New York State Department of Health (NYSDOH)

New York State Obstetric Hemorrhage Project

Release Date: September 2022

NEW YORK STATE | Department of Health

New York State nyspQc Perinatal Quality Collaborative

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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:

Readiness to respond to an obstetric hemorrhage by implementing standardized policies and procedures and developing rapid response teams.	**Recognition** of obstetric hemorrhage by performing ongoing quantification of actual blood loss and triggers of maternal deterioration during and after all births.
Response to hemorrhage by performing regular on-site, multidisciplinary hemorrhage drills.	**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
Bellevue Hospital Center
BronxCare Hospital Center
Canton-Potsdam Hospital
Chenango Memorial Hospital Inc
Coney Island Hospital
Crouse Health
Ellis Hospital - Bellevue Woman's Care Center Division
Elmhurst Hospital Center
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
Kings County Hospital Center
Lenox Hill Hospital
Lincoln Medical and Mental Health Center
Long Island Jewish Forest Hills
Maimonides Medical Center
Mercy Hospital
Metropolitan Hospital Center
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
Nicholas H Noyes Memorial Hospital
North Central Bronx Hospital
North Shore University Hospital

Acknowledgments

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.

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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

"A Driver Diagram serves as tool for building and testing theories for improvement." (Provost L, Bennett B. What's your theory? Driver diagram serves as tool for building and testing theories for improvement. Quality Progress. 2015 Jul:36-43).

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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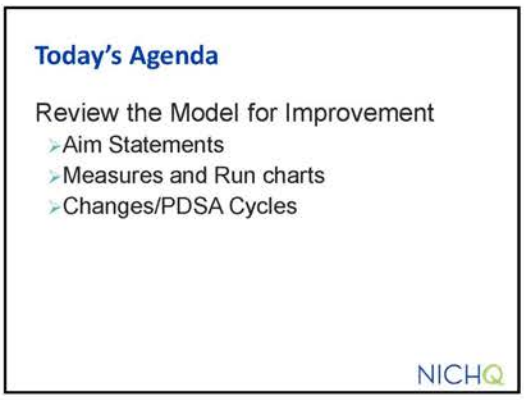
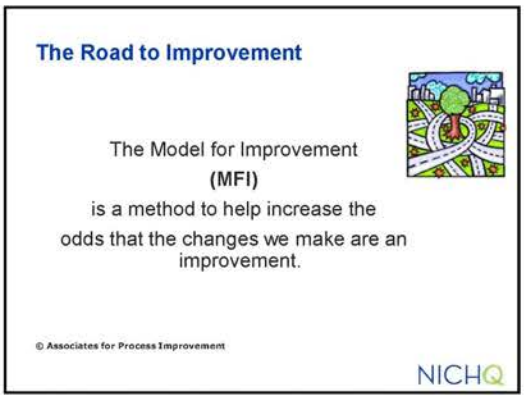
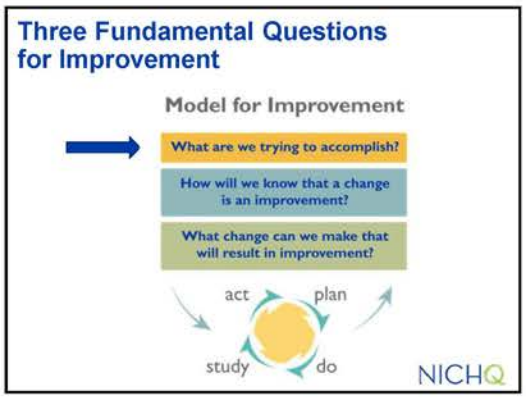
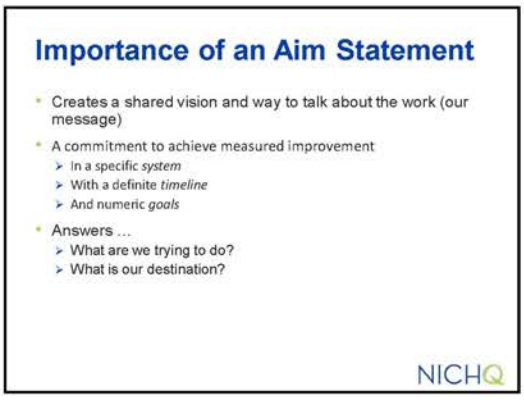
Presenter: Patricia Heinrich, RN, MSN









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Importance of Aim Statement

- Provides a basis for developing the rest of the project (measures and changes)
- Predictor of team success

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Creating an Aim Statement

- What? • What do you want to happen?
- For Whom? • Target population
- By When? • Deadline for when the aim will be achieved
- How Much? • Measurable concrete goals

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A SMART AIM

- **S** – Specific
- **M** – Measureable
- **A** – Actionable, Achievable
- **R** – Realistic
- **T** – Time bound

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Examples of Unclear Definitions

- Timely completion of the activities
- A complete list
- Attendance rate
- Negative outcome
- Improved communication
- Increased awareness

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Examples of Unclear Definitions

- Timely completion of the activities
- "Soon" is *not* a time
- Improved communication
- Increased awareness

NICHQ

Examples of Unclear Definitions

- Timely completion of the activities
- "Soon" is *not* a time
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"Hope" is *not* a plan

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Examples of Unclear Definitions

- Timely completion of the activities
- "Soon" is *not* a time
- "Hope" is *not* a plan
- Improved communication
- Increased awareness
- "Some" is *not* a number

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Example: PPH Aim Statement

- **By June 2017, hospitals in the Obstetric Hemorrhage Project aim to reduce obstetric-related severe morbidity and/or admission to ICU, by 10%.**
- **We will do this by:**
  - implementing evidence based strategies to identify earlier women at risk for, and/or experiencing hemorrhage,
  - improving management and response to hemorrhage events, and
  - improved review and documentation of all cases.

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Example: PPH Aim Statement

- By June 2017, **hospitals in the Obstetric Hemorrhage Project aims to reduce obstetric-related severe morbidity and/or admission to ICU, by 10%.**
- **We will do this by:**
  - implementing evidence based strategies to identify earlier women at risk for, and/or experiencing hemorrhage,
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  - improved review and documentation of all cases.

What?
For whom?
By when?
How much?

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Actionable Aim Statement Checklist

- ✓ **SMART** – Is the AIM statement specific, measureable, actionable, achievable, realistic and time bound?
- ✓ **Control:** Who controls the process to be changed?
- ✓ **Resources:** Are there sufficient resources to achieve the aim?
- ✓ **Team:** Who else needs to be involved for success?

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Three Fundamental Questions for Improvement

Model for Improvement

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

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How will we know a change is an improvement?

- "All improvement requires change, but not all change is an improvement"
- Improvement efforts are about making changes to the system.
- It is not about measurement. However…

"Of all changes I've observed, about 5% were improvements, the rest, at best, were illusions of progress." - W. Edwards Deming

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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

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Measurement for Improvement

- A few key measures that clarify a team's aim and make it tangible should be reported each month
  - Six to eight measures ideal, maximum of ten
- Usefulness not perfection
- Make sure the data can be easily collected
  - Integrate measurement into the daily routine.
  - Make use of available data systems for measurement
- More frequent data the better
- Well defined
- Useful variation to guide improvement and test changes

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Measurement in Three Worlds

Aspect	Accountability	Research	Improvement
Purpose	**Compare, reassure, evaluate**	**Discover new knowledge**	**To bring new knowledge into daily practice.**
Bias	Adjust data to reduce bias	Design to eliminate	Accept stable bias
Data/sample Size	**N/A. Report 100%**	**As much as possible just in case**	**Just enough data, small sequential samples**
How to determine improvement	No focus on change	Hypothesis, Statistical tests: F-test, t-test, chi square, p value	Run or Shewhart charts
Testing Strategy	**No tests**	**1 large blind test. Can take long periods of time to obtain results**	**Small sequential observable tests that accelerate the rate of improvement**

Source: The Data Guide: Learning from Data to Improve Healthcare. Developed from: Solberg, Leif I., Mosser, Gordon and McDonald, Susan. "The Three Faces of Performance Measurement: Improvement, Accountability and Research." Journal on Quality Improvement. March 1997. Vol 23. No. 3

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

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Measurement Checklist

- Do you have an outcome measure(s) that ties directly to your aim statement?
- Do you have a process measure(s) that reflects the progress with the key changes you must make to achieve the aim?
- Is it easy and practical to collect these measures?
- Do they help you understand how you are doing (the base of improvement)?
  - Can you graph it as a line chart or run chart over time?
  - Can you annotate the chart with key changes you made?

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Methods of Measurement

- Clinical measures of patients' health
- Documentation of behaviors
- Questionnaires
- Assessments
- Summary of databases
- Chart audits
- Observations

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Integrate Data Collection for Measures in Daily Work

- Include the collection of data with another current work activity (for example, peak flow with other vital signs; data from office visit flowsheets)
- Develop an easy-to-use data collection form or make Information Systems/registry input and output easy for clinicians
- Clearly define roles and responsibilities for on going data collection
- Set aside time to review data with those who collect it

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Area of Frequent Confusion:
Global Collaborative Measures vs. PDSA Cycle Measures

Achieving Aim → **Global (Core) Project Measures**:
Overall **results** related to the project aim (core measures and teams' additional and balancing measures)

Adapting Changes During PDSA Cycles → **PDSA Measures**
-PDSA-specific measures:
- Quantitative data on the impact of a particular change
- Qualitative data to help refine the change

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Collecting Data on the Measures

- Gather historical data on the measures related to the aim (outcome and process) and balancing measures if available
- Collect data on measures related to the aim for the length of the Collaborative
- For PDSA cycle measures, collect data during the time period you are testing or adapting a change to your system (during cycles)

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How Can Data Be Displayed

- Bar Chart
- Histogram
- Line Chart
- Pie Chart
- Run Chart
- Control Chart

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Plotting Data in Time Order

- Summary statistics hide information (patterns, outliers)
- In improvement efforts, changes are not fixed, but are adapted over time
- Time series graphs annotated with changes and other events provide evidence of sustained improvement

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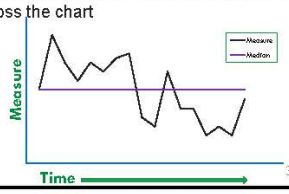
Run Chart Basics

- **X AXIS** – Generally Time (day, week, month, etc.)
- **Y AXIS** – Your measure (% of patients with care plan, average time from triage to administration of pain medication)
- **MEDIAN** – Run charts have a median line drawn straight across the chart



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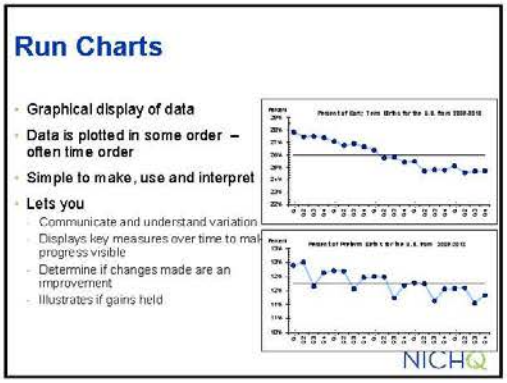

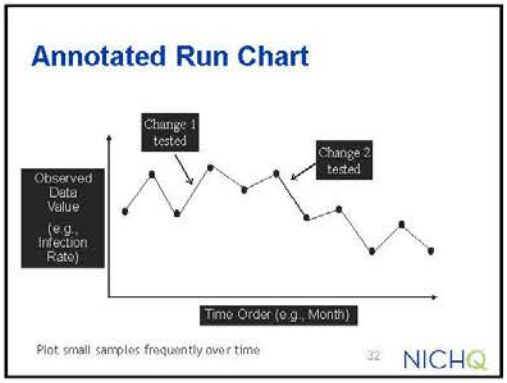

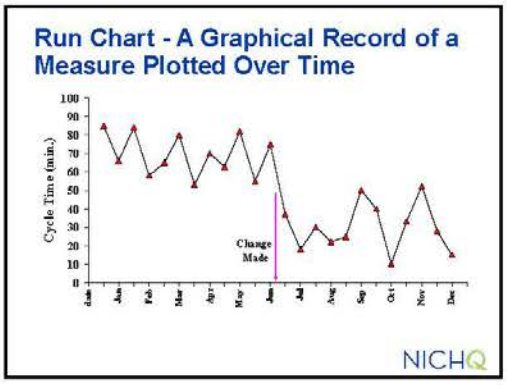

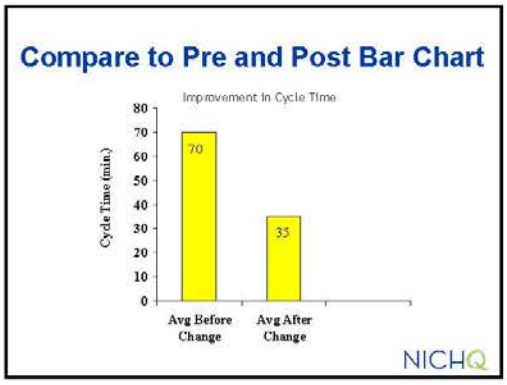

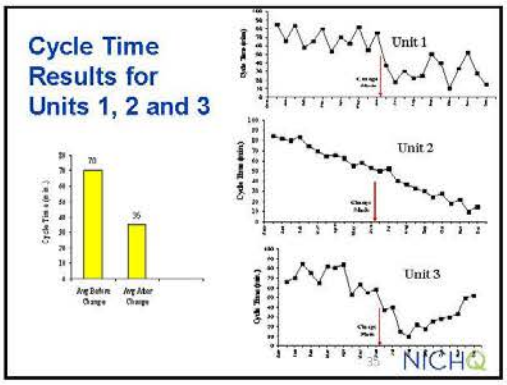

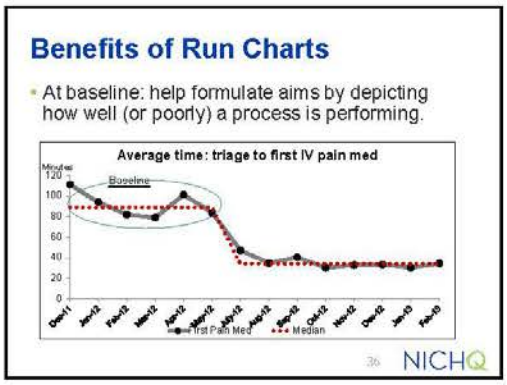

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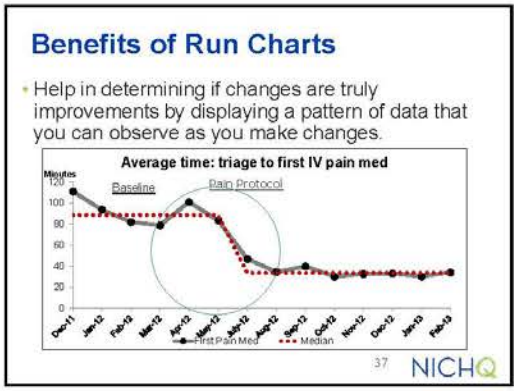

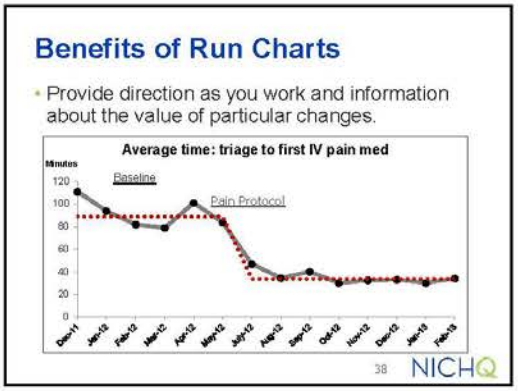

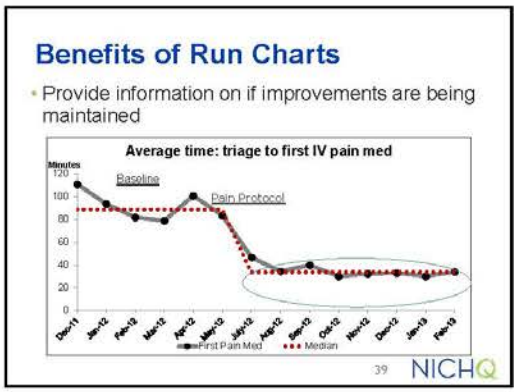

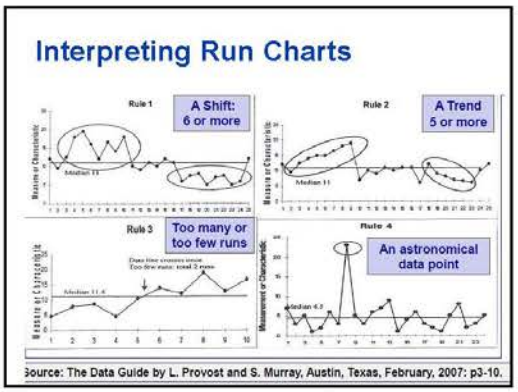

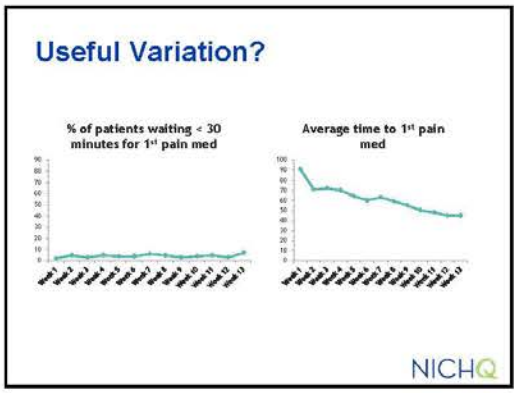

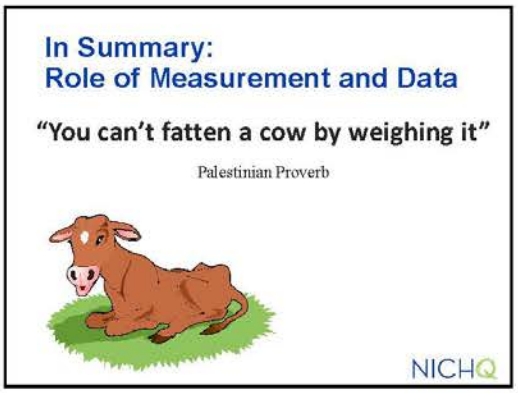

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Three Fundamental Questions for Improvement

Model for Improvement

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in improvement?

act → plan → do → study

NICHQ

Ideas for Change

Predictable Responses

- More of the same
- Make the change perfect

Improvement Science Response

- Learn how the system works
- Learn how the processes function that make up the system
- Use evidence based change or good ideas known to work elsewhere
- Use creativity to generate ideas for change

NICHQ

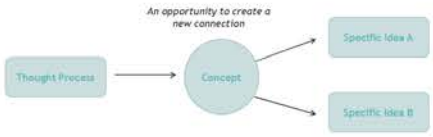
Developing Changes

- Don't re-invent the wheel!
  - "Steal shamelessly" from other teams!
- Experience and creativity
  - Include people that will be involved in testing the change or will be impacted by the change
- Understand the system

NICHQ

Change Concept and Specific Changes

- A general notion or approach to change that has been found to be useful in developing specific ideas for changes that lead to improvement.



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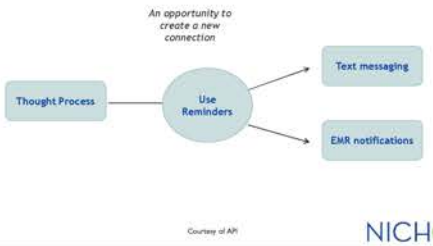
Change Concept and Specific Changes



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Questions?

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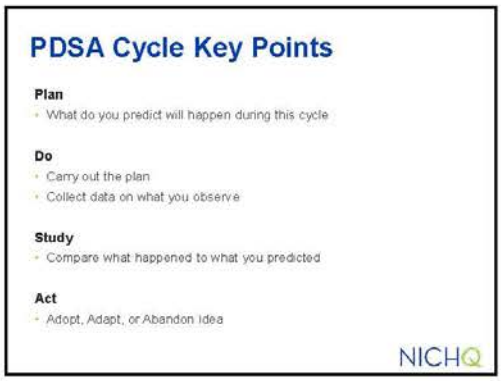

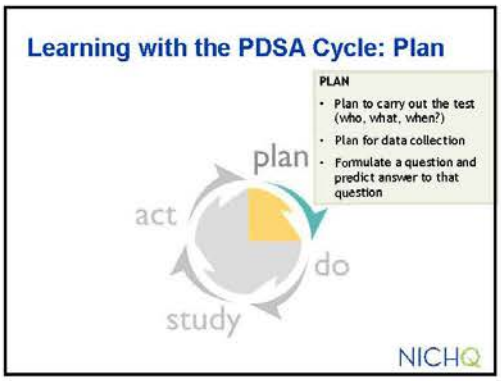

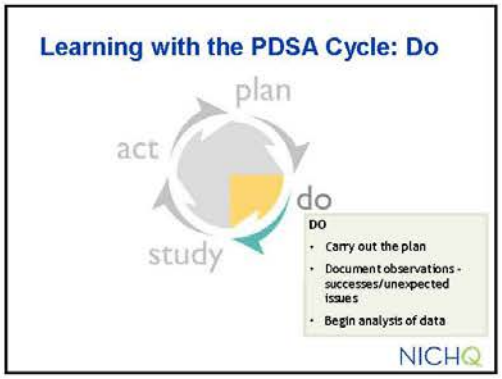

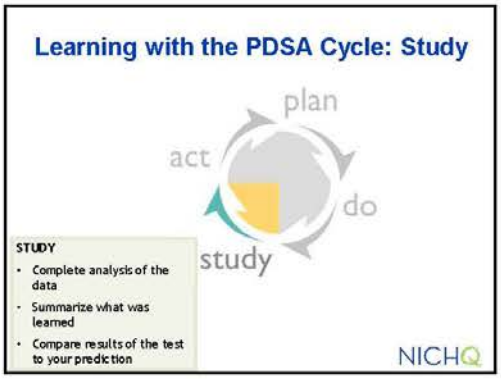

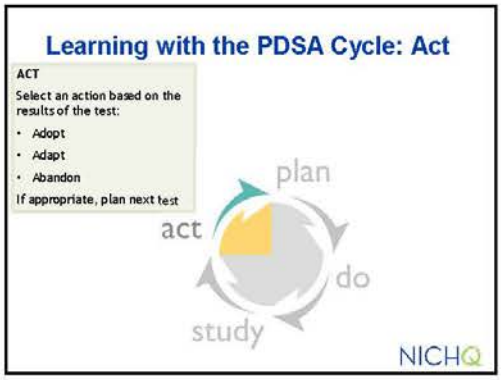

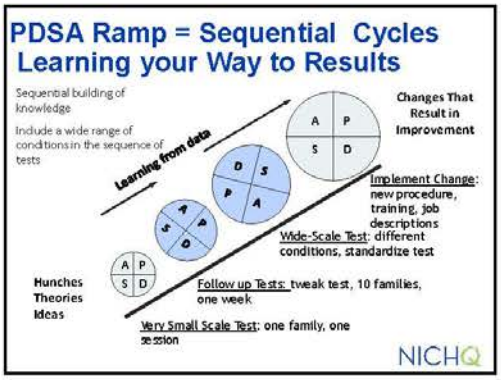

Quality Improvement Training for New York State Obstetric Hemorrhage Project

Presenter: Patricia Heinrich, RN, MSN

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

NICHQ

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**

NICHQ

Hip, Hip, Hooray!!

Graduated to Safe Sleep Today!

York Hospital
NICU

Date

Awesome job!!

NICHQ

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*

NICHQ

PLAN: For the next five NICU infants that move from prone to supine sleep position the nurse will complete a graduation certificate
Prediction: Families of all 5 infants will receive education on safe sleep and 4 out of 5 will report that they intend to practice safe sleep
Data Collection: # of families receiving education, number of families reporting a 7 or higher that they intend to practice safe sleep (plan operational aspects)

NICHQ

DO: Nurse completes graduation certificate for 5 infants and leaves certificate in infant bassinet.
2 families ask about the certificate and the nurse explains the certificate and provides education on safe sleep. Both families ask several questions and the education takes longer than the nurse anticipated.

The 2 families that receive education report an 8 for intending to practice safe sleep

NICHQ

Quality Improvement Training for New York State Obstetric Hemorrhage Project

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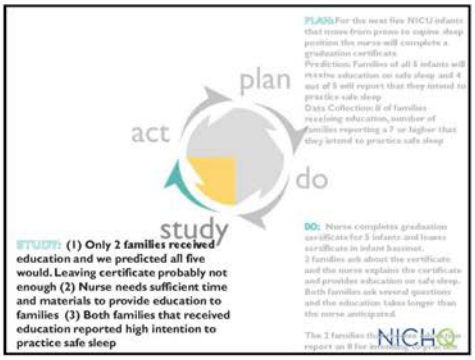

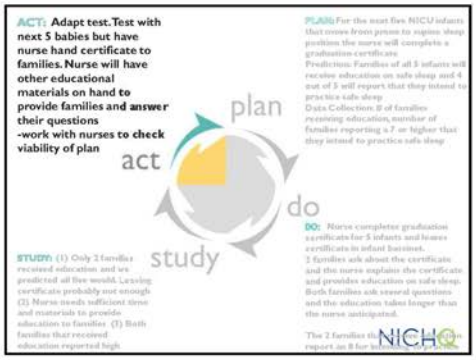

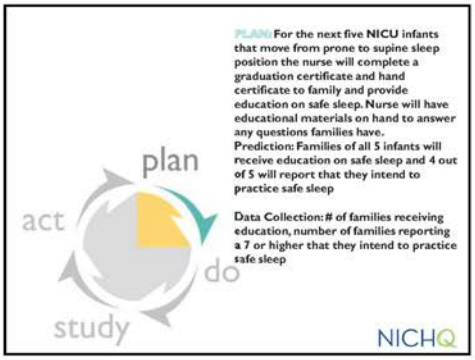

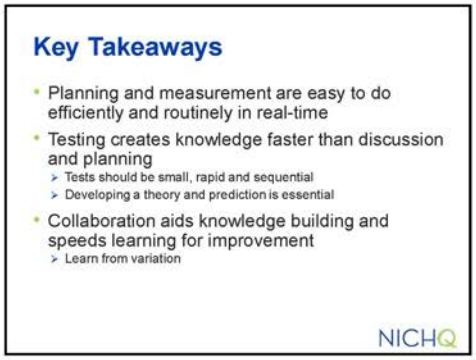

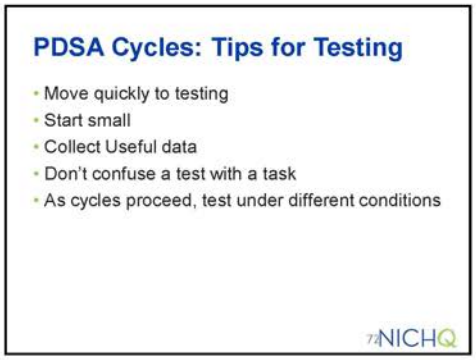

Quality Improvement Training for New York State Obstetric Hemorrhage Project

Presenter: Patricia Heinrich, RN, MSN

Tip: Start Small

Scale down size of test (# of patients, location, time)

- Do initial PDSAs on smallest scale possible (n=1)
  - The next birth
  - One staff member
  - One mom
- Start with volunteers
- "Failed" cycles are good learning opportunities, particularly when small

The Scale of the Next PDSA Cycle

Staff/Clinician, Agency, Constituents, Stakeholders Readiness to Change or Current Commitment

Current Situation		Resistant	Indifferent	Ready
Low degree of belief that current change idea will lead to improvement	Cost of failure large	Very Small Scale Test	Very Small Scale Test	Very Small Scale Test
	Cost of failure small	Very Small Scale Test	Very Small Scale Test	Small Scale Test
High degree of belief that current change idea will lead to improvement	Cost of failure large	Very Small Scale Test	Small Scale Test	Large Scale Test
	Cost of failure small	Small Scale Test	Large Scale Test	Implement

Courtesy of API

NICHQ

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

NICHQ

PDSA vs Project Measures

Project Measures	VS	PDSA Measures
Used to answer the question: Are we meeting our Aim?		Used to answer the question: Did this one PDSA (small test) work?
Gathered at monthly or weekly frequency		Gathered in moment or day
Live together in a set of measures: Process, Outcomes, Balancing		Use one or two measures, just to evaluate that PDSA
Measured for a period of several weeks or months, for life of project and after		Measured for only as long as it informs this and other similar tests

NICHQ

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 resource/education program
  - Writing a policy

NICHQ

Tip: Test under as many conditions as possible

- Think about factors that could lead to breakdowns, supports needed, "naysayers"
  - Day shift/night shift
  - Urban/rural
  - Cultural differences
  - Weekdays/weekends
  - Regular staffing/short staffed
  - Experienced/inexperienced staff
  - English speaking family/non English speaking
  - High health literate family/pre-literate family

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Quality Improvement Training for New York State Obstetric Hemorrhage Project

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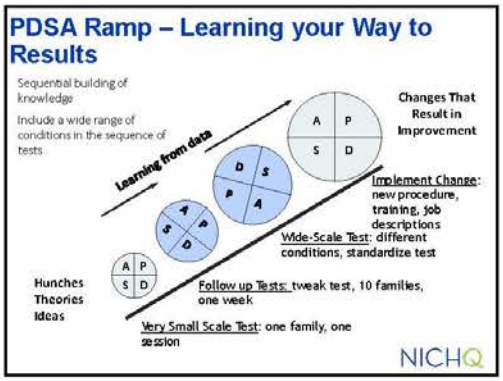

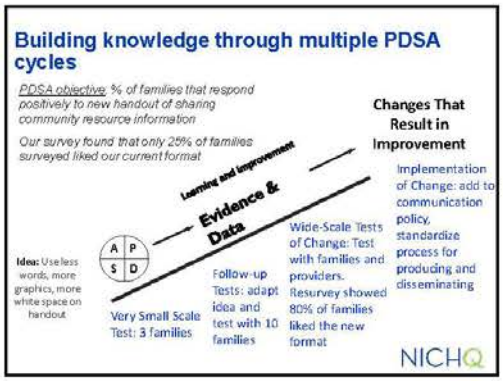

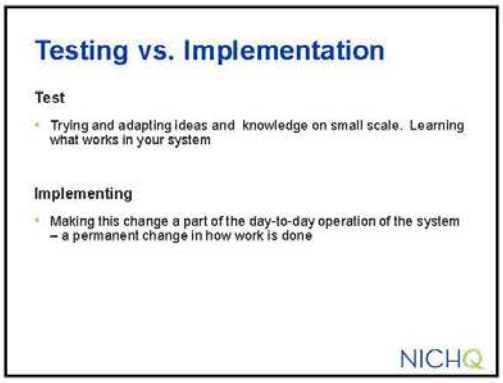

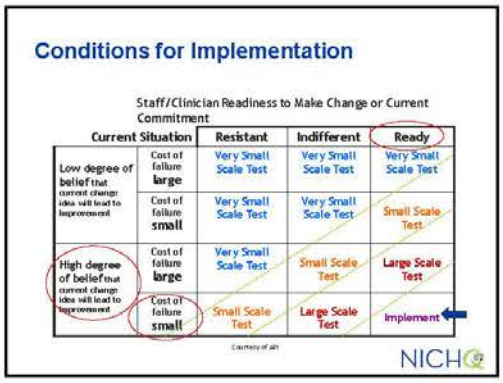

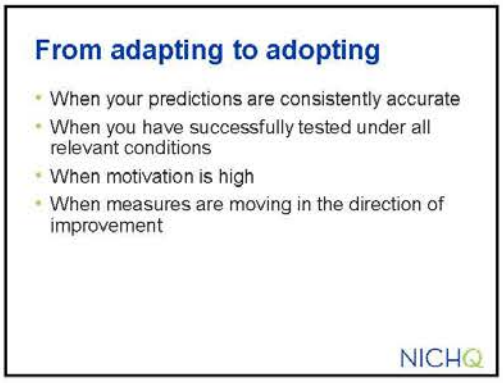

Quality Improvement Training for New York State Obstetric Hemorrhage Project

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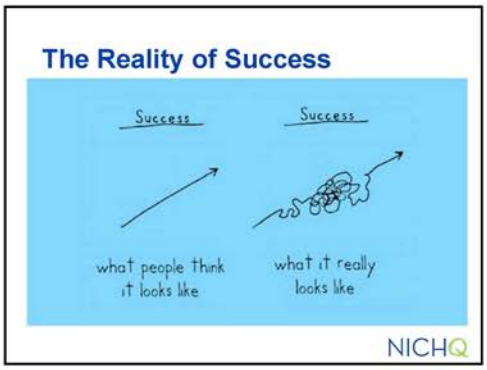
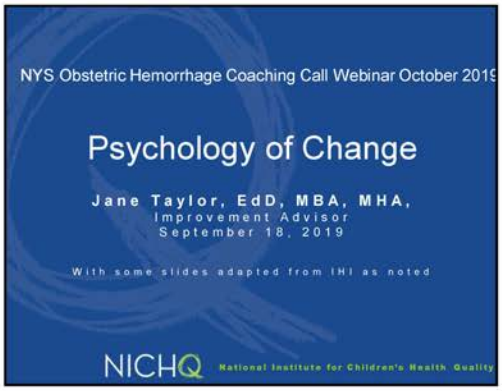
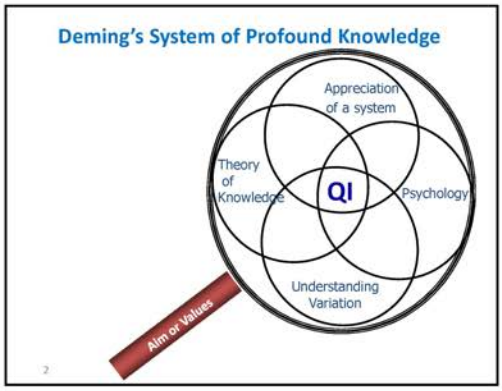
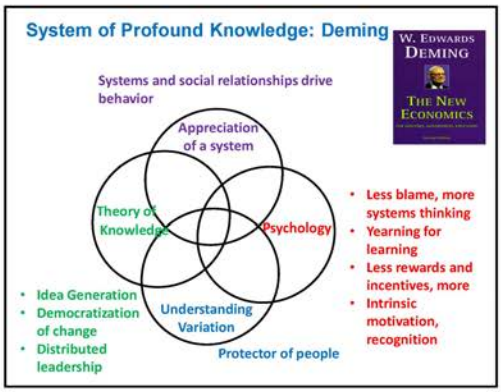


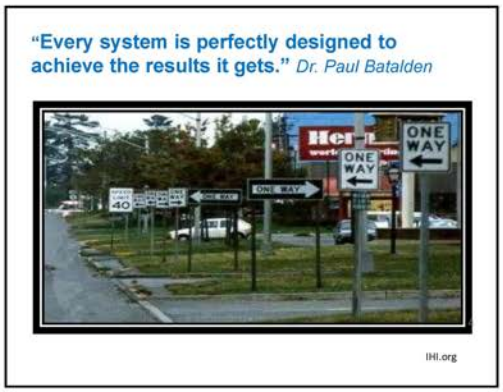
Psychology of Change

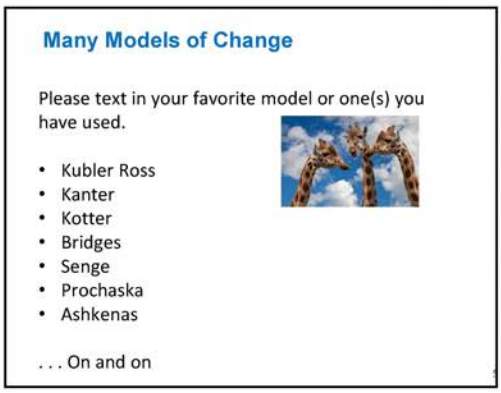
Presenter: Jane Taylor, EdD, MBA, MHA

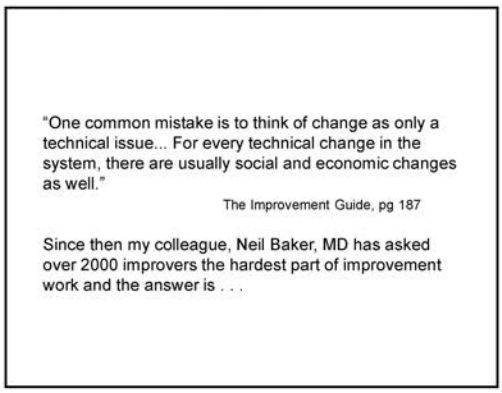












Psychology of Change

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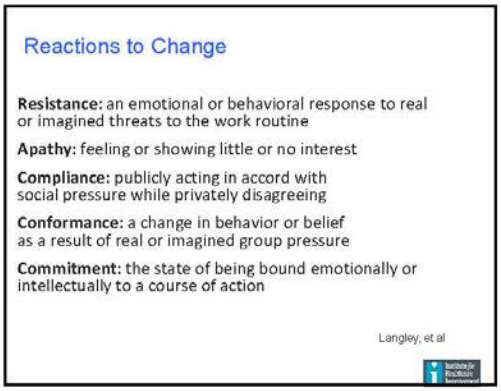
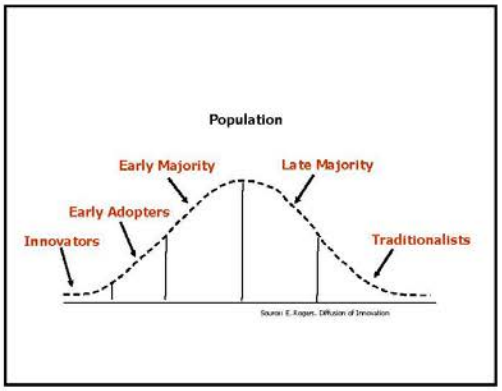
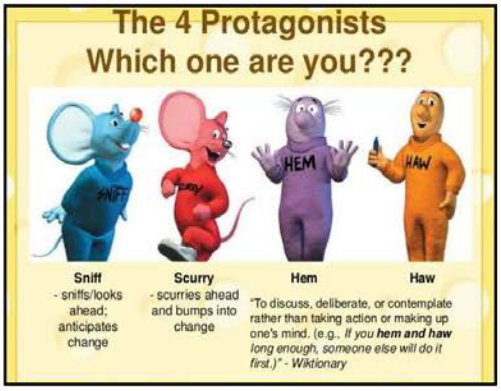
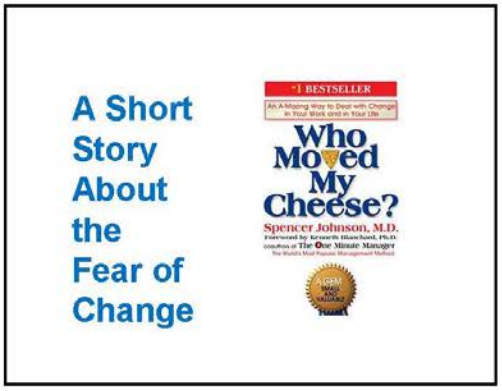
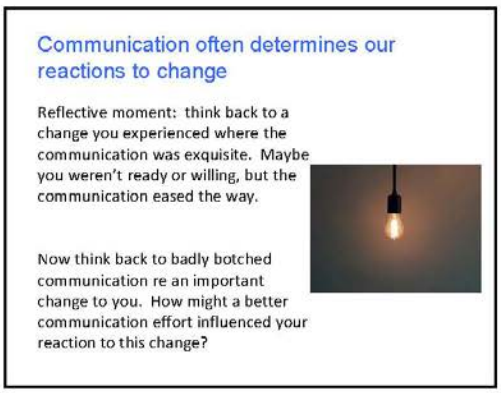
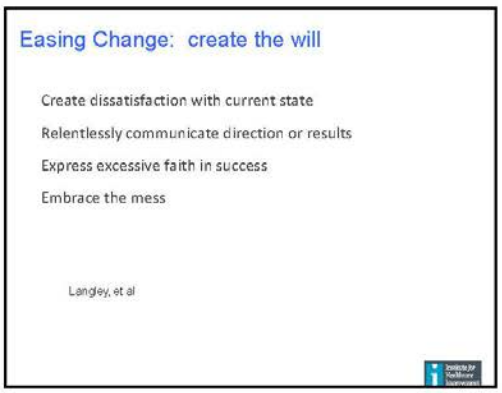












Psychology of Change

Presenter: Jane Taylor, EdD, MBA, MHA

Provide information on why

Empathize but don't expect to eliminate it
Show how change supports aim of organization
Put change in historical perspective
Link to needs of patient, family and community
Reframe as opportunity
Provide hot line for questions/comments

Langley, et al

Provide Specifics and Publicize the Change

How will the change effect people?
- Share results from testing and early implementation
- Be prepared for questions
- Study rational objections and be prepared to address them
- Include members of team who tested in presentations

Publicize the change
- Use symbolism, stores, pictures, etc.
- Summarize key points and agreements as made
- Show appreciation for those developing and testing change
- Take advantage of significant events (crisis, inspection, complaint) and tie to implementation

Langley, et al

Get Consensus on Resources and Other Supports

Agree ahead of implementation on what resources and support is required – get formal sign off
Define a plan with milestones/dates
Ask leaders and key people to publicly support
Express confidence in those asked to carry out the change

Langley, et al

Gaining Commitment

For one of your own projects, identify one or more changes you plan to implement or are currently testing:

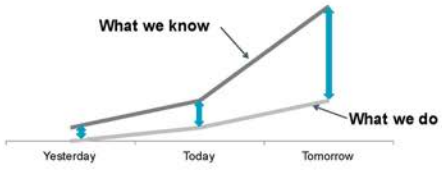
- What can your team do to create an atmosphere of commitment to the change?
- Who (name up to 3 people) would it be very important to recruit when trying to make this change the norm?
- How can data be used regularly with staff at the frontline to encourage ongoing commitment?

The following slides are from the Institute for Healthcare Improvement (IHI)

Fall 2018

IHI Psychology of Change Framework to Advance and Sustain Improvement

The "Know-Do" Gap



Psychology of Change

Presenter: Jane Taylor, EdD, MBA, MHA

What Holds Us Back?

- The rate at which improvements spread relies at least in part on people.
- People's resistance to change comes from fear.
  - Fear of failure, of losing control, of moving from habit to uncertainty

Psychology of Change

The science and art of human behavior as it relates to transformation

- Focuses on the people directly and indirectly affected by improvement
- Recognizes the inherent value in each person, regardless of identity or position
- Aims to activate people's agency in the face of fear

Source: Hilton K, Anderson A. *IHI Psychology of Change Framework to Advance and Sustain Improvement*. Boston, MA: Institute for Healthcare Improvement; 2018. ihi.org/psychology

Psychology of Change

AGENCY

The ability of an individual or group to choose to act with purpose

POWER

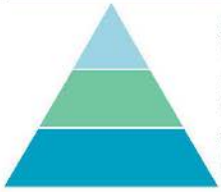
+

The ***ability*** to act with purpose

The emotional resources to ***choose*** to act

Source: Hilton K, Anderson A. *IHI Psychology of Change Framework to Advance and Sustain Improvement*. Boston, MA: Institute for Healthcare Improvement; 2018. ihi.org/psychology

Three Levels of Agency



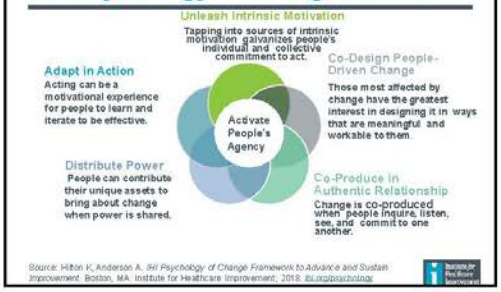
Self:
An individual's agency to make his or her own choices

Interpersonal:
The collective agency of people acting together

System:
The structures, processes, and conditions that support the exercise of agency within and across institutions and organizations

Source: Hilton K, Anderson A. *IHI Psychology of Change Framework to Advance and Sustain Improvement*. Boston, MA: Institute for Healthcare Improvement; 2018. ihi.org/psychology

IHI Psychology of Change Framework



Source: Hilton K, Anderson A. *IHI Psychology of Change Framework to Advance and Sustain Improvement*. Boston, MA: Institute for Healthcare Improvement; 2018. ihi.org/psychology

Unleash Intrinsic Motivation

Tapping into sources of intrinsic motivation galvanizes people's individual and collective commitment to act.

Recommended Practices

1. Public Narrative
2. Motivational Task Design
3. Play and Celebrate

Source: Hilton K, Anderson A. *IHI Psychology of Change Framework to Advance and Sustain Improvement*. Boston, MA: Institute for Healthcare Improvement; 2018. ihi.org/psychology

Psychology of Change

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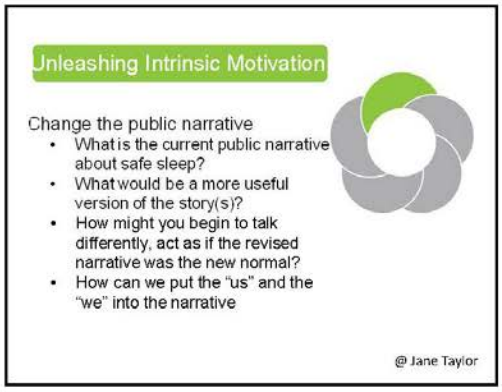
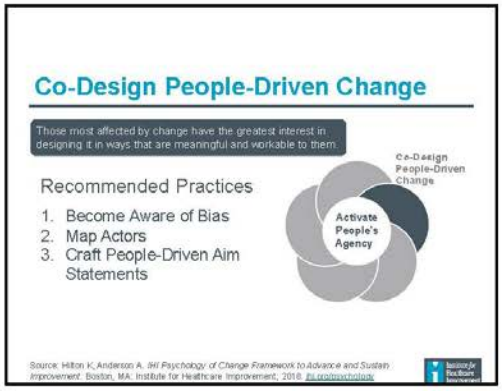
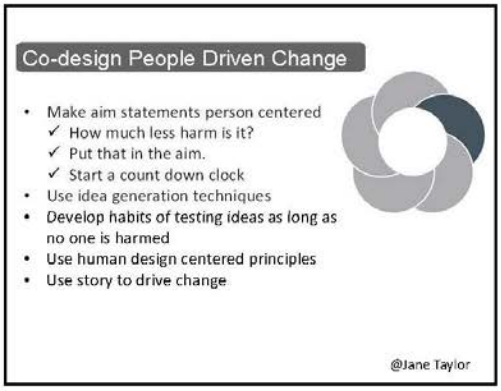
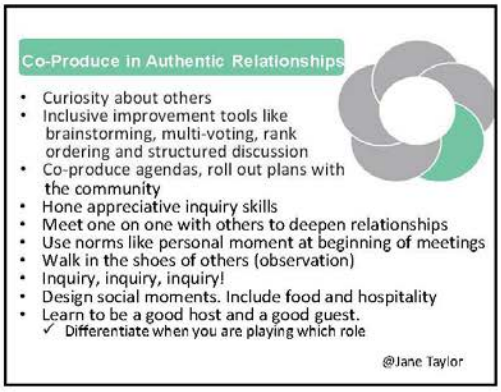


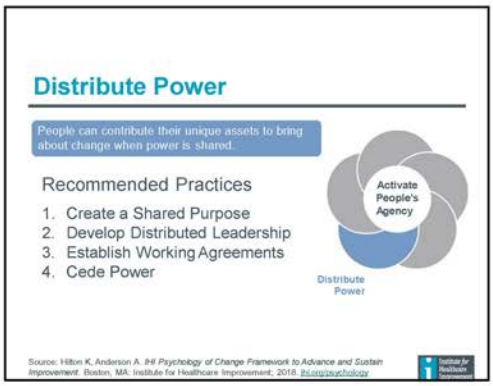


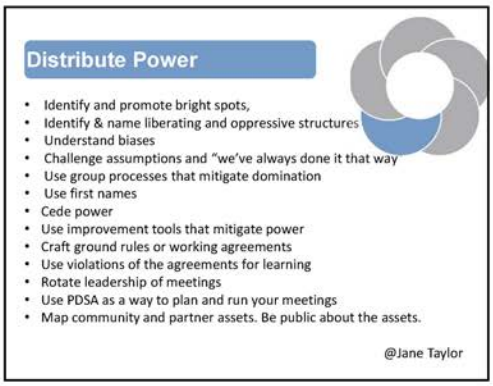


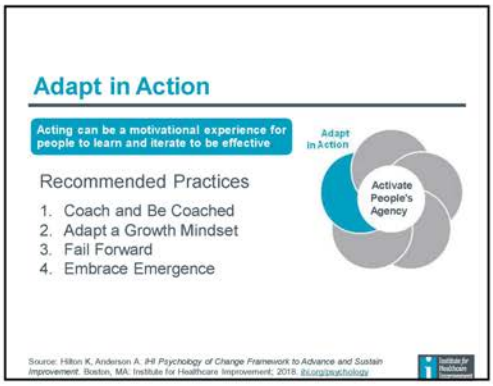


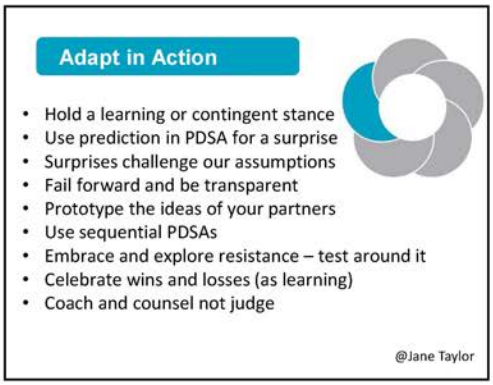
Psychology of Change

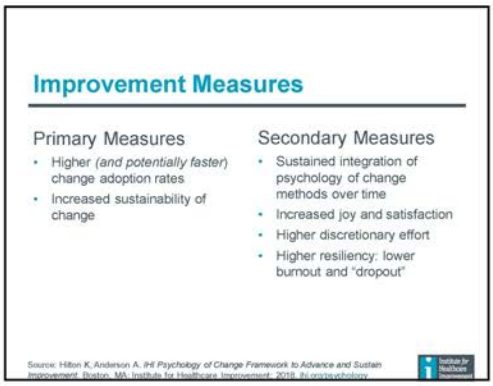
Presenter: Jane Taylor, EdD, MBA, MHA

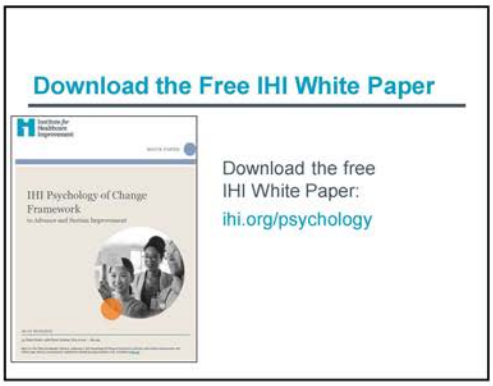






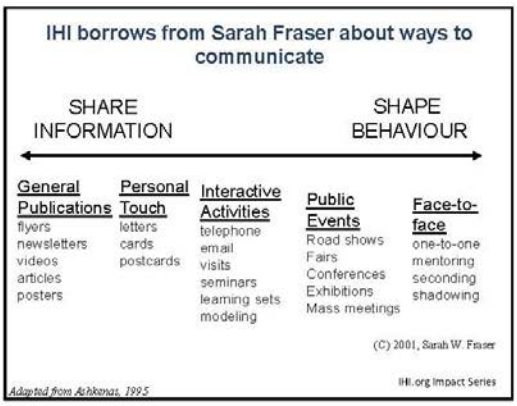






Psychology of Change

Presenter: Jane Taylor, EdD, MBA, MHA



SMARTIE AIM Statement Worksheet

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 measureable? 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?

