxygen saturation %.
   3. Communicate with team and implement orders (i.e. Arterial Blood Gas).

REFERENCES
ACOG District II Safe Motherhood Initiative 2014
ACOG OB Hemorrhage Risk Assessment Tables (revised January 2019) and OB Hemorrhage Checklist - Stages 1, 2, 3 and 4 (revised June 2019)
Belfort, Michael A. “Management of postpartum hemorrhage at vaginal delivery” UpToDate
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Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

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Clinical Care: Policy and Procedure

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TJC, New Standards for Perinatal Safety (3-2020) P.06.01.01, PC.06.03.01

DEFINITION
Postpartum Hemorrhage (PPH):
Cumulative 24-hour blood loss of 1000ml or signs/symptoms of hypovolemia
- Primary: PPH occurs within 24 hours after delivery (also called Early PPH)
  Vaginal delivery greater than 500ml and Cesarean Delivery greater than 1000ml should be a signal for investigation.
- Secondary: PPH occurs 24 hours to 12 weeks after delivery (also called Late PPH)

Archival history:
Reviewed: n/a

BACK TO START OF TOOLKIT
BACK TO START OF SECTION
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

### Obstetric Hemorrhage

#### Risk Assessment Tables

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<tr>
<th>Labor &amp; Delivery Admission</th>
<th>Medium Risk</th>
<th>High Risk</th>
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<td>Risk Factors</td>
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<tr>
<td>Prior cesarean, uterine surgery, or multiple laparotomies</td>
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<tr>
<td>Multiple gestation</td>
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<td>1 or more prior births</td>
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<tr>
<td>Prior PPH</td>
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<tr>
<td>Large myomas</td>
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<td>EFW &gt; 4000 g</td>
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<td>Obesity (BMI &gt; 40)</td>
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<td>Hematocrit &lt; 30% &amp; other risk</td>
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<td>Intervention</td>
<td>Type &amp; SCREEN, review protocol</td>
<td>Type &amp; CROSS, review protocol</td>
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<th>Intrapartum</th>
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<tr>
<td>Chorioamnionitis</td>
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<td>Prolonged oxytocin &gt; 24 hours</td>
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<tr>
<td>Prolonged 2nd stage</td>
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<td>Magnesium sulfate</td>
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<td>Intervention</td>
<td>Type &amp; SCREEN, review protocol</td>
<td>Type &amp; CROSS, review protocol</td>
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*Establish a culture of huddles for high-risk patients and post-event debriefing*

Safe Motherhood Initiative

Revised January 2019

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ACOG

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Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

### ADMISSION HEMORRHAGE RISK FACTORS

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<th>Medium (type &amp; screen)</th>
<th>High (type &amp; crossmatch)</th>
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<td>No previous uterine incision</td>
<td>Multiple gestation</td>
<td>Prior cesarean birth(s) or uterine surgery</td>
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<tr>
<td>Singleton pregnancy</td>
<td>&gt;4 previous vaginal births</td>
<td>Placenta previa, low lying placenta</td>
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<tr>
<td>≤ 4 previous vaginal births</td>
<td>Prior post-partum hemorrhage</td>
<td>Suspected Placenta accreta, increta or percreta or suspected abruption</td>
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<td>No known bleeding disorder</td>
<td>Large Myomas</td>
<td>Hematocrit &lt; 30 AND other risk factors</td>
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<tr>
<td>EFW &gt; 4000G</td>
<td>Platelets &lt; 70,000</td>
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<tr>
<td>Obesity (BMI &gt;40)</td>
<td>Known coagulopathy</td>
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<tr>
<td>Hematocrit &lt;30%</td>
<td>Active bleeding</td>
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<td></td>
</tr>
<tr>
<td>*2 or more medium risk factors</td>
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### INTRAPARTUM RISK

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<th>High Risk (Type &amp; Cross)</th>
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<td>Chorioamnionitis</td>
<td>New Active Bleeding</td>
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<td>Prolonged Oxytocin &gt;24 hours</td>
<td>2 or more medium (admission and/or intrapartum) risk factors</td>
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</tr>
<tr>
<td>Prolonged 2nd Stage</td>
<td></td>
<td></td>
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<tr>
<td>Magnesium Sulfate</td>
<td></td>
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</tbody>
</table>
Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

Obstetric Hemorrhage Checklist

Complete all steps in prior stages plus current stage regardless of stage in which the patient presents.

RECOGNITION:
- Call for assistance (Obstetric Hemorrhage Team)
- Designate: [ ] Team leader [ ] Checklist reader/recorder [ ] Primary RN
- Announce: [ ] Cumulative blood loss [ ] Vital signs [ ] Determine stage

STAGE 1: Blood loss >1500mL after delivery with normal vital signs and lab values. Vaginal delivery >500-999mL should be treated as in Stage 1.

INITIAL STEPS:
- Ensure 16G or 18G IV Access
- Increase IV fluid (crystalloid without oxytocin)
- Insert indwelling urinary catheter
- Fundal massage
- MEDICATIONS:
  - Ensure appropriate medications given patient history
  - Increase oxytocin, additional uterotonic

STAGE 2: Continued bleeding (EBL up to 5000mL or 2 or 3 uterotonics) with normal vital signs and lab values (two or more uterotonics in addition to routine oxytocin administration, or 1.2 administrations of the same uterotonic)

INITIAL STEPS:
- Mobilize additional help
- Place and IV (16-18G)
- Draw STAT labs (CBC, Coags, Fibrogen)
- Prepare OR
- MEDICATIONS:
  - Continue Stage 1 medications; consider TXA

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Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

STAGE 3: Continued Bleeding (EBL > 1500mL OR > 2 RBCs given OR at risk for occult bleeding/ coagulopathy OR any patient with abnormal vital signs/labs/oliguria)

INITIAL STEPS:
- Mobilize additional help
- Move to OR
- Announce clinical status (vital signs, cumulative blood loss, etiology)
- Outline and communicate plan

MEDICATIONS:
- Continue Stage 1 medications; consider TXA

BLOOD BANK:
- Initiate Massive Transfusion Protocol (if clinical coagulopathy: add cryoprecipitate, consult for additional agents)

ACTION:
- Achieve hemostasis, intervention based on etiology
- Escalate interventions

Oxytocin (Pitocin):
- 10-40 units per 500-1000mL solution

Methylergonovine (Methergine):
- 0.3 milligrams IM (may repeat)
- Avoid with hypertension

15-methyl PGF2α (Hemabate, Carprofen):
- 250 micrograms IM (may repeat in 65 minutes, maximum 8 doses)
- Avoid with asthma; use with caution with hypertension

Misoprostol (Cytotec):
- 800-5000 micrograms PR
- 600 micrograms PO or 800 micrograms SL

Transsacitic Acid (TXA)
- 1 gram IV over 10 min (add 1 gram via to 1000mL NS & give over 10 min; may be repeated once after 30 min)

Possible interventions:
- Bakri balloon
- Compression suture/B-Lynch suture
- Uterine artery ligation
- Hysterectomy

STAGE 4: Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)

INITIAL STEPS:
- Mobilize additional resources

MEDICATIONS:
- ACLS

BLOOD BANK:
- Simultaneous aggressive massive transfusion

ACTION:
- Immediate surgical intervention to ensure hemostasis (hysterectomy)

Post-Hemorrhage Management
- Determine disposition of patient
- Debrief with the whole obstetric care team
- Debrief with patient and family
- Document

Revised September 2020

Safe Motherhood Initiative

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Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

<table>
<thead>
<tr>
<th>OB HEMORRHAGE KIT</th>
<th>LOCATED IN PYXIS</th>
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</thead>
<tbody>
<tr>
<td><strong>Drug</strong></td>
<td><strong>Dose</strong></td>
</tr>
<tr>
<td>Oxytocin (Pitocin)</td>
<td>I.V. 20 to 40 units in 1 liter of Normal saline or Lactated Ringer's Solution</td>
</tr>
<tr>
<td>Methyl-ergonovine (Methergine)</td>
<td>0.2 mg I.M.</td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>400 to 600 mcg Bucally, OR 800 to 1,000 mcg Rectally</td>
</tr>
<tr>
<td>Carprofen Tromethamine (Ibuprofen)</td>
<td>0.25 mg I.M.</td>
</tr>
<tr>
<td>Tranexamic acid (TXA) (Lysetta, Cyklokapron)</td>
<td>1g I.V. push over 10 mins OR 1g I.V. in 50 - 100ml bag of NS over 10-30 mins</td>
</tr>
<tr>
<td>Vasopressin</td>
<td>20 units/100 mL bag</td>
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Clinical Care: Policy and Procedure


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Attachment 4 Response Team Algorithm

Attachment 1
KEY:
Green: Overhead
Grey: Beeper

OB Hemorrhage

The practitioner identifying the OB Hemorrhage Calls CODE NOELLE

Any staff available to call, from L&D/2 South dial x 7911. CODE NOELLE (specify location)

RN Supervisor to L&D Unit
2 South Charge RN
L&D Charge Nurse
L&D Primary RN Implementer 2nd RN Recorder
OB Resident
OB Attending On call
Anesthesiol
Respiratory

Facilitator
Assist with unit flow
Assist with flow of patients on affected unit
Communicates to Unit Clerk

Place IV, Lollis, Blenis Insert Foley
Bedside assessment order blood and labs

To Location: OB Hemorrhage cart Code: 135. Urerstomies

Communicates to Sonob Tech

Implement Mass Transfusion Protocol and pre-op medications
Back up amending call in

Transports Patient to OR

Follows Physician’s orders. Run ABCs

Revised: 3/6/2016

Reviewed 9/2020
NYU Langone Health: Obstetric Hemorrhage, Management of the Patient Experience

O94 Hemorrhage Management

NYU Langone Hospitals
Obstetrics Service
Service Process Standard

PROTOCOL: Obstetric Hemorrhage, Management of the Patient Experiencing

PURPOSE: To provide guidance to the obstetric team for the clinical management of the patient experiencing obstetrical hemorrhage.

LEVEL: Interdependent

SUPPORTIVE DATA:
1. Hemorrhage is one of the leading causes of maternal mortality; and considered one of the most preventable.
2. Death due to obstetrical hemorrhage is multi-factorial and prevention requires an interdisciplinary response.
3. Hospital systems that support a rapid and coordinated response to extreme blood loss can limit maternal morbidity and improve maternal survival.
4. Pregnant women have hemodynamic compensatory mechanisms that may blunt the initial typical responses to blood loss, such as tachycardia and hypertension, until severe decompensation has occurred. Hypotension, dizziness, pallor and oliguria do not occur until blood loss is substantial (15% or more of total blood volume).
5. Underestimation of blood loss and reliance on symptoms and hemodynamic changes may delay fluid resuscitation and transfusion. If clinical judgement indicates the need for transfusion, do not delay while awaiting laboratory results. Fluid resuscitation and transfusion should be based on the estimation of current blood loss and the expectation of continued bleeding, regardless of apparent maternal hemodynamic instability. Initial laboratory parameters may not be indicative of current hemodynamic status. The purpose of transfusion of blood products is to replace coagulation factors and red cells for oxygen-carrying capacity, not for volume replacement.
6. Obstetric hemorrhage may be classified into 4 stages with accompanying signs and symptoms:
   a. Stage 1: Blood loss 500ml (Vaginal Delivery) or 1000ml (Cesarean)
NYU Langone Health: Obstetric Hemorrhage, Management of the Patient Experience

OH Hemorrhage Management

Delivery) with normal vital signs and lab values

b. Stage 2: Continued bleeding with QBL: > 1500ml, for cesarean birth: > 900ml, or 2 uterotonic for vaginal birth with normal vital signs and lab values

c. Stage 3: Continued bleeding:
   i. Blood loss: > 1500 for cesarean birth OR > 900ml for vaginal birth
   ii. 2 units PRBCs given
   iii. OR at risk for occult bleeding, coagulopathy
   iv. OR any patient with abnormal vital signs labs abnormal

d. Stage 4: Cardiovascular Collapse: Massive Hemorrhage, hypovolemic shock, or amniotic fluid embolism

7. Maternal hemorrhage emergencies should be handled with the same level of urgency and preparation as a cardiac code. The Obstetric Hemorrhage Team was developed as an organized response to maternal hemorrhage and a dedicated “hemorrhage cart” that is maintained by the unit will be brought to the bedside.

8. The New York State Department of Health, the New York City Department of Health and Mental Hygiene and the Joint Commission on Accreditation of Healthcare Organizations recommend that hospitals form hemorrhage teams and conduct “Hemorrhage Drills” to ensure the most efficient response to a hemorrhage emergency.

ASSESSMENT/INTERVENTIONS: (Pre-hemorrhage)

A. Risk Assessment: admission, pre-hemorrhage, and ongoing

1. On admission Labor and Delivery, review prenatal record patient’s history to identify the “at risk” patient. Risk factors include:

   a. Moderate Risk
      i. Prior C-section, uterine surgery, or multiple hysterotomies
      ii. Uterine over-distention
         1) FFW: > 4000gms
         2) Multiple Gestation
            i. Large anterior fibroids
            ii. Hematocrit: < 30
            iii. History of postpartum hemorrhage
            iv. BMI: > 40
            v. > 4 prior births
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b. **High Risk:**
   i. Patients with two or more moderate risk factors
   ii. Placenta previa, low-lying placenta
   iii. Suspected or known placenta accreta, percreta, increta
   iv. Coagulopathy
   v. Platelet count < 70,000

c. **Low Risk:** Patients presenting without any of the risk factors listed above.

2. Once per shift, and when maternal status changes, review antepartum and intrapartum risk factors. Intrapartum risk factors include:
   a. **Moderate Risk:**
      i. Chorioamnionitis
      ii. ≥ 24 hours of oxytocin
      iii. Prolonged 2nd stage of labor
         1) ≥ 2 hours for a Multipara
         2) ≥ 3 hours for a Primipara
      iv. Magnesium Sulfate
   b. **High Risk:**
      i. New Active Bleeding
      ii. 2 or more medium (admission and/or intrapartum) risk factors.
   c. Patients presenting without any of the risk factors listed above are at Low Risk for obstetric hemorrhage.

3. The following delivery events place the patient at higher risk for postpartum hemorrhage:
   a. Uterine Atony
   b. Genitourinary tract lacerations, episiotomy
   c. Retained products of conception
   d. Invasive or other abnormal placentation
   e. Uterine rupture
   f. Uterine inversion
   g. Operative vaginal delivery or cesarean birth

4. Consider pre-eclampsia status, as blood volume does not expand as normal.

**B. Interventions based on Hemorrhage Risk:**

1. Draw CBC and Type & Screen per HIP order on all patients, regardless of risk status.
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OB Hemorrhage Management

2. Review labs results for antibody presence. If antibodies detected then:
   a. Call blood bank for further information about antibody and potential cross matching time.
   b. Huddle with primary RN, Safety Officer, and primary attending. Discuss:
      i. Hemorrhage risk
      ii. Plan of care
      iii. Potential need for transfusion
      iv. Determine number of packed red blood cells to have on hold in blood bank

3. Draw additional labs per LIP for patients at moderate or high risk.

4. For patients at High Risk:
   a. Consider placement of 16G IV
   b. Bring blood products to the bedside if requested and ordered by attending provider.
   c. Other interventions per attending provider:
      i. Cell saver and technician on standby
      ii. Consult with interventional radiologist
      iii. Consult with on-call GYN oncologist
      iv. Consider delivery location

5. Interventions for patients who are Jehovah’s Witness or declines blood products (regardless of risk status):
   a. Ensure that the “Consent to Refuse Blood Products” form is completed, preferably obtained during the prenatal period. Appropriate counseling by the attending provider should occur early in the antepartum period. Ensure that the patient has adequate opportunity to speak to an obstetrician and anesthesiologist regarding her concerns and the risks/benefits of OB hemorrhage interventions upon admission to L&D.
   b. Administer iron therapy and hematopoietic agents per LIP order.
   c. Anticipate use of cell saver for C-section.
   d. Administer volume expanders per LIP order.
   e. Notify unit nursing leadership

ASSESSMENTS/INTERVENTIONS: (Hemorrhage)
A. All Obstetrical Hemorrhage
   1. Consider ultrasound machine for possible sonographic examination of the uterus for
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OB Hemorrhage Management

- Retained products of conception.
- Anticipate surgical management for the patient experiencing an obstetrical hemorrhage.
- Obtain placenta for inspection to look for missing cotyledons or aberrant vessels which may indicate the presence of an accessory lobes(s) and send to the pathology department.
- Anticipate blood product transfusion. The FIP's decision to transfuse should be based on the estimation of current blood loss and the expectation of continued bleeding, regardless of apparent maternal hemodynamic instability. **DO NOT DELAY** transfusion while awaiting laboratory results. Use cross matched blood if available, otherwise use type specific or O negative packed red blood cells.
- Monitor for signs and symptoms of hypovolemic shock.

B. By Stage of OB Hemorrhage

**Stage 1:**

1. **Initial Steps:**
   a. Ensure 14G or 18G IV Access
   b. Increase IV fluid (crystalloid without oxytocin)
   c. Insert indwelling urinary catheter, as needed
   d. Two hamped (funda) massage
   e. Consider bringing hemorrhage cart to bedside

2. **Medications:** (see ADDENDUM)
   a. Ensure appropriate medications given patient history
   b. Increase oxytocin from usual order set dose, additional uterotonics
   c. Consider colloid administration

3. **Blood Bank:**
   a. Consider ordering blood, releasing order when needed

4. **Action:**
   a. Determine etiology and treat
   b. Prepare OR, if clinically indicated (optimize visualization/examination)

5. **Assessment/Documentation:**
   a. Vital signs, including oxygen saturation, level of consciousness q 5-15 min
   b. Continue to quantify blood loss, and record cumulative blood loss on the whiteboard.
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Stage 2:

1. Initial Steps:
   b. Bring Hemorrhage Cart to bedside, along with portable light and ultrasound machine if needed.
   c. Alert primary attending if not at bedside.
   d. Perform interventions listed in Stage 1.
   e. Treat in place and transfer to OR or ICU at direction of OHT.
   f. Draw STAT labs per MD order. Anticipate CBC, Coagulation panel, Basic Metabolic Panel, Fibrinogen, arterial or venous blood gas, TEG.
   g. Establish 2nd large bore IV, at least 18G but 16G is preferable if needed.
   h. Maintain fluid volume with LR.
   i. Anticipate need for and assist in preparation and insertion of uterine tamponade balloon.

2. Medications: (see ADDENDUM)
   a. Administer additional uterine tone medications per LDR order.
   b. Consider colloid administration.

3. Blood Bank:
   a. Transfuse blood products as ordered by LDR.

4. Assessment/Documentation:
   a. Continue stage 1 assessments and documentation.
   b. Assess for signs of internal bleeding.

Stage 3:

1. Initial Steps:
   a. Activate OHT if not already done.
   b. Continue mobilization from stage 1 and 2.
   c. Coordinate possible transfer to OR or ICU if needed.
   d. Assign family support person.
   e. Apply upper body warming blanket if feasible.
   f. Use fluid warmer for blood products.
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g. Apply SCD boots if feasible.

h. Anticipate central hemodynamic monitoring or vasopressor support.

i. Anticipate and prepare for interventions based on the etiology of the hemorrhage:
   i. Uterine Tamponade Balloon
   ii. Vaginal uterine packing
   iii. Vaginal exploration/laceration repair
   iv. D&C
   v. Hematoma repair
   vi. Compression B-lynch Suture
   vii. Arterial embolization ligation
   viii. Hysterectomy.

2. Medications (see ADDED DCU)
   a. Consider tranexamic acid
   b. Consider re-dosing if received antibiotics as per LBP.
   c. Continue transfusion of blood products as ordered
      i. 1:1 ratio of PRBC to FFP. 1 unit platelet after every 4 PRBCs.
      ii. Anticipate the need to transfuse cryoprecipitate if patient is showing clinical signs of coagulopathy.
      iii. Intensivist Hematology consult as needed.

3. Blood Bank:
   a. Initiate Massive Transfusion Protocol as indicated.

4. Assessments/Documentation
   a. Continue stage 1 & 2 assessments and documentation
   b. Assess for signs of coagulopathy

Stage 4:
1. Mobilize Additional Resources as necessary
2. Activate Massive Transfusion Protocol
3. Perform ACLS as necessary

C. Special Circumstances:
   1. Post Stage 3 Hemorrhage (stabilized). Consider Stage 1 or Stage 2 based on risk factors.
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OH Hemorrhage Management

a. Initiate Modified Postpartum Management after stabilization of bleeding, regardless of delivery mode.
   i. Assess and evaluate character of blood loss and fundus every 15 minutes.
   ii. Monitor vital signs including oxygen saturation every 15 minutes.
   iii. Maintain monitoring and recording of strict intake and output.

b. Quantify cumulative weight of blood loss hourly; add it to cumulative blood loss on the White Board and I&O record.

c. Continue the above interventions for Modified Postpartum Management until OB care provider clears patient to resume vaginal delivery or cesarean section plan of care.

2. Antepartum Hemorrhage

a. Activate OHT and consider IRT.

b. Displace uterus.

c. Quantify blood

d. Assess and evaluate character and color of blood.

e. Place woman on continuous external fetal monitor. Assess and document fetal heart and uterine contraction patterns at least every 15 minutes.

f. Assess and evaluate presence and characteristics of pain

g. Anticipate the performance of an abdominal ultrasound by the LIP to assist in locating the source of the bleeding, placental position, gestational age, and fetal position.

h. Avoid vaginal and speculum exams until placenta previa is ruled out by ultrasound.

i. Evaluate laboratory values.

   i. Send blood specimens as ordered for hemogram, basic metabolic and coagulation profiles such as PT, PTT, fibrinogen, FDP, D-Dimer.
   ii. Obtain order for type and cross match for at least 2 units of packed red blood cells.
   iii. Repeat type and screen every 72 hours while woman is hospitalized.
   iv. Anticipate blood product replacement as needed.

j. Transfuse blood products as ordered

k. Maintain restricted activity as per IIP order. Promote lateral positioning.

l. Anticipate expedited delivery.
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3. **Coagulation Problems**
   a. Assess for bleeding from gums, nose, venipuncture and IV sites, bladder, uterus, incision sites, or episiotomy. Bleeding, purpura or bruising may occur.
   b. Profuse vaginal bleeding (postpartum with a firm uterus) and associated shock which may be out of proportion to the observed blood loss strongly suggests that coagulopathy has developed and that the blood components are needed.
   c. Anticipate aggressive fluid therapy. Administer fluid and blood products as ordered to replace and maintain circulating blood volume and clotting factors.
   d. Avoid intramuscular injections.
   e. Notify Nursing Leadership and prepare patient for transfer, when stable, to a higher level of care in close proximity to an operating room.

**SAFETY/CORRECTIVE ACTIONS**
1. **If** patient exhibits any of the following signs and symptoms, THEN notify the LIP and return to assessments/interventions based on stage of hemorrhage:
   a. Vital sign changes greater than 15%.
   b. Pulse oximetry 88-92 less than 95%.
   c. Pulse greater than 110.
   d. Respiratory rate greater than 26 or less than 14.
   e. Urine output less than 30 cc per hour.
   f. Decreasing level of consciousness.
   g. Onset or increase of vaginal bleeding.
   h. Evidence of intraventricular hemorrhage.
   i. Agitation or restlessness, or impending sense of doom.
2. **If** patient requires invasive hemodynamic monitoring such as an arterial line, central venous catheter or Swan-Ganz catheter, THEN prepare patient for transfer to a critical care setting in close proximity to an Operating Room.
   a. Anesthesiologist, obstetrician, Safety Officer, and nursing leadership or designee will determine postoperative disposition of the patient in conjunction with critical care physicians.
3. **If** patient desires to be breastfed, THEN notify the Lactation Consultant to watch for evidence of Shocks syndrome (pulmonary edema).
4. **If** patient has a stage 3 (>1500 ml) THEN consider re-dosing antibiotics as per LIP.
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HOSPITAL POLICIES, TOOLS & FORMS

PATIENT EDUCATION:
1. Inform patient and family of what is happening, treatment and expected outcome.
2. Explain interventions and why they are being performed.
3. Education may be limited in an emergency situation but should be attempted as much as possible.
4. The patient should be counseled by the physician about the likelihood of hysterectomy and blood transfusion if the diagnosis or strong suspicion of placenta accreta is formed before delivery.
5. Explain the potential for delayed lactogenesis due to Sheehan’s syndrome and interventions that can assist in increasing milk supply.

DOCUMENTATION:
1. Document the following
   a. Maternal and fetal assessments and interventions.
   b. Communications with health care practitioners.
   c. Changes in plan of care.
   d. Patient responses.
2. Document medications and dosages given
3. Document nursing or medical consults
4. Document intake and output, including quantified blood loss
5. Document blood product administration
6. Document patient and family education
7. If an Obstetrical Hemorrhage Team is called, document the event in the EATR, and all team members sign off on the OHT documentation.

REFERENCES
NYU Langone Health: Obstetric Hemorrhage, Management of the Patient Experience

OB Hemorrhage Management


DEVELOPED BY: OB Collaborative Practice Council

APPROVED BY: OB Collaborative, Pharmacy and Therapeutic Committee

DATE ISSUED: July 2010

REVIEW MONTH: June

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Revised July 2015
Revised April 2019
Revised September 2019
Revised June 2020

DISTRIBUTION: Patient Care & Nursing Standards manual
Ellucid website
# NYU Langone Health: Obstetric Hemorrhage, Management of the Patient Experience

## Obstetric Hemorrhage Management

### ADDENDUM
Uterotonics Agents & Medications for Postpartum Hemorrhage

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Primary Route (Alternate)</th>
<th>Frequency of Dose</th>
<th>Side Effects</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin (Pitocin)</td>
<td>20-40 Unit in 1000 mL of NS or 5% dextrose/0.45% NaCl solution IM / IV drip</td>
<td>IV or IM, unless if there is no IV access, IM may be used during Caesarean section</td>
<td>Continuous infusion</td>
<td>Usually none. Rarely, vomiting, watery stool, headache have been reported.</td>
<td>None for postpartum administration. Does not contraindicate with EPHEDRINE.</td>
</tr>
<tr>
<td>Methylergonovine (Methergin)</td>
<td>2 mg IM or IM/muscular</td>
<td>IM or IM/muscular</td>
<td>Every 2-4 hours</td>
<td>Hypertension, hypotension, nausea, vomiting</td>
<td>History of presence of hypertension, pre-eclampsia</td>
</tr>
<tr>
<td>15-methyl Prostaglandin F2α (Carboprost) (Hemabate)</td>
<td>25 mg IM / IM/muscular</td>
<td>IM / IM/muscular</td>
<td>Every 15-30 minutes not to exceed 8 doses</td>
<td>Vomiting, diarrhea, nausea, flushing or hot flashes, chills or shivering.</td>
<td>Acute cardiac, pulmonary, especially asthma, renal or hepatic disease</td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>600-1000 mcg</td>
<td>Per rectum, PO, or buccally</td>
<td></td>
<td>Vomiting, diarrhea, fever, chilli.</td>
<td>None for postpartum administration.</td>
</tr>
<tr>
<td>Tranexamic Acid</td>
<td>1 gram</td>
<td>IM or Intravenous</td>
<td>IV drip at 50 mL/hr, Maximum 30 min</td>
<td>Nausea, vomiting, diarrhea, hypotension, edema; and allergic reactions</td>
<td>Renal impairment - caution</td>
</tr>
<tr>
<td>Colloid</td>
<td>As per anesthesiologist or intensivist</td>
<td>IM</td>
<td>IM drip at 300 mL/hr for 130 kg patient</td>
<td>Fever, increased somnolence, decreased Hct, decreased urine output</td>
<td>1. Sepsis 2. Thrombocytopenia or coagulopathy 3. Hypovolemic shock</td>
</tr>
</tbody>
</table>

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NEW YORK STATE DEPARTMENT OF HEALTH

nysPQC
Prenatal Quality Collaborative
Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)

Policy/Procedure

Title: Management of Maternal Hemorrhage  Effective Date: Dec. 2006
Department: Maternal Child Health  Policy #: TX MCH24

Page 1 of 14 Including appendices

PURPOSE/ POLICY STATEMENT
Obstetrical hemorrhage is one of the leading causes of maternal mortality. Prompt recognition and treatment of hemorrhage is vital in reducing maternal mortality. Causes of obstetrical hemorrhage may occur in the antepartum, intrapartum or postpartum period. In the event of a “Code H” emergency, all elective procedures in L&D will be put on hold until Code H is cleared. I.e. Elective Pitocin Induction.

SCOPE
Physician, Certified Nurse Midwife (CNM/CM), Registered Nurse, Maternity Tech., Anesthesia, Nursing Supervisor

DEFINITION
Post-Partum Hemorrhage - Quantified blood loss greater than 1000 cc (Vaginal delivery or C-Section)
Code H – response mechanism used to activate maternal hemorrhage team.
- All patients admitted to L&D will have a Type and Screen or Type and Cross (based on risk assessment below) and a CBC drawn.
- All patients who are moderate or high risk must have a minimum of a saline lock for IV access.
Identify Patients at risk for Maternal Hemorrhage:
- Antepartum/Intrapartum Hemorrhage:
  - Placenta Previa
  - Abruptio Placenta
  - Placenta Accreta
  - Patients on Anticoagulation Therapy: Heparin, Lovenox Therapy
  - Patients with known Coagulation Disorders: ITP, vonWillbrand’s Disease, HELLP Syndrome
  - Uterine Rupture
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**ADMISSION HEMORRHAGE RISK FACTORS**

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Low (type &amp; screen)</th>
<th>Medium (type &amp; screen)</th>
<th>High (type &amp; crossmatch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No previous uterine incision</td>
<td>Multiple gestation</td>
<td>Prior cesarean birth(s) or uterine surgery</td>
<td></td>
</tr>
<tr>
<td>Singleton pregnancy</td>
<td>&gt;4 previous vaginal births</td>
<td>Placenta previa, low lying placenta</td>
<td></td>
</tr>
<tr>
<td>≤ 4 previous vaginal births</td>
<td>Prior post-partum hemorrhage</td>
<td>Suspected Placenta accreta, increta or percreta or suspected abruption.</td>
<td></td>
</tr>
<tr>
<td>No known bleeding disorder</td>
<td>Large Myomas</td>
<td>Hematocrit &lt; 30 AND other risk factors</td>
<td></td>
</tr>
<tr>
<td>EFW &gt; 4000G</td>
<td>Platelets &lt; 70,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obesity (BMI &gt;40)</td>
<td>Known coagulopathy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hematocrit &lt;30%</td>
<td>Active bleeding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INTRAPARTUM RISK**

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Medium (Type &amp; Screen)</th>
<th>High Risk (Type &amp; Cross)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chorioamnionitis</td>
<td>New Active Bleeding</td>
<td></td>
</tr>
<tr>
<td>Prolonged Oxytocin &gt;24 hours</td>
<td>2 or more medium (admission and/or intrapartum) risk factors</td>
<td></td>
</tr>
<tr>
<td>Prolonged 2nd Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium Sulfate</td>
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</tbody>
</table>
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**PROCEDURE**

1. **Assessment of the Patient:**
   - Once hemorrhage is identified, attending physician, CNM/NM, OB Hospitalist, or service physician if applicable will be notified stat.
   - Call hospital operator to overhead page Obstetrical Code ‘H’ and location (i.e. L&D, T5, room#...)
   - Initiate Maternal Hemorrhage Protocol (see page 7). Patients admitted through the main ED with an OB hemorrhage will be evaluated by the ED Physician and a determination will be made as to whether patient requires immediate treatment in the main ED, requires the OR, or can be transported to the OBED or Labor and Delivery unit.

2. **Notification Procedure**
   - Upon recognition of a patient with a bleeding emergency, call “Obstetrical Code H”. Staff member will dial the operator and announce “Obstetrical CODE H” with the location.
   - Immediately upon notification the operator will activate the maternal hemorrhage response team via page followed by an overhead verbal page “Obstetrical CODE H” with location.
     Members of the Maternal Hemorrhage response team to be paged and called are:
     - Nurse Manager/Nursing Supervisor (operator will contact by cellphone)
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- Anesthesia
- OB Hospitalist (GSH)
- On call Obstetrician (SACH – operator will page/call)
- Lab/Blood Bank Personnel

- The Charge Nurse of L&D/labor nurse (SACH) will inform the nurse manager if there is a need to obtain operating room staff as decided by the attending OB. The nurse manager will then inform OR staff of need.
- In the absence of the nurse manager and on the off shifts (weekends, holidays, nights) the charge nurse of L&D/labor nurse (SACH) will inform the nursing supervisor of the need for OR staff. The nursing supervisor will follow up with OR notification.

In the event of an antepartal/intrapartal hemorrhage, at GSH the L&D charge nurse will inform the NICU RN & Neonatologist of the emergency and request their presence at the delivery. At SACH the labor nurse will call the pediatrician on call.

Medication Response
- Access “Code H” medication kit from L&D pyxis and bring to location of the emergency. (Kit includes; pitocin, methergine, hemabate, and cytotec)
- Access Tranexamic Acid (TXA) 1 gram vial from L&D pyxis.
- Medications will be administered per MD order.
- Reference medication response recommendations in stages of hemorrhage (starting page 7).
- At the conclusion of the Code H: GSH – nursing shall replenish medications that were used during the Code H from the kit by removing the medications from the Pyxis cabinet utilizing the patient’s name. The nurse will then return the appropriately stocked Code H Kit to the Pyxis refrigerator. SACH – the Code H kit will be sent to Pharmacy, pharmacy will restock the medications & return the kit to the L&D Pyxis.

3. Response Team
- In the event additional critical care personnel is required (Intensivist, Critical Care RN, Respiratory Therapist) dial the operator and announce Rapid Response with the patient’s location. The nurse manager/nursing supervisor, in collaboration with the charge nurse/labor nurse (SACH) will coordinate management of emergency needs.

Designated Duties:
1. Surgeon and Anesthesiologist will be designated as team leaders
2. L&D or MB (depending on patient location) primary nurse will remain with patient and act as circulating nurse
3. Second RN will be designated as scribe, document event and assist anesthesiologist as needed.
4. Third RN or maternity tech. will act as a runner and will obtain equipment and set up as needed

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5. An L&D maternity tech will scrub for any surgical procedure when available. Competenced RN’s or operating room techs/RNs may scrub if needed.
6. OR scrub Tech and OR RN will be called to act as a resource person and/or to relieve L&D scrub RN and maternity technician as needed as identified by surgeon.
7. One RN will act as a runner for blood specimen transport and pick up.
8. Additional team members will be called by nursing supervisor on an “as needed” basis as per physician in charge of the emergency i.e. Additional Medical/Surgical Support

4 Laboratory
   a. Lab will be on alert for the duration of the emergency via follow up phone call.
   b. The following Lab work is required and drawn as STAT
      i. Type and Screen (additional sample will be needed – pt. will be re-banded)
      ii. CBC
      iii. PT, PTT, Fibrinogen
   c. Specimens will be given priority for processing and results will be available within 30 minutes of time received
   d. Critical lab values will be reported immediately per Policy TX Safe 18 (12/15).

5 Transfusion Protocol:
   a. The charge nurse or designee will begin communication with blood bank personnel, identify emergency location, and the need to initiate the massive transfusion protocol (MTP) per Policy TX Blood #11.
   b. If blood bank has no active sample and blood is required immediately a determination will be made by the physician if uncrossed matched blood is desired. If yes the emergency release of blood form will be filled out and taken to the blood bank for release of 2 units of uncrossed matched O negative blood.
      Forms are available in the OB Hemorrhage cart and on all units. Patient will then be typed and cross matched and re-banded.
   c. If blood bank has an active sample it will be notified of need for blood products.
      2 Units of blood will be available within 10 minutes. 4 units of blood will be processed and kept available. Each time 2 units are called for, 2 more units will be prepared and designated for the patient- keeping the number at 4 units until the emergency is over.
      i. Blood Release Cards, labels, blood tubes, and Red Hollister ID Blood Bands will be kept in OB Hemorrhage cart

6 Anesthesia
   a. Anesthesiologist will determine need for additional anesthesia support staff
   b. OR is alerted to possible need for additional personnel

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c. Charge nurse and anesthesiologist will maintain in constant communication with regard to the status of blood products.

