Every Drop Counts: Improving Maternal Outcomes

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PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Disclosure

- No financial relationships with ineligible companies to disclose.

Learning Objectives

By the end of the presentation, participants should be able to

- Associate effective communication and teamwork with improving maternal outcomes during a postpartum hemorrhage.
- Discuss the importance of quantifying blood loss for every birth.
- Formulate a process for quantifying blood loss for vaginal and cesarean births.

Contributions to Maternal Mortality

- Lack of standardized, consistent, and integrated obstetric practice
- Lack of community-based care
- Pervasive racial and socioeconomic health disparities
- State level variations
- **Race and ethnicity**

How to Reduce Maternal Mortality?

Integrated and continued care from the preconception period through pregnancy, and during postpartum period

Let's Talk That Dirty Word… Cost!

Morbidity

- Hospitalization of the mother and their infants – **accounts for 58% of the costs**
- Mean per-patient cost for women with severe maternal morbidity = $50,212 compared to $23,795 for those without
- Increase in maternity-related costs of 111% (commercial payers) and 175% (Medicaid)

(Black et al., 2021; Cheney, 2021)

The Cost of Maternal Mortality.

From 2018-2020 the national economic burden of lives lost

$27.4 billion

Let’s Go Back In Time

“As early as 1839 the dangers attended on postpartum hemorrhage were recognized as constituting a serious problem.” (Wright, 1941)

There is also a rather wide-spread belief that at the time of confinement a woman can stand the loss of a considerable amount of blood with relative impunity, and fortunately blood losses during labor do seem to be attended with less harm than at other times. As mentioned above the fact that most women will stand rather large losses without showing alarming reactions may result in giving those doing obstetrics a false sense of security, which may end seriously. Concomitant with this sense of security there may be a certain amount of carelessness and lack of supervision of the third stage of labor. Blood loss should be minimized in every labor and no effort should be spared to accomplish this result.[45]

(Wright, 1941)

Pastore,[23] Beecham[3] and others believe that accurate measurement of blood loss will further help in the study and hence prevention of excessive hemorrhages. There is a general tendency to underestimate losses above 450 c.c., and overestimate those losses below 150 c.c.; so there is a lax attitude when treatment is most needed. If actual measurements are taken, they will reveal an increased incidence of postpartum hemorrhage.[23]

orrhage would be 600 c.c.[23] To accurately determine the cases of postpartum hemorrhage it becomes necessary to measure the blood loss during delivery. A measuring

a serious or fatal postpartum hemorrhage should almost never occur. If the obstetrical patient has adequate

It is also important that the actual amount of blood lost is known, and for that purpose it should be measured.

Wright, 1941

responsible for excessive blood loss have been presented. A study of the puerperium has also been made. Comparison of estimated and measured blood losses revealed that estimations are erroneous and misleading. The

(Pastore, 1936)

The accepted definition of postpartum haemorrhage is an estimated blood loss of at least 500 ml. after vaginal delivery. Estimation of blood loss is often unreliable, for few attendants have a clear appreciation of the appearance of 500 ml. of blood soaked into linen and the other accoutrements of delivery. Because of the failure to recognize the extent of haemorrhage, its true importance in maternal morbidity and mortality tends to be missed. Several methods have been used in attempts to measure blood loss accurately. Gatch and Little (1924)

(Brant, 1967)

The use of a blood loss monitor is of the greatest help in deciding which cases should receive blood and how much should be given.

(Toldy & Scott, 1969)

metropolitan hospital, were selected for the study during their labour. Related samples t tests and Pearson's product moment correlation coefficients compared the actual measured blood loss, and the attending midwives' estimated blood loss. Significant differences were found, supporting the hypotheses at the 0.05 level of significance, that subjective visual estimation of blood loss during childbirth remains an inaccurate method. Both under and over estimation occurred regardless of the midwives' years of experience or education. The findings from this study imply that midwives should adopt more reliable methods of measuring blood loss. Furthermore, midwifery curricula should

(White, 1990)

Thirty-six studies were included that evaluated the accuracy of visual estimation; tested methods to improve skills in measurement; examined their effect on PPH diagnosis and treatment, and / or explored additional factors associated with blood loss evaluation. The review found that health professionals were highly inaccurate at estimating blood loss as a volume. Training resulted in short term improvements in skills but these were not retained and did not improve clinical outcomes. Multi-faceted interventions changed

(Hancock et al., 2015)

Quantitative measurement of blood loss identified many cases of undiagnosed PPH. Additionally, African American and Hispanic/Latina women were more likely to be diagnosed with PPH. (Khan et al., 2025)

Cochrane Systematic Review has concluded that there was no significant difference in the clinical outcomes among visual estimation, volumetric method, and gravitational method.[36] This is because the volume of blood loss is just one of the variables that determines the clinical outcome. (Mohamed & Chandraharan, 2025)

EBL was underestimated for vaginal deliveries ($P = 0.02$) and overestimated for cesarean deliveries ($P = 0.02$). PPH values were both associated with longer hospital stays ($P < 0.001$), and higher cost of care ($P < 0.0001$). Compared to Caucasian women, African American and Hispanic/Latina women had higher rates of PPH ($P < 0.001$ and $P < 0.05$, respectively).