     _____

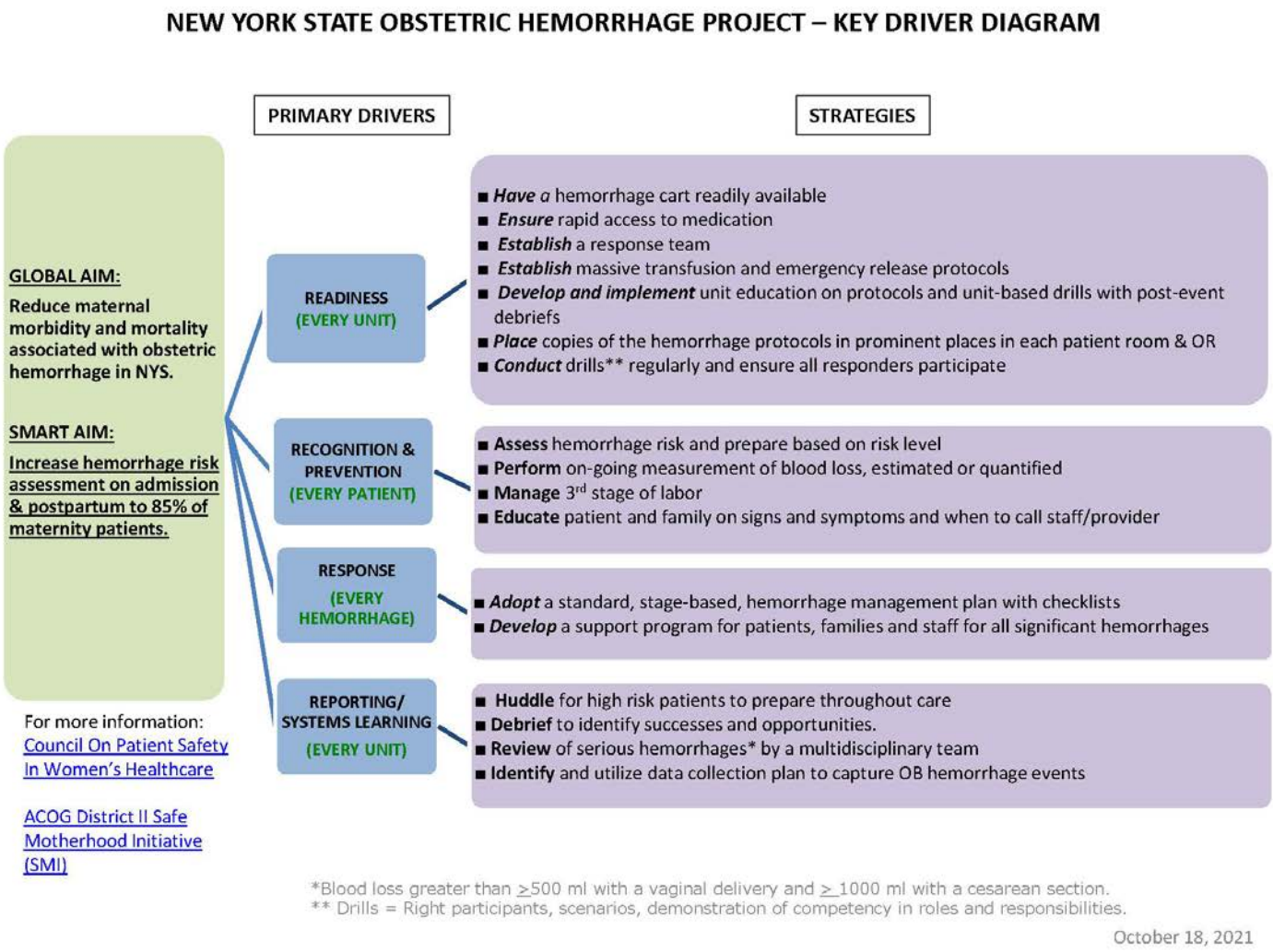
   - **EQUITABLE** – How will you reduce disparities and assure all patients receive equitable care (**care** that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status)?

     _____

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

NEW YORK STATE | Department of Health

New York State Obstetric Hemorrhage Project – Key Driver Diagram



PDSA Tutorial

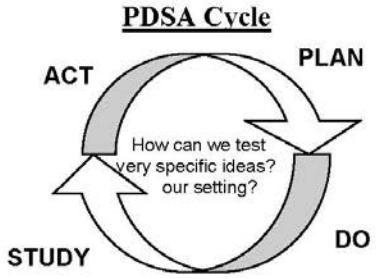
PDSA Tutorial

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?

1

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.

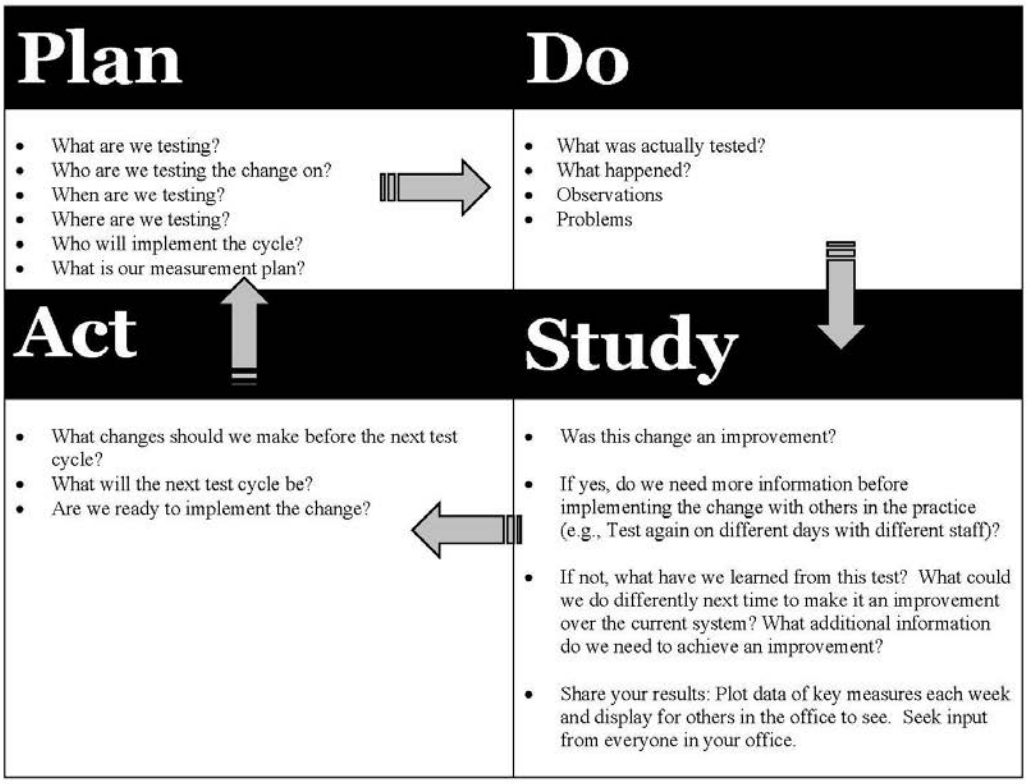
PDSA Tutorial

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 patents for an early elective delivery.

PDSA Cycle



3

PDSA Cycle Worksheet

PDSA Cycle Worksheet

Team:	Date of Test:	Date of Completion:
Overall Project Aim:		
What is the objective of the test?		

PLAN:

Brief description of the test:

How will you know that the change is an improvement?

What driver does the change impact?

What do you predict will happen?

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

Plan for collecting data:

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:

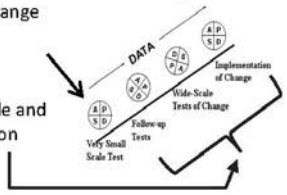
ACT:

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.

☐ Adopt: 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:

PDSA Cycle Feedback Sheet

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):

PDSA #: **Date:** **Reviewer:**

PLAN: **Review Question:**	**Was it Addressed?** (√ if yes)	**Comments/Notes:**
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?		
Suggestions to improve the DO phase of the PDSA.		
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)?		

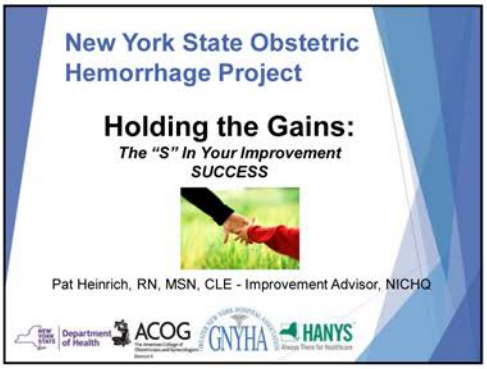
Additional Comments: Please update on your PDSA progress and return completed form. Note - you are using a different reporting tool (PDSA FORM) which is fine but please add the date at the top.

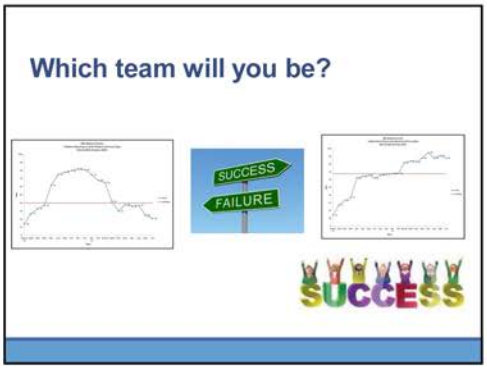
For more information about the Model for Improvement and PDSAs go to:

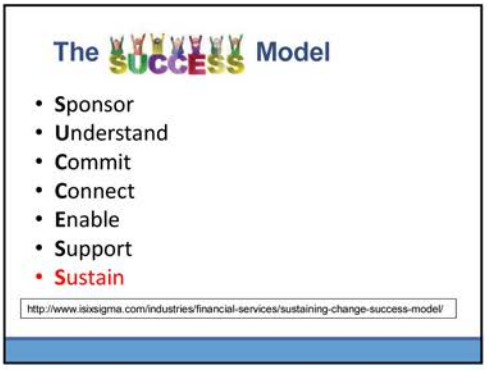
1. NYSPQC PDSA Tutorial
2. E- module QI 101 (review of the Model for Improvement)
3. E- module QI 102 (focus on PDSA)

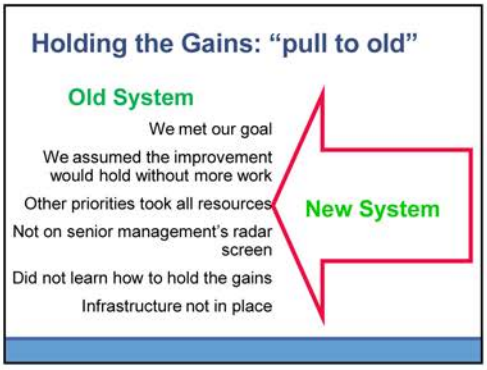
Quality Improvement Framework: Holding the Gains

Presenter: Patricia Heinrich, RN, MSN



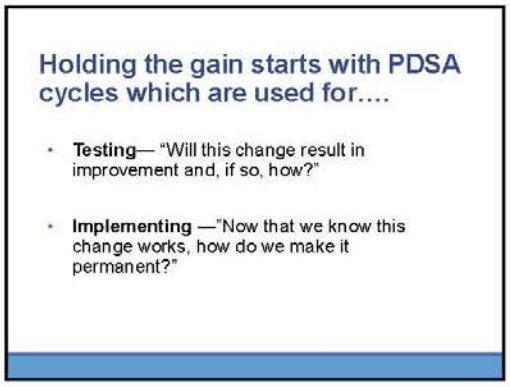


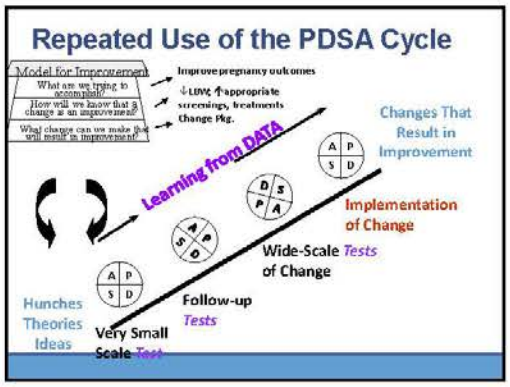


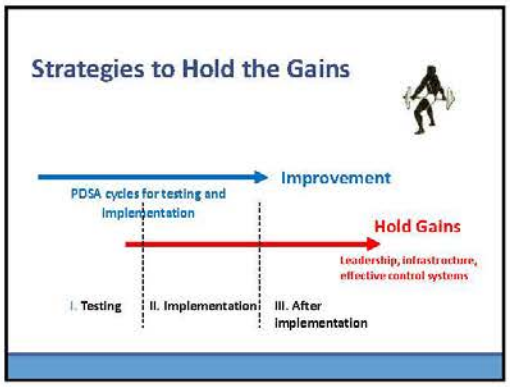


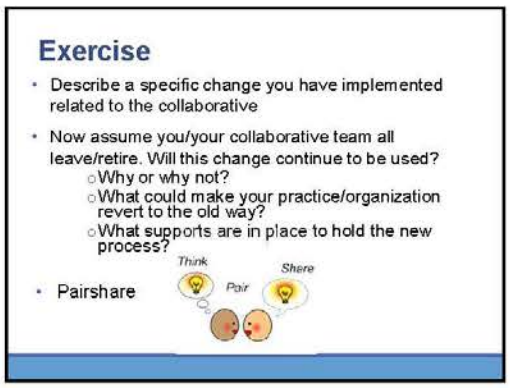
Quality Improvement Framework: Holding the Gains

Presenter: Patricia Heinrich, RN, MSN









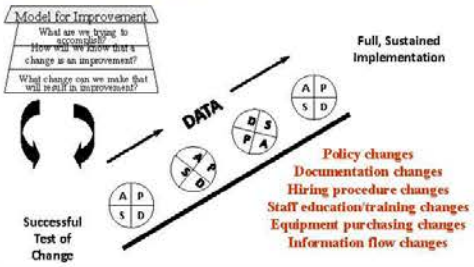
Quality Improvement Framework: Holding the Gains

Presenter: Patricia Heinrich, RN, MSN

1. Leadership

- Define plan with milestones/dates
- Organizational leaders and key opinion leaders publicly support and set expectations
- Provide information on why change being made
  - Empathize w/anxiety-don't expect to eliminate it
  - Show how change supports aim of organization
  - Put it in historical perspective
  - Link to needs of patient/family/community
  - Reframe as opportunity
- Results of testing site broadly disseminated
- Infrastructure changes are made clear
- New roles and accountabilities are defined
- Provide hot line for questions/comments

2. Infrastructure



Implementation Worksheet: Redesign of Support Processes for Implementation of Change

Change being implemented:

Areas to consider	What has already been done	What needs to happen
Policies		
Documentation		
Hiring Procedures		
Staff education/training		
Job descriptions		
Information Flow		
Equipment Purchases		
Ongoing review of Measures		

3. Effective control system

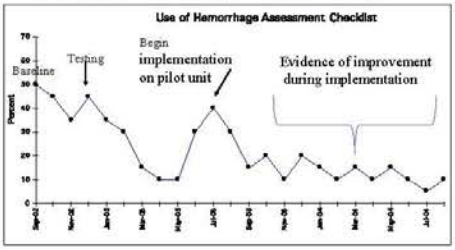
- Leadership sets performance goals and accountabilities
- Data collection is continued
- Team meets regularly and reviews performance on a regular basis
- Team responds to gaps in performance with improvement plan

Holding Gains During Implementation

- Supportive Management Structure
- Structures to "Foolproof" Change
- Robust, Transparent Feedback Systems
- Shared Sense of the Systems to Be Improved
- Culture of Improvement and a Deeply Engaged Staff
- Formal Capacity-Building Programs

Source: Improvement leader's guide to sustainability and spread. NHS Modernisation Agency. Ipswich, England: Ancient House Printing Group; 2002

Continue to collect data over time, especially when conditions are expected to change



Quality Improvement Framework: Holding the Gains

Presenter: Patricia Heinrich, RN, MSN

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.

Kahneman D. Thinking, fast and slow. 2011. Farrah, Straus and Giroux. New York, NY.

The final "S" = Time to CELEBRATE!

- The change is implemented and sustained
- New requirements are reflected in performance score cards, 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.

http://www.isixsigma.com/industries/financial-services/sustaining-change-success-model/

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?

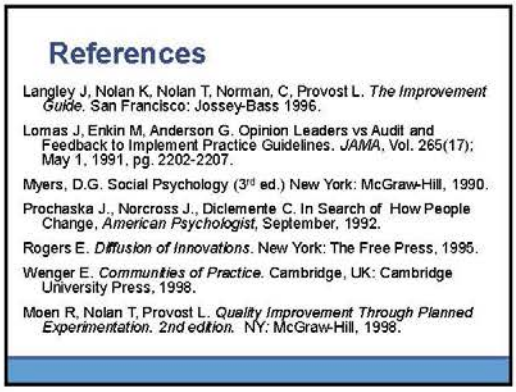
Homework

- 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



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

New York State Obstetric Hemorrhage Project – Aggregate Data Collection Tool

Morbidity and Mortality	
Massive Transfusion	
Number of maternity patients, ≥ 20 weeks completed gestation, admitted to labor and delivery for the birth hospitalization	
Number of maternity patients, admitted to labor and delivery ≥ 20 weeks completed gestation, **receiving four or more units of packed red blood cells**	
Morbidity and Mortality Associated with Obstetric Hemorrhage	
Number of maternity patients, ≥ 20 weeks completed gestation, admitted to labor and delivery for the birth hospitalization, **diagnosed with obstetric hemorrhage**[4]	
Number of maternity patients, admitted to labor and delivery ≥ 20 weeks completed gestation, diagnosed with obstetric hemorrhage[4], **admitted to higher level of care**[5]	
Number of maternity patients, admitted to labor and delivery ≥ 20 weeks completed gestation, diagnosed with obstetric hemorrhage[4] and had a **hysterectomy during the birth hospitalization**	
Number of maternity patients, admitted to labor and delivery ≥ 20 weeks completed gestation, diagnosed with obstetric hemorrhage[4] and **died during the birth hospitalization**	

[1] Performed when patient is first admitted to hospital, whether that is through the emergency department or antepartum clinic.
[2] 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.
[3] In Situ, i.e., on labor and delivery or post-partum floor.
[4] For the purposes of this project, obstetric hemorrhage is defined as ≥ 500 ml blood loss associated with a vaginal delivery, and ≥ 1,000 ml blood loss associated with a cesarean section.
[5] Admitted to higher level of care includes admission to your hospital's ICU or transfer out to a higher-level hospital (e.g. RPC).

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

Revised: May 14, 2020 2

New York State Obstetric Hemorrhage Project – Patient Specific Data Collection Tool

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:	
a. Admitted to a higher level of care (check all that apply)	☐Yes, admitted to ICU (at your hospital) ☐Yes, transferred to another hospital ☐Yes, transferred from another hospital ☐No
b. Received a hysterectomy at your hospital	☐Yes ☐No
c. Died at your hospital	☐Yes ☐No
9. Volume of blood loss	_____ mL
a. Method of calculating blood loss	☐Formal quantification ☐Visual estimation ☐Mixed methods
10. Did the patient experience any of the following at your hospital during this delivery hospitalization (check all that apply)	☐ Abnormally adherent placenta (accreta, increta, percreta) ☐ Amniotic fluid embolism ☐ Defects of coagulation (inherited and acquired)[1] ☐ Hematoma / Laceration (specify)_____ ☐ Other intraperitoneal bleeding (uterine rupture excluded) ☐ Placenta previa ☐ Placental abruption ☐ Retained placenta or products of conception ☐ Retro-peritoneal bleeding ☐ Uterine anomalies ☐ Uterine atony ☐ Uterine inversion ☐ Uterine rupture ☐ Other (specify)_____
11. Clinical debrief conducted post-hemorrhage event[2]	☐Yes ☐No
12a. Documentation of risk assessment on admission	☐ Yes ☐No
12b. Documentation of risk assessment postpartum (between birth and discharge)	☐ Yes ☐No

[1] 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.

[2] 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

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:** _____

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

New York State Obstetric Hemorrhage Project – Race/Ethnicity Patient Data Collection Tool

Patient #	Ethnicity				Race (check all that apply)								Documented risk assessment for OB hemorrhage	
	Hispanic*	Non-Hispanic	Declined to answer	Not reported	American Indian / Alaska Native	Asian**	Black / African American	Native Hawaiian / Pacific Islander***	White	Other (specify)	Declined to answer	Not reported	On admission to the birth hospitalization[1]	At least once postpartum[2]
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

* 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 2

New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log

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 1

New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log

New York State Obstetric Hemorrhage Project
Obstetric Hemorrhage Risk Assessment Log

Month: _____ **Year:** _____

Patient	Risk assessment for obstetric hemorrhage completed **on admission** to the birth hospitalization[1]	Risk assessment for obstetric hemorrhage completed at least once **post-partum**[2]
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
Total (enter into Aggregate Data Collection Tool)		

[1] Performed when patient is first admitted to hospital, whether that is through the emergency department or antepartum clinic.
[2] 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 2

New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log

New York State Obstetric Hemorrhage Project
Obstetric Hemorrhage Risk Assessment Log

On Admission to the Birth Hospitalization

Month: _____ **Year:** _____

Patient	Risk assessment for obstetric hemorrhage completed on admission to the birth hospitalization*
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
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 3

New York State Obstetric Hemorrhage Project – Obstetric Hemorrhage Risk Assessment Log

New York State Obstetric Hemorrhage Project
Obstetric Hemorrhage Risk Assessment Log

Post-Partum Period

Month: _____ **Year:** _____

Patient	Risk assessment for obstetric hemorrhage completed at least once **post-partum***
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
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 4

New York State Obstetric Hemorrhage Project – Structure Measures Data Collection Tool

New York State Obstetric Hemorrhage Project
Structure Measures Data Collection Tool

Instructions: Enter the status for the 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: _____

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

October 1, 2019 1

New York State Obstetric Hemorrhage Project – Structure Measures Data Collection Tool

Response	
11. Unit-standard, stage-based OB hemorrhage emergency management plan with checklists available for use	☐ Haven't started ☐ Working on it ☐ In place
OB specific resources and protocols to support patients, family and/or staff through major OB complications:	
12. Patients	☐ Haven't started ☐ Working on it ☐ In place
13. Family	☐ Haven't started ☐ Working on it ☐ In place
14. Staff	☐ Haven't started ☐ Working on it ☐ In place
Reporting and Systems Learning	
15. Established a system to perform regular, formal debriefs after cases with severe maternal morbidity*	☐ Haven't started ☐ Working on it ☐ In place
16. Multidisciplinary case reviews of all serious hemorrhages** for systems issues	☐ Haven't started ☐ Working on it ☐ In place
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.):	
17. Staged checklist	☐ Haven't started ☐ Working on it ☐ In place
18. Recommended instrument checklist	☐ Haven't started ☐ Working on it ☐ In place
19. Risk assessment tables	☐ Haven't started ☐ Working on it ☐ In place
20. Massive transfusion protocol	☐ Haven't started ☐ Working on it ☐ In place
21. Debriefing form	☐ Haven't started ☐ Working on it ☐ In place

*Severe maternal morbidity is defined as the transfusion of ≥4 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 ≥4 units of PRBCs; and/or use of uterine compression sutures, balloon tamponade, or non-scheduled hysterectomy for postpartum hemorrhage.

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 f ocused 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.

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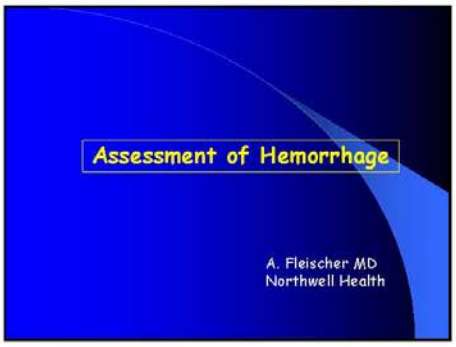
Contents

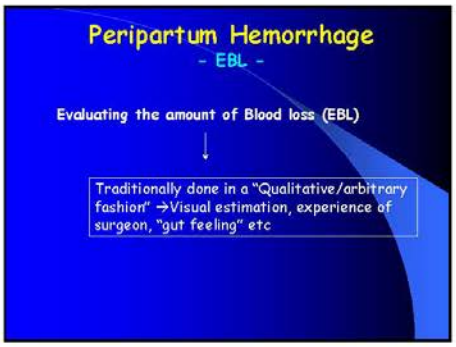
Click on titles/page numbers to go to directly to each section

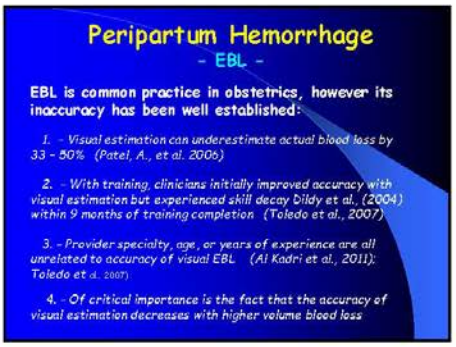
Assessment of Hemorrhage

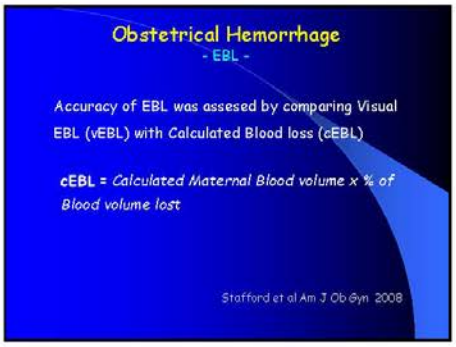
Presenter: Adiel Fleischer, MD, FACOG

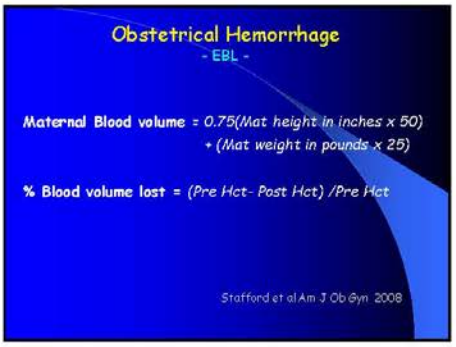
DRIVER : RECOGNITION











Assessment of Hemorrhage

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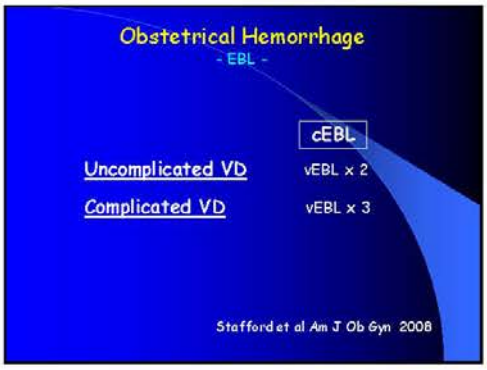

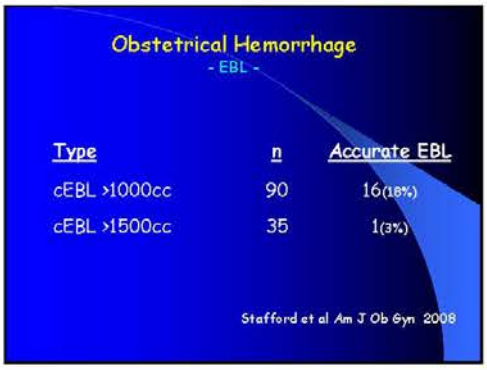

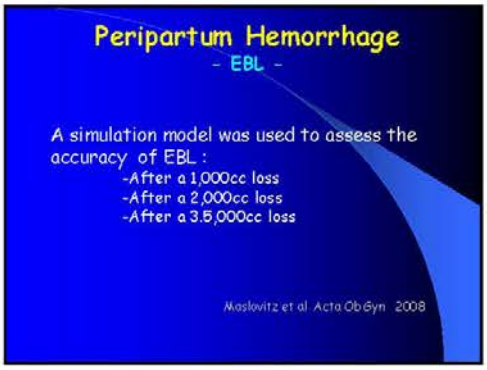

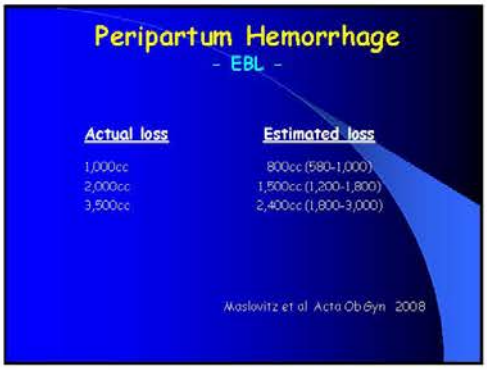

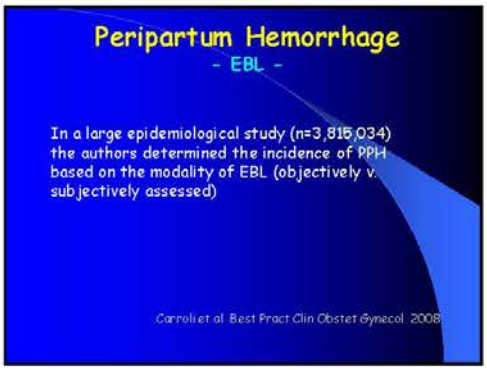

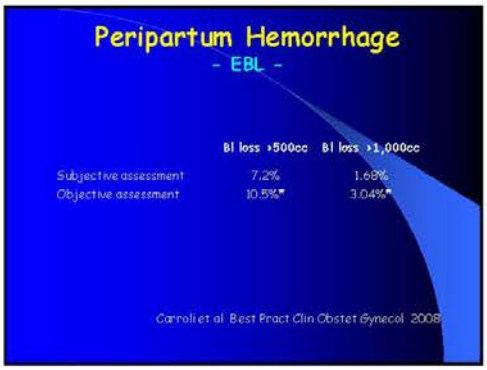

Assessment of Hemorrhage

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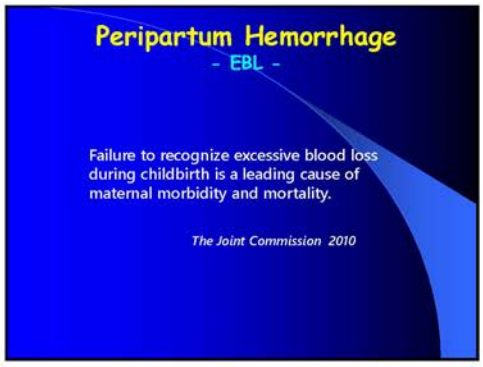

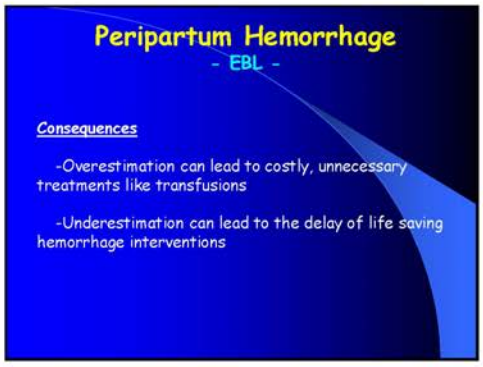

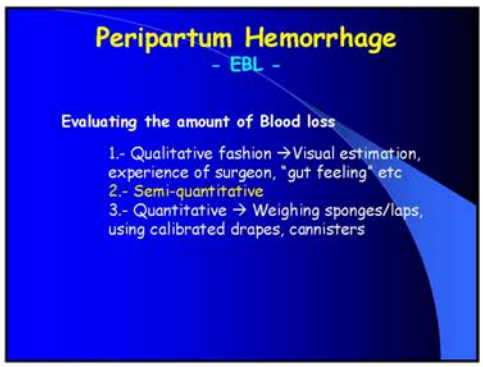

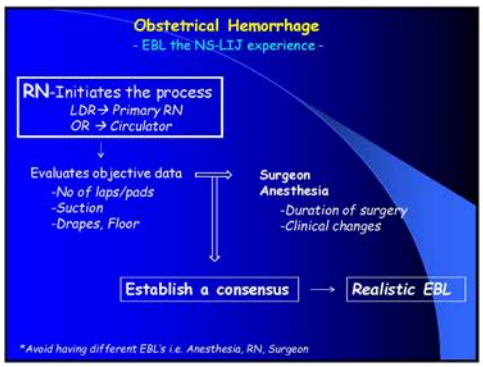

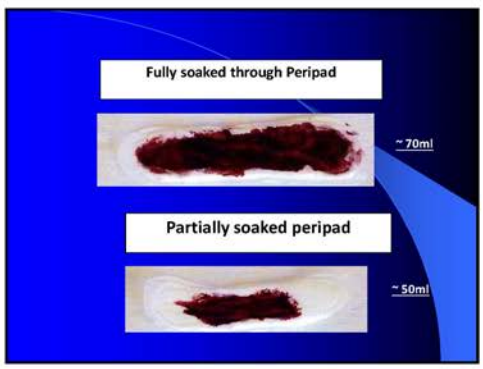

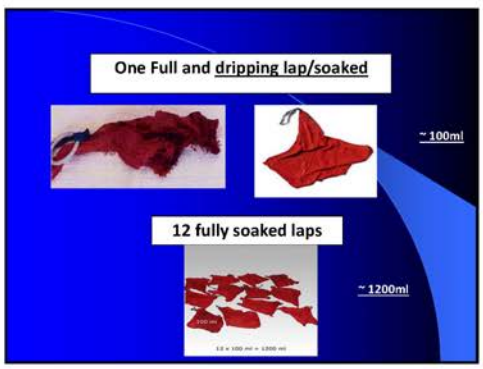

Assessment of Hemorrhage

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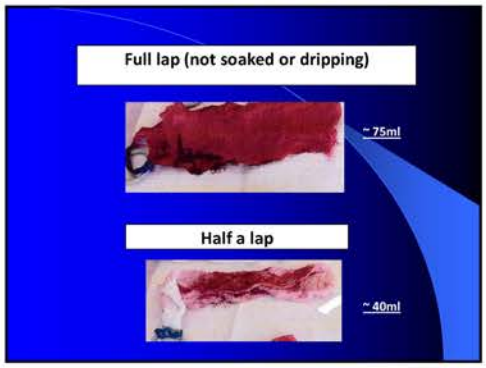

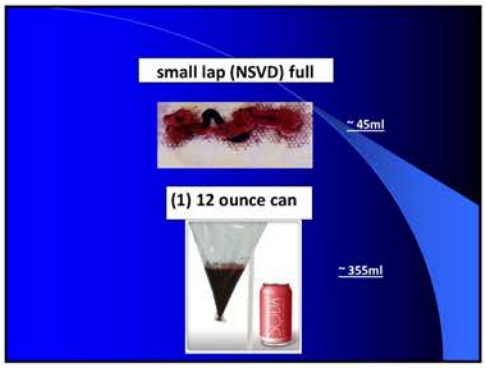

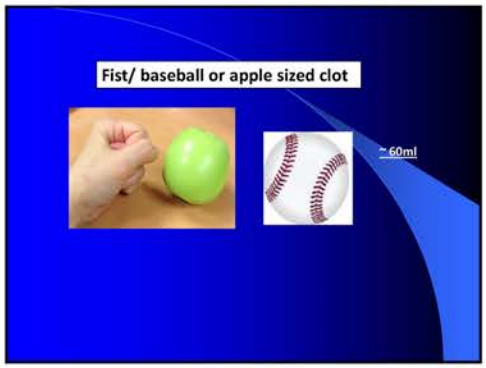

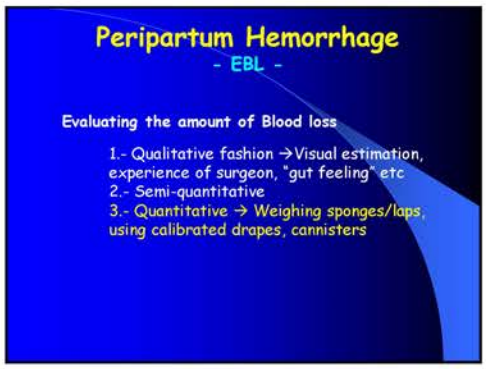

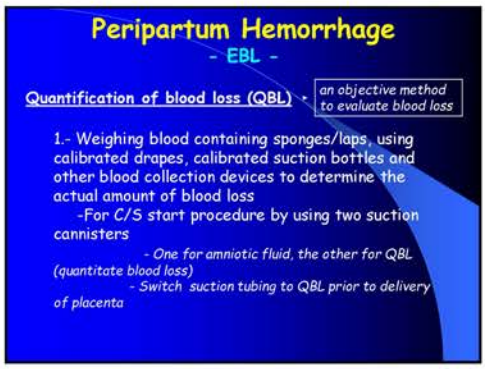

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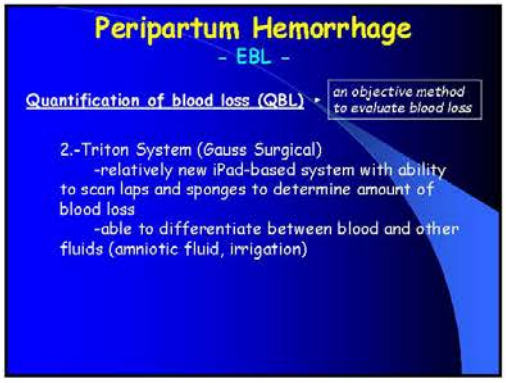
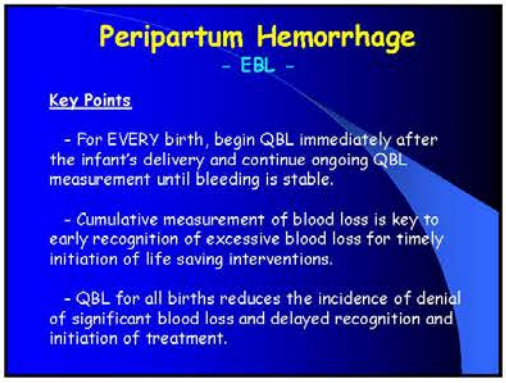
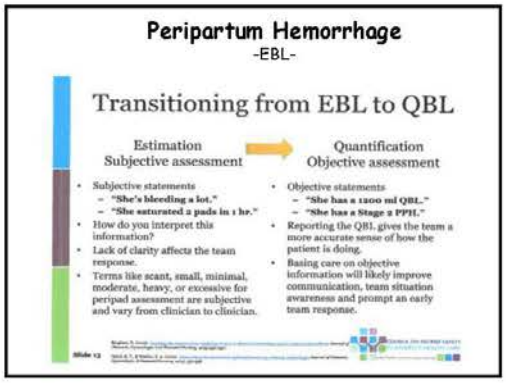
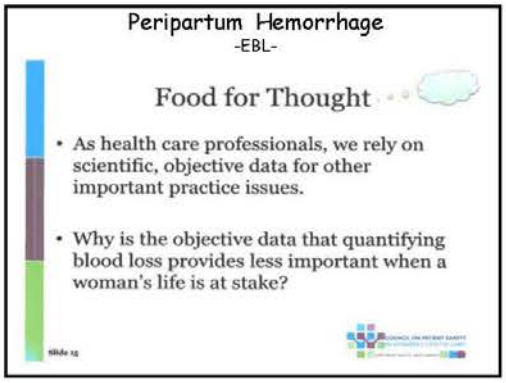




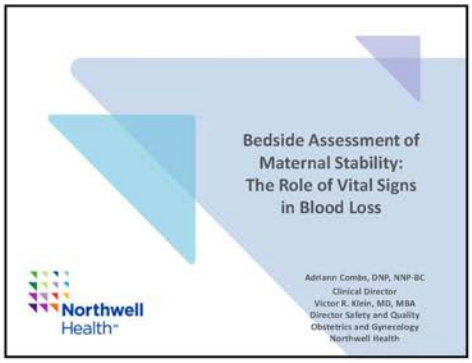


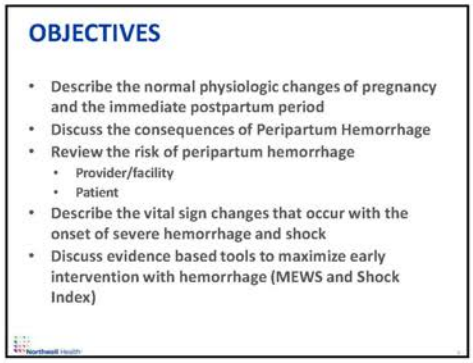


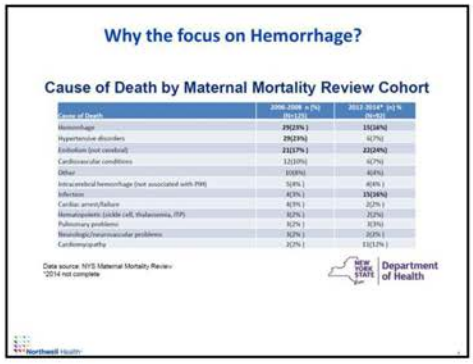
Bedside Assessment of Maternal Stability: The Role of Vital Signs

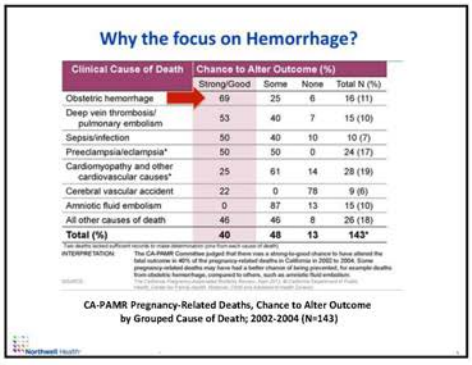
Presenter: Adriann Combs, DNP, NNP-BC; Victor R. Klein, MD, MBA

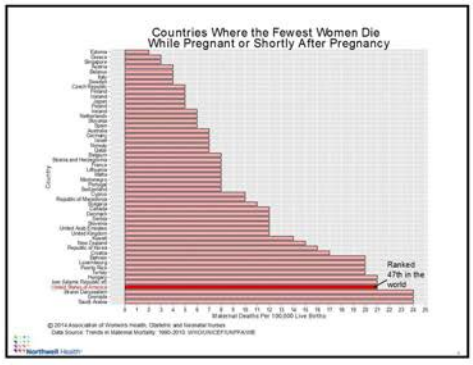
DRIVER : RECOGNITION











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 (SMM) and Mortality
  - Blood products
  - ICU admissions
  - Hysterectomies
- Unrecognized and untreated PPH can lead to **DEATH** in 2 to 6 hours
- Early recognition and treatment can lead to improved survival
- Tremendous emotional and financial impacts

Hypovolemic shock→ multi-organ dysfunction → DEATH

Financial Impact of Severe Maternal Morbidity

Family and Child Health NYC Health

Cardiovascular and Respiratory Physiology during Normal Pregnancy

Physiologic Component	Change
Blood Volume	Increases by 25-52% by late pregnancy with a larger (45-50%) increase in plasma volume compared with red cell mass (20%)
Blood Pressure	Decreases until mid pregnancy with gradual increase to baseline at term
Heart Rate	Rises to 120% of baseline by 32 weeks GA
Cardiac Output/Stroke Volume	CO increases 30-50% with a peak in the second trimester
Systemic Vascular Resistance	Reaches nadir by 24 weeks with a progressive increase by term
Functional Residual Capacity	10-20% decrease by term
Minute Ventilation	20-40% increase by term
Alveolar Ventilation	50-70% increase by term
Tidal Volume	30-35% increase by term

Hemorrhage Risk: Facility and Provider Resources

- An assessment of the facilities resources; provider and system.
  - Clear guidelines for when the patient's needs exceed the facilities capacity to treat and a process for immediate, safe transfer
- A method to quantify blood loss, used routinely.
- A thorough review and understanding of blood availability.
  - A massive transfusion protocol
  - A team that reviews all hemorrhages that require 4 or more units of blood
- A clear process to follow in the event of maternal blood loss and hemorrhage including clear escalation.
  - A Hemorrhage Team
  - A standard mechanism to document activities related to hemorrhage
  - A no judgement policy if someone calls a hemorrhage code, no intimidation accepted
  - Standard debriefing
  - Supportive administration
- Frequent in-situ, multidisciplinary drills that identify potential problems during hemorrhage (rarely cancelled).
  - A "hemorrhage cart", reproducible anywhere a hemorrhage could occur
  - A medication box, reproducible anywhere a hemorrhage could occur
  - Recurrent education to all staff that may participate in hemorrhages
    - Nursing and nursing administration
    - Medicine, OB/Gyn, Anesthesia, Gyn/Onc, General surgery
    - RT
    - Blood bank

HEMORRHAGE RISK: PATIENT

Prenatal	Antepartum	Peripartum: Moderate	Peripartum: High
• Suspected previa/accrete/ increta/percreta • BMI >50 • Clinically significant bleeding disorder • Other significant medical/surgical risk (consider patients who decline transfusion)	Placenta accreta 34 0/7 – 35 6/7 Placenta previa 36 0/7 – 37 6/7 Prior classical cesarean 36 0/7 – 37 6/7 Prior myomectomy 37 0/7 – 38 6/7 Prior myomectomy, if extensive 36-37	• Prior cesarean, uterine surgery, or multiple laparotomies • Obesity (BMI > 40) • Hematocrit < 30% & other risk • Prior PPH • Active bleeding • Known coagulopathy • Large myomas • EFW > 4000 grams	• Placenta previa/low lying • Suspected accreta/percreta • Multiple gestation • 4 prior births • Platelet count < 70,000 • 2 or more moderate risk factors
Transfer to appropriate level of care for delivery	High risk for accreta: Obtain proper imaging Be transferred to appropriate level	Type & SCREEN, review protocol	Type & CROSS, review protocol

Significant Blood Loss

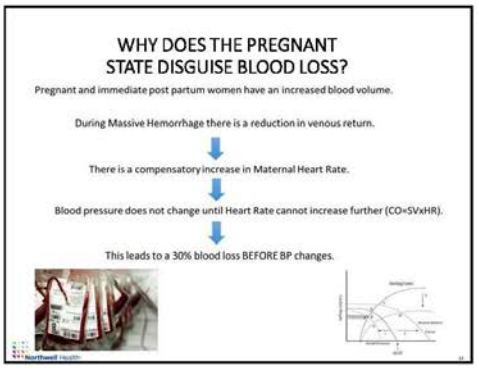
- ACOG (reVITALize project) has recently endorsed a revised definition:
- Cumulative blood loss of > 1000 mL OR blood loss accompanied by **sign/symptoms of**
- **hypovolemia** within 24 hours following the birth process (Cumulative blood loss of 500-
- 999 mL alone should trigger increased supervision and potential interventions as clinically indicated).