7 Staffing
a. The nurse manager/supervisor will respond to unit and adjust staffing as necessary. Additional staff will be called as needed or pulled from other areas of the hospital. Priority will be given to the emergency.
b. Charge nurse will designate assignments for the duration of the emergency as outlined in section 3. This includes but is not limited to:
   i. Primary Nurse
   ii. Circulating Nurse
   iii. Scrub Tech
   iv. Unit Assistant
   v. Messenger/Runner
   vi. Family Liaison

8 Post-Operative Care Procedure
a. The Anesthesiologist and the Obstetrician will determine if the patient should be transferred to a higher level of care.
b. The nurse manager/nursing supervisor will facilitate the transfer of the patient.
c. Report will be given by the primary nurse to the receiving nurse face to face using the nursing transfer summary form.
d. Patient will be transferred with cardiac and other appropriate monitoring in place as needed with anesthesiologist, primary RN and attending physician.

9 Equipment
a. The following equipment will be made available during the emergency:
   i. Bair Hugger Blanket
   ii. Adult Code Cart
   iii. C/Section Instruments
   iv. L&D Hysterectomy Tray
   v. Ultrasound Machine
   vi. OB Hemorrhage Cart
   vii. Rapid Infuser (located in Emergency Dept.)

10 Quality Review
a. All maternal hemorrhage events will be reviewed by a quality management team which will consist of members from:
   - OB Nursing Leadership
   - Chief of Obstetrics
   - OB Hospitalist (GSH only)
   - Quality Management Department

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### Cumulative Blood Loss >1000ml vaginal birth or C/S - OR-
- Vital signs >15% change or HR >110, BP <85/45, 02 sat <95% - OR-
- Increased bleeding during recovery or postpartum

#### STAGE 1: OB HEMORRHAGE

<table>
<thead>
<tr>
<th>MOBILIZE</th>
<th>ACT</th>
<th>THINK</th>
</tr>
</thead>
</table>
| **Primary nurse, Physician or Midwife:**  
- Activate OB Hemorrhage, Protocol  
- Notify obstetrician (in-house and attending)  
- Notify Charge Nurse  
- Notify anesthesiologist  
- Notify NICU | **Primary Nurse:**  
- Establish IV access if not present, at least 18 gauge  
- Increase IV Oxytocin rate, 167-333 mL/hour of 30 units/500 mL solution titrated to uterine tone  
- Continue vigorous fundal massage  
- Administer Methylene 0.2 mg IM per protocol (if not hypertensive), give once, if no response, move to alternate agent  
- Vital signs, including 02 sat & level of consciousness (LOC) q 5 minutes  
- Weigh materials, calculate and record cumulative blood loss q 5-15 minutes  
- Administer oxygen to maintain 02 sat. at >95%  
- Empty bladder: straight cath. or place Foley with urineter  
- Type and Crossmatch for 2 units Red Blood Cells STAT (if not already done)  
- Keep patient warm  
- Physician or midwife:  
- Rule out retained Products of Conception, laceration, hematoma  
- Surgeon (if cesarean birth and still open)  
- Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior or uterus, and retained placenta  
- Staff will maintain communication with the patient and the family during and after the event explaining to the patient what is occurring and updating the family on the patient’s condition. | **Consider potential etiology:**  
- Uterine atony  
- Trauma/Laceration  
- Retained placenta  
- Amniotic Fluid Embolism  
- Uterine Inversion  
- Coagulopathy  
- Placenta Accreta  

Once stabilized: Modified Postpartum management with increased surveillance

---

Bon Secours Charity Health System Policy and Procedures Manual
Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)

<table>
<thead>
<tr>
<th>STAGE 2: OB HEMORRHAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOBILIZE</td>
</tr>
<tr>
<td>Primary nurse (or charge nurse):</td>
</tr>
<tr>
<td>Call obstetrician to bedside</td>
</tr>
<tr>
<td>Call Anesthesiologist</td>
</tr>
<tr>
<td>Activate Response Team:</td>
</tr>
<tr>
<td>✗ Notify Blood bank of hemorrhage; MTP initiation</td>
</tr>
<tr>
<td>Charge Nurse:</td>
</tr>
<tr>
<td>✗ Notify 2nd OB</td>
</tr>
<tr>
<td>✗ Initiate OB Hemorrhage Record</td>
</tr>
<tr>
<td>✗ Notify nursing supervisor</td>
</tr>
<tr>
<td>✗ Assign single person to communicate with blood bank</td>
</tr>
<tr>
<td>✗ Assign family support person</td>
</tr>
<tr>
<td>✗ Page Nurse Manager and Anesthesia</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

Bon Secours Charity Health System Policy and Procedures Manual

If cumulative blood loss > 1500ml, > 2units PRBC’s given, VS unstable, or suspicion of DIC Proceed to STAGE 3
**Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)**

### STAGE 3: OB Hemorrhage

<table>
<thead>
<tr>
<th>MOBILIZE</th>
<th>ACT</th>
<th>THINK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse or Physician:</td>
<td>Establish team leadership and assign roles</td>
<td>Selective Embolization (IR)</td>
</tr>
<tr>
<td>Charge Nurse or designee:</td>
<td>Move to OR if not already there</td>
<td>Interventions based on etiology not yet completed</td>
</tr>
<tr>
<td></td>
<td>Repeat CBC/PLTS, Coag Panel STAT and Chem. 12 panel q 30-60 min</td>
<td>Prevent hypothermia</td>
</tr>
<tr>
<td>Anesthesiologist (as indicated):</td>
<td>Arterial blood gases</td>
<td>Conservative or Definitive Surgery:</td>
</tr>
<tr>
<td></td>
<td>Central hemodynamic monitoring</td>
<td>Uterine Artery Ligation</td>
</tr>
<tr>
<td></td>
<td>CVP or PA line</td>
<td>Hysterectomy</td>
</tr>
<tr>
<td></td>
<td>Arterial line</td>
<td>For Resuscitation:</td>
</tr>
<tr>
<td></td>
<td>Vasopressor support</td>
<td>Aggressively Transfuse</td>
</tr>
<tr>
<td>Intubation</td>
<td></td>
<td>Based on Vital Signs, Blood</td>
</tr>
<tr>
<td>Primary Nurse:</td>
<td>Unresponsive Coagulopathy:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Announce VS and cumulative measured blood loss q 5-10 minutes</td>
<td>After 8-10 units PRBCs and coagulation factor</td>
</tr>
<tr>
<td></td>
<td>apply upper body warming blanket if feaible</td>
<td>Replacement may consider risk/benefit of Factor VII</td>
</tr>
<tr>
<td>Blood Bank:</td>
<td>Use fluid warmer and/or rapid infuser for fluid &amp; blood product administration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prepare to issue additional blood products as needed – stay ahead</td>
<td>Once Stabilized: Modified Post-Partum Management; Consider ICU</td>
</tr>
</tbody>
</table>

Bon Secours Charity Health System Policy and Procedures Manual
Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)

APPENDICES
Appendix A – Blood Products
Appendix B – Uterotonic Agents for Postpartum Hemorrhage
Appendix C - Obstetric Hemorrhage Care Guidelines – Checklist Format
Appendix D – Oxytocin Rate Equivalents
Appendix E – Debriefing Tool

RELATED POLICIES
TX Safe #18 - Reporting of Critical Values
TX Blood #11 - Massive Transfusion Protocol
TX Blood #12 - Blood Administration
TX Blood #6 - Blood Bank’s Emergency Release of Blood
SOP #29 - Safety Event Reporting

DISCLAIMER
The following disclaimer is required to be placed on policies: “Procedures are resources to assist staff in carrying out specific actions. Procedures do not specify all circumstances to which they apply and cannot guarantee safety. Safety is promoted by people being skilled at judging when and how or not to adapt procedures to local clinical circumstances which may warrant adaptation due to unique patient characteristics or extenuating circumstances.”

REFERENCES
https://www.acog.org/Search?Keyword=safe+motherhood+2018

APPLICABLE FACILITIES
Good Samaritan Hospital, Suffern
Saint Anthony Hospital, Warwick

Bon Secours Charity Health System Policy and Procedures Manual
Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)

POLICY HISTORY
Good Samaritan Hospital Original Policy – TX MCH #24
St. Anthony Community Hospital Original Policy - NA

AUTHORED BY
Authors by - OB Hemorrhage Team 11/10

APPROVED BY
OB Leadership Committee 12/10
Director of Anesthesia 12/10, 2/19
Director of Laboratory 5/10, 2/19
Director of Blood Bank 5/10, 2/19
Pharmacy & Therapeutics Committee 2/11, 10/19
Policy Process Committee 12/11.
Director Obstetrics 5/10
Director Maternity Services 5/19
Nurse Manager L&D 5/19
Medical Executive Committee 5/19
Director Pharmacy SACH & GSH 10/19

APPROVAL DATE(S):

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/06 D</td>
<td>1/13R</td>
</tr>
<tr>
<td>9/11 C</td>
<td>11/17 C</td>
</tr>
<tr>
<td>12/11 C</td>
<td>11/19 - C</td>
</tr>
</tbody>
</table>

MM/YY, D for developed, C for changed, R for reviewed
Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)

Appendix A.

BLOOD PRODUCTS

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packed Red Blood Cells (PRBC)</td>
<td>(approx. 35-40 min. for crossmatch – once sample is in the lab and assuming no antibodies present)</td>
<td>Best first-line product for blood loss</td>
</tr>
<tr>
<td>Fresh Frozen Plasma (FFP)</td>
<td>(approx. 35-45 min to thaw for release)</td>
<td>Highly desired if &gt;2 units PRBCs given, or for prolonged PT, PTT</td>
</tr>
<tr>
<td>Platelets (PLTS)</td>
<td>Local variation in time to release (may need to come from regional blood bank)</td>
<td>Priority for women with Platelets &lt;50,000</td>
</tr>
<tr>
<td>Cryoprecipitate (CRYO)</td>
<td>(approx. 35-45 min to thaw for release)</td>
<td>Priority for women with Fibrinogen levels &lt;80</td>
</tr>
</tbody>
</table>

10 unit pack raises Fibrinogen 80-100mg/dl Best for DIC with low fibrinogen and don’t need volume replacement

Appendix B.

UTEROTONIC AGENTS FOR POSTPARTUM HEMORRHAGE

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Frequency</th>
<th>Side Effects</th>
<th>Contraindications</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pencocillin (Oxytocin)</td>
<td>30 units</td>
<td>IV</td>
<td>Continuous</td>
<td>Nausea, vomiting, hypotension</td>
<td>Hypersensitivity to drug</td>
<td>Room temp</td>
</tr>
<tr>
<td></td>
<td>per 500 ml</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rate admin.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>to uterine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methergine (Methylergine)</td>
<td>0.2mg/mL</td>
<td>IM</td>
<td>5 min max</td>
<td>Nausea, vomiting, Hypertension</td>
<td>BP, or HTN or PHT or TIA</td>
<td>Refrigerate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 doses</td>
<td></td>
<td></td>
<td>No light</td>
</tr>
<tr>
<td>Hemabate (15-methyl PG F3a)</td>
<td>250 mcg</td>
<td>IM or intra</td>
<td>1Q5</td>
<td>Nausea, vomiting, Hypotension</td>
<td>BP, or HTN or PHT or TIA</td>
<td>Refrigerate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>venous injection</td>
<td>1Q5</td>
<td></td>
<td></td>
<td>No light</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cytotec (Misoprostol)</td>
<td>800-1000 mcg</td>
<td>Per rectum (PR)</td>
<td></td>
<td>Nausea, vomiting, Hypotension</td>
<td>BP, or HTN or PHT or TIA</td>
<td>Room temp</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tranexamic Acid (TXA)</td>
<td>1 gram</td>
<td>IV/IS/VIP</td>
<td>Once can be repeated X1 in 30 minutes</td>
<td>None</td>
<td>Hypercoagulopathy</td>
<td>Room temp</td>
</tr>
</tbody>
</table>
Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)

Appendix C.

**OBSTETRIC HEMORRHAGE CARE GUIDELINES**

**CHECKLIST FORMAT**

**PRENATAL ASSESSMENT & PLANNING**

- Identify and prepare for patients with special considerations: Placenta Previa/Accreta, Bleeding Disorder, or those who Decline Blood Products
- Screen and aggressively treat severe anemia: if oral iron fails, initiate IV Iron Sucrose Protocol to reach desired Hgb/Hct, especially for at risk mothers.

<table>
<thead>
<tr>
<th>Admission Assessment &amp; Planning</th>
<th>Ongoing Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verify type &amp; Antibody Screen from prenatal record</td>
<td>Evaluate for Risk Factors (see below)</td>
</tr>
<tr>
<td>○ Order Type &amp; Screen on every patient admitted to Labor and Delivery.</td>
<td>If medium risk:</td>
</tr>
<tr>
<td></td>
<td>○ Order Type &amp; Screen</td>
</tr>
<tr>
<td></td>
<td>○ Review Hemorrhage Protocol</td>
</tr>
<tr>
<td></td>
<td>If high risk:</td>
</tr>
<tr>
<td></td>
<td>○ Order Type &amp; Crossmatch 2 units PRBCs</td>
</tr>
<tr>
<td></td>
<td>○ Review Hemorrhage Protocol</td>
</tr>
<tr>
<td></td>
<td>○ Notify OB Anesthesia</td>
</tr>
<tr>
<td></td>
<td>Identify women who may decline transfusion</td>
</tr>
<tr>
<td></td>
<td>○ Notify OB provider for plan of care</td>
</tr>
<tr>
<td></td>
<td>○ Early consult with OB anesthesia</td>
</tr>
<tr>
<td></td>
<td>○ Review Consent Form</td>
</tr>
<tr>
<td></td>
<td>□ Evaluate for development of additional risk factors in labor:</td>
</tr>
<tr>
<td></td>
<td>● Prolonged 2nd stage labor</td>
</tr>
<tr>
<td></td>
<td>● Prolonged oxytocin use</td>
</tr>
<tr>
<td></td>
<td>● Active bleeding</td>
</tr>
<tr>
<td></td>
<td>● Chorioamnionitis</td>
</tr>
<tr>
<td></td>
<td>● Magnesium sulfate treatment</td>
</tr>
<tr>
<td></td>
<td>□ Increase Risk level (see below) and convert to Type &amp; Crossmatch</td>
</tr>
<tr>
<td></td>
<td>□ Treat multiple risk factors as High Risk</td>
</tr>
</tbody>
</table>

**STAGE 0: All Births: Prevention & Recognition of OB Hemorrhage**

- Active Management of Third Stage
  - Oxytocin infusion: 30 units oxytocin/500ml solution titrate infusion rate to uterine tone; or 10 units IM; do not give oxytocin as IV push
  - Vigorous fundal massage for at least 15 seconds

- Ongoing Quantitative Evaluation of Blood Loss
  - Using formal methods, such as graduated containers, visual comparisons and weight of blood soaked materials (1gm = 1ml)

- Ongoing Evaluation of Vital Signs

- If: Cumulative Blood Loss >1000ml vaginal birth or C/S - OR - Vital Signs >15% change or HR ≥110, BP ≤85/45, O2 sat <95% - OR - Increased bleeding during recovery or postpartum, proceed to STAGE 1

Bon Secours Charity Health System Policy and Procedures Manual
Appendix D.

<table>
<thead>
<tr>
<th>Oxytocin 20 unit/1000 ml Rate</th>
<th>Oxytocin milli-units/min</th>
<th>Equivalent Rate for Oxytocin 30 units/500 ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25 ml/hr</td>
<td>42 milli-units/min</td>
<td>42 ml/hr</td>
</tr>
<tr>
<td>1.50 ml/hr</td>
<td>50 milli-units/min</td>
<td>50 ml/hr</td>
</tr>
<tr>
<td>5.00 ml/hr</td>
<td>167 milli-units/min</td>
<td>167 ml/hr</td>
</tr>
<tr>
<td>10.00 ml/hr</td>
<td>333 milli-units/min</td>
<td>333 ml/hr</td>
</tr>
</tbody>
</table>

Appendix E.

Obstetric Team Debriefing Form

[Form with multiple options for identifying what went well, opportunities for improvement, etc.]

Bon Secours Charity Health System Policy and Procedures Manual
Newark-Wayne Community Hospital: OB Hemorrhage Clinical Event Debrief Form

ROCHESTER REGIONAL HEALTH
Newark-Wayne Community Hospital

OB Hemorrhage Clinical Event Debrief Form
Event Date: ________________ Time: ________________
Form completed by: ____________________________

Directions:
- Debrief form is to be completed immediately after clinical event by a team member (any nurse or provider).
- After the debrief, a team member is to enter a SafeConnect event report.
- The debrief form is uploaded to the SafeConnect report and then given to Erin Nicol.

Goal:
- Allow team a debrief mechanism to talk immediately about a patient care situation to capture what went well, what could have been done better and what prevented the team from caring for the patient effectively.

Event type (Hemorrhage/Shoulder Dystocia/STAT C/S/etc.): ____________________________
Event background: ________________________________________________________________

Debrief participants: ______________________________________________________________

What went well: __________________________________________________________________

What did we learn/Opportunities for improvement: ________________________________

What would we do differently next time: ____________________________________________

Skills/Equipment Used/Actions Taken: 

<table>
<thead>
<tr>
<th>Action</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the Hemorrhage Cart used?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the OB Hemorrhage Checklist used? (And was it followed appropriately)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was a Bakri balloon inserted?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the patient receive a blood transfusion?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the Massive Transfusion Protocol activated?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the patient brought to the OR?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was ENIT/Hospitalist assistance requested?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the patient transferred to a higher level of care?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did an OB nurse stay with the patient in OR/ICU/etc.?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(See reverse for follow-up.)
Newark-Wayne Community Hospital: OB Hemorrhage Clinical Event Debrief Form

---

**ROCHESTER REGIONAL HEALTH**

Newark-Wayne Community Hospital

**OB Hemorrhage Clinical Event Debrief Form**

<table>
<thead>
<tr>
<th>Skills/Equipment Used/Actions Taken, continued:</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were the applicable TeamSTEPPS communication tools used? (If yes, list which ones in the comments.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was an interdisciplinary Patient-Centered Huddle initiated?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the Hemorrhage Cart restocked?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was a Safe Connect event entered?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**What needs to be followed up on?**

<table>
<thead>
<tr>
<th>Identified Issues/Opportunities For Improvement</th>
<th>Ideas For Next Time/Actions To Be Taken</th>
<th>Person Responsible For Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other notes:**

Please return form to Erin Nicol for event tracking/follow-up.

Page 2 of 2
Northern Westchester Hospital: Obstetric Team Debriefing Form

<table>
<thead>
<tr>
<th>Type of event:</th>
<th>Date of event:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location event:</td>
<td></td>
</tr>
<tr>
<td>Members of team present: (check all that apply)</td>
<td></td>
</tr>
<tr>
<td>□ Primary RN</td>
<td>□ Primary MO</td>
</tr>
<tr>
<td>□ Anesthesia personnel</td>
<td>□ Neonatology personnel</td>
</tr>
<tr>
<td>□ Nurse Manager</td>
<td>□ OB/Surgical tech</td>
</tr>
<tr>
<td>□ Charge RN</td>
<td>□ MFM leader</td>
</tr>
<tr>
<td>□ Resident(s)</td>
<td>□ Patient Safety Officer</td>
</tr>
<tr>
<td>□ Other RNs</td>
<td></td>
</tr>
</tbody>
</table>

Thinking about how the obstetric emergency was managed,

Identify what went well: (Check if yes)
- □ Communication
- □ Role clarity (leader/supporting roles identified and assigned)
- □ Teamwork
- □ Situational awareness
- □ Decision-making
- □ Other:

Identify opportunities for improvement: “human factors” (Check if yes)
- □ Communication
- □ Role clarity (leader/supporting roles identified and assigned)
- □ Teamwork
- □ Situational awareness
- □ Decision-making
- □ Other:

Identify opportunities for improvement: “systems issue” (Check if yes)
- □ Equipment
- □ Medication
- □ Blood product availability
- □ Inadequate support (in unit or other areas of the hospital)
- □ Delays in transporting the patient (within hospital or to another facility)
- □ Other:

Safe Motherhood Initiative
Northern Westchester Hospital:
Obstetric Team Debriefing Form

Obstetric Team Debriefing Form

Remember: Debriefing is meant to be a learning experience and a way to address both human factors and systems issues to improve the response for next time. There is to be no blaming/finger-pointing.

Type of event: 
Date of event: 

Location of event: Members of team present: (check all that apply)

- Primary RN
- Primary MO
- Anesthesia personnel
- Neonatology personnel
- Nurse Manager
- OB/Surgical tech
- Charge RN
- MFM leader
- Unit Clerk
- Resident(s)
- Patient Safety Officer
- Other RNs

Thinking about how the obstetric emergency was managed,

<table>
<thead>
<tr>
<th>Identify what went well:</th>
<th>Identify opportunities for improvement: “human factors” (Check if yes)</th>
<th>Identify opportunities for improvement: “systems issue” (Check if yes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Check if yes)</td>
<td>(Check if yes)</td>
<td>(Check if yes)</td>
</tr>
<tr>
<td>Communication</td>
<td>Communication</td>
<td>Equipment</td>
</tr>
<tr>
<td>Role clarity (leader/supporting roles identified and assigned)</td>
<td>Role clarity (leader/supporting roles identified and assigned)</td>
<td>Medication</td>
</tr>
<tr>
<td>Teamwork</td>
<td>Teamwork</td>
<td>Blood product availability</td>
</tr>
<tr>
<td>Situational awareness</td>
<td>Situational awareness</td>
<td>Inadequate support (in unit or other areas of the hospital)</td>
</tr>
<tr>
<td>Decision-making</td>
<td>Decision-making</td>
<td>Delays in transporting the patient (within hospital or to another facility)</td>
</tr>
<tr>
<td>Other:</td>
<td>Other:</td>
<td>Other:</td>
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</table>

Safe Motherhood Initiative
NYU Langone Health: Stat Huddle Debrief

STAT Huddle Debrief

Call a STAT Huddle with OB Safety Officer and Anesthesiologist on all PACU patients with the following vital signs:

- Pulse ≥ 130, × 2 or for 15 minutes
- BP decrease of 20% (from pre-op value) × 2 or for 15 minutes
- Respiratory Rate ≥ 26 × 2 or for 15 minutes
- Pulse Ox ≤ 93% × 15 minutes

Please complete the following debrief for each STAT Huddle called:

Reason for calling:

- HR ≥ 130
- BP decrease of 20%
- RR ≥ 26
- SpO₂ ≤ 93%

Interventions:

- Continue to monitor
- Medication given
- OHT Called

If an OHT was not called at the time of the STAT Huddle, was an OHT called later?

Yes □  No □
**Southside Hospital: OB Hemorrhage Flowsheet**

<table>
<thead>
<tr>
<th>Time</th>
<th>BP</th>
<th>HR</th>
<th>Temp</th>
<th>Resp Rate</th>
<th>SPO2</th>
<th>Mental Status</th>
<th>Shock Index</th>
</tr>
</thead>
</table>

**Post Hemorrhage Management**
- Clinical considerations (including disposition of management)
- Debrief
- Documentation after debrief
- Discuss with patient/family members

**Debriefing**
- Provider Signature
- Print Name
- Circulating RN Signature
- Print Name
- Scribe RN Signature
- Print Name
- Additional Team Members
- Name
- Title
- Name
- Title

**Recognize**
- Call for assistance (Obstetric Hemorrhage Team)
- Designate:
  - Team Leader
  - Primary RN
  - Scribe
  - Anesthesia
- Assessment:
  - Cumulative Blood Loss
  - Vital Signs
  - Identity Stage
- Scribe to call out 5 minute intervals

**Hemorrhage Cart**

**Possible Interventions**
- B ket bolus
- Compression suture
- Lynch suture
- Uterine artery ligation
- Hypothermia

**Determine Etiology and Treat**
- Tone (i.e., aching)
- Trauma (i.e., laceration)
- Tissue (i.e., retroplacental)
- Thrombin (i.e., coagulation dysfunction)

- Dopamine (Phenylephrine): 10-40 mcg/kg per minute, maximum 250 mcg/kg per minute
- Nitroprusside (Nitroprusside): 5-20 mcg/kg per minute
- Nitroglycerin (Nitroglycerin): 1-10 mcg/kg per minute
- Magnesium Sulfate (MgSO4): 1-2 g/kg per minute
- Tranexamic Acid (TA): 0.75-5 mg/kg per minute
Southside Hospital: OB Hemorrhage Flowsheet

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Blood loss = 500mL vaginal OR blood loss &gt; 1,000mL associated with normal vital signs and lab values</td>
</tr>
</tbody>
</table>

- Initial Steps:
  - IV access: 1g or 18g
  - Increase IV fluid without escalation
  - Insert Foley Catheter
  - Pelvic massage

- Medications:
  - Ensure appropriate medications given patient history
  - Increase regimen, additional medications

- Initial Steps:
  - Mobile additional help
  - Place 3rd AV (8F, 10F)
  - Draw STAT labs (CBC, Coag, PTT, INR)
  - Prepare OR

- Medications:
  - Continue Stage 1 medications, consider T & T

- Initial Steps:
  - Obtain 2 units RBC’s
  - Thrombectomy

- Action:
  - For uterine atony consider uterine balloon or surgical interventions
  - Consider moving patient to OR
  - Elevate therapy with goal of hemostasis

---

<table>
<thead>
<tr>
<th>Time</th>
<th>SBP</th>
<th>Pulse/RR</th>
<th>Weight Index</th>
<th>BPO2</th>
<th>Temp</th>
<th>GBL in mL</th>
<th>IV #1</th>
<th>IV #2</th>
<th>Fluid Volume</th>
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<tbody>
<tr>
<td>1</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Blood Products</th>
<th>Urine Output</th>
<th>CBC, CRP, INR (if abnormal values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Medications</td>
</tr>
</tbody>
</table>

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| Stage 2 | Continued Bleeding: GBL up to 1,500mL OR 2 |

- Initial Steps:
  - Mobile additional help
  - Move to OR
  - Amnion-chorionic status

- Medications:
  - Continue therapy, cumulative blood loss, electrolytes

- Initial Steps:
  - Complete Stage 1 medications, consider T & T

- Blood Bank:
  - Initiate Massive Transfusion Protocol (if clinical indications and appropriateness, consult for additional agents)

- Action:
  - Achieve hemostasis, intervention based on electrolytes
  - Elevate interventions

- Blood Products: 1 unit IV every 15 min until patient stable, allow 60 mL/kg over 60 min, may be repeated once after 30 min

- Blood Products: 1 unit IV every 15 min until patient stable, allow 60 mL/kg over 60 min, may be repeated once after 30 min

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- Blood Products: 1 unit IV every 15 min until patient stable, allow 60 mL/kg over 60 min, may be repeated once after 30 min

---

| Stage 3 | Continued Bleeding: GBL > 1,500mL OR 2 |

- Initial Steps:
  - Mobile additional reasons

- Blood Bank:
  - Simultaneous aggressive massive transfusion

- Blood Products: 1 unit IV every 15 min until patient stable, allow 60 mL/kg over 60 min, may be repeated once after 30 min

- Blood Products: 1 unit IV every 15 min until patient stable, allow 60 mL/kg over 60 min, may be repeated once after 30 min

- Blood Products: 1 unit IV every 15 min until patient stable, allow 60 mL/kg over 60 min, may be repeated once after 30 min
Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Rapid Response Record

Date: ___________ Room #: ___________ Time Called: ___________ Family Notified: ___________

Rapid Response Activation:
Code status:☐ Full ☐ DNR ☐ DNI ☐ Refer to MOLST
Set of VS:
BP: ___________ P: ___________ T: ___________ R: ___________ SaO2: ___________
Blood sugar result: ___________

Assessment:
The patient’s mental status is:
☐ Alert and oriented to person, place and time
☐ Cooperative ☐ Confused
☐ Agitated ☐ Combative ☐ Comatose/unresponsive
☐ Responding only to painful stimuli
☐ Lethargic but conversing and able to swallow
☐ Strurred speech
☐ Difficulty swallowing
Lung sounds:
Right:☐ Clear ☐ Decreased/tight
☐ Crackles ☐ Stridor
☐ Wheezes

Interventions:
☐ Oral airway/Nasal airway
☐ Suctioning
☐ O2 Therapy
☐ ARB
☐ IV Fluid Volume Adjustment
☐ Cardiac Monitoring

Reassessment:

Outcome:
☐ Stayed on unit ☐ Transferred to ___________
☐ Code Blue Activated
Signature: ___________ Date: ___________ Time: ___________

RN: ___________ Date: ___________ Time: ___________
Supervisor/Manager: ___________ Date: ___________ Time: ___________
Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Obstetric Hemorrhage Checklist

Complete all steps in prior stages plus current stage regardless of stage in which the patient presents.

Postpartum hemorrhage is defined as cumulative blood loss of greater than or equal to 1,500ml or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours. However, blood loss >1,500ml in a vaginal delivery is abnormal, and should be investigated and managed as outlined in Stage 1.

Recognition:
- [ ] Call for assistance (Obstetric Hemorrhage Team)
- [ ] Designate: Team leader
- [ ] Checklist reader/recorder
- [ ] Primary RN

Assessment:
- [ ] Cumulative blood loss
- [ ] Vital signs
- [ ] Determine stage

Stage 1: Blood loss >1,500ml, after delivery with normal vital signs and lab values. Vaginal delivery 500-999ml should be treated as in Stage 1.

Initial Steps:
- [ ] Ensure s/s or d/s IV Access
- [ ] Increase IV fluid (crystalloid without oxytocin)
- [ ] Insert indwelling urinary catheter
- [ ] Fundal massage

Medications:
- [ ] Ensure appropriate medications given patient history
- [ ] Increase oxytocin, additional uterotonic

Blood Bank:
- [ ] Confirm active type and screen and consider crossmatch of 2 units PRBCs

Actions:
- [ ] Determine etiology and treat
- [ ] Prepare OR, if clinically indicated (optimize visualization/examination)

Stage 2: Continued bleeding (EBL up to 1,500ml OR 2 or 3 uterotonics) with normal vital signs and lab values (one or more uterotonics in addition to oxytocin administration: any 2 administrations of the same uterotonic)

Initial Steps:
- [ ] Mobilize additional help
- [ ] Place and IV (16-18G)
- [ ] Draw STAT labs (CBC, Coag, fibrinogen)
- [ ] Prepare OR

Medications:
- [ ] Continue Stage 1 medications; consider TXA

Blood Bank:
- [ ] Obtain 2 units PRBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
- [ ] Thaw 2 units FFP

Actions:
- [ ] For uterine atony: consider uterine balloon or packing, possible surgical interventions
- [ ] Consider moving patient to OR
- [ ] Escalate therapy with goal of hemostasis

Safe Motherhood Initiative

Revised September 2020

Oxytocin (Pitocin):
10-40 units per 500-1000ml solution

Methylergonovine (Methergine):
0.2 milligrams IM (may repeat), Avoid with hypertension

25-methyl PGE2 (Hemabate, Carbetocin):
250 micrograms IM (may repeat in 15 minutes, maximum 8 doses); Avoid with asthma; use with caution with hypertension

Misoprostol (Cytotec):
800-1000 micrograms PR
600 micrograms PO or 800 micrograms SL

Tone (i.e., atony)
Trauma (i.e., laceration)
Thrombus (i.e., coagulation dysfunction)

Transaxemic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 1000ml NS, & give over 10 min; may be repeated once after 30 min)

Possible interventions:
• Bakri balloon
• Compression suture/B-Lynch suture
• Uterine artery ligation
• Hysterectomy
Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Stage 3: Continued Bleeding (EBL > 1500 mL OR > 2 RBCs given OR at risk for occult bleeding/ coagulopathy OR any patient with abnormal vital signs/labs/eligibility)

- **Initial Steps:**
  - Mobilize additional help
  - Move to OR
  - Announce clinical status
  - Vital signs, cumulative blood loss, etiology
  - Outline and communicate plan

- **Medications:**
  - Continue Stage 1 medications; consider TXA

- **Blood Bank:**
  - Initiate Massive Transfusion Protocol
  - (If clinical coagulopathy: add cryoprecipitate, consult for additional agents)

- **Action:**
  - Achieve hemostasis, intervention based on etiology
  - Escalate interventions

  - Oxytocin (Pitocin): 10-40 units per 500-1000mL solution
  - Methylergonovine (Methergine): 0.2 milligrams IM (may repeat)
  - Amid with hypertension
  - 25-methyl PGF alpha (Hemabate, Carboprost): 250 micrograms IM (may repeat in 45 minutes, maximum 8 doses)
  - Avoid with asthma
  - Use with caution with hypertension
  - Misoprostal (Cytotec): 800-1000 micrograms PR
  - 600 micrograms PO or 800 micrograms SL
  - Tranexamic Acid (TXA): 1 gram IV over 10 min (add 1 gram vial to 1000 mL NS & give over 10 min; may be repeated once after 30 min)

  - Possible interventions:
    - Bakri balloon
    - Compression suture/B-lynch suture
    - Uterine artery ligation
    - Hysterectomy

Stage 4: Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)

- **Initial Step:**
  - Mobilize additional resources

- **Medications:**
  - ACLS

- **Blood Bank:**
  - Simultaneous aggressive massive transfusion

- **Action:**
  - Immediate surgical intervention to ensure hemostasis (hysterectomy)

  - Post-Hemorrhage Management
    - Determine disposition of patient
    - Debrief with the whole obstetric care team
    - Debrief with patient and family
    - Document

Revised September 2020

Safe Motherhood Initiative

ACOG
### Hemorrhage Flow Sheet

<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
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<tbody>
<tr>
<td><strong>Evaluation</strong></td>
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<tr>
<td>Cumulative Blood Loss:</td>
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<tr>
<td>Symptoms: cold, dizzy, clammy, lightheaded, mental status</td>
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<td>Blood Pressure:</td>
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<td>Urine Output:</td>
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<td><strong>Labs</strong></td>
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<td>Platelets:</td>
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<td>Fibrinogen:</td>
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</tbody>
</table>

*Attachment #3*

OB_70 May 2016

Additional Information on Back
Alice Hyde Medical Center: 
HEMORRHAGE FMC-51 Attachments

### Pre-Delivery Hemorrhage Risk Assessment

<table>
<thead>
<tr>
<th>LOW RISK</th>
<th>MEDIUM RISK</th>
<th>HIGH RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 4 previous births</td>
<td>Hematocrit &lt;30%</td>
<td>2 or more Medium Risk Factors</td>
</tr>
<tr>
<td>No Uterine Incision</td>
<td>EFW &gt;4000 Grams</td>
<td>Active Bleeding</td>
</tr>
<tr>
<td>No Bleeding disorder</td>
<td>Large Myomas</td>
<td>Known Coagulopathy</td>
</tr>
<tr>
<td>Singleton Pregnancy</td>
<td>Multiple Gestation</td>
<td>Placenta Previa/Low Lying Placenta</td>
</tr>
<tr>
<td>No History of PPH</td>
<td>Obesity</td>
<td>Platelet Count &lt;70,000</td>
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<td></td>
<td>Prior PPH</td>
<td>Suspected Accreta/Percreta</td>
</tr>
<tr>
<td></td>
<td>Prior Uterine Surgery</td>
<td>VBAC</td>
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<tr>
<td></td>
<td>Greater than 4 births</td>
<td></td>
</tr>
</tbody>
</table>

### Post-Delivery Hemorrhage Risk Assessment

<table>
<thead>
<tr>
<th>HIGH RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abruptio Placenta (see FMC-135 Abruptio Placenta)</td>
</tr>
<tr>
<td>Grand Multiparty</td>
</tr>
<tr>
<td>Over Distended Uterus (multiple gestation, polyhydramnios, fetal macrosomia)</td>
</tr>
<tr>
<td>Prolonged Labor</td>
</tr>
<tr>
<td>History of post partum hemorrhage</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
</tr>
<tr>
<td>Instrumental Delivery</td>
</tr>
<tr>
<td>Prolonged use of oxytocin agents in labor, magnesium sulfate and terbutaline</td>
</tr>
<tr>
<td>Retained placental fragments or retention of blood clots</td>
</tr>
</tbody>
</table>
Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Hemorrhage Cart

- 3 Curved Clamps
- 2 Long Sponge sticks
- Med. Scissors
- Mayo Scissors
- Large Forceps
- Needle Holder
- Long Uterine clamps
- Uterine wall Retractors
- Rigby Vaginal Retractor
- Gelpi Retractor
- Side Opening Vaginal Speculum
- Vaginal Speculum
- 2 Vaginal Retractors
- Dull Currettes
- Sharp Currettes
- Foley Tray
- 0.9% Sodium Chloride
- IV Administration Set
- Needle Counter
- 20ml Syringe
- 30ml syringe
- 3 Lap Sponges
- Bakri Postpartum Balloon
Crouse Hospital: Hemorrhage Guidelines

---

Crouse Hospital Policy & Procedure
Blood: Massive Transfusion Protocol (MTP)

Policy Name: Blood: Massive Transfusion Protocol (MTP)
PPPG Category: Clinical Practice
Applies To: All Units
Key Words: Blood, Transfusion, MTP, Massive
Associated Forms & PPPGs:
- Massive Transfusion Protocol Guide (Doc #8672)
- Lab Requisition during Massive Transfusion Final (Doc #8673)

Original Effective Date: 06/01/07
Review Dates: 02/01/14
Revision Dates: 05/01/08, 09/01/12, 12/01/14, 10/01/15, 12/07/15, 02/11/19
This Version’s Effective Date: 02/11/19

Policy
This policy is to provide a hospital wide standard for facilitating the rapid acquisition of appropriate blood and blood components safely during a massive hemorrhagic event while limiting the untoward effects of stored blood (hypothermia, metabolic effects, and dilutional coagulopathy) through effective communication between clinical and laboratory staff. This policy outlines the responsibilities of both areas to provide blood component support to the patient. If possible, one contact (or point person) will be identified in both the clinical area and in Transfusion Services to facilitate effective communication.

