Postpartum Hemorrhage:

Practice Updates

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YKHC

7/2/19

Disclosures

- Nothing to disclose

- I would like to thank the Yupik and other Tribes of the Delta for allowing us to live on their land, work with their community, and deliver their babies

Objectives

- Understand global and national trends in PPH
- Identify risk factors
- Explore the data behind various practices for prevention and management
- Case based approach, emphasizing implementation of best practices

An Ignored Truth:

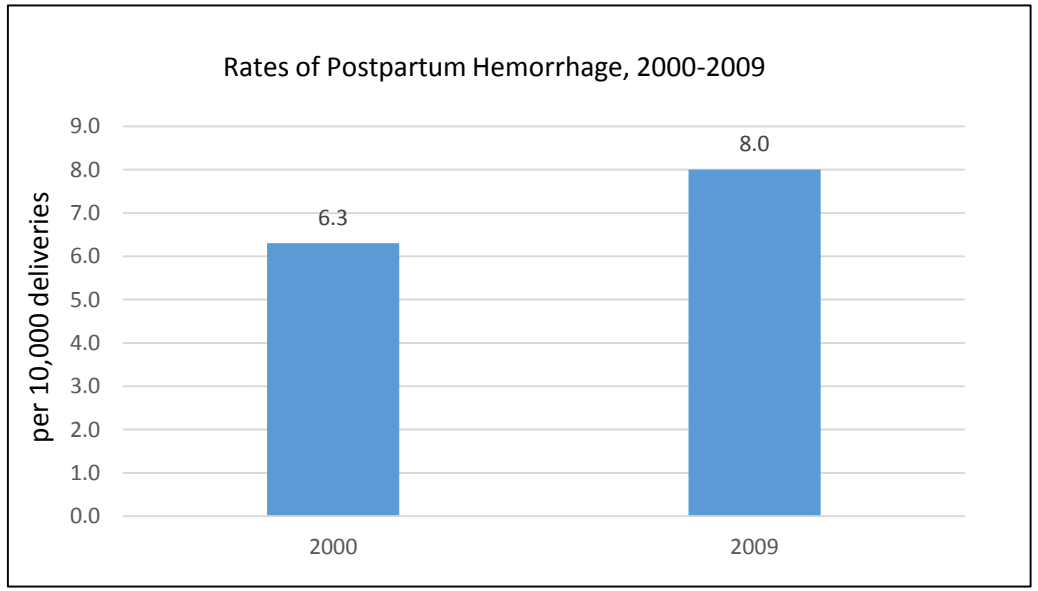
Maternal Mortality in American Indigenous and Alaska Native Communities