(Khan et al., 2025)

Evidence to Practice?

100 years

-

17 years

=

83 years

What Do We Know About QI?

- Used to improve systems, processes, and/or outcomes
- Data contributes to decision making
- Focus on:
    - doing things right
    - evaluate “how we are doing”

Fineout-Overholt et al., 2023

Please Do Something Amazing (PDSA)

Commitment to Action: Eliminating Preventable Maternal Mortality

American Academy of Emergency Nurse Practitioners | American Academy of Family Physicians | American College of Cardiology | American College of Emergency Physicians | American College of Nurse-Midwives | American College of Obstetricians and Gynecologists | American College of Physicians | American Paramedic Association | American Psychiatric Association | American Society of Addiction Medicine | Association of Physician Assistants in Obstetrics and Gynecology | Association of Women's Health, Obstetric and Neonatal Nurses | College of Urgent Care Medicine | Emergency Nurses Association | National Association of Emergency Medical Technicians | National Association of Nurse Practitioners in Women's Health | National Rural Health Association | Society of Emergency Medicine Physician Assistants | Society for Maternal-Fetal Medicine

ACOG, 2022

Commitment to Action: Goal

- Increase awareness
- Improve identification
- Enhance understanding

ACOG, 2022

DNV: Healthcare standards

“As you are aware CMS has recently added new CoP's for obstetrical care that will begin being rolled out in January 2025. We are in the process of developing some standards to meet those new CoP's around obstetrical care. The process is that the standards will go to CMS for review and approval before we implement them. Currently, it is our expectation that the hospitals follow nationally recognized guidelines and standards of practice, for all service lines including perinatal services.”

(A. M. Pizzi, personal communication, December 17, 2024)

Blueprint for Addressing the Maternal Health Crisis

Focus

- Ensure emergency department readiness for obstetric emergencies
- Ensure transfer protocols in place to transfer to higher levels of care
- Ensure hospitals conduct reviews on all maternal deaths
- Ensure annual staff training on evidence-based maternal health practices

Hospital Outpatient Prospective Payment System

Conditions of participation (CoPs)

- Baseline standards for the organization, staffing, and delivery of OB care
- Staff training on evidence-based maternal health practice
- Emergency service readiness for facilities who offer emergency services
- Maternal quality assessment and performance improvement (QAPI)
- Discharge planning related to transfer protocols

OPPS: CoPs

Emergency Services' Readiness

- Revised current rule for readiness for readiness in caring for emergency services' patients, including pregnant, birthing, and postpartum women
- Must have adequate equipment and protocols to meet the emergency needs of patients.
- Staff must be trained on protocols and equipment annually and documentation must show demonstrated knowledge
- Required to have equipment, supplies, and medication used in treating emergency cases. CMS does not indicate specific items

OPPS: CoPs

Transfer Protocols

- written policies and procedures for transferring patients under its care
- Provide training annually

2020 - Bittersweet

Perinatal Safety Standards

Quantifying Blood Loss

Not because we want to…

…but because we have to!

In Addition….

QBL

PC.06.01.01

- **Evidence-based PPH risk assessment tool**
  - **admission to LD**
  - **admission to PP**
- **Evidence-based procedures for stage-based management**
- **Dedicated hemorrhage supply kit**
- **Annual drills and debriefing w/ designated team**
- **Education**
- **Review PPH cases**
- **Education for patients**

Alliance for Innovation on Maternal Health

- 2014
- Maternal safety and quality improvement initiative
- Evidence based patient safety bundles

Bottom line

IMPROVE MATERNAL OUTCOMES

AIM BUNDLE - READINESS

- Rapid response team
- Standardized stage-based obstetric hemorrhage emergency management plan
- Emergency release and MTP
- Maintain a hemorrhage cart
- Immediate access to first- and second-line hemorrhage medications
- Conduct interprofessional and interdepartmental team-based drills with debriefs

AIM BUNDLE - RECOGNITION

- Hemorrhage risk assessment
- Quantify blood loss
- Active management of the third stage of
- Ongoing patient education
- Stage-based, obstetric hemorrhage emergency management plan
- Provide trauma-informed support for patients

AIM BUNDLE - REPORTING

- Establish a culture of multidisciplinary planning, huddles, and post-event debriefs
- Perform multidisciplinary reviews
- Monitor outcomes and process measures
- Establish processes for data reporting and the sharing of data.