Procedure
Nursing/Provider Responsibilities:
To activate the massive transfusion protocol when a large blood loss is anticipated:

1. Call Transfusion Services (ext. 47404) to declare a hemorrhage (or possible hemorrhage) as early in the process as possible.
2. Provide Transfusion Services staff with:
   - patient name
   - medical record/patient number
   - diagnosis
   - location (notify Transfusion Services each time the location changes)
   - phone extension (include on all "stat stickers" for lab result reporting)
   - name of a contact person (notify Transfusion Services if this changes i.e. shift change)
3. Obtain a patient blood sample if requested by Transfusion Services and send STAT to the lab. Use the appropriate STAT stickers (green for OR, pink for L&D). Write the phone extension or the OR room number on the requisition to aid in quick reporting of the lab testing.
4. A charge slip complete with the patient name and medical record/patient number is required to pick up all blood components from Transfusion Services. The charge slip must specify what components and how many are requested. Take components as they are available. Do NOT delay transport of components to patient to wait for components still being processed by Transfusion Services.
5. Blood warmer usage is required during a massive transfusion event. A rapid infuser/pressure bag should be utilized, if available.
6. Regular monitoring of hemoglobin, platelet count, coagulation tests, electrolytes, and ABG’s should be used to guide therapy.
7. Consider redosing antibiotics following massive fluid/blood infusions.
Crouse Hospital: Hemorrhage Guidelines

Crouse Hospital Policy & Procedure
Blood: Massive Transfusion Protocol (MTP)
Responsible Party: Jill Hauser, Rachel Elder, MD
Lead Author: Diane Lloyd
PPP #: P0039
Effective Date: 02/11/19
Page 2 of 4

8. The pharmacy is contacted (ext 17631, option 1) for questions regarding anticoagulant reversals and TXA (Tranexamic Acid for prevention or reduction of bleeding).

9. Notify Transfusion Services each time the patient location or status changes (i.e. OR to ICU).

Notes:
1. Emergency Release of Uncrossmatched Red Cells is available when there is no patient sample available or no time to complete the testing on the patient sample. The ordering provider can request the emergency release of uncrossmatched red cells by calling Transfusion Services. Transfusion Services will issue the 2 units of Uncrossmatched Red Cells with an Emergency Release form that needs to be signed by the ordering provider and returned to the Transfusion Services department ASAP (within 23 hours).

2. Red cell and plasma components must be stored at 1-6°C until transfused. The PACU refrigerator will be utilized for monitored storage if the event is handled in the main OR. Coolers can be utilized for other patient care areas if necessary.

3. Platelet components MUST NEVER BE REFRIGERATED and will be stored in Transfusion Services until requested by the clinician. If the platelets are not infused within 30 minutes of arrival to the patient, return the platelets to Transfusion Services for reissue at a later time.

4. Transfusion Services will automatically "stay ahead" on red cells (4 units), thawed plasma (2 units), and platelets (1 pheresis) during the event. Do not call Transfusion Services to "add units on" The transfusion ratio is determined by the ordering provider based upon lab values and clinical indicators.

5. Cryoprecipitate is indicated when fibrinogen is less than 100 mg/dL and will be prepared only if ordered by a clinician. One pre-pooled cryoprecipitate is equivalent to 5 single units.

Transfusion Services Responsibilities:
1. Transfusion Services will activate the massive transfusion protocol (MTP) when:
   a. requested by physician and/or nursing personnel
   b. a patient has used ≥ 4 units red cells in 2 hours (or ≥ 10 units red cells in 12 hours)

2. Notify supervisory personnel, the Pathologist, and other laboratory departments that the MTP has been initiated. Assess staffing and call in additional staff if necessary.

3. Review the patient history in the LIS to determine if a type and screen (TYSa) has been tested in the last 3 days, and if crossmatched units are available. Request a patient sample if needed.

4. Transfusion Services will automatically "stay ahead" on red cells (4 units), thawed plasma (2 units), and platelets (1 pheresis) during the event. Keep the Pathologist apprised of the number of units issued, if emergency release is required, and any lab tests ordered throughout the event.

5. Recommend testing to include ABG, PT, PTT, fibrinogen, BMP, ionized calcium, and CBC.

6. Suggest ordering cryoprecipitate if fibrinogen is less than 100 mg/dL.

Laboratory Supervisory Staff Responsibilities:
1. Assess staffing and reallocate technical resources where needed.

2. Ensure that all testing requested on the MTP patient is prioritized and results are communicated ASAP.

Conclusion of MTP:
1. The point person will notify Transfusion Services when the MTP is no longer in effect.

2. All unused blood components will be returned to Transfusion Services for controlled storage.

3. Transfusion Services staff will collate information regarding the number of MTP’s occurring in the hospital and will present data to the Transfusion Performance Improvement Council.
Crouse Hospital: Hemorrhage Guidelines

Crouse Hospital Policy & Procedure
Blood: Massive Transfusion Protocol (MTP)
Responsible Party: Jill Hausworth, Rachel Elder, MD
Lead Author: Diane Lloyd
PPPG #: P0039
Effective Date: 02/11/19
Page 3 of 4

Primary Sources

Definitions
Massive Transfusion: The replacement of at least one blood volume within 12 hours.

Addendums, Diagrams & Illustrations
Appendix A: Massive Transfusion Protocol Guidelines
Transfusion Services Phone #: 47404 / Fax #: 7138

Activated:
- By practitioner or nursing personnel when a large blood loss is anticipated.
- OR
- By Transfusion Services automatically when a patient uses > 4 red cells in 2 hours or >10 red cells in 12 hours.

Nursing will:
- Establish point person and phone extension to use to communicate with Transfusion Services/Laboratory.
- Send appropriate patient samples. Use area-specific "stat" labels for OB or OR.
- Keep Transfusion Services apprised of changes to patient location and status.
- Expedite blood component pick up by calling Transfusion Services prior to arrival and bringing patient identification with them (i.e. charge slip).
- Take components as they are available. Do NOT delay transport of components to patient to wait for components still being processed by Transfusion Services.

Key points:
- Transfuse blood products using a blood warmer to prevent hypothermia. Keep patient warm, consider use of warming blanket.
- Use rapid infuser/pressure bag when patient condition seems necessary.
- Check lab values periodically throughout the event, including pH.
- Packed cells contain citrate that binds calcium; check ionized calcium periodically and replace as needed.
- Consider redosing antibiotics following massive fluid/blood infusions.
- The transfusion ratio should be determined by the ordering provider based upon lab values and clinical indicators.
- Consider the use of Tranexamic Acid (TXA).

Once activated Transfusion Services will:
- Crossmatch 4 units of red cells and stay 4 units ahead until the bleeding is under control.
- Thaw 2 units of plasma and stay 2 units ahead.
- Maintain platelet inventory, assess blood inventory and order additional units STAT, if needed.
- Communicate with other lab departments to ensure priority handling of patient samples.
- Notify the Pathologist (470-7396).
Crouse Hospital: Hemorrhage Guidelines

Appendix B: Massive Transfusion Protocol Guide - See form # 8672

**SUGGESTED BASELINE TESTING (IN ORDER OF DRAW):**
Underlying acidosis and coagulopathy, such as DIC or low fibrinogen should be evaluated.

<table>
<thead>
<tr>
<th>Suggested Baseline Testing - In Order of Draw</th>
<th>Order at start of hemorrhage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Arterial blood gas (ABG)</td>
<td>syringe on ice</td>
</tr>
<tr>
<td>2 PT, PTT, fibrinogen</td>
<td>1 blue tube, completely full</td>
</tr>
<tr>
<td>3 Lytes, Ionized calcium, and glucose</td>
<td>1 dark green tube-lithium heparin or may use ABG syringe</td>
</tr>
<tr>
<td>4 CBC</td>
<td>1 lavender tube</td>
</tr>
<tr>
<td>5 Blood type and crossmatch</td>
<td>if not done previously: 1 pink top tube</td>
</tr>
</tbody>
</table>

**Testing During Event - In Order of Draw**
Consider this every 30-60 minutes.

<table>
<thead>
<tr>
<th>Testing During Event - In Order of Draw</th>
<th>Consider this every 30-60 minutes</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>4 CBC</td>
<td>1 lavender tube</td>
</tr>
<tr>
<td>5 D-dimer if DIC is suspected</td>
<td>1 lavender tube</td>
</tr>
</tbody>
</table>

**SUGGEST REPEAT LABORATORY TESTING AFTER 5-7 UNITS OF RBCS**

Component Usage Guidelines:

<table>
<thead>
<tr>
<th>Consider When:</th>
<th>Component</th>
<th>Dose</th>
<th>Expected Increase in Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncontrolled bleeding (≥1500 ml loss) regardless of initial Hgb/Hct</td>
<td>Red cells</td>
<td>As needed to maintain adequate oxygenation and Hgb &gt; 7</td>
<td>1 gm hemoglobin per unit</td>
</tr>
<tr>
<td></td>
<td>Use a blood warmer for infusion &gt; 100 ml/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continued Bleeding and an INR ≥ 1.5</td>
<td>Plasma</td>
<td>2-4 units (10-15 ml/kg)</td>
<td>25% of factors</td>
</tr>
<tr>
<td>Continued Bleeding and a Pt count &lt; 80,000 or microvascular bleeding</td>
<td>Platelets</td>
<td>1 dose is one pheresis</td>
<td>30,000 to 60,000 per dose</td>
</tr>
<tr>
<td>Bleeding and Fibrinogen &lt; 100 mg/dL</td>
<td>Cryoprecipitate</td>
<td>1-2 units/10 Kg, Delivered in pool of 5 units</td>
<td>50 mg/dL</td>
</tr>
<tr>
<td>Uncontrolled Bleeding</td>
<td>Tranexamic Acid (TXA)</td>
<td>1 gm IV over 10 minutes - followed by a maintenance dose of 1 gm infused over 8 hours</td>
<td>Call Pharmacy at 7631 for consultation</td>
</tr>
<tr>
<td>Anticoagulant Reversals and TXA</td>
<td>Contact the pharmacy (ext 17631, option 1) for questions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crouse Hospital: Hemorrhage Guidelines

<table>
<thead>
<tr>
<th>Treatment of Acute OB Hemorrhage</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tranexamic Acid (TXA)</td>
<td>1,000 mg over 10 minutes if bleeding continues after 30 minutes or restarts within 24 hours after the first dose, a second dose of 1,000 mg may be given.</td>
</tr>
<tr>
<td>Antifibrinolytic agent given IV best given within 3 hours of delivery (promotes clotting by preventing blood clots from breaking down)</td>
<td>Do not inject more rapidly than 1 mL/minute to avoid hypotension</td>
</tr>
</tbody>
</table>

Effective Date: 04/26/20
### Huntington Hospital: Guideline
### OB Hemorrhage Guideline

<table>
<thead>
<tr>
<th>Guideline Title: OBSTETRICAL HEMORRHAGE</th>
<th>Department Approval Date: 9/10/2015</th>
<th>Reviewed: Revised: May 2019</th>
<th>Page 1 of 21</th>
</tr>
</thead>
</table>

**GENERAL STATEMENT OF PURPOSE:**
To prepare for and assist in the response to abnormal bleeding.

**POLICY:**
All patients admitted to the OB Service will be assessed as to their risk for peripartum hemorrhage

**SCOPE:**
This policy applies to all members of the Huntington Hospital Northwell Health work force but not limited to employees, medical staff, volunteers, students, physician office staff, and other persons performing work for or at Huntington Hospital.

**PROCEDURES/GUIDELINES:**
**Antepartum Period**
During the antepartum period, identify patients that may require special delivery plan (i.e. timing of delivery, additional resources, consults, multidisciplinary meetings, etc).

- Placenta previa
- Placenta accreta
- Previous classical cesarean section
- History of myomectomy
- Refusal of blood transfusion
- Bleeding disorder
- Current anticoagulation (therapeutic)
- Significant co-morbidities

**Condition for which timing of delivery is critical**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Timing of Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placenta accreta</td>
<td>34 1/2 - 35 1/2 weeks</td>
</tr>
<tr>
<td>Placenta previa</td>
<td>36 1/2 - 37 1/2 weeks</td>
</tr>
<tr>
<td>Prior classical C/S</td>
<td>36 1/2 - 37 1/2 weeks</td>
</tr>
<tr>
<td>Previous myomectomy</td>
<td>37 1/2 - 38 1/2 weeks</td>
</tr>
<tr>
<td>If extensive</td>
<td>36 1/2 - 37 1/2 weeks</td>
</tr>
</tbody>
</table>

For Placenta accreta notify and plan:
- Surgical support / Hemorrhage Team,
- Interventional Radiology (IR),

S/WCHS Guideline/ Hypertension guideline- Final Final.docx
Huntington Hospital: Guideline
OB Hemorrhage Guideline

Refusal of blood products:
- Discuss with patient family and complete the blood product preference list (see appendix)²
- Obtain the necessary consults (MFM/Hematology/Obstetric Anesthesia)

Admission to L&D
At the time of admission identify patients that refuse blood transfusion.
For patients that refuse blood transfusion:
- If the blood product preference list has not yet been completed or is not available complete the form at this time (on admission).
- Call for a Perinatal Huddle on admission
- Contact the Hemorrhage Team if additional risk factors for hemorrhage exist (previa, fibroids, overdistended uterus, etc.)
- Similarly call for a Perinatal Huddle and contact the Hemorrhage Team for patients admitted for delivery that are fully anticoagulated
- At the time of delivery if the patient is having a C-section or if there are other risk factors, 10 minutes prior to the start of the operation initiate (if no contraindications) prophylactic administration of tranexamic acid (1 gram IV over 10 minutes given slowly).

At the time of admission, obtain a type and cross match if the patient is at significant risk for peripartum hemorrhage:
- Placenta previa
- Actively bleeding
- Placenta accreta
- History of PPH
- Bleeding disorder
- Significant anemia
- Current anticoagulation
- Other conditions deemed relevant by the provider

All other patients will have a type and screen obtained at the time of their admission.

The following elements are critical in the event of significant obstetrical hemorrhage
1. Emergency Blood release
2. Massive Transfusion Protocol (MTP)
3. Hemorrhage cart/Medication kit
4. Hemorrhage Team (Different than the primary obstetric team)

Emergency Blood release: The ability to urgently retrieve one to three units of packed red blood cells either crossmatched or uncrossmatched by calling the blood bank.

Massive Transfusion Protocol (MTP)² - System Laboratory Policy SLS-703
- An MTP can be called by the operating/delivery surgeon, the anesthesiologist as a result of discussion with operating surgeon.
- Designated primary nurse calls 2600 and MTP is paged overhead.
- Designated primary nurse calls blood bank to alert them of the MTP and gives the following information:
  - Patient’s name, DOB, MR:
  - Location
- Charge RN or 1st RN to respond to the event is the team lead
- Team lead assigns roles and is responsible for crowd control
  - Communicator
  - Scribe
  - Runner

This guideline does not represent the only standard of care, and the health care professionals must use appropriate judgment depending on the particular clinical situation.
Huntington Hospital: Guideline
OB Hemorrhage Guideline

- Designated Runner will pick up cooler in blood bank which will have 4 units of PRBC, 4 units of FFP and 1 Unit of Platelets.

- Communicator will determine from the clinical team of the MTP is still necessary once the products in 1st cooler are near completion.
- If a second cooler is necessary, the Communicator will determine from the clinical team if factors are warranted.
- Communicator will call the blood bank and ask for 2nd cooler along with requested factors if indicated.
- Process will continue until the clinical team no longer needs the MTP.
- The Communicator will notify blood bank that the MTP is cancelled.

*Please note- after the patient is stabilized, you must order in sunrise whatever products the patient received during the code fusion and return to blood bank whatever products weren’t used immediately*

*In cases of Massive Transfusion appropriate/acceptable RBC: FFP ratios include 1:1, 1.5:1, or 2:1

**Hemorrhage Cart/Medication Kit**

**Vaginal**
- Vag retractors, long weighted speculum
- Long instruments (needle holder, clamps etc)
- Uterine Bakri balloon
- Banjo Curette
- Bright task light/Head lamp
- Procedure diagrams

**Cesarean Delivery**
- Hysterectomy tray
- Reloadable straight needle for B-Lynch suture
- Uterine Bakri balloon
- Procedure diagrams

**Medication Kit**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Vial/ampule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitocin 20u/I</td>
<td>1 bag</td>
</tr>
<tr>
<td>Pitocin 10u</td>
<td>2 vials</td>
</tr>
<tr>
<td>Hemabate 250 microgram/ml</td>
<td>1 ampule</td>
</tr>
<tr>
<td>Cytotec 200 microgram/tablet</td>
<td>5 tabs</td>
</tr>
<tr>
<td>Methergine 0.2 mg/ml</td>
<td>1 ampule</td>
</tr>
<tr>
<td>Tranexamic acid 0.1g/ml</td>
<td>1 ampule</td>
</tr>
</tbody>
</table>

**Hemorrhage Team**

1. Surgical/Critical Care support- (GYN Oncology, MFM, General OB/GYN)
2. Anesthesia support- 2nd Anesthesiologist
3. Nursing support- Nursing Administration/Nursing Supervision, designated nursing staff assigned to OB emergencies from each of the WCHS units. Nursery/SCN nurse will attend to the infant or act as a resource to the team. Responding WCHS nurses will remain until released by Charge Nurse
4. Administrative support-(blood bank, laboratory, logistical support)

This guideline does not represent the only standard of care, and the health care professionals must use appropriate judgment depending on the particular clinical situation.
Huntington Hospital: Guideline
OB Hemorrhage Guideline

*Indications for contacting the Hemorrhage Team*
-Any PIH diagnosed as Stage 3 (abnormal vital signs, laboratory results or clinical status)
-See defined stages of hemorrhage
-Any PPH in patients refusing blood transfusions
-Prior to delivery for patients refusing blood transfusions and additional risk factors for PPH
- Prior to delivery for patients with high index of suspicion for placenta accreta

**Estimated Blood Loss (EBL)**

The CBL (EBL) process is initiated by the Nurse (Primary RN in the LDR and circulating RN in the OR) on the basis of number of laps, sponges, suction bottle, drapes. The number is communicated to the surgeon and the consensus amount is documented in the record.

When CBL (in the OR or LDR) reaches 1,500cc and hemostasis not yet achieved, the RN will alert the surgeon as well as a second attending obstetrician who will then present to the patient area and assess if additional resources are necessary. This call for the second obstetrician is a mandatory trigger that the RN is empowered and required to do.

At this time, the need for additional anesthesiology support will be discussed, as well.

**Peripartum Hemorrhage:**

Patient diagnosed with peripartum hemorrhage—observed increased bleeding
(Vaginal Delivery: 500cc  Cesarean Section: 1,000cc)
- Patient suspected of postpartum hemorrhage (intra-abdominal) → because of abnormal Vital Signs, Urinary Output, Lab results, Clinical presentation.

↓

- Establish EBL for that event  calculate estimated blood loss (also known as CBL: Calculated Blood Loss)
- Including delivery EBL and previous episodes
- Determine Stage of Hemorrhage
- Alert provider (see MOWS for timely bedside evaluation)
- For patients refusing blood transfusion alert the Hemorrhage Team at this time
- Monitor Vital Signs (Blood Pressure, Heart Rate, Shock Index)
- Initiate documentation in PPH flow sheet
- Assess IV access (at least 18 gauge)
- Insert Foley catheter (Document Urinary Output with uterine and institute hourly IBH)
- Type and cross 2 units (if not already done)
- Monitor vital signs which includes BP, Pulse, Respirations, shock index and urinary output
- Accomplish 2nd IV access (large bore)

Management: See PPH Algorithm

This guideline does not represent the only standard of care, and the health care professionals must use appropriate judgment depending on the particular clinical situation.
# Huntington Hospital: Guideline
## OB Hemorrhage Guideline

**Patients: EBL > 1, Shocks and hemostasis not yet achieved**

**Site:** OR/LDR

### Communications/Logistics

- **EBL**: RN alerts surgeon to EBL.
- **RN alerts 2nd Obstetrician**
- **2nd Attending**: 
  - Administer antibiotics
  - If antibiotics already used, 
    - without success
  - Initiating blood bank
  - Call for 2nd Anesthesiologist

### Hemostasis

- **Vaginal** → Bakri balloon
- **C/S** → Compression sutures
  - (B-Lynch, etc.)
  - In the judgment of
  - Hemostasis is met
  - Others: Traction, removed tissue
  - anticoagulants etc.
  - Address the source or cause of bleeding

### Replacement

- IV Fluids (R), in a 1:1 ratio to 
- Transfuse and 1g IV FFP

- If blood is the flow
  - Start transfusion (RBC, FFP)

- Abnormal vital signs, urinary
  - Lab results
  - In the judgment of
    - Hemostasis is met
  - For patient refusing blood
  - clotting factors now

### Observe for 15-30 min

- **If not in the OR move**
  - patient to OR now
  - Contact Hemorrhage Team

- **If not already done**
  - Start transfusion now
  - Blood loss (EBL > 200cc and)
  - Low Hct, Acute etc initiate MTP at this time (RBC, FFP, PRs → 2:1:1)

- If ongoing, specific despite MTP consider: 
  - Fibrinogen, Prothrombin
  - Complex Concentrate (Kovalon, Ronexa, etc.)
Huntington Hospital: Guideline
OB Hemorrhage Guideline

Patients: Suspected bleeding (extra-abdominal)
- Abnormal vital signs, altered mental status
- Abnormal laboratory results (Hb, Hct, kidneys, liver chemistry)
- Abdominal clinical exam

Communications/Logistics
- Initiate use of PPH Flow Sheet
- Bedside evaluation
  - within 15-20 min (if not done, consider going to L&D)
  - Provider & PA, NP, Neonatologist
  - Notify Maternal Risk Team***
  - Call ICU, OR, Cardiology
Include Abdominal/Pelvic Ultrasound (CT if needed)

If: free fluid or large collection
- IV fluids 1000cc
- Measure vital signs at bedside
- Femoral Heddle

If: free fluid or large collection
- Move patient to L&D
- Measure vital signs at bedside
- Femoral Heddle

Conservative management if hemodynamically stable

Decision made by AM, MD

- IV fluids
- Transfuse and by IV Drip
- Transfer as necessary
- For patient's refractory bleeding, consider giving clotting factors if acceptable
- Evaluate 60 min

- Conditions deteriorates
- Lack of improvement

Hemostasis

Replacement
Huntington Hospital: Guideline
OB Hemorrhage Guideline

Communications Logistic
- Bedside evaluation within 15-20 min of initial contact
- Notify Neurosurgical Team
- Initiate use of Flow Sheet
- Provider, NP, or resident: Notify Attending MD

Hemostasis
- Blood, Bladder
- Intravenous agents
- Other (Antihistamines, medications, coagulopathy, etc.)
- Address source of cause of bleeding

Observe 15 min; → bleeding continues
- Move patient to LRD area
- Continue interventions
- Get blood to floor; start

Site: PACU or Postpartum floor

Replacement
- IV fluids
- Transfusion: Acid lst

Abnormal Vital Signs
- Abnormal lab results
- Transfusion
- Urinary output

Emergency output

- Move patient to LRD area
- Continue interventions
- Get blood to floor; start

- Abnormal vaginal lab results

**For patients transfusing Blood, contact Huntington Team or lab, now.**
Huntington Hospital: Guideline
OB Hemorrhage Guideline

- For those releasing transfusion contact Hemorrhage Team with
  - CBC, Coagulation studies
  - Platelet administration
  - Clotting factors (thrombin, POC) if acceptable

Observe 15-30min** → Bleeding continues

- Urinoma Multiple
- Contact Hemorrhage Team
- Open OR

- Explore surgery → to Injury Hemostasis
- If bleeding moderate, hemodynamically stable and Intervention Radiology immediately available • Simulcast may be in action
- If brisk bleeding, abnormal V/S, Lab results, or

**Repeat US to confirm hematomas of 15-30min until normal

***Urinary output, vital signs, and abdominal exam to confirm the need to take action immediately

Patients: Cardiovascular collapse in the setting of PPH

Site: OR, LDR, PACU, PP Floor

(Stage 4 Hemorrhage)

Communications/Logistics

- Code Team
- OB Rapid Response Team

Hemostasis

- Emergency Hysterectomy
- OCP

Replacement

- OCP
- NCP
→ Do not delay surgical intervention because of coagulopathy or patient’s hemodynamic status. The surgical intervention should be implemented concurrently with replacement therapy. Successful resuscitation is dependent on insuring hemostasis in the most expeditious way possible. Hemostasis in conjunction with rapid replacement therapy is the best approach to maximize survival rates for these critical patients.
Huntington Hospital: Guideline
OB Hemorrhage Guideline

REFERENCES TO REGULATIONS AND OR OTHER RELATED POLICIES

CLINICAL REFERENCES:
1. Sponge et al Obstet Gynecol 2011
2. Committee Opinion Number 560, American College of OB/GYN
6. Crash-2 Study Lancet 2010

Approvals:

<table>
<thead>
<tr>
<th>Name and Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Grosso MD, FAAP</td>
</tr>
<tr>
<td>Chief Medical Officer, Chair Pediatrics</td>
</tr>
<tr>
<td>Mitchell Kramer, MD FACOG</td>
</tr>
<tr>
<td>Chief of Obstetrics and Gynecology</td>
</tr>
<tr>
<td>Susan Knoepfle MPA, RN, NE-BC</td>
</tr>
<tr>
<td>Chief Nursing Executive</td>
</tr>
<tr>
<td>Jennifer Baerlein MS, RNC-OB</td>
</tr>
<tr>
<td>Administrative Director, WCHS</td>
</tr>
<tr>
<td>Andrew Feit, MD</td>
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<tr>
<td>Chief of Anesthesia</td>
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<td>Gary Stone, MD</td>
</tr>
<tr>
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</tr>
<tr>
<td>Jon Zenker</td>
</tr>
<tr>
<td>Director of Laboratory</td>
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<tr>
<td>Christine Hendricks</td>
</tr>
<tr>
<td>Director of Pharmacy</td>
</tr>
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</table>
Huntington Hospital: Guideline
OB Hemorrhage Guideline

**Hemorrhage Team:**

<table>
<thead>
<tr>
<th>Gyn Oncology</th>
<th>Maternal Fetal Medicine</th>
<th>General Ob-Gyn</th>
<th>General Surgery/other</th>
</tr>
</thead>
</table>

Huntington Hospital- MD1 Provider on shift. MD as needed. Anesthesiologist on shift. 24/7 Anesthesiologist as needed. Designated Nursing Response-WCHS team: Nursing Administration Supervision. Rapid Response team when indicated.

**Estimating Blood Loss**

- 4x4 gauze pad – 3 mL
- Full & dripping purple chux – 800 mL
- Full & dripping blue chux – 300 mL
- Fully soaked peripad – 70-100 mL
- Partially soaked peripad – 50 mL
- Full & dripping lap pad (half pad) used in vaginal delivery – 40-45 mL
- Full lap pad (half pad) used in vaginal delivery (not dripping) – 30 mL
- Full & dripping lap pad used in surgery – 100 mL
- Full lap pad used in surgery (not dripping) – 60-75 mL
- 12 ounce soda can – 355 mL
- Fist or baseball size clot – 60 mL

**ALL DOCUMENTATION OF BLOOD LOSS MUST BE REFERRED TO IN mL.**
Huntington Hospital: Guideline
OB Hemorrhage Guideline

Assessing the degree of Hemorrhage

1 – Volume of blood already lost (EBL)
2 – Rate of bleeding (at the time of evaluation)
3 – Consequences of blood loss:
   - Hemodynamic abnormalities (BP, Pulse, Shock Index, Urinary Output)
   - Hb, Hct Abnormalities
   - Metabolic abnormalities (pH, Base Deficit, Lactic acid)
   - Patient Clinical status (anxious, confused, lethargic)

Stages 1 ➔ Stage 4

Peripartum Hemorrhage
- Stages of Hemorrhage* -

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>f Bleeding (&gt;500cc vag, &gt;1,000cc C/S)  Normal V.S., Labs and clinical picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 2</td>
<td>f f Bleeding (EBL, 1,000-1,500cc)  Normal V.S., Labs and clinical picture</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Ongoing Bleeding ➝ EBL &gt; 1,500cc; or Brisk bleeding (&gt;500cc/10-min)</td>
</tr>
<tr>
<td></td>
<td>Or any of these abnormalities in the context of bleeding (regardless of EBL or Transfusion)</td>
</tr>
<tr>
<td></td>
<td>Abr: BP, Pulse, Shock Index, Urinary Output</td>
</tr>
<tr>
<td></td>
<td>Abr: Coagulation, pH, BD, Lactic acid, Hb/Hct (&gt;3g drop in Hb)</td>
</tr>
<tr>
<td></td>
<td>Abr: Clinical status (confused, lethargic)</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Cardiovascular collapse in the setting of severe hemorrhage</td>
</tr>
<tr>
<td></td>
<td>- Profound hypovolemic shock (blood loss not replaced)</td>
</tr>
<tr>
<td></td>
<td>- AFE (sudden c-v collapse) ➝ heavy vaginal bleeding</td>
</tr>
</tbody>
</table>

*Modified after American College of Surgeons
Huntington Hospital: Guideline
OB Hemorrhage Guideline

Uterine Atony

1st Line uterotonic

**Oxytocin** (Recommend regimen)
- 40U/1,000cc at 125cc/hr

**Methergine**
- 0.2mg IM (may be repeated q 2-4 hrs)

*Causes vasoconstriction - avoid in Hypertensive patients

2nd Line uterotonic

**Carboprost** (15methyl PG F2a)
- 250mg IM - may be repeated q15min -q2hrs (max x8)

**Cytotec**
- 800-1,000mg rectally

*May cause bronchospasm - Avoid in patients with asthma
** Causes vasodilation - Avoid in patients already hypotensive
Huntington Hospital: Guideline
OB Hemorrhage Guideline

Antifibrinolytic Therapy
Tranexamic acid (Cyklokapron, Transmin)

The development of coagulopathy in patients with significant hemorrhage includes the process of hyperfibrinolysis. Recent data identifies increased fibrinolysis as a major risk factor for massive transfusion and mortality rates.

Considerable data from the surgical literature suggest beneficial effects from using antifibrinolitics in patients at risk for hemorrhage or as treatment for patients already bleeding:

1. Prophylactic administration of Tranexamic acid (Tranexamic acid) reduces surgical blood loss by approximately 30%.
2. Administration of Tranexamic acid in the presence of significant bleeding decreases both, transfusion, and mortality rates without increasing rates of thromboembolic disease.

As such its use in obstetrics may prevent or decrease morbidity and mortality associated with postpartum hemorrhage.
The following is a proposed protocol for the use of antifibrinolytic therapy for the prevention and treatment of PPH.

Prophylaxis (the following high-risk patients may benefit from administration of Tranexamic acid) at the time of delivery:

- Patients refusing blood products undergoing delivery
- Patients fully anticoagulated undergoing delivery
- Patients at significant risk for major PPH, i.e., placenta previa/accreta

Therapy:
- All patients diagnosed with postpartum hemorrhage

Dose of Tranexamic acid (Cyklokapron, Transmin):
- Initial dose 1g infused slowly over 10 min prior to start of surgery (or 10mg/Kg)
- Repeat doses:
  - 1mg/kg/hr for next 8 hrs
  - 1g administered 8 hrs later
  - At the discretion of MD

Contra-indications
- Patients with active VTE
- Patients at high risk for VTE (personal history of VTE, carrier of major thrombophylia)

Risk factors for PPH:
- Placenta previa
- Large myomas
- Uterine overdistension (multiple gestation, polyhydramnios)
- History of postpartum hemorrhage
- Chorioamnionitis
- Abnormal labor (prolonged labor)
Huntington Hospital: Guideline
OB Hemorrhage Guideline

- Prothrombin Complex Concentrate (PCC) –

PCC are plasma derived products containing vitamin K dependent clotting factors: FII, FVII, FIX, FX. They are classified as 3 or 4 Factor PCC:

<table>
<thead>
<tr>
<th>Name</th>
<th>Contains Factors</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Factors PCC: Behulin</td>
<td>II, IX, X (little VII)</td>
<td>25-50u Kg</td>
</tr>
<tr>
<td>4 Factors PCC: Kcentra</td>
<td>FII, FIX, FX, FVII</td>
<td>25-50u Kg</td>
</tr>
</tbody>
</table>

- Prothrombin Complex Concentrate –

Administration of PCC (either alone or in combination with Fibrinogen concentrates)

↓

1. Significantly decreases transfusion requirements
2. Decreases morbidity rates (Pulmonary edema, Multiple Organ Failure, Abdominal Compartment Syndrome)

The advantage over FFP is that PCC provides the same clotting replacements in much smaller volumes
Hand – Off Communication OR → PACU

Procedure:
- NSVD
- Instrumental delivery
- C/S

EBL: Total
- In OR

Interventions:
- Iterotomies
- Blood transfusion

Vital Signs:
- On admission to hospital
- Last 30 minutes in OR

Urinary Output:
- Total output in OR

Labs:
- Sent
- Received

Medical/Obstetrical Co-morbidities:
- Chronic hypertension
- Other
Hand – Off Communication PACU → Postpartum

Procedure:
- NSVD
- Instrumental delivery
- CS

EBL: Total
- In Labor and Delivery
- In the PACU

Interventions (OR/LDR or PACU)
- Tocolytics
- Blood transfusion
- Packing
- Bakri balloon
- Surgical/IR interventions

Vital Signs
- On admission to hospital
- On admission to PACU
- Last 30 minutes in PACU

Urinary Output
- Total output in PACU
- Total output on Postpartum

Labs
- Sent
- Received

Medical/Obstetrical co-morbidities
- Chronic hypertension
- Other
Huntington Hospital: Guideline
OB Hemorrhage Guideline

Hand – Off Communication Postpartum → OR/PACU

Procedure
- NSVD
- Instrumental Delivery
- C/S

EBL: Total
- In Labor and Delivery
- In the PACU
- On Post Partum

Interventions (OR/LDR or PACU) – list drugs used, provide dosages and amounts
- Uterotonic
- Blood Transfusion
- Packing
- Bakri Balloon
- Surgical IR interventions

Vital Signs
- On admission to the hospital
- On admission to the PACU
- Last 30 minutes on PACU
- Last 30 minutes on Postpartum

Urinary Output
- Total output in PACU or LDR
- Total Output on Postpartum

Labs Sent
- Sent
- Received

Medical/Obstetrical co-morbidities
- Chronic Hypertension
- Other
Huntington Hospital: Guideline
OB Hemorrhage Guideline

### Blood and Non-Blood Product Preferences – Out-Patient Assessment Form

My signature below indicates that I agree to the following blood and/or non-blood products which may be administered to me during my hospitalization. My attending physician has reviewed and fully explained to me the risks and benefits of the following blood products and methods for alternative non-blood medical management and blood conservation available to me. My attending physician named above has also fully explained to me the potential risk associated with not authorizing blood or non-blood management during my hospitalization. Blood Bank Notified Form Completed: Yes / No  Date  Time

**NOTE:** If any changes are made to this information, they must be dated, timed and initialed by the patient and provider.