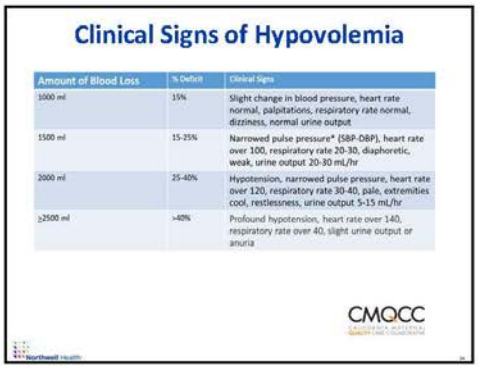
CMQCC

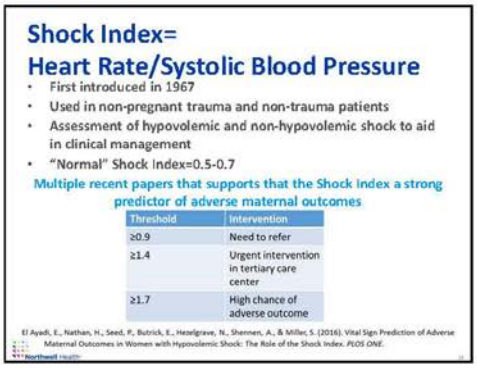
Bedside Assessment of Maternal Stability: The Role of Vital Signs

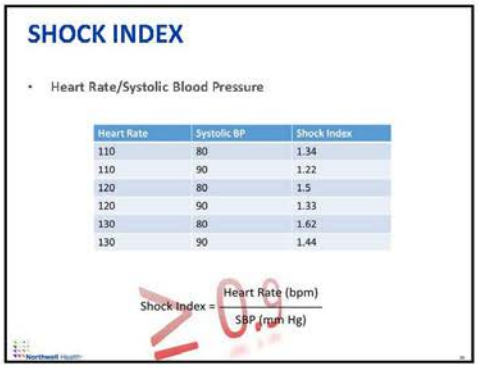
Presenter: Adriann Combs, DNP, NNP-BC; Victor R. Klein, MD, MBA

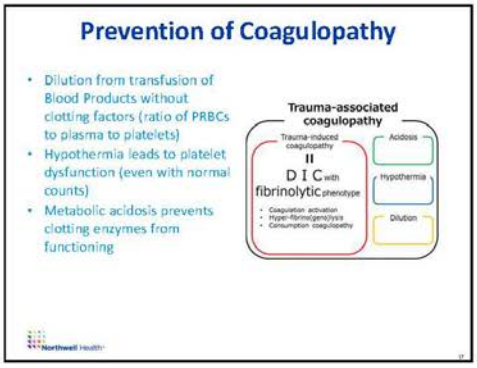
DRIVER : RECOGNITION

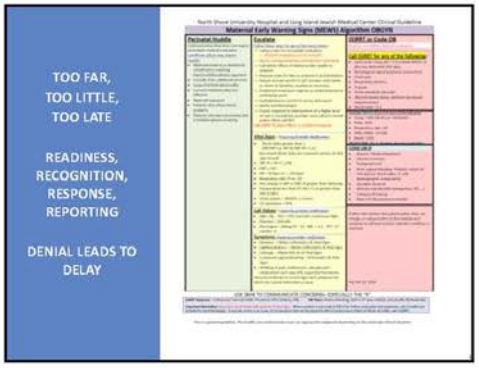












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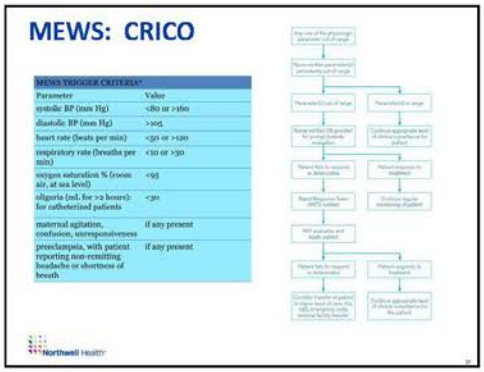
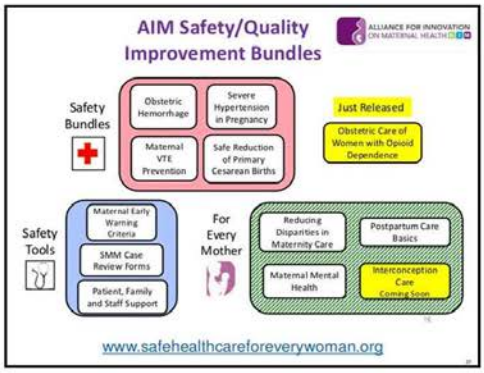
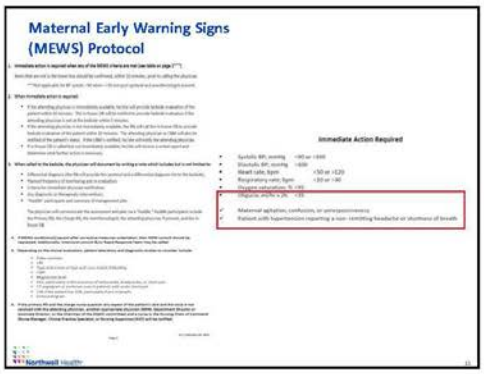
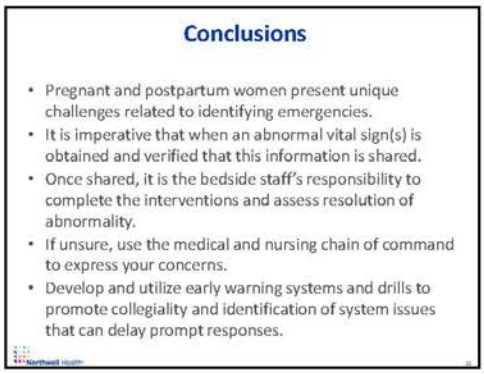
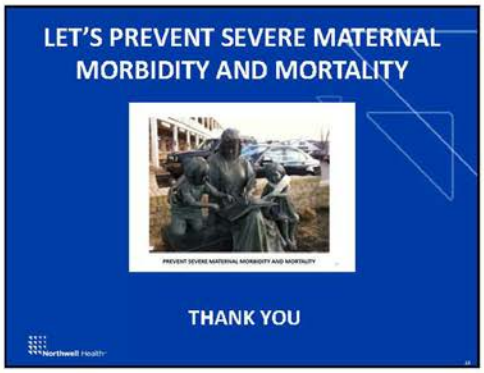
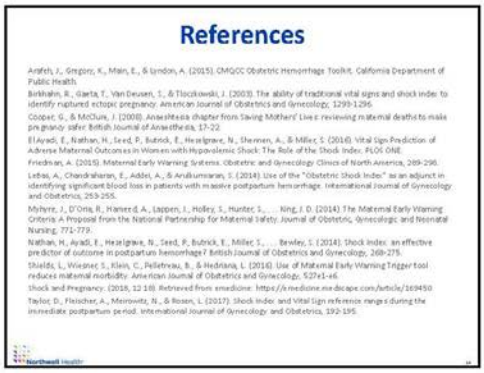








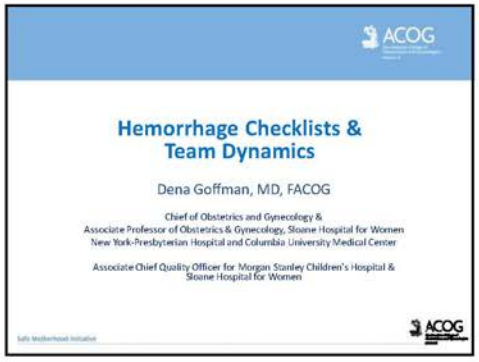


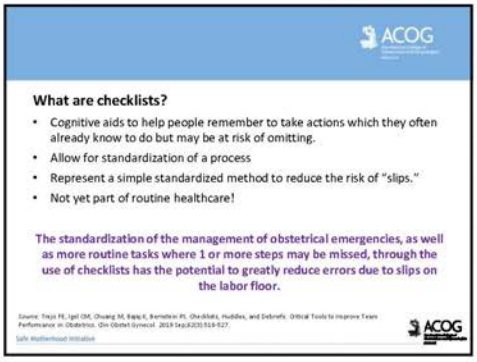


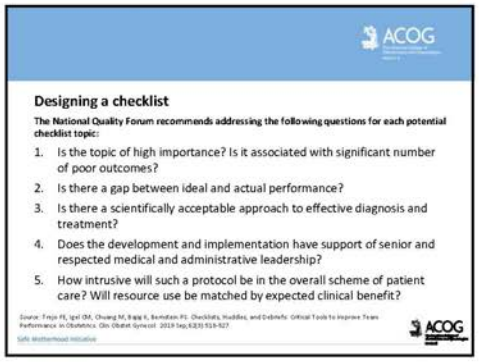
Hemorrhage Checklists & Team Dynamics

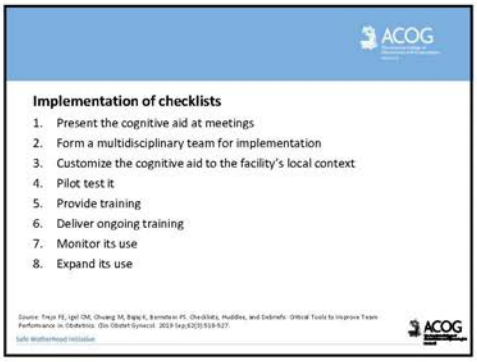
Presenter: Dena Goffman, MD, FACOG

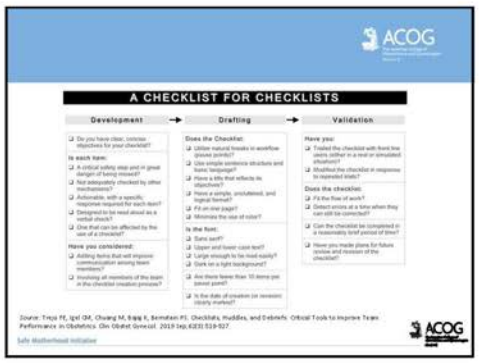
DRIVERS: RESPONSE, REPORTING AND SYSTEMS LEARNING

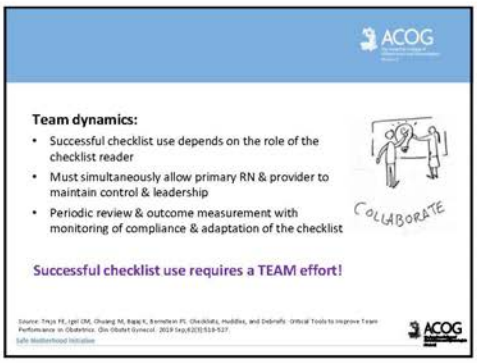












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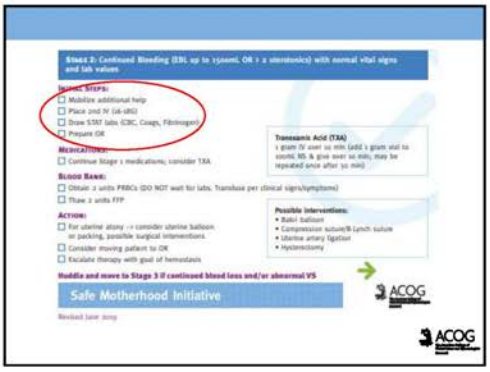
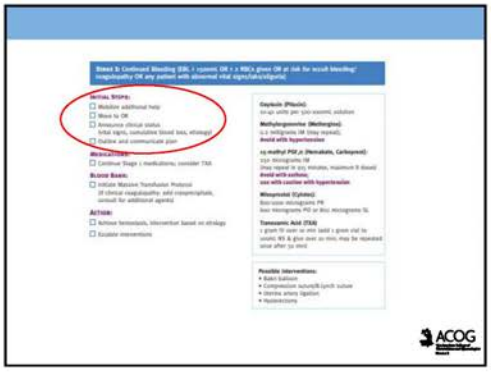
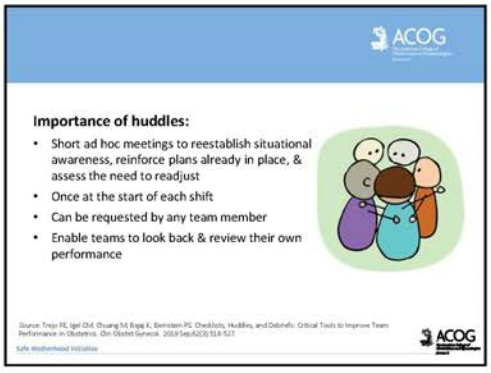
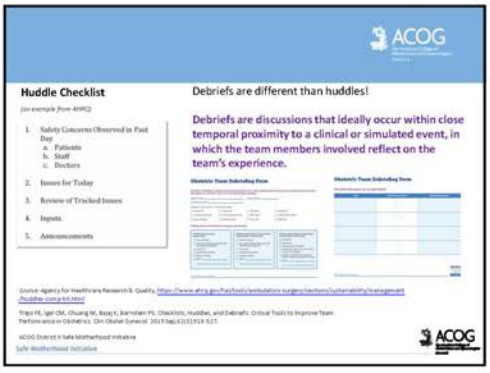




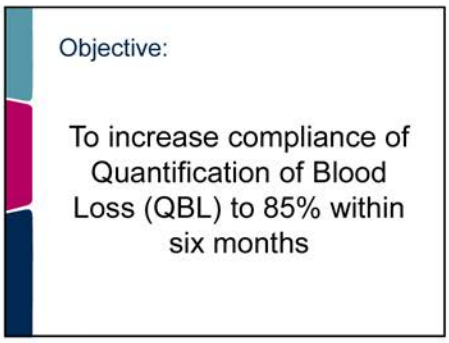


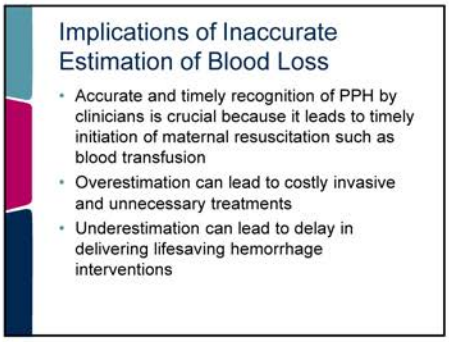


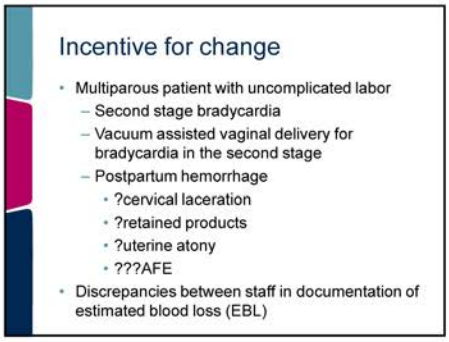
Implementation of Quantification of Blood Loss (QBL) at an Academic Medical Center

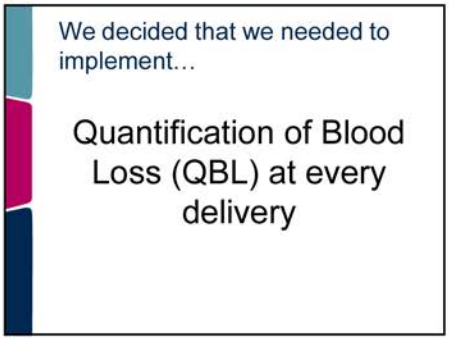
Presenter: Peter Bernstein, MD, MPH, FACOG; Meleen Chuang, MD, FACOG; Elizabeth Igboechi, RN; Esther Schiavello, RN; Leeshun Rivera, PA

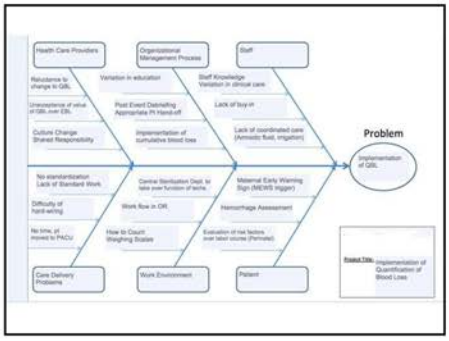
DRIVERS: RECOGNITION AND PREVENTION











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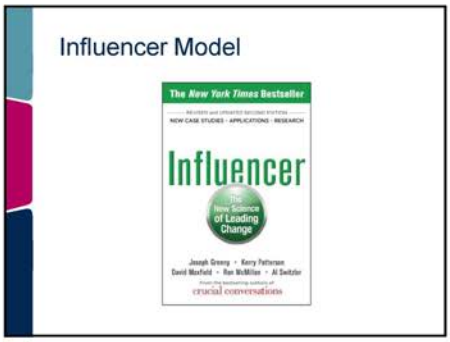

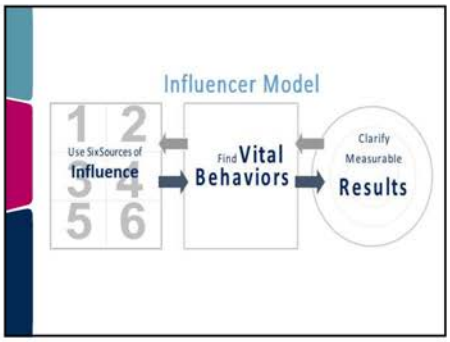

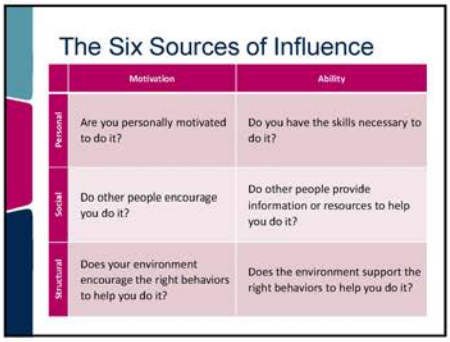

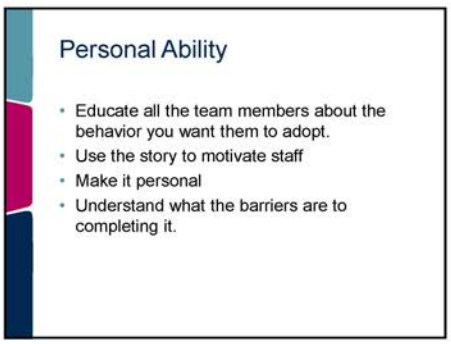

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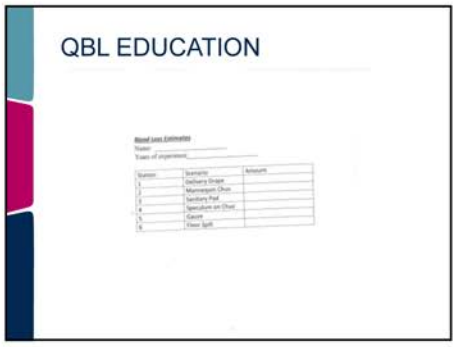

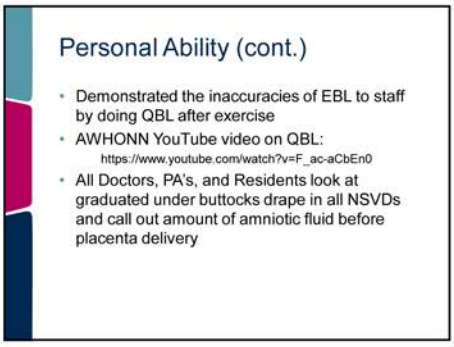

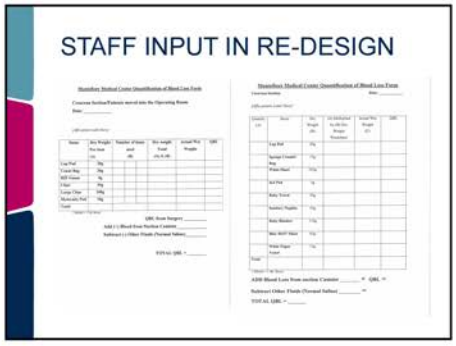

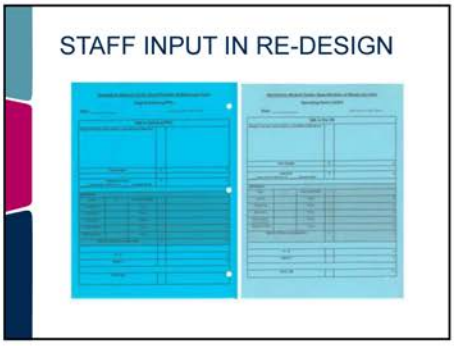

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DRIVERS: RECOGNITION AND PREVENTION

Social Ability

- Create an environment of support
- Expect individuals to ask for help
- Expect others to offer help
- Empower coaches
- Maximize peer support

Social Ability (cont)

- Everyone is doing it
- Everyone is expecting it
- Everyone is asking about it
- It is being documented on the White Board

Structural Motivation

Does the environment encourage the expected behavior?

- Use incentives wisely (less is more)
- Safety specialist available to demonstrate/assist in ORs and LDRs
- Physician champions also available to educate/assist with QBL at deliveries
- Posting results of QBL data

Social Motivation (cont.)

- Posting statistics on unit board on success at implementation
- Asked staff to participate in pictures to use at presentation for Montefiore
- Offer staff a party when target goal is reached

Structural Ability

Does the physical environment support the desired behavior?

- Scales were purchased for every room
- Calculators were purchased and available on unit
- All OB Techs standardized using only 1 Liter of NS (for irrigation) for all C-sections
- Postpartum used baby scales to weigh

QBL IN LDR

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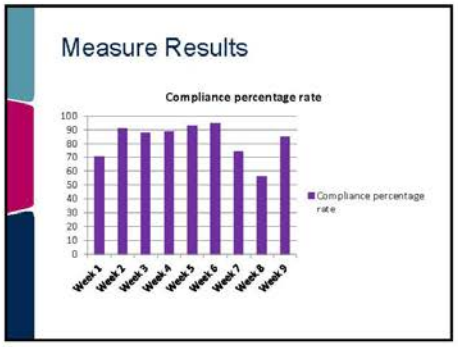
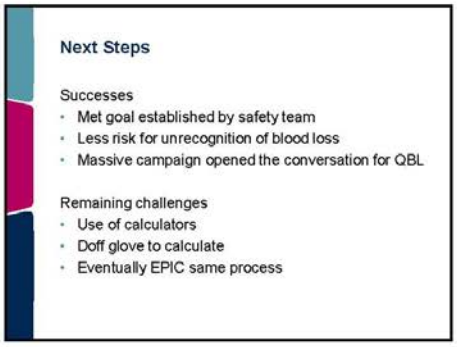
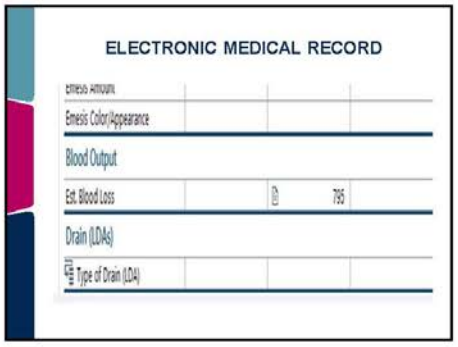
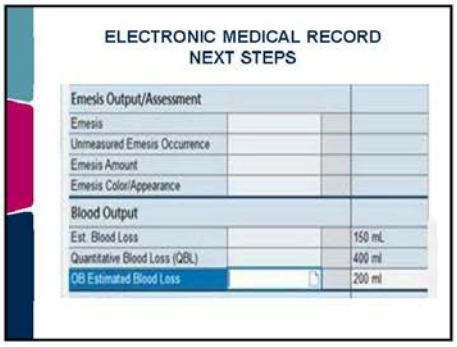
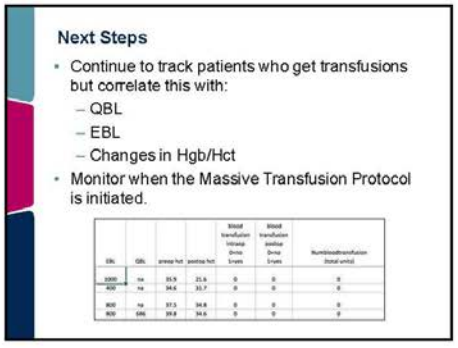
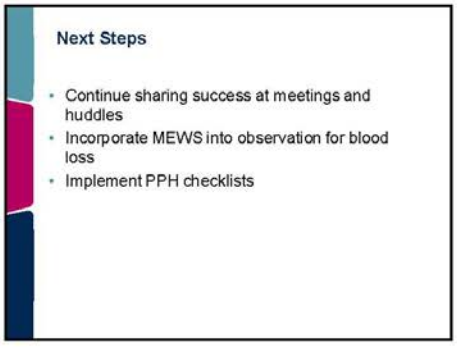








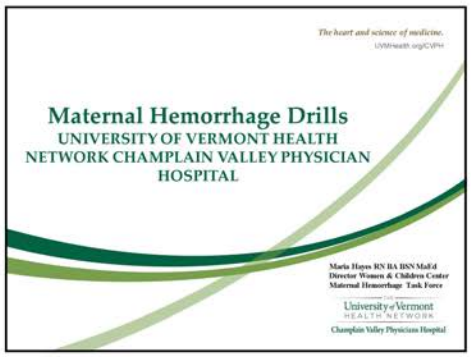


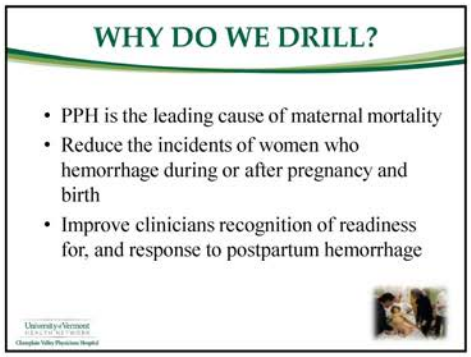


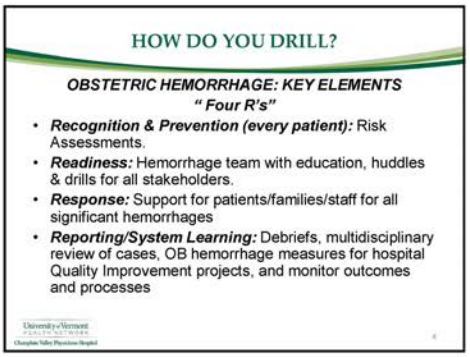
Maternal Hemorrhage Drills University of Vermont Health Network Champlain Valley

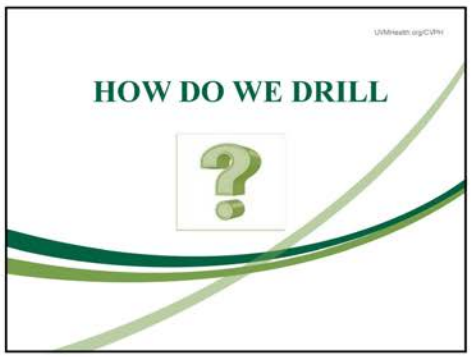
Presenter: Maria Hayes, RN, BA, BSN, MaED

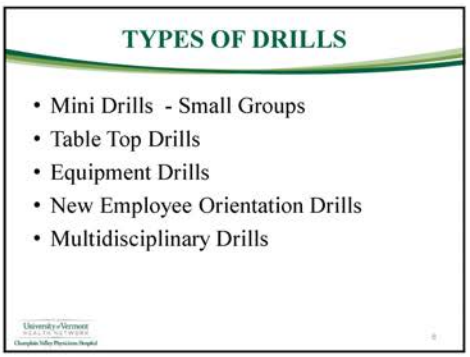
DRIVER : READINESS







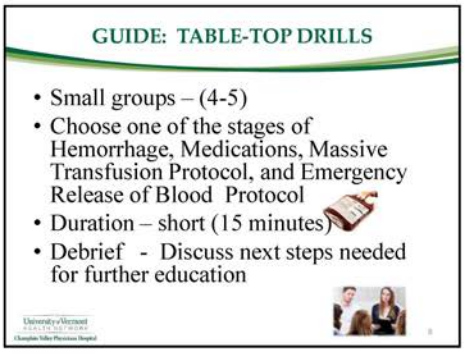


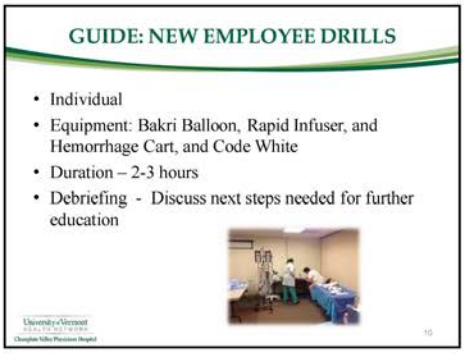


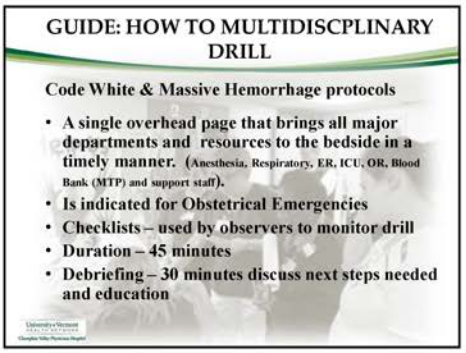
Maternal Hemorrhage Drills University of Vermont Health Network Champlain Valley

Presenter: Maria Hayes, RN, BA, BSN, MaED

DRIVER : READINESS







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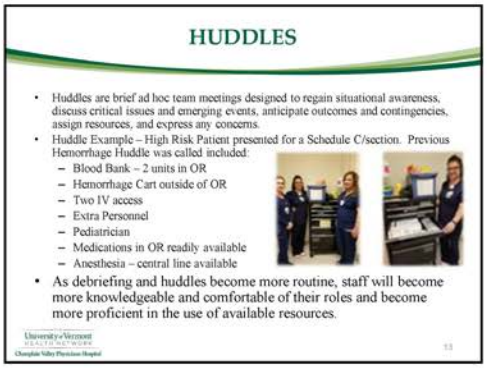
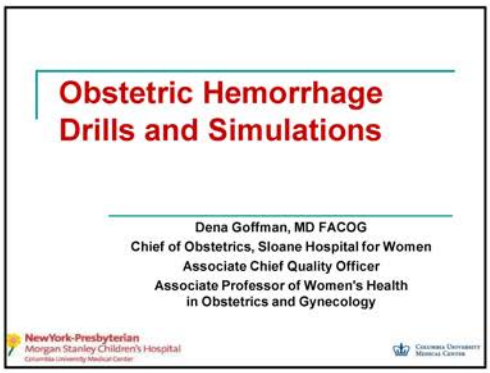
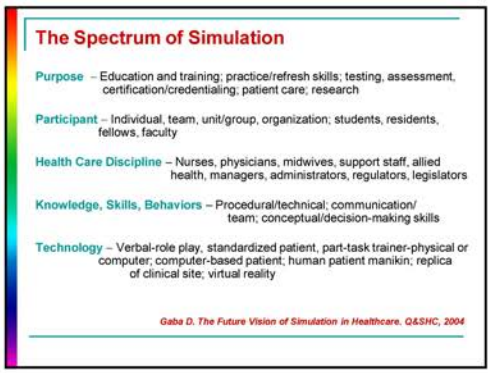


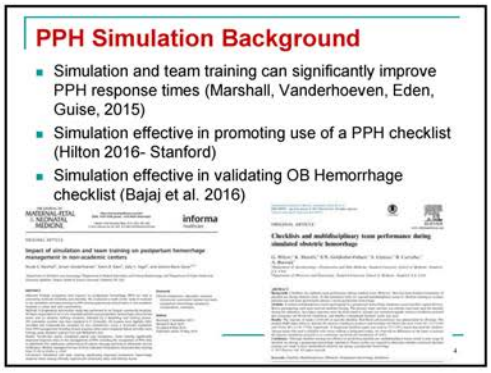
Obstetric Hemorrhage Drills and Simulations

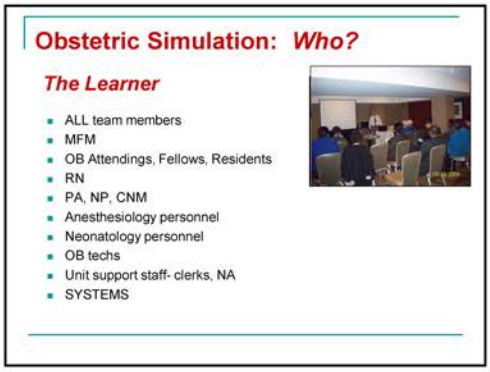
Presenter: Dena Goffman, MD, FACOG

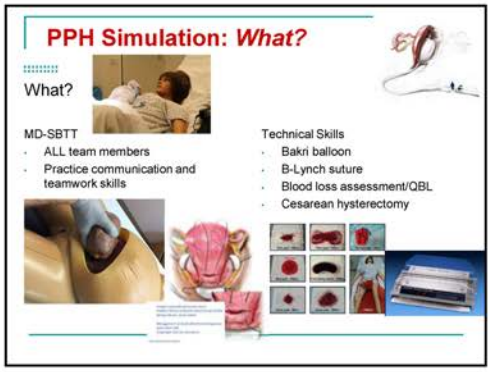
DRIVERS: RESPONSE, REPORTING AND SYSTEMS LEARNING











Obstetric Hemorrhage Drills and Simulations

Presenter: Dena Goffman, MD, FACOG

DRIVERS: RESPONSE, REPORTING AND SYSTEMS LEARNING

Obstetric Simulation: *When? How often?*

- *When?*
  - Dedicated teaching time
  - Scheduled simulation time
  - Unannounced drills
- *How often?* Crofts et al, *OBGYN* 2007
  - Shoulder dystocia skills retained at 3 weeks, 6 months and 1 year
  - van de Ven et al. 2017 noted a decline in beneficial effects of MD-SBTT after 3 months and recommend more frequent drills

PPH Simulation: Where?

In-situ
- Useful for discovering latent systems issues
- Allows teams to practice in the regular environment
- Difficult to schedule when census is high

Offsite (Simulation Center)
- Free of distractions
- Dedicated space
- Difficult to re-create real environment
- Difficult to pull staff off of busy units

PPH Simulation: Why?

National Partnership for Maternal Safety

PPH Simulation: Why?

Alliance for Innovation in Maternal Health

PPH Simulation: Why?

ACOG Practice Bulletin

PPH Simulation: How?

- Identify and involve stakeholders
- Recruit and train "champions"
- Identify & prioritize objective(s)
- Simulations:
  - Have explicit goals
  - Integrate clinical, teamwork & communication skills
  - Identify process and outcome measures
  - Include time for debriefing and feedback
- Develop/Refine safety protocols and algorithms
- Provide feedback about process and outcome measures, policy and procedural changes and system improvements to staff

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
  - Partopants
  - PROMPT FLEX
  - Actress
  - 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 CCOB
- 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

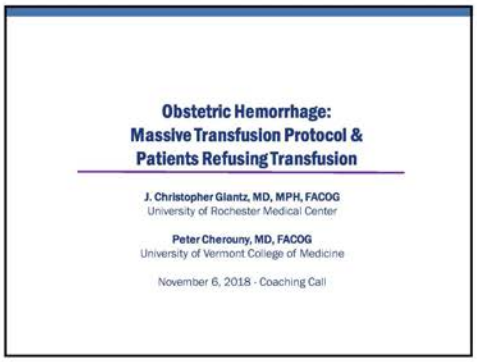
Conclusions and Questions

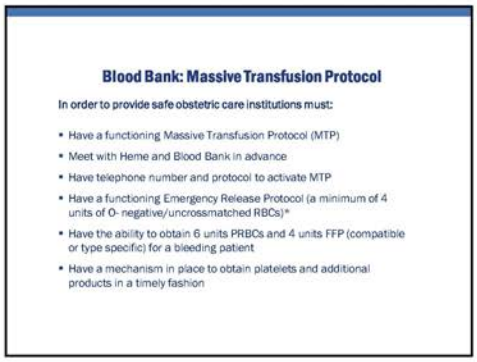
- We know: Who? What? Why?
- Outstanding questions about: When? Where? How and How Often?
- Not one size fits all

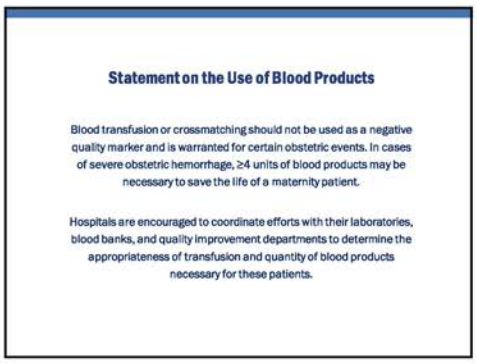
Obstetric Hemorrhage: Massive Transfusion Protocol & Patients Refusing Transfusion

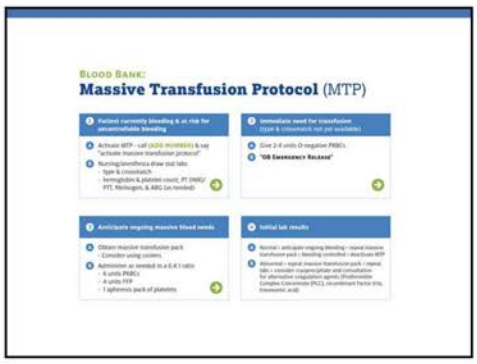
J. Christopher Glantz, MD, MPH, FACOG; Peter Cherouny, MD, FACOG

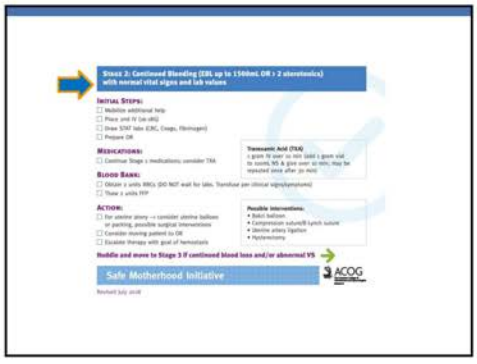
DRIVERS: RESPONSE, REPORTING AND SYSTEMS LEARNING











BACK TO START OF TOOLKIT
BACK TO START OF SECTION

Obstetric Hemorrhage: Massive Transfusion Protocol & Patients Refusing Transfusion

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

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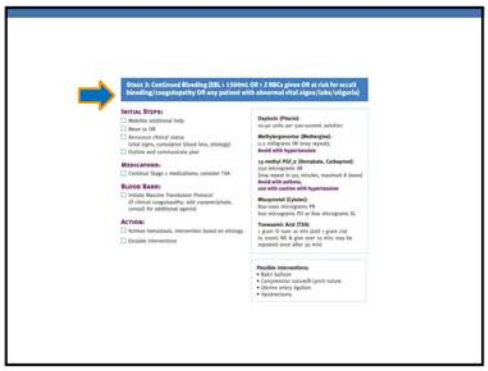
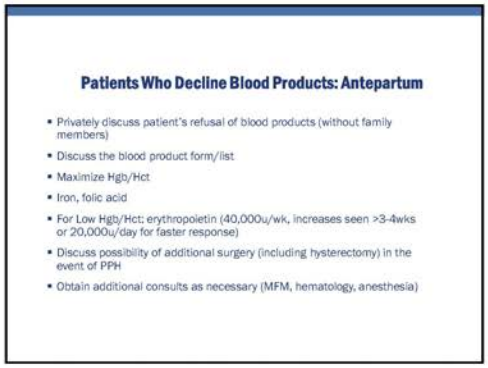
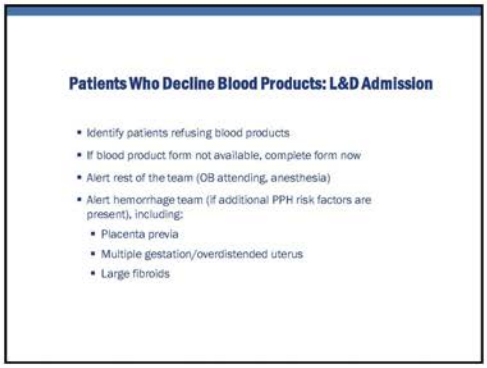
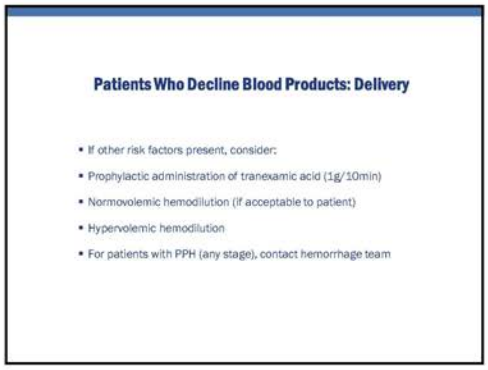
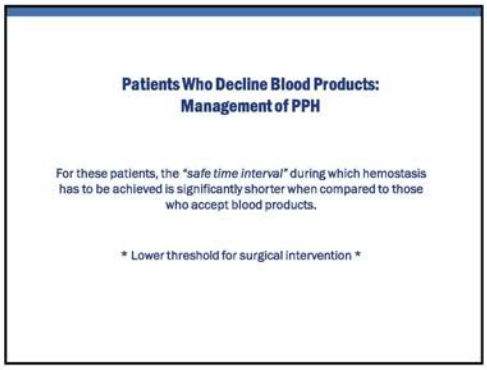






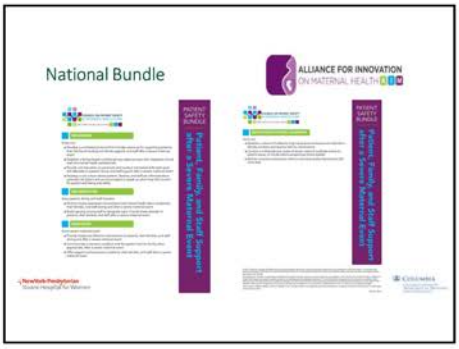


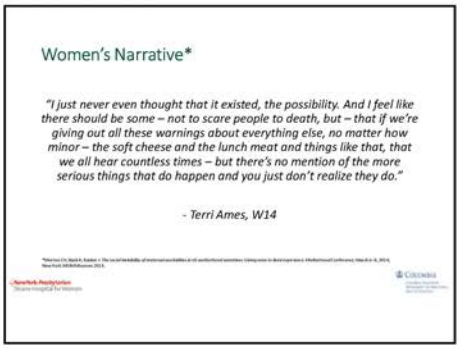


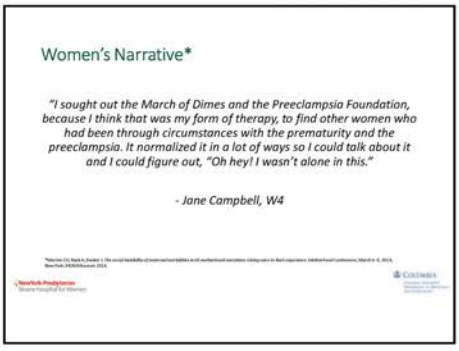
Patient & Family Engagement Following a Severe Maternal Event

Presenter: Dena Goffman, MD, FACOG

DRIVER : RESPONSE







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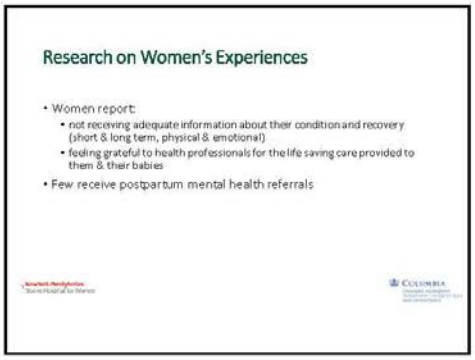

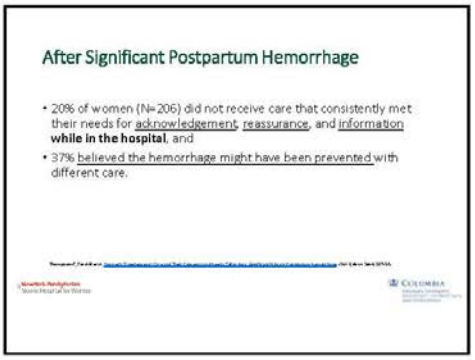

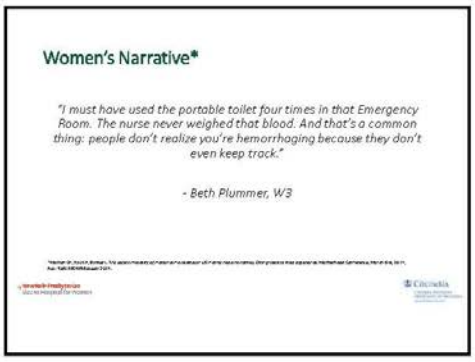

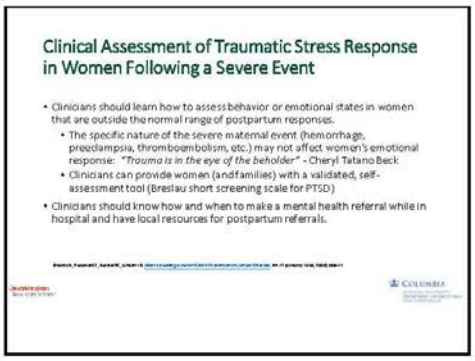

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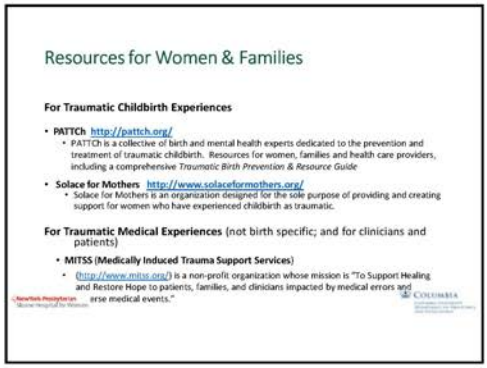
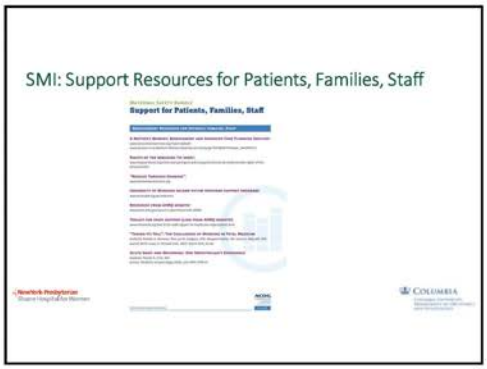
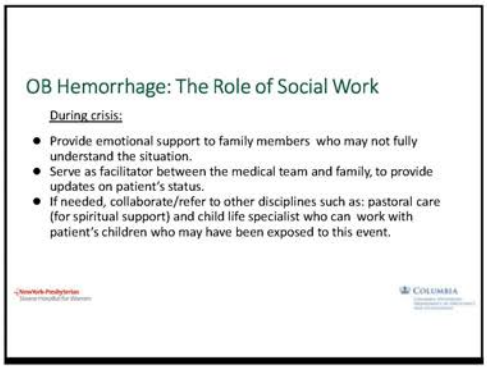
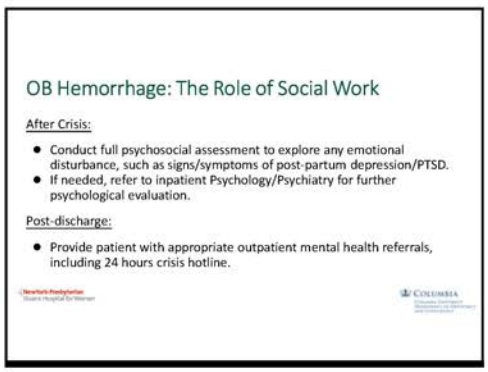
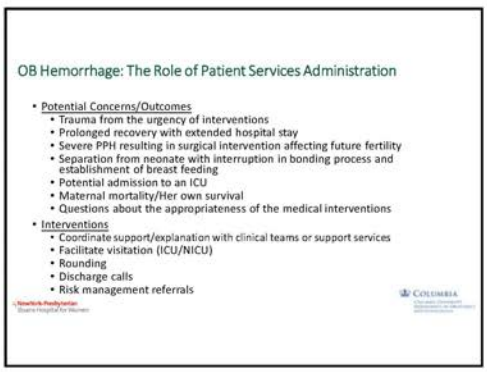