AIM- RESPECTFUL CARE

- Include each patient & their support network in huddles/debriefs
- Engage in open, transparent, and empathetic communication with patient and their support network

R-E-S-P-E-C-T

If that is not reason enough

Ashley’s Story

Ashley's Story

3 days PP

I didn't know I was losing too much blood.

5 days PP

I'm going to die. Something is wrong with me.

Emergency Room

You are an overwhelmed new mother

Second opinion

Are you bleeding enough? It is probably your emotions.

Maybe I'm just tired. Maybe I'm losing it.

Ashley's Story

Massive gush; clot the size of a pineapple

Call back in 30 minutes if the bleeding didn't stop.

Demand to talk to on call Doctor

Lie down, see if the blood loss slows down. If not, call 911

Passed out

Surrounded by enough blood to fill an IV bag

Call 911

My blood pressure was dropping

Ashley's Story

Emergency Room

No, I am not OK

Blood transfusion

You will be just fine

Admitted to ICU

Gushing blood, no one seemed worried

19 bags of blood, 4 bags of plasma, 4 bags of platelets

Different blood combinations threw off my body chemistry

The trauma that almost killed me might have saved my life

Ashley's Story

Discharged from ICU

I thought about what could have been done better

It all circles back to awareness and education.

If the providers were more aware of PPH, they would have identified the situation faster

Ashley's Story

Ideally, providers should share their awareness and education about PPH with their patients.

Pregnancy-Related Mortality Ratios: Hemorrhage

- Mortality ratio for hemorrhage 1.94/100,000 live births
- Ruptured ectopic 22.9%
- Postpartum hemorrhage 21.2%
- Placenta accreta 12.7%

Hollier et al., 2024

Jaclyn’s Story

Jaclyn's Story

It was 45 minutes before anyone realized that my intuition was right

Bleeding severely

I knew something was very wrong

Stopped the bleeding but restarted 5 minutes later

Taken to the OR

Do you plan to have more children?

I was worried I night never meet my daughter or be there to raise my son.

Jaclyn's Story

Reached the OR

Prepare for the worst

Stay in the ICU

Instead of taking happy newborn family pictures, I spent those early days fighting for my life.

Discharged home

Weakened condition was so poor

Jaclyn’s Story

I want all future moms to feel empowered and compelled to educate themselves about PPH.