<table>
<thead>
<tr>
<th>Category I</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
<th>May Accept Under Certain Circumstances</th>
</tr>
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<tbody>
<tr>
<td>Red Blood Cells</td>
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<tr>
<td>Platelets</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Autologous Banked Blood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category II – minor blood fractions – fractionated out from human plasma</strong></td>
<td></td>
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<tr>
<td>Albumin</td>
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<tr>
<td>Fibrinogen Glue</td>
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<tr>
<td>Erythropoietin</td>
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<tr>
<td>RhoGAM</td>
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<tr>
<td>Human Immunoglobulin</td>
<td></td>
<td></td>
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<tr>
<td>Cryoprecipitate</td>
<td></td>
<td></td>
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<tr>
<td>Humate-P</td>
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<tr>
<td>Fibrinogen Complex Concentrate</td>
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<tr>
<td><strong>Category II (Does not contain human plasma) +</strong></td>
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</tr>
<tr>
<td>Factor VII A (Novo 7)</td>
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<tr>
<td><strong>Category III – no blood component</strong></td>
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<tr>
<td>Transamin Acid</td>
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<tr>
<td>Amine</td>
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<tr>
<td>Heterotrich</td>
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<tr>
<td><strong>Category IV</strong></td>
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<tr>
<td>Inotropeic Hemodilution</td>
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<tr>
<td>Hypotensive Hemodilution</td>
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<tr>
<td>Cell Saver</td>
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</tr>
<tr>
<td>Other</td>
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<td></td>
</tr>
</tbody>
</table>

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**MATERNAL FETAL MEDICINE**

<table>
<thead>
<tr>
<th>Patient Signature</th>
<th>Patient Signature</th>
<th>Patient Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name</td>
<td>Name</td>
</tr>
<tr>
<td>MD</td>
<td>MD</td>
<td>MD</td>
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</tbody>
</table>

**ANESTHESIOLOGY**

<table>
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<tr>
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</thead>
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<tr>
<td>Name</td>
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</tbody>
</table>

**HEMATOLOGY**

<table>
<thead>
<tr>
<th>Patient Signature</th>
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<tbody>
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</tr>
<tr>
<td>MD</td>
<td>MD</td>
<td>MD</td>
</tr>
</tbody>
</table>

Date:  Time:  Reaffirmed upon Admission to the Hospital by:  Date:  Time:  

ONCE COMPLETED, THIS FORM IS TO BE FAXED INTO MY MEDICAL FILE (MMF on L&D) 516-562-4894  NFM and Anesthesia consult will be scheduled together.

---

**NEW YORK STATE**
Department of Health

**nyspc**
Perinatal Quality Collaborative
Huntington Hospital: Guideline
OB Hemorrhage Guideline

<table>
<thead>
<tr>
<th>Where to Order</th>
<th>COMPONENT</th>
<th>CONTENT</th>
<th>Expected Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Bank</td>
<td>Packed Red Blood Cells</td>
<td>Contains red blood cells and a small amount of plasma</td>
<td>250 ml increases hematocrit by 3-4% and hemoglobin by 1 g/dl</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Fresh Frozen Plasma (FFP)</td>
<td>Plasma which contains clotting factors, albumin and immunoglobulins</td>
<td>250 ml increases fibrinogen, normalization of PT, PTT</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Platelets</td>
<td>Platelets and plasma</td>
<td>250 ml increases platelets</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Autologous Blood</td>
<td>Donated by patient for self-use</td>
<td>Need a high/normal hematocrit and usually is not used in emergencies</td>
</tr>
</tbody>
</table>

**Minor Blood Fractions**

| Blood Bank     | Albumin        | A protein in human serum, highly processed/treated plasma derivative   | Reverse hypervolemia (draws interstitial fluid into circulation)                |
| Blood Bank     | Factor VII     | Concentrated preparation of clotting factor VII                         | Initiates thrombosis by activating platelets and the clotting cascade           |
|                | NovoSeven      |                                                                          | improving coagulation. Only effective after major sources of bleeding are repaired, create a fibrin clot to achieve hemostasis |
| OR             | Fibrin Glue    | Fibrinogen and thrombin,                                               |                                                                                   |
| Pharmacy       | Erythropoietin | A hormone produced in the kidney; may contain albumin                  | Controls RBC production                                                        |
| Blood Bank     | RhoGAM         | Medicine containing antibodies                                          | Removes fetal cells that entered maternal circulation to prevent sensitization |
| Blood Bank     | Human Immunoglobulin | Human protein antibodies                                         | Immune antibodies to protect from infection                                      |
| Blood Bank     | Cryoprecipitate | Fibrinogen, Factors VII, vWF, XIII, Fibronectin                      | Increases fibrinogen                                                            |
| Blood Bank     | Humate-P (vWF/F VIII) | Protein factors; vWF, Factor VIII – human derived                   | May stop excessive bleeding, plays a role in clotting                          |
| Blood Bank     | Prothrombin Complex Concentrate | Blood clotting factors II, VII, IX, X, and protein C and S; human derived | Reverses anticoagulation therapy, accelerates coagulation                        |

**No Blood Component**

| Pharmacy       | Tranexamycin    | Antifibrinolytic                                                        | Potentially decreases amount and duration of blood loss by preventing breakdown of fibrin, preserving clots. May reduce progression to a more severe bleed. 1 gram 8 hours later. |
| Pharmacy       | Amicar         | Derivative amino acid lysine; anti-fibrinolytic                         | Aids in fibrinolysis                                                           |
| Pharmacy       | Hetastarch     | Non-ionic starch derivative                                             | Volume expander (Hespian) prevents shock                                         |

**Category IV**

<table>
<thead>
<tr>
<th>Anesthesiology</th>
<th>Isovolumic Hemodilution</th>
<th>Autologous blood removed from patient</th>
<th>Limits the use of banked blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypervolemic Hemodilution</td>
<td>Administering a large volume of fluid before surgery so that when you lose volume during surgery you lose fewer RBCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Saver – closed circuit</td>
<td>Autologous blood – Blood lost during procedure</td>
<td>Can return up to 250 ml IV in 3 minutes, devoid of plasma and platelets</td>
<td></td>
</tr>
</tbody>
</table>
### Blood and Non-blood Product Preferences – In-Patient Assessment Form

My signature below indicates that I agree to the following blood and/or non-blood products which may be administered to me during my hospitalization. My attending physician [name] has reviewed and fully explained to me the risks and benefits of the following blood products and methods for alternative non-blood medical management and blood conservation available to me. My attending physician named above has also fully explained to me the potential risk associated with not authorizing blood or non-blood management during my hospitalization.

**NOTE:** If any changes are made to this information, they must be dated, timed and initialed by the patient and provider.

Blood Bank Notified Form Completed and form faxed to Blood Bank: Yes / No  Date: Time:

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<td>Cryoprecipitate – needs consent</td>
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<tr>
<td>Tranexamic Acid</td>
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<td>Amicar</td>
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<td>Hetastarch</td>
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<td>Category IV</td>
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<tr>
<td>Isovolemic Hemodilution</td>
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<tr>
<td>Other</td>
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</tr>
</tbody>
</table>

**Patient Identification**

**Category:**

**Obstetrical Attending:**

**Anesthesiologist:**

**Signature:**

**Print Name:**

**Date:**

**Time:**
Long Island Jewish Forest Hills: Maternal Early Warning Signs Protocol

Maternal Early Warning Signs (MEWS) Protocol

1. Immediate action is required when any of the MEWS criteria are met (see table on page 2***)
   Items that are not in the lower box should be confirmed, within 10 minutes, prior to calling the physician.
   **Not applicable for BP systolic <90 when <=30 min post epidural and anesthesiologist present.

2. When immediate action is required:
   - If the attending physician is immediately available, he/she will provide bedside evaluation of the patient within 10 minutes. The in-house OB will be notified to provide bedside evaluation if the attending physician is not at the bedside within 5 minutes.
   - If the attending physician is not immediately available, the RN will call the in-house OB to provide bedside evaluation of the patient within 10 minutes. The attending physician or CM will also be notified of the patient’s status. If the CM is notified, he/she will notify the attending physician.
   - If in-house OB is called but not immediately available, he/she will receive a verbal report and determine what further action is necessary.

3. When called to the bedside, the physician will document by writing a note which includes but is not limited to:
   - Differential diagnosis (the RN will provide this protocol and a differential diagnosis list to the bedside).
   - Planned frequency of monitoring and re-evaluation.
   - Criteria for immediate physician notification.
   - Any diagnostic or therapeutic interventions.
   - “Huddle” participants and summary of management plan.
   - The physician will communicate the assessment and plan via a “Huddle.” Huddle participants include the Primary RN, the Charge RN, the Anesthesiologist, the attending physician if present, and the in-house OB.

4. If MEWS condition(s) persist after corrective measures undertaken, then MFM consult should be requested. Additionally, Intensivist consult &/or Rapid Response Team may be called.

5. Depending on the clinical evaluation, patient laboratory and diagnostic studies to consider include:
   - Pulse oximeter
   - CBC
   - Type and screen or type and cross match if bleeding
   - CMP
   - Magnesium level
   - EKG, particularly in the presence of tachycardia, bradycardia, or chest pain
   - CT angiogram or perfusion scan in patients with acute chest pain
   - CXR if the patient has SOB, particularly if pre-eclamptic
   - Echocardiogram

6. If the primary RN and the charge nurse question any aspect of the patient’s care and the issue is not resolved with the attending physician, another appropriate physician (MFM, Department Director or Associate Director, or the Chairman of the DQAIC committee) and a nurse in the Nursing Chain of Command (Nurse Manager, Clinical Practice Specialist, or Nursing Supervisor/AVP) will be notified.
Long Island Jewish Forest Hills: Maternal Early Warning Signs Protocol

Immediate Action Required

- Systolic BP; mmHg  <90 or >160
- Diastolic BP; mmHg  >100
- Heart rate; bpm  <50 or >120
- Respiratory rate; bpm  <10 or >30
- Oxygen saturation; % <95
- Oliguria; ml/hr x 2h  <35

✓ Maternal agitation, confusion, or unresponsiveness
✓ Patient with hypertension reporting a non-remitting headache or shortness of breath
TITLE: MANAGEMENT OF OBSTETRICAL HEMORRHAGE

GUIDELINE:
All obstetrical patients will be assessed for risk factors for obstetrical hemorrhage. The guideline is activated at the Stage 1 level if blood loss is > 500 mL for vaginal birth or > 1000 mL for cesarean birth. If the patient is not responsive to initial therapies, advanced care is provided as discussed in subsequent stages.

APPLICABILITY: OBSTETRICS

PURPOSE:
To provide guidelines for the optimal response of the multidisciplinary team in the event of obstetrical hemorrhage. To aid in the early recognition of patients at risk for obstetrical hemorrhage, to identify stages of hemorrhage and treatment goals.

EVIDENCE-BASED SUPPORTIVE DATA:
1. Hemorrhage is one of the leading causes of maternal mortality. The causes of death due to hemorrhage are multi-factorial and prevention requires an interdisciplinary response.
2. Postpartum hemorrhage occurs in more than 10% of all births and accounts for 25% of maternal deaths.
3. Initial signs and symptoms of blood loss can be difficult to detect due to compensatory responses, increased circulating volume in pregnant women, and circulatory changes that occur with delivery of the placenta.
4. Early opportunities exist to assess risk, anticipate, and plan in advance of most obstetric hemorrhages.
5. A standardized approach to hemorrhage includes a clearly defined, staged checklist of appropriate actions to be taken in an emergency situation which can help to improve patient outcomes.
6. Each obstetric unit has a standardized, secured and dedicated hemorrhage cart containing emergency hemorrhage supplies and severe hemorrhage response procedures. Verification of cart integrity will be performed daily.
7. Each obstetric unit has a standardized, secured and dedicated hemorrhage kit containing uterotonic medications.
8. Visual estimation of blood loss (EBL) consistently results in errors of underestimation. Methods to quantify blood loss (QBL), such as weighing, are significantly more accurate than EBL (AWHONN, 2014).
9. Oxytocin administration for active management of third stage of labor is recommended for all births.
10. Hospital systems that support early recognition and a rapid, coordinated response to extreme blood loss can limit maternal morbidity and improve maternal survival. Obstetric hemorrhage emergencies should be handled with the same level of urgency and preparation as a cardiac code. Any licensed health care team member can call for help and activate maternal hemorrhage response as clinically indicated.
NYP Brooklyn Methodist Hospital: Management of Obstetric Hemorrhage Policy

New York-Presbyterian Brooklyn Methodist Hospital
Department of Obstetrics
Perinatal Practice Guideline
Page 2 of 12

MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D

11. Education of the hemorrhage procedure will be provided to all staff and providers who treat pregnant and postpartum patients: upon orientation, whenever changes to the procedure occur, and every two years. Education will be role-specific.

12. Drills will be conducted at least annually to determine system issues, teamwork and communication opportunities. Drills are to include representation from each discipline identified in this procedure and will include a team debrief following the drill.

13. Hemorrhage cases that meet criteria established by NYP Department of

14. Quality and Patient Safety in collaboration with the Perinatal Practice Council will be reviewed to evaluate the effectiveness of the care, treatment, and services provided by the hemorrhage response team during the event.

15. Education will be provided to patients and their families, to include the designated support person when possible.

16. This guideline is used in conjunction with the following:
   a. Massive Transfusion Protocols (MTP):
      BBG33 – Massive Transfusion Protocol (MTP)
   b. Nursing Clinical Standards:
      OB 1770 Post Vaginal and Cesarean Birth Management
      9200-107 Blood Transfusion
   c. Hospital Policy:
      9200-214 Chain of Communication
   d. Perinatal Practice Guidelines
      Obstetrical Anesthesia – refer to protocol

1. RISK ASSESSMENT AND PLANNING: EVALUATE FOR RISK FACTORS
   At a minimum, all patients admitted to Labor and Delivery, Antepartum and
   Postpartum units should have the following completed:
   A. Complete blood count and active type and screen sent to the blood bank
   B. Informed consents for administration of blood products.
   C. Identify women who may decline transfusion
      1) Notify OB provider to confirm plan of care
      2) Notify OB Anesthesiology team
      3) Review health care proxy and consent.
      1. Determine risk factors for hemorrhage. See Tables 1 through 4.
         Complete risk assessment upon admission to Labor & Delivery, then
         ongoing evaluation for development of additional risk factors during
         labor (Pre-Birth) and following delivery in recovery phase (Post-Birth).
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MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D

Table 1: Risk Assessment: Labor & Delivery Admission

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Factor</th>
<th>Plan of Care</th>
</tr>
</thead>
</table>
| Low        | • No previous uterine incision  
• Singleton pregnancy  
• ≤4 previous vaginal births  
• No known bleeding disorder  
• No history of PPH | • Obtain Type and Screen |
| Medium     | • Multiple gestation >4 previous vaginal births  
• Prior cesarean birth or prior uterine incision  
• Large uterine fibroids  
• History of 1 previous PPH  
• Family history in first degree relatives who experienced PPH**  
• Chorioamnionitis  
• Fetal demise**  
• EFW > 4 KG  
• Maternal obesity (BMI >40*)  
• Polyhydramnios**  
• Patient refusing blood products* | • Obtain Type and Screen  
• Notify appropriate personnel |
| High       | • Has 2 or more medium risk factors  
• Active bleeding  
• Suspected abnormal placentation (accrregular or previa/lowlying)  
• Known coagulopathy  
• History of more than one  
• previous PPH**  
• Hematocrit < 30  
• Thrombocytopenia  
• Alloimmunization* | • Prepare blood  
• Notify appropriate personnel  
• Consider delivering at facility with appropriate level of care capable of managing a high risk mother. |

*Allscripts and Meditech sites  
**Epic sites only
## Management of Obstetrical Hemorrhage, Cont’d

### Table 2: Risk Assessment Pre-Birth

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Factor Admission Risk Factors AND:</th>
<th>Plan of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>• No previous uterine infection</td>
<td>• Verify that Type and Screen results are active and present</td>
</tr>
<tr>
<td></td>
<td>• Singleton pregnancy</td>
<td>• Use scales/calibrated equipment to quantify cumulative blood loss</td>
</tr>
<tr>
<td></td>
<td>• ≤4 previous vaginal births</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No known bleeding disorder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No history of PPH</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>• Prolonged oxytocin &gt;24h</td>
<td>• Notify OB provider, charge RN and call team huddle.</td>
</tr>
<tr>
<td></td>
<td>• Chorioamnionitis</td>
<td>• Verify active Type &amp; Screen</td>
</tr>
<tr>
<td></td>
<td>• Induction/augmentation of labor</td>
<td>• Verify 18G or larger IV access present and patent.</td>
</tr>
<tr>
<td></td>
<td>• Labor &gt;18 hours</td>
<td>• Verify PPH cart and uterotonic are available on unit.</td>
</tr>
<tr>
<td></td>
<td>• Prolonged second stage</td>
<td>• Use scales/calibrated equipment to quantify cumulative blood loss</td>
</tr>
<tr>
<td></td>
<td>• Magnesium sulfate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Maternal temperature &gt;100.4°F</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>• New active bleeding greater than bloody show</td>
<td>• Notify OB provider, charge RN, anesthesiologist and call team huddle.</td>
</tr>
<tr>
<td></td>
<td>• Suspected abruption</td>
<td>• Confirm blood prepared</td>
</tr>
<tr>
<td></td>
<td>• 2 or more “Medium Risk” factors on admission or intrapartum</td>
<td>• Verify 18G or larger IV access present and patent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Verify PPH cart and uterotonic are available on unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use scales/calibrated equipment to quantify blood loss,</td>
</tr>
</tbody>
</table>
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**MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D**

### Table 3: Risk Assessment Post-Birth

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Factor</th>
<th>Plan of Care</th>
</tr>
</thead>
</table>
| **Low**    | Admission AND Intrapartum Risk Factors AND:  
No previous uterine incision  
Singleton pregnancy  
≤4 previous vaginal births  
No known bleeding disorder  
No history of PPH | • Verify that Type and Screen results are active and present:  
• Use scales/calibrated equipment to quantify cumulative blood loss |

| **Medium** | Operative vaginal delivery  
Third of fourth degree laceration or episiotomy  
Cesarean birth  
Precipitous delivery  
Shoulder dystocia | Notify OB provider, charge RN and call team huddle.  
Verify active Type & Screen  
Verify 18G or larger IV access present and patent.  
Verify PPH cart and uterotonic are available on unit.  
Use scales/calibrated equipment to quantify cumulative blood loss |

| **High**   | Active bleeding  
Difficult placental extraction  
Concealed abruption  
Uterine inversion | Notify OB provider, charge RN, anesthesiologist and call team huddle.  
Confirm blood prepared  
Verify 18G or larger IV access present and patent  
Verify PPH cart and uterotonic are available on unit.  
Use scales/calibrated equipment to quantify blood loss. |
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MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D

2. STAGES OF OBSTETRIC HEMORRHAGE

A. ALL BIRTHS: PREVENTION AND RECOGNITION OF OB HEMORRHAGE:
   
   Universal Active Management of Third Stage of Labor
   
   1) Prophylactic uterotonic are given with delivery of the anterior shoulder or just after delivery of the infant.

   2) Uterotonic of choice is oxytocin and is administered as follows:

   - 30 units oxytocin per 500 mL fluid. Dose is 15 \text{ mU}
   - oxytocin per hour at a rate of 250 mL per hour. Run
   - infusion for 2 hours to deliver 30 \text{ mU} oxytocin over 2
   - hours.

   OR

   - 10 units oxytocin IM (reserve for patients without
   - intravenous access)

   3) Provide vigorous fundal massage for at least 15 seconds

ONGOING EVALUATION OF VITAL SIGNS AND CLINICAL TRIGGERS

B. STAGE 1: Blood loss >1000mL after delivery with NORMAL vital
   signs and lab values. Vaginal delivery 500-999mL should be treated
   as in Stage 1.

   1) Perform fundal massage
   2) Record and announce cumulative quantitative blood loss
   3) Record vital signs and oxygen saturation every 5 minutes
   4) Obtain hemorrhage cart and bring to patient’s bedside
   5) Establish IV access with at least 16 gauge, if possible
   6) Insert/Maintain urinary catheter
   7) Increase IV fluid (crystalloid 3:1 ratio without oxytocin)
   8) Increase oxytocin, additional uterotonic (Table 4)
   9) Confirm active type and screen and consider Type & Cross 2 units
   RBCs
   10) Determine and treat etiology by evaluating uterine atony, trauma or
       laceration, retained placenta, placenta accreta, uterine inversion,
       uterine rupture, coagulopathy or amniotic fluid embolism. (Evaluate
       patient for the 4 T’s (tone, trauma, tissue, thrombin).
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### MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D

#### TABLE 4: Uterotonic Medications for Stage 1 Hemorrhage

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Primary Route/ (Alternate)</th>
<th>Frequency of Dose</th>
<th>Side Effects</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin (Pitocin)</td>
<td>30 Units in 500 mL of solution IM: 10 units</td>
<td>TV or Intramuscular if there is no TV access.</td>
<td>Continuous Infusion</td>
<td>Usually none. Nausea, vomiting, water intoxication have been reported.</td>
<td>Hypersensitivity to drug. Do not administer with DSMA.</td>
</tr>
<tr>
<td>Methylergometrine (Methergine)</td>
<td>0.2 mg IM or Intramuscular</td>
<td>Every 2-4 hours</td>
<td>Hypertension, hypotension, nausea, vomiting</td>
<td>Hypertension, preeclampsia.</td>
<td></td>
</tr>
<tr>
<td>18-methyl Prostaglandin F 2 Carboprost (Hemabate)</td>
<td>0.25 mg IM</td>
<td>Every 15 minutes for maximum of 8 doses</td>
<td>Vomiting, diarrhea, nausea, flushing or hot flashes, chills or shivering.</td>
<td>Asthma, Caution with active hepatic, cardiac or renal disease.</td>
<td></td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>800-1000 mcg 600 mcg PO 800 mcg Sublingual</td>
<td>Per Rectum PO Sublingual</td>
<td>Once</td>
<td>Nausea, vomiting, diarrhea, fever and chills.</td>
<td>Hypersensitivity to drug.</td>
</tr>
</tbody>
</table>
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MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D

TABLE 5: Additional Medications to Consider if Suboptimal Response to Uterotonics:

<table>
<thead>
<tr>
<th>Name</th>
<th>Mechanism of action</th>
<th>Dose</th>
<th>Route/Alt. Routes</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tranexamic Acid (TXA)</td>
<td>Antifibrinolytic</td>
<td>1g/10 mL diluent (stocked in premixed 10-mL vial(s))</td>
<td>IV/P/V infusion over 10 min. Oral if no IV access May be given in 50 mL DS or NS over 10 min.</td>
<td>Can repeat X 1 in 30 min if refractory hemorrhage Caution if H/O thrombosis Can be given prophylactically in patients at high risk for hemorrhage. Maximum infusion rate: 100 mg/minute</td>
</tr>
</tbody>
</table>

N.B.: Tranexamic acid has been shown to be effective in reducing blood loss and the need for transfusion in obstetric, gynecologic, and other surgery. Side effects, including thrombotic events, are rare. It is most effective when given within 3 hours of the onset of hemorrhage.

C. STAGE 2: Continued bleeding with EBL up to 1500 mL OR requiring ≥ 2 uterotonics with NORMAL vital signs AND lab values

1) Activate rapid, coordinated hemorrhage response team
2) Establish second IV access with 16 gauge, if possible
3) Draw and send STAT labs including: CBC, coagulation profile and fibrinogen level
4) Place warming blanket on patient
5) If uterine atony present, consider intrauterine balloon, embolization or surgical interventions
6) Continue administration of medications from Stage 1 (Table 4); consider TXA (Table 5)
7) DO NOT WAIT for lab results. Transfuse patient per clinical signs, symptoms and ongoing blood loss
8) Notify Blood Bank of OB hemorrhage while obtaining 2 units RBCs to bedside and thaw 2 units FFP
9) Prepare OR. Consider moving patient to operating room for improved exposure and potential D&C

D. STAGE 3: Continued bleeding with EBL > 1500 mL OR > 2 units RBCs given OR at risk for occult bleeding/coagulopathy OR any patient with ABNORMAL vital signs /labs /oliguria

1) ACTIVATE MASSIVE TRANSFUSION PROTOCOL (MTP)
    a) See Supportive Data #8 for campus - specific activation guidance.
MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT'D

2) Outline management plan; perform serial re-evaluation and communicate with hemorrhage team.
3) Assemble additional staff to include advanced GYN surgeon, operating room support staff and perfusionist.
4) Move to OR.
5) Announce clinical status (vital signs, cumulative blood loss). Communicate plan.
7) If coagulopathic, add cryoprecipitate. Consider consultation for alternative agents.
8) Continue administration of medications from Stage 1 (Table 4), consider TXA (Table 5).
9) Utilize fluid warmer and/or rapid infuser for fluid and blood product administration.
10) Identify etiology of bleeding, examine for lacerations, send labs for coagulopathy and consider imaging for occult bleed.
11) Achieve hemostasis immediately, interventions based on etiology. Surgical options include B-Lynch suture, uterine compression suture, uterine vessel ligation and hysterectomy. Reverse coagulopathy by actively transfusing blood products.
12) Consider transfer to higher level of care.

E. STAGE 4: Cardiovascular collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)
1) Perform immediate surgical intervention as necessary to ensure hemostasis by performing hysterectomy.
2) Replace blood and factors aggressively, expeditiously and simultaneously regardless of patient’s coagulation status.

F. TERMINATE MASSIVE TRANSFUSION PROTOCOL. The designated physician or the on-call blood bank physician will notify the blood bank when the MTP is terminated.

G. At the conclusion of the hemorrhage, the team performs a post-event multidisciplinary debrief with a focus on identification of system level improvement opportunities. The team performs a debrief with the patient and family. The debrief is encouraged to be held immediately if the case has progressed to Hemorrhage Stage 2. Participants at minimum should be the primary OB provider, anesthesiologist and nurse, all other participants as able.
### MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D

**TABLE 6: Hemorrhage Response Team**

*Response Team may be activated by mobile device, manual emergency button located in patient room or notification to central communications operator.*

<table>
<thead>
<tr>
<th>Primary Responders</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>OB Providers: Attending/Midwife/Resident/PA/NP</td>
<td>Serve as team lead; Performs initial assessment, prescribes diagnostic and therapeutic interventions, outlines management plan.</td>
</tr>
<tr>
<td>Anesthesiology Attending/Resident</td>
<td>Assists with initial assessment and interventions, manages airway, hemodynamic s, pain control, administers blood products. Communicates plan in collaboration with OB provider.</td>
</tr>
<tr>
<td>Charge RN</td>
<td>Assists Primary RN in implementation of interventions, brings PPH cart, assigns clear roles including runner to blood bank, prepares OR, coordinates bed placement, assists with direct hand-off.</td>
</tr>
<tr>
<td>Primary RN</td>
<td>Activation of response team. Communicates patient condition to primary responders, assists in implementing interventions as ordered by team leader, remains with patient until stabilization or resolution of the problem with direct handoff.</td>
</tr>
<tr>
<td>Secondary Responders</td>
<td>May be consulted when necessary in PPH Stage 3</td>
</tr>
<tr>
<td>Advanced GYN Surgeon</td>
<td></td>
</tr>
<tr>
<td>Critical Care Physician</td>
<td></td>
</tr>
<tr>
<td>Respiratory Therapist</td>
<td></td>
</tr>
<tr>
<td>Interventional Radiologist</td>
<td></td>
</tr>
</tbody>
</table>
MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT’D

Procedure for Quantitative Blood Loss for Vaginal Delivery (QBL)
1. Using formal methods such as graduated containers and weight of soaked material (1 gm = 1 mL). Weigh blood-soaked materials and subtract known dry weight of material.
2. Ongoing evaluation of vital signs and urine output
3. Following onset of heavy bleeding, > 500 mL after vaginal delivery and >1000 mL after Cesarean delivery, perform ongoing assessment of maternal vital signs
4. Consider Foley catheter with urimeter to assess urine output.

Procedure for Quantitative Blood Loss for Cesarean Delivery (QBL)
1. Before delivery of the placenta, suction drape pockets and surgical field. Measure and note amniotic fluid within the suction canister, change the suction canister.
2. After delivery of the placenta, suction drape pockets and field and measure and note amount of blood in the suction canister.
3. Prior to adding irrigation fluid, ensure that the scrub team communicates when irrigation is beginning.
4. Weigh all blood-soaked materials and clots. Calculate the weight and convert to milliliters.
5. At the conclusion of the surgery, add the volume of quantified blood calculated by weight with the volume of quantified blood in the suction canister to determine total QBL.

DOCUMENTATION:
A. Nursing documentation to include but not limited to the following: Assessments including pre-birth and post-birth risk assessments, interventions, notifications, and patient response.
B. Provider documentation to include but not limited to the following: Assessments including admission risk assessment, plan of care, interventions, notifications, consults, and patient response.

EDUCATION:
Educate patient, family (and designated support person when possible):
A. Signs and symptoms of postpartum hemorrhage during hospitalization that alert the patient to seek immediate care.
B. Signs and symptoms of postpartum hemorrhage after discharge that alert the patient to seek immediate care.
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REFERENCES:


Association of Women’s Health, Obstetric and Neonatal Nurses (2014). Quantification of blood loss: Practice Brief No. 1. JOGNN, 00, 1–3. DOI: 10.1111/1552-6909.12519


California Maternal Quality Care Collaborative, July 2017, “Tranexamic acid (TXA) for Obstetric Hemorrhage.”


RESPONSIBILITY: Obstetrics: Perinatal Practice Committee

APPROVAL METHOD:

Issued: 8/2016 (Policy 5250-P-11)
Supersedes: 6/2018 (Policy OB 1719)
Reviewed and Revised: 8/2020

Approved by:
Perinatal Practice Committee: 8/2020
Nursing Practice Council: 8/2020
Southside Hospital: Hemorrhage Guidelines

<table>
<thead>
<tr>
<th>Northwell Health: South Shore University Hospital</th>
<th>OB/GYN SERVICE LINE GUIDELINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLICY TITLE: Hemorrhage Guidelines</td>
<td>SECTION:</td>
</tr>
<tr>
<td>Prepared by:</td>
<td></td>
</tr>
<tr>
<td>Ariel Fleischer, MD</td>
<td></td>
</tr>
<tr>
<td>Adopted by SSH with hospital specific changes</td>
<td></td>
</tr>
<tr>
<td>by Mary Moreno, MSN, NM</td>
<td></td>
</tr>
<tr>
<td>Effective Date:</td>
<td>02.09.2021</td>
</tr>
<tr>
<td>Last Revised/Reviewed:</td>
<td>05.2015, 12.14.16, 06.27.2019,</td>
</tr>
<tr>
<td></td>
<td>02.09.2021</td>
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</tbody>
</table>

This is a general guideline. The health care professionals must use appropriate judgment depending on the particular clinical situation.

PURPOSE: To prepare for and assist in the response to abnormal bleeding.

SCOPE:

This policy applies to all members of the Northwell Health South Shore University Hospital work force but not limited to employees, business associates, medical staff, volunteers, students, physician office staff, and other persons performing work for or at Northwell Health.

POLICY:

All patients admitted to the OB Service will be assessed as to their risk for peripartum hemorrhage and treated quickly when signs and symptoms are suspicious of same.

GUIDELINES:

Antepartum Period

During the antepartum period, identify patients that may require special delivery plan (i.e. timing of delivery, additional resources, consults, multidisciplinary meetings, etc).

- Placenta previa
- Placenta accreta
- Previous classical cesarean section
- History of myomectomy
- History of blood transfusion
- Bleeding disorder
- Current anticoagulation (therapeutic)
- Significant comorbidities

Condition for which timing of delivery is critical

<table>
<thead>
<tr>
<th>Condition</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placenta accreta</td>
<td>14&quot; - 15 6/7&quot;</td>
</tr>
<tr>
<td>Placenta previa</td>
<td>16&quot; - 17 6/7&quot;</td>
</tr>
<tr>
<td>Prior classical C/S</td>
<td>30&quot; - 37 6/7&quot;</td>
</tr>
<tr>
<td>Previous myomectomy</td>
<td>37 6/7&quot; - 38 6/7&quot;</td>
</tr>
<tr>
<td>If extensive</td>
<td>36&quot; - 37 6/7&quot;</td>
</tr>
</tbody>
</table>

For Placenta accreta notify and plan:
- Surgical support / Hemorrhage Team
- Interventional Radiology (IR)
- Urology (as indicated)

Refusal of blood products:
- Discuss with patient/family and complete the blood product preference list (see appendix)
- Obtain the necessary consults (MFM Hematology/Obliteral Anesthesia)
Southside Hospital: Hemorrhage Guidelines

Admission to L&D
Identify patients who refuse blood transfusion at the time of admission.

For patients who refuse blood transfusion:
- If the blood product preference list has not yet been completed or is not available complete the form at this time (on admission).
- Call for a Perinatal Huddle on admission
- Contact the Hemorrhage Team if additional risk factors for hemorrhage exist (previa, fibroids, overdistended uterus, etc.)
- Similarly call for a Perinatal Huddle and contact the Hemorrhage Team for patients admitted for delivery that are fully anticoagulated
- At the time of delivery, if the patient is having a C-section or if there are other risk factors, 10 minutes prior to the start of the operation, initiate (if no contraindications) prophylactic administration of tranexamic acid (1 gram IV over 10 minutes given slowly)

At the time of admission, obtain a type and cross match if the patient is at significant risk for peripartum hemorrhage:
- Placenta previa
- Actively bleeding
- Placenta accreta
- History of PPH
- Bleeding disorder
- Significant anemia
- Current anticoagulation
- Other conditions deemed relevant by the provider

All other patients will have a type and screen obtained at the time of their admission.