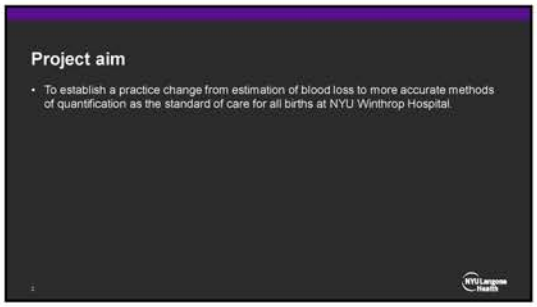


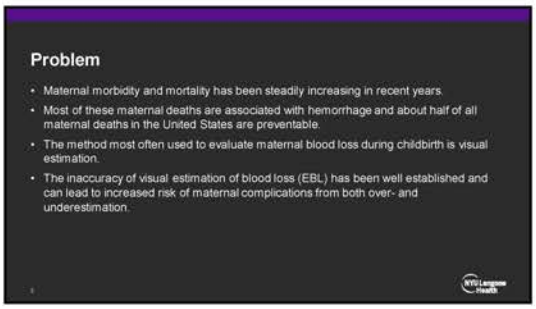


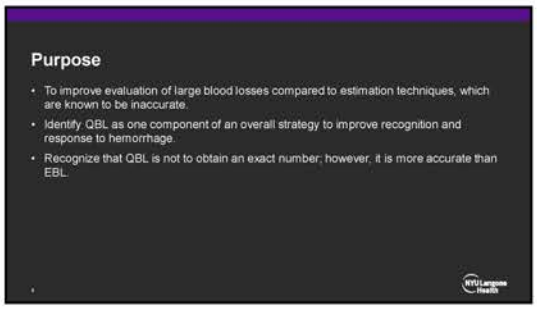
Quantification of Blood Loss "Stop Guessing"

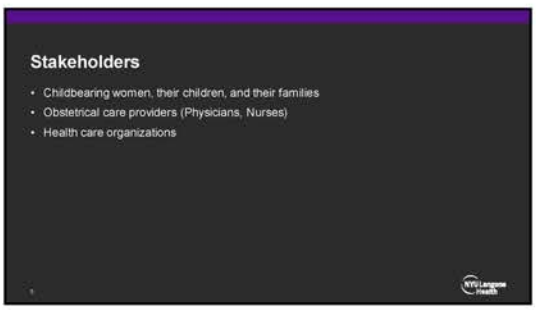
Presenter: Laura Braithwaite, MSN, RNC-OB, C-EFM; Genevieve B. Sicuranza, MD, FACOG; Rosanne Vertichio, MS, RN

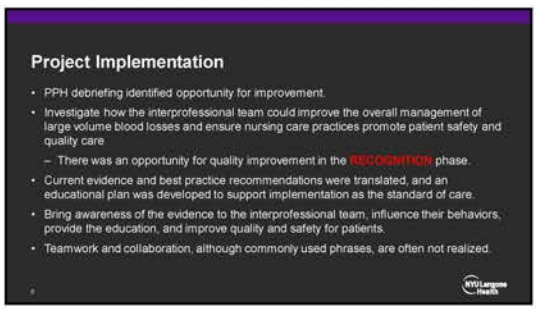
DRIVERS: RECOGNITION AND PREVENTION











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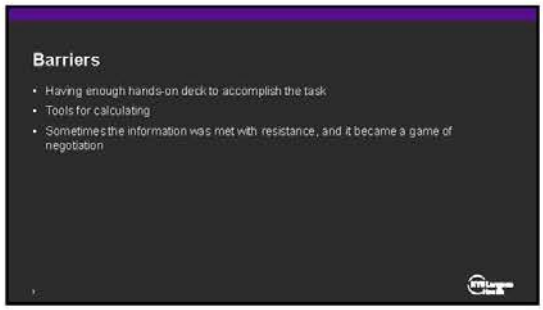
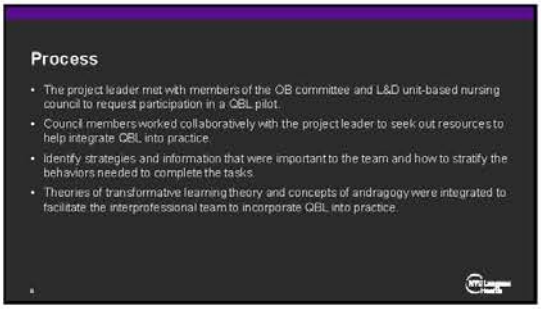
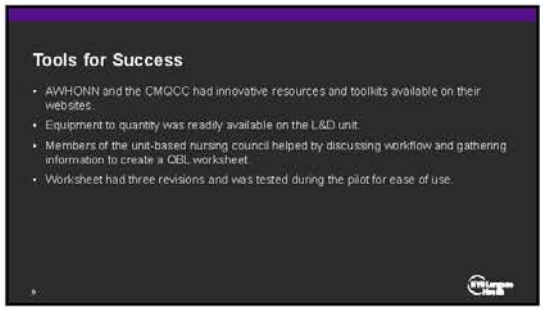
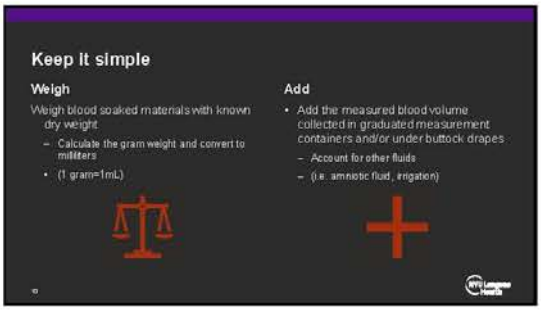
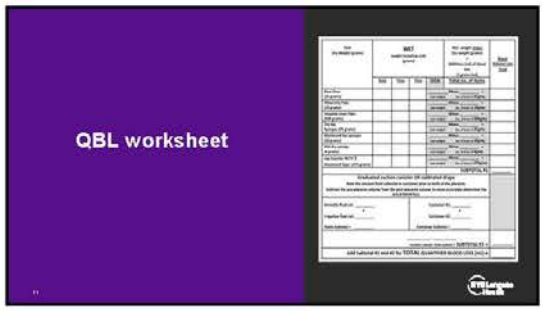
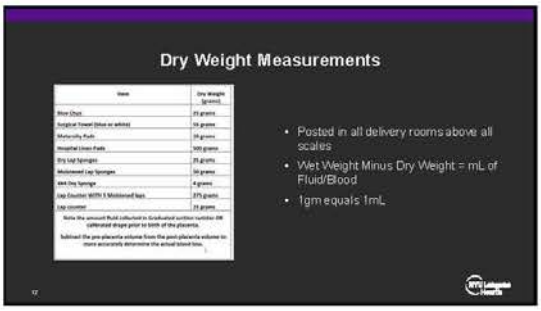








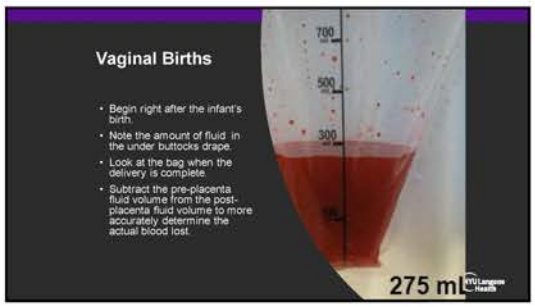


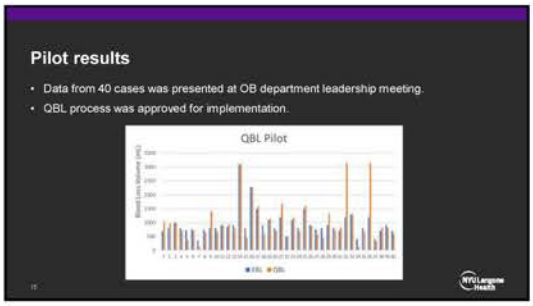


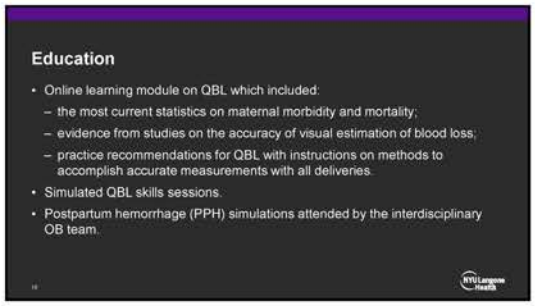
Quantification of Blood Loss "Stop Guessing"

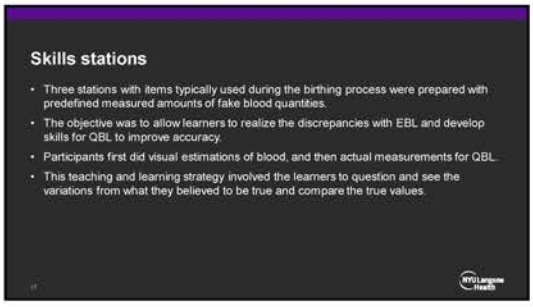
Presenter: Laura Braithwaite, MSN, RNC-OB, C-EFM; Genevieve B. Sicuranza, MD, FACOG; Rosanne Vertichio, MS, RN

DRIVERS: RECOGNITION AND PREVENTION









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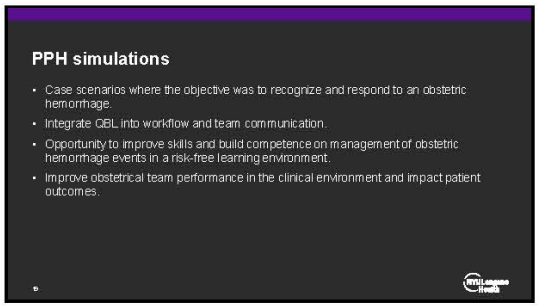

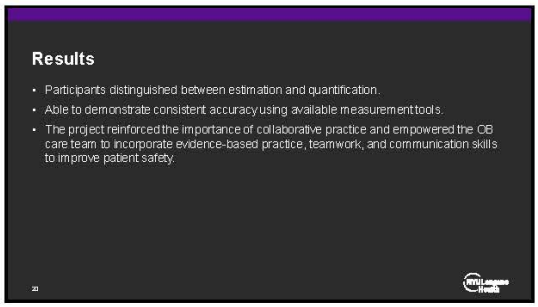

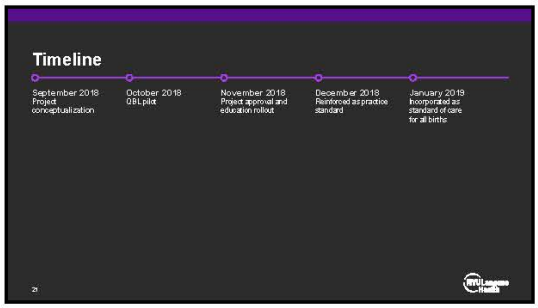

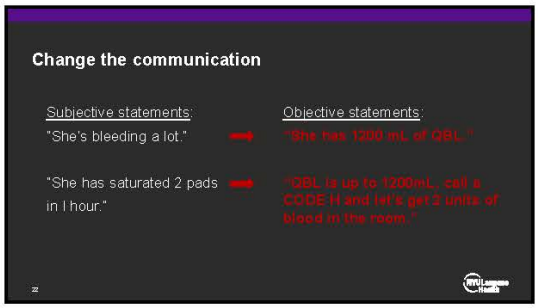

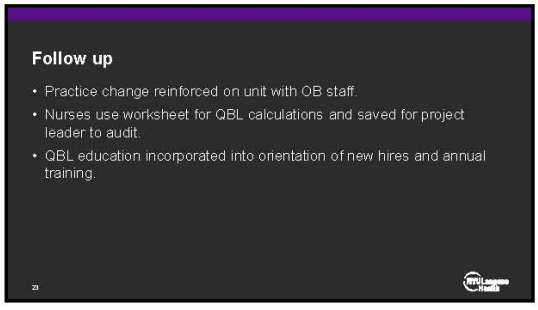

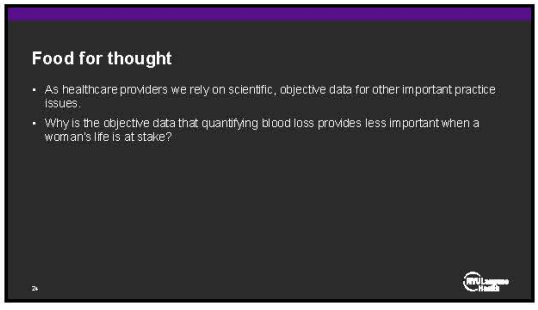

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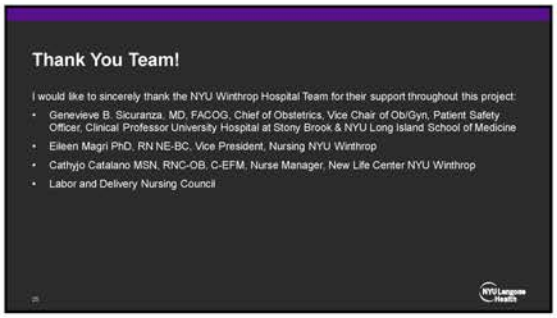

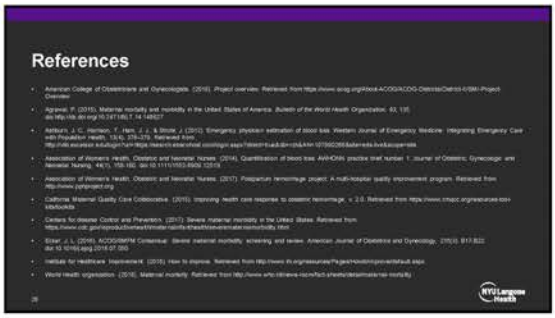

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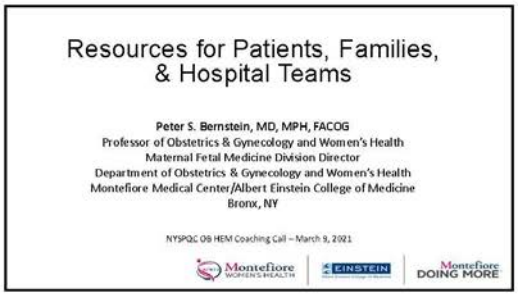
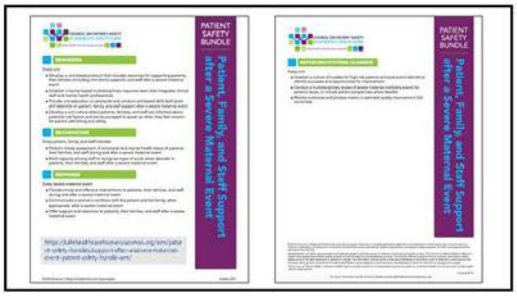
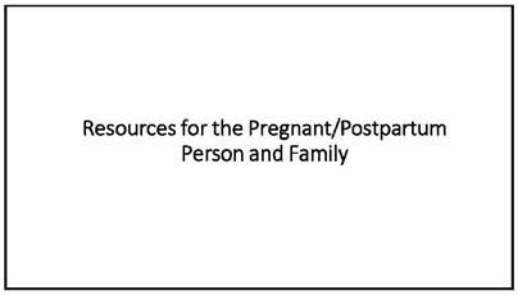
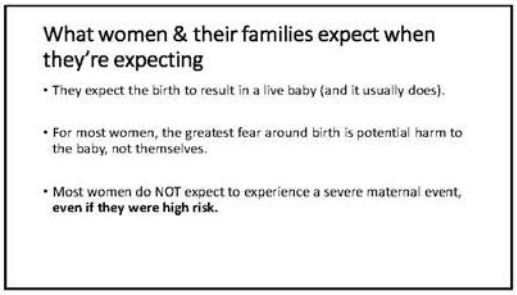
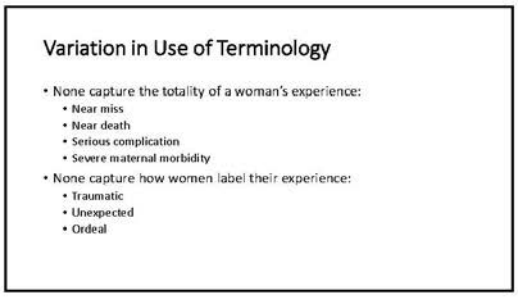
DRIVER : RESPONSE

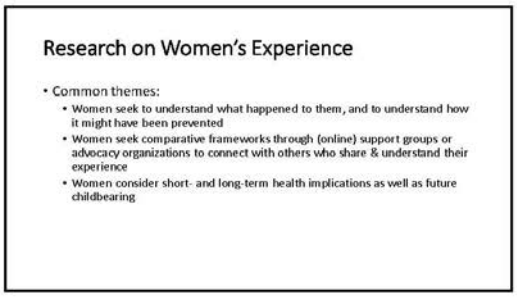












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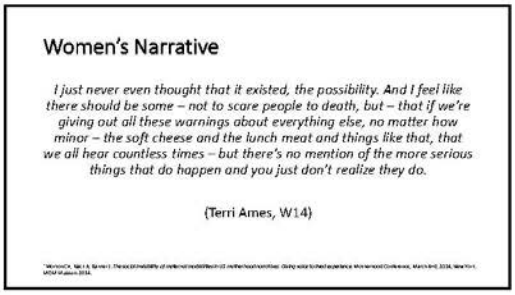

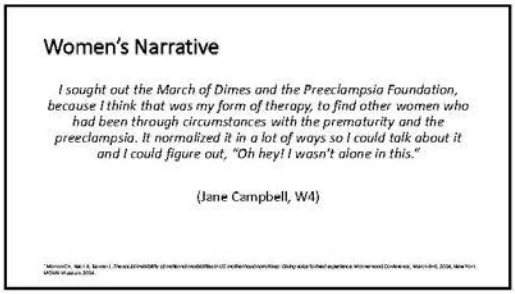

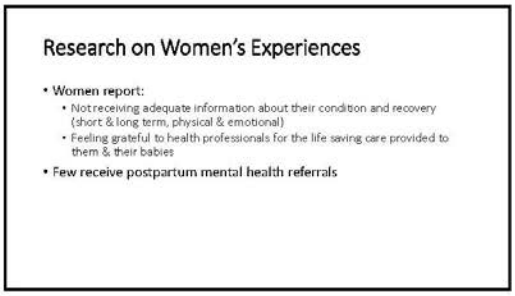

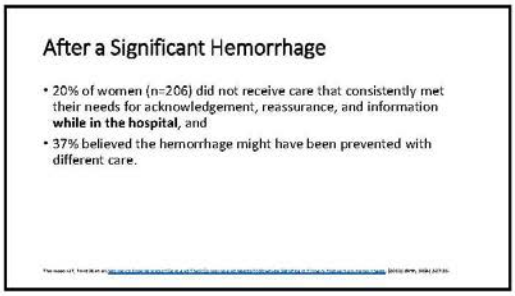

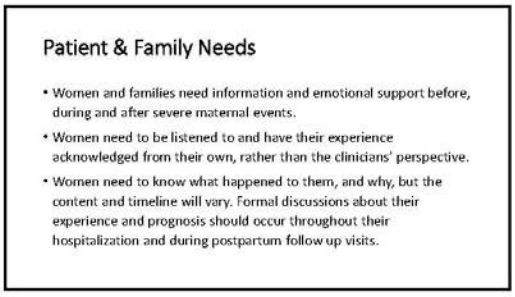

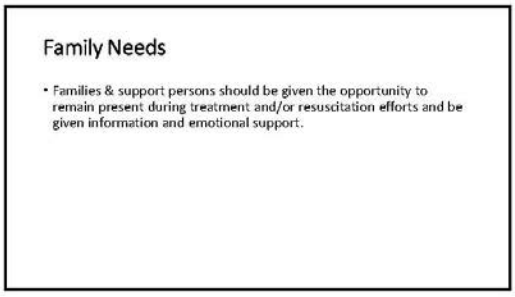

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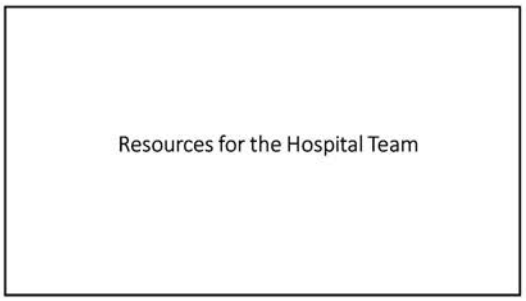
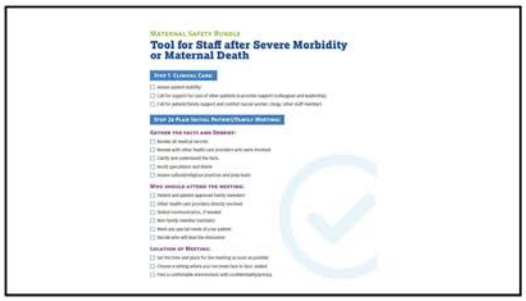
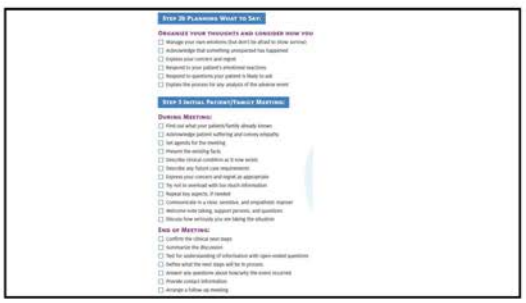
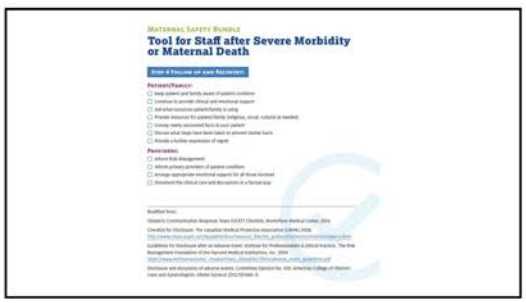
DRIVER : RESPONSE









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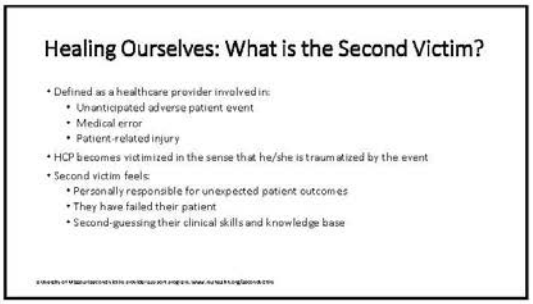

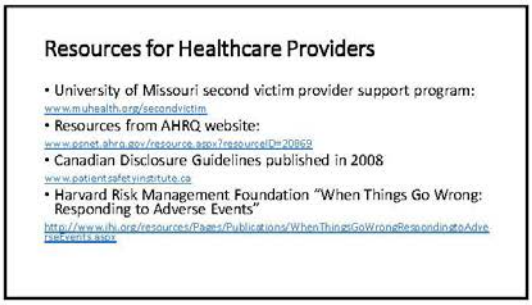

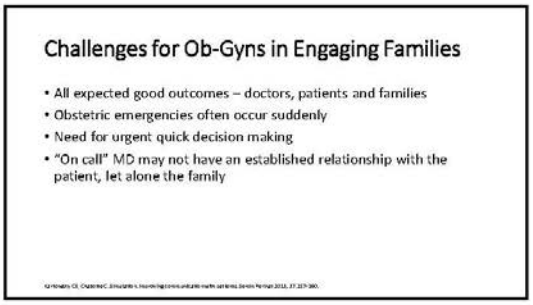

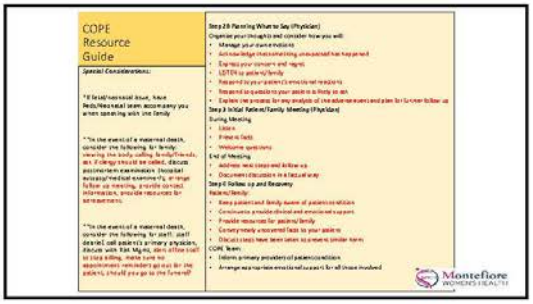

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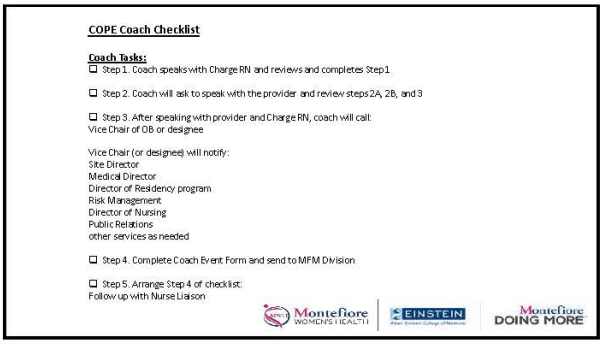

COPE Coach Checklist

Coach Tasks:

☐ Step 1. Coach speaks with Charge RN and reviews and completes Step 1.

☐ Step 2. Coach will ask to speak with the provider and review steps 2A, 2B, and 3

☐ Step 3. After speaking with provider and Charge RN, coach will call:
Vice Chair of OB or designee

Vice Chair (or designee) will notify:
Site Director
Medical Director
Director of Residency program
Risk Management
Director of Nursing
Public Relations
other services as needed

☐ Step 4. Complete Coach Event Form and send to MFM Division

☐ Step 5. Arrange Step 4 of checklist:
Follow up with Nurse Liaison

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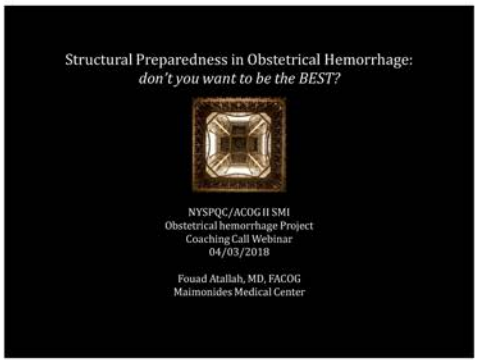
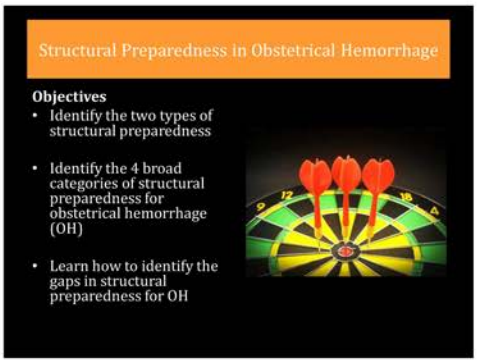
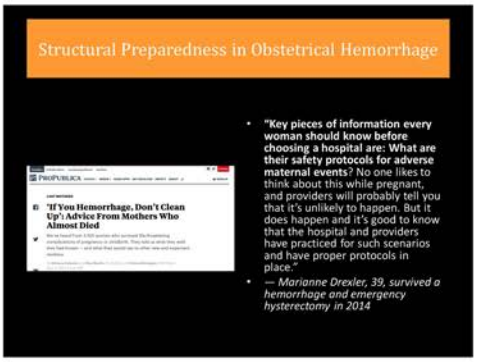
Structural Preparedness in Obstetrical Hemorrhage: don't you want to be the BEST?

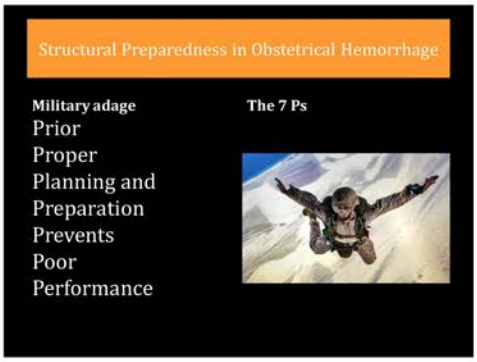
Presenter: Fouad Atallah, MD, FACOG

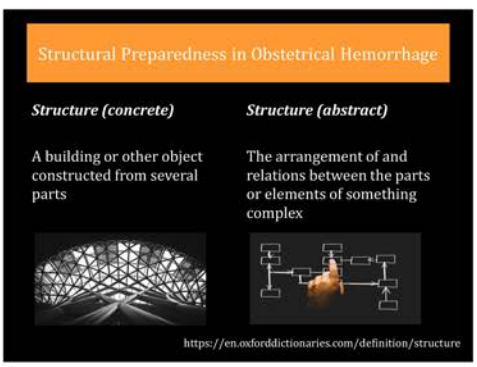
DRIVERS: READINESS, REPORTING AND SYSTEMS LEARNING

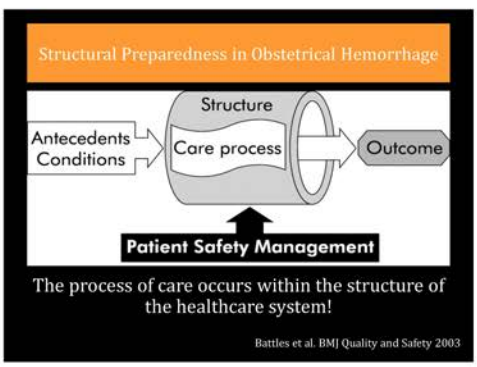












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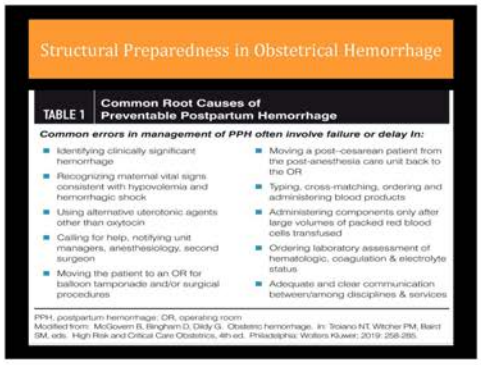
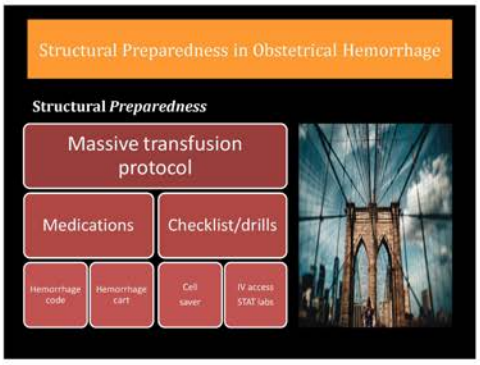
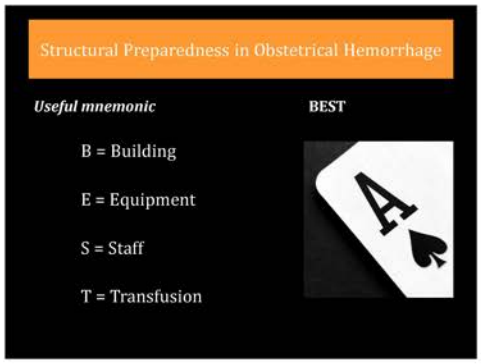
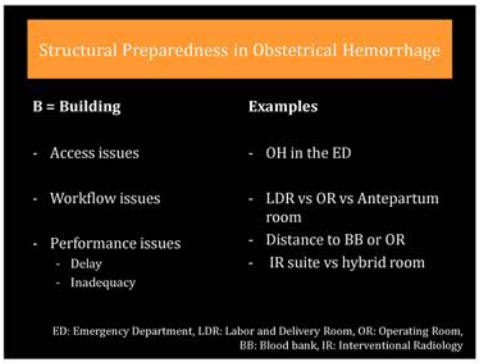
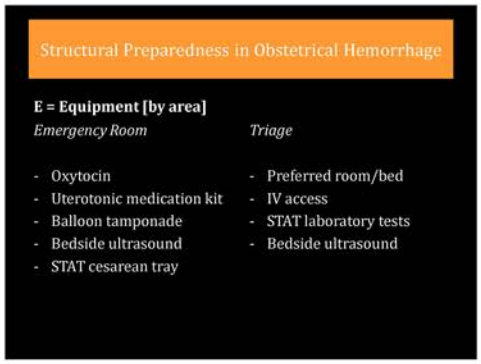
DRIVERS: READINESS, REPORTING AND SYSTEMS LEARNING







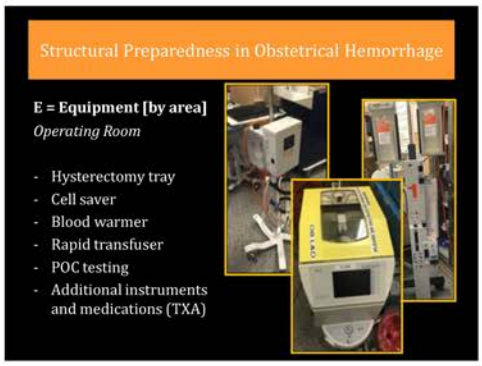


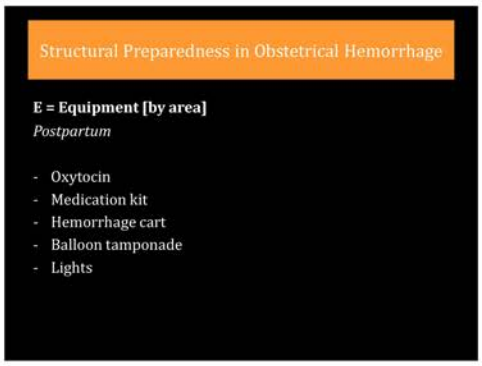


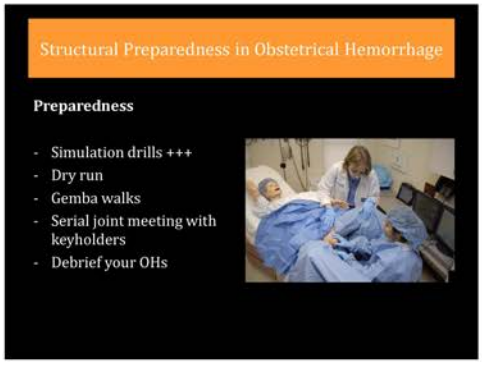
Structural Preparedness in Obstetrical Hemorrhage: don't you want to be the BEST?

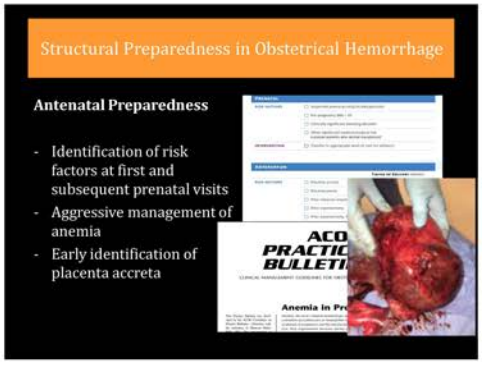
Presenter: Fouad Atallah, MD, FACOG

DRIVERS: READINESS, REPORTING AND SYSTEMS LEARNING









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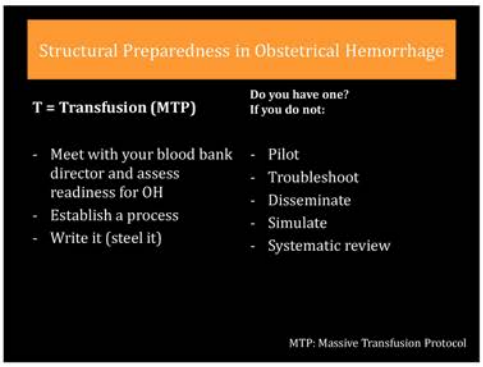

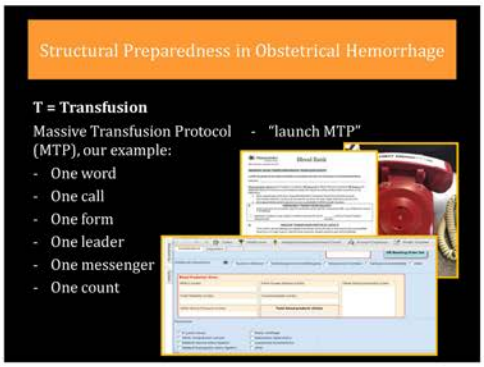

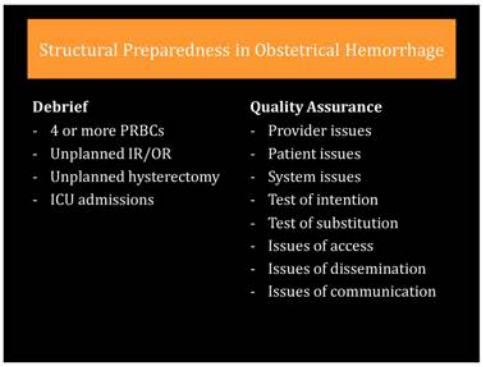

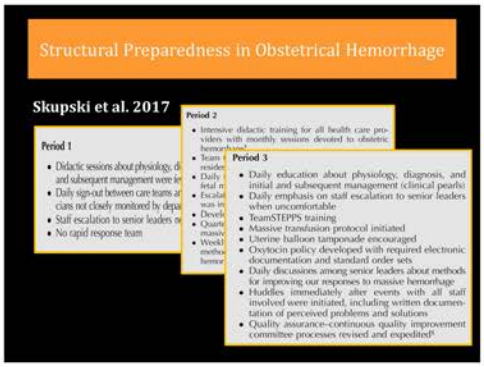

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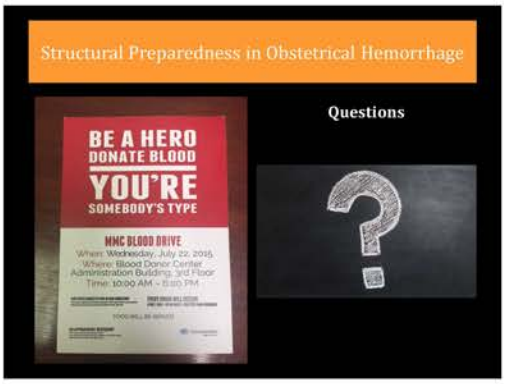
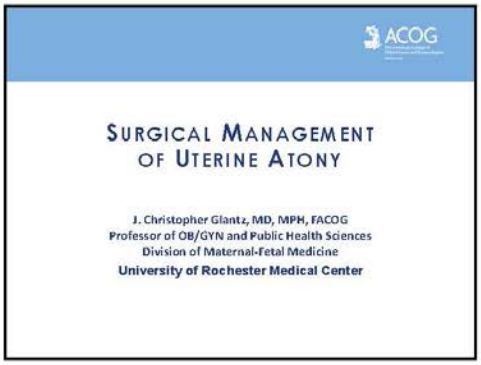
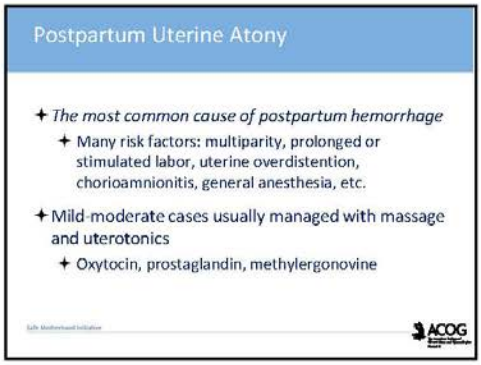


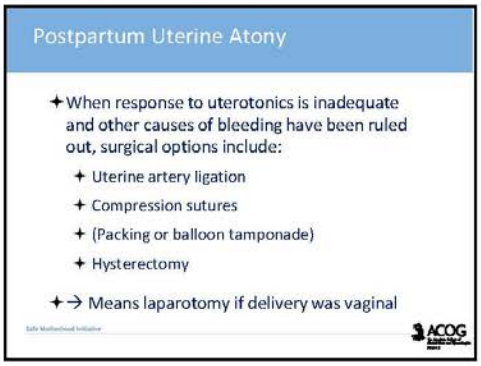
Surgical Management of Uterine Atony

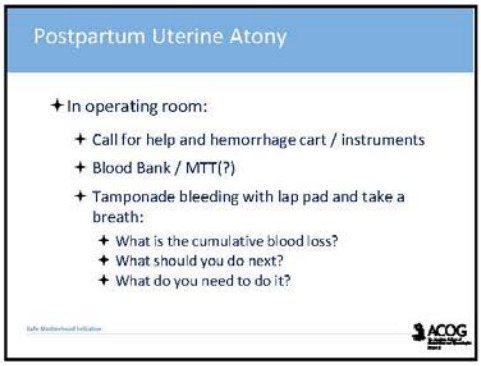
Presenter: J. Christopher Glantz, MD, MPH, FACOG

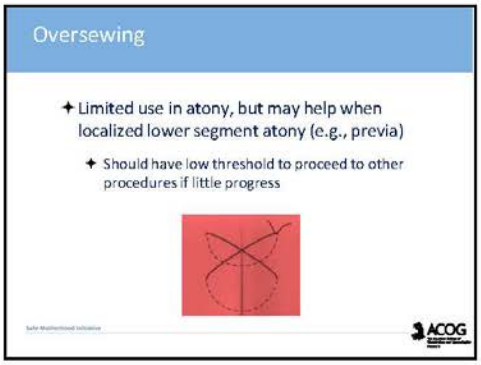
DRIVER : RESPONSE

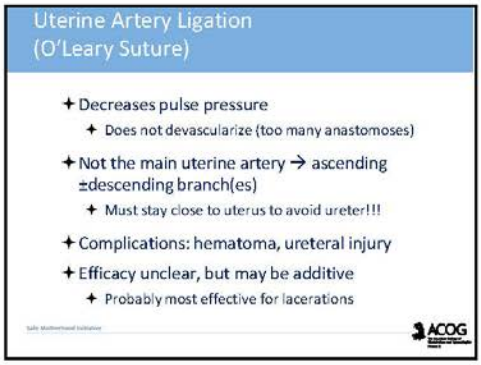










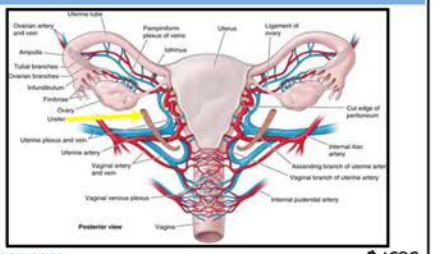


Surgical Management of Uterine Atony

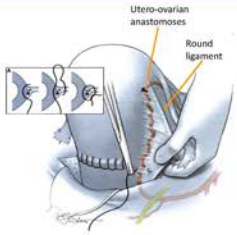
Presenter: J. Christopher Glantz, MD, MPH, FACOG

DRIVER : RESPONSE

Pelvic Anatomy



Technique of Uterine Artery Ligation



- Palpate uterine vessels and pull broad ligament laterally to create avascular space
- Needle medial to vessels, through myometrium
  - Above junction of cervix
  - Avoid posterior structures!
- Needle continues around artery and back through broad ligament
- Repeat on other side prn
- Can do same on utero-ovarian anastomoses prn

Image from Operative Obstetrics (Gillstrap & Cunningham)

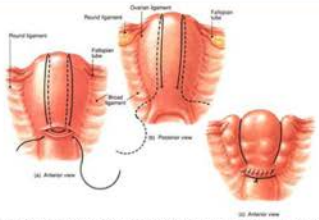
Hypogastric (Internal Iliac) Artery Ligation

- 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)

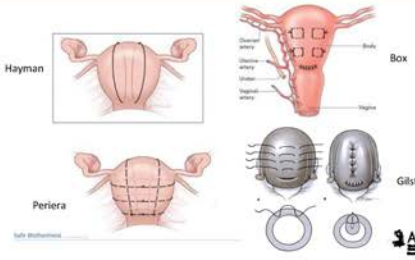
- Sutures around/through the uterus to compress or tamponade bleeding vessels
- B-Lynch most common
  - First reported in 1997: successful in 5 of 5 women
    - Reported success varies from 75% to 95%
  - Many variations on the theme
  - Complications: failure, necrosis, infection, sewing the cervix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

B-Lynch



Thick suture, front & back, manually compress the uterus while suture tied

Theme and Variations



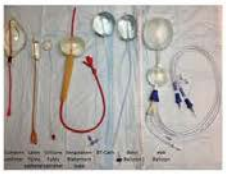
Surgical Management of Uterine Atony

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

DRIVER : RESPONSE

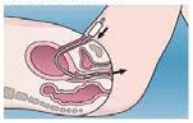
Balloon Tamponade

- Not "surgery" per se
  - Has replaced uterine packing
- Inserted into uterine cavity and inflated with saline
  - Separate lumen for drainage
- Early versions used Foleys, but most common current version is the Bakri
  - Also ebb and BT-Cath systems



Balloon Insertion

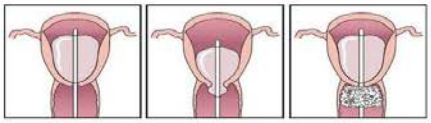
Transabdominally: pull hub out through the cervix and vagina to draw the balloon through incision into uterus; inflate once the uterus is closed



Transvaginally: use ring or packing forceps to introduce; may use ultrasound guidance; inflate with ≈500 cc of fluid; does bleeding slow/stop?

Connect drainage port to collection bag and monitor output

Balloon Placement



Correct | Too low | Supported by vaginal pack

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
  - Uterotonics → 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 (amputate?)
  - Limited exposure (esp. deep in pelvis)
  - Edema → friable 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 hyst?
  - Subtotal or total?

Hysterectomy

- Handle With Care: fragile tissues
- Extra clamps, many small bites, avoid traction/twisting
- Double ties (loop + transfixion)
  - Tie slowly to avoid cutting through tissue
  - Meticulous hemostasis
- Gentle retraction of bladder and broad ligament
- Visualize ureter if possible
  - Retrofill bladder (versus cystotomy) if uncertainty about integrity

Surgical Management of Uterine Atony

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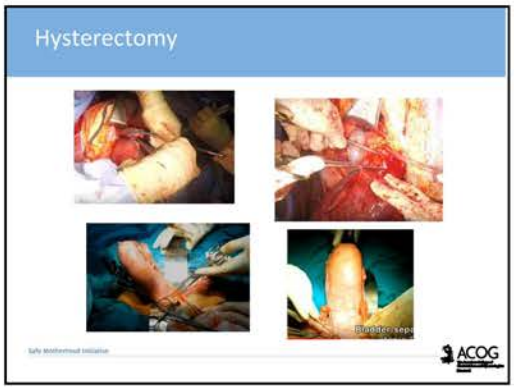
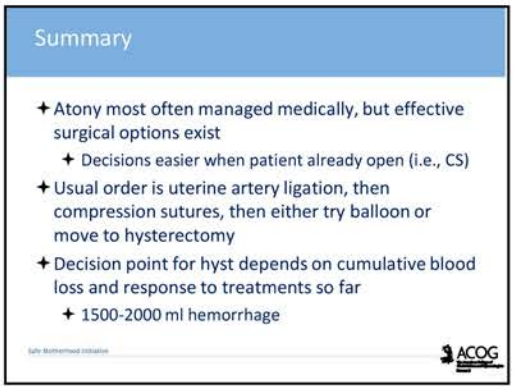
DRIVER : RESPONSE





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.

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DRIVER
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Contents

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Recognition and Prevention

DRIVER
Recognition and Prevention

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DRIVER
Reporting/Systems Learning

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 #8672)
Lab Requisition during Massive Transitional 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: 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 (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 (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 (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: Blood: Massive Transfusion Protocol (MTP)

Primary Sources

Fung, AABB Technical Manual, 18th Edition, 2017

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).

Crouse Hospital: Blood: Massive Transfusion Protocol (MTP)

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.