Kim’s Story

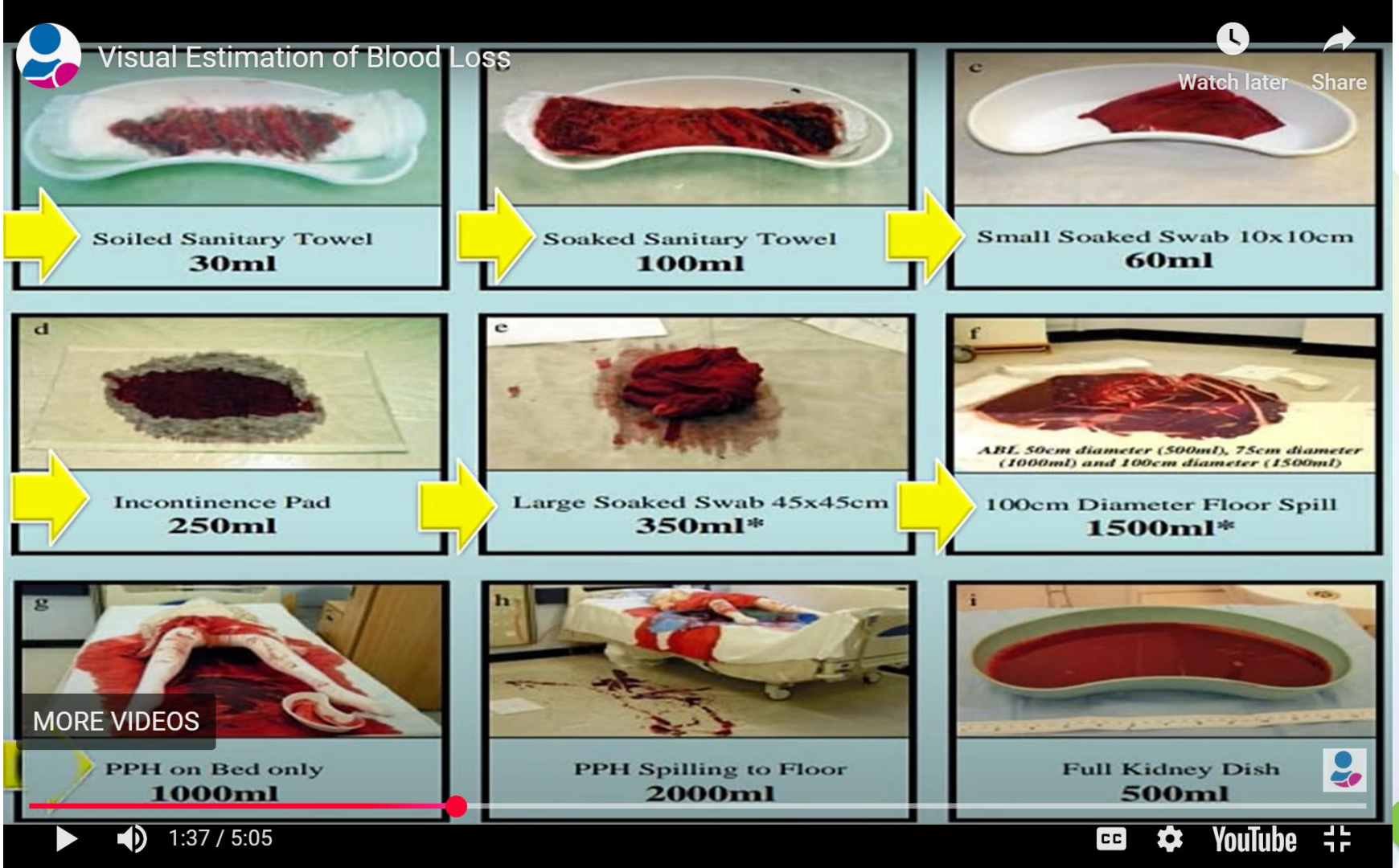
“There was so much blood he didn’t think it was possible that she could live”

The Eye is Not That Keen

1. Imprecise EBL leads to delayed response
2. EBL associated with 30% error
3. EBL – underestimate with high volumes and overestimate with low volumes

ACOG, 2019

ESTIMATION OF BLOOD LOSS


Visual Estimation of Blood Loss
Watch later
Share
Soiled Sanitary Towel
30ml
Soaked Sanitary Towel
100ml
Small Soaked Swab 10x10cm
60ml
Incontinence Pad
250ml
Large Soaked Swab 45x45cm
350ml*
ABL 50cm diameter (500ml), 75cm diameter (1000ml) and 100cm diameter (1500ml)
100cm Diameter Floor Spill
1500ml*
PPH on Bed only
1000ml
PPH Spilling to Floor
2000ml
Full Kidney Dish
500ml
MORE VIDEOS
1:37 / 5:05
YouTube






It’s Not Perfect – It is Better

1. QBL more accurate
2. QBL associated with higher likelihood to identify PPH sooner

ACOG, 2019

To Measure or Not To Measure

QBL does not

- predict postpartum hemoglobin values
- Change incidence of postpartum blood transfusion

Clinical Outcomes unclear?????

A Bundle is Not Just a Bundle

Maternal mortality reviews have consistently found missed or delayed diagnosis and delay in initiating treatment are recurrent problems in care of women with excessive obstetric blood loss.

Implementation of safety bundles in U.S.-based birth settings has been found to significantly reduce maternal morbidity in participating hospitals!

ACOG, 2019

Interprofessional Teamwork Training

Simulation

- Promotion of clinical skills
- Improve teamwork and communication
- Optimizes collaboration
- Enhance nontechnical human factors

Debriefing

- Discuss essential elements related to performance
- Identify what went well
- Identify areas of opportunity
- Close loop communication, clear mental model
- Learn from the experience and make changes

Pearls for Patient Debrief

- Debrief with patient & support person(s) as a team
- Sit at the bedside
- Pause for questions
- Review of clinical event by provider
- Listen to the family/patient & respond to their needs/questions
- Express concerns & offer time for questions for clarity
- Document the discussion as part of plan of care/discharge instructions (Provider)
- Document discussion & reinforce information (RN)
- Notify provider if patient is not clear on events & plan of care
- Utilize skilled communicators/interpreters as appropriate
- Delineate the follow up plan with written discharge instructions

The question is not WHY?

The question is WHY NOT?

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