The following elements are critical in the event of significant obstetrical hemorrhage
1 - Emergency Blood Release
2 - Massive Transfusion Protocol (MTP)
3 - Hemorrhage Tray
4 - Medication (available in Medication Room)
4 - Hemorrhage Team


Massive Transfusion Protocol (MTP) - See Massive Transfusion and Emergency Release Protocol

Hemorrhage Tray

Vaginal
Vaginal retractors, long weighted speculum
Long instruments (needle holder, clamps etc.)
Uterine Balki balloon
JADA®
Banjo Curette
Bright task light/Head lamp
Procedure diagrams

Cesarean Delivery
Hysterectomy tray
Reloadable straight needle for B-Lynch suture
Uterine Balki balloon
JADA®
Procedure diagrams

Medications
Pitocin 20ui
Pitocin 10u
Hemabate 250 microgram/ml
Cytotec 200microgram/tablet
Methergine 0.2 mg/ml
Tranexamic acid 0.1g/ml

1 bag
2 vials
1 ampule
5 tabs
1 ampule
1 ampule
Southside Hospital: Hemorrhage Guidelines

Hemorrhage Team: “Code II” will notify required staff

Surgical/Critical Care support (Gyn Oncology, MFM, General Ob/Gyn,)
Anesthesia support (2nd person)
Nursing support
Administrative (Blood Bank, Laboratory, Logistical support)

*Indications for contacting the Hemorrhage Team
- Any PPH diagnosed as Stage 3 (Abnormal vital signs, laboratory results or clinical status)
- Any PPH in patients refusing blood transfusions
- Prior to delivery for patients refusing blood transfusions and additional risk factors for PPH
- Prior to delivery for patients with high index of suspicion for placenta accreta

Estimated Blood Loss (EBL)

The CBL (EBL) process is initiated by the Nurse (Primary RN in the LDR and circulating RN in the OR) on the basis of number of laps, sponges, suction bottle, drapes. The number is communicated to the surgeon and the consensus amount is documented in the record.

When CBL (in the OR or LDR) reaches >1500cc (and hemostasis not yet achieved, the RN will alert the surgeon as well as a second attending obstetrician who will then present to the patient area and assess if additional resources are necessary. This call for the second obstetrician is a mandatory trigger that the RN is empowered and required to do.

At this time, the need for additional anesthesia support will be discussed, as well.

Peripartum Hemorrhage:
- Patient diagnosed with peripartum hemorrhage-observed increased bleeding
  (Vaginal Delivery > 500cc  Cesarean Section > 1,000cc)
- Patient suspected of postpartum hemorrhage (intra-abdominal) → because of abnormal Vital Signs, Urinary Output, Lab results, Clinical presentation.

- Establish EBL for that event, calculate estimated blood loss (CBL: Calculated Blood Loss)
  (include delivery EBL and previous episodes)
- Determine Stage of Hemorrhage
- Alert provider (see MEOWS for timely bedside evaluation)
- For patients refusing blood transfusion alert the Hemorrhage Team at this time
- Monitor Vital Signs (Blood Pressure, Heart Rate, Shock Index)
- Initiate documentation in PPH flow sheet
- Ensure IV access (at least 18 gauge)
- Insert Foley catheter (Document Urinary Output) with uterometer and instituted hourly I&O
- Type and cross 2 units (if not already done)
- Monitor vital signs which includes BP, Pulse, Respirations, shock index and urinary output.
- Accomplish 2nd IV access (large bore)
Southside Hospital: Hemorrhage Guidelines

Management: See PPH Algorithm
Patients: EBL>1,500cc and hemostasis not yet achieved

Site: OR/LDR

HOSPITAL POLICIES, TOOLS & FORMS

Communications/Logistics
RN alerts surgeon re: PPH.
RN alerts 2nd Obstetrician.
2nd Averting proceeds if additional resources are necessary.
Initiate use of PPH flow sheet.
Call for 2nd Anesthesiologist.

Homostasis
- Administer uterotonic.
- If intercostal already used, without success:
  - Vaginal balloon
  - CS: Compression sutures (H-lynch, etc.)
  - Mbiopaperc decompression.
  - Others (transc, retained tampon, coagulation).

- Address the source of cause of bleeding.

- Observe for 15-30 min** → Bleeding continues
  - If not in OR move patient to OR now.
  - Contact hemorrhage team.

  - Escalate steps to ensure homostasis.
    - Proceed to next steps not already tried***:
      - Compression sutures.
      - Stepwise decancellation.
      - Vicryl arrow ligature.
      - Hysterectomy.
      - For patient hemodynamically stable, moderate bleeding and IR immediately available → embolization may be an alternative.

  - If not already done start transfusion now:
    - For severe loss (EBL > 2,000cc) and:
      - low BP, adequate clotting MTP at this time (RBC, FFP, Pher 4-4:1).
    - If clotting platelets despite MTP:
      - Consider: Fibrinogen, Prothrombin Complex Concentrate (Konexa, Behring).

**For patients receiving blood or abnormal vital signs, evacuate patient to hemorrhage team now.
***If bleeding stops initially, but subsequently starts again, proceed to next steps as outlined.

***Do not delay surgical intervention pending correction of coagulopathy, unless, or normalization of vital signs. For patients with abnormal vital signs, lab results and no desire for future childbearing or those refusing blood consider going straight to Hysterectomy.
Southside Hospital: Hemorrhage Guidelines

**Patients: Suspected bleeding (intra-abdominal)**
- Abnormal vital signs
- Abnormal laboratory results (e.g., Acidosis, Coagulopathy)
- Abnormal clinical exam

**Communications/Logistics**
- Initiate use of PPH Flow Sheet
- Bedside evaluation
  - Assess PPV
  - Notify P.A., N.P., Sr. resident
  - Notify Attending obstetrician**
- I & O, Labs, CBC, Coagulation
- Include Abdominal/Pelvic Ultrasound (CT if needed)

**Site: PACU or Postpartum floor**
- IV fluids
- Transfusion as necessary
- For patient refusing blood, consider giving
clothing factors if acceptable
- Decision made by MD, M.D.

**Hemostasis**
- Early L&D
- Contact Hemorrhage Team

**Replacement**
- Condition deteriorates
- Lack of improvement
- Laparotomy
  - Blood transfusion
  - Pitrkectomy
  - Hysterectomy

**Outcome**
- Return to OR**
- If hemodynamically unstable or refusing blood products

*Repeat Baseline abnormal vital signs 45-60min until normalized
**For patients refusing blood contact Hemorrhage Team at this time
*** Do not delay surgical intervention pending correction of coagulopathy, acidosis, or normalization of vital signs
Southside Hospital: Hemorrhage Guidelines

**Patients: Abnormal Vaginal Bleeding (PPH)**

**Communications/Logistics**
- Bedside evaluation
  - within 15-20 min (if not, consider more in L&D)
  - Provider → PA, NP, Sr. resident, Notify Attending MD
  - Initiate use of Flow Sheet

**Hemostasis**
- Medical
  - Empty bladder
  - Bilateral uterine massage
  - A foreseeable agent

**Replacement**
- IV Fluids
  - Transfusion 1L IV 10ml
  - Type & Crossmatch

**Site: PACU or Postpartum floor**

**Brisk bleeding**
- Abnormal Vital Signs*, Abnormal Lab results
- Refraining blood (JOY)

Immediately after intervention or
Vehicle evaluation 15-30min

- Move patient to L&D area
- Attending obstetrician at bedside
- For those refusing transfusions:
  - Contact Hemorrhage Team
  - CBC, Coagulation studies

**Observe 15-30min* → Bleeding continues**

- Continue monitoring
- Baloon bladder
- Others → Based on etiology

Get blood to the floor. Start transfusion if:
- Abnormal vital signs
- Laboratory results
- Transfusion
- For patient refusing blood, consider administration of clotting factors (Fibrinogen, PCP) if

**Observe 15-30min*** → Bleeding continues

- Perinatal Huddle
- Contact Hemorrhage Team
- Open OR

**Locate steps → to ensure hemostasis**
- If bleeding moderate, hemodymanically stable and Intervention Radiology immediately available → embolization may be an option
- If brisk bleeding, abnormal V.S. Lab results, or
  - refraining transfusion, proceed to laparotomy now***
  - Compression sutures (15-16cm)
  - Uterine artery ligation
  - Bilateral devascularization
  - Hysterectomy

Start transfusion if:
- Abnormal vital signs, urinary output, laboratory results
- FFP: 1,500cc
- brisk bleeding
- In the opinion of the surgeon
  - Extensive surgery is required
  - For massive blood loss
  - Start MTH: D-P: FFP: Pts: 4:1:1
  - If coagulopathy despite MTH
  - Consider Prothrombin Complex Concentrate (Recombinant Factor)

---

*Suspens document abnormal Vital signs at 15-30min until normal
*If bleeding shows subsides, but subsequently starts again → proceed to next steps as outlined
***Do not delay surgical intervention pending correction of coagulopathy, sedation, or normalization of vital signs

For patient in stage 3 and no lease for future childbirth or refusing blood consider using strength 18 Intervention.
Southside Hospital: Hemorrhage Guidelines

<table>
<thead>
<tr>
<th>Communications/Logistics</th>
<th>Hemostasis</th>
<th>Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Team</td>
<td>Emergency Hysterectomy</td>
<td>CPR</td>
</tr>
<tr>
<td>OB Rapid Response Team</td>
<td></td>
<td>MTP</td>
</tr>
</tbody>
</table>

Do not delay surgical intervention because of coagulopathy or patient's hemodynamic status. The surgical intervention should be implemented concurrently with replacement therapy. Successful resuscitation is dependent on insuring hemostasis in the most expeditious way possible. Hemostasis in conjunction with rapid replacement therapy is the best approach to maximize survival rates for these critical patients.
REFERENCES TO REGULATIONS AND OR OTHER RELATED POLICIES

CLINICAL REFERENCES:
1. Sponge et al Obstet Gynecol 2011
2. Committee Opinion Number 560, American College of OBGYN
3. Guly; HR et al Resuscitation 2011
6. Crash-2 Study Lancet 2010

Reviewed and approved by:

<table>
<thead>
<tr>
<th>SIGNATURES:</th>
<th>DATE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benjamin M. Schwartz, MD, FACOG, FACS, Senior VP and Regional Ambulatory Physician, Executive, Eastern Region Chairman, Department of Obstetrics and Gynecology, South Shore University Hospital</td>
<td>Signature on file</td>
</tr>
<tr>
<td>Ralph J. Civello, RN MSN NEC, Nurse Executive</td>
<td>Signature on file</td>
</tr>
<tr>
<td>Jill M. Donnelly, MSN, RNC-OB, C-EMT, CBC Director of Patient Care Services Women &amp; Children’s Services</td>
<td>Signature on file</td>
</tr>
<tr>
<td>Luis Bracero, MD, Chief Maternal Fetal Medicine</td>
<td>Signature on file</td>
</tr>
</tbody>
</table>
Southside Hospital: Hemorrhage Guidelines

**Estimating Blood Loss**

- 2x4 gauge pad - 5 mL
- Full & dripping purple chux - 800 mL
- Full & dripping blue chux - 300 mL
- Fully soaked peripad - 70-100 mL
- Partially soaked peripad - 50 mL
- Full & dripping lap pad (half pad) used in vaginal delivery - 40-45 mL
- Full lap pad (half pad) used in vaginal delivery (not dripping) - 30 mL
- Full & dripping lap pad used in surgery - 100 mL
- Full lap pad used in surgery (not dripping) - 60-75 mL
- 12 ounce soda can - 355 mL
- Fist or baseball size clot - 50 mL

ALL DOCUMENTATION OF BLOOD LOSS MUST BE REFERRED TO IN mL
Assessing the degree of Hemorrhage

1. Volume of blood already lost (EBL)
2. Rate of bleeding (at the time of evaluation)
3. Consequences of blood loss:
   - Hemodynamic abnormalities (BP, Pulse, Shock Index, Urinary Output)
   - Metabolic abnormalities (pH, Base Deficit, Lactate etc.)
   - Patient Clinical status (anxious, confused, lethargic)

Stages 1 → Stage 4

<table>
<thead>
<tr>
<th>Peripartum Hemorrhage</th>
<th>Stages of Hemorrhage*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong></td>
<td>Bleeding (500ml vag., 1,000ml CS) → Normal V.S., Labs and clinical picture.</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
<td>Bleeding (EBL, 1,000-1,500ml) → Normal V.S., Labs and clinical picture.</td>
</tr>
<tr>
<td><strong>Stage 3</strong></td>
<td>Ongoing Bleeding → EBL, 1,500ml or brisk bleeding 500ml: 10mm</td>
</tr>
<tr>
<td></td>
<td>Or any of these abnormalities in the context of bleeding (regardless of EBL or Transfusion)</td>
</tr>
<tr>
<td></td>
<td>Abns.: BP, Pulse, Shock Index, Urinary Output</td>
</tr>
<tr>
<td></td>
<td>Abns.: Coagulation, pH, BD, Lactic acid, Hb, Heat (14g drop in Hb)</td>
</tr>
<tr>
<td></td>
<td>Abns.: Clinical status (confused, lethargic)</td>
</tr>
<tr>
<td><strong>Stage 4</strong></td>
<td>Cardiovascular collapse in the setting of severe hemorrhage</td>
</tr>
<tr>
<td></td>
<td>Profound hypovolemic shock (blood loss not replaced)</td>
</tr>
<tr>
<td></td>
<td>AHI (sudden ex. collapse) → heavy vaginal bleeding</td>
</tr>
</tbody>
</table>

*Modified after American College of Surgeons
Southside Hospital: Hemorrhage Guidelines

**Uterine Atony**

1st Line uterotonics

**Oxytocin** *(Recommend regimen)*
- 40U/1,000cc at 125cc/hr

**Methergine**
- 0.2mg IM (may be repeated q 2-4 hrs)

*May cause Vasocostriction — avoid in Hypertensive patients

2nd Line uterotonics

**Carboprost** *(15methyl PGF2a)*
- 250µg IM — may be repeated q15min—q2hrs (max x8)

**Cortisone**
- 800-1,000mg rectally

*May cause bronchoospasm — Avoid in patients with asthma
** Causes vasoconstriction — Avoid in patients already hypotensive
Antifibrinolytic Therapy

Tranexamic acid (Cyklokapron, Transmin)

The development of coagulopathy in patients with significant hemorrhage includes the process of hyperfibrinolysis. Recent data identifies increased fibrinolysis as a major risk factor for massive transfusion and mortality rates.

Considerable data from the surgical literature suggest beneficial effects from using antifibrinolytics in patients at risk for hemorrhage or as treatment for patients already bleeding:

1. Prophylactic administration of Tranexamic acid (Tranexamic acid) reduces surgical blood loss by approximately 30%.
2. Administration of Tranexamic acid in the presence of significant bleeding decreases both, transfusion, and mortality rates without increasing rates of thromboembolic disease.

As such its use in obstetrics may prevent or decrease morbidity and mortality associated with postpartum hemorrhage.

The following is a proposed protocol for the use of antifibrinolytic therapy for the prevention and treatment of PP HEL.

**Prophylaxis** (the following high-risk patients may benefit from administration of Tranexamic acid) at the time of delivery:

- Patients refusing blood products undergoing delivery
- Patients fully anticoagulated undergoing delivery
- Patients at significant risk for major PP HEL, i.e., placenta previa accreta

**Therapy:**

- All patients diagnosed with postpartum hemorrhage

**Dose of Tranexamic acid (Cyklokapron, Transmin):**

- **Initial dose:** 1g infused slowly over 10 min prior to start of surgery (or 10mg/kg)
- **Repeat doses:**
  - 1mg/kg/hr for next 8 hrs
  - 1g administered 8 hrs later
  - At the discretion of MD

**Contra-indications**

- Patients with active VTE
- Patients at high risk for VTE (personal history of VTE, carrier of major thrombophilia)

* Risk factors for PP HEL:

- Placenta previa
- Large myomas
- Uterine overdistension (multiple gestation, polyhydramnios)
- History of postpartum hemorrhage
- Chorioamnionitis
- Abnormal labor curve (prolonged labor)
Southside Hospital: Hemorrhage Guidelines

- **Prothrombin Complex Concentrate (PCC)** –

  PCC are plasma derived products containing vitamin K dependent clotting factors: FII, FVII, F IX, FX. They are classified as 3 or 4 Factor PCC:

<table>
<thead>
<tr>
<th>Name</th>
<th>Contains Factors</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Factors PCC: Behaim</td>
<td>II, IX, X (little VII)</td>
<td>25-50u Kg</td>
</tr>
<tr>
<td>4 Factors PCC: Kcentra</td>
<td>FII, F IX, FX, FVII</td>
<td>25-50u Kg</td>
</tr>
</tbody>
</table>

- **Prothrombin Complex Concentrate** –

  Administration of PCC (either alone or in combination with Fibrinogen concentrates)

  1. Significantly decreases transfusion requirements
  2. Decreases mortality rates (Pulmonary edema, Multiple Organ Failure, Abdominal Compartment Syndrome)

  The advantage over FFP is that PCC provides the same clotting replacements in much smaller volumes.
Southside Hospital: Hemorrhage Guidelines

Hand – Off Communication OR → PACU

Procedure:
- NSVD
- Instrumental delivery
- C/S
- Duration

FBL: Total
- In OR

Interventions:
- Hemostatics
- Blood transfusion

Vital Signs
- On admission to hospital
- Last 30 minutes in OR

Urinary Output
- Total output in OR

Labs
- Sent
- Received

Medical/Obstetrical Co-morbidities
- Chronic hypertension
- Other
Southside Hospital: Hemorrhage Guidelines

Hand – Off Communication PACU → Postpartum

Procedure:
- NSVD
- Instrumental delivery
- C/S

EBL: Total
- In Labor and Delivery
- In the PACU

Interventions (OR/IDR or PACU)
- Uterotones
- Blood transfusion
- Packing
- Bakri balloon
- Surgical IR interventions

Vital Signs
- On admission to hospital
- On admission to PACU
- Last 30 minutes in PACU

Urinary Output
- Total output in PACU
- Total output on Postpartum

Labs
- Sent
- Received

Medical/Obstetrical co-morbidities
- Chronic hypertension
- Other
Hand – Off Communication Postpartum → OR/PACU

Procedure
- NSVD
- Instrumental Delivery
- C/S

EBL: Total
- In Labor and Delivery
- In the PACU
- On Post Partum

Interventions (OR/LDR or PACU) list drugs used, provide dosages and amounts
- Uterotonic
- Blood Transfusion
- Packing
- Balloon
- Surgical/IR interventions

Vital Signs
- On admission to the hospital
- On admission to the PACU
- Last 30 minutes on PACU
- Last 30 minutes on Postpartum

Urinary Output
- Total output in PACU or LDR
- Total output on Postpartum

Labs Sent
- Sent
- Received

Medical/Obstetrical co-morbidities
- Chronic hypertension
- Other
Southside Hospital: Hemorrhage Guidelines

## Blood and Non-Blood Product Preferences – Out-Patient Assessment Form

My signature below indicates that I agree to the following blood and/or non-blood products which may be administered to me during my hospitalization. My attending physician has reviewed and fully explained to me the risks and benefits of the following blood products and methods for alternative non-blood medical management and blood conservation available to me. My attending physician named above has also fully explained to me the potential risk associated with not authorizing blood or non-blood management during my hospitalization. Blood Bank Notified Form Completed: Yes / No Date: _____

**NOTE:** If any changes are made to this information, they must be dated, timed and initialed by the patient and provider.

<table>
<thead>
<tr>
<th>Category I</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
<th>May Accept Under Certain Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Blood Cells</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh Frozen Plasma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autologous Banked Blood</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Category II – minor blood fractions – fractionated out from human plasma**
<table>
<thead>
<tr>
<th>Product</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibre (Fibrin)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythropoietin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RhGAM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Immunoglobulin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humate-P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prothrombin Complex Con.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Category III – Does not contain human plasma**
<table>
<thead>
<tr>
<th>Product</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor VIII (Novo-7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor VIII Recombinant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor IX Recombinant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Category IV – no blood component**
<table>
<thead>
<tr>
<th>Product</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tranexamic Acid</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amicar</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haftrastrix</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MATERNAL FETAL MEDICINE**

<table>
<thead>
<tr>
<th>Patient Signature</th>
<th>Patient Signature</th>
<th>Patient Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print Name</td>
<td>Print Name</td>
<td>Print Name</td>
</tr>
<tr>
<td>MD</td>
<td>MD</td>
<td>MD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time:</td>
<td>Time:</td>
</tr>
</tbody>
</table>

Bloodified upon Admission to the Hospital by Date: Time:
### Blood Product Education Form

<table>
<thead>
<tr>
<th>Where to Order</th>
<th>Component</th>
<th>Content</th>
<th>Expected Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Bank</td>
<td>Packed Red Blood Cells</td>
<td>Contains red blood cells and a small amount of plasma</td>
<td>250 ml: Increases hematocrit by 3-4% and hemoglobin by 1 g/dl</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Fresh Frozen Plasma (FFP)</td>
<td>Plasma which contains clotting factors, albumin and immunoglobulins</td>
<td>250 ml: Increases fibrinogen, normalization of PT, PTT</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Platelets</td>
<td>Platelets and plasma</td>
<td>250 ml: Increases platelets</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Autologous Blood</td>
<td>Donated by patient for self-use</td>
<td>Need a high/normal hematocrit and usually is not used in emergencies</td>
</tr>
</tbody>
</table>

#### Minor Blood Fractions

<table>
<thead>
<tr>
<th>Component</th>
<th>Content</th>
<th>Expected Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Bank</td>
<td>Albumin</td>
<td>A protein in human serum, highly processed/treated plasma derivative</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Factor VII Nowseven</td>
<td>Concentrated preparation of clotting factor VII</td>
</tr>
<tr>
<td>OR</td>
<td>Fibrin Glue</td>
<td>Fibrinogen and thrombin.</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Erythropoietin</td>
<td>A hormone produced in the kidney; may contain albumin.</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>RhoGAM</td>
<td>Medicine containing antibodies</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Human Immunoglobulin</td>
<td>Human protein antibodies</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Cryoprecipitate</td>
<td>Fibrogen, Factors VIII, vWF, XIII, Fibronectin</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Humate-P (VWF/F VIII)</td>
<td>Protein factors; vWF, Factor VIII – human derived</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Prothrombin Complex Concentrate</td>
<td>Blood clotting factors II, VII, IX, X, and protein C and S; human derived</td>
</tr>
</tbody>
</table>

#### No Blood Component

<table>
<thead>
<tr>
<th>Component</th>
<th>Content</th>
<th>Expected Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy</td>
<td>Tranexamic Acid</td>
<td>Antifibrinolytic</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Amicar</td>
<td>Derivative amino acid lysine; antifibrinolytic</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Hetastarch</td>
<td>Non-ionic starch derivative</td>
</tr>
</tbody>
</table>

#### Category IV

<table>
<thead>
<tr>
<th>Anesthesiology</th>
<th>Isovolemic Hemodilution</th>
<th>Autologus blood removed from patient</th>
<th>Limits the use of banked blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypervolemic Hemodilution</td>
<td>Administering a large volume of fluid before surgery so that when you lose volume during surgery you lose fewer RBCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Saver – closed circuit</td>
<td>Autologus blood – Blood lost during procedure</td>
<td></td>
<td>Can return up to 250 ml IV in 3 minutes, devoid of plasma and platelets</td>
</tr>
</tbody>
</table>
Southside Hospital: Hemorrhage Guidelines

Blood and Non-blood Product Preferences – In-Patient Assessment Form

My signature below indicates that I agree to the following blood and/or non-blood products which may be administered to me during my hospitalization. My attending physician has reviewed and fully explained to me the risks and benefits of the following blood products and methods for alternative non-blood medical management and blood conservation available to me. My attending physician named above has also fully explained to me the potential risk associated with not authorizing blood or non-blood management during my hospitalization.

NOTE: If any changes are made to this information, they must be dated, timed and initialed by the patient and provider.

Blood Bank Notified Form completed and form faxed to Blood Bank Yes / No Date: __________ Time: __________

<table>
<thead>
<tr>
<th>Category I</th>
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<tbody>
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<tr>
<td>Fresh Frozen Plasma</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autologous Banked Blood</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Category II – minor blood fractions** – fractionated out from human plasma

<table>
<thead>
<tr>
<th>Product</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
<th>May Accept Under Certain Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibrin Glue</td>
<td></td>
<td></td>
<td></td>
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<td>Erythropoietin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RhoGAM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Immunoglobulin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cryoprecipitate – needs consent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humate- P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prothrombin Complex Concentrate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category II (Does not contain human plasma)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor VII A (Novo 7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor VIII Recombinant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor IX Recombinant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Category III – no blood component**

<table>
<thead>
<tr>
<th>Product</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
<th>May Accept Under Certain Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tranexamic Acid</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amicar</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hematostarch</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Category IV**

<table>
<thead>
<tr>
<th>Product</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
<th>May Accept Under Certain Circumstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isovolemic Hemodilution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypervolemic Hemodilution</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cell Saver**

<table>
<thead>
<tr>
<th>Category</th>
<th>Will Accept</th>
<th>Will Not Accept</th>
<th>May Accept Under Certain Circumstances</th>
</tr>
</thead>
</table>

**Patient Information**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Signature</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Print Name</td>
<td>Signature</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td>Signature</td>
<td>Date</td>
<td>Time</td>
</tr>
</tbody>
</table>

**Obstetrician**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Signature</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Print Name</td>
<td>Signature</td>
<td>Date</td>
<td>Time</td>
</tr>
</tbody>
</table>

**Anesthesiologist**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Signature</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Print Name</td>
<td>Signature</td>
<td>Date</td>
<td>Time</td>
</tr>
</tbody>
</table>
Southside Hospital: Hemorrhage Guidelines

### Abnormal Patient Status Algorithm

<table>
<thead>
<tr>
<th>Code UICH</th>
<th>requires immediate evaluation by the OB team</th>
<th>Physicians Escalation - bedside evaluation within 15 minutes</th>
<th>Perinatal Huddle</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td></td>
<td>Clinical Status: altered mental status, difficulty breathing or increased vaginal bleeding</td>
<td>Does not require immediate medical evaluation</td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>VITAL SIGNS: if abnormal, confirm within 15 min</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>If confirmed: Contact provider (escalate as necessary) Repeat Vital Signs every 15 minutes until normal Abnormal Values: SBP below 90mm Hg SBP above 160mm Hg DBP above 110 HR below 60 HR above 120 bpm Shock Index above 1.1 (maternal pulse/SP) Urine output below 30cc/hr times 2 hours</td>
<td>Conditions requiring a multidisciplinary approach where consults from additional services are warranted ESI level 3 (as reported by the ED)</td>
</tr>
<tr>
<td>Eti levels 1 and 2 (as reported by the ED)</td>
<td>LABS:</td>
<td>example</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>HGB below 8g HCT below 25%</td>
<td>Fetal issues:</td>
<td></td>
</tr>
<tr>
<td>Maternal Ureasephonismess</td>
<td>Platelets below 100,000</td>
<td>All confirmed structural abnormalities</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>Fibrinogen below 200 mg/dL</td>
<td>Significant maternal medical comorbidities</td>
<td></td>
</tr>
<tr>
<td>Significant Respiratory distress</td>
<td>PT above 13 INR above 1.2 PTT above 37</td>
<td>Logistical/Staffing Issues</td>
<td></td>
</tr>
<tr>
<td>and/or SPO2 less than 90% with</td>
<td>Lactic acid above 3mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>pH below 7.3 BD above -3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder Dextroegs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>uterine inversion</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate how this will be implemented at your institution (name of RRT, contact info etc).

Indicate how this will be implemented at your institution (level of provider, contact info, potential escalation, etc).

Indicate how this will be implemented at your institution (members of Perinatal Huddle, contact info etc).

---

HOSPITAL POLICIES, TOOLS & FORMS
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

POLICY/PURPOSE: Obstetric hemorrhage is the leading direct cause of maternal mortality world-wide. An obstetric hemorrhage may include blood loss due to an antepartum or intrapartum condition (including, but not limited to: placental abruption, placenta previa, vasa previa, morbidly adherent placenta, uterine rupture, maternal trauma, ectopic rupture), or more commonly, due to bleeding that occurs in the immediate (<24 hours after birth) or delayed (>24 hrs through < 6 weeks after birth) postpartum period.

Most of maternal death secondary to obstetric hemorrhage is preventable. Prevention of adverse outcomes is dependent on recognition of risk factors, timely identification of abnormal bleeding, and prompt initiation of appropriate clinical management. The purpose of this policy is to outline organizational systems and procedures for recognition, prevention, readiness, response, and reporting of this potentially life-threatening obstetric complication.

SPECIAL CONSIDERATIONS:
- A postpartum hemorrhage (PPH) is defined as:
  - cumulative blood loss >500 ml for a vaginal delivery, or
  - >1000ml blood loss for a cesarean section, or
  - bleeding that is accompanied by signs and symptoms of hypovolemia within the first 24 hours after birth.
- Hemorrhage should also be considered in the presence of maternal vital signs that suggest deterioration even when the uterus is firm, visual inspection of the lower genital tract is negative and vaginal bleeding is not visibly excessive. Treatment of a hemorrhage should not be delayed by waiting until there is a change in vital signs or lab values (Belfort, 2019).
- Administration of blood products following or during a hemorrhage should be considered based on cumulative blood loss volume and the patient’s complete clinical presentation, even in the presence of stable vital signs.
- 15-40% of women who have an obstetric hemorrhage do not have known risk factors.
- Management of an obstetric hemorrhage may include pharmacologic, mechanical, and surgical interventions directed toward resolving the causative factor(s) of the hemorrhage. The most common etiology of PPH is uterine atony, followed by retained placenta, lower genital tract lacerations and thrombosis.
- Pharmacologic measures may include: Oxytocin, Methergine, Cytotec, Hemabate and Tranexamic acid.
  - Special considerations: Tranexamic acid administration within 3 hours from birth. Should be administered as soon as possible after onset of bleeding, and may be used in all forms of hemorrhage, including genital tract trauma. (WHO, 2017)
  - Anesthesia may administer Tranexamic Acid 1 G IV push; may be repeated once after 30 minutes.
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

PROCEDURE:
I. Readiness - The following actions are organizational processes in place at VBMC:
   a. An emergency protocol "Code H" response is available for activation via Vocera upon
      recognition of an obstetric hemorrhage (See APPENDIX A)
   b. The hemorrhage supply cart (Code H cart) will be stocked (see APPENDIX C) and available in
      the OB PACU.
   c. A hemorrhage medication kit (Code H meds), containing Oxytocin, Methergine, Cytotec, and
      Hemabate- will be available for rapid access in the following Pyxis: Triage, L&D, North,
      South, Recovery. Tranexamic acid will be available on the OB unit (L&D pyxis) and the OR
      (anesthesia pyxis).
   d. A Massive Transfusion Protocol is available to be activated as needed per patient condition
      and provider order.
   e. All nursing and ancillary bedside staff is expected to participate in periodic obstetric
      hemorrhage knowledge review and/or simulation training.

II. Recognition & Prevention - The following actions will be taken for every obstetric patient:
   1. A risk assessment will be evaluated and documented at admission, q shift, change in patient
      condition, change in primary RN, and again post-delivery (on admission to the Postpartum unit).
      Follow the recommendations for anticipated interventions as listed in the table below:

<table>
<thead>
<tr>
<th>Standard Risk Level</th>
<th>Anticipated Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>No known extra risk factors</td>
<td>Confirm Type and Screen</td>
</tr>
<tr>
<td>MEDIUM Risk Factors</td>
<td>Review labs (e.g., platelets, hemoglobin)</td>
</tr>
<tr>
<td>Prior cesarean, uterine surgery, or multiple laparotomies</td>
<td>Notify Provider &amp; charge nurse</td>
</tr>
<tr>
<td>Multiple gestation</td>
<td>Initiate or maintain IV access</td>
</tr>
<tr>
<td>&gt; 4 prior births</td>
<td>Ensure availability of Code H cart &amp; meds</td>
</tr>
<tr>
<td>Prior PPH</td>
<td>Utilize QBL at delivery and postpartum</td>
</tr>
<tr>
<td>Large Myomases</td>
<td>Maintain awareness of cumulative blood loss</td>
</tr>
<tr>
<td>EFW &gt; 4000 g</td>
<td></td>
</tr>
<tr>
<td>Obesity (BMI &gt; 40)</td>
<td></td>
</tr>
<tr>
<td>Hematocrit &lt; 30% &amp; other risk</td>
<td></td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td></td>
</tr>
<tr>
<td>Prolonged oxytocin &gt; 24 hours</td>
<td></td>
</tr>
<tr>
<td>Prolonged 2nd stage</td>
<td></td>
</tr>
<tr>
<td>Magnesium sulfate</td>
<td></td>
</tr>
</tbody>
</table>
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

2. A complete blood count and active type and screen will be ordered on admission for labor.
3. A valid blood transfusion consent or refusal will be obtained (or located from prenatal record).
   a. If patient declines blood transfusion:
      i. Notify OB provider, Anesthesia, and Bloodless care team.
      ii. Consider having Interventional Radiology evaluate and obtain consent for uterine embolization before delivery
      iii. Consider utilizing cell-saver during cesarean section
4. Cumulative blood loss measurement, including quantification of blood loss (QBL) at every delivery. [When QBL is not possible due to delivery circumstances, EBL, or a combination of QBL and EBL, may be utilized.] (See APPENDIX D for QBL Process Algorithm and APPENDIX E for dry weight reference table.)
5. There will be universal active management of the 3rd stage of labor including administration of postpartum oxytocin IV or IM (IV: 20-40 units in 1000ml LR, titrate rate for uterine tone up to 500ml/hr. IM: 10 units IU or IM) and fundal massage.
6. After delivery, the patient will be assessed at intervals as ordered by DB provider. Continue to calculate cumulative blood loss, utilizing QBL measurement as necessary. Any cumulative blood loss > 500ml for vaginal delivery or > 1000ml for cesarean delivery is considered a postpartum hemorrhage and should be documented and staged as such.

RESPONSE:
1. Carefully evaluate the woman’s status and vital signs with any increased bleeding, change in assessment, or change in level of consciousness.
2. Be alert for symptoms that may indicate hemodynamic instability, even in the absence of visible blood loss:

<table>
<thead>
<tr>
<th>Signs and Symptoms</th>
<th>Blood Pressure</th>
<th>Blood Loss (% blood lost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palpitations, lightheadedness, mild increase in heart rate</td>
<td>Normal</td>
<td>500 to 1000 ml (10 to 15)</td>
</tr>
</tbody>
</table>
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

<table>
<thead>
<tr>
<th>Weakness, sweating, tachycardia (100 to 120 beats/minute)</th>
<th>Slightly Low</th>
<th>1000 to 1500 mls (15 to 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restlessness, confusion, pallor, oliguria, tachycardia (120 to 140 beats/minute)</td>
<td>70-80</td>
<td>1500 to 2000 mls (25 to 35)</td>
</tr>
<tr>
<td>Lethargy, air hunger, anuria, collapse, tachycardia (&gt;140 beats/minute)</td>
<td>50-70</td>
<td>2000 to 3000 mls (35 to 45)</td>
</tr>
</tbody>
</table>

1. Assess and document QBL for increased bleeding.
2. Notify the OB provider for increased bleeding or other clinical triggers that may indicate hemodynamic instability:
   a. Heart rate >110
   b. BP <85/45 or 15% drop
   c. Oxygen saturations <95%
   d. Temperature <36.0°C
   e. Ongoing blood loss
   f. Urine output <30ml/hr
5. At conclusion of hemorrhage event:
   a. Inform blood bank MTP is complete
   b. Team debriefs patient and family
   c. Team performs interdisciplinary debrief (See APPENDIX F)
6. After any stage hemorrhage, plan of care should be communicated including but not limited to:
   a. Repeat CBC after the event
   b. Blood product administration
   c. Monitoring parameters (e.g., VS, I&O)
7. Continue frequent and regular assessment for continued hemorrhage, DIC, and signs of hemodynamic instability as described in steps 2 & 4.
8. Nursing documentation should include: Assessments, hemorrhage staging, interventions, patient response, provider notification, and any necessary escalation.
9. Patient/Family Education
   a. Plan of care
   b. Ongoing management and interventions
10. Patient and Family Support
    a. Promote infant bonding
    b. For breastfeeding mothers assess for delayed breastmilk production associated with hemorrhage (Troiano, Witcher, & Baird 2019).

Reporting/Systems Learning
1. All hemorrhages should be documented in the Adverse Event Reporting System- MIDAS: https://dimensions.health.quest.org/SitePages/MidasOccurrence-Reports.aspx
2. Utilize feedback from event and simulation debriefing to identify system improvement opportunities and interdisciplinary educational needs.
3. Report and conduct systematic review of any hemorrhage that fulfills the following criteria:
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

a. > 1500ml blood loss
b. administration of 4 or more units of blood products
c. Unplanned hysterectomy or uterine artery embolization
d. Unexpected admission to the ICU.