Suggested Baseline Testing - In Order of Draw **Order at start of hemorrhage**		
1	Arterial blood gas (ABG)	syringe on ice
2	PT, PTT, fibrinogen	1 blue tube, completely full
3	Lytes, Ionized calcium, and glucose	1 dark green tube-lithium heparin or may use ABG syringe
4	CBC	1 lavender tube
5	Blood type and crossmatch	if not done previously; 1 pink top tube

Testing During Event - In Order of Draw **Consider this every 30- 60 minutes**		
1	Arterial blood gas (ABG)	syringe on ice
2	PT, PTT, fibrinogen	1 blue tube, completely full
3	Lytes, Ionized calcium, and glucose	1 dark green tube-lithium heparin or may use ABG syringe
4	CBC	1 lavender tube
5	D-dimer if DIC is suspected	1 lavender tube

➢ **SUGGEST REPEAT LABORATORY TESTING AFTER 5-7 UNITS OF RBCS**

Component Usage Guidelines

Consider When:	Component	Dose	Expected Increase in Values
Uncontrolled bleeding (>1500 ml loss) regardless of initial Hgb/Hct	Red cells Use a blood warmer for infusion > 100 ml/min	As needed to maintain adequate oxygenation and Hgb > 7	1 gm hemoglobin per unit
Continued Bleeding and an INR ≥ 1.5	Plasma	2-4 units (10-15 ml/kg)	25% of factors
Continued Bleeding and a Plt count < 80,000 or microvascular bleeding	Platelets	1 dose is one pheresis	30,000 to 60,000 per dose
Bleeding and Fibrinogen < 100mg/dL	Cryoprecipitate	1-2 units/10 Kg. Delivered in pool of 5 units	50 mg/dL
Uncontrolled Bleeding	Tranexamic Acid (TXA)	1 gm IV over 10 minutes - followed by a maintenance dose of 1 gm infused over 8 hours	Call Pharmacy at 7631 for consultation
Anticoagulant Reversals and TXA	Contact the pharmacy (ext 17631, option 1) for questions		

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

Kaleida Health POLICY	Title: Massive Blood Transfusion Policy (MBTP) - Adult Owner: Transfusion Services	# CL.31 Issued: 7/5/16
Keywords: MBTP, transfusion, massive transfusion		

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**

A. Communication and Responsibility: Department of Surgery, Emergency Medicine, Obstetrics and Gynecology, Nursing, Transfusion Service/Blood Bank, Operating Rooms and Intensive Care.

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

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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.

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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 uncrossmatched 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 platelet pheresis

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.

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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.69 – 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

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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

Holcomb, JB, et al., Transfusion of Plasma, Platelets, and Red Blood Cells in a 1:1:1 vs a 1:1:2 Ratio and Mortality in Patients With Severe Trauma, The PROPPR Randomized Clinical Trial JAMA. 2015;313(5):471-482. doi:10.1001/jama.2015.12.

Smith, CE, et al., Massive Transfusion Protocol (MTP) for Hemorrhagic Shock, ASA Committee on Blood Management. Resources from the American Society of Anesthesiologists, Retrieved from http://www.asahq.org/resources/resources-from-asa-committees/committee-on-patient-blood-management/mtp-for-hemorrhagic-shock on July 1, 2015.

CL.53 – Adult/Pediatric Transfusion Therapy
PED.31 – Massive Blood Transfusion Policy Pediatric Trauma Patients
PT.1 – Informed Consent for Blood Product Transfusion
SS.69 – Blood/ Blood Products: Warming Devices

Version History:

Effective Date:	Reviewed/ Revised
11/13/17	Revised
9/12/16	Reviewed no changes

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Kaleida 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)

Saratoga Hospital	
Title: Massive Tranfusion Protocol	**Last Review Dates:** 12/31/15, 5/5/16, 5/30/17, 11/15/19
Origination Date: 12/2/2008	**Last Revised Date:** 4/25/18, 9/13/18, 2/8/19, 10/1/20
Manual: Nursing Practice Manual	**Replaces Policy**: N/A
Document Owner: Director of Emergency Dept, Director of ICCU, Manager, Blood Bank Supervisor	**Page:1 of 6**
Final Approval: Chief Nursing Officer/VP Blood Bank Laboratory Medical Director	

Scope: Saratoga Hospital

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.

Saratoga Hospital: Massive Transfusion Protocol (MTP)

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:

Product	Sets					
	1	2	3	4	5	6
RBC-LR	4	4	4	4	4	4
Plasma	2	2	2	2	2	2
Plateletpheresis		1		1		1
Pooled Cryo			2			2

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-LR 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, NO.2; April-June 2004.
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- Managing Massive Transfusion: Clinical Perspective: John R. Hess, MD, MPH, FACP, FAAAS; American Red Cross Presentation; 9/10/08
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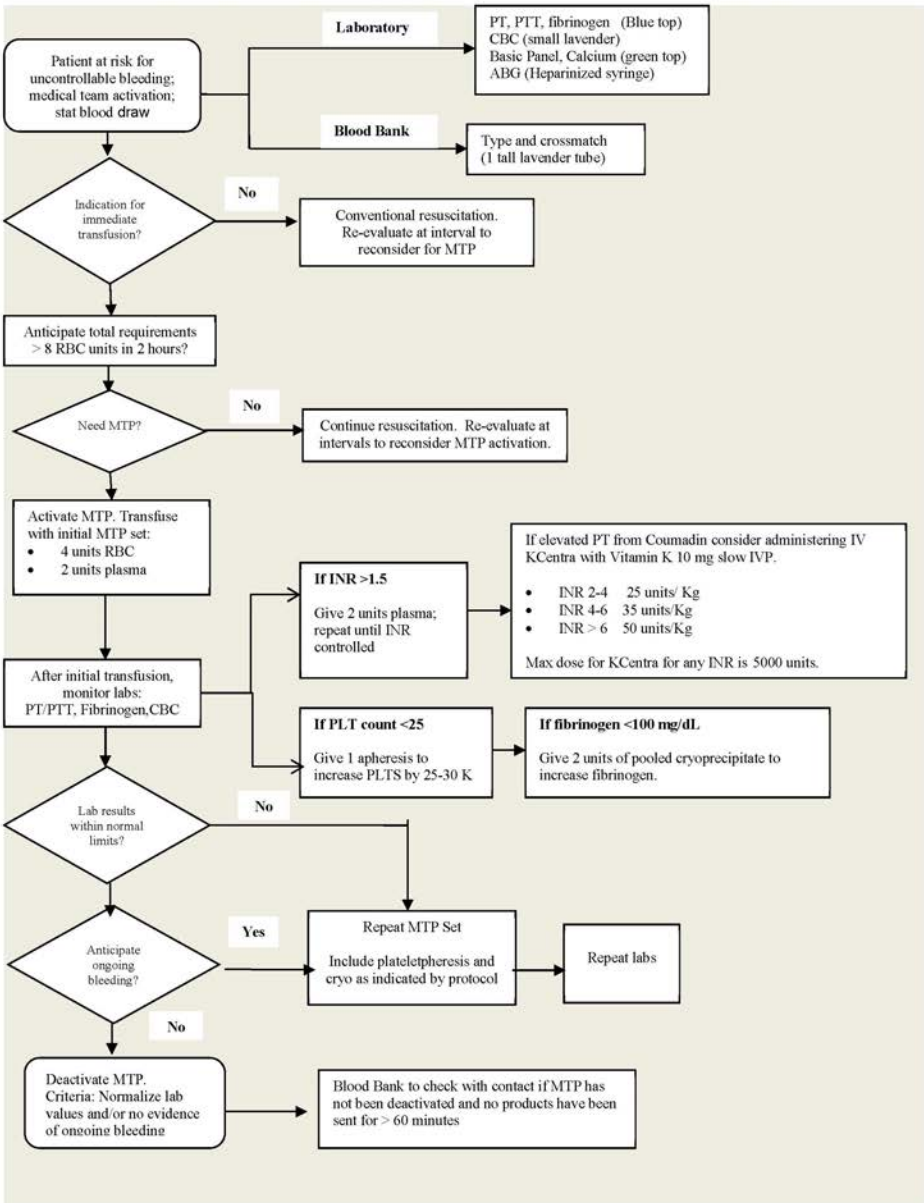
- Albany Medical Center, Albany NY. "*Blood Bank: Massive Transfusion Protocol*" 8/15/17.

Saratoga Hospital: Massive Transfusion Protocol (MTP)

- American Association of Blood Banks; Technical Manual, current edition.
- Wiegand, D.L. (2017), AACN Procedure Manual for High Acuity, Progressive, and Critical Care, 7th ed. 1088-1099.

Appendix 1: Transfusion Algorithm:



Saratoga Hospital: Massive Transfusion Protocol (MTP)

Emergency Release of Blood

Blood is to be transfused immediately:

- **Contact Blood Bank (8458) directly or *Vocera* and request emergency release.**
- **Provide patient name, DOB and HO# (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 anestheisologist.
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.
4. Initiate the "*Emergency Release/MTP Tracking*" form.
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 plateletpheresis
   - 4 pooled cryoprecipitate products (thaw only when requested).
9. Order MTPR in the computer system to document request for MTP. Use canned comment "BMTPPR" 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:

Product	Sets					
	1	2	3	4	5	6
RBC-LR	4	4	4	4	4	4
Plasma	2	2	2	2	2	2
Plateletpheresis		1		1		1
Pooled Cryo			2			2

NOTE: Provider may request changes to the MTP set. Document any requested changes on the Emergency Release Tracking Sheet.

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 transfusion 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 of units that have not been screened for antigens.
   b. Issue uncrossmatched, 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

MOUNT SINAI SOUTH NASSAU
POLICY & PROCEDURE

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-267 Blood Transfusion: Administration of PRBC, FP, and Blood Components, and Procedure for Warming Blood OF-ADM-020 Laboratory Policy & Procedure: TRM2.1.31 *Emergency Transfusion* Rapid Infuser Policy PF-PCS-248 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 physiologically-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

1

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

- 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/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
- 1 unit RBC's increases: Hgb 1gm/dl, Hct 3% *(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 70kg adult by 20-40 20–40 x 10^9/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 (VIII, VWF, XIII) with minimal volume

ADDITIONAL AGENTS:

Tranexamic Acid (TXA)

An antifibrinolytic that competitively inhibits activation of plasminogen; used as a hemostatic 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 hyperfibrinolysis on TEG (Thromboelastography) or predictors of fibrinolysis such as hypothermia (t less than 36.0), acidosis (pH less than 7.2), thrombocytopenia (plts less than 200) or coagulopathy (INR greater than 1.3 or PTT 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, Cofact, 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:

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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)
- Must manifest persistent signs of hypo perfusion:
  - 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 overhead 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)

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   c. Dedicated trained blood runners (2) *(ED unit clerk and F1 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.
   b. Obtain physician signature and place patient label on 1 PINK "Emergency Release of Uncrossmatched Blood" form
   c. Select MTP on "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. Assess and/or obtain IV access (2- large bore IV's 16 or 18 gauge)
   b. Monitor and record vital signs every 15 min or more frequently if required
   c. Page surgery 800 or 143 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 pack affording 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 transfused 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 blue transfusion slips 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.

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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 hematocrits, platelets count, (no WBC or differential necessary), electrolytes, PT/PTT, INR, ABG, Fibrinogen levels, and any other relevant tests.
   e. Tranexamic AcidTXA should be administered 1 gram in 100ml of NS over 10 minutes, then repeat 1 gram over 8 hours in 250ml of NS

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

   f. ABG, ionized Calcium, CBC, BMP, PT/PTT/Fibrinogen hourly until MTP discontinued.
   g. Consider Kcentra if PT remains abnormal.
      a. Team leader may consider using:
         i. Rapid Infuser per *Rapid Infuser Policy*
            1. When the team leader requests use of the Level 1 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 competency 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 uncrossmatched blood form from the runner 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.

l. **<u>TERMINATION OF MTP PROTOCOL</u>**

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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/blood products should be returned to blood bank by the runner when no further transfusion is indicated as soon as possible.
e. The blood/blood products must be returned 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:**
   a. 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:**
   a. Pediatric patients that are 50kg 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 HS neg, CMV neg blood at 15ml/kg**
      And only AB fresh frozen plasma or AB cryoprecipitate if necessarily.

o. **Post MTP Clinical Considerations:**
   a. 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

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v. Hypocalcaemia
vi. Hypomagnesaemia
vii. Transfusion-associated circulatory overload (TACO)

e. Monitor the patient for signs of **delayed complications** following massive transfusion, including but not limited to:
   i. Systemic Inflammatory Response Syndrome (SIRS)
   ii. Bacterial Sepsis
   iii. Transfusion related acute lung injury (TRALI)

f. 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.*

g. Obtain blood work as ordered

h. Monitor input and output status
   i. Note: particular focus in patients with known history or strong potential for cardiac disease.

i. Monitor patient's temperature and institute warming measures as ordered by team leader.

j. 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 /Blood Product wastage (Y,N) Explain
10. RHOGAM administered if indicated? (Y,N) Explain
11. TXA, K-CENTRA, Novo-Seven or DDAVP Administered? (Y,N) Explain
12. Were Labs ordered as recommended and results followed? (Y,N)
13. Complications: TACO,TRALI, HEMOLYSIS, OVER TRANSFUSION; THROMBOSIS RELATED- MI,CVA,TIA
14. Ratio of PRBC:FP:PLATELETS; Totals of EACH
15. Amount of Crystalloids; 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**
2. Duchesne JC, Hunt JP, Wahl G, et al. Review of current blood transfusions strategies in a mature level I trauma center: were we wrong for the last 60 years? **J Trauma. 2008; 65:272-278**
3. Sinha R, Roxby D, Bersten A. Experience with a massive transfusion protocol in the management of massive hemorrhage. Transfusion Medicine. **British Blood Transfusion Society 2013:23:108-113**

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

REVIEWS/APPROVALS:

Original Approval	1/16 Oversight Committee
Reviewed without Revisions	1/18
Reviewed and Approved	5/18 Oversight Committee, 6/18 Medical Board
Reviewed and Approved	01/2020 Oversight Committee, 01/2020 Medical Board

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)

Northwell Health

Long Island Jewish Forest Hills

POLICY/GUIDELINE TITLE: 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)	**ADMINISTRATIVE POLICY AND PROCEDURE MANUAL**
POLICY #: 100.37	**CATEGORY:** Administrative
System Approval Date: 6/21/18 **Site Implementation Date:** 7/25/18	**Effective Date:** 09/2008 **Last Reviewed/Approved:** 02/2017
Prepared by: Office of Quality Management Office of Legal Affairs	**Notations:** Previously: 100.37 Entitled: "Refusal of blood transfusion or blood products for adults, minors, and pregnant women"

GENERAL STATEMENT of PURPOSE

The purpose of this policy is to outline a process based on best practice for treating patients (adults, minors and pregnant women) who refuse or wish to avoid medically indicated transfusions of blood or blood products. This policy sets forth the requirements to assist the health care team to provide clinically appropriate care and alternative treatments for Blood Avoidant Patients.

POLICY

It is the policy of Northwell Health to respect the wishes of all patients with capacity to make health care decisions involving the right to forgo or refuse treatment including blood transfusions or blood products and other potential life sustaining interventions. It is also the policy of Northwell Health to respect the wishes of a person authorized to make decisions on behalf of a patient who lacks decision making capacity, to avoid blood or blood products. The attached guidelines provide recommendations to achieve these goals.

SCOPE

This policy applies to all Northwell Health employees, as well as medical staff, volunteers, students, trainees, physician office staff, contractors, trustees and other persons performing work for or at Northwell Health; faculty and students of the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell conducting research on behalf of the Zucker School of Medicine on or at any Northwell Health facility; and the faculty and students of the Hofstra Northwell School of Graduate Nursing and Physician Assistant Studies.

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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 avoidant 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 Consultant Team, contact the local Blood Bank Director or designee, Pharmacy and/or Hematology service 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 who is the parent of a child or who is 16 years or older and living independently from his or her parents or guardians.

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 on another document containing the required components.

Jehovah'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."

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)

Robert J. Goebert--516-445-0098(C) 516-742-1691(H) Nassau County HLC
Gerald Renner--631-495-7749(C) 631-581-3196(H) Suffolk County HLC
Paul Peterson--917-915-2399(C) 718-776-2399(H) NY City HLC (5 boroughs)
William Woods--917-592-5667(C) 631-926-3309(H) Mid-Hudson Region

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 to REGULATIONS and/or OTHER RELATED POLICIES
- NY Public Health Law Article 29-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
- Rogers, D., Crookston, K. (2006). The approach to the patient who refuses blood transfusion.
  - Transfusion. 46, 1471-1477.
- Roback, J. (2011).Technical Manual of the American Association of Blood Banks, 17th Edition. American Association of Blood Banks: Bethesda, MD.

ATTACHMENTS
- Flowchart for Cardiothoracic Surgery
- Flowchart for Orthopedic Surgery
- Blood Education Form

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FORMS

- VD003 Informed Consent for Blood Avoidance, Blood Refusal and Blood Management

APPROVAL:	
Northwell Health Policy Committee	5/24/18
System PICG/Clinical Operations Committee	6/21/18

Standardized Versioning History:
*= Northwell Health Policy Committee Approval; ** =PICG/Clinical Operations Committee Approval
8/12/08* 09/25/08**
1/10/12* 01/19/12**
11/29/12* 12/13/12 **
12/16/16 provisional*
02/7/17❖ Expedited 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)

Attachment A

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 #VD003 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

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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 Witnesses Regional Liaisons may be included in discussions with the patient's consent.

g. 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 Avoidant 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 objection 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 Consultant Team and Jehovah's Witnesses Regional Liaisons should be called. Parents / 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

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)

the Minor's death or seriously jeopardize the Minor's health. The parent / 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 parent/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 #VD003 Informed 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 for herself.

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 #100.23 Informed Consent (Including Medical Decision 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)

blood, the patient's decision should be followed and alternative treatments should be considered and provided if appropriate.

f. 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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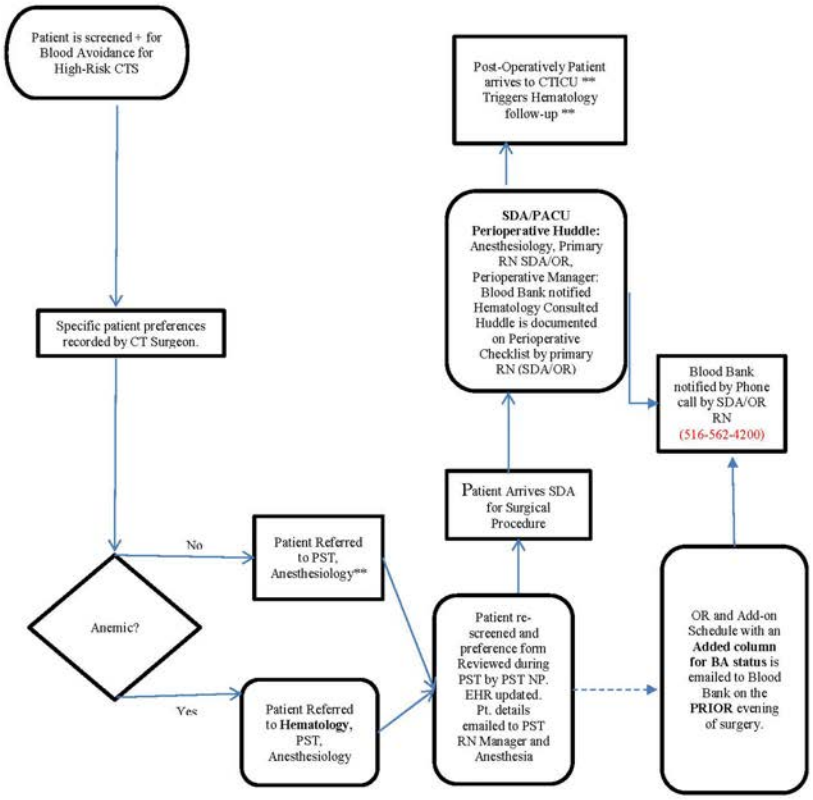
Orthopedic (Elective) and CT Surgery Blood Avoidance Process Flowchart



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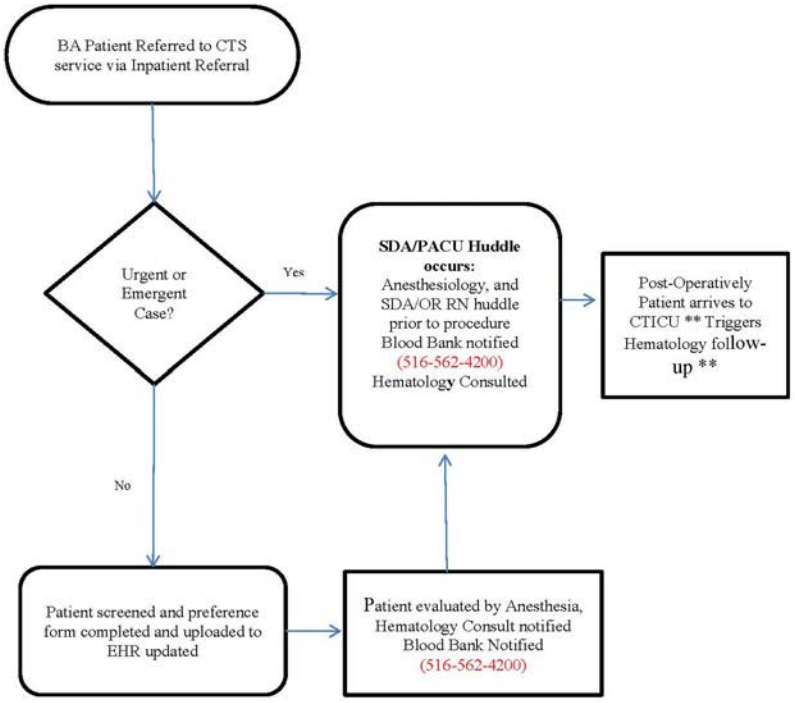
Orthopedic (Elective) and CT Surgery Blood Avoidance **INPATIENT PROCESS: URGENT/NON-URGENT**



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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)

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.
2. Anesthesia Provider confirms review for Anesthesia Risk Alert Categories.
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.

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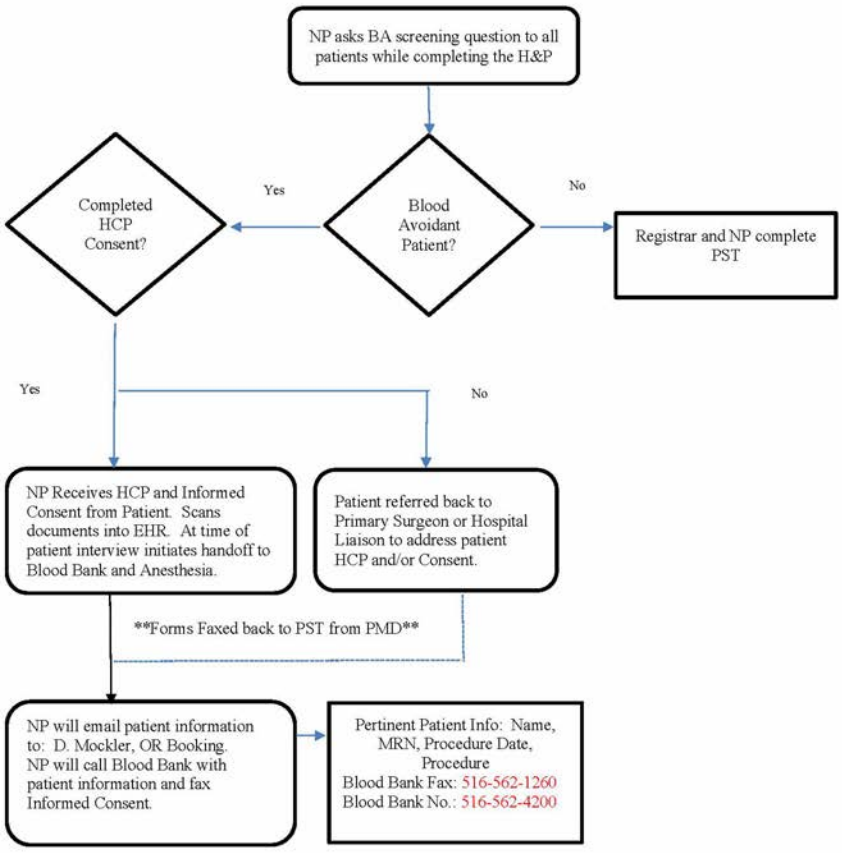
Long Island Jewish Forest Hills: Blood Avoidance Program: For Patients Refusing Blood Transfusions and Patients Wishing to Avoid the Use of Blood and Blood Products (Adults, Minors, and Pregnant Women)

FOR INTERNAL USE ONLY FOR INTERNAL USE ONLY



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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)

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.

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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)

- **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 quoi, 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 commands. 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) 516-742-1691(H)
  - Suffolk County HLC - Gerald Renner--631-495-7749(C) 631-581-3196(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:

http://www.siuh.edu/Our-Services/Clinical-Services/Bloodless-Medicine/FAQs.aspx (SIUH Blood avoidance Medicine FAQ).
http://www.hopkinsmedicine.org/bloodless_medicine_surgery/faqs.html (Johns Hopkins Medicine Blood avoidance Medicine FAQ).
https://www.jw.org/en/ (Jehovah's Witnesses website).

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

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

Category I-Minor blood fractions (contain specific elements from the four elements of blood):	Will Accept	Will Not Accept
• **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.		
• **Erythropoietin (except Aranesp)-** stimulates bone marrow to produce red blood cells.		

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VD003 (5/25/18)

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

• **Fibrin FSealant-** A formulation used to create a fibrin clot.		
• **Rh-immune globulin (RhoGAM)-** An immunoglobulin (antibody) derived from pooled plasma.		
• **Human Immunoglobulin-** Substance made from human blood plasma. The plasma, processed from donated human blood, contains antibodies that protect the body against diseases.		
• **Prothrombin Complex Concentrate (Kcentra)-** Protein complex that promotes clot formation by increasing the levels of coagulation		
• **Anti-inhibitor Coagulant Complex (FEIBA)-** Promotes and restores Thrombin generation.		
• **Cryoprecipitate-** Plasma-derived material containing various clotting factors that aid in the reduction of bleeding associated with uremia, liver disease, disseminated intravascular coagulation, etc.		
• **Factor VIII/vonWillebrand (Humate-P)-** Plasma derived protein that is obtained from pooled human plasma and used to promote platelet aggregation and adhesion.		
Category II-Synthetic protein elements of blood: (Does not contain human plasma)	**Will Accept**	**Will Not Accept**
• **Factor VIIa (NOVOSEVEN)-** This is the recombinant or synthetic form of Factor VII (protein that causes blood to clot).		
• **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.		
• **Factor IX Recombinant-** A protein substance in blood plasma that is essential for the clotting of blood.		
• **Factor XIII Recombinant (Tretten)-** Product that routinely prevents bleeding in patients with rare genetic clotting disorder (also known as congenital Factor XIII-a subunit deficiency).		
Category III-Intentionally Removed From This List - Does not contain human blood products		
Category IV-Procedures involving patient's own blood:	**Will Accept**	**Will Not Accept**
• **Cell Saver-** continually processes and recirculates the patient's own blood during surgery. Shed blood is suctioned from the wound, centrifuged, washed, mixed with an additive/anticoagulant solution and then re-infused via a filter (leucocyte depleted) as required.		

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VD003 (5/25/18)

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

4. **Explanation of Medications that contain no element of blood.** I understand that the following products contain no elements of blood and may be used as determined medically appropriate.
   - Erythropoietin–recombinant (e.g. Aranesp), DDAVP, Vitamin K, Amicar, and Tranexamic Acid
5. **Understanding of this form.** I confirm that I have read this form, 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/Agent/Relative/Guardian* (Signature)	Date / Time	Print Name	Relationship if other than patient
Telephonic Interpreter's ID # **OR**	Date / Time		
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 unemancipated minor under the age of 18 or is otherwise incapable of signing.

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/agent/relative/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
VD003 (5/25/18)

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 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 (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

EXAMPLE

BLOOD PRODUCT ACCEPTANCE LIST **PATIENT ID:** _____

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.

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

Signature: _____ Date: _____ Time: _____

Safe Motherhood Initiative

ACOG The American College of Obstetricians and Gynecologists District II

Revised February 2019

White Plains Hospital: Patient who decline Blood Products

EXAMPLE

BLOOD PRODUCT EDUCATION FORM

WHERE TO ORDER	COMPONENT	CONTENT	EXPECTED EFFECT
Blood Bank	Packed Red Blood Cells	Contains red blood cells and a small amount of plasma	250 ml: Increases hematocrit by 3-4% and hemoglobin by 1 g/dl
Blood Bank	Fresh Frozen Plasma (FFP)	Plasma which contains clotting factors, albumin and immunoglobulins	250 ml: Increases fibrinogen, normalization of PT, PTT
Blood Bank	Platelets	Platelets and plasma	250 ml: Increases platelets
Blood Bank	Autologous Blood	Donated by patient for self-use	Need a high/normal hematocrit and usually is not used in emergencies
	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/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	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
	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	Autologus blood – Blood lost during procedure	Can return up to 250 ml IV in 3 minutes, devoid of plasma and platelets

Safe Motherhood Initiative

ACOG The American College of Obstetricians and Gynecologists District II

Revised February 2019

NEW YORK STATE Department of Health

New York State nyspQc Perinatal Quality Collaborative

BACK TO START OF TOOLKIT
BACK TO START OF SECTION

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 **Page 1 of 2**
TITLE: OBSTETRICAL ALERT

DATE OF ISSUE: 2/15 **APPROVAL:** Sandra McCarthy, MSOL, MSN, DNP, CNO
LAST REVIEW/REVISED: 3/20 **APPROVAL:** Marlane Zlotek, BSN, RN, Perinatal Unit Director
NEXT REVIEW: 3/22
FACILITIES COVERED: ☒ **AOMC** ☐ **AMS** ☐ **SJH** ☐ **IDMH**
OWNER(S): 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 ArNet for the most up to date version."

Arnot Ogden Hospital: Obstetrical Alert

POLICY #: OB.021 **Page 2 of 2**
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):

- ACOG Committee Opinion #590 March 2014 Reaffirmed 2016. Preparing for Clinical Emergencies in Obstetrics and Gynecology.

FORM(S):

Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

WESTCHESTER MEDICAL CENTER
Clinical Care: Policy and Procedure

	Manual Code: OB-001A	Page 1 of 13
SUBJECT: **Code Noelle: Obstetrical Hemorrhage**		
EFFECTIVE: 01/2016	__ **REVIEWED OR** _X_ **REVISED date**: 09/2020	
Applicable Campus: _X_ Poughkeepsie _X_ Valhalla	**Patient population:** _X_ Neonate ___ Pediatric _X_ Adult ___ Behavioral Health ___ Not applicable	
NOTE: The e-version of this document is the latest and the only acceptable one. If you have a paper version of it, you are responsible to ensure it is identical to the e-version. Printed material is considered to be uncontrolled documentation.		

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 Registered Nurse (RN) from Labor & 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 with 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/accrete/increate/percreta
- Pre-pregnancy BMI >50
- Clinically significant bleeding disorder
- Other significant medical/surgical risk
- Abnormal placentation
- Prior classical cesarean
- Prior myomectomy
- Uterine anomalies

Labor & Delivery (L&D) Admission:

- Prior cesarean, uterine surgery or multiple laparotomies
- Multiple gestation
- Grandmultip
- 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

	Manual Code: OB-001A	Page 2 of 13
SUBJECT: **Code Noelle: Obstetrical Hemorrhage**		
NOTE: The e-version of this document is the latest and the only acceptable one. If you have a paper version of it, you are responsible to ensure it is identical to the e-version. Printed material is considered to be uncontrolled documentation.		

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

Intrapartum:
- Chorioamnionitis
- Prolonged oxyticin 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)
- chorioamninitis
- Drug: terbutaline, magnesium sulfate, prolonged oxytocin use, general anesthesia
- Uterine inversion
- Fibroid 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 anticioagulation

POLICY STATEMENTS
1. Staff shall be trained on the risk factors, etiology and identification of Obstetrical Hemorrhage and their role 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)

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4. Quantification of blood loss (QBL), such as weighing, are significantly more accurate than estimate blood loss (EBL). QBL reduces the likelihood that clinicians will underestimate the volume of blood lost and delay early recognition and treatment.
5. A Code Noelle shall 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 Noelle, the patient shall be on a continuous cardiac/respiratory monitor.
9. During a Code Noelle, vital signs shall be assessed and documented, including Pulse, Respirations, 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 Noelle"**; 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 beeper (7am-6pm)
   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 Noelle Clear.
5. Debriefing with the MHT is advised after the Code Noelle 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 Attendings as needed.).
5. Identifies the need for Cell Saver.
6. Implements the use of the Bakri Balloon/tamponade if indicated.
7. OB Attending shall conduct a team debrief following a Code Noelle
8. Sign all verbal orders given during the emergency

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B. OB Resident:

1. Assess patient condition:
    a. Vital signs
    b. Urine output
    c. Identify hemorrhage stage, documents 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 Noelle/ 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 ROTEM. (Needs one Blue top tube with yellow Type and Screen slip ROTEM 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 have a Primary RN, and Recorder RN.
3. Communicate with Supervision and Charge RN from Antepartum/Postpartum Unit, for delegate 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

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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
4. Assess Vital Signs Q 5 minutes: pulse, respirations, BP, and oxygen saturation.
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 Noelle/ 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.
14. Administer crystalloid solution as ordered.
15. Administer medications as ordered by MD.
16. Administer blood products as ordered by MD and per WMC transfusion policy
17. Assist MD with Bakri Balloon if necessary.
18. Transport patient to OR.
19. Measure soaked chux, and weigh for blood loss estimation (1gm = 1ml 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

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).

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DEFINITION
Postpartum Hemorrhage (PPH):
Cumulative 24 hour blood loss of 1000ml or signs/symptoms of hypovolemia

- **Primary:** PPH occurs with 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
Revised:	6/2019, 8/2018

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Attachment 1

EXAMPLE

OBSTETRIC HEMORRHAGE

Risk Assessment Tables

LABOR & DELIVERY ADMISSION

	MEDIUM RISK	HIGH RISK
RISK FACTORS	☐ Prior cesarean, uterine surgery, or multiple laparotomies	☐ Placenta previa/low lying
	☐ Multiple gestation	☐ Suspected accreta/percreta
	☐ > 4 prior births	☐ Platelet count < 70,000
	☐ Prior PPH	☐ Active bleeding
	☐ Large myomas	☐ Known coagulopathy
	☐ EFW > 4000 g	☐ 2 or more medium risk factors
	☐ Obesity (BMI > 40)	/
	☐ Hematocrit < 30% & other risk	/
INTERVENTION	☐ Type & SCREEN, review protocol	☐ Type & CROSS, review protocol

INTRAPARTUM

	MEDIUM RISK	HIGH RISK
RISK FACTORS	☐ Chorioamnionitis	☐ New active bleeding
	☐ Prolonged oxytocin > 24 hours	☐ 2 or more medium (admission and/or intrapartum) risk factors
	☐ Prolonged 2nd stage	/
	☐ Magnesium sulfate	/
INTERVENTION	☐ Type & SCREEN, review protocol	☐ Type & CROSS, review protocol

** Establish a culture of huddles for high-risk patients and post-event debriefing **

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ACOG

Revised January 2019

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ADMISSION HEMORRHAGE RISK FACTORS Evaluation		
Low (type & screen)	**Medium (type & screen)**	**High (type & crossmatch)**
No previous uterine incision	Multiple gestation	Prior cesarean birth(s) or uterine surgery
Singleton pregnancy	>4 previous vaginal births	Placenta previa, low lying placenta
≤ 4 previous vaginal births	Prior post-partum hemorrhage	Suspected Placenta accreta, increta or percreta or suspected abruption.
No known bleeding disorder	Large Myomas	Hematocrit < 30 AND other risk factors
	EFW > 4000G	Platelets < 70,000
	Obesity (BMI >40)	Known coagulopathy
	Hematocrit <30%	Active bleeding
		*2 or more medium risk factors
INTRAPARTUM RISK Evaluation		
	Medium (Type & Screen)	**High Risk (Type & Cross)**
	Chorioamnionitis	New Active Bleeding
	Prolonged Oxytocin >24 hours	2 or more medium (admission and/or intrapartum) risk factors
	Prolonged 2nd Stage	
	Magnesium Sulfate	

Westchester Medical Center: Code Noel: Obstetrical Hemorrhage

Obstetric Hemorrhage Checklist

EXAMPLE

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 1,000mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours. However, blood loss >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

Announce: ☐ Cumulative blood loss ☐ Vital signs _____ ☐ Determine stage

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.

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 uterotonics

BLOOD BANK:

☐ Confirm active type and screen and consider crossmatch of 2 units PRBCs

ACTION:

☐ Determine etiology and treat
☐ Prepare OR, if clinically indicated (optimize visualization/examination)

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

Methylergonovine (Methergine):
0.2 milligrams IM (may repeat);
Avoid with hypertension

15-methyl $PGF_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM (may repeat in q15 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)
Tissue (i.e., retained products)
Thrombin (i.e., coagulation dysfunction)

STAGE 2: Continued Bleeding (EBL up to 1500mL OR ≥ 2 uterotonics) with normal vital signs and lab values *(*two or more uterotonics in addition to routine oxytocin administration; or ≥ 2 administrations of the same uterotonic)*

INITIAL STEPS:

☐ Mobilize additional help
☐ Place 2nd IV (16-18G)
☐ Draw STAT labs (CBC, Coags, Fibrinogen)
☐ Prepare OR

MEDICATIONS:

☐ Continue Stage 1 medications; consider TXA

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100mL NS & give over 10 min; may be repeated once after 30 min)

BLOOD BANK:

☐ Obtain 2 units PRBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
☐ Thaw 2 units FFP

ACTION:

☐ For uterine atony --› consider uterine balloon or packing, possible surgical interventions
☐ Consider moving patient to OR
☐ Escalate therapy with goal of hemostasis

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

Huddle and move to Stage 3 if continued blood loss and/or abnormal VS

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ACOG The American College of Obstetricians and Gynecologists District II

Revised September 2020

NEW YORK STATE Department of Health

New York State nyspQc Perinatal Quality Collaborative

BACK TO START OF TOOLKIT
BACK TO START OF SECTION

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):
0.2 milligrams IM (may repeat);
Avoid with hypertension

15-methyl $PGF_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM
(may repeat in q15 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

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100mL 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

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OB HEMORRHAGE KIT				**LOCATED IN PYXIS**
Drug	**Dose**	**Frequency**	**Pharmacokinetics**	**Nursing considerations**
Oxytocin (Pitocin)	I.V. 20 to 40 units in 1 liter of Normal saline or Lactated Ringer's Solution I.M.10 units	Continuous infusion	I.V. Onset: Immediate Duration: 1 hour I.M. Onset: 3 to 5 minutes Duration: 2 to 3 hours	Avoid undiluted rapid I.V. infusion, which causes hypotension. *May cause nausea and vomiting.*
Methyl-ergonovine (Methergine)	0.2 mg I.M.	Every 2 to 4 hours	Onset: 7 to 15 minutes Duration: 3 hours	Avoid if patient is **hypertensive** **Cannot be given IV** *May cause nausea and vomiting.*
Misoprostol (Cytotec)	400 to 600 mcg Bucally, OR 800 to 1,000 mcg Rectally	1 dose **only**	Onset: 3 to 4 minutes	Allergic to prostaglandin **Cannot be given IV** *May cause nausea and vomiting.*
Caroprost Tromethamine (Hemabate)	0.25 mg I.M.	Every 15 to 90 minutes; 8 doses maximum	Onset and duration: Mostly unknown; Peak in 15 to 30 minutes	Avoid using drug in patients with **Asthma.** Use cautiously if the patient has hepatic, renal, or cardiac dysfunction. *May cause nausea and vomiting.*
Tranexamic acid (TXA) (Lysteda, Cyklokapron)	1g IV push over 10 mins OR 1g IV in 50 - 100ml bag of NS over 10-30 mins	If bleeding continues after 30 mins or stops and restarts within 24 hours after the 1st dose, a 2nd dose of 1g over 10 mins may be given.	Onset: 5 to 15 minutes Duration: 3 hours	**DO NOT** inject in lines with blood, PCN, or Mannitol. **Side effects**: hypotension with rapid injection, visual disturbances, dizziness, nausea, vomiting, diarrhea, allergic dermatitis. **Contraindications:** hypercoagulopathy, h/o DVT, PE, cerebral thrombosis
Vasopressin	20 units/100 mL bag	1ml of diluted solution (0.2 units/ml) can be given IM, Directly in Uterine wall	Onset and duration: 4 to 8 minutes	Causes intense vasospasm at site of injection & **Bradycardia** *May cause nausea and vomiting.*

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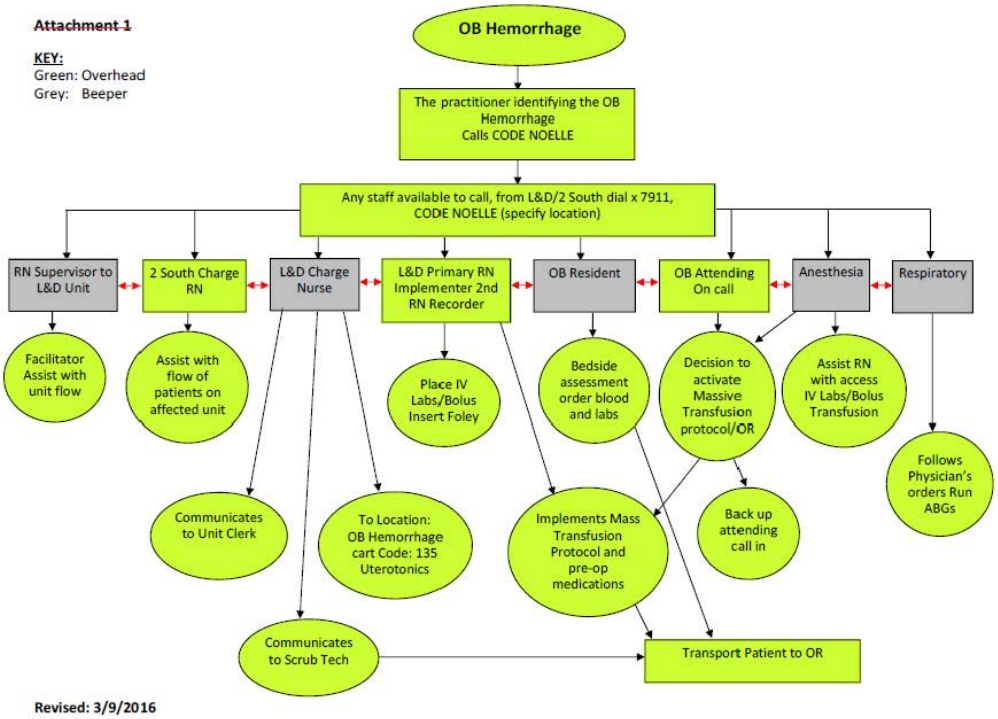
Attachment 4 Response Team Algorithm



Reviewed 9/2020

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

OB 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 hypotension, 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

Delivery) with normal vital signs and lab values

b. Stage 2: Continued bleeding with QBL <1500mL for cesarean birth, <900mL OR > 2 uterotonics 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 sign/labs/oliguria

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 Teamwas developed as an organized response to maternal hemorrhage and a dedicated "hemorrhage cart" that is maintained by the unit will be brought to thebedside.

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 on-going

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 laparotomies

ii. Uterine over-distention

1) EFW > 4000gms

2) Multiple Gestation

i. Large uterine 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 accrete/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 LIP order on all patients, regardless of risk status.

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2. Review T&S 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/Refusal to 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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retained products of conception.

2. Anticipate surgical management for the patient experiencing an obstetrical hemorrhage.
3. Obtain placenta for inspection to look for missing cotelydons or aberrant vessels which may indicate the presence of an accessory lobe(s) and send to the pathology department.
4. Anticipate blood product transfusion. The LIP'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.
5. Monitor for signs and symptoms of hypovolemic shock.

B. By Stage of OB Hemorrhage

Stage 1:

1. **Initial Steps:**
   a. Ensure 16G or 18G IV Access
   b. Increase IV fluid (crystalloid without oxytocin)
   c. Insert indwelling urinary catheter, as needed
   d. Two handed fundal massage
   e. Consider bringing hemorrhage cart to bedside
2. **Medications:** (see ADDEDDUM)
   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:**
   a. Consider activating Obstetrical Hemorrhage Team (OHT), See OHT Structure Standard
   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 as needed.
   h. Maintain fluid volume with LR
   i. Anticipate need for and assist in preparation and insertion of uterine tamponade balloon
2. **Medications:** (see ADDEDDUM)
   a. Administer additional uterontonic medications per LIP order
   b. Consider colloid administration.
3. **Blood Bank:**
   a. Transfuse blood products as ordered by LIP.
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 SICU
   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 ADDEDDUM)
    a. Consider tranexamic acid
    b. Consider re-dosing if received antibiotics as per LIP.
    c. Continue to transfuse 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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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 bloodloss 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. <u>Antepartum Hemorrhage</u>

a. Activate OHT and consider LRT.
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 fetalheart 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, andfetal position.
h. Avoid vaginal and speculum exams until placenta previa is ruled out byultrasound.
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 LIP 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. Petechiae, 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 Sp02 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 uterine atony.
   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 breastfeed **THEN** notify the Lactation Consultant to watch for evidence of Sheehan syndrome (pituitary ischemia).
4. **IF** patient has a stage 3 (>1500 ml) **THEN**, consider re-dosing antibiotics as per LIP.

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OB Hemorrhage Management

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 EMR, and all team members sign off on the OHT documentation.

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OB Hemorrhage Management

ADDENDUM
Uterotonic Agents & Medications for Postpartum Hemorrhage

Medication	Dose	Primary Route (Alternate)	Frequency of Dose	Side Effects	Contra-indications
Oxytocin (Pitocin)	20-40 Units in 1000 mL of NS or RL solution IM: 10 units	IV or Intramuscular if there is no IV access. Intramyometrial during Cesarean.	Continuous infusion. IM 1 dose only	Usually none. Nausea, vomiting, water intoxication have been reported.	None for postpartum administration. *Do not administer with D5W.*
Methylergonovine (Methergine)	0.2 mg	IM or Intramyometrial	Every 2-4 hours	Hypertension, hypotension, nausea, vomiting	History or presence of hypertension, preeclampsia.
15- methyl Prostaglandin F 2 (Carboprost) (Hemabate)	0.25 mg	IM Intramyometerial	Every 15-90 minutes, not to exceed 8 doses	Vomiting, diarrhea, nausea, flushing or hot flashes, chills or shivering.	Active cardiac, pulmonary (especially asthma), renal or hepatic disease.
Misoprostol (Cytotec)	600-1000 mcg	Per Rectum, PO, or buccally		Nausea, vomiting, diarrhea, fever and chills.	None for postpartum administration.
Tranexamic Acid	1 gm	IV in 50 or 100mL Saline	May repeat at 30 mins ONCE	Nausea, vomiting, diarrhea, hypotension, giddiness, and allergic dermatitis	Renal Impairment - caution
Colloid	As per anesthesiologist or intensivist	IV	20 cc/ kg/ day. Equivalent to 1400 mL for a 70 kg patient.	Pruritus, increased serum amylase, decreased Hct., decreased coags.	1. Sepsis 2. Thrombocytopenia or coagulopathy 3. Baseline renal dysfunction

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BON SECOURS CHARITY HEALTH SYSTEM
A member of the
Westchester Medical Center Health Network

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, vonWillibrand's Disease, HELLP Syndrome
  - Uterine Rupture

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- Trauma
- Postpartum Hemorrhage:
  - Uterine Atony
  - Retained POC
  - Cervical, vaginal tears
  - Coagulopathy
  - Uterine Inversion
  - Bleeding from Surgical Sites

ADMISSION HEMORRHAGE RISK FACTORS Evaluation		
Low (type & screen)	**Medium (type & screen)**	**High (type & crossmatch)**
No previous uterine incision	Multiple gestation	Prior cesarean birth(s) or uterine surgery
Singleton pregnancy	>4 previous vaginal births	Placenta previa, low lying placenta
≤ 4 previous vaginal births	Prior post-partum hemorrhage	Suspected Placenta accreta, increta or percreta or suspected abruption.
No known bleeding disorder	Large Myomas	Hematocrit < 30 AND other risk factors
	EFW > 4000G	Platelets < 70,000
	Obesity (BMI >40)	Known coagulopathy
	Hematocrit <30%	Active bleeding
		*2 or more medium risk factors
INTRAPARTUM RISK Evaluation		
	Medium (Type & Screen)	**High Risk (Type & Cross)**
	Chorioamnionitis	New Active Bleeding
	Prolonged Oxytocin >24 hours	2 or more medium (admission and/or intrapartum) risk factors
	Prolonged 2nd Stage	
	Magnesium Sulfate	

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Admission Assessment & Planning		Ongoing Risk Assessment
□**Verify type & antibody screen from prenatal record** □ Order Type & Screen on every patient admitted to Labor and Delivery.	□ **Evaluate for Risk Factors** (see below) **If 2 medium risk factors:** □ Order Type & Cross-match 2 Units PRBC's □ Review Hemorrhage Protocol **If 1 high risk factor:** □ Order Type & Cross-match 2 units PRBCs □ Review Hemorrhage Protocol (page 7) □ Notify Anesthesia **Identify** women who may decline transfusion □ Notify OB provider for plan of care □ Early consult with anesthesia □ Review Consent Form	□ **Evaluate for development of additional risk factors in labor:** • Prolonged 2nd stage labor • Prolonged oxytocin use • Active bleeding • Chorioamnionitis • Magnesium sulfate treatment □ **Increase Risk level** (see below) **and convert to Type & Cross-match** □ **Treat multiple risk factors as High Risk**

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. Competencied 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. <u>If blood bank has no active sample</u> 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 red banded.
c. <u>If blood bank has an active sample</u> 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

MOBILIZE	ACT	THINK
Primary nurse, Physician or Midwife to: □ Activate OB Hemorrhage, Protocol **PRIMARY Nurse to:** □ 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 unit/500 ml** solution titrated to uterine tone □ Continue vigorous fundal massage □ Administer Methergine 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 sats. at >95% □ Empty bladder: straight cath. or place Foley with urimeter □ 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 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

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STAGE 2: OB HEMORRHAGE		
MOBILIZE	ACT	THINK
Primary nurse (or charge nurse): □ Call obstetrician to bedside □ Call Anesthesiologist □ Activate Response Team: □ Notify Blood bank of hemorrhage; MTP initiation **Charge Nurse:** □ Notify 2nd OB □ Initiate OB Hemorrhage Record □ Notify nursing supervisor □ Assign single person to communicate with blood bank □ Assign family support person □ Page Nurse Manager and Anesthesia	**Team Leader** □: Methergine 0.2mg IM Q 5minutes up to 5 doses. Additional uterotonic medication: Misoprostol 800-1000 mcg PR and Hemabate 250 mg IM every 15 minutes for maximum of 8 doses **Other interventions (see right column) while waiting for response to medications** □ Bimanual uterine massage □ Move to OR (if on postpartum unit, move to L&D or OR) □ Initiate MTP □ Order labs STAT (CBC/Plts., Chem. 12 panel, Coag. Panel, ABG) □ Transfuse PRBCs based on clinical signs and response do not wait for lab results **Primary Nurse:** □ Establish 2nd large bore IV, at least 18 gauge □ Assess and announce Vital Signs and cumulative blood loss q 5-10 minutes □ Set up blood administration set and blood warmer for transfusion □ Administer meds, blood products and draw labs, as ordered □ Keep patient warm **Second Nurse** (or charge nurse): □ Place Foley with urimeter (if not already done) □ Obtain portable light, OB procedure tray and Hemorrhage Cart □ Obtain blood products from the Blood Bank □ Assist with move to OR (if indicated) **Blood Bank:** □ See MTP Policy □ 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.	**Sequentially advance through procedures** and other interventions based on etiology: **Vaginal Birth** **If trauma (vaginal, cervical or uterine):** • Visualize and repair **If retained placenta** • D&C **If uterine atony or lower uterine segment bleeding:** • Intrauterine Balloon **If above measures unproductive:** • Selective embolization (Interventional Radiology if available & adequate experience) **C-section:** • B-Lynch Suture • Intrauterine Balloon **If Uterine Inversion:** • Anesthesia and uterine relaxation drugs for manual reduction **If Amniotic Fluid Embolism:** • Maximally aggressive respiratory, vasopressor and blood product support **If vital signs are worse than estimated or measured blood loss:** possible uterine rupture or broad ligament tear with internal bleeding; **move to laparotomy** **Once stabilized:** Modified postpartum management with increased surveillance
Re-evaluate Bleeding and Vital Signs **If cumulative blood loss > 1500ml, > 2units PRBC's given, VS unstable, or suspicion of DIC** **Proceed to STAGE 3**		

Bon Secours Charity Health System Policy and Procedures Manual

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

STAGE 3: OB Hemorrhage		
MOBILIZE	ACT	THINK
Nurse or Physician: □ Activate Massive Hemorrhage Protocol **Charge Nurse or designee:** □ Notify Gyn. surgeon □ Notify adult intensivist □ Call-in OR staff as needed □ Reassign staff as needed □ Call-in supervisor, CNS or manager □ Continue OB Hemorrhage Record (In OR, anesthesiologist will assess and document VS) □ If transfer considered, notify ICU **Blood Bank:** □ Prepare to issue additional blood products as needed – **stay ahead**	**Establish team leadership and assign roles** □ **Move to OR** if not already there □ Repeat CBC/PLTS, Coag Panel STAT and Chem. 12 panel q 30-60 min **Anesthesiologist** (as indicated): □ Arterial blood gases □ Central hemodynamic monitoring □ CVP or PA line □ Arterial line □ Vasopressor support □ Intubation **Primary Nurse:** □ Announce VS and cumulative measured blood loss q 5-10 minutes □ apply upper body warming blanket if feasible □ Use fluid warmer and/or rapid infuser for fluid & blood product administration □ Apply sequential compression stockings to lower extremities □ Circulate in OR **Second nurse and/or anesthesiologist:** □ Continue to administer meds, blood products and draw labs, as ordered **Third Nurse (or charge nurse):** □ Recorder □ 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. □Complete and document a post case debrief (Appendix E)	• **Selective Embolization (IR)** • **Interventions based on etiology not yet completed** • **Prevent hypothermia** **Conservative or Definitive Surgery:** • Uterine Artery Ligation • Hysterectomy For Resuscitation: Aggressively Transfuse Based on Vital Signs, Blood Loss 6:4:1 PRBCs: FFP: Platelets **Unresponsive Coagulopathy:** • After 8-10 units PRBCs and coagulation factor Replacement may consider risk/benefit of Factor VIIa **Once Stabilized:** Modified Post-Partum Management; Consider ICU

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 #8 - 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 how not to adapt procedures to local clinical circumstances which may warrant adaptation due to unique patient characteristics or extenuating circumstances."

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Main, E., Goffman, D., Scavone, B., Low, L., Bingham, D., Fontaine, P. Levy, B. (2015). National partnership for maternal safety: Consensus bundle on obstetric hemorrhage. *Anesthesia & Analgesia: July 2015-Volume 121, p142-148.*

APPLICABLE FACLITIES

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

Authored 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	5/19
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):

12/06 D	1/13R			
9/11 C	11/17 C			
12/11 C	11/19 - C			

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	
Packed Red Blood Cells (PRBC) (approx. 35-40 min. for crossmatch – once sample is in the lab and assuming no antibodies present)	Best first-line product for blood loss
Fresh Frozen Plasma (FFP) (approx. 35-45 min to thaw for release)	Highly desired if >2 units PRBCs given, or for prolonged PT, PTT
Platelets (PLTS) Local variation in time to release (may need to come from regional blood bank)	Priority for women with Platelets <50,000
Cryoprecipitate (CRYO) (approx. 35-45 min to thaw for release)	Priority for women with Fibrinogen levels <80 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						
Drug	**Dose**	**Route**	**Frequency**	**Side Effects**	**Contraindications**	**Storage**
Pitocin® (Oxytocin)	30 units per 500 ml, Rate titrated to Uterine tone	IV infusion	Continuous	Usually none Nausea, vomiting, hyponatremia ("water intoxication") with prolonged IV admin. ↓ BP and ↑ HR with high doses, esp. IV push	Hypersensitivity to drug	Room temp
Methergine® (Methylergonivine) 0.2mg/ml	0.2mg	IM (not given IV)	5 min max 5 doses	Nausea, vomiting Severe hypertension, esp. with rapid Administration or in patients with HTN or PIH	Hypertension, PIH, Heart disease Hypersensitivity to drug **Caution** if multiple doses of ephedrine have been used, may exaggerate hypertensive response	Refrigerate Protect from light
Hemabate® (15-methyl PG F2a) 250 mcg/ml	250 mcg	IM or intra-Myometrial (not given IV)	-Q15 -Not to exceed 8 doses/24 hrs.	Nausea, vomiting, Diarrhea Fever (transient), Headache Chills, shivering Hypertension Bronchospasm	Contraindicated in women with hepatic disease, active cardiac or pulmonary disease Hypersensitivity to drug. Use caution for patients that have asthma, hypertension/hypotension.	Refrigerate
Cytotec® (Misoprostol) 100 or 200mcg tablets	800-1000mcg	Per rectum (PR)	One time	Nausea, vomiting, diarrhea Shivering, Fever (transient) Headache	Rare Known allergy to prostaglandin Hypersensitivity to drug	Room temp
Tranexamic Acid (TXA)	1gram	IVSS/IVP	Once can be repeated X1 in 30 minutes	None	Carrier of major thrombophilia Active DVT High risk for VTE Thrombogenic cardiac rhythm disease Subarachnoid hemorrhage Severe renal insufficiency	Room temp

Bon Secours Charity Health System Policy and Procedures Manual

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.		
Admission Assessment & Planning		**Ongoing Risk Assessment**
Verify type & Antibody Screen from prenatal record □ Order Type & Screen on every patient admitted to Labor and Delivery.	Evaluate for **Risk Factors** (see below) **If medium risk:** □ Order Type & Screen □ Review Hemorrhage Protocol **If high risk:** □ Order Type & Cross-match 2 units PRBCs □ Review Hemorrhage Protocol □ Notify OB Anesthesia **Identify** women who may decline transfusion □ Notify OB provider for plan of care □ Early consult with OB anesthesia □ Review Consent Form	□ **Evaluate for development of additional risk factors in labor:** • Prolonged 2nd stage labor • Prolonged oxytocin use • Active bleeding • Chorioamnionitis • Magnesium sulfate treatment □ **Increase Risk level** (see below) **and convert to Type & Crossmatch** □ **Treat multiple risk factors as High Risk**
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, 02 sat <95% -OR- Increased bleeding during recovery or postpartum, proceed to STAGE 1		

Bon Secours Charity Health System Policy and Procedures Manual

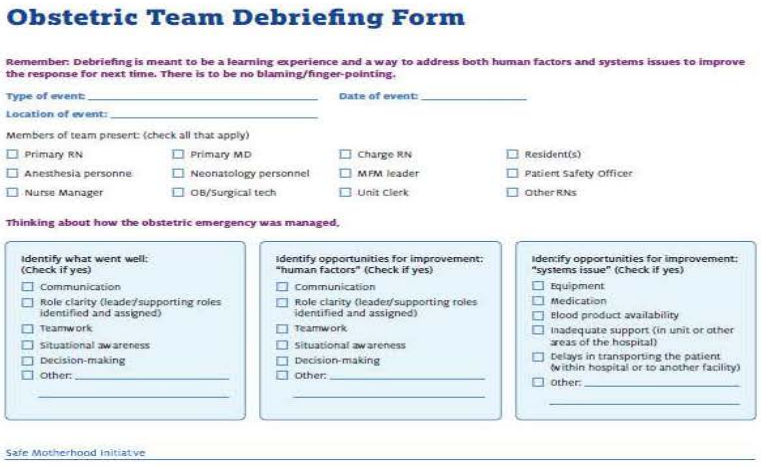
Good Samaritan Hospital Suffern: Management of Maternal Hemorrhage Care of the Obstetrical Patient (debrief form)

Appendix D.

Oxytocin Rate Equivalents

Oxytocin 20 unit/1000 ml Rate	Oxytocin milli-units/min	Equivalent Rate for Oxytocin 30 units/500 ml
125 ml/hr	42 milli-units/min	42 ml/hr
150 ml/hr	50 milli-units/min	50 ml/hr
500 ml/hr	167 milli-units/min	167 ml/hr
1000 ml/hr	333 milli-units/min	333 ml/hr

Appendix E.



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

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

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

Patient ID Sticker

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

(See reverse for follow-up.)

Newark-Wayne Community Hospital: OB Hemorrhage Clinical Event Debrief Form

ROCHESTER REGIONAL HEALTH

Newark-Wayne Community Hospital

Patient ID Sticker

OB Hemorrhage Clinical Event Debrief Form

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

What needs to be followed up on?

Identified Issues/ Opportunities For Improvement	Ideas For Next Time/ Actions To Be Taken	Person Responsible For Follow-Up

Other notes:

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

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

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

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

NYU Langone Health: Stat Huddle Debrief

STAT Huddle Debrief

Patient Label

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

Pulse ≥ 130, x 2 or for 15 minutes

BP decrease of 20% (from pre-op value) x 2 or for 15 minutes

Respiratory Rate ≥ 26 x 2 or for 15 minutes

Pulse Ox ≤ 93% x 15 minutes

Please complete the following debrief for each STAT Huddle called:

Reason for calling:

HR ≥ 130 ☐ BP decrease of 20% ☐ RR ≥ 26 ☐ SpO_2 ≤ 93% ☐

Interventions:

Continue to monitor ☐ Medication given ☐ OHT Called ☐

Other (please specify) _____

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

Southside Hospital
Northwell Health

OB HEMORRHAGE FLOWSHEET
PAGE 4 OF 4

Print Name	Initial	Signature	Date	Time

Post- Hemorrhage Management

☐ Clinical considerations (including disposition of management)
☐ Debrief
☐ Documentation after debrief
☐ Discuss with patient/family members

Debriefing

Time/ Date: _____

Provider Signature: _____ Print Name: _____

Circulating RN Signature: _____ Print Name: _____

Scribe RN Signature: _____ Print Name: _____

Additional Team Members

Nursing Supervisor: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

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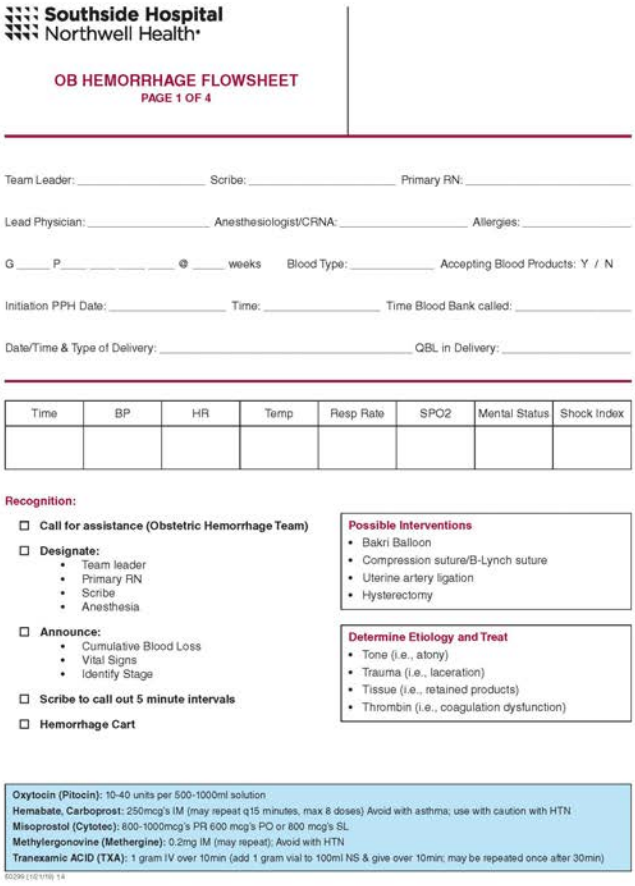

Southside Hospital
Northwell Health

OB HEMORRHAGE FLOWSHEET
PAGE 1 OF 4

Team Leader: _____ Scribe: _____ Primary RN: _____

Lead Physician: _____ Anesthesiologist/CRNA: _____ Allergies: _____

G ____ P____ ____ ____ ____ @ ____ weeks Blood Type: _____ Accepting Blood Products: Y / N

Initiation PPH Date: _____ Time: _____ Time Blood Bank called: _____

Date/Time & Type of Delivery: _____ QBL in Delivery: _____

Time	BP	HR	Temp	Resp Rate	SPO2	Mental Status	Shock Index

Recognition:

☐ **Call for assistance (Obstetric Hemorrhage Team)**

☐ **Designate:**
- Team leader
- Primary RN
- Scribe
- Anesthesia

☐ **Announce:**
- Cumulative Blood Loss
- Vital Signs
- Identify Stage

☐ **Scribe to call out 5 minute intervals**

☐ **Hemorrhage Cart**

Possible Interventions
- Bakri Balloon
- Compression suture/B-Lynch suture
- Uterine artery ligation
- Hysterectomy

Determine Etiology and Treat
- Tone (i.e., atony)
- Trauma (i.e., laceration)
- Tissue (i.e., retained products)
- Thrombin (i.e., coagulation dysfunction)

Oxytocin (Pitocin): 10-40 units per 500-1000ml solution
Hemabate, Carboprost: 250mcg's IM (may repeat q15 minutes, max 8 doses) Avoid with asthma; use with caution with HTN
Misoprostol (Cytotec): 800-1000mcg's PR 600 mcg's PO or 800 mcg's SL
Methylergonovine (Methergine): 0.2mg IM (may repeat); Avoid with HTN
Tranexamic ACID (TXA): 1 gram IV over 10min (add 1 gram vial to 100ml NS & give over 10min; may be repeated once after 30min)

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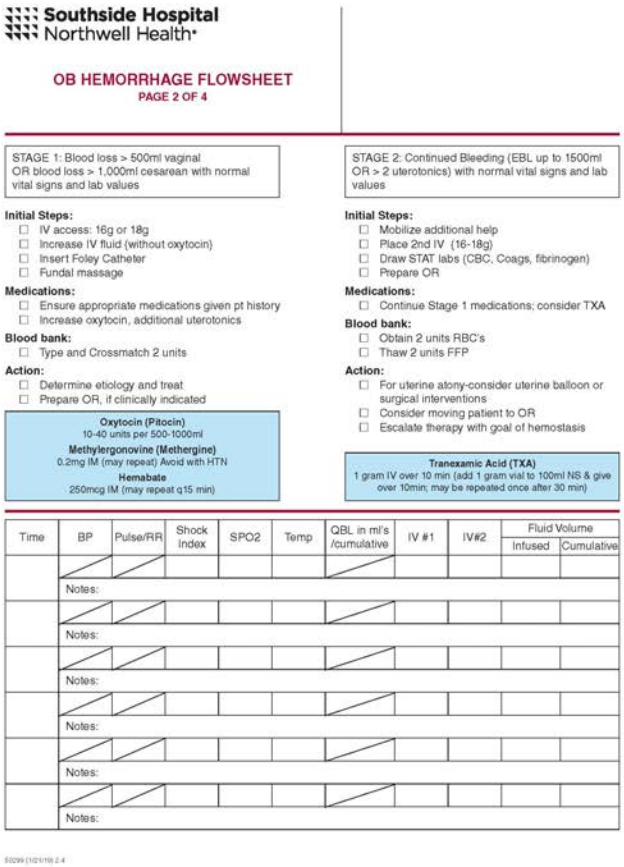
Southside Hospital: OB Hemorrhage Flowsheet



Southside Hospital
Northwell Health

OB HEMORRHAGE FLOWSHEET
PAGE 2 OF 4

STAGE 1: Blood loss > 500ml vaginal OR blood loss > 1,000ml cesarean with normal vital signs and lab values

Initial Steps:
- ☐ IV access: 16g or 18g
- ☐ Increase IV fluid (without oxytocin)
- ☐ Insert Foley Catheter
- ☐ Fundal massage

Medications:
- ☐ Ensure appropriate medications given pt history
- ☐ Increase oxytocin, additional uterotonics

Blood bank:
- ☐ Type and Crossmatch 2 units

Action:
- ☐ Determine etiology and treat
- ☐ Prepare OR, if clinically indicated

Oxytocin (Pitocin)
10-40 units per 500-1000ml
Methylergonovine (Methergine)
0.2mg IM (may repeat) Avoid with HTN
Hemabate
250mcg IM (may repeat q15 min)

STAGE 2: Continued Bleeding (EBL up to 1500ml OR > 2 uterotonics) with normal vital signs and lab values

Initial Steps:
- ☐ Mobilize additional help
- ☐ Place 2nd IV (16-18g)
- ☐ Draw STAT labs (CBC, Coags, fibrinogen)
- ☐ Prepare OR

Medications:
- ☐ Continue Stage 1 medications; consider TXA

Blood bank:
- ☐ Obtain 2 units RBC's
- ☐ Thaw 2 units FFP

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

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100ml NS & give over 10min; may be repeated once after 30 min)

Time	BP	Pulse/RR	Shock Index	SPO2	Temp	QBL in ml's /cumulative	IV #1	IV#2	Fluid Volume Infused	Fluid Volume Cumulative
	Notes:									
	Notes:									
	Notes:									
	Notes:									
	Notes:									
	Notes:									

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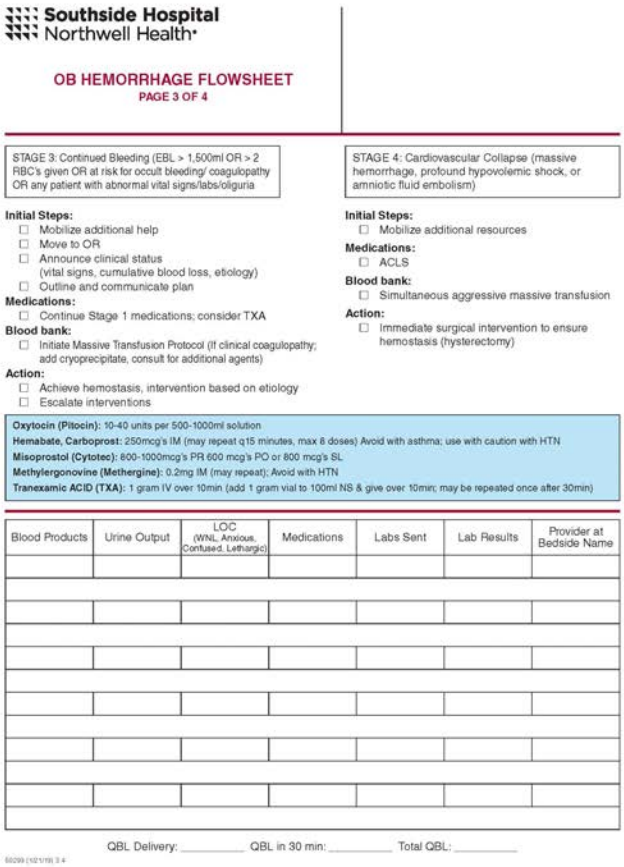

Southside Hospital
Northwell Health

OB HEMORRHAGE FLOWSHEET
PAGE 3 OF 4

STAGE 3: Continued Bleeding (EBL > 1,500ml OR > 2 RBC's 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

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)

Oxytocin (Pitocin): 10-40 units per 500-1000ml solution
Hemabate, Carboprost: 250mcg's IM (may repeat q15 minutes, max 8 doses) Avoid with asthma; use with caution with HTN
Misoprostol (Cytotec): 600-1000mcg's PR 600 mcg's PO or 800 mcg's SL
Methylergonovine (Methergine): 0.2mg IM (may repeat); Avoid with HTN
Tranexamic ACID (TXA): 1 gram IV over 10min (add 1 gram vial to 100ml NS & give over 10min; may be repeated once after 30min)

Blood Products	Urine Output	LOC (WNL, Anxious, Confused, Lethargic)	Medications	Labs Sent	Lab Results	Provider at Bedside Name

QBL Delivery: _____ QBL in 30 min: _____ Total QBL: _____

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Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

THE University of Vermont HEALTH NETWORK

Alice Hyde Medical Center

Attachment #1

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_____
Sa02_____
Blood sugar result _____

☐ SBP less than 90 or MAP less than 65
☐ SBP greater than 200
☐ HR less than 40 or greater than 130
☐ Temp less than 98.6F or greater than or equal to 101F
☐ RR less than 10 or greater than 20
☐ SpO2 less than 90%
☐ Urine output < 50ml in 4 hours
☐ Agitation or delirium ☐ Acute change in LOC
☐ Acute significant bleed ☐ Uncontrolled pain ☐ Seizures
☐ Failure to respond to treatment
☐ Other: _____

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
☐ Slurred speech
☐ Difficulty swallowing

Skin:
☐ Warm and dry ☐ Pale
☐ Mottled ☐ Diaphoretic
☐ Extremities are cold ☐ Extremities are warm

Pupils:
☐ Dilated ☐ Equal
☐ Constricted ☐ Reactive

Lung sounds:

Right:
☐ Clear ☐ Decreased/tight
☐ Crackles ☐ Stridor
☐ Wheezes

Left:
☐ Clear ☐ Decreased/tight
☐ Crackles ☐ Stridor
☐ Wheezes

Interventions:

☐ Oral airway/Nasal airway
☐ Suctioning
☐ O2 Therapy
☐ ABG
☐ IV Fluid Volume Adjustment
☐ Cardiac Monitoring
☐ 12 Lead EKG
☐ IV access
☐ PRN Medications
☐ POCT Glucose
☐ Initiate Hemorrhage Protocol
☐ Code Blue
☐ No Intervention

Reassessment:

_____
_____
_____
_____

Outcome:

Outcome: ☐ Stayed on unit ☐ Transferred to _____ ☐ Code Blue Activated

Signature:

RN: _____ Date_____ Time_____

Supervisor/Manager:_____ Date_____ Time_____

Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Attachment 2

Obstetric Hemorrhage Checklist

EXAMPLE

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 1,000mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours. However, blood loss >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

Announce: ☐ Cumulative blood loss ☐ Vital signs _____ ☐ Determine stage

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.

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 uterotonics

BLOOD BANK:

☐ Confirm active type and screen and consider crossmatch of 2 units PRBCs

ACTION:

☐ Determine etiology and treat
☐ Prepare OR, if clinically indicated (optimize visualization/examination)

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

Methylergonovine (Methergine):
0.2 milligrams IM (may repeat);
Avoid with hypertension

15-methyl PGF$_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM (may repeat in q15 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)
Tissue (i.e., retained products)
Thrombin (i.e., coagulation dysfunction)

STAGE 2: Continued Bleeding (EBL up to 1500mL OR ≥ 2 uterotonics) with normal vital signs and lab values (*two or more uterotonics in addition to routine oxytocin administration; or ≥ 2 administrations of the same uterotonic)

INITIAL STEPS:

☐ Mobilize additional help
☐ Place 2nd IV (16-18G)
☐ Draw STAT labs (CBC, Coags, Fibrinogen)
☐ Prepare OR

MEDICATIONS:

☐ Continue Stage 1 medications; consider TXA

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100mL NS & give over 10 min; may be repeated once after 30 min)

BLOOD BANK:

☐ Obtain 2 units PRBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
☐ Thaw 2 units FFP

ACTION:

☐ For uterine atony --> consider uterine balloon or packing, possible surgical interventions
☐ Consider moving patient to OR
☐ Escalate therapy with goal of hemostasis

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

Huddle and move to Stage 3 if continued blood loss and/or abnormal VS

Safe Motherhood Initiative

ACOG

Revised September 2020

Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

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):
0.2 milligrams IM (may repeat);
Avoid with hypertension

15-methyl PGF$_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM
(may repeat in q15 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

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100mL 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

Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Attachment #3

THE University of Vermont HEALTH NETWORK
Alice Hyde Medical Center

Hemorrhage Flow Sheet

	Time:	Time:	Time:	Time:	Time:	Time:	Time:
Date:							
Evaluation							
Cumulative Blood Loss:							
Symptoms: cold, dizzy, clammy, lightheaded, mental status							
Blood Pressure:							
Pulse:							
02 Saturation:							
Urine Output:							
Replacements							
Fluids:							
RBC:							
FFP:							
Platelets:							
Fibrinogen:							
Cryoprecipitate:							
Meds Given							
Pitocin:							
Methergine:							
Hemabate, Carboprost:							
Misoprostol:							
Trans Acid:							
Pressor Agents:							
Labs							
Hct/hb:							
PT/PTT/INR:							
Platelets:							
Fibrinogen:							
pH:							
Lactate:							
Base Deficit:							

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Additional Information on Back

Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Attachment #4

Pre-Delivery Hemorrhage Risk Assessment

LOW RISK	MEDIUM RISK	HIGH RISK
Less than 4 previous births	Hematocrit <30%	2 or more Medium Risk Factors
No Uterine Incision	EFW >4000 Grams	Active Bleeding
No Bleeding disorder	Large Myomas	Known Coagulopathy
Singleton Pregnancy	Multiple Gestation	Placenta Previa/Low Lying Placenta
No History of PPH	Obesity	Platelet Count <70,000
	Prior PPH	Suspected Accreta/Percreta
	Prior Uterine Surgery	VBAC
	Greater than 4 births	

Post-Delivery Hemorrhage Risk Assessment

HIGH RISK
Abruptio Placenta (see FMC-135 Abruptio Placenta)
Grand Multiparty
Over Distended Uterus (multiple gestation, polyhydramnios, fetal macrosomia)
Prolonged Labor
History of post partum hemorrhage
Chorioamnionitis
Instrumental Delivery
Prolonged use of oxytocin agents in labor, magnesium sulfate and terbutaline
Retained placental fragments or retention of blood clots

Alice Hyde Medical Center: HEMORRHAGE FMC-51 Attachments

Attachment # 5

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)
Responsible Party: Jill Hauswirth, Rachel Elder, MD Lead Author: Diane Lloyd

PPPG #: P0039
Effective Date: 02/11/19
Page **1** of **4**

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 #8672)
Lab Requisition during Massive Transitional 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

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 (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 (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

Primary Sources

Fung, AABB Technical Manual, 18th Edition, 2017

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).

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.

Suggested Baseline Testing - In Order of Draw **Order at start of hemorrhage**		
1	Arterial blood gas (ABG)	syringe on ice
2	PT, PTT, fibrinogen	1 blue tube, completely full
3	Lytes, lonized calcium, and glucose	1 dark green tube-lithium heparin or may use ABG syringe
4	CBC	1 lavender tube
5	Blood type and crossmatch	if not done previously; 1 pink top tube

Testing During Event - In Order of Draw **Consider this every 30- 60 minutes**		
1	Arterial blood gas (ABG)	syringe on ice
2	PT, PTT, fibrinogen	1 blue tube, completely full
3	Lytes, lonized calcium, and glucose	1 dark green tube-lithium heparin or may use ABG syringe
4	CBC	1 lavender tube
5	D-dimer if DIC is suspected	1 lavender tube

➢ **SUGGEST REPEAT LABORATORY TESTING AFTER 5-7 UNITS OF RBCS**

Component Usage Guidelines

Consider When:	Component	Dose	Expected Increase in Values
Uncontrolled bleeding (>1500 ml loss) regardless of initial Hgb/Hct	Red cells Use a blood warmer for infusion > 100 ml/min	As needed to maintain adequate oxygenation and Hgb > 7	1 gm hemoglobin per unit
Continued Bleeding and an INR ≥ 1.5	Plasma	2-4 units (10-15 ml/kg)	25% of factors
Continued Bleeding and a Plt count < 80,000 or microvascular bleeding	Platelets	1 dose is one pheresis	30,000 to 60,000 per dose
Bleeding and Fibrinogen < 100mg/dL	Cryoprecipitate	1-2 units/10 Kg. Delivered in pool of 5 units	50 mg/dL
Uncontrolled Bleeding	Tranexamic Acid (TXA)	1 gm IV over 10 minutes - followed by a maintenance dose of 1 gm infused over 8 hours	Call Pharmacy at 7631 for consultation
Anticoagulant Reversals and TXA	Contact the pharmacy (ext 17631, option 1) for questions		

Crouse Hospital: Hemorrhage Guidelines

treatment of acute OB hemorrhage		
Tranexamic acid (TXA) Antifibrinolytic agent given IV best given within 3 hours of delivery (promotes clotting by preventing blood clots from breaking down	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	Do not inject more rapidly than 1 mL/minute to avoid hypotension

Huntington Hospital: Guideline
OB Hemorrhage Guideline

Huntington Hospital Northwell Health	Obstetrics and Gynecology Clinical Guidelines **HH-Maternal Child Health**		
Guideline Title: **OBSTETRICAL HEMORRHAGE**			
Prepared by: Mitchell Kramer MD, FACOG Melissa Engel MSN, MBA/MHA, RNC Adapted from North Shore and LIJ	Department Approval Date: 9/10/2015	Reviewed: Revised: May 2019	Page 1 of 21

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

Placenta accreta	$34^{0/7}$ - $35^{6/7}$ weeks
Placenta previa	$36^{0/7}$ - $37^{6/7}$ weeks
Prior classical C/S	$36^{0/7}$ - $37^{6/7}$ weeks
Previous myomectomy	$37^{0/7}$ - $38^{6/7}$ weeks
If extensive	$36^{0/7}$ - $37^{6/7}$ weeks

For Placenta accreta notify and plan:
- *Surgical support / Hemorrhage Team,*
- *Interventional Radiology (IR),*

S:\WCHS Guidelines\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)[1]
-Obtain the necessary consults (MFM/Hematology/Obstetrical 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 deliver 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 obstetrical 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)* - 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 I 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	Cesarean Delivery
-Vag retractors, long weighted speculum	-Hysterectomy tray
- Long instruments (*needle holder, clamps etc*)	- Reloadable straight needle for B-Lynch suture
-Uterine Bakri balloon	- Uterine Bakri balloon
-Banjo Curette	- Procedure diagrams
-Bright task light/Head lamp	-
- Procedure diagrams	

Medication Kit

Pitocin 20u/l	1 bag
Pitocin 10u	2 vials
Hemabate 250 microgram/ml	1 ampule
Cytotec 200microgram/tablet	5 tabs
Methergine 0.2 mg/ml	1 ampule
Tranexamic acid 0.1g/ml	1 ampule

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)

Huntington Hospital: Guideline
OB Hemorrhage Guideline

**Indications for contacting the Hemorrhage Team*
-Any PPH 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 accrete

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 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 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
-Assure IV access (at least 18 gauge)
-Insert foley catheter *(Document Urinary Output)with urometer and institute 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)

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> 1,500cc and hemostasis not yet achieved **Site: OR/LDR**

Communications/Logistics	**Hemostasis**	**Replacement**
RN→alerts surgeon re…EBL	Atony:	IV Fluids (RL in a 1:1 ratio to EBL)
RN alerts 2nd Obstetrician 2nd Attending →assesses if additional resources are necessary*	- Administer uterotonics -If uterotonics already used, without succes	Tranexamic acid 1g IV/10min Get blood to the floor Start transfusion (RBC/FFP) if :
Initiate use of PPH flow sheet	-Vaginal → Bakri balloon	-Abnormal vital signs, urinary output
Call for 2nd Anesthesiologist	-C/S → Compression sutures (B-Lynch, etc)	lab results - In the judgment of surgeon
	→ Stepwise devascularization	hemostasis is not imminent
	Others *(Trauma, retained tissue, coagulopathy etc.)*	For patient refusing blood: consider admin clotting factors now
	-Address the source or cause of bleeding	(Fibrinogen, PCC) if acceptable

Observe for 15-30 min** → Bleeding continues

If not in the OR move patient to OR now
Contact Hemorrhage Team

-**Escalate steps** → to insure hemostasis
-Proceed to next steps not already tried***:
- Compression sutures
- Stepwise devascularization
- Uterine artery ligation
- 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, acidosis etc: initiate MTP at this time **(RBC:FFP:Plts → 4:4:1)**
-If coagulopathic despite MTP consider: Fibrinogen, Prothromin Complex Concentrate (*Kcentra, Bebulin*)

Huntington Hospital: Guideline
OB Hemorrhage Guideline

**For patients refusing blood or abnormal vital signs, Coagulopathy/Acidosis, contact Hemorrhage Team now*
***If bleeding stops/subsides, but subsequently starts again → proceed to next steps as outlined*
****Do not delay surgical intervention pending correction of coagulopathy, acidosis, 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*

Patients: Suspected bleeding (intra-abdominal) — **Site: PACU or Postpartum floor**

-Abnormal vital signs*, urinary output
-Abnormal laboratory results (↓Hb >4g, Acidosis, Coagulopathy)
-Abnormal clinical exam

Communications/Logistics

Initiate use of PPH Flow Sheet
Bedside evaluation
- within 15-20 min *(if not done, consider move to L&D)*
-Provider →PA, NP, Sr resident
-Notify Attending obstetrician**
I&O, Labs: CBC, Coagulation
Include Abdominal/Pelvic Ultrasound (CT if needed)

If – for free fluid or large collection → IV fluids 1,000cc → *Evaluate 60 min*

If + for free fluid or large collection → -Move patient to L&D
- Attending obstetrician at bedside
-Perinatal Huddle

Hemostasis

Conservative management if hemodynamically stable → - IV fluids
- Tranexamic acid 1g IV/10min
- Transfusion as necessary
- For pat's refusing blood, consider giving clotting factors if acceptable

Decision made by Att. MD

Return to OR*** *(if hemodynamically unstable or refusing blood products)*

Replacement

Evaluate 60 minutes

-Condition deteriorates
-Lack of improvement

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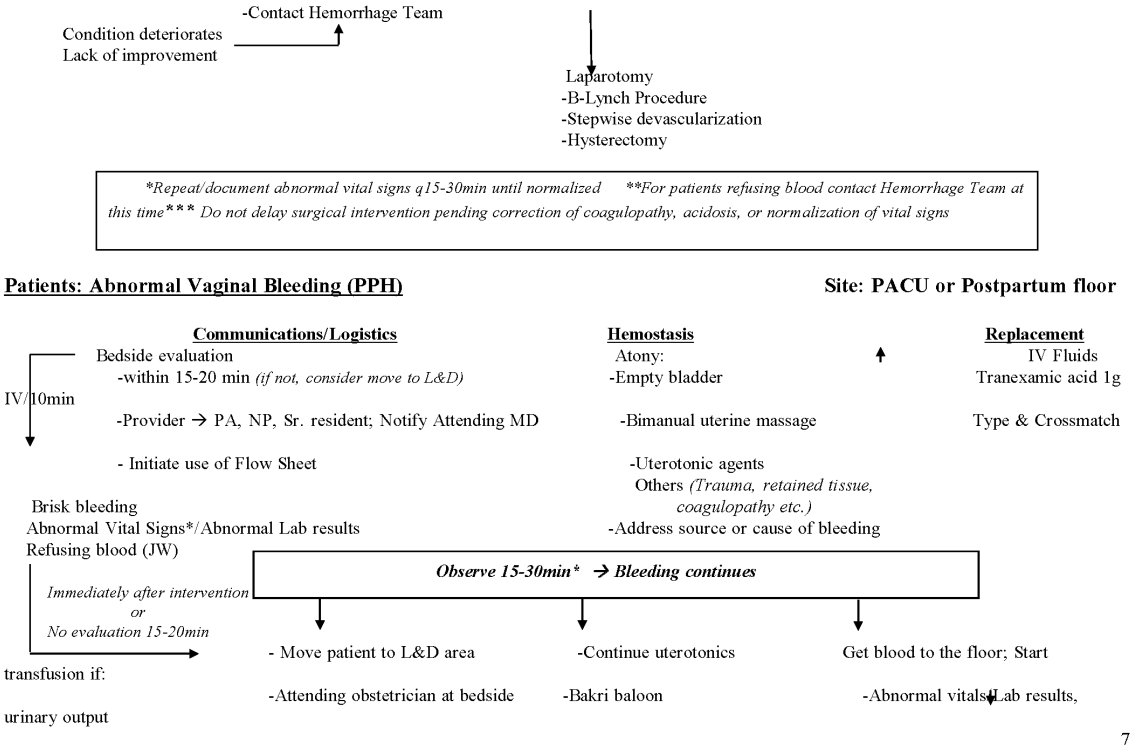
Huntington Hospital: Guideline
OB Hemorrhage Guideline



Huntington Hospital: Guideline
OB Hemorrhage Guideline

-For those refusing transfusions contact Hemorrhage Team now
consider administration of clotting factors (Fibrinogen, PCC) if acceptable

-Others →*Based on etiology*
- CBC, Coagulation studies

-Brisk bleeding
-For pat's refusing blood

Observe 15-30min** → Bleeding continues

-Perinatal Huddle
-Contact Hemorrhage Team
-Open OR

-**Escalate steps** → to insure hemostasis
- If bleeding moderate, hemodynamically stable and Intervention Radiology immediately available →embolization may be an option
-If brisk bleeding, abnormal V.S./Lab results, or

Start transfusion if:
-Abnormal vital signs urinary output, laboratory results
-EBL> 1,500cc
-Brisk bleeding
-In the opinion of the surgeon extensive surgery is required
For massive blood loss
→Start MTP **RBC: FFP: Plts 4:4:1**
If coagulopathic despite MTP consider Prothromin Complex Concentrate *(Kcentra Bebulin)*

**Repeat/document abnormal Vital signs q15-30min until normal*
***If bleeding stops/subsides, but subsequently starts again→ proceed to next steps as outlined*
**** Do not delay surgical intervention pending correction of coagulopathy, acidosis, or normalization of vital signs; For patient's in stage 3 and no desire for future childbearing or refusing blood consider going straight to Hysterectomy*

Patients: Cardiovascular collapse in the setting of PPH

Site: OR, LDR, PACU, PP floor

(Stage 4 Hemorrhage)

Communications/Logistics	Hemostasis	Replacement
-Code Team -OB Rapid Response Team	-Emergency Hysterectomy	-CPR -MTP

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Huntington Hospital: Guideline
OB Hemorrhage Guideline

→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.

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Huntington Hospital: Guideline
OB Hemorrhage Guideline

REFERENCES TO REGULATIONS AND OR OTHER RELATED POLICIES

CLINICAL REFRENCES:

1. Sponge et al Obstet Gynecol 2011
2. Committee Opinion Number 560,
   American College of OBGYN
3. Guly, HR et al Resuscitation 2011
4. Rappaport et al Am J Emerg Med 2013
5. Riddez L, et al J of Trauma 1998
6. Crash-2 Study Lancet 2010
7. Nienaber, et al; Int J Care 2011

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Huntington Hospital: Guideline
OB Hemorrhage Guideline

Hemorrhage Team:

Gyn Oncology **Maternal Fetal Medicine** **General Ob-Gyn** **General Surgery/other**

Huntington Hospital- MD1 Provider on shift, MD as needed, Anesthesiologist on shift, 2nd Anesthesiologist as needed, Designated Nursing Response-WCHS team/Nursing Administration/Supervision, Rapid Response team when indicated.

Estimating Blood Loss

4X4 gauze 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 = 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 ac.)
-Patient Clinical status (anxious, confused, lethargic)

Stages 1 → Stage 4

Peripartum Hemorrhage
-Stages of Hemorrhage*-

Stage 1	↑ Bleeding (>500cc vag, >1,000cc C/S) → Normal V.S., Labs and clinical picture.
Stage 2	↑↑ Bleeding (EBL 1,000-1,500cc) → Normal V.S., Labs and clinical picture
Stage 3	Ongoing Bleeding → EBL > 1,500cc; or Brisk bleeding (>500cc/10min) **Or any of these abnormalities in the context of bleeding (regardless of EBL or Transfusion)** Abn: BP, Pulse, Shock Index Urinary Output Abn: Coagulation, pH, BD, Lactic ac, Hb/Hct (>4g drop in Hb) Abn: Clinical status (confused, lethargic)
Stage 4	Cardio-vascular collapse in the setting of servere hemorrhage -Profound hypovolemic shock (blood loss not replaced) -AFE (sudden c-v collapse) → heavy vaginal bleeding

**Modified after American College of Surgeons*

Huntington Hospital: Guideline
OB Hemorrhage Guideline

Uterine Atony

1st Line uterotonics

Oxytocin (Recommend regimen)
- 40U/1,00cc at 125cc/hr

Methergine*
0.2mg IM (may be repeated q 2-4 hrs)

**Causes Vasoconstriction –avoid in Hypertensive patients*

2nd Line uterotonics

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 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 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, Transamin):*

-**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 curve (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:

	Name	Contains Factors	Dose
3 Factors PCC:	Bebulin	II, IX, X (little VII)	25-50u/Kg
4 Factors PCC:	Kcentra	FII, FIX, FX, FVII	25-50u/Kg

- 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

Huntington Hospital: Guideline
OB Hemorrhage Guideline

Hand – Off Communication OR → PACU

Procedure:
- NSVD
- Instrumental delivery
- C/S -Duration ____

EBL: Total
-In OR

Interventions:
-Uterotonics
-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

Huntington Hospital: Guideline
OB Hemorrhage Guideline

Hand – Off Communication PACU→ Postpartum

Procedure:
- NSVD
- Instrumental delivery
- C/S

EBL: Total
-In Labor and Delivery
-In the PACU

Interventions (OR/LDR or PACU)
-Uterotonics
-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
- -Uterotonics
- -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

North Shore LIJ North Shore University Hospital
North Shore-Long Island Jewish Health System

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.

Category I	Will Accept	Will Not Accept	May Accept Under Certain Circumstances
Red Blood Cells			
Fresh Frozen Plasma			
Platelets			
Autologous Banked Blood			
Category II – minor blood fractions – fractionated out from human plasma			
Albumin			
Fibrin Glue			
Erythropoietin			
RhoGAM			
Human Immunoglobulin			
Cryoprecipitate			
Humate-P			
Prothrombin Complex Concentrate			
Category II (Does not contain human plasma)-+			
Factor VII A (Novo 7)			
Factor VIII Recombinant			
Factor IX Recombinant			
Category III – no blood component			
Tranexamic Acid	✓		
Amicar	✓		
Hetastarch	✓		
Category IV			
Isovolemic Hemodilution			
Hypervolemic Hemodilution			
Cell Saver			
Other:			

MATERNAL FETAL MEDICINE	ANESTHESIOLOGY	HEMATOLOGY
Patient Signature:	Patient Signature:	Patient Signature:
Print Name:	Print Name:	Print Name:
MD:	MD:	MD:
Print Name:	Print Name:	Print Name:
Date:	Date:	Date:
Time:	Time:	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) 516-562-4694 MFM and Anesthesiology consults will be scheduled together

Huntington Hospital: Guideline
OB Hemorrhage Guideline

BLOOD PRODUCT EDUCATION

Where to Order	COMPONENT	CONTENT	Expected Effect
Blood Bank	Packed Red Blood Cells	Contains red blood cells and a small amount of plasma	250 ml: Increases hematocrit by 3-4% and hemoglobin by 1 g/dl
Blood Bank	Fresh Frozen Plasma (FFP)	Plasma which contains clotting factors, albumin and immunoglobulins	250 ml: Increases fibrinogen, normalization of PT, PTT
Blood Bank	Platelets	Platelets and plasma	250 ml: Increases platelets
Blood Bank	Autologus Blood	Donated by patient for self-use	Need a high/normal hematocrit and usually is not used in emergencies
	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/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	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	Autologus blood removed from patient	Limits the use of banked blood
	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	Autologus blood – Blood lost during procedure	Can return up to 250 ml IV in 3 minutes, devoid of plasma and platelets

Huntington Hospital: Guideline
OB Hemorrhage Guideline

Patient Identification

North Shore LIJ North Shore University Hospital
North Shore-Long Island Jewish Health System

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:_____

Category I	Will Accept	Will Not Accept	May Accept Under Certain Circumstances
Red Blood Cells			
Fresh Frozen Plasma			
Platelets			
Autologous Banked Blood			
Category II – minor blood fractions – fractionated out from human plasma			
Albumin			
Fibrin Glue			
Erythropoietin			
RhoGAM			
Human Immunoglobulin			
Cryoprecipitate – needs consent			
Humate-P			
Prothrombin Complex Concentrate			
Category II (Does not contain human plasma)			
Factor VII A (Novo 7)			
Factor VIII Recombinant			
Factor IX Recombinant			
Category III – no blood component			
Tranexamic Acid	✓		
Amicar	✓		
Hetastarch	✓		
Category IV			
Isovolemic Hemodilution			
Hypervolemic Hemodilution			
Cell Saver			
Other:			

PATIENT	OBSTETRICAL ATTENDING	ANESTHESIOLOGIST
Signature:	Signature:	Signature:
Print Name:	Print Name:	Print Name:
Date:	Date:	Date:
Time:	Time:	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 CNM will also be notified of the patient's status. If the CNM 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 conditions(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

NYP Brooklyn Methodist Hospital: Management of Obstetric Hemorrhage Policy

NewYork-Presbyterian Brooklyn Methodist Hospital
Department of Obstetrics
Perinatal Practice Guideline
Page 1 of 12

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 obstetric hemorrhage. To aid in the early recognition of patients at risk for obstetric 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

NewYork-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).

NYP Brooklyn Methodist Hospital: Management of Obstetric Hemorrhage Policy

NewYork-Presbyterian Brooklyn Methodist Hospital
Department of Obstetrics
Perinatal Practice Guideline
Page 3 of 12

MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT'D

Table 1: Risk Assessment: Labor & Delivery Admission

Risk Level	Risk Factor	Plan of Care
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 • 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 placentation (accretaspectrum or previa/lowlying) • Known coagulopathy History of more than one • previous PPH** Hematoc rit < 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

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Table 2: Risk Assessment Pre-Birth

Risk Level	Risk Factor Admission Risk Factors AND:	Plan of Care
Low	• 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	• Prolonged oxytocin >24h • Chorioamnionitis • Induction/augmentation of labor • Labor >18 hours • Prolonged second stage • Magnesium sulfate • Maternal temperature >100.4 F	• 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 uterotonics are available on unit. • Use scales/calibrated equipment to quantify cumulative blood loss
High	• New active bleeding greater than bloody show • Suspected abruption • 2 or more "Medium Risk" factors on admission or intrapartum	• 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 uterotonics available on unit • Use scales/calibrated equipment to quantify blood loss.

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MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT'D

Table 3: Risk Assessment Post-Birth

Risk Level	Risk Factor Admission AND Intrapartum Risk Factors AND:	Plan of Care
Low	• 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 uterotonics 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 uterotonics 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 uterotonics 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 mu oxytocin per hour at a rate of 250 mL per hour. Run infusion for 2 hours to deliver 30 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 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).

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MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT'D

TABLE 4: Uterotonic Medications for Stage 1 Hemorrhage

Medication	Dose	Primary Route/ (Alternate)	Frequency of Dose	Side Effects	Contra-indications
Oxytocin (Pitocin)	30 Units in 500 mL of solution IM: 10 units	IV or Intramuscular if there is no IV access.	Continuous infusion	Usually none. Nausea, vomiting, water intoxication have been reported.	Hypersensitivity to drug. *Do not administer with D5W.*
Methylergo-novine **(Methergine)**	0.2 mg	IM or Intra-myometrial	Every 2-4 hours	Hypertension, hypotension, nausea, vomiting	Hypertension, preeclampsia.
15- methyl Prostaglandin F 2 Carboprost **(Hemabate)**	0.25 mg	IM	Every 15 minutes for maximum of 8 doses	Vomiting, diarrhea, nausea, flushing or hot flashes, chills or shivering.	Asthma, Caution with active hepatic, cardiac or renal disease.
Misoprostol **(Cytotec)**	800-1000 mcg 600 mcg PO 800 mcg	Per Rectum PO Sublingual	Once	Nausea, vomiting, diarrhea, fever and chills.	Hypersensivity to drug.

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MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT'D

TABLE 5: Additional Medications to Consider if Suboptimal Response to Uterotonics:

Name	Mechanism of action	Dose	Route/ Alt. Routes	Remarks
Tranexamic Acid (TXA)	Antifibrinolytic	1g/10 ml diluent (stocked in premixed 10-ml vials)	IVP/IV infusion over 10 min./oral if no IV access; May be given in 50 mls D5 or NS over 10 min.	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**

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. <u>STAGE 2:</u> 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. <u>STAGE 3:</u> 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.

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MANAGEMENT OF OBSTETRICAL HEMORRHAGE, CONT'D

2) Outline management plan; perform serial re-evaluation and communicate with hemorrhageteam
3) Assemble additional staff to include advanced GYN surgeon, operating room support staffand perfusionist
4) Move to OR
5) Announce clinical status (vital signs, cumulative blood loss). Communicate plan.
6) Aggressively replace loss with 6:4:1 ratio ofPRBC:FFP:Platelets
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.

NYP Brooklyn Methodist Hospital: Management of Obstetric Hemorrhage Policy

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.

Primary Responders:	**Role:**
OB Providers: Attending/Midwife/Resident/PA/NP	Serve as team lead: Performs initial assessment, prescribes diagnostic and therapeutic interventions, outlines management plan.
Anesthesiology Attending/Resident	Assists with initial assessment and interventions, manages airway, hemodynamic s, pain control, administers blood products. Communic ates plan in collaboration with OB provider.
Charge RN	Assists Primary RN in impleme ntation of interventions, brings PPH cart, assigns clear roles including runner to Blood Bank, prepares OR, coordinates bed placement, assists with direct hand-off.
Primary RN	Activation of response team. Communic ates patient condition to primary responders, assists in imple menting interventions as ordered by team leader, remains with patient until stabilization or resolution of the problem with direct handoff.
Secondary Responders:	***May be consulted when necessary in PPH Stage 3***
Advanced GYN Surgeon	
Critical Care Physician	
Respiratory Therapist	
Interventional Radiologist	

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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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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

Northwell Health: South Shore University Hospital	OB/GYN SERVICE LINE GUIDELINES		
POLICY TITLE: Hemorrhage Guidelines	**SECTION:**		
Prepared by: Adiel Fleischer, MD Adopted by SSH with hospital specific changes by Mary Moreira, MSN, NM	**Effective Date:** 02/09/2021	**Last Revised/Reviewed:** 05/2015, 12/14/16, 06/27/2019, 02/09/2021	**Page 1 of 20**

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
-Refusal of blood transfusion
-Bleeding disorder
-Current anticoagulation (therapeutic)
-Significant co-morbidities

Condition for which timing of delivery is critical

Placenta accreta	$34^{0/7}$ - $35^{6/7}$ weeks
Placenta previa	$36^{0/7}$ - $37^{6/7}$ weeks
Prior classical C/S	$36^{0/7}$ - $37^{6/7}$ weeks
Previous myomectomy	$37^{0/7}$ - $38^{6/7}$ weeks
If extensive	$36^{0/7}$ - $37^{6/7}$ weeks

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)[1]
-Obtain the necessary consults (MFM/Hematology/Obstetrical 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 deliver, 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

Emergency Blood Release – See Massive Transfusion and Emergency Release Protocol

Massive Transfusion Protocol (MTP)*- See Massive Transfusion and Emergency Release Protocol

Hemorrhage Tray

Vaginal	Cesarean Delivery
Vaginal retractors, long weighted speculum	Hysterectomy tray
Long instruments (*needle holder, clamps etc.*)	Reloadable straight needle for B-Lynch suture
Uterine Bakri balloon	Uterine Bakri balloon
JADA®	JADA®
Banjo Curette	Procedure diagrams
Bright task light/Head lamp	
Procedure diagrams	

Medications

Pitocin 20u/l	1 bag
Pitocin 10u	2 vials
Hemabate 250 microgram/ml	1 ampule
Cytotec 200microgram/tablet	5 tabs
Methergine 0.2 mg/ml	1 ampule
Tranexamic acid 0.1g/ml	1 ampule

Southside Hospital: Hemorrhage Guidelines

Hemorrhage Team: "Code H" 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)
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 >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 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 (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
-Assure IV access (at least 18 gauge)
-Insert foley catheter *(Document Urinary Output) with urometer and institute 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**

Communications/Logistics	Hemostasis	Replacement
RN→alerts surgeon re…EBL RN alerts 2nd Obstetrician 2nd Attending →assesses if additional resources are necessary* Initiate use of PPH flow sheet Call for 2nd Anesthesiologist	Atony: -Administer uterotonics -If uterotonics already used, without success Vaginal → Bakri balloon C/S → Compression sutures (B-Lynch, etc) → Stepwise devascularization Others *(Trauma, retained tissue, coagulopathy)*	IV Fluids (RL in a 1:1 ratio to EBL) Tranexamic acid 1g IV/10min Get blood to the floor Start transfusion (RBC/FFP) if : - Abnormal vital signs, urinary output lab results - In the judgment of surgeon hemostasis is not imminent For patient refusing blood: consider admin clotting factors now (Fibrnogen, PCC) if acceptable

Address the source or cause of bleeding

Observe for 15-30 min** → Bleeding continues

If not in the OR move patient to OR now Contact Hemorrhage Team	-**Escalate steps** → to insure hemostasis -Proceed to next steps not already tried***: - Compression sutures - Stepwise devascularization - Uterine artery ligation - 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, acidosis etc: initiate MTP at this time **(RBC:FFP:Plts → 4:4:1)** -If coagulopathic despite MTP consider: Fibrinogen, Prothrombin Complex Concentrate (*Kcentra, Bebulin*)

**For patients refusing blood or abnormal vital signs Coagulopathy/Acidosis contact Hemorrhage Team now*
***If bleeding stops/subsides, but subsequently starts again→ proceed to next steps as outlined*
****Do not delay surgical intervention pending correction of coagulopathy, acidosis, 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) **Site: PACU or Postpartum floor**

-Abnormal vital signs*, urinary output
-Abnormal laboratory results (↓Hb >4g, Acidosis, Coagulopathy)
-Abnormal clinical exam

Communications/Logistics
Initiate use of PPH Flow Sheet
Bedside evaluation
- within 15-20 min *(if not done, consider move to L&D)*
-Provider →PA, NP, Sr resident
-Notify Attending obstetrician**
I&O, Labs: CBC, Coagulation
Include Abdominal/Pelvic Ultrasound (CT if needed)

If – for free fluid or large collection
→ IV fluids 1,000cc
→ *Evaluate 60 min*
→ Condition deteriorates / Lack of improvement

If + for free fluid or large collection
→ -Move patient to L&D
- Attending obstetrician at bedside
-Perinatal Huddle
-Contact Hemorrhage Team

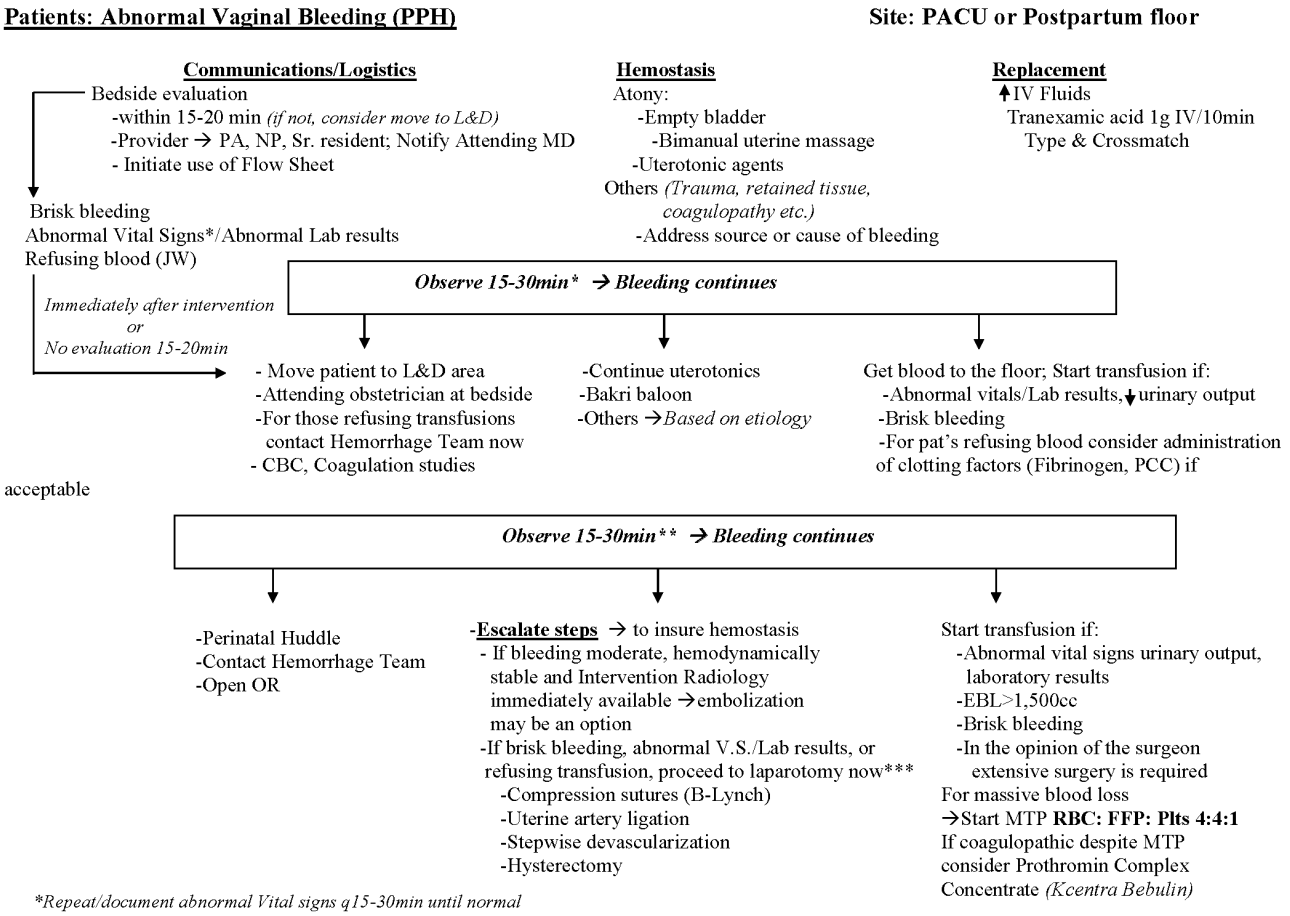
Hemostasis
Conservative management if hemodynamically stable → - IV fluids
- Tranexamic acid 1g IV/10min
- Transfusion as necessary
- For pat's refusing blood, consider giving clotting factors if acceptable
→ *Evaluate 60 minutes*
→ -Condition deteriorates
-Lack of improvement

Decision made by Att. MD
→ Return to OR***
(if hemodynamically unstable or refusing blood products)
→ Laparotomy
-B-Lynch Procedure
-Stepwise devascularization
-Hysterectomy

**Replacement*

**Repeat/document abnormal vital signs q15-30min 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



*Repeat/document abnormal Vital signs q15-30min until normal
**If bleeding stops/subsides, but subsequently starts again→ proceed to next steps as outlined
*** Do not delay surgical intervention pending correction of coagulopathy, acidosis, or normalization of vital signs;
For patient's in stage 3 and no desire for future childbearing or refusing blood consider going straight to Hysterectomy

Southside Hospital: Hemorrhage Guidelines

(Stage 4 Hemorrhage)

Communications/Logistics	Hemostasis	Replacement
-Code Team -OB Rapid Response Team	-Emergency Hysterectomy	-CPR -MTP

→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.

Southside Hospital: Hemorrhage Guidelines

REFERENCES TO REGULATIONS AND OR OTHER RELATED POLICIES

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Reviewed and approved by:

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Luis Bracero, MD *Chief* *Maternal Fetal Medicine*	*Signature on file*	02/09/2021

Southside Hospital: Hemorrhage Guidelines

Estimating Blood Loss

4X4 gauze 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 = 60 mL

ALL DOCUMENTATION OF BLOOD LOSS MUST BE REFERRED TO IN mL

Southside Hospital: Hemorrhage Guidelines

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 ac.)
- -Patient Clinical status (anxious, confused, lethargic)

Stages 1 → Stage 4

Peripartum Hemorrhage
-Stages of Hemorrhage*-

Stage 1	↑ Bleeding (>500cc vag, >1,000cc C/S) → Normal V.S., Labs and clinical picture.
Stage 2	↑↑ Bleeding (EBL 1,000-1,500cc) → Normal V.S., Labs and clinical picture
Stage 3	Ongoing Bleeding → EBL > 1,500cc; or Brisk bleeding (>500cc/10min) **Or any of these abnormalities in the context of bleeding (regardless of EBL or Transfusion)** Abn: BP, Pulse, Shock Index Urinary Output Abn: Coagulation, pH, BD, Lactic ac, ↓Hb/Hct (>4g drop in Hb) Abn: Clinical status (confused, lethargic)
Stage 4	Cardio-vascular collapse in the setting of servere hemorrhage -Profound hypovolemic shock (blood loss not replaced) -AFE (sudden c-v collapse)→ heavy vaginal bleeding

**Modified after American College of Surgeons*

Southside Hospital: Hemorrhage Guidelines

Uterine Atony

1st Line uterotonics

Oxytocin (Recommend regimen)
- 40U/1,00cc at 125cc/hr

Methergine*
0.2mg IM (may be repeated q 2-4 hrs)

**Causes Vasoconstriction → avoid in Hypertensive patients*

2nd Line uterotonics

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

Southside Hospital: Hemorrhage Guidelines

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 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, Transamin):*

-**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 curve (prolonged labor)

Southside Hospital: Hemorrhage Guidelines

- 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:

	Name	Contains Factors	Dose
3 Factors PCC:	Bebulin	II, IX, X (little VII)	25-50u/Kg
4 Factors PCC:	Kcentra	FII, FIX, FX, FVII	25-50u/Kg

- 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

Southside Hospital: Hemorrhage Guidelines

Hand – Off Communication OR → PACU

Procedure:
- NSVD
- Instrumental delivery
- C/S -Duration ____

EBL: Total
-In OR

Interventions:
-Uterotonics
-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/LDR or PACU)
-Uterotonics
-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

Southside Hospital: Hemorrhage Guidelines

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
- -Uterotonics
- -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

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:_____Time: _____

NOTE: If any changes are made to this information, they must be dated, timed and initialed by the patient and provider.

Category I	Will Accept	Will Not Accept	May Accept Under Certain Circumstances
Red Blood Cells			
Fresh Frozen Plasma			
Platelets			
Autologous Banked Blood			
Category II – minor blood fractions – fractionated out from human plasma			
Albumin			
Fibrin Glue			
Erythropoietin			
RhoGAM			
Human Immunoglobulin			
Cryoprecipitate			
Humate-P			
Prothrombin Complex Concentrate			
Category II (Does not contain human plasma)-+			
Factor VII A (Novo 7)			
Factor VIII Recombinant			
Factor IX Recombinant			
Category III – no blood component			
Tranexamic Acid	✓		
Amicar	✓		
Hetastarch	✓		
Category IV			
Isovolemic Hemodilution			
Hypervolemic Hemodilution			
Cell Saver			
Other:			

MATERNAL FETAL MEDICINE	ANESTHESIOLOGY	HEMATOLOGY
Patient Signature:	Patient Signature:	Patient Signature:
Print Name:	Print Name:	Print Name:
MD:	MD:	MD:
Print Name:	Print Name:	Print Name:
Date:	Date:	Date:
Time:	Time:	Time:
Reaffirmed upon Admission to the Hospital by:	Date:	Time:

Southside Hospital: Hemorrhage Guidelines

BLOOD PRODUCT EDUCATION FORM

Where to Order	COMPONENT	CONTENT	Expected Effect
Blood Bank	Packed Red Blood Cells	Contains red blood cells and a small amount of plasma	250 ml: Increases hematocrit by 3-4% and hemoglobin by 1 g/dl
Blood Bank	Fresh Frozen Plasma (FFP)	Plasma which contains clotting factors, albumin and immunoglobulins	250 ml: Increases fibrinogen, normalization of PT, PTT
Blood Bank	Platelets	Platelets and plasma	250 ml: Increases platelets
Blood Bank	Autologus Blood	Donated by patient for self-use	Need a high/normal hematocrit and usually is not used in emergencies
	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/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	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	Autologus blood removed from patient	Limits the use of banked blood
	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	Autologus blood – Blood lost during procedure	Can return up to 250 ml IV in 3 minutes, devoid of plasma and platelets

Southside Hospital: Hemorrhage Guidelines

Patient Identification

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:_____

Category I	Will Accept	Will Not Accept	May Accept Under Certain Circumstances
Red Blood Cells			
Fresh Frozen Plasma			
Platelets			
Autologous Banked Blood			
Category II – minor blood fractions – fractionated out from human plasma			
Albumin			
Fibrin Glue			
Erythropoietin			
RhoGAM			
Human Immunoglobulin			
Cryoprecipitate – needs consent			
Humate-P			
Prothrombin Complex Concentrate			
Category II (Does not contain human plasma)			
Factor VII A (Novo 7)			
Factor VIII Recombinant			
Factor IX Recombinant			
Category III – no blood component			
Tranexamic Acid	✓		
Amicar	✓		
Hetastarch	✓		
Category IV			
Isovolemic Hemodilution			
Hypervolemic Hemodilution			
Cell Saver			
Other:			

PATIENT	OBSTETRICAL ATTENDING	ANESTHESIOLOGIST
Signature:	Signature:	Signature:
Print Name:	Print Name:	Print Name:
Date:	Date:	Date:
Time:	Time:	Time:

Southside Hospital: Hemorrhage Guidelines

Abnormal Patient Status Algorithm

Code OB- requires immediate evaluation by the OB team	Physician Escalation- bedside evaluation within 15 minutes	Perinatal Huddle
Breech/Head Entrapment	Clinical Status: altered mental status, difficulty breathing or increased vaginal bleeding	Does not require immediate medical evaluation
Brisk vaginal bleeding (>500cc over 10 min)	VITAL SIGNS: if abnormal, confirm within 15 min	
Category 3 fetal heart rate tracings	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 40 HR above 120 bpm Shock Index above 1.1 (maternal pulse/SBP) Urine output below 30cc/hr times 2 hours	Conditions requiring a multidisciplinary approach where consults from additional services are warranted ESI level 3 (as reported by the ED)
ESI levels 1 and 2 (as reported by the ED)	LABS:	example
Maternal Seizure	HGB below 8g HCT below 25%	Fetal issues:
*Maternal Unresponsiveness	Platelets below 100,000	All confirmed structural abnormalities
Prolapsed Cord	Fibrinogen below 200 mg%	Significant maternal medical comorbidities
*Significant Respiratory distress	PT above 13 INR above 1.2 PTT above 37	Logistical/Staffing issues
and/or SPO2 less than 90% with	Lactic acid above 3mg	
Oxygen	pH below 7.3 BD above -3	
Shoulder Dystocia		
Uterine Inversion		
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)

Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

Nuvance Health

Title: Obstetric Hemorrhage	**Policy Manual**: MCH- Perinatal	**Owner**: Maternal Child Health
For use at:		
☒ Vassar Brother Medical Center ☐ HQ Medical Practice ☐ Health Quest Heart Center	☐ The Thompson House ☐ Health Quest Urgent Care ☐ Health Quest Home Care	☐ Northern Dutchess Hospital ☐ Putnam Hospital Center ☐ Sharon Hospital

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

- Surgical and Mechanical measures include: Fundal massage, Intrauterine balloon tamponade, manual removal of retained tissue, laceration repair, uterine curettage, uterine compression suture, uterine artery ligation, uterine artery embolization via interventional radiology, hysterectomy

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:

STANDARD Risk Level	Anticipated Interventions
▪ No known extra risk factors	▪ Confirm Type and Screen ▪ Review labs (e.g., platelets, hemoglobin) ▪ Notify Provider & charge nurse ▪ Initiate or maintain IV access ▪ Ensure availability of Code H cart & meds ▪ Utilize QBL at delivery and postpartum ▪ Maintain awareness of cumulative blood loss
MEDIUM Risk Factors	
▪ Prior cesarean, uterine surgery, or multiple laparotomies ▪ Multiple gestation ▪ > 4 prior births ▪ Prior PPH ▪ Large Myomas ▪ EFW > 4000 g ▪ Obesity (BMI > 40) ▪ Hematocrit < 30% & other risk ▪ Chorioamnionitis ▪ Prolonged oxytocin > 24 hours ▪ Prolonged 2nd stage / ▪ Magnesium sulfate	
HIGH Risk Factors	**Anticipated Interventions**

Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

▪ 2 or more medium risk factors ▪ Suspected accreta/percreta ▪ Platelet count < 70,000 ▪ Placenta previa/low lying ▪ Active bleeding ▪ Known coagulopathy ▪ New active bleeding	▪ Confirm Type & Cross- consider having typed and crossed blood available before delivery ▪ Review labs (e.g., platelets, hemoglobin) ▪ Notify Provider, Anesthesia, & charge nurse ▪ Consider 2nd large bore IV ▪ Conduct interdisciplinary huddle on admission, change in patient status, prior to delivery, and PRN. ▪ Consider having Interventional Radiology evaluate and obtain consent for uterine embolization before delivery ▪ Have hemorrhage cart and/or medication kit available at delivery ▪ Consider additional personnel to perform QBL at delivery ▪ Maintain awareness of cumulative blood loss

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 OB 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:

Signs and Symptoms	Blood Pressure	Blood Loss (% blood lost)
Palpitations, lightheadedness, mild increase in heart rate	Normal	***500 to 1000 mls*** (10 to 15)

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Weakness, sweating, tachycardia (100 to 120 beats/minute)	Slightly Low	***1000 to 1500 mls*** (15 to 25)
Restlessness, confusion, pallor, oliguria, tachycardia (120 to 140 beats/minute)	70-80	***1500 to 2000 mls*** (25 to 35)
Lethargy, air hunger, anuria, collapse, tachycardia (>140 beats/minute)	50-70	***2000 to 3000 mls*** (35 to 45)

(Belfort, 2019)

3. Assess and document QBL for increased bleeding.
4. 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 <36.0oC
    e. Ongoing blood loss
    f. Urine output <30ml/hr
5. Utilize Code H protocol for team response to obstetric hemorrhage (APPENDIX A).
6. Utilize Code H Checklist for treatment and management of obstetric hemorrhage (APPENDIX B).
7. 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)
8. 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)
9. Continue frequent and regular assessment for continued hemorrhage, DIC, and signs of hemodynamic instability as described in steps 2 & 4.
10. Nursing documentation should include: Assessments, hemorrhage staging, interventions, patient response, provider notification, and any necessary escalation.
11. Patient/Family Education
    a. Plan of care
    b. Ongoing management and interventions
12. 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/Midas-Occurrence-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.

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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**

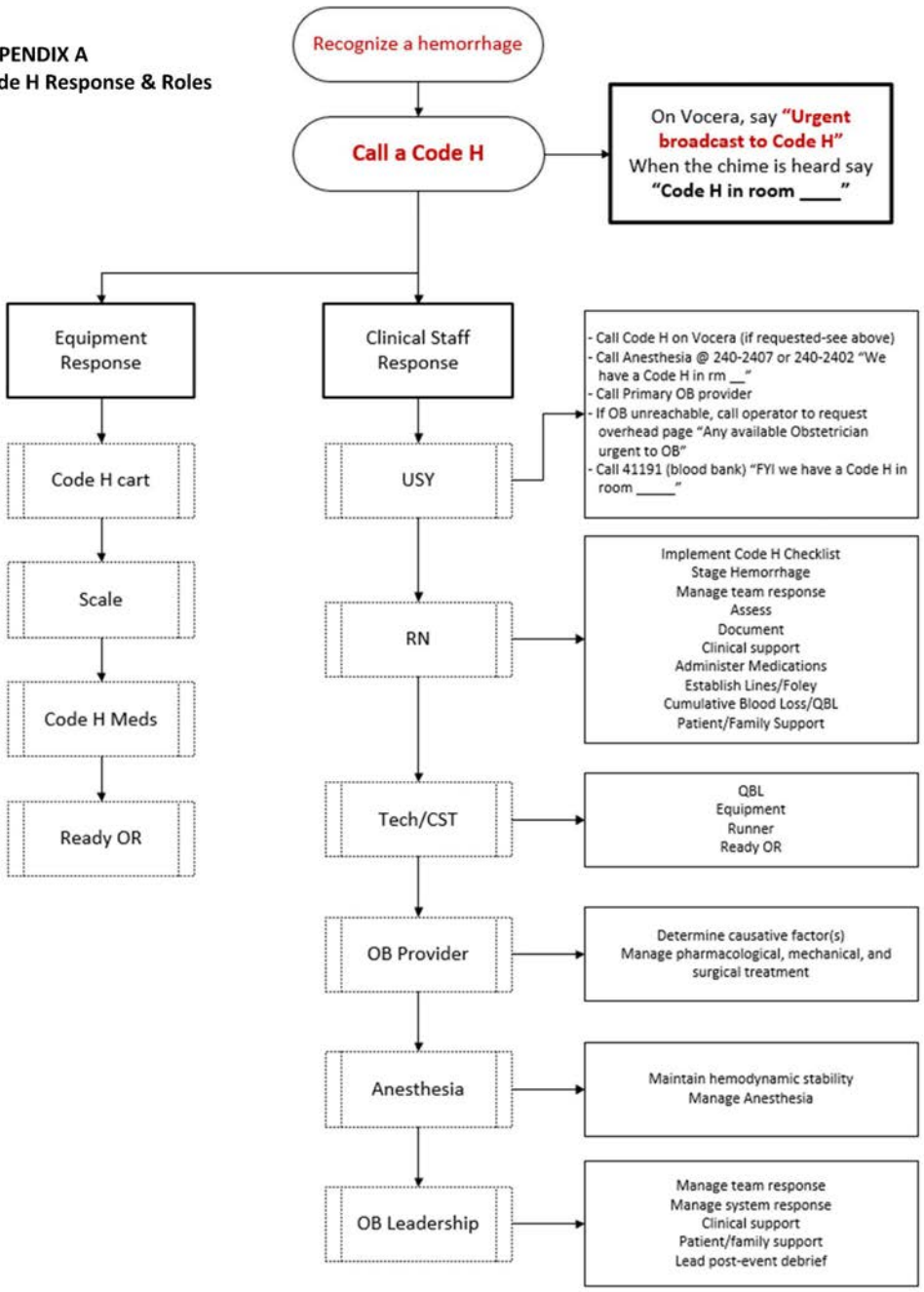
POLICY HISTORY:
Supersedes: N/A
Original implementation date: 11/2006
Date Reviewed: 9/08, 2/11, 8/17, 4/20
Reviewed by: MCH Policy Committee
Date Revised: 9/08 8/10 3/12 1/13 1/14 5/20
Next Date Policy is Due for Review: 05/2021

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)	

Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

APPENDIX A
Code H Response & Roles



Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

APPENDIX B

Nuvance Health Code H Checklist

❑ Call For Assistance: **"Urgent broadcast to Code H" "Code H room_____"**

Announce:

- ❑ Hemorrhage stage_____
- ❑ Vital signs _____
- ❑ Blood loss (cumulative)_____
- ❑ Designated roles (recorder, meds, IV, etc.)

Steps: ***(QBL should be ongoing)***

Stage 1: **Blood loss > 500ml vaginal OR >1000 ml C/S** or increased bleeding during recovery/postpartum

- ❑ Fundal massage
- ❑ Ensure 16G or 18G IV access
- ❑ Increase oxytocin
- ❑ Uterotonics (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 NRB
- ❑ Increase IV fluid (crystalloid without oxytocin)
- ❑ Draw STAT labs
- ❑ Uterotonics (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)

Uterotonics

Oxytocin:
10-40 units per 500-1000 ml solution

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

Carboprost (Hemabate):
250 micrograms IM
(may repeat q 15 min, max 8 doses)
Avoid with asthma; use with caution with hypertension, COVID-19

Misoprostol (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 100 ml NS and given over 10 min; may be repeated once after 30 min)

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
- ❑ Mobilize additional help
- ❑ Escalate interventions
- ❑ Continue uterotonics
- ❑ Initiate Massive Transfusion Protocol

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

Version 2.0 5/2020

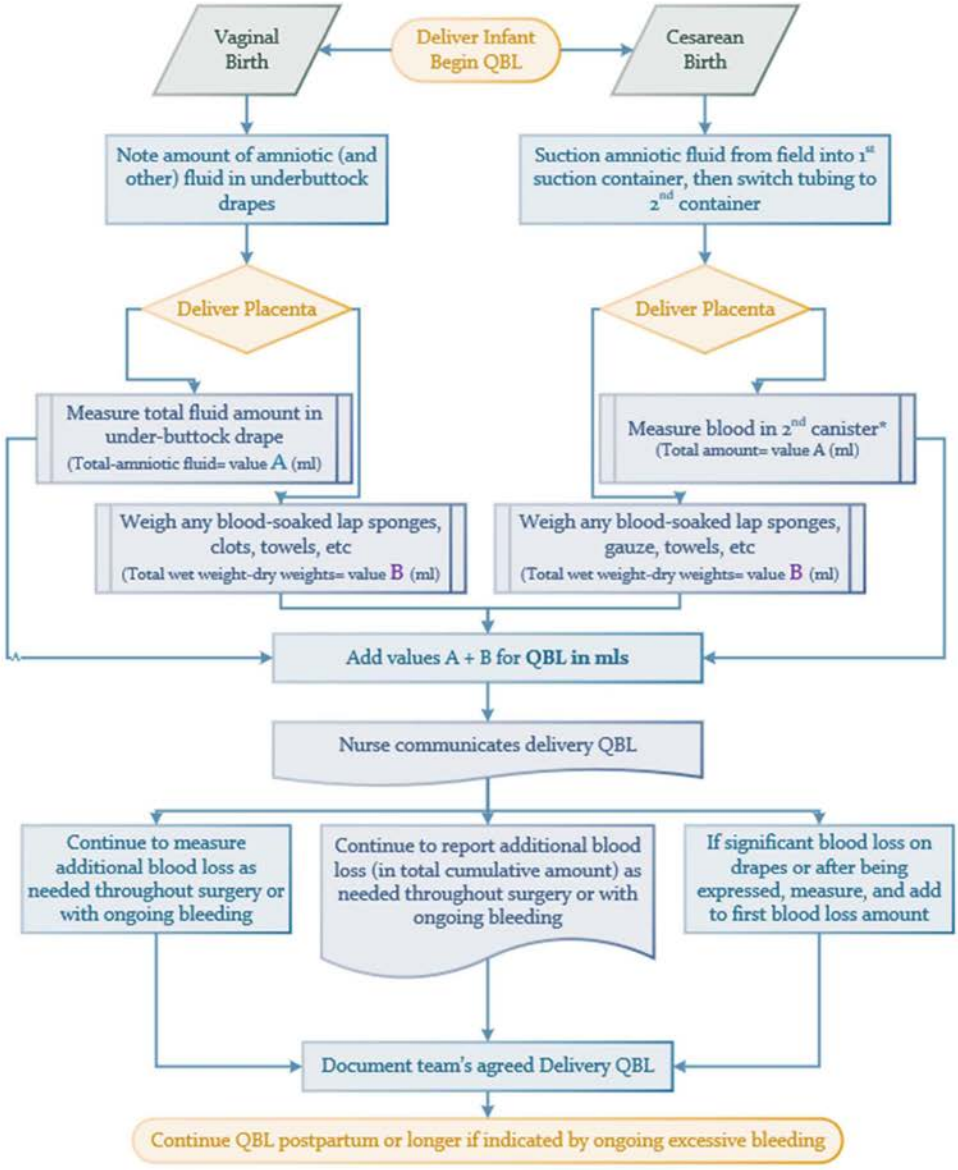
Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

APPENDIX C – Code H Cart Supply List

	Top of Cart		Drawer 3
1	Code H Sterile Instrument Set	1	1000ml Lactated Ringers
1	Reference Binder	1	1000ml Normal Saline
	Drawer 1	1	Blood Administration Set
1 ea size	Sterile Gloves (size 6-8.5)	1	Primary Tubing
10	Lubricant gel		**Drawer 4**
2	Lap Sponges- pkg of 5	1	Speculum
2	X-ray detectable sponges	1	Urine Meter
	Drawer 2	1	1000ml Normal Saline
2	IV start kits	1	Bakri Balloon
2 each	Blood collection tubes (marble, pink, lavender, green, blue)	2	Kerlix vaginal packing
2	#18 and #20 jelco	2	Lap Sponges- bands xray detectable
2	extension sets	1 each	Sterile Gloves (size 6-8.5)
2	vacutainer with needle		**Drawer 5**
1	blood band	1	Bedpan
4	10ml saline flush	2	Chux pads
1	T-connecter	1	Foley Cath kit
1	Biohazard lab bag	1	Graduated collection container
10	Alcohol wipes	2	Betadine 4oz bottle
1	Saline vial	6	Lubricating gel
1	filter straw	1	Flashlight
3	22g x 1 1/2" syringe	2	Latex-free catheter #16Fr
	Sutures	1	Latex-free catheter #18Fr
2	0 Prolene	1	Irrigation bulb syringe 60ml
2	2-0 Prolene		
2	0 Vicryl		
2	2-0 Vicryl		
2	4-0 Vicryl		
2	0 Chromic CT-1		
2	2-0 Chromic CT-1		
2	3-0 Chromic CT-1		
2	2-0 Chromic SH		
2	3-0 Chromic SH		

Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

APPENDIX D- **QBL Algorithm**



Vassar Brothers Medical Center: Obstetric Hemorrhage Policy

APPENDIX E

DRY WEIGHTS

ITEM	DRY WEIGHT	2	3	4	5	10
PLASTIC CHUX	25GM	50	75	100	125	
PERI PAD	10GM	20	30	40	50	
CLOTH CHUX	535GM	1070	1605	2140	2675	
UNDER BUTTOCK DRAPE	130GM	260	390	520	650	
DIAPER	20GM	40	60	80	100	
LAP WITH RING	30GM	60	90	120	150	
LAP W/O RING	19	38	57	76	95	
4X4	4GM	8	12	16	20	
LAP COUNTER BAG	22GM	44	66	88	110	
LAP COUNTER+ 10 LAPS WITH RING						322
BLUE SURGICAL TOWEL	50GM	100	150	200	250	
FULL SHEET	515	1030	1545	2060	2575	
HALF SHEET	317	634	951	1268	1585	
FITTED SHEET	624	1248	1872	2496	3120	
GOWN	350	700	1050	1400	1750	
SUCTION CANISTERS						
TOTAL						

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.

Type of event: _____ Date of Event: _____

Location of event: _____

Members of team present: (check all that apply)

☐ Primary RN ☐ Primary MD ☐ Charge RN ☐ Anesthesia Personnel

☐ Neonatology personnel ☐ MFM Leader ☐ Nurse Leader ☐ OB/Surgical tech

☐ Unit Secretary ☐ Other RNs

Thinking about how the obstetric emergency was managed,

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

FOR IDENTIFIED ISSUES, FILL IN TABLE BELOW

ISSUE	ACTIONS TO BE TAKEN	PERSON RESPONSIBLE

South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

Mount Sinai South Nassau

MOUNT SINAI SOUTH NASSAU
POLICY & PROCEDURE

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		
CROSS REFERENCE:	Blood Transfusion: Administration of PRBC, FFP, and Blood Components, and Procedure for Warming Blood OF-ADM-020 Guidelines for Identifying Obstetrical Patients requiring Critical Care PF-OB-123 Massive Transfusion Protocol (MTP) Guideline PF-ER-279; Massive Transfusion Algorithm PF-ER-279(a) Laboratory Policy & Procedure: TRM2.1.31 Emergency Transfusion Oxytocin (Pitocin) Administration for Induction and Augmentation of Labor; Second Trimester Intrauterine Fetal Demise; and the Patient Status Post First Trimester Complete Passage of Products of Conception PF-OB-250		

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 0): 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.

1

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 weighted, 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 debrief immediately after PPH/Code H occurrence.

Code H Activation (Stages I through IV): Patient with PPH

Stage I	Cumulative blood loss of 1000 ml (vaginal delivery or cesarean delivery), but less than 1500 ml *with normal vital signs and lab values.*
Stage II	Continued bleeding, cumulative blood loss up to 1500 ml OR any patient requiring at least 2 or more uterotonics in addition to Oxytocin *with normal vital signs and lab values.*
Stage III	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/labs/oliguria or patient at risk for occult bleeding (post cesarean, coagulopathy).
Stage IV	Cardiovascular collapse in setting of massive hemorrhage.

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 ob provider's discretion
- An interdisciplinary team (OB provider(s), anesthesiologist, primary RN and charge RN) huddle will occur 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 quantitave evaluation of blood loss. QBL should be continued if active bleeding is present, and if the patient's with a blood loss of more than 1000ml condition warrants. QBL evaluation may continue in the postpartum care setting as per ob 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 ob provider's discretion), 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 gage) 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 -Tone, Trauma, Tissue, Thrombin)
- 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 urometer
- Consider Code H activation
- Prepare the Operating Room for possible patient transfer there
- The patient/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.

MEDICATION	DOSE	PRECAUTIONS

South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

Oxytocin (Pitocin)*	10 – 20 units per 500 ml IV as continuous infusion, or 10 units IM	Avoid undiluted IV push, causes hypotension
Methylergonovine (Methergine)*	0.2 milligrams intramuscularly (may be repeated every 2- 4 hours)	Avoid in hypertension, Reynaud's. Do not administer intravenously
15-methyl PGF2α (Hemabate, Carboprost)*	250 micrograms intramuscularly(may repeat every 15 – 90 minutes, maximum 8 doses)	Avoid in asthma, hepatic, renal, cardiovascular disease Risk of diarrhea, fever, tachycardia
Misoprostol (Cytotec)	800-1000 micrograms rectally once	
Tranexamic Acid (TXA)	1 gram IVPB infused over 10 minutes **Repeat Doses (rare):** at the discretion of MD, surgery with bleeding continuing >4 hours, 1 gram administered 8 hours later	• Contraindications: ○ Active venous thromboembolism ○ At risks for thrombosis, history of DVT/PE ○ Subarachnoid hemorrhage ○ Thrombogenic cardiac rhythm ○ Severe renal insufficiency • Relative Contraindications: ○ Thrombophilia (homozygous FVL, 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 Packed Red Blood Cells (PRBC)
- ✓ 2 units of Frozen Plasma (FP)

* *1 unit of single donor Platelets can be requested by the ob 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 with diff., 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 uterotonic medications
- Consider TXA

***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:**

Anesthesiologist
In-house attending obstetrician
OB resident(s)/ OB PA(s)
GYN Oncology attending physician
L & D RNs, Mother Baby and NICU RNs
Nursing Administrator (NM, DON or ANS)
Blood Bank
Main OR staff
Dedicated Blood Runner
RRT RN
IV Team RN
Laboratory/Phlebotomist
Respiratory Therapist

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 its 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 P RBC; 6 Units thawed FP; 1unit 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)
  - ✓ Amniotic fluid embolism (sudden CV collapse followed by heavy uterine bleeding from uterine relaxation and associated coagulopathy)
  - ✓ Anesthetic complications
  - ✓ Intracranial 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 (NM, 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:

ACOG (2017). Postpartum hemorrhage (2017). Practice Bulletin # 183
ACOG (2019). Quantitative Blood Loss in Obstetric Hemorrhage. Committee Opinion, #794, vol 134*(6)*.
AWHONN (2015). Quantification of blood loss. Practice brief #1. JOGNN(44).

REPLACES: OBSTETRICS: Management of Obstetric and Gynecologic Hemorrhage Code H- Team-Transfusion Emergency (multiple revisions); Unit Based policy

Original approval	3/19 Oversight Committee; 4/19 Medical Board
Reviewed and Approved	10/19 Administration
Reviewed and Approved	01/2020 Policy Oversight Committee
Reviewed and Approved	11/2020 WCS Steering Committee, 11/2020 Policy Oversite Committee

South Nassau Communities Hospital: Code H – Obstetric Hemorrhage

Appendix A

PPH Risk Assessment

Prenatal Hemorrhage Risk Assessment:

[ ] Suspected previa/accrete/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
[ ] Chorioamnionitis
[ ] Prolonged oxytocin >24 hours
[ ] Prolonged 2nd stage*
[ ] Magnesium sulfate
[ ] Hematocrit <30%

High Risk
[ ] Placenta previa/low lying
[ ] Suspected accrete/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 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

Patient label

Called Code H Activation at _____am-pm on _____/_____/_____

	Times					
G: ___ P___ Gest Age: _____ Delivery Date: _____						
PATIENT STATUS: STAGE 0 applies to all deliveries						
BP						
MAP						
PULSE						
RESPIRATIONS						
Oxygen Saturations						
Neuro: A = alert/oriented V= response to verbal P= repsonse to pain U= unresponsive						
Fundal Height						
Uterine tone						
Blood Loss						
Urine output						
Type & Cross						
PATIENT STATUS: CODE H ALERT STAGE I						
Suspicion of possible maternal hemorrhage: HX of: prolonged induction, post partum hemhorrage, anemia, uterine surgery, thrombocytopenia, placenta previa/accreta. Fibroids, grand multipara, VBAC, macrosomia, multiple gestation						
Cardiac monitor						
2nd IV Line						
PATIENT STATUS: CODE H ACTIVATION STAGE II - IV **Maternal hemorrhage, hemodynamics unstable >500 ml vaginal or >1000 ml c/s**						
Code H called by operator						
Head of bed lowered						
Oxygen at 8-10 L/min by mask						
Uterine massage						
Foley catheter insertion						
Lab request slip to blood bank						
Team members response (see back)						
MEDICATIONS						
Pitocin (dose in units/route)						
Hemabate 250 micrograms (route)						
Methergine 0.2 mg (route)						
Tranexamic Acid 1000mg (IV, over 10 min)						
Cytotec 1000 micrograms, rectally						
IV FLUIDS (No. of bags & time hung)						
IV normal saline 1000ml						
IV Lactated ringers 1000ml						
BLOOD PRODUCTS (time hung)						
Packed red blood cells						
Fresh frozen plasma						
Platelets						
Cryoprecipitate						
Warming device						
DRAW LABS						
Hgb= hemoglobin, Hct= hematocrit, P= Platelets F= Fibrinogen, PT, PTT, INR						
OTHER						
Surgical intervention: Cesarean Section, Hysterectomy						
Consults: surgical, hemotology, critical care,						
Transfer to critical care bed						

Completed by: _____RN Date: _____

9

NYP Brooklyn Methodist Hospital: Caesarean Delivery QBL Worksheet

NewYork-Presbyterian
Brooklyn Methodist Hospital

Cesarean Delivery
Obstetric Hemorrhage QBL Worksheet

PRE-WEIGHT (A)				
ITEM	**QUANTITY (#)**	**DRY WEIGHT**	**=**	**TOTAL**
Dry Lap	X	25	=	
Blue Chux	X	45	=	
Disposable Underpad	X	135	=	
Sheets	X	485	=	
Gown	X	335	=	
White Towel	X	60	=	
Lap Bag	X	25	=	
Placenta Basin	X	25	=	
1 SCD	X	120	=	
Drape	X	400		
Add the Totals for the Pre-weight			A =	grams
Total Normal Saline /Sterile H_2O Given to Tech			I =	mL
Amount left			II =	mL
Fluid Used, I 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 =	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

Risk factors & Assessment	Notes or Calculations

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)

NewYork-Presbyterian
Brooklyn Methodist Hospital

Obstetric Hemorrhage Checklist

Complete all steps in prior stages plus current stage regardless of stage in which the patient presents. Time of medication or interventions can be written in the spaces next to them in each stage.

Recognition:

☐ Call for assistance (Obstetric Hemorrhage Team) Time:_____ AM / PM

Designate: ☐ Team leader_____ ☐ Checklist reader/recorder_____ ☐ Primary RN_____

Announce: ☐ Cumulative blood loss (Weigher)_____ ☐ Vital signs_____ ☐ Stage (Reader/Recorder)

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

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 uterotonics

Blood Bank:_____

- ☐ Type and Crossmatch 2 units RBCs

Action:_____

- ☐ Determine etiology and treat →
- ☐ Prepare OR, if clinically indicated (optimize visualization/examination

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 $PGF_2\alpha$ (Hemabate, Carboprost): _____
_____
250 micrograms IM (may repeat in q15 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)
Tissue (i.e., retained products)
Thrombin (i.e., coagulation dysfunction)

Stage 2: Continued Bleeding (QBL up to 1500mL OR >2 uterotonics) with normal vital signs and lab values

Initial Steps:_____

- ☐ Mobilize additional help
- ☐ Place 2nd IV (16-18G) _____
- ☐ Draw STAT labs (CBC, Coags, Fibrinogen)
- ☐ Prepare OR _____

Tranexamic Acid (TXA) _____
1 gram IV over 10 min (add 1 gram vial to 50 mL NS or D5; maybe repeated after 30min)

Medications:

- ☐ Continue Stage 1 medications; consider TXA

Blood Bank:_____

- ☐ Obtain 2 units RBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms) _____
- ☐ Thaw 2 units FFP _____

Action: _____

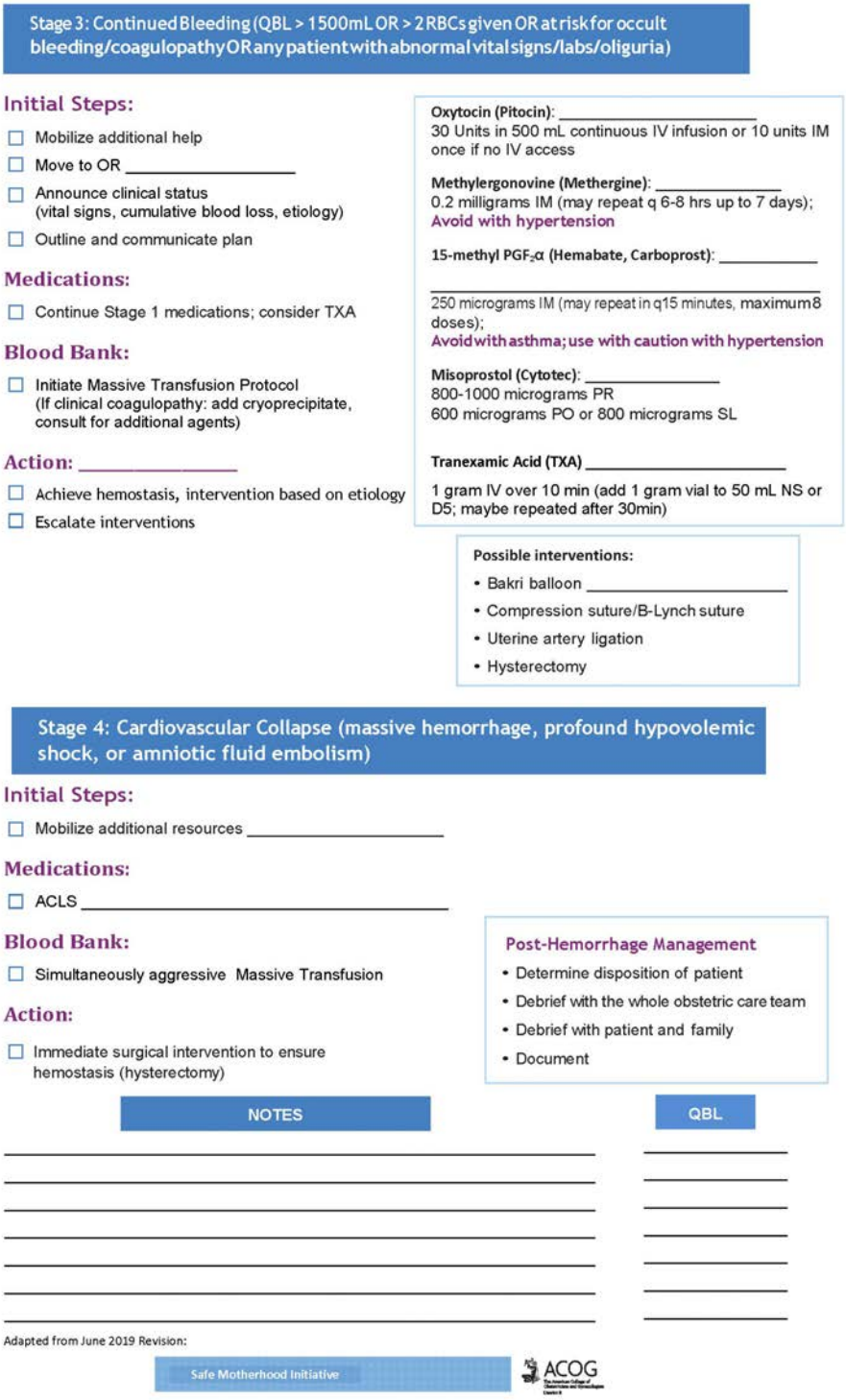
- ☐ For uterine atony --> consider uterine balloon or packing, possible surgical interventions
- ☐ Consider moving patient to OR
- ☐ Escalate therapy with goal of hemostasis

Possible interventions:

- Bakri balloon _____
- Compression suture/B-Lynch suture
- Uterine artery ligation
- Hysterectomy

Huddle and move to Stage 3 if continued blood loss and/or abnormal VS →

NYP Brooklyn Methodist Hospital: Hemorrhage Recorder Checklist (2 pages)



Stage 3: Continued Bleeding (QBL > 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): _____
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 $PGF_2\alpha$ (Hemabate, Carboprost): _____
_____
250 micrograms IM (may repeat in q15 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

Tranexamic Acid (TXA) _____
1 gram IV over 10 min (add 1 gram vial to 50 mL NS or D5; maybe repeated after 30min)

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

NOTES	QBL

Adapted from June 2019 Revision:

Safe Motherhood Initiative ACOG

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
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TITLE: MANAGEMENT OF OBSTETRICAL HEMORRHAGE

TABLE OF CONTENTS:

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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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 over-ride 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:
https://infonet.nyp.org/Lab/Shared%20Documents/MassiveHemorrhageProtocol.pdf

At Weill Cornell:
https://infonet.nyp.org/Lab/Shared%20Documents/MTPUpdate.pdf

At Allen Hospital:
http://infonet.nyp.org/Lab/Shared%20Documents/AllenHospitalMassiveTransfusionProtocol.pdf

At Lower Manhattan Hospital:
https://infonet.nyp.org/Lab/Shared%20Documents/LMHEmergencyReleaseofBloodProductsandMassiverTansfusionProtocol.pdf

At Lawrence Hospital:
https://infonet.nyp.org/Lawrence/ClinicalPolicies/MassiveTransfusionProtocol-MTP.pdf

b. **Nursing Clinical Standards:**
OB 1770 Post Vaginal and Cesarean Birth Management
http://infonet.nyp.org/Nursing/Standards/PostVaginalandCesareanBirthManagement.pdf

PROC 750, Blood, Blood Components, Factor Concentrates and Factor Derivatives Administration Procedure at:
https://infonet.nyp.org/Nursing/Standards/BloodComponentsDerivativesAdministrationProcedure.pdf#search=procedure%20750

c. **Hospital Policy:**
C112: Chain of Communication Guidelines
http://infonet.nyp.org/QA/HospitalManual/C112ChainOfCommunicationGuidelines.pdf

d. **Perinatal Practice Guidelines**
Obstetrical Anesthesia Consultation Guideline
http://infonet.nyp.org/wmnshlth/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

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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.

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Table 1: Risk Assessment: Labor & Delivery Admission

Risk Level	Risk Factor	Plan of Care
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 placentation (accreta 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.

*Allscripts and Meditech sites
**Epic sites only

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Table 2: Risk Assessment Pre-Birth

Risk Level	Risk Factor Admission Risk Factors AND:	Plan of Care
Low	• 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	• Chorioamnionitis • Induction/augmentation of labor • Labor > 18 hours • Prolonged second stage • Magnesium sulfate • Maternal temperature > 100.4 F	• Notify OB provider, charge RN and call team huddle. • Verify active Type & Scree • Verify 18G or larger IV access present and patent. • Verify PPH cart and uterotonics are available on unit. • Use scales/calibrated equipment to quantify cumulative blood loss
High	• New active bleeding greater than bloody show • Suspected abruption • 2 or more "Medium Risk" factors on admission or intrapartum	• 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 uterotonics available on unit • Use scales/calibrated equipment to quantify blood loss.

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Table 3: Risk Assessment Post-Birth

Risk Level	Risk Factor Admission AND Intrapartum Risk Factors AND:	Plan of Care
Low	• 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 uterotonics 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 uterotonics available on unit • Use scales/calibrated equipment to quantify blood loss.

2. STAGES OF OBSTETRIC HEMORRHAGE

A. ALL BIRTHS: PREVENTION AND RECOGNITION OF OB HEMORRHAGE: *Universal Active Management of Third Stage of Labor*

1) Prophylactic uterotonics 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

Medication	Dose	Primary Route/ (Alternate)	Frequency of Dose	Side Effects	Contra-indications
Oxytocin (Pitocin)	30 Units in 500 mL of solution IM: 10 units	IV or Intramuscular if there is no IV access.	Continuous infusion	Usually none. Nausea, vomiting, water intoxication have been reported.	Hypersensitivity to drug. *Do not administer with D5W.*
Methylergo-novine **(Methergine)**	0.2 mg	IM or Intra-myometrial	Every 2-4 hours	Hypertension, hypotension, nausea, vomiting	Avoid with hypertension, preeclampsia.
15- methyl Prostaglandin F 2 Carboprost (Hemabate)	250 mcg	IM	Every 15 minutes for maximum of 8 doses	Vomiting, diarrhea, nausea, flushing or hot flashes, chills or shivering.	Avoid with asthma. Caution with active hepatic, cardiac or renal disease.
Misoprostol (Cytotec)	800-1000 mcg 600 mcg PO 800 mcg	Per Rectum PO Sublingual	Once	Nausea, vomiting, diarrhea, fever and chills.	Hypersensitivity to drug.

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TABLE 5: Additional Medications to Consider if Suboptimal Response to Uterotonics:

Name	Mechanism of action	Dose	Route/ Alt. Routes	Remarks
Tranexamic Acid (TXA)	Antifibrinolytic	1g/10 ml diluent (stocked in pre-mixed 10-ml vials)	IVP/IV infusion over 10 min./oral if no IV access; May be given in 50 mls D5 or NS over 10 min.	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**

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. <u>STAGE 2:</u> 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. <u>STAGE 3:</u> 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.

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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.
6) Consider aggressive replacement with 1:1:1 ratio of RBC:FFP:Platelets
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.

Primary Responders:	**Role:**
OB Providers: Attending/Midwife/Resident/PA/NP	Serve as team lead: Performs initial assessment, prescribes diagnostic and therapeutic interventions, outlines management plan.
Anesthesiology Attending/Resident	Assists with initial assessment and interventions, manages airway, hemodynamics, pain control, administers blood products. Communicates plan in collaboration with OB provider.
Charge RN	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.
Primary RN	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.
Secondary Responders:	***May be consulted when necessary in PPH Stage 3***
Advanced GYN Surgeon	Assists with advanced surgical interventions
Critical Care Physician	Coordinates intensive care interventions with primary team, determines ECMO needs
Respiratory Therapist	Assists with airway management, oxygenation, ventilation and therapeutic interventions
Interventional Radiologist	Performs selective embolization

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.

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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. 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.
   a. 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.
   b. 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.
   a. 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.
   b. 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

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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

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Obstetric Hemorrhage Checklist

EXAMPLE

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 1,000mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours. However, blood loss >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

Announce: ☐ Cumulative blood loss ☐ Vital signs _____ ☐ Determine stage

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.

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 uterotonics

BLOOD BANK:

☐ Confirm active type and screen and consider crossmatch of 2 units PRBCs

ACTION:

☐ Determine etiology and treat
☐ Prepare OR, if clinically indicated (optimize visualization/examination)

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

Methylergonovine (Methergine):
0.2 milligrams IM (may repeat);
Avoid with hypertension

15-methyl $PGF_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM (may repeat in q15 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)
Tissue (i.e., retained products)
Thrombin (i.e., coagulation dysfunction)

STAGE 2: Continued Bleeding (EBL up to 1500mL OR ≥ 2 uterotonics) with normal vital signs and lab values *(*two or more uterotonics in addition to routine oxytocin administration; or ≥ 2 administrations of the same uterotonic)*

INITIAL STEPS:

☐ Mobilize additional help
☐ Place 2nd IV (16-18G)
☐ Draw STAT labs (CBC, Coags, Fibrinogen)
☐ Prepare OR

MEDICATIONS:

☐ Continue Stage 1 medications; consider TXA

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100mL NS & give over 10 min; may be repeated once after 30 min)

BLOOD BANK:

☐ Obtain 2 units PRBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
☐ Thaw 2 units FFP

ACTION:

☐ For uterine atony --> consider uterine balloon or packing, possible surgical interventions
☐ Consider moving patient to OR
☐ Escalate therapy with goal of hemostasis

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

Huddle and move to Stage 3 if continued blood loss and/or abnormal VS

Safe Motherhood Initiative

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Revised September 2020

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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):
0.2 milligrams IM (may repeat);
Avoid with hypertension

15-methyl $PGF_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM
(may repeat in q15 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

Tranexamic Acid (TXA)
1 gram IV over 10 min (add 1 gram vial to 100mL 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

NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

NewYork-Presbyterian

Columbia University Medical Center

TS029 Massive Hemorrhage Protocol
Document Number: TS029 **Revision:** 2.02
Submitted By: Sylvia Parker-Jones **Created Date:** 05/13/2015
Approved: Joseph Schwartz (10/14/2020) **Effective Date:** 10/23/2020
Folder Name: Transfusion Medicine\Blood Bank Policies and Procedures
Printed copies not valid.

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 **1**:**1**:**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

Title: TS029 Massive Hemorrhage Protocol
Document Number: TS029
LTR: LTR25116 Revision: 2.02

N/A

PROCEDURE:

I. 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 MH 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 Epic electronic "Massive Hemorrhage Protocol Order" or a manual (downtime) "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. And the Supervising 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 an electronically initiated MHP, 10 MHP Pick UP slips will print in the

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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 (manual) initiated MHP, a (downtime) 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.

I. 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

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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:

Weight (kg)	Red Cells	Plasma	Platelets	Cryoprecipitate
0 - 10	1 unit	1 unit	50 mL	15 mL
11 - 25	2 unit	2 unit	100 mL	30 mL
≥ 26	See Adult dosing			

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 technologist 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:

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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 apheresis platelets

If plasma compatible platelets are not available, platelets should be released in the following order:

First choice	AB
Second choice	A
Third choice	B
Fourth choice	O

   - **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:

Weight (kg)	Red Cells	Plasma	Platelets	Cryoprecipitate
0 - 10	1 unit	1 unit	50 mL	15 mL
11 - 25	2 unit	2 unit	100 mL	30 mL

If plasma-compatible platelets are not available, platelets should be released in the following order:

First choice	AB
Second choice	A
Third choice	B
Fourth choice	O

D. 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 10 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

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- **6 units** of **AB** 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:

First choice	AB
Second choice	A
Third choice	B
Fourth choice	O

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:

Weight (kg)	Red Cells	Plasma	Platelets	Cryoprecipitate
0 - 10	1 unit	1 unit	50 mL	15 mL
11 - 25	2 unit	2 unit	100 mL	30 mL

Platelets should be released in the following order:

First choice	AB
Second choice	A
Third choice	B
Fourth choice	O

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.

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2. If no additional sample is available for crossmatching:
    a. The "Initiating Physician" will be contacted for an additional sample
    b. Antigen negative RBC will be released as an emergency release
    c. If compatible RBC cannot be quickly identified, the supervisor and on-call physician will direct the release of the most appropriate RBCs (closest possible antigen negative RBCs)

III. 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 date, 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 no 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 Supervisor review.

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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 back 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:

Responsible Party	Activity	Document

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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 • Submits a manual Blood Product Pick-up Slip to blood bank for every round of products	• Massive Hemorrhage Protocol Order form • MHP Blood Product Pick-up Slip • Blood Product Pick UP slip (manual)
Transfusion Service Staff	• Contact Transfusion Medicine physician • Contact Transfusion Service On-call Supervisor • Prepare products • Completion of Massive Hemorrhage Protocol Order Form	• Blood Product Order form • 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	• Massive Hemorrhage Protocol Order form • Notes from on-call physician

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NYP Columbia University Medical Center: Massive Hemorrhage Protocol Flowbox

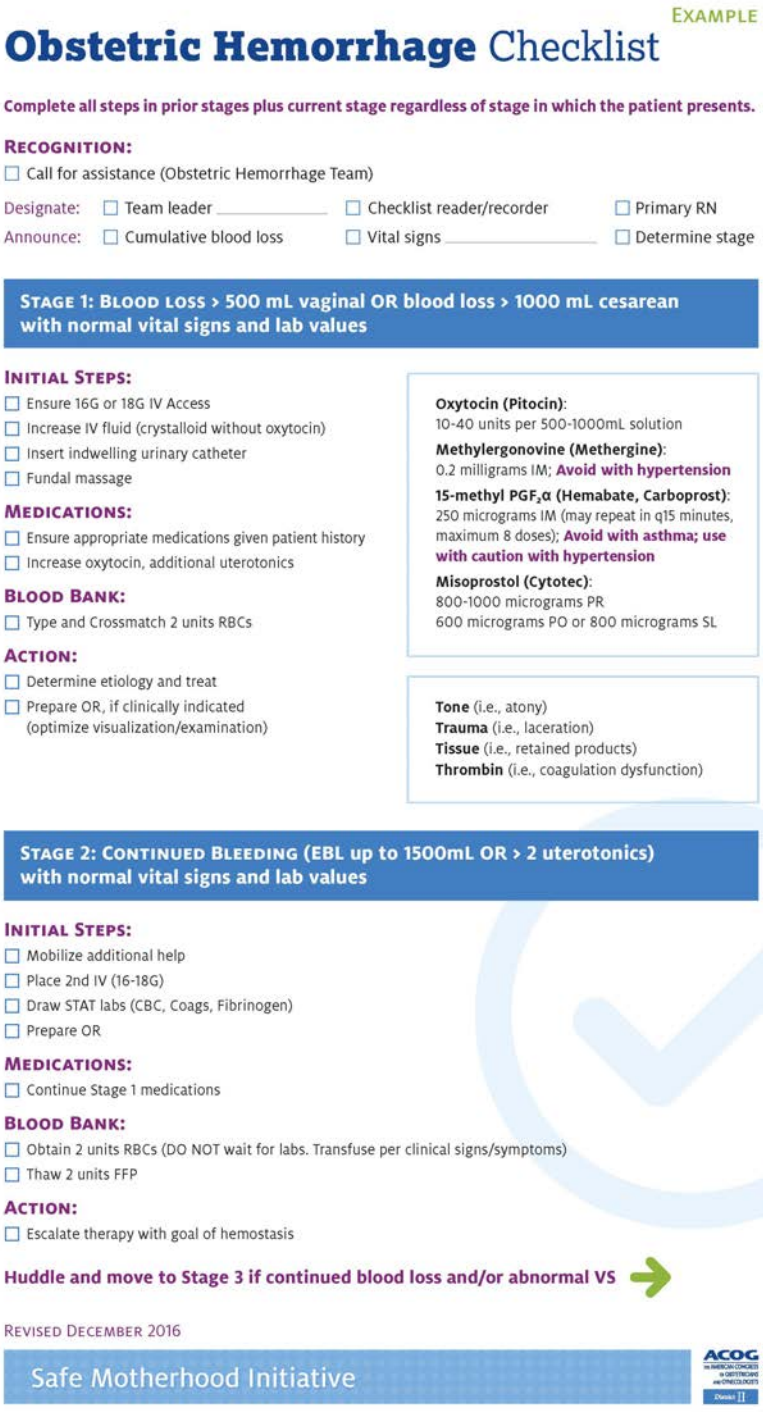
Title: TS029 Massive Hemorrhage Protocol
Document Number: TS029
LTR: LTR25116 Revision: 2.02

SOP HISTORICAL RECORD

DATE	WRITTEN/REVISED BY	REVISION #	REVISION MADE
6/1/10	RAH/JS		
3/3/11	RAH/EH	1	Update after "post implementation validation"
4/25/13	YT	2	Changed quantity and type of platelet and cryoprecipitate products issued
5/31/13	YT	3	Added criteria for activating the MTP and requirement for a pick-up slip.
9/30/13	HPP/YT	4	Added the pediatric protocol and modified termination criteria
5/6/14	SPJ	5	Added Blood Product Order form and instructions for submission
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



EXAMPLE

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 > 500 mL vaginal OR blood loss > 1000 mL cesarean with normal vital signs and lab values

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 uterotonics

BLOOD BANK:

☐ Type and Crossmatch 2 units RBCs

ACTION:

☐ Determine etiology and treat
☐ Prepare OR, if clinically indicated (optimize visualization/examination)

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

Methylergonovine (Methergine):
0.2 milligrams IM; **Avoid with hypertension**

15-methyl $PGF_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM (may repeat in q15 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)
Tissue (i.e., retained products)
Thrombin (i.e., coagulation dysfunction)

STAGE 2: CONTINUED BLEEDING (EBL up to 1500mL OR > 2 uterotonics) with normal vital signs and lab values

INITIAL STEPS:

☐ Mobilize additional help
☐ Place 2nd IV (16-18G)
☐ Draw STAT labs (CBC, Coags, Fibrinogen)
☐ Prepare OR

MEDICATIONS:

☐ Continue Stage 1 medications

BLOOD BANK:

☐ Obtain 2 units RBCs (DO NOT wait for labs. Transfuse per clinical signs/symptoms)
☐ Thaw 2 units FFP

ACTION:

☐ Escalate therapy with goal of hemostasis

Huddle and move to Stage 3 if continued blood loss and/or abnormal VS

REVISED DECEMBER 2016

Safe Motherhood Initiative

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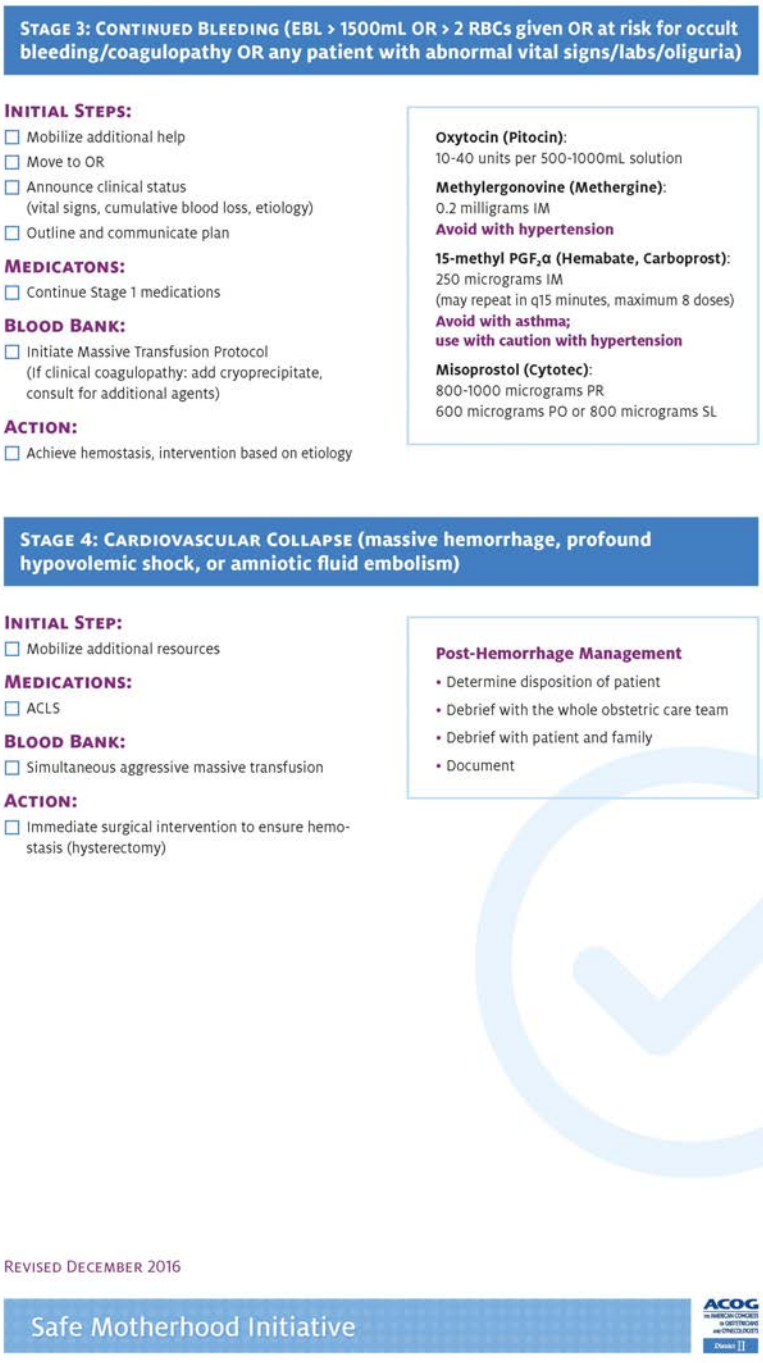
John R. Oishei Children's Hospital of Buffalo: Obstetric Hemorrhage Checklist ACOG



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

MEDICATONS:
- ☐ 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

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

Methylergonovine (Methergine):
0.2 milligrams IM
Avoid with hypertension

15-methyl PGF$_2\alpha$ (Hemabate, Carboprost):
250 micrograms IM
(may repeat in q15 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

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

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Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

AAMC

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:**	
PATIENT NAME: Monica Ztest **PATIENT AGE:** 30 y.o **CHIEF COMPLAINT:** 30yo G3P3 s/p NSVD 39 weeks postpartum hemorrhage	
Brief narrative description of case *Include the presenting patient chief complaint and overall learner goals for this case*	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. . Epidural is in place,. Pt did not void yet, complains of gush of blood. Baby is in NICU
Primary Learning Objectives *What should the learners gain in terms of knowledge and skill from this case? Use action verbs and utilize Bloom's Taxonomy as a conceptual guide*	• Identify postpartum hemorrhage • Appropriate management steps for postpartum hemorrhage • Appropriate call for Code Noelle • Tranexamic acid ordered at time of 3rd uterotonic • Emergency blood ordered correctly • Team leader and assignment of roles

Last Updated: January 9, 2017

Stony Brook Medical Center: Stony Brook Medicine Hemorrhage Sim L and D

Critical Actions *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.*	• Identify postpartum hemorrhage • Fundal massage given • Provider notified • Increase oxytocin infusion to 1000ml/hr • Inspect cervix/vagina for lacerations • Straight cath/foley • Administer two additional uterotonics correctly (dose and route) • 2nd large bore IV started • Anesthesia notified • Stat labs ordered • 2 units PRBCs ordered stat • Decision to move to OR • Debrief the case
Learner Preparation *What information should the learners be given prior to initiation of the case?*	**n/a**

INITIAL PRESENTATION			
Initial vital signs	**HR 110, BP 100/70, R 18**		
Overall Appearance *What do learners see when they first enter the room?*	**Somewhat anxious first mother. Patient stating that she felt a gush of blood.**		
Actors and roles in the room at case start *Who is present at the beginning and what is their role? Who may play them?*			
HPI *Please specify what info here and below must be asked vs what is volunteered by patient or other participants*			
Past Medical/Surgical History	**Medications**	**Allergies**	**Family History**
Asthma	**Albuterol prn**	**NKDA**	**Heart disease on both sides, Dad passed away from heart attack.**

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Physical Examination	
General	**All normal**
HEENT	
Neck	
Lungs	
Cardiovascular	
Abdomen	
Neurological	
Skin	
GU	
Psychiatric	

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..

Intervention / Time point	Change in Case	Additional Information
Initial vital signs HR 110 BP 100/70, **500cc blood loss when RN attempts uterine massage**	First line uterotonic given (oxytocin increased), fundal massage given, notify provider	Uterine atony, boggy uterus continues despite interventions
		Continuous trickle of blood
Next vital signs: HR 120, BP 80/50, Pulse ox 92% Bleeding continues	Next uterotonic given, cervix/vagina inspected for lacerations, bedside sono, straight cath, anesthesia notified, O2 applied	**500 blood loss when resident enters to assess bleeding**
		Continuous trickle of blood
Next VS: HR 140, BP 60/30, Pulse ox 90%, bleeding continues	Next uterotonic given, PRBCs ordered, stat labs drawn, Decision to move to OR, tranexamic acid ordered, Code Noelle called	**500cc blood loss after 3rd uterotonic given**

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
	InfantHigh 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:

	On At Start	Available if Asked for
Non-Invasive BP Cuff	X	
Arterial Line		
EKG		

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Pulse Oximeter		X
CVP		
PA Catheter		
Temperature Probe		
Capnography		
ICP		
Other:		
Other:		

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
Methergine 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)

Code		Code		Code	
X	IV Hep Lock/Saline Lock		Intubated		Anesthesia Machine
X	IV Pumps		Adult Advanced Airway Equipment (Intubation, etc…)		Nerve Stimulator
	IV at KVO		Pediatric Advanced Airway Equipment (Intubation, etc…)		Ultrasound Specify probe needed:
	Arterial line in place		BLS Airway Equipment (BVM, Nasal Cannula, NRB, etc…)		Dental Chair
	Central Line Access		Chest Tube with Pleur-Evac		Hospital Bed
	Femoral Line Access		Bronchoscope		Other:
	Defibrillator	X	iSimulate Monitor		Other:

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	Code Cart Adult		iSimulate 12 Lead EKG Monitor		Other:
	Code Cart Pediatric		Echo Machine and Probe (TTE or TEE)		Other:
	CPR Auto Compression Device (Lifestat)		Ventricularostomy with Bolt in place		Other:

3a. Medication Required:

	Emergency Medication Tray (contains the following medications):
	Ca. Chloride, Epinephrine 1:10000, Epinephrine 1:1000, Versed, Ativan, Atropine, Amiodarone, Lidocaine, Rocuronium, Succinylcholine, Etomidate, Heparin, Sublingual Nitro, IV Lasix, IV Lopressor, Plavix, Solumedrol, ASA, Benadryl

3b. Additional Requested Medication(s)/IV Drips:

	Oxytocin 40 units in 1 liter		
	Lactated Ringers 1 liter		
	Normal saline 0.9% 1 liter		
2	Mathergine 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

Patient and Family Support Checklist for Postpartum Hemorrhage

Montefiore WOMEN'S HEALTH

Montefiore DOING MORE

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)
- ☐ Communication 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 extubation 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, PQCNC 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 OB Hemorrhage

Patient Feedback Questions for for Obstetric Hemorrhage

Montefiore WOMEN'S HEALTH

Montefiore DOING MORE

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 (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: Patients Who Decline Blood Products

EXAMPLE

BLOOD PRODUCT ACCEPTANCE LIST **PATIENT ID:** _____

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.

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

Signature: _____ Date: _____ Time: _____

Safe Motherhood Initiative

ACOG The American College of Obstetricians and Gynecologists District II

Revised February 2019

NEW YORK STATE Department of Health

New York State nyspQc Perinatal Quality Collaborative

BACK TO START OF TOOLKIT
BACK TO START OF SECTION

White Plains Hospital: Patients Who Decline Blood Products

EXAMPLE

BLOOD PRODUCT EDUCATION FORM

WHERE TO ORDER	COMPONENT	CONTENT	EXPECTED EFFECT
Blood Bank	Packed Red Blood Cells	Contains red blood cells and a small amount of plasma	250 ml: Increases hematocrit by 3-4% and hemoglobin by 1 g/dl
Blood Bank	Fresh Frozen Plasma (FFP)	Plasma which contains clotting factors, albumin and immunoglobulins	250 ml: Increases fibrinogen, normalization of PT, PTT
Blood Bank	Platelets	Platelets and plasma	250 ml: Increases platelets
Blood Bank	Autologous Blood	Donated by patient for self-use	Need a high/normal hematocrit and usually is not used in emergencies
	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/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	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
	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	Autologus blood – Blood lost during procedure	Can return up to 250 ml IV in 3 minutes, devoid of plasma and platelets

Safe Motherhood Initiative

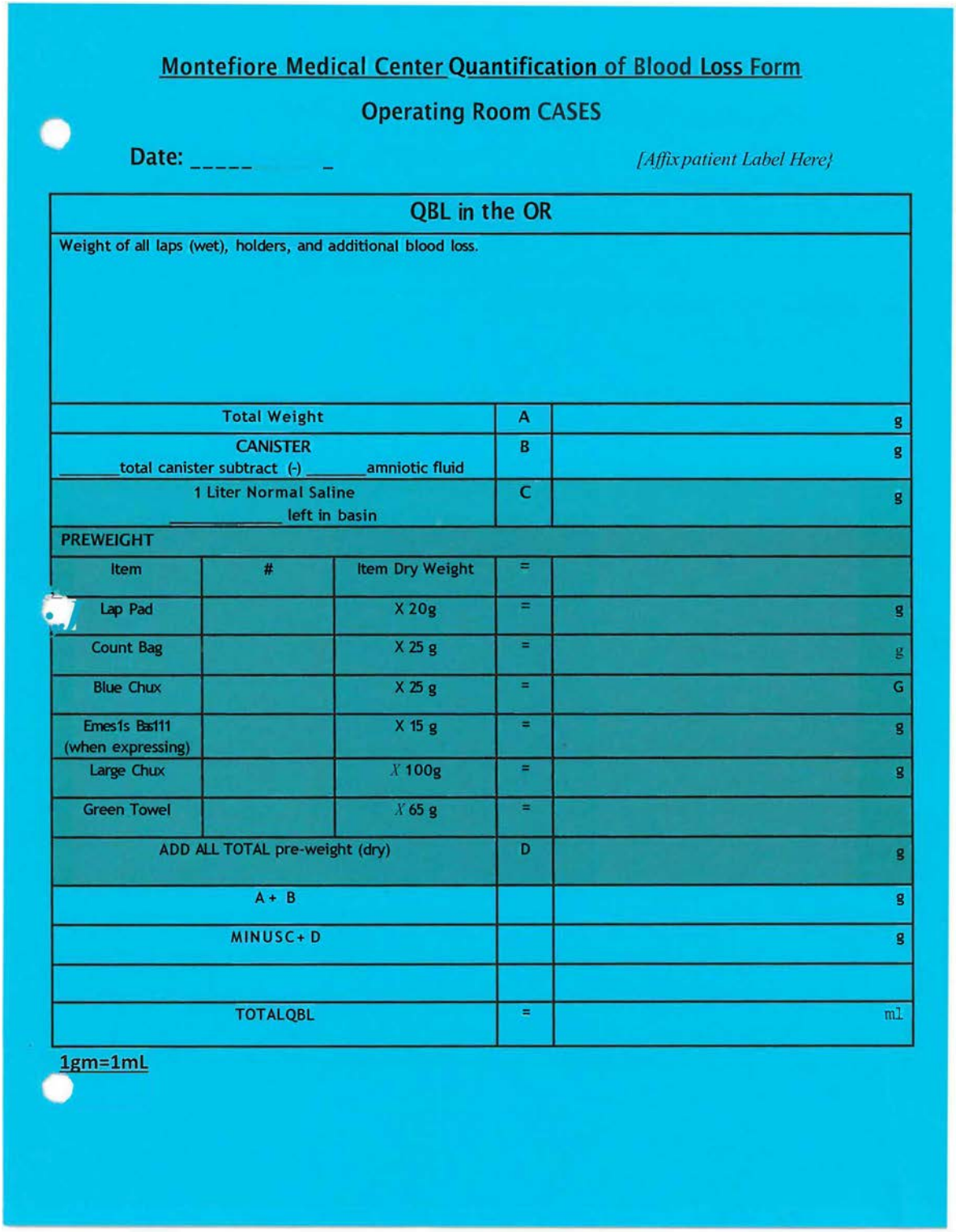
ACOG The American College of Obstetricians and Gynecologists District II

Revised February 2019

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

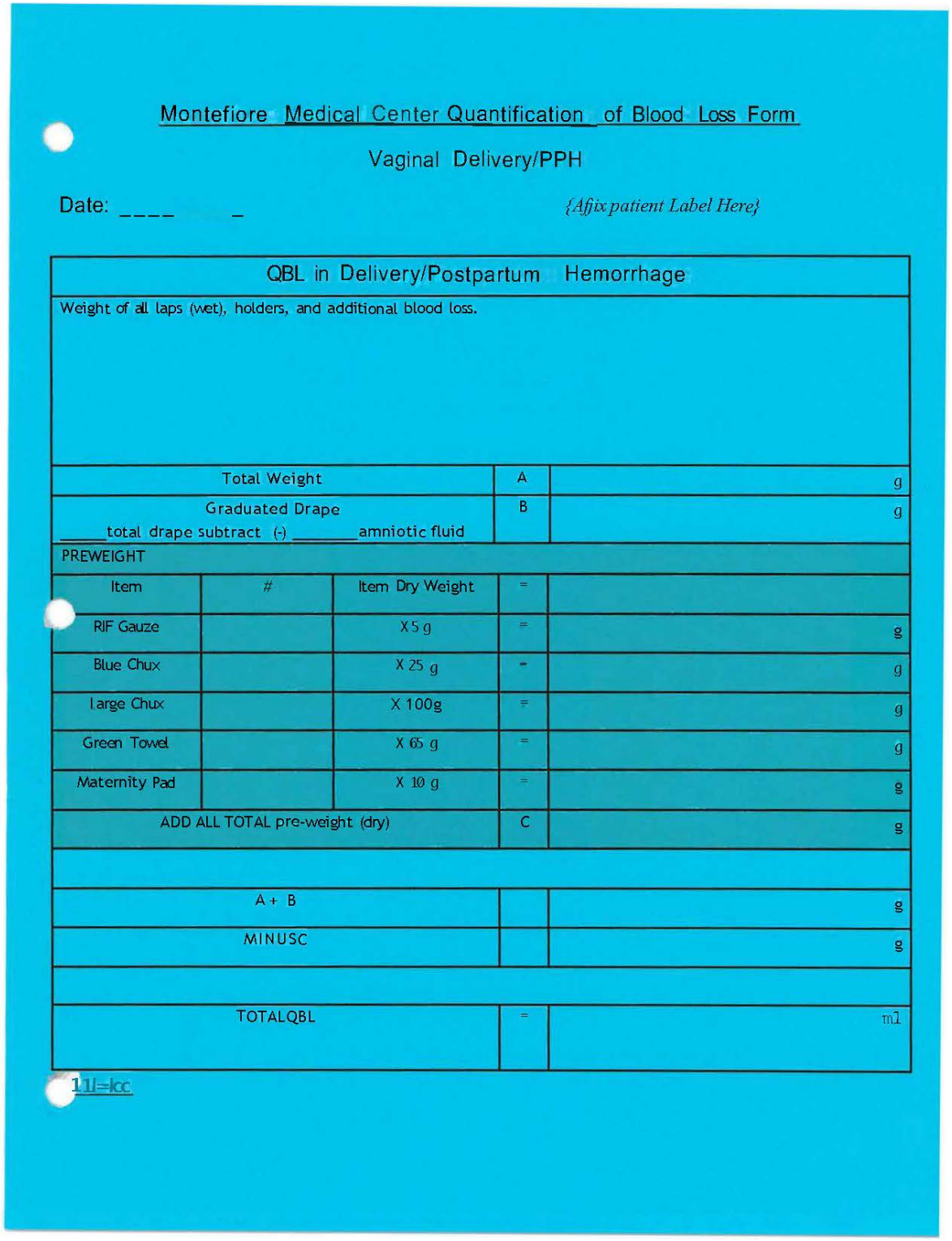
Date: _____

[Affix patient Label Here]

QBL in the OR				
Weight of all laps (wet), holders, and additional blood loss.				
Total Weight			A	g
CANISTER _____total canister subtract (-) _____amniotic fluid			B	g
1 Liter Normal Saline _____ left in basin			C	g
PREWEIGHT				
Item	#	Item Dry Weight	=	
Lap Pad		X 20g	=	g
Count Bag		X 25 g	=	g
Blue Chux		X 25 g	=	G
Emesis Basin (when expressing)		X 15 g	=	g
Large Chux		X 100g	=	g
Green Towel		X 65 g	=	
ADD ALL TOTAL pre-weight (dry)			D	g
A + B				g
MINUS C + D				g
TOTAL QBL			=	ml

1gm=1mL

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.				
Total Weight			A	g
Graduated Drape _____total drape subtract (-) _____amniotic fluid			B	g
PREWEIGHT				
Item	#	Item Dry Weight	=	
RIF Gauze		X 5 g	=	g
Blue Chux		X 25 g	=	g
Large Chux		X 100g	=	g
Green Towel		X 65 g	=	g
Maternity Pad		X 10 g	=	g
ADD ALL TOTAL pre-weight (dry)			C	g
A + B				g
MINUSC				g
TOTALQBL			=	ml

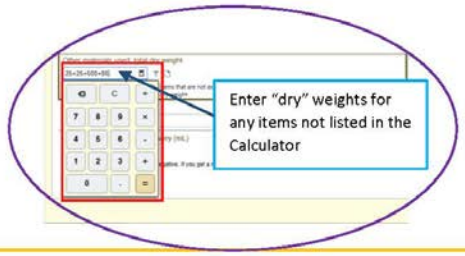
1 1l=lcc

Newark-Wayne Community Hospital: QBL Calculator Screenshot Abbv

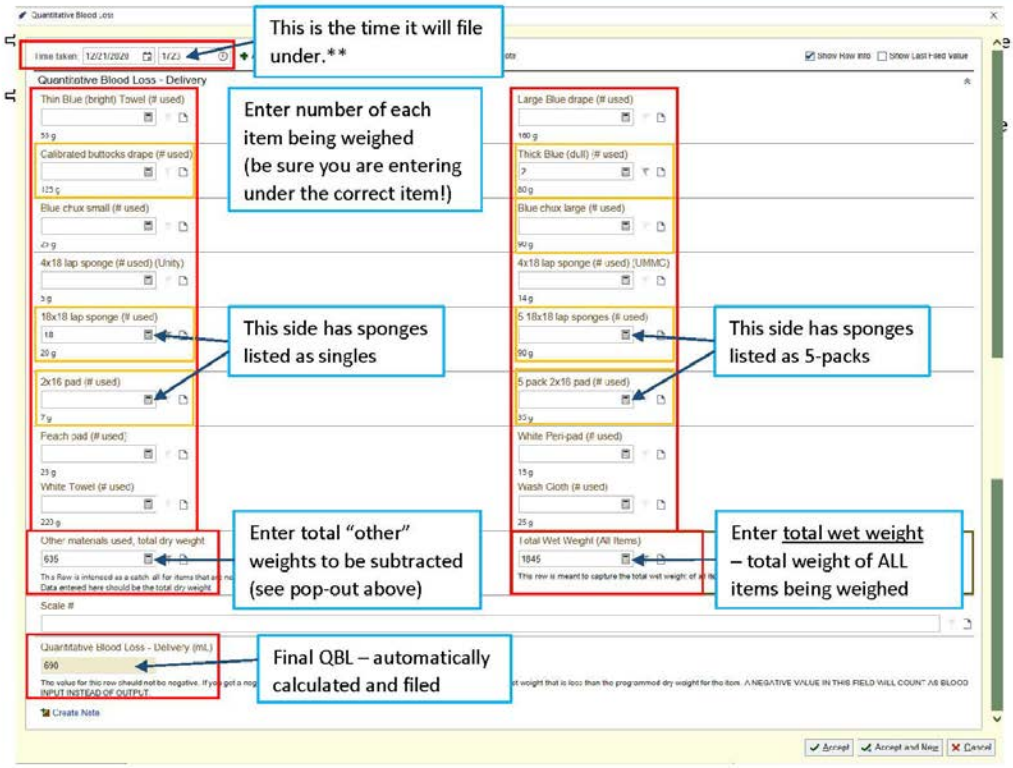
QBL Calculator Screenshot

Most commonly used items in QBL Calc:

- Calibrated [under]buttocks drape (in vag del kit)
- Thick Blue (dull) = Sterile towel from instrum. packs
- Blue chux large = Regular blue chux
- 18 x 18 lap sponge = Large lap sponge in c/s kits
- 2 x 16 pad = Small sponge in vag del kits
- "Other" dry weights = Lap sponge holders, saline, amniotic fluid, suction canister, etc.



Calculator(s) within the Calculator! Makes it easier to add up multiple numbers in one field, such as the "other" dry weights!



****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.)

# OF ITEMS	DRY WEIGHTS	DRY WEIGHT
	10 DRY LAP SPONGES = 200 G	
	1 EMPTY LAP SPONGE HOLDER = 25 G	
	1 EMPTY LG SUCTION CANISTER = 85 G	
	1 DRY STERILE BLUE TOWEL‡ = 80 G	
	1 LITER NORMAL SALINE † = 1000 G	
	OR TABLE BUNDLE ‡* = 585 G	
	1 EMPTY LARGE RED TRASH BAG = 50 G	
	10 DRY RAYTEC 4X4'S = 30 G	
	1 DRY BATH BLANKET ‡ = 620 G	
	1 DRAW SHEET ‡ = 285 G	
	1 REGULAR SHEET ‡ = 400 G	
	1 FITTED SHEET ‡ = 650 G	
	1 REGULAR TOWEL‡ = 230 G	
	10 DRY VAGINAL SPONGES = 70 G	
	1 EMPTY UNDER-BUTTOCKS DRAPE = 125 G	
	1 DRY LARGE CHUX = 90 G	
	1 DRY PERI-PAD = 10 G	
	1 DRY SMALL CHUX = 20 G	
	1 DRY TABLE COVER = 135 G	

WET WEIGHT – DRY WEIGHT BLOOD LOSS
DELIVERY TOTAL
PPH MEDS GIVEN

PACU/PP PAD WEIGHTS
DELIVERY + PAD WEIGHTS CUMULATIVE

† 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:

[ ] + [ ] = [ ]

Amt from 3 | Amt from 6 | Total QBL in mls

Cesarean Section Weights:

- **Cesarean Counter = 20gm**
- **Raytec 4x4s (1)=2gm (5)=10gm (10)=20gm**
- **OR Laps (1)=20gm (5)=100gm (10)=200gm**
- **Blue Towel =(1)80gm (4)320gm**
- **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= 166gm
- Raytec 4x4s **(1)**=2gm **(5)**=10gm **(10)**=20gm
- Under buttocks drape= 170gm
- Delivery laps **(1)=6gm (5)=30gm (10)=60gm**

St. Peter's Health: QBL Worksheets

BBC QBL Worksheet

This is a supplement to your I&O, and Blood loss should be recorded their first!

Total weight of saturated items	Minus total weight of dry items	Episode total	Rolling QBL total

Strong Memorial Hospital: QBL Calculation Worksheet

QBL Calculation Worksheet

PHASE 1: POST DELIVERY QBL CALCULATION

Item	Quantity	Multiply (X)	Dry Weight	Equals (=)	Total
Pink Basin	1	X	120g	=	120g
Sterile Blue Towel		X	50g	=	
Sterile Sponge- (lap pads)		X	14g	=	
Covidien "MVP" Pad		X	125g	=	
Under Buttocks Drape		X	140g	=	
Clear Kidney Basin		X	20g	=	
Green Patient Gown		X	305g	=	
Blue Patient Gown		X	270g	=	
Large Blue Patient Gown		X	505g	=	
Draw Sheet		X	275g	=	
Pink Pad		X	385 g	=	
Sterile sponge holder	1	X	30 g	=	
Total amount of Irrigation used			_____	=	
Total fluid in Neptune Canister (after delivery of the baby)			_____	=	
DRY WEIGHT TOTAL					

WET WEIGHT TOTAL (FROM SCALE)	SUBTRACT (-)	DRY WEIGHT TOTAL (FROM ABOVE CALCULATION)	Equals (=)	**POST DELIVERY** QBL TOTAL
	-		=	

PHASE 2: RECOVERY QBL CALCULATION

Item	Quantity	Multiply (X)	Dry Weight	Equals (=)	Total
Pink Basin	1	X	120g	=	120g
Covidien "MVP" Pad		X	125g	=	
Blue Chux Pad		X	20g	=	
Small Peri Pad		X	15g	=	
Large Peri Pad		X	45g	=	
Mesh Underwear		X	20g	=	
Green patient Gown		X	305g	=	
Blue patient Gown		X	270g	=	
Large Blue patient Gown		X	505g	=	
Diaper Ice Pack		X	_____	=	
Snap & Crack Ice Pack		X	_____	=	
_____		X	_____	=	
_____		X	_____	=	
DRY WEIGHT TOTAL					

WET WEIGHT TOTAL (FROM SCALE)	SUBTRACT (-)	DRY WEIGHT TOTAL (FROM ABOVE CALCULATION)	Equals (=)	**RECOVERY** QBL TOTAL
	-		=	

FINAL PHASE: TOTAL QBL CALCULATION

POST DELIVERY QBL	ADD (+)	**RECOVERY QBL**	**QBL TOTAL**
	+		

6
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VanOtterloo LR, Seacrist MJ, Morton CH and Main EK. Quality improvement opportunities identified through case review of pregnancy-related deaths from venous thromboembolism. JOGNN 2019; 48:300–310. https://doi.org/10.1016/j.jogn.2019.02.006.

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
Council on Patient Safety in Women's Health Care: Practicing for Patients PPH Manual
CMQCC Obstetric Hemorrhage Toolkit
CMQCC Obstetric Hemorrhage Toolkit – Version 2 – Updated 2015

Quality Improvement

Bennett, B, and Provost, L. What's Your Theory? Quality Progress. July 2015. https://www.apiweb.org/QP_whats-your-theory_201507.pdf.

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Web Links

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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

E-mail: NYSPQC@health.ny.gov
Phone: (518) 473-9883
Website: www.nyspqc.org

New York State nyspQc Perinatal Quality Collaborative