REFERENCES/SOURCES

ATTACHMENTS:
1. Appendix A- Code H Response & Roles Algorithm
2. Appendix B- Code H Checklist
3. Appendix C- Code H cart supply list
4. Appendix D- QBL Process Detail Algorithm
5. Appendix E- Dry Weight Table
6. Appendix F- Event Debrief Form

POLICY HISTORY:
Supersedes: N/A
Original Implementation date: 11/2006
Date Reviewed: 9/08, 2/11, 8/17, 4/20
Reviewed by: MCH Policy Committee
Date Revised: 9/08 8/10 3/12 1/13 1/14 5/20
Next Date Policy is Due for Review: 05/2021

APPROVAL:

| Maternal Child Health Policy Committee | Date: 05/21/2020 |
| Quality and PI Committee (consent agenda) | |
| Medical Executive Committee (consent agenda) | |
| Affiliate Board of Trustees (consent agenda) | |
Appendix A
Code H Response & Roles

- Recognize a hemorrhage
  - Call a Code H
    - On Vocera, say "Urgent broadcast to Code H"
      - When the chime is heard say "Code H in room _____"

Equipment Response
- Code H cart
- Scale
- Code H Meds
- Ready OR

Clinical Staff Response
- USY
- RN
  - Implement Code H Checklist
    - Stage Hemorrhage
    - Manage team response
    - Assess
    - Document
    - Clinical support
    - Administer Medications
    - Establish Lines/Foley
    - Cumulative Blood Loss/OBL
    - Patient/Family Support

Tech/CST
- QBL
  - Equipment
  - Runner
  - Ready OR

OB Provider
- Determine causative factor(s)
- Manage pharmacological, mechanical, and surgical treatment
- Maintain hemodynamic stability
  - Manage Anesthesia
- Manage team response
  - Manage system response
  - Clinical support
  - Patient/Family support
  - Lead post-event debrief
- OB Leadership

Vassar Brothers Medical Center: Obstetric Hemorrhage Policy
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

### Code H Checklist

**Announce:**
- Hemorrhage stage
- Vital signs
- Blood loss (cumulative)
- Designated roles (recorder, meds, IV, etc.)

**Steps:** *(QBL should be ongoing)*

#### Stage 1: Blood loss > 500 ml vaginal OR >1000 ml C/S or increased bleeding during recovery/postpartum
- Fundal massage
- Ensure 16G or 18G IV access
- Increase oxytocin
- Uterotonic (appropriate for pt hx)
- Prepare OR
- Determine etiology and treat

#### Stage 2: < 1500 ml cumulative blood loss;
Continued bleeding or >2 uterotonics given
- Prepare OR
- Mobilize additional help
- Place 2nd IV
- Administer oxygen @ 10 lpm via NR
- Increase IV fluid (crystalloid without oxytocin)
- Draw STAT labs
- Uterotonic (consider TXA)
- Insert indwelling catheter
- Consider moving pt to OR, uterine balloon/packing, surgical interventions
- Obtain 2 units PRBCs (transfuse per clinical s/s, DO NOT wait for lab results)

#### Stage 3: Cumulative blood loss > 1500 ml or > 2 units PRBCs given or VS unstable or suspicion for DIC
- Move to OR
- Announce clinical status (VS, cumulative blood loss, etiology)
- Outline and communicate plan

#### Stage 4: Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)
- Activate rapid response
- Perform immediate surgical intervention as necessary to ensure hemostasis (hysterectomy)
- Aggressively replace volume

**Uterotonics**
- Oxytocin:
  - 10-40 units per 500-1000 ml solution
- Methylergonovine (Methergine):
  - 0.2 milligrams IM (may repeat)
  - Avoid with hypertension
- Carprofen (Hemabate):
  - 250 micrograms IM
  - (may repeat q 15 min, max 8 doses)
  - Avoid with asthma; use with caution with hypertension, COVID-19
- Misoprostol (Cyotec):
  - 800-1000 micrograms PR
  - 600 micrograms PO or
  - 800 micrograms SL
- Tranexamic Acid (TXA):
  - 1 gram IV over 10 min
  - (add 1 gram vial to 100 ml NS and given over 10 min; may be repeated once after 30 min)
### APPENDIX C – Code H Cart Supply List

<table>
<thead>
<tr>
<th>Top of Cart</th>
<th>Drawer 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code H Sterile Instrument Set</td>
<td>1000ml Lactated Ringers</td>
</tr>
<tr>
<td>Reference Binder</td>
<td>1000ml Normal Saline</td>
</tr>
</tbody>
</table>

**Drawer 1**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sterile Gloves (size 6-8.5)</td>
<td>10</td>
</tr>
<tr>
<td>Lubricant gel</td>
<td>1</td>
</tr>
<tr>
<td>Lap Sponges- pkg of 5</td>
<td>2</td>
</tr>
<tr>
<td>X-ray detectable sponges</td>
<td>2</td>
</tr>
</tbody>
</table>

**Drawer 2**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV start kits</td>
<td>2</td>
</tr>
<tr>
<td>Blood collection tubes (marble, pink, lavender, green, blue)</td>
<td>2</td>
</tr>
<tr>
<td>#18 and #20 jelco</td>
<td>2</td>
</tr>
<tr>
<td>Extension sets</td>
<td>2</td>
</tr>
<tr>
<td>Vacutainer with needle</td>
<td>2</td>
</tr>
</tbody>
</table>

**Drawer 3**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10ml saline flush</td>
<td>4</td>
</tr>
<tr>
<td>T-connector</td>
<td>1</td>
</tr>
<tr>
<td>Biohazard lab bag</td>
<td>1</td>
</tr>
<tr>
<td>Alcohol wipes</td>
<td>10</td>
</tr>
<tr>
<td>Saline vial</td>
<td>1</td>
</tr>
<tr>
<td>Filter straw</td>
<td>1</td>
</tr>
<tr>
<td>22g x 1 1/2&quot; syringe</td>
<td>3</td>
</tr>
<tr>
<td>Sutures</td>
<td>2</td>
</tr>
<tr>
<td>0 Prolene</td>
<td>2</td>
</tr>
<tr>
<td>2-0 Prolene</td>
<td>2</td>
</tr>
<tr>
<td>0 Vicryl</td>
<td>2</td>
</tr>
<tr>
<td>2-0 Vicryl</td>
<td>2</td>
</tr>
<tr>
<td>4-0 Vicryl</td>
<td>2</td>
</tr>
<tr>
<td>0 Chromic CT-1</td>
<td>2</td>
</tr>
<tr>
<td>2-0 Chromic CT-1</td>
<td>2</td>
</tr>
<tr>
<td>3-0 Chromic CT-1</td>
<td>2</td>
</tr>
<tr>
<td>2-0 Chromic SH</td>
<td>2</td>
</tr>
<tr>
<td>3-0 Chromic SH</td>
<td>2</td>
</tr>
</tbody>
</table>

**Drawer 4**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Tubing</td>
<td>1</td>
</tr>
<tr>
<td>Speculum</td>
<td>1</td>
</tr>
<tr>
<td>Urine Meter</td>
<td>1</td>
</tr>
</tbody>
</table>

**Drawer 5**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedpan</td>
<td>1</td>
</tr>
<tr>
<td>Chux pads</td>
<td>2</td>
</tr>
<tr>
<td>Foley Cath kit</td>
<td>1</td>
</tr>
<tr>
<td>Graduated collection container</td>
<td>1</td>
</tr>
<tr>
<td>Betadine 4oz bottle</td>
<td>2</td>
</tr>
<tr>
<td>Lubricating gel</td>
<td>6</td>
</tr>
<tr>
<td>Flashlight</td>
<td>1</td>
</tr>
<tr>
<td>Latex-free catheter #16Fr</td>
<td>2</td>
</tr>
<tr>
<td>Latex-free catheter #18Fr</td>
<td>1</td>
</tr>
<tr>
<td>Irrigation bulb syringe 60ml</td>
<td>1</td>
</tr>
</tbody>
</table>
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

APPENDIX D - QBL Algorithm

1. **Vaginal Birth**
   - Note amount of amniotic (and other) fluid in under-buttocck drapes
   - Deliver Placenta
   - Measure total fluid amount in under-buttocck drapes
     (Total amniotic fluid = value A (ml))
   - Weigh any blood-soaked lap sponges, clots, towels, etc.
     (Total wet weight - dry weight = value B (ml))
   - Add values A + B for QBL in mls
   - Nurse communicates delivery QBL
   - Continue to measure additional blood loss as needed throughout surgery or with ongoing bleeding

2. **Cesarean Birth**
   - Deliver Infant Begin QBL
   - Suction amniotic fluid from field into 1st suction container, then switch tubing to 2nd container
   - Deliver Placenta
   - Measure blood in 2nd canister
     (Total amount = value A (ml))
   - Weigh any blood-soaked lap sponges, gauze, towels, etc.
     (Total wet weight - dry weight = value B (ml))
   - Add values A + B for QBL in mls
   - Nurse communicates delivery QBL
   - Continue to report additional blood loss (in total cumulative amount) as needed throughout surgery or with ongoing bleeding
   - If significant blood loss on drapes or after being expressed, measure, and add to first blood loss amount
   - Document team's agreed Delivery QBL
   - Continue QBL postpartum or longer if indicated by ongoing excessive bleeding
### APPENDIX E

#### DRY WEIGHTS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DRY WEIGHT</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLASTIC CHUX</td>
<td>25GM</td>
<td>50</td>
<td>75</td>
<td>100</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>PERI PAD</td>
<td>10GM</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>CLOTH CHUX</td>
<td>535GM</td>
<td>1070</td>
<td>1605</td>
<td>2140</td>
<td>2675</td>
<td></td>
</tr>
<tr>
<td>UNDER BUTTOCK DRAPE</td>
<td>130GM</td>
<td>260</td>
<td>390</td>
<td>520</td>
<td>650</td>
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</tr>
<tr>
<td>DIAPER</td>
<td>20GM</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>LAP WITH RING</td>
<td>30GM</td>
<td>60</td>
<td>90</td>
<td>120</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>LAP W/O RING</td>
<td>12</td>
<td>38</td>
<td>57</td>
<td>76</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>4x4</td>
<td>4GM</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>LAP COUNTER BAG</td>
<td>22GM</td>
<td>44</td>
<td>66</td>
<td>88</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>LAP COUNTER+ 10 LAPS WITH RING</td>
<td></td>
<td></td>
<td></td>
<td>322</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BLUE SURGICAL TOWEL</td>
<td>50GM</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>FULL SHEET</td>
<td>515</td>
<td>1030</td>
<td>1545</td>
<td>2060</td>
<td>2575</td>
<td></td>
</tr>
<tr>
<td>HALF SHEET</td>
<td>317</td>
<td>634</td>
<td>951</td>
<td>1268</td>
<td>1585</td>
<td></td>
</tr>
<tr>
<td>FITTED SHEET</td>
<td>624</td>
<td>1248</td>
<td>1872</td>
<td>2496</td>
<td>3120</td>
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<tr>
<td>GOWN</td>
<td>350</td>
<td>700</td>
<td>1050</td>
<td>1400</td>
<td>1750</td>
<td></td>
</tr>
</tbody>
</table>

#### SUCTION CANISTERS

| TOTAL                     |           |     |     |     |     |     |

---

**Vassar Brothers Medical Center: Obstetric Hemorrhage Policy**
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

APPENDIX F Found in the patient’s chart HOT PINK form; NOT PART OF THE PT’S MEDICAL RECORD

OBSTETRIC TEAM DEBRIEFING FORM

Remember: Debriefing is meant to be a learning experience and a way to address both human factors and systems issues to improve the response for next time. There is to be no blaming/finger-pointing.

<table>
<thead>
<tr>
<th>Type of event</th>
<th>Date of Event</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of event:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Members of team present: (check all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Primary RN</td>
</tr>
<tr>
<td>□ Neonatology personnel</td>
</tr>
<tr>
<td>□ Unit Secretary</td>
</tr>
</tbody>
</table>

Thinking about how the obstetric emergency was managed,

<table>
<thead>
<tr>
<th>Identify what went well: (Check if yes)</th>
<th>Identify opportunities for improvement: “human factors” (Check if yes)</th>
<th>Identify opportunities for improvement: “systems issue” (Check if yes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Communication</td>
<td>□ Communication</td>
<td>□ Equipment</td>
</tr>
<tr>
<td>□ Role clarity (leader/supporting roles identified and assigned)</td>
<td>□ Role clarity (leader/supporting roles identified and assigned)</td>
<td>□ Medication</td>
</tr>
<tr>
<td>□ Teamwork</td>
<td>□ Teamwork</td>
<td>□ Blood product availability</td>
</tr>
<tr>
<td>□ Situational awareness</td>
<td>□ Situational awareness</td>
<td>□ Inadequate support (in unit or other areas of the hospital)</td>
</tr>
<tr>
<td>□ Decision-making</td>
<td>□ Decision-making</td>
<td>□ Delays in transporting the patient (within hospital or to another facility)</td>
</tr>
<tr>
<td>Other:</td>
<td>Other:</td>
<td>Other:</td>
</tr>
</tbody>
</table>

FOR IDENTIFIED ISSUES, FILL IN TABLE BELOW

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>ACTIONS TO BE TAKEN</th>
<th>PERSON RESPONSIBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

POLICY TITLE: Code H: Obstetric Hemorrhage
POLICY NUMBER: PF-OB-313 LAST REVIEWED DATE: 11/2020
POLICY CATEGORY/MANUAL: Women & Children’s Services Hospital-wide Policies

PURPOSE: This policy outlines strategies to decrease obstetric patients’ morbidity and mortality related to postpartum hemorrhage (PPH), including risk assessment and prompt treatment as well as measures aimed to accurately quantify blood loss (QBL) and establish systems for rapid mobilization of resources and escalation.

DEFINITIONS:

Hemorrhage: A single, satisfactory definition of postpartum hemorrhage does not exist. However, current guidelines support a definition of hemorrhage as blood loss greater than 1000 ml for vaginal delivery and/or cesarean section. Massive obstetric hemorrhage is defined as blood loss greater than 1500 ml. Any bleeding that results in signs and symptoms of hemodynamic instability or bleeding that could result in hemodynamic instability if left untreated,

Code H Alert: Patent identified as moderate high risk for PPH on admission (Appendix A) suspicion of possible hemorrhage.

Prevention of PPH (Stage O): Applies to all births. Active management of the third stage of labor is more effective than physiological management in preventing blood loss, severe postpartum hemorrhage and prolonged third stage of labor.
South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

Calculating Quantitative Blood Loss (QBL):  
- Measure the amount of fluid prior to delivery of placenta in suction canisters, surgical vaginal drape pockets  
- Weigh all blood-soaked materials and blood clots to determine QBL  
- When weighed, 1 gram = 1 ml

Measure the amount of fluid in suction canisters and surgical vaginal drape pockets. When calculating blood loss, subtract the amount of amniotic fluid and irrigation fluid from the total fluid volume. Subtract the dry weight of laps, pads and other dry goods. The interdisciplinary team will confirm the QBL amount during delivery immediately after PPH Code H occurrence.

Code H Activation (Stages I through IV): Patient with PPH

<table>
<thead>
<tr>
<th>Stage</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>Cumulative blood loss of 1000 ml (vaginal delivery or cesarean delivery), but less than 1500 ml with normal vital signs and lab values.</td>
</tr>
<tr>
<td>Stage II</td>
<td>Continued bleeding, cumulative blood loss up to 1500 ml OR any patient requiring at least 2 or more uterotomies in addition to Oxytocin with normal vital signs and lab values.</td>
</tr>
<tr>
<td>Stage III</td>
<td>Continued bleeding with cumulative blood loss greater than 1500 ml or more than 2 units of packed RBCs given or any patient with abnormal vital signs, lab, oliguria or patient at risk for occult bleeding (post cesarean, coagulopathy).</td>
</tr>
<tr>
<td>Stage IV</td>
<td>Cardiovascular collapse in setting of massive hemorrhage.</td>
</tr>
</tbody>
</table>

POLICY STATEMENT:
- PPH risk assessment will be performed for every obstetric patient admitted to Labor and Delivery (L&D). Risk assessment should occur during the initial visit for prenatal care. PPH risk will be reassessed as changes in patient’s status occur in intrapartum and postpartum period.
- A type and cross match of at least 2 units of packed red blood cells will be performed for patients with known high risk for PPH and with medium risk factors at the provider’s discretion.
- An interdisciplinary team (O.B. provider(s), anesthesiologist, primary RN and charge RN) will attend at least upon admission to L&D and prior to delivery for all Code H alert patients.
- The team will continuously assess the patients, who exhibit physiologic changes associated with blood loss and modify patient management accordingly. Active management of the third stage of labor during vaginal delivery will be implemented for every patient, as a more effective method than physiological management in preventing blood loss, severe postpartum hemorrhage and prolonged third stage of labor.

1. Administer 500 ml bolus of 10 units Oxytocin in 500 mL RL or Oxytocin 10 units intramuscularly x 1 in absence of IV access, after delivery of anterior shoulder of the neonate.
South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

2. Vigorous fundal massage.
3. Umbilical cord traction.
4. Ongoing quantitative evaluation of blood loss. QBL should be continued if active bleeding is present, and if the patient’s blood loss of more than 1000ml condition warrants. QBL evaluation may continue in the postpartum care setting as per the provider’s orders.
5. Ongoing evaluation of vital signs and intake and output (I&O).

PROCEDURE:

I. CODE H ALERT (Stage 0): Risk for possible PPH
1. When the interdisciplinary team has determined that the patient meets the criteria for high risk for PPH (or moderate risk for PPH at the provider’s discretion), the primary RN will notify the Blood Bank to type and cross match the patient’s blood (Refer to Appendix B) for available blood products.
2. A second peripheral IV line (16-18 gauge) will be inserted.
3. Blood Bank supervisor will assess in-house resources available and the need for additional staff in an event of CODE H Obstetric activation.

II. CODE H ALERT/PPH (Stage I) (Interventions may be performed concurrently):
• Call for assistance alert interdisciplinary team and escalate
• Request Code H medication box and Code H cart
• Massage fundus
• Initiate Obstetric Hemorrhage Checklist (Appendix B)
• Identify team leader, assign roles (timekeeper/scribe)
• Designate a runner (a person who will obtain blood from Blood Bank)
• Document vital signs, O2 saturation every 5 to 15 minutes
• Administer oxygen as needed to maintain O2 saturation at or above 95%
• Determine and treat PPH etiology (4 Ts - Tonic, Trauma, Tissue, Tension)
• Monitor and document blood loss (QBL)
• Increase Oxytocin concentration in the IV bag or administer additional Oxytocin IM
• Increase IV fluids
• Consider administering other uterotonic medications
• Consider inserting Foley catheter with a urimeter
• Consider Code H activation
• Prepare the Operating Room for possible patient transfer there
• The patient’s support person will be informed of PPH and the initiation of the Code H by a member of the interdisciplinary team. Patient support person will be continuously updated on status changes. Every effort will be made to allow the support person to stay with the patient.
• A multidisciplinary team debrief is required immediately after any PPH. A Post Emergency Team Debriefing Form (located on hospital intranet under Hospital Forms) should be utilized as a tool during the debrief.
• Patient’s Code H alert activation status will be discussed during report upon transfer for postpartum care and updated in EMR as needed for situational awareness of the interdisciplinary care team.

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>DOSE</th>
<th>PRECAUTIONS</th>
</tr>
</thead>
</table>

3
### South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage/Instructions</th>
<th>Side Effects, Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin (Pitocin)*</td>
<td>10 – 20 units per 500 ml IV as continuous infusion, or 10 units IM</td>
<td>Avoid undiluted IV push, causes hypotension</td>
</tr>
<tr>
<td>Methylergometrine (Methergine)*</td>
<td>0.2 milligrams intramuscularly (may be repeated every 2-4 hours)</td>
<td>Avoid in hypertension, Reynaud’s. Do not administer intravenously</td>
</tr>
<tr>
<td>15-methyl PGF2α (Hemabate, Carboprost)*</td>
<td>250 micrograms intramuscularly (may repeat every 15-90 minutes, maximum 8 doses)</td>
<td>Avoid in asthma, hepatic, renal, cardiovascular disease Risk of diarrhea, fever, tachycardia</td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>800-1000 micrograms rectally once</td>
<td></td>
</tr>
</tbody>
</table>
| Tranexamic Acid (TXA)       | 1 gram IVPB infused over 10 minutes                                                    | • Contraindications:  
  - Active venous thromboembolism  
  - At risks for thrombosis, history of DVT/PE  
  - Subarachnoid hemorrhage  
  - Thrombogenic cardiac rhythm  
  - Severe renal insufficiency  
  
- Relative Contraindications:  
  - Thrombophilia (homozygous FV Leiden, prothrombin gene mutation, Antithrombin III deficiency or compound heterozygote) |

*Uterotonics may be administered via intrauterine injection

### III. CODE H ACTIVATION (Stage II through Stage IV):

When the team has determined the need for Code H activation, in addition to steps followed for Code H alert/PPH procedure:
- A call is made to the operator (dial 220) to announce a “Code H” and the location of the code
- A designated staff person will call the Blood Bank to notify of a Code H activation
- The Blood Bank will prepare and release:
South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

- 4 units of Packaged Red Blood Cells (PRBC)
- 2 units of FRESH Plasma (FP)

* 1 unit of single donor Platelets can be requested by the obst provider and/or anesthesiologist at any time

- Emergency Transfusion Request Form and a sheet of patient’s labels will be provided to Blood Bank
- When there is insufficient time to obtain a type and crossmatch on the patient, uncross-matched O negative blood may be administered

- Consider STAT labs (CBC withdiff., coagulation & fibrinogen)
- Consider use of CELL SAVER set up and begin collection
- Warming blanket
- Consider the use of blood warmer
- Consider prepare moving the patient to Operating Room
- Continue Stage I uterine medications
- Consider TN-A

*During the hours of 7 AM - 10 PM*, the operator initiates a group page and will announce “CODE H” and the location three (3) times over the Public Address System and beeper system.

*During the hours of 10 PM - 7AM*, group pages will beep three (3) times and give specific “Code H” and the location over the beeper.

**CODE H Team Members:**

<table>
<thead>
<tr>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesiologist</td>
</tr>
<tr>
<td>In house attending obstetrician</td>
</tr>
<tr>
<td>OB resident(s) OIF PA(s)</td>
</tr>
<tr>
<td>GYN Oncology attending physician</td>
</tr>
<tr>
<td>L &amp; D RNs, Mother Baby and NICU RNs</td>
</tr>
<tr>
<td>Nursing Administrator (NM, DON or ANS)</td>
</tr>
<tr>
<td>Blood Bank</td>
</tr>
<tr>
<td>Main OR staff</td>
</tr>
<tr>
<td>Dedicated Blood Runner</td>
</tr>
<tr>
<td>RRT RN</td>
</tr>
<tr>
<td>IV Team RN</td>
</tr>
<tr>
<td>Laboratory/Phlebotomist</td>
</tr>
<tr>
<td>Respiratory Therapist</td>
</tr>
</tbody>
</table>

When the patient is stable, “Deactivate Code H” announcement will be made at the direction of the team leader physician.

**IV. Massive Transfusion Protocol (MTP) Activation:** The team leader may consider activating MTP once the menu of blood products for Code H has been exhausted, continuous bleeding persists and patient is hemodynamically unstable (Stage III and Stage IV). Upon the activation of MTP following a Code H activation, Blood Bank will release 2 units of PRBCs, 4 units of FP and 1 unit of platelets (this combination of blood products is consistent with 2nd pick up during MTP activation). Subsequent Pickups: 6 Units PRBC; 6 Units thawed FP; 1 unit Platelets continuously prepared and released until discontinued by the team leader physician.
South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

- For patients with cardiovascular collapse in setting of massive hemorrhage, consider the differential diagnoses:
  - Profound hypovolemic shock (blood loss not replaced)
  - Anoxic fluid embolism (sudden CV collapse followed by heavy uterine bleeding from uterine relaxation and associated coagulopathy)
  - Anesthetic complications
  - Intrapartum hemorrhage
  - Peripartum cardiomyopathy
- In the Operating Room facilitate access to additional items:
  - Bakri balloon
  - Hysterectomy tray
  - Uterine compression sutures
  - Consider uterine artery ligation
- Collaborate with health care team members to determine the appropriate site for continuing care of the patient. Consider consulting with additional experts such as Maternal Fetal Medicine (MFM) specialist, trauma surgeon, critical care physician, Nursing Administrator (NN), DON, ANS will facilitate patient transfer to an appropriate critical care unit
- Consider hematology (at the earliest signs of DIC), urology, GI and/or general surgeon consult.

When the patient is stable, “Deactivate MTP” announcement will be made at the direction of the team leader physician.

REFERENCES:

REPLACES: OBSTETRICS: Management of Obstetric and Gynecologic Hemorrhage
Code H- Team-Transfusion Emergencies (multiple revisions); Unit Based policy

<table>
<thead>
<tr>
<th>Original approval</th>
<th>3.19 Oversight Committee, 4.19 Medical Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reviewed and Approved</td>
<td>10.19 Administration</td>
</tr>
<tr>
<td>Reviewed and Approved</td>
<td>01.2020 Policy Oversight Committee</td>
</tr>
<tr>
<td>Reviewed and Approved</td>
<td>11.2020 WCS Steering Committee, 11.2020 Policy Oversight Committee</td>
</tr>
</tbody>
</table>
# South Nassau Communities Hospital: Code H - Obstetric Hemorrhage

## Appendix A

### PPJH Risk Assessment

**Prenatal Hemorrhage Risk Assessment:**

- [ ] Suspected previa accreta/increta/percreta
- [ ] Pre-pregnancy BMI > 40
- [ ] Clinically significant bleeding disorder
- [ ] Other significant medical/surgical risk (consider patients who decline transfusion)

**Action:** Transfer to appropriate level of care for delivery

### Intrapartum Hemorrhage Risk Assessment:

**Low Risk**

- [ ] Any obstetric patient without medium and high risk factors

**Medium Risk**

| [ ] Prior cesarean, uterine surgery; multiple laparotomies |
| [ ] Multiple gestation |
| [ ] 4 prior births |
| [ ] Prior obstetric hemorrhage |
| [ ] Large myomas |
| [ ] EFW > 4000g |
| [ ] Chorangioma |
| [ ] Prolonged oxytocin > 24 hours |
| [ ] Prolonged 2nd stage |
| [ ] Magnesium sulfate |
| [ ] Hematocrit < 30% |

**High Risk**

- [ ] Placenta previa low lying
- [ ] Suspected accreta/percreta
- [ ] Platelet count < 70,000
- [ ] Active bleeding
- [ ] Known coagulopathy
- [ ] 2 or more medium risk factors
- [ ] Obesity (BMI > 40)
- [ ] New active bleeding
- [ ] 2 or more medium risk factors (admission and/or intrapartum)
South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

Appendix B

Blood Products:

Packed Red Blood Cells
- Oxygen carrying capacity
- Volume expansion: 200-250 ml
- 1 unit RBC’s increases: Hgb 1.5-1.7 Hct 3% (Hct does not reflect acute hemorrhage for 4 hours full equilibration may take 24-48 hours).

Platelets
- <10,000 to 20,000 post-delivery consider replacing.
- <50,000 perioperative consider replacing
- Platelet pack (6-8 units increase count 5,000-10,000).

Frozen Plasma
- replaces clotting factor
- increases fibrinogen 10mg dl per 100 ml of FFP
- common to infuse 1 unit FFP per 4-6 units RBCs

Cryoprecipitate
- Does not contain Anti-thrombin III
- Indicated when initial fibrinogen 50 or lower
- Increase fibrinogen 10mg dl per unit of cryoprecipitate
- Replaces clotting factors with minimal volume
South Nassau Communities Hospital: Code H - Obstetric Hemorrhage

Appendix C

Obstetrical Hemorrhage Flow Sheet

<table>
<thead>
<tr>
<th>Q:</th>
<th>P:</th>
<th>Gest Age:</th>
<th>Delivery Date:</th>
<th>Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent Status: STAGE 0 applies to all deliveries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BP</td>
<td>MAP</td>
<td>Pulse</td>
<td>Respiration</td>
<td>Oxygen Saturations</td>
</tr>
<tr>
<td>Neuro: A = alert/oriented V = response to verbal P = response to pain U = unresponsive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundal Height</td>
<td>Uterine tone</td>
<td>Blood Loss</td>
<td>Urine output</td>
<td></td>
</tr>
<tr>
<td>Type &amp; Cross</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PATIENT STATUS: CODE H ALERT: STAGE I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suspicion of possible maternal hemorrhage: HX of: prolonged induction, post partum hemorrhage, anemia, uterine surgery, thrombocytopenia, placenta previa/accreta, fibrinolysis, grand multipara, VBAC, macrosomia, multiple gestation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac monitor</td>
<td>End IV Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PATIENT STATUS: CODE H ACTIVATION: STAGE II - IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal hemorrhage, hemodynamics unstable &gt;500 ml vaginal or &gt;1000 ml c/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code H called by operator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head of bed lowered</td>
<td>Oxygen at 6-10 Limin by mask</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uterine massage</td>
<td>Foley catheter insertion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab request slip to blood bank</td>
<td>Team members response (see back)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEDICATIONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P:racin (dose in units/route)</td>
<td>Hematate 250 micrograms (route)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methergine 0.2 mg (route)</td>
<td>Tranexamic Acid 1000mg (IV, over 10 min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cysteine 1000 micrograms, rectally</td>
<td>IV FLUIDS (No. of bags &amp; time hung)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV normal saline 1000ml</td>
<td>IV lactated ringer 1000ml</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BLOOD PRODUCTS (time hung)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packed red blood cells</td>
<td>Fresh frozen plasma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelets</td>
<td>Cryoprecipitate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warming device</td>
<td>DRAW LABS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hgb = hemoglobin, Hct = hematocrit, P = Platelets</td>
<td>F = Fibrinogen, PT, PTT, INR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical intervention: Cesarean Section, Hysterectomy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consults: surgical, hematology, critical care</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfer to critical care bed</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Completed by: _______ RN Date: _______
### Cesarean Delivery Obstetric Hemorrhage QBL Worksheet

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY (X)</th>
<th>DRY WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Lap</td>
<td>X</td>
<td>25</td>
</tr>
<tr>
<td>Blue Chux</td>
<td>X</td>
<td>45</td>
</tr>
<tr>
<td>Disposable Underpad</td>
<td>X</td>
<td>135</td>
</tr>
<tr>
<td>Sheets</td>
<td>X</td>
<td>485</td>
</tr>
<tr>
<td>Gown</td>
<td>X</td>
<td>335</td>
</tr>
<tr>
<td>White Towel</td>
<td>X</td>
<td>60</td>
</tr>
<tr>
<td>Lap Bag</td>
<td>X</td>
<td>25</td>
</tr>
<tr>
<td>Placenta Basin</td>
<td>X</td>
<td>25</td>
</tr>
<tr>
<td>1 SCD</td>
<td>X</td>
<td>120</td>
</tr>
<tr>
<td>Drape</td>
<td>X</td>
<td>400</td>
</tr>
</tbody>
</table>

Add the Totals for the Pre-weight

A = grams

Total Normal Saline /Sterile H₂O Given to Tech

I = ml.

Amount left

II = ml.

Fluid Used, 1 minus II

B = ml.

WEIGHT of ALL BLOODY ITEMS from ABOVE

C = grams

Final Volume in suction canister(s)

Y = ml.

Volume in suction canister immediately before removal of placenta

X = ml.

Volume of Blood in Canister, Y minus X

D = ml.

**QUANTITATIVE BLOOD LOSS (QBL)**

\[ C - (A + B) + D = \text{ml.} \]

- 1 gram = 1 ml.

The following should be the standard Operating Room set-up:

- 2 sheets on table
  - 1 flat
  - 1 draw
- 1 disposable underpad
- 6 blue chux

1. Use the list of dry weights for all delivery items that may become soaked with blood to calculate the total dry weight (A).
2. Suction drape pockets before delivery of placenta (to establish amniotic fluid volume).
3. The surgeon must announce that the placenta is about to be delivered so the circulating nurse can note level of fluid in the canister (to establish amniotic fluid volume).
4. Remember when setting up the canisters, to have the measuring grid on the canister facing outward for easy visibility.
5. Suction drape pockets before documenting final canister volume.
6. Weigh all clots in placenta basin or with towels, chux, etc.
NYP Brooklyn Methodist Hospital: Hemorrhage Recorder Checklist (2 pages)
NYP Brooklyn Methodist Hospital: Hemorrhage Recorder Checklist (2 pages)

| Stage 3: Continued Bleeding (QBL > 1500 mL OR > 2 RBCs given OR at risk for occult bleeding/coagulopathy OR any patient with abnormal vital signs/labs/oliguria) |
| Initial Steps: |
| Mobilize additional help |
| Move to OR |
| Announce clinical status (vital signs, cumulative blood loss, etiology) |
| Outline and communicate plan |
| Medications: |
| Continue Stage 1 medications; consider TXA |
| Blood Bank: |
| Initiate Massive Transfusion Protocol (If clinical coagulopathy: add cryoprecipitate, consult for additional agents) |
| Action: |
| Achieve hemostasis, intervention based on etiology |
| Escalate Interventions |
| Oxytocin (Pitocin): 30 Units in 500 mL continuous IV infusion or 10 units IM once if no IV access |
| Methylergonovine (Methergine): 0.2 milligrams IM (may repeat q 6-8 hrs up to 7 days); Avoid with hypertension |
| 15-methyl PGF2α (Menotab, Carprofen):  |
| Misoprostol (Cytotec): 800-1000 micrograms PR 600 micrograms PO or 800 micrograms SL |
| Transaxenic Acid (TXA): 1 gram IV over 10 min (add 1 gram vial to 50 mL NS or DS; maybe repeated after 30 min) |
| Possible interventions: |
| Bakri balloon |
| Compression suture/B-Lynch suture |
| Uterine artery ligation |
| Hysterectomy |

| Stage 4: Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism) |
| Initial Steps: |
| Mobilize additional resources |
| Medications: |
| ACLS |
| Blood Bank: |
| Simultaneously aggressive Massive Transfusion |
| Action: |
| Immediate surgical intervention to ensure hemostasis (hysterectomy) |
| Post-Hemorrhage Management |
| Determine disposition of patient |
| Debrief with the whole obstetric care team |
| Debrief with patient and family |
| Document |

Adapted from June 2019 Revision: Safe Motherhood Initiative
NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage
2020 Checklist

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TITLE: MANAGEMENT OF OBSTETRICAL HEMORRHAGE

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<td>IV. Stage-Based Management: Stages 1 - 4</td>
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<td>ii. Family Communication, Team Debriefing</td>
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<td>V. Quantitative Blood Loss Procedure</td>
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<td>VI. Documentation, Patient Education</td>
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<td>VII. References, Approvals</td>
<td>13</td>
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<tr>
<td>VIII. Appendix: Safe Motherhood Initiative Stage-Based Checklist</td>
<td>14-15</td>
</tr>
</tbody>
</table>

GUIDELINE: All obstetrical patients will be assessed for risk factors for obstetrical hemorrhage. The guideline is activated at the Stage 1 level if blood loss is > 500 mL for vaginal birth or > 1000 mL for cesarean birth. If the patient is not responsive to initial therapies, advanced care is provided as discussed in subsequent stages. All steps in prior stages are to be completed plus steps in current stage regardless of stage in which the patient presents.

APPLICABILITY: OBSTETRICS

PURPOSE: To provide guidelines for the optimal response of the multidisciplinary team in the event of obstetric hemorrhage. To aid in the early recognition of patients at risk for obstetric hemorrhage, to identify stages of hemorrhage and treatment goals.

SUPPORTIVE DATA:

1. Hemorrhage is one of the leading causes of maternal mortality. The causes of death due to hemorrhage are multi-factorial and prevention requires an interdisciplinary response.
2. Postpartum hemorrhage occurs in more than 10% of all births and accounts for 25% of maternal deaths.
3. Initial signs and symptoms of blood loss can be difficult to detect due to compensatory responses, increased circulating volume in pregnant women, and circulatory changes that occur with delivery of the placenta.
4. Early opportunities exist to assess risk, anticipate, and plan in advance of most obstetric hemorrhages.
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Management of Obstetrical Hemorrhage
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POLICY STATEMENTS:

1. A standardized management approach to hemorrhage includes a clearly defined, staged checklist of appropriate actions to be taken in an emergency situation which can help to improve patient outcomes. The staged approach described within this guideline is adapted from ACOG District II Safe Motherhood Initiative (SMI). Refer to reference #3.

2. Each obstetric unit has a standardized, secured and dedicated hemorrhage supply kit containing emergency hemorrhage supplies. The supply kit will have the Safe Motherhood Initiative Obstetric Hemorrhage checklist that delineates key procedural steps for severe hemorrhage response. Verification of supply kit integrity will be performed daily.

3. Each obstetric unit has a standardized, secured and dedicated hemorrhage kit containing uterotonic medications that is immediately available and capable of override dispensing from the automated dispensing medication cabinet.

4. Visual estimation of blood loss (EBL) consistently results in errors of underestimation. Methods to quantify blood loss (QBL), such as weighing, are significantly more accurate than EBL (AWHONN, 2014).

5. Oxytocin administration for active management of third stage of labor is recommended for all births.

6. Hospital systems that support early recognition and a rapid, coordinated response to extreme blood loss can limit maternal morbidity and improve maternal survival. Obstetric hemorrhage emergencies should be handled with the same level of urgency and preparation as a cardiac code. Any licensed health care team member can call for help and activate maternal hemorrhage response as clinically indicated.

7. Education of the hemorrhage procedure will be provided to all staff and providers who treat pregnant and postpartum patients to be inclusive of the Emergency Department providers and nursing staff: upon orientation, whenever changes to the process or procedure occur, or every two years. Education will be role-specific.

8. Drills will be conducted at least annually to determine system issues, teamwork, and communication opportunities. Drills are to include representation from each discipline identified in this procedure and will include a team debrief following the drill.

9. Hemorrhage cases that meet criteria established by NYP Department of Quality and Patient Safety will be reviewed to evaluate the effectiveness of the care, treatment, and services provided by the hemorrhage response team during the event.

10. Education will be provided to patients and their families, to include the designated support person when possible.
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**RELATED STANDARDS:**

a. **Massive Hemorrhage Protocols:**
   At Columbia:

   At Weill Cornell:
   [https://infohet.nyp.org/Lab/Shared%20Documents/MTPUpdate.pdf](https://infohet.nyp.org/Lab/Shared%20Documents/MTPUpdate.pdf)

   At Allen Hospital:

   At Lower Manhattan Hospital:

   At Lawrence Hospital:

b. **Nursing Clinical Standards:**
   OB 1770 Post Vaginal and Cesarean Birth Management

   PROC 750, Blood, Blood Components, Factor Concentrates and Factor Derivatives Administration Procedure at:

c. **Hospital Policy:**
   C112: Chain of Communication Guidelines

d. **Perinatal Practice Guidelines**
   Obstetrical Anesthesia Consultation Guideline
   [http://infohet.nyp.org/wnmshlth/Perinatal/ObstetricalAnesthesiaConsultation.pdf](http://infohet.nyp.org/wnmshlth/Perinatal/ObstetricalAnesthesiaConsultation.pdf)

1. **RISK ASSESSMENT AND PLANNING: EVALUATE FOR RISK FACTORS**
   At a minimum, all patients admitted to Labor and Delivery, Antepartum and Postpartum units should have the following completed:
   A. Complete blood count and active type and screen sent to the blood bank
B. Informed consents for administration of blood products.
C. Identify women who may decline transfusion
   1) Notify OB provider to confirm plan of care
   2) Notify OB Anesthesiology team
   3) Review health care proxy and consent.
D. Determine risk factors for hemorrhage. See Risk Assessment Tables 1 through 4.
   1) Complete risk assessment upon admission to Labor & Delivery, then ongoing evaluation for development of additional risk factors during labor (Pre-Birth) and following delivery in recovery phase (Post-Birth).
   Post-birth risk assessment (Table 3) will be performed upon admission to the postpartum unit.
# NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage 2020 Checklist

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## Table 1: Risk Assessment: Labor & Delivery Admission

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Factor</th>
<th>Plan of Care</th>
</tr>
</thead>
</table>
| Low        | • No previous uterine incision  
             • Singleton pregnancy  
             • ≤4 previous vaginal births  
             • No known bleeding disorder  
             • No history of PPH       | • Obtain Type and Screen                         |
| Medium     | • Prolonged oxytocin >24h  
             • Multiple gestation  
             • >4 previous vaginal births  
             • Prior cesarean birth or prior uterine incision  
             • Large uterine fibroids  
             • History of 1 previous PPH  
             • Family history in first degree relatives who experienced PPH++  
             • Chorioamnionitis  
             • Fetal demise**  
             • EFW > 4 KG  
             • Morbid obesity BMI >40*  
             • Polyhydramnios**  
             • Patient refusing blood products* | • Obtain Type and Screen  
                                            • Notify appropriate personnel                   |
| High       | • Has 2 or more medium risk factors  
             • Active bleeding  
             • Suspected abnormal placentaion (acciara spectrum or previa/low-lying)  
             • Known coagulopathy  
             • History of more than one previous PPH**  
             • Hematocrit < 30  
             • Thrombocytopenia  
             • Alloimmunization* | • Prepare blood  
                                            • Notify appropriate personnel  
                                            • Consider delivering at facility with appropriate level of care capable of managing a high risk mother |

---

*Abbrev: and hemodet bloods  
** Hypo: only
# Table 2: Risk Assessment Pre-Birth

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Factor Admission Risk Factors AND:</th>
<th>Plan of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>- No previous uterine incision&lt;br&gt; - Singleton pregnancy&lt;br&gt; - ≤4 previous vaginal births&lt;br&gt; - No known bleeding disorder&lt;br&gt; - No history of PPH</td>
<td>- Verify that Type and Screen results are active and present&lt;br&gt; - Use scales/calibrated equipment to quantify cumulative blood loss</td>
</tr>
<tr>
<td>Medium</td>
<td>- Chorioamnionitis&lt;br&gt; - Induction/augmentation of labor&lt;br&gt; - Labor &gt; 18 hours&lt;br&gt; - Prolonged second stage&lt;br&gt; - Magnesium sulfate&lt;br&gt; - Maternal temperature &gt; 100.4°F</td>
<td>- Notify OB provider, charge RN and call team huddle&lt;br&gt; - Verify active Type &amp; Screen&lt;br&gt; - Verify 18G or larger IV access present and patent&lt;br&gt; - Verify PPH cart and uterotonic agents available on unit&lt;br&gt; - Use scales/calibrated equipment to quantify cumulative blood loss</td>
</tr>
<tr>
<td>High</td>
<td>- New active bleeding greater than bloody show&lt;br&gt; - Suspected abruption&lt;br&gt; - 2 or more “Medium Risk” factors on admission or intrapartum</td>
<td>- Notify OB provider, charge RN, anesthesiologist and call team huddle&lt;br&gt; - Confirm blood prepared&lt;br&gt; - Verify 18G or larger IV access present and patent&lt;br&gt; - Verify PPH cart and uterotonic agents available on unit&lt;br&gt; - Use scales/calibrated equipment to quantify blood loss</td>
</tr>
</tbody>
</table>
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Table 3: Risk Assessment Post-Birth

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Risk Factor Admission AND Intrapartum Risk Factors AND:</th>
<th>Plan of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>• No previous uterine incision • Singleton pregnancy • ≤4 previous vaginal births • No known bleeding disorder • No history of PPH</td>
<td>• Verify that Type and Screen results are active and present • Use scales/calibrated equipment to quantify cumulative blood loss</td>
</tr>
<tr>
<td>Medium</td>
<td>• Operative vaginal delivery • Third or fourth degree laceration or episiotomy • Cesarean birth • Precipitous delivery • Shoulder dystocia</td>
<td>• Notify OB provider, charge RN and call team huddle • Verify active Type &amp; Screen • Verify 18G or larger IV access present and patent • Verify PPH cart and uterotonic are available on unit • Use scales/calibrated equipment to quantify cumulative blood loss</td>
</tr>
<tr>
<td>High</td>
<td>• Active bleeding • Difficult placental extraction • Concealed abruption • Uterine inversion</td>
<td>• Notify OB provider, charge RN, anesthesiologist and call team huddle • Confirm blood prepared • Verify 18G or larger IV access present and patent • Verify PPH cart and uterotonic are available on unit • Use scales/calibrated equipment to quantify blood loss</td>
</tr>
</tbody>
</table>

2. STAGES OF OBSTETRIC HEMORRHAGE

A. ALL BIRTHS: PREVENTION AND RECOGNITION OF OB HEMORRHAGE: Universal Active Management of Third Stage of Labor

1) Prophylactic uterotonic are given with delivery of the anterior shoulder or just after delivery of the infant.
2) Uterotonic of choice is oxytocin and is administered as follows:

30 units oxytocin per 500 mL fluid. Dose is 15 units oxytocin per hour at a rate of 250 mL per hour. Run infusion for 2 hours to deliver 30 units oxytocin over 2 hours. OR

10 units oxytocin IM (reserve for patients without intravenous access)

3) Provide vigorous fundal massage for at least 15 seconds
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**ONGOING EVALUATION OF VITAL SIGNS AND CLINICAL TRIGGERS**

**B. STAGE 1:** Blood loss >1000mL after delivery with NORMAL vital signs and lab values. Vaginal delivery 500-999mL should be treated as in Stage 1.
1) Perform fundal massage
2) Record and announce cumulative quantitative blood loss
3) Record vital signs and oxygen saturation every 5 minutes
4) Obtain hemorrhage supply kit and bring to patient’s bedside
5) Establish IV access with at least 18 gauge, if possible
6) Insert/Maintain urinary catheter
7) Increase IV fluid (crystalloid 3:1 ratio without oxytocin)
8) Increase oxytocin, additional uterotonics (Table 4)
9) Confirm active type and screen and consider Type & Cross 2 units RBCs
10) Determine and treat etiology by evaluating uterine atony, trauma or laceration, retained placenta, placenta accreta, uterine inversion, uterine rupture, coagulopathy or amniotic fluid embolism.
(Evaluate patient for the 4 T’s (tone, trauma, tissue, thrombin).

**TABLE 4: Uterotonic Medications for Stage 1 Hemorrhage**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
<th>Primary Route/ (Alternate)</th>
<th>Frequency of Dose</th>
<th>Side Effects</th>
<th>Contra-indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxytocin (Pitocin)</td>
<td>30 Units in 500 mL of solution IM: 10 units</td>
<td>IV or Intramuscular if there is no IV access</td>
<td>Continuous infusion</td>
<td>Usually none. Nausea, vomiting, water intoxication have been reported.</td>
<td>Hypersensitivity to drug. Do not administer with DSW.</td>
</tr>
<tr>
<td>Methylergonovine</td>
<td>0.2 mg</td>
<td>IM or Intra-myometrial</td>
<td>Every 2-4 hours</td>
<td>Hypertension, hypotension, nausea, vomiting</td>
<td>Avoid with hypertension, preeclampsia.</td>
</tr>
<tr>
<td>15- methyl Prostaglandin F 2 Carboprost (Hemabate)</td>
<td>250 mcg</td>
<td>IM</td>
<td>Every 15 minutes for maximum of 8 doses</td>
<td>Vomiting, diarrhea, nausea, flushing or hot flashes, chills or shivering.</td>
<td>Avoid with asthma. Caution with active hepatic, cardiac or renal disease.</td>
</tr>
<tr>
<td>Misoprostol (Cytotec)</td>
<td>800-1000 mcg 600 mcg PO 800 mcg</td>
<td>Per Rectum PO Sublingual</td>
<td>Once</td>
<td>Nausea, vomiting, diarrhea, fever and chills.</td>
<td>Hypersensitivity to drug.</td>
</tr>
</tbody>
</table>
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TABLE 5: Additional Medications to Consider if Suboptimal Response to Uterotonics:

<table>
<thead>
<tr>
<th>Name</th>
<th>Mechanism of Action</th>
<th>Dose</th>
<th>Route/Alt. Routes</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tranexamic Acid</td>
<td>Antifibrinolytic</td>
<td>1g/10 ml diluent (stocked in pre-mixed 10-mL vials)</td>
<td>TIV/IV infusion over 10 min/oral if no IV access; May be given in 50 mL D5 or NS over 10 min.</td>
<td>Can repeat X 1 in 30 min in refractory hemorrhage. Caution if h/o thrombosis. Can be given prophylactically in patients at high risk for hemorrhage. Maximum infusion rate: 100 mg/minute</td>
</tr>
</tbody>
</table>

N.B. Tranexamic Acid has been shown to be effective in reducing blood loss and the need for transfusion in obstetric, gynecologic and other surgery. Side effects, including thrombotic events, are rare. It is most effective when given within 3 hours of the onset of hemorrhage.

C. STAGE 2: Continued bleeding with EBL up to 1500 mL OR requiring ≥ 2 uterotonics with NORMAL vital signs AND lab values (2 or more uterotonics in addition to routine oxytocin administration; or ≥ 2 administrations of the same uterotonic).

1) Activate rapid, coordinated hemorrhage response team
2) Establish second IV access with 16 gauge, if possible
3) Draw and send STAT labs including: CBC, coagulation profile and fibrinogen level
4) If uterine atony present, consider intrauterine balloon, embolization or surgical interventions
5) Continue administration of medications from Stage 1 (Table 4), consider TXA (Table 5)
6) DO NOT WAIT for lab results. Transfuse patient per clinical signs, symptoms and ongoing blood loss
7) Notify Blood Bank of OB hemorrhage while obtaining 2 units RBCs to bedside and thaw 2 units FFP
8) Prepare OR. Consider moving patient to operating room for improved exposure and potential D&C
9) Perform team huddle and move to Stage 3 if continued blood loss and/or abnormal vital signs.

D. STAGE 3: Continued bleeding with EBL > 1500 mL OR > 2 units RBCs given OR at risk for occult bleeding/coagulopathy OR any patient with ABNORMAL vital signs /labs /oliguria

1) CONSIDER ACTIVATION OF MASSIVE HEMORRHAGE PROTOCOL (MHP)
   a) See Related Standards (Letter ‘a’) for campus – specific activation guidance of MHP.
NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage 2020 Checklist

2) Outline management plan; perform serial re-evaluation and communicate with hemorrhage team.

3) Assemble additional staff which may include advanced GYN surgeon, operating room support staff and perfusionist for cell saver.

4) Move to OR.

5) Announce clinical status (vital signs, cumulative blood loss), Communicate plan.


7) If coagulopathy, add cryoprecipitate. Consider consultation for alternative agents.

8) Continue administration of medications from Stage 1 (Table 4), consider TXA (Table 5)

9) Utilize fluid warmer and/or rapid infuser for fluid and blood product administration.

10) Identify etiology of bleeding, examine for lacerations, send labs for coagulopathy and consider imaging for occult bleed.

11) Achieve hemostasis immediately, interventions based on etiology. Surgical options include B-Lynch suture, uterine compression suture, uterine vessel ligation and hysterectomy. Reverse coagulopathy by actively transfusing blood products.

12) Consider transfer to higher level of care.

E. STAGE 4: Cardiovascular collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)

1) Perform immediate surgical intervention as necessary to ensure hemostasis by performing hysterectomy.

2) Replace blood and factors aggressively, expeditiously and simultaneously regardless of patient’s coagulation status.

3) Medications as per ACLS protocol as necessary.

F. TERMINATE MASSIVE HEMORRHAGE PROTOCOL. The designated physician or the on-call blood bank physician will notify the blood bank when the MHP is terminated.

G. During all stages of hemorrhage, provide timely and clear information to patient and family about events that have happened and the plan going forward. Explain risks, benefits and alternatives to treatment plans as best as possible. Provide continuous reassurance.

H. At the conclusion of a severe hemorrhage, the team performs a post-event multidisciplinary debrief with a focus on identification of system level improvement opportunities. Severe hemorrhage cases include transfusion of ≥4 units RBCs, unexpected hysterectomy and/or transfer to ICU level of care. However, if the team desires, a debrief may be performed for any hemorrhage event. Participants at minimum should be the primary OB provider, anesthesiologist and nurse, all other participants as able.
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**TABLE 6: Hemorrhage Response Team**

*Response Team may be activated by mobile device, manual emergency button located in patient room or notification to central communications operator.*

<table>
<thead>
<tr>
<th>Primary Responders:</th>
<th>Role:</th>
</tr>
</thead>
<tbody>
<tr>
<td>OB Providers:</td>
<td>Serve as team lead: Performs initial assessment, prescribes diagnostic and therapeutic interventions, outlines management plan.</td>
</tr>
<tr>
<td>Attending/Midwife/Resident/PA/NP</td>
<td></td>
</tr>
<tr>
<td>Anesthesiology Attending/Resident</td>
<td>Assists with initial assessment and interventions, manages airway, hemodynamics, pain control, administers blood products. Communicates plan in collaboration with OB provider.</td>
</tr>
<tr>
<td>Charge RN</td>
<td>Assists Primary RN in implementation of interventions, brings PPH cart, assigns clear roles including runner to Blood Bank, prepares OR, coordinates bed placement, assists with direct hand-off.</td>
</tr>
<tr>
<td>Primary RN</td>
<td>Activation of response team. Communicates patient condition to primary responders, assists in implementing interventions as ordered by team leader, remains with patient until stabilization or resolution of the problem with direct handoff.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Responders:</th>
<th>May be consulted when necessary in PPH Stage 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced GYN Surgeon</td>
<td>Assists with advanced surgical interventions</td>
</tr>
<tr>
<td>Critical Care Physician</td>
<td>Coordinates intensive care interventions with primary team, determines ECMO needs</td>
</tr>
<tr>
<td>Respiratory Therapist</td>
<td>Assists with airway management, oxygenation, ventilation and therapeutic interventions</td>
</tr>
<tr>
<td>Interventional Radiologist</td>
<td>Performs selective embolization</td>
</tr>
</tbody>
</table>

Procedure for Quantitative Blood Loss for Vaginal Delivery (QBL)

1. Using formal methods such as graduated containers and weight of soaked material (1 gm = 1 mL). Weigh blood-soaked materials and subtract known dry weight of material.
2. Ongoing evaluation of vital signs and urine output.
3. Following onset of heavy bleeding, > 500 mL after vaginal delivery and >1000 mL after Cesarean delivery, perform ongoing assessment of maternal vital signs.
4. Consider Foley catheter with urimeter to assess urine output.
5.  

---

[Back to Start of Toolkit](#)
NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage 2020 Checklist

**Procedures for Quantitative Blood Loss for Cesarean Delivery (QBL)**

1. Before delivery of the placenta, suction drape pockets and surgical field. Measure and note amniotic fluid within the suction canister, change the suction canister.
2. After delivery of the placenta, suction drape pockets and field. Measure and note amount of blood in the suction canister. Calculate the difference between steps 1 and 2.
3. Prior to adding irrigation fluid, ensure that the scrub team communicates when irrigation is beginning and note amount of irrigation fluid dispensed.
4. Weigh all blood-soaked materials, linens, towels and lap pads. Weigh absorbent materials that were underneath patient. Weigh any clots. Calculate the weight and convert grams to milliliters (1 gm = 1 mL).
5. At the conclusion of the surgery, measure irrigation volume remaining and subtract from original dispensed amount. Add the volume of quantified blood with the volume of quantified blood in the suction canister to determine total QBL.

**DOCUMENTATION:**

A. Nursing documentation to include but not limited to the following:
   - Assessments including pre-birth and post-birth risk assessments, interventions, notifications, education and patient response.
B. Provider documentation to include but not limited to the following:
   - Assessments including admission risk assessment, plan of care, interventions, notifications, consults, and patient response.

**PATIENT EDUCATION:**

Educate patient, family (and designated support person when possible):
A. Signs and symptoms of postpartum hemorrhage during hospitalization that alert the patient to seek immediate care.
   - Passage of any vaginal clots or bleeding that appears to be getting heavier or vaginal pad is soaked within 1 hour, feeling dizziness or lightheaded.
   - Review ACOG’s “Urgent Maternal Warning Signs” written handout.
B. Signs and symptoms of postpartum hemorrhage after discharge that alert the patient to seek immediate care.
   - Passage of egg-sized or larger vaginal clots, bleeding appears to be getting heavier or vaginal pad is soaked within 1 hour for 2 or more hours, dizziness or lightheaded or experienced loss of consciousness.
   - Review ACOG’s “Urgent Maternal Warning Signs” written handout.
C. Prior to discharge, review education resource “Postpartum Hemorrhage Patient Information” with each patient who has met the following QBL criteria: Vaginal birth > 1000 mL and Cesarean birth > 1500 mLs, available in English, Spanish and Chinese.
   [https://infonet.nyp.org/PatientED/HMMatters/PostpartumHemorrhagePPHPatientInformation.pdf](https://infonet.nyp.org/PatientED/HMMatters/PostpartumHemorrhagePPHPatientInformation.pdf)
NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage 2020 Checklist

REFERENCES:


Association of Women’s Health, Obstetric and Neonatal Nurses (2014). Quantification of blood loss: Practice Brief No. 1. JOGNN, 00, 1–3. DOI: 10.1111/1552-6909.12519


RESPONSIBILITY:
Obstetrics: Perinatal Practice Committee

GUIDELINE DATES:
Issued: March 2016, Revised March, 2018, October 2020
Reviewed & Approved by: Perinatal Practice Committee: March, 2020
Cross Campus Nursing Practice Council: May, 2020
Cross Campus Nursing Practice Council & Medical Board Jan 2021
NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage 2020 Checklist
NYP Columbia University Medical Center: Management of Obstetrical Hemorrhage 2020 Checklist

NewYork-Presbyterian Hospital
Sites: All Campuses Except NYP/Queens, NYP/Brooklyn, NYP/Hudson Valley
Perinatal Practice Guideline
Page 15 of 10

Stage 3: Continued Bleeding (EBL) 9000mL OR 2 x RBCs given OR at risk for occult bleeding/
coagulopathy OR any patient with abnormal fetal signs/falls/oliguria

Initial Steps:
- Mobilize additional help
- Move to OR
- Annex clinical status (fetal signs, cumulative blood loss, etiology)
- Outline and communicate plan

Medications:
- Continue Stage 1 medications; consider TXA

Blood Bank:
- Initiate Massive Transfusion Protocol (if clinical coagulopathy; add cryoprecipitants, consult for additional agents)

Action:
- Achieve hemostasis, intervention based on etiology
- Escalate interventions

Orphenadrine (Pitocin):
- 20-40 units per 500-1000 mL solution

Methylxanthine (Methergine):
- 0.2 milligram IM (may repeat)
- Avoid with hypertension

15-methyl PGF 2a (Hemabate, CarboPrist):
- 250 micrograms IM
- May repeat in 15-30 minutes, maximum 8 doses
- Avoid with asthma; use with caution with hypertension

Misoprostol (Cyprole):
- 500-1000 micrograms IM
- 600 micrograms PO or 800 micrograms SL

Transaxemic Acid (TXA):
- 1 gram IV over 10 min (add 1 gram over 20-30 min, IV & give over 10 min; may be repeated once after 30 min)

Possible Interventions:
- Bakri balloon
- Compression suture/3-0 Lynch suture
- Ultrasound arteriography
- Hysterectomy

Stage 4: Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock, or anesthetic fluid embolism)

Initial Step:
- Mobilize additional resources

Medications:
- ACLS

Blood Bank:
- Simultaneous aggressive massive transfusion

Action:
- Immediate surgical intervention to ensure hemostasis (hysterectomy)

Post-Hemorrhage Management
- Determine disposition of patient
- Debrief with the whole obstetric care team
- Debrief with patient and family
- Document

Safe Motherhood Initiative

Revised September 2020

Safe Motherhood Initiative
NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

**PURPOSE:**
To ensure rapid availability of transfusion products for patients with unexpected massive hemorrhage with a standard transfusion component dose to optimize patient care and safety.

**PRINCIPLE:**

**Adult Massive Hemorrhage (MH) – unexpected** transfusion of 10 units or more of RBCs (approximately one total blood volume (TBV) within 24 hours, transfusion of more than 4 RBC units in 1 hour with anticipation of continued need for blood product support or replacement of more than 50% of TBV by blood products within 3 hours.

**Pediatric Massive Hemorrhage (MH) – unexpected** transfusion of more than 100% TBV within 24 hours; transfusion support to replace ongoing hemorrhage of more than 10% TBV per minute, or replacement of more than 50% TBV by blood products within 3 hours.

MH is most often associated with trauma, solid organ transplantation, obstetrical emergencies, and surgical complications. Timely replacement of volume and oxygen carrying capacity in these situations is critical. However, due to the unexpected nature of these bleeds, providing blood products quickly without sacrificing patient safety is often a challenge. Furthermore, emerging evidence suggests that volume resuscitation using a 3:1 ratio of packed red blood cells (1 dose = 6 units), plasma (1 dose = 6 units), and platelets (1 dose = 1 single donor unit) improves patient survival.

**SCOPE:**
This protocol applies to unexpected massive hemorrhage in the emergency department, operating room, or on patient floors at New York Presbyterian Hospital, Columbia University Irving Medical Center Campus.

**EQUIPMENT AND SUPPLIES:**
NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

PROCEDURE:

1. Initiation of Massive Hemorrhage Protocol (MHP)
   
   A. The MHP must be activated by a designated member of the clinical team caring for the patient.
   
   B. The patient must be currently exsanguinating unexpectedly and the criteria for a MHP as defined above are fulfilled.
   
   C. To initiate the MHP, the designated person must notify the Blood Bank at 305-2679 or 305-2673.
   
   D. A Massive Hemorrhage Protocol Order form must be submitted via e-mail electronic "Massive Hemorrhage Protocol Order" or a manual (downstairs) "Massive Hemorrhage Protocol Order" form must be submitted via fax, tube or hand delivery with the following information provided:
      
      1. Patient name, Demographics (DOB & Sex), MRN, and Location
      
      2. Name, signature and contact number of the provider (physician PA, NP) ordering the blood products must be provided when using the manual MHP Order form. An order: Attending Provider Name must be included. The ordering physician, contact number and the supervising attending physician information will be embedded in the electronic MHP order. This ordering physician will be designated "Initiating Physician."
      
      NOTE: Only a physician or physician appointed designee can initiate the MHP.

   E. The technologist will notify the "Initiating Physician" that:
      
      1. A transporter must report to the blood bank pick-up window immediately with the patient’s information: Patient Name, MRN, location, and Demographics (DOB & Sex)
      
      2. The blood bank will make no further calls for pick up.
      
      3. A transporter must continue to report to the blood bank pick-up window with the patient’s information in order to retrieve each subsequent round of products.
      
      a. For electronically initiated MHP, 10 MHP Pick Up slips will print in the
blood bank for retrieval of products. The transporter must present the patient information via a patient label or Rover for patient identification purpose.

b. For a downtime (synchronous) initiated MHP, a (synchronous) Blood Product Pick-Up slip manually filled out with the patient information, or with a patient label, must be brought to blood bank for retrieval of products and patient identification purpose.

F. The technologist will page and notify the on-call supervisor and blood bank resident that a MHP has been initiated. If the on-call blood bank resident cannot be reached, the technologist will notify the on-call Transfusion Medicine Attending physician.

G. The following information will be provided to the on-call blood bank physician:

1. Patient name, MRN & location.
2. “Initiating Physician” name and contact number.
3. If known, the patient’s:
   a. ABO Type
   b. RhD Type
   c. Current antibody screen
   d. History of alloantibodies

H. The initiation of the MHP (time of original call, paging the resident) will be documented in the communication book.

J. The on-call blood bank physician will contact the “Initiating Physician” or the attending physician caring for the patient to:

1. Confirm the patient’s name, MRN, and location.
2. Confirm the diagnosis and clinical status.
3. Provide direct contact number information such as cell phone or home phone number.

J. Basic Guidelines:

1. Dosing - Adult patients (≥ 26 kg):
   - 6 units of RBCs
   - 6 units of plasma
   - 1 dose of apheresis platelets
   - 1 dose (5 units Pre-pooled) of Cryoprecipitate
NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

2. Dosing: Pediatric patients (< 26 kg):
   - Pediatric transfusions depend on weight. The following protocol divides the pediatric patients into 2 groups based on weight.
   - The recommended blood product quantities by patient weight are as follows:

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>RBCs</th>
<th>Plasma</th>
<th>Platelets</th>
<th>Cryoprecipitate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10</td>
<td>1 unit</td>
<td>1 unit</td>
<td>50 mL</td>
<td>15 mL</td>
</tr>
<tr>
<td>11 - 25</td>
<td>2 unit</td>
<td>2 unit</td>
<td>100 mL</td>
<td>30 mL</td>
</tr>
<tr>
<td>&gt; 25</td>
<td>See Adult dosing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Plasma and cryoprecipitate take 30 minutes to thaw, so there may be a delay at times when there’s no thawed product available. Send transport to pick up the available products while the frozen products are being prepared.

4. The Blood Bank staff is going to be busy preparing products as fast as they can. Multiple, redundant phone calls to the Blood Bank will slow down product release.

5. The blood bank will prepare predesignated packages of components with a 1:1:1 ratio of RBCs: plasma: platelets without additional requests from the “initiating physician.”

6. A follow-up will be made every 30 minutes by the on-call Blood Bank physician with the “initiating physician” to determine the efficacy of the released products and the need for additional products.

7. The on-call blood bank physician will contact the blood bank technologists to direct the preparation and release of appropriate blood products.

II. Preparation and release of products

A. The technologist will confirm the following:
   1. The patient has a current type and screen.
   2. There is sufficient patient sample for appropriate crossmatching.

B. If either condition is not met, the technologist will inform the “initiating physician” to draw 2 EDTA (pink top) samples for ABO typing, antibody screening, and crossmatching.

C. If the conditions in II.A are met, the following products will be prepared within 10 minutes of MHP initiation.
1. For adult patients (< 26 kg):
   - 6 units of compatible RBC
   - 6 units of compatible plasma will be placed in the water bath or 24-hour plasma will be provided.
   - 1 dose of compatible antiplatelets

   If plasma compatible platelets are not available, platelets should be released in the following order:

<table>
<thead>
<tr>
<th>First choice</th>
<th>AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second choice</td>
<td></td>
</tr>
<tr>
<td>Third choice</td>
<td>B</td>
</tr>
<tr>
<td>Fourth choice</td>
<td>O</td>
</tr>
</tbody>
</table>

   - 1 dose (5 units Pre-pooled) of Cryoprecipitate

2. For pediatric patients (< 26 kg):
   - Pediatric transfusions depend on weight. The following protocol divides the pediatric patients into 2 groups based on weight:
   - The recommended blood product quantities by patient weight are as follows:

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Red Cells</th>
<th>Plasma</th>
<th>Platelets</th>
<th>Cryoprecipitate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10</td>
<td>1 unit</td>
<td>1 unit</td>
<td>50 mL</td>
<td>15 mL</td>
</tr>
<tr>
<td>11 - 25</td>
<td>2 unit</td>
<td>2 unit</td>
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<td>30 mL</td>
</tr>
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   If plasma-compatible platelets are not available, platelets should be released in the following order:

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<tbody>
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<td>B</td>
</tr>
<tr>
<td>Fourth choice</td>
<td>O</td>
</tr>
</tbody>
</table>

3. If the patient does not have a valid ABO type, the blood bank technologist will follow the emergency release procedure for release of products. The following products will be prepared within 15 minutes of MHP initiation:

   1. For adult patients (< 26 kg):
      - 6 units of O Negative RBCs for females
      - 6 units of O Positive RBCs for males
NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

Title: TR029 Massive Hemorrhage Protocol
Document Number: TR029
LTR: LTR25116 Revision: 2.02

- 6 units of ABO FFP will be placed in the water bath or 24-hour plasma will be provided.
- 1 dose of compatible apheresis platelets

Platelets should be released in the following order:

<table>
<thead>
<tr>
<th>First choice</th>
<th>AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second choice</td>
<td>A</td>
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<tr>
<td>Third choice</td>
<td>B</td>
</tr>
<tr>
<td>Fourth choice</td>
<td>O</td>
</tr>
</tbody>
</table>

The first choice for platelets should be Rh negative for females and Rh positive for males. If inventory does not permit – Rh positive platelets will be issued.

- 1 dose (5 units pre-pooled) of Cryoprecipitate

2. For pediatric patients (<26 kg):
   - Pediatric transfusions depend on weight. The following protocol divides the pediatric patients into 2 groups based on weight.
   - The recommended blood product quantities by patient weight are as follows:

<table>
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<th>Red Cells</th>
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<th>Cryoprecipitate</th>
</tr>
</thead>
<tbody>
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<td>1 unit</td>
<td>1 unit</td>
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<td>15 mL</td>
</tr>
<tr>
<td>11 - 25</td>
<td>2 unit</td>
<td>2 unit</td>
<td>100 mL</td>
<td>30 mL</td>
</tr>
</tbody>
</table>

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<table>
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<tr>
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<th>AB</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Third choice</td>
<td>B</td>
</tr>
<tr>
<td>Fourth choice</td>
<td>O</td>
</tr>
</tbody>
</table>

The first choice for platelets should be Rh negative for females and Rh positive for males. If inventory does not permit – Rh positive platelets will be issued.

3. Once the ABO type of the patient is confirmed, all products should be ABO compatible.

E. For a patient with a positive antibody screen:

1. If compatible RBC cannot be quickly identified, the supervisor and on-call blood bank physician will direct the release of the most appropriate RBCs.
NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

II. Delivery of blood bank products

A. Blood bank will issue the product in one of the following ways:
   1. Personal pick-up at the blood bank window.
   2. The pneumatic tube system. Note: if the pneumatic tube is used, the Blood Bank can only send 2 units at a time.

IV. Laboratory Monitoring

A. CBC, PT INR, aPTT, fibrinogen, ionized calcium, D-dimer, and pH levels should be sent after infusion of every other transfusion package in order to appropriately guide the use of subsequent products and replacement therapy.

B. Laboratory monitoring is the responsibility of the clinical team and the "Initiating Physician." If the fibrinogen level drops below 100 mg/dL, 2 doses of cryoprecipitate should be considered for inclusion in the next transfusion package.

V. Completion of Massive Hemorrhage Protocol Order Form

A. Enter all required fields on the Massive Hemorrhage Protocol Order Form, making sure to complete all data, time, and signature fields.
B. Confirm a Type and Screen sample was tested pre or post issue of MHP blood and products or indicate not applicable (N/A) if no sample was received for testing. Document date and time.
C. Confirm ABO Confirm was tested pre or post issue of MHP blood and products or indicate not applicable (N/A) if no sample was received for testing. Document date and time.
D. Immediately notify the Transfusion Medicine physician of positive antibody screen test results. Document date and time.
E. Immediately notify the Transfusion Medicine physician of incompatible crossmatch results. Document date and time.
F. Leave all MHP order forms for Supervision review.
VI. Termination of MHP

A. The on-call blood bank physician will follow up with the “Initiating Physician” every 30 minutes to determine the efficacy of the released products and the need for additional products.

B. The MHP will be terminated when either of the following occurs (whichever is sooner):

1. The designated “Initiating Physician” or the on-call blood bank physician notifies the blood bank that the MHP is terminated, and electronically place a Stop Massive Hemorrhage Protocol Order Set. Note: this order set must be placed for the backed documentation of transfused units to occur in the EMR.

2. The on-call Transfusion Medicine physician calls to notify the blood bank the MHP is terminated.

3. 4 hours have elapsed since the MHP was initiated and the “Initiating Physician” has not notified the blood bank that the MHP should be continued.

INTERPRETATION:

N/A

SAFETY MEASURES:

Refer to institutional and laboratory safety policies and procedures.

ACTIVITIES:

<table>
<thead>
<tr>
<th>Responsible Party</th>
<th>Activity</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

**Initiating Physician or Designee**
- Initiates the MHP by calling the Blood Bank
- Orders a Massive Hemorrhage Protocol Order in the EMR or submits a manual Massive Hemorrhage Protocol Order form to blood bank
- Submit a manual Blood Product Pick-up Slip to blood bank for every round of products

**Transfusion Service Staff**
- Contact Transfusion Medicine physician
- Contact Transfusion Service On-call Supervisor
- Prepare products
- Completion of Massive Hemorrhage Protocol Order Form

**Transfusion Service Managers/Supervisors**
- Maintain adequate inventory
- Coordinate between technologists and on-call physician

**Transfusion Medicine On-Call Physician**
- Contact initiating physician and attending responsible for patient to review basic guidelines of MHP
- Direct appropriate release of blood products
- Notify Transfusion Service when MHP is terminated

**Transfusion Medicine Physician**
- Subsequent review and follow up of events pertaining to MHP

**Notes**
- Massive Hemorrhage Protocol Order form
- Notes from on-call physician

**Related Forms**
- Massive Hemorrhage Protocol Order Form
- MHP Blood Product Pick-up Slip
- Blood Product Pick-up Slip (manual)
REFERENCES:


Shaz BH, Dente CJ, Nicholas J, et al. Increased number of coagulation products in relationship to red blood cell products transfused improves mortality in trauma patients. Transfusion. 2009 Oct 5,


# NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

## SOP HISTORICAL RECORD

<table>
<thead>
<tr>
<th>DATE</th>
<th>WRITTEN/REVISED BY</th>
<th>REVISION #</th>
<th>REVISION MADE</th>
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</thead>
<tbody>
<tr>
<td>6/1/12</td>
<td>RAELEK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/3/13</td>
<td>RAHLEK</td>
<td>1</td>
<td>Update after &quot;post implementation validation.&quot;</td>
</tr>
<tr>
<td>4/25/13</td>
<td>YL</td>
<td>2</td>
<td>Changed quantity and type of platelet and cryoprecipitate products issued</td>
</tr>
<tr>
<td>5/31/13</td>
<td>YL</td>
<td>3</td>
<td>Added criteria for activating the NYP and requirement for a pick-up ship</td>
</tr>
<tr>
<td>9/30/13</td>
<td>HPP/YL</td>
<td>4</td>
<td>Added the pediatric protocol and modified termination criteria</td>
</tr>
<tr>
<td>5/6/14</td>
<td>SPJ</td>
<td>5</td>
<td>Added Blood Product Order form and instructions for submission</td>
</tr>
</tbody>
</table>

**REMOVED:**

Director review & version history captured by SoftTech Health Document Management as of 9/2/14
John R. Oishei Children's Hospital of Buffalo: Obstetric Hemorrhage Checklist ACOG
John R. Oishei Children's Hospital of Buffalo: Obstetric Hemorrhage Checklist ACOG

**Stage 3: Continued Bleeding (EBL > 1500mL OR > 2 RBCs given OR at risk for occult bleeding/coagulopathy OR any patient with abnormal vital signs/labs/oliguria)**

**Initial Steps:**
- Mobilize additional help
- Move to OR
- Announce clinical status (vital signs, cumulative blood loss, etiology)
- Outline and communicate plan

**Medications:**
- Continue Stage 1 medications

**Blood Bank:**
- Initiate Massive Transfusion Protocol (if clinical coagulopathy: add cryoprecipitate, consult for additional agents)

**Action:**
- Achieve hemostasis, intervention based on etiology

**Stage 4: Cardiovascular Collapse (massive hemorrhage, profound hypovolemic shock, or amniotic fluid embolism)**

**Initial Step:**
- Mobilize additional resources

**Medications:**
- ACLS

**Blood Bank:**
- Simultaneous aggressive massive transfusion

**Action:**
- Immediate surgical intervention to ensure hemostasis (hysterectomy)

**Post-Hemorrhage Management**
- Determine disposition of patient
- Debrief with the whole obstetric care team
- Debrief with patient and family
- Document

---

Revised December 2016

Safe Motherhood Initiative

ACOG
Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

Stony Brook Clinical Simulation Center (CSC)
Template for Mannequin Simulation Session

This template is designed to assist in the development of simulation cases. The information requested below is for purposes of preparation and achieving educational and training objectives, as outlined by the Simulation Center at Stony Brook and the MedEdPortal of the Association of American Medical Colleges (AAMC).

Section 1: Case Information

Appendix A: MedEdPORTAL Simulation Case Template

SIMULATION CASE TITLE: Labor and Delivery Hemorrhage Drill

AUTHORS:

<table>
<thead>
<tr>
<th>PATIENT NAME:</th>
<th>Monica Ztest</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATIENT AGE:</td>
<td>30 y.o</td>
</tr>
<tr>
<td>CHIEF COMPLAINT:</td>
<td>30 yo G3P3 s/p NSVD 39 weeks postpartum hemorrhage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brief narrative description of case</th>
<th>Patient is s/p NSVD at 39 weeks gestation of 4210 gram male 30 minutes ago. Placenta delivered spontaneously, no lacerations, QBL 350cc. Oxytocin currently infusing at 500cc/hr. Medical history include Asthma, no surgical History. Epidual is in place, IV not placed yet, complains of gush of blood. Baby is in NICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Learning Objectives</td>
<td>Identify postpartum hemorrhage</td>
</tr>
<tr>
<td></td>
<td>Appropriate management steps for postpartum hemorrhage</td>
</tr>
<tr>
<td></td>
<td>Appropriate call for Code Noelle</td>
</tr>
<tr>
<td></td>
<td>Tranexamic acid ordered at time of 3rd uterotonic</td>
</tr>
<tr>
<td></td>
<td>Emergency blood ordered correctly</td>
</tr>
<tr>
<td></td>
<td>Team leader and assignment of roles</td>
</tr>
</tbody>
</table>

Last Updated: January 9, 2017
Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

<table>
<thead>
<tr>
<th>Critical Actions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>List which steps the participants should take to successfully manage the simulated patient. These should be listed as concrete actions that are distinct from the overall learning objectives of the case.</td>
<td></td>
</tr>
<tr>
<td>• Identify postpartum hemorrhage</td>
<td></td>
</tr>
<tr>
<td>• Fundal massage given</td>
<td></td>
</tr>
<tr>
<td>• Provider notified</td>
<td></td>
</tr>
<tr>
<td>• Increase oxytocin infusion to 1000ml/hr</td>
<td></td>
</tr>
<tr>
<td>• Inspect cervix/vagina for lacerations</td>
<td></td>
</tr>
<tr>
<td>• Straight cath/foley</td>
<td></td>
</tr>
<tr>
<td>• Administer two additional uterotonic (dose and route)</td>
<td></td>
</tr>
<tr>
<td>• 2&quot; large bore IV started</td>
<td></td>
</tr>
<tr>
<td>• Anesthesia notified</td>
<td></td>
</tr>
<tr>
<td>• Stat labs ordered</td>
<td></td>
</tr>
<tr>
<td>• 2 units PRBCs ordered stat</td>
<td></td>
</tr>
<tr>
<td>• Decision to move to OR</td>
<td></td>
</tr>
<tr>
<td>• Debrief the case</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learner Preparation</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>What information should the learners be given prior to initiation of the case?</td>
<td>n/a</td>
</tr>
</tbody>
</table>

**INITIAL PRESENTATION**

<table>
<thead>
<tr>
<th>Initial vital signs</th>
<th>HR 110, BP 100/70, R 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Appearance</td>
<td>Somewhat anxious first mother. Patient stating that she felt a gush of blood.</td>
</tr>
<tr>
<td>Actors and roles in</td>
<td></td>
</tr>
<tr>
<td>the room at case</td>
<td></td>
</tr>
<tr>
<td>start</td>
<td></td>
</tr>
<tr>
<td>HPI</td>
<td></td>
</tr>
<tr>
<td>Past Medical/Surgical History</td>
<td>Medications</td>
</tr>
<tr>
<td>Asthma</td>
<td>Albuterol prn</td>
</tr>
</tbody>
</table>
Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

<table>
<thead>
<tr>
<th>Physical Examination</th>
<th>General</th>
<th>All normal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HEENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neck</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lungs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardiovascular</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abdomen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neurological</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Psychiatric</td>
<td></td>
</tr>
</tbody>
</table>

**INSTRUCTOR NOTES - CHANGES AND CASE BRANCH POINTS**

This section should be a list with detailed description of each step than may happen during the case. If medications are given, what is the response? Do changes occur at certain time points? Should the nurse or other participant prompt the learners at given points? Should new actors or participants enter, and when? Are there specific things the patient will say or do at given times? There are a few examples given, but it is expected that most cases will have many more changes and potential branch points...

<table>
<thead>
<tr>
<th>Intervention / Time point</th>
<th>Change in Case</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial vital signs HR 110 BP 100/70, 500cc blood loss when RN attempts uterine massage</td>
<td>First line uterotonic given (oxytocin increased), fundal massage given, notify provider</td>
<td>Uterine atony, boggy uterus continues despite interventions</td>
</tr>
<tr>
<td>Next vital signs: HR 120, BP 80/50, Pulse ox 92% Bleeding continues</td>
<td>Next uterotonic given, cervix/vagina inspected for lacerations, bedside sono, straight cath, anesthesia notified, O2 applied</td>
<td>500cc blood loss when resident enters to assess bleeding</td>
</tr>
<tr>
<td>Next VS: HR 140, BP 60/90, Pulse ox 90%, bleeding continues</td>
<td>Next uterotonic given, PRBCs ordered, stat labs drawn, Decision to move to OR, tranexamic acid ordered, Code Noelle called</td>
<td>500cc blood loss after 3rd uterotonic given</td>
</tr>
</tbody>
</table>
Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

Section 2: Equipment and Supplementary Documents

1. Room Set-up:
   1a. Room Type:
       - In-Patient Room
       - ICU
       - Emergency Department
       - OR
       - X Labor & Delivery
       - Other:
       - Comments:

   1b. Manikin/Confederate/SP needs:
       - Adult High Fidelity Manikin
       - Child High Fidelity Manikin
       - Infant High Fidelity Manikin
       - Newborn High Fidelity Manikin
       - Premature Baby High Fidelity Manikin
       - X Maternal Delivery Adult High Fidelity Manikin
       - Confederates:
       - Number of Confederates needed:
       - Confederate Roles:
       - Standardized Patients (SPs):
       - Number of SPs needed:
       - SP Roles:
       - (must supply SP Training materials if SP used)
       - Other:

2. Monitors Required:

<table>
<thead>
<tr>
<th>Monitor</th>
<th>On At Start</th>
<th>Available if Asked for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Invasive BP Cuff</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arterial Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EKG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

<table>
<thead>
<tr>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Oximeter</td>
</tr>
<tr>
<td>CVP</td>
</tr>
<tr>
<td>PA Catheter</td>
</tr>
<tr>
<td>Temperature Probe</td>
</tr>
<tr>
<td>Capnography</td>
</tr>
<tr>
<td>ICP</td>
</tr>
<tr>
<td>Other:</td>
</tr>
<tr>
<td>Other:</td>
</tr>
</tbody>
</table>

3. Other Equipment Required:
- Red rubber straight catheter
- Foley catheter
- Non-rebreather O2 mask
- 2 liters blood
- LR 1000 ml
- Oxytocin 40 units 1 liter
- Methylene 0.2mg IM (syringe and needle) 2 doses
- Cytotec 200mcg tabs (5 tabs)
- Ultrasound
- RIC (need EMR record for patient - to order stat labs and emergency blood)

Use Code:
- I = Initial (should be set up at start of simulation)
- R = In room and ready for use
- A = Available if needed and asked for (not in room)

<table>
<thead>
<tr>
<th>Code</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>IV Hep Lock/Saline Lock</td>
<td>Intubated</td>
</tr>
<tr>
<td>X</td>
<td>IV Pumps</td>
<td>Adult Advanced Airway Equipment (Intubation, etc...)</td>
</tr>
<tr>
<td></td>
<td>IV at KVO</td>
<td>Pediatric Advanced Airway Equipment (Intubation, etc...)</td>
</tr>
<tr>
<td></td>
<td>Arterial line in place</td>
<td>BLS Airway Equipment (BVM, Nasal Cannula, NRB, etc...)</td>
</tr>
<tr>
<td></td>
<td>Central Line Access</td>
<td>Chest Tube with Pleur-Evac</td>
</tr>
<tr>
<td></td>
<td>Femoral Line Access</td>
<td>Bronchoscope</td>
</tr>
<tr>
<td></td>
<td>Defibrillator</td>
<td>iSimulate Monitor</td>
</tr>
</tbody>
</table>

BACK TO START OF TOOLKIT
BACK TO START OF SECTION
# Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

<table>
<thead>
<tr>
<th>Code Cart Adult</th>
<th>iSimulate 12 Lead EKG Monitor</th>
<th>Other:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code Cart Pediatric</td>
<td>Echo Machine and Probe (TTE or TEE)</td>
<td>Other:</td>
</tr>
<tr>
<td>CPR Auto Compression Device (Lifestat)</td>
<td>Ventriculocorony with Bolt in place</td>
<td>Other:</td>
</tr>
</tbody>
</table>

### 3a. Medication Required:

**Emergency Medication Tray (contains the following medications):**

### 3b. Additional Requested Medication(s)/IV Drips:
- Oxytocin 40 units in 1 liter
- Lactated Ringers 1 liter
- Normal saline 0.9% 1 liter
- 2 Mathergens 0.2mg
- 5 Cytotec 200mcg

### 4. Supplementary Documents (please attach electronic copy below):

| CXR |
| 12 Lead EKG |
| Echo |
| X | ABG |
| Lab Results |
| Paper Chart |
| Physical Assessment |
| Handout |
| Other: |
| Other: |
| Other: |

Attach Supplementary Documents:
Patient and Family Support Checklist for Postpartum Hemorrhage

Supporting patients and families during a serious maternal event is a vital aspect of patient care. Use this checklist to help ensure patients and their family members have their emotional needs met when a postpartum hemorrhage occurs.

Prior to the Event

☐ Identify a staff person who will provide continuous updates to the family and facilitate completion of the below listed support items. ***Whenever possible, identification of this person should occur during morning huddle (using previously prescribed process) so that the assigned individual is immediately ready to support families in the event of an emergency.***

Immediately Following the Event

☐ Introduce yourself and your role to the family

☐ Offer to move the family to a new room, away from where the hemorrhage took place; explain that the purpose of maintaining soiled linens etc. is to enable accurate measurement of blood loss.

☐ Explain to the family what has happened and what they can expect to occur in the next few hours; including the length of surgery (if applicable) and how often you will be in touch with them (at least every hour); provide them with your contact information; act as a liaison between the family and other units in order to provide timely updates

If the Patient is in Critical Care

☐ Prepare family members for what they might see (e.g. patient is intubated)

☐ Communicate with the family about what the patient already knows (e.g. does she know she’s had a hysterectomy)

☐ Provide the patient with updates about her baby and provide pictures, etc; if possible, bring baby to patient and identify ways she can be involved with the care of her baby (e.g. first bath)

☐ If patient is intubated or unable to appeal clearly, provide a whiteboard or comparable way for her to communicate

☐ Ask patient what her needs are and facilitate support (e.g. ensure mom wanting to breastfeed has lactation support)

☐ Assess patient’s understandings of her medical status/care plan and provide support as needed (e.g. patient may fear estabulation and need reassurance from clinician)

☐ Offer emotional support by way of social worker, psychologist or chaplain

Prior to Discharge

☐ Acknowledge the trauma of what the patient has experienced and provide anticipatory guidance to patient and family regarding physical and emotional recovery

☐ Provide postpartum resources about “what to expect” after discharge (e.g. POCNC resources, Life After Postpartum Hemorrhage)

☐ Encourage early follow-up with provider upon discharge

☐ Invite patient to schedule time with her providers to debrief the event
Patient Feedback Questions for Obstetric Hemorrhage

Receiving feedback from patients to understand the OBH experience from their perspective is vital for improving quality and safety. Use the questions below to guide you through conversations with your OBH patients. Consider providing follow-up with patients by phone within 10-14 days of discharge. Before they go home, let them know to expect the call, it will increase the likelihood of connecting.

Postpartum Hemorrhage/Bleeding Questions for Patients

Introduce the questions by letting the patient know you are reaching out because your hospital is working to ensure that women who experience hemorrhage/significant bleeding after delivery receive all of the support they need. Let her know that hearing about her experience will help your team understand what they are doing well (and should keep doing) and what should consider doing differently. If she agrees to help, proceed with the following questions…

1. Can you tell me about your delivery and postpartum experience? (let the patient tell her story. Allow the patient to talk for as long as she wishes.)
   Possible follow-ups:
   - Were you alone or was someone there with you? Who? What have they told you about the experience?
   - Did you know you were at risk for postpartum hemorrhage/bleeding?
   - Was your C-section/hysterectomy/etc. planned?
2. What do you remember being told about hemorrhage/bleeding before being discharged?
3. Did you have any concerns about going home? Did you develop any concerns once you were home?
4. What information do you wish you had received before going home?
5. What could we have done better to support you before, during, or after your hemorrhage/bleeding?
6. Would you be interested in meeting with your doctor to learn more about what happened during your hemorrhage/bleeding?
7. What else would you like for me to know?
8. Do you have any questions for me?
White Plains Hospital: Patients Who Decline Blood Products

PATIENTS WHO DECLINE BLOOD PRODUCTS

In The Office

Antepartum Discussions and Documentation:

1. Screen all patients regarding potential to refuse some/all blood products
2. Discuss and document the risks of hemorrhage and the increased risk of death and morbidity
3. Discuss possibility of additional surgery, including hysterectomy, in the event of a PPH
4. Privately discuss patient’s refusal of blood products (without family members) to understand patient’s autonomous decisions in the event of a PPH
5. Present and complete the blood product acceptance form (see attached)
6. Document the patient’s understanding of the consequences of refusing blood products in a detailed informed consent form (see attached)
7. Complete a health care proxy form. This should be completed with a health care agent designated, clarifying the agent’s ability to make decisions regarding blood products if the patient’s capacity is lost due to anesthesia or hypotension/shock
8. Send the documents and documented discussions to the delivering hospital

Antepartum Preparation:

1. Maximize Hb/Hct
   -Iron, Vitamin C and folic acid (oral or IV as indicated)
   -For low Hb/Hct consider hematology consult and/or Erythropoietin 40,000 units/week or 20,000 units/day for faster response (recombinant erythropoietin contains albumin and may not be acceptable to all patients)
2. Obtain consultations from MFM and anesthesia as indicated
3. Identify hemorrhage risk factors and consider delivery at hospital with higher level surgical/intensive care (e.g. placenta increta)

In The Hospital

Labor & Delivery Admission:

1. On admission, identify all patients who refuse blood products
2. If blood product form is not available, complete the form on L&D
3. Alert the OB team (attending, hospitalist, anesthesia)
4. Identify risk factors for hemorrhage
5. Prophylactic administration of tranexamic acid (1 g/10 ml) immediately prior to delivery and normovolemic hemodilution (if acceptable to the patient) should be done
White Plains Hospital: Patients Who Decline Blood Products

**BLOOD PRODUCT ACCEPTANCE LIST**

<table>
<thead>
<tr>
<th>Category</th>
<th>WILL ACCEPT</th>
<th>WILL NOT ACCEPT</th>
<th>MAY ACCEPT UNDER CERTAIN CIRCUMSTANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category I</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Blood Cells</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh Frozen Plasma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autologous Banked Blood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category II</strong> (Contains human plasma)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albumin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibrin Glue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibrinogen Concentrate (Riv-Stap)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RhogAM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plasma Protein Fractions/Plasmanate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Immunoglobulin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 8/9WF Concentrate (Humate-P and Wilate)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prothrombin Complex Concentrate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bebulin (3 Factors)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kcentra (4 Factors)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category III</strong> (Does not contain human plasma)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 7A (Novo 7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 8 Recombinant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 9 Recombinant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 13 Recombinant (Tretten)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category IV</strong> (No blood component)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tranexamic Acid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amicar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DDAVP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythropoietin — recombinant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hetastarch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balanced Salt Solutions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category V</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isovolemic Hemodilution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypervolemic Hemodilution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Saver</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signature: ___________________________  Date: ____________  Time: ____________

**Safe Motherhood Initiative**

Revised February 2019

*ACOG*
### White Plains Hospital: Patients Who Decline Blood Products

**Blood Product Education Form**

<table>
<thead>
<tr>
<th>WHERE TO ORDER</th>
<th>COMPONENT</th>
<th>CONTENT</th>
<th>EXPECTED EFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Bank</td>
<td>Packed Red Blood Cells</td>
<td>Contains red blood cells and a small amount of plasma</td>
<td>250 mL: Increases hematocrit by 3-4% and hemoglobin by 1 g/dL</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Fresh Frozen Plasma (FFP)</td>
<td>Plasma which contains clotting factors, albumin and immunoglobulins</td>
<td>250 mL: Increases fibrinogen, normalization of PT, PTT</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Platelets</td>
<td>Platelets and plasma</td>
<td>250 mL: Increases platelets</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>Autologous Blood</td>
<td>Donated by patient for self-use</td>
<td>Need a high/normal hematocrit and usually is not used in emergencies</td>
</tr>
</tbody>
</table>

**Minor Blood Fractions**

| Blood Bank | Albumin | A protein in human serum, highly processed/treated plasma derivative | Reverse hypovolemia (draws interstitial fluid into circulation) |
| Blood Bank | Factor VII NovoSeven | Concentrated preparation of clotting factor VII | Initiates thrombosis by activating platelets and the clotting cascade improving coagulation. Only effective after major sources of bleeding have been repaired. |
| Ointment | Fibrin Glue | Fibrinogen and thrombin | Create a fibrin clot to achieve hemostasis |

**Pharmacy**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythropoietin</td>
<td>A hormone produced in the kidneys; may contain albumin.</td>
<td>Controls RBC production</td>
</tr>
<tr>
<td>RhoGAM</td>
<td>Medicine containing antibodies</td>
<td>Removes fetal cells that entered maternal circulation to prevent sensitization</td>
</tr>
<tr>
<td>Human Immunoglobulin</td>
<td>Human protein antibodies</td>
<td>Immune antibodies to protect from infection</td>
</tr>
<tr>
<td>Cryoprecipitate</td>
<td>Fibrinogen, Factors VIII, VWF, Factor XII, Fibronectin</td>
<td>Increases fibrinogen</td>
</tr>
<tr>
<td>Humate-P (VWF/F VIII)</td>
<td>Protein factors; VWF, Factor VIII — human derived</td>
<td>May stop excessive bleeding, plays a role in clotting</td>
</tr>
<tr>
<td>Prothrombin Complex Concentrate</td>
<td>Blood clotting factors II, VII, IX, X, and protein C and S; human derived</td>
<td>Reverses anticoagulation therapy, accelerates coagulation</td>
</tr>
</tbody>
</table>

**No Blood Component**

<table>
<thead>
<tr>
<th>Category</th>
<th>Component</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy</td>
<td>Tranexamic Acid</td>
<td>Anti-fibrinolytic</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Amicar</td>
<td>Derivative amino acid lysine; anti-fibrinolytic</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Hetastarch</td>
<td>Non-ionic starch derivative; prevents shock</td>
</tr>
</tbody>
</table>

**Category IV**

<table>
<thead>
<tr>
<th>Anesthesiology</th>
<th>Component</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isovolemic Hemodilution</td>
<td>Autologous blood removed from patient</td>
<td>Limits the use of banked blood</td>
</tr>
<tr>
<td>Hypervolemic Hemodilution</td>
<td>Administering a large volume of fluid before surgery so that when you lose volume during surgery you lose fewer RBCs</td>
<td></td>
</tr>
<tr>
<td>Cell Saver — closed circuit</td>
<td>Autologous blood – Blood lost during procedure</td>
<td>Can return up to 250 mL IV in 3 minutes, devoid of plasma and platelets</td>
</tr>
</tbody>
</table>

**Safe Motherhood Initiative**

| Revised February 2019 | ACOG | Department of Health | nyspQC | New York State Department of Health | New York State | Prenatal Quality Collaborative | 335 | BACK TO START OF TOOLKIT | BACK TO START OF SECTION |
White Plains Hospital: Patients Who Decline Blood Products

Informed Consent White Plains Hospital (Refusal to Permit Blood Transfusion)
QBL Worksheets for OR

Montefiore Medical Center Quantification of Blood Loss Form

Operating Room CASES

Date: ____________________

[Affix patient label here]

QBL in the OR

Weight of all laps (wet), holders, and additional blood loss.

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Dry Weight</th>
<th>=</th>
<th>g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lap Pad</td>
<td>X 20g</td>
<td>=</td>
<td>g</td>
</tr>
<tr>
<td>Count Bag</td>
<td>X 25g</td>
<td>=</td>
<td>g</td>
</tr>
<tr>
<td>Blue Chux</td>
<td>X 25g</td>
<td>=</td>
<td>G</td>
</tr>
<tr>
<td>Emesis BedIII (when expressing)</td>
<td>X 15g</td>
<td>=</td>
<td>g</td>
</tr>
<tr>
<td>Large Chux</td>
<td>X 100g</td>
<td>=</td>
<td>g</td>
</tr>
<tr>
<td>Green Towel</td>
<td>X 65g</td>
<td>=</td>
<td>g</td>
</tr>
</tbody>
</table>

ADD ALL TOTAL pre-weight (dry)  D  g

A + B  g

MINUSC + O  g

TOTALQBL  mL

1 g = 1 mL
QBL Worksheets for VD

Montefiore Medical Center Quantification of Blood Loss Form
Vaginal Delivery/PPH

Date: ____________

(Affix patient label here)

QBL in Delivery/Postpartum Hemorrhage

Weight of all laps (wet, holders, and additional blood loss.

<table>
<thead>
<tr>
<th>Item</th>
<th>Dry Weight</th>
<th>Item Dry Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Gauze</td>
<td>X5 g</td>
<td></td>
</tr>
<tr>
<td>Blue Chux</td>
<td>X25 g</td>
<td></td>
</tr>
<tr>
<td>Large Chux</td>
<td>X100 g</td>
<td></td>
</tr>
<tr>
<td>Green Towel</td>
<td>X60 g</td>
<td></td>
</tr>
<tr>
<td>Maternity Pad</td>
<td>X39 g</td>
<td></td>
</tr>
</tbody>
</table>

ADD ALL TOTAL pre-weight (dry) C

A + B

MINUS C

TOTAL QBL

1/10 kr
Newark-Wayne Community Hospital: QBL Calculator Screenshot Abbv

This is the time it will fill under.

Enter number of each item being weighed (be sure you are entering under the correct item!)

This side has sponges listed as singles

This side has sponges listed as 5-packs

Enter total “other” weights to be subtracted (see pop-out above)

Enter total wet weight — total weight of all items being weighed

Final QBL — automatically calculated and filed

**If you need to change your original entry, you need to GO BACK TO THE TIME THE ORIGINAL ENTRY WAS FILED, otherwise it will create a new entry and add the new entry to the original, giving you an incorrect total blood loss.

Hover over the QBL Calculator tab in the Delivery Summary to see the original entry/file time.

Revised 01-2021
Newark-Wayne Community Hospital: QBL Calculator Screenshot Abbv

### QBL Dry Weights

- Don’t forget to use the QBL Calculator to calculate and document your delivery blood loss! (Instructions on reverse.)

<table>
<thead>
<tr>
<th># OF ITEMS</th>
<th>DRY WEIGHTS</th>
<th>DRY WEIGHT</th>
<th>WET WEIGHT - DRY WEIGHT</th>
<th>BLOOD LOSS</th>
<th>PACU/PP PAD WEIGHTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 DRY LAP SPONGES</td>
<td>200 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 EMPTY LAP SPONGE HOLDER</td>
<td>25 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 EMPTY LG SUCTION CANISTER</td>
<td>85 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 DRY STERILE BLUE TOWEL</td>
<td>80 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 LITER NORMAL SALINE</td>
<td>1000 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR TABLE BUNDLE</td>
<td>585 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 EMPTY LARGE RED TRASH BAG</td>
<td>50 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 DRY RAYTEC 4x4's</td>
<td>30 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 DRY BATH BLANKET</td>
<td>620 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 DRAW SHEET</td>
<td>285 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 REGULAR SHEET</td>
<td>400 G</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1 FITTED SHEET</td>
<td>650 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 REGULAR TOWEL</td>
<td>230 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 DRY VAGINAL SPONGES</td>
<td>70 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 EMPTY UNDER-BUTTOCKS DRAPE</td>
<td>125 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 DRY LARGE CHUX</td>
<td>90 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 DRY PERI-PAD</td>
<td>10 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 DRY SMALL CHUX</td>
<td>20 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 DRY TABLE COVER</td>
<td>135 G</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Does not include container
- Please note that linen sizes and weights can vary so these weights are averages; please use your clinical judgement when weighing linen items to quantify blood loss
- OR Table Bundle = 1 table cover, 1 draw sheet, and 2 large chux

1 GRAM (G) = 1 MILLILITER (mL)
OUR SCALES ROUND TO THE NEAREST 5 G (5 mL)
CALCULATE AND DOCUMENT IN mL/g NOT OZ

Revised 01-2021
St. Peter’s Health: QBL Worksheets

BBC QBL Worksheet (Not part of permanent record)

1 gram = 1 ml

1. Total canister/drape volume
   After delivery complete

2. Initial canister/drape volume
   Prior to placenta (amniotic/urine)

3. Subtract for initial total**

4. Weigh all blood-soaked items
   All chux, pads, OR sheet, laps
   *Don't weigh those soaked with irrigation*

5. Add up all dry weights

6. Subtract for additional blood volume

Total QBL:

\[
\text{Amt from 3} + \text{Amt from 6} = \text{Total QBL in mls}
\]

Cesarean Section Weights:
- Cesarean Counter = 20gm
- Raytec 4x4s (1)=20gm (5)=10gm (10)=20gm
- OR Laps (1)=20gm (5)=10gm (10)=20gm
- Blue Towel (1)=300gm (4)=1200gm
- Canister Weight = 356gm
- Disposable OR Sheet = 433gm
- Large White Mothers Bed Pad=115gm

Vaginal Delivery Counts:
- Vaginal Counter= 20gm
- Large White Mothers Bed Pad= 115 gm
- Large Peri Pad= 65gm
- Small Peri Pad= 10gm
- Ice Pack= 160gm
- Raytec 4x4s (1)=20gm (5)=10gm (10)=20gm
- Under buttocks dress= 170gm
- Delivery laps (1)=46gm (5)=310gm (10)=60gm
**BBC QBL Worksheet**

This is a supplement to your I&O, and blood loss should be recorded their first!

<table>
<thead>
<tr>
<th>Total weight of saturated items</th>
<th>Minus total weight of dry items</th>
<th>Episode total</th>
<th>Rolling QBL total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
# QBL Calculation Worksheet

## Phase 1: Post Delivery QBL Calculation

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Multiply (X)</th>
<th>Dry Weight</th>
<th>Equals (+)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pink Basin</td>
<td>1</td>
<td>X</td>
<td>120g</td>
<td>=</td>
<td>120g</td>
</tr>
<tr>
<td>Sterile Blue Towel</td>
<td>X</td>
<td></td>
<td>50g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Sterile Sponge (lap pads)</td>
<td>X</td>
<td></td>
<td>14g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Covidien &quot;MVP&quot; Pad</td>
<td>X</td>
<td></td>
<td>125g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Clear Kidney Basins</td>
<td>X</td>
<td></td>
<td>20g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Green Patient Gown</td>
<td>X</td>
<td></td>
<td>305g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Blue Patient Gown</td>
<td>X</td>
<td></td>
<td>270g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Large Blue Patient Gown</td>
<td>X</td>
<td></td>
<td>505g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Drape Sheet</td>
<td>X</td>
<td></td>
<td>275g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Pink Pad</td>
<td>X</td>
<td></td>
<td>385g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Sterile sponge holder</td>
<td>1</td>
<td>X</td>
<td>30g</td>
<td>=</td>
<td></td>
</tr>
</tbody>
</table>

Total amount of irrigation used:

Total fluid in Neptune Canister (after delivery of the baby):

**Dry Weight Total**

<table>
<thead>
<tr>
<th>Wet Weight Total (From Scale)</th>
<th>Subtract (-)</th>
<th>Dry Weight Total (From Above Calculation)</th>
<th>Equals (+)</th>
<th>Post Delivery QBL Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Phase 2: Recovery QBL Calculation

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Multiply (X)</th>
<th>Dry Weight</th>
<th>Equals (+)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pink Basin</td>
<td>1</td>
<td>X</td>
<td>120g</td>
<td>=</td>
<td>120g</td>
</tr>
<tr>
<td>Covidien &quot;MVP&quot; Pad</td>
<td>X</td>
<td></td>
<td>125g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Blue Chux Pad</td>
<td>X</td>
<td></td>
<td>20g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Small Peri Pad</td>
<td>X</td>
<td></td>
<td>15g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Large Peri Pad</td>
<td>X</td>
<td></td>
<td>45g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Mesh Underwear</td>
<td>X</td>
<td></td>
<td>20g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Green patient Gown</td>
<td>X</td>
<td></td>
<td>305g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Blue patient Gown</td>
<td>X</td>
<td></td>
<td>270g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Large Blue patient Gown</td>
<td>X</td>
<td></td>
<td>505g</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Diaper Ice Pack</td>
<td>X</td>
<td></td>
<td>=</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>Snaps &amp; Crack Ice Pack</td>
<td>X</td>
<td></td>
<td>=</td>
<td>=</td>
<td></td>
</tr>
</tbody>
</table>

**Dry Weight Total**

<table>
<thead>
<tr>
<th>Wet Weight Total (From Scale)</th>
<th>Subtract (-)</th>
<th>Dry Weight Total (From Above Calculation)</th>
<th>Equals (+)</th>
<th>Recovery QBL Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Final Phase: Total QBL Calculation

<table>
<thead>
<tr>
<th>Post Delivery QBL</th>
<th>Add (+)</th>
<th>Recovery QBL</th>
<th>QBL Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6
References
References

Journal Articles


References

Journal Articles

Kaimal, A., Norton, ME. Counseling women at increased risk of maternal morbidity and mortality. Society for Maternal-Fetal Medicine Consult Series #55.

Kilpatrick SJ. Next steps to reduce maternal morbidity and mortality in the USA. Women's Health 2015;11(2):193-199.


References

Journal Articles


Evidence-based Tools and Resources

ACOG District II Obstetric Hemorrhage Bundle
ACOG Practice Bulletins (ACOG membership log-in needed)
AWHONN: Postpartum Hemorrhage Project
AWHONN: Quantification of Blood Loss Video
Council on Patient Safety in Women’s Health Care: OB Hemorrhage Bundle
CMQCC Obstetric Hemorrhage Toolkit
CMQCC Obstetric Hemorrhage Toolkit – Version 2 – Updated 2015

Quality Improvement

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Web Links
Web Links

New York State Perinatal Quality Collaborative (NYSPQC)
www.nyspqc.org

New York State Department of Health (NYSDOH) Health Commerce System (HCS)
https://commerce.health.state.ny.us/public/hcs_login.html

American College of Obstetricians and Gynecologists (ACOG)
www.acog.org

ACOG Safe Motherhood Initiative Toolkit
Obstetric Hemorrhage ACOG

Centers for Disease Control and Prevention Perinatal Quality Collaborative Resources
http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/PQC.htm

Healthcare Association of New York State (HANYS)
https://www.hanys.org/

Greater New York Hospital Association (GNYHA)
https://www.gnyha.org/

Institute for Healthcare Improvement
www.ihi.org

National Institute for Children’s Healthcare Quality (NICHQ)
www.nichq.org
End of Toolkit

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Website: www.nyspqc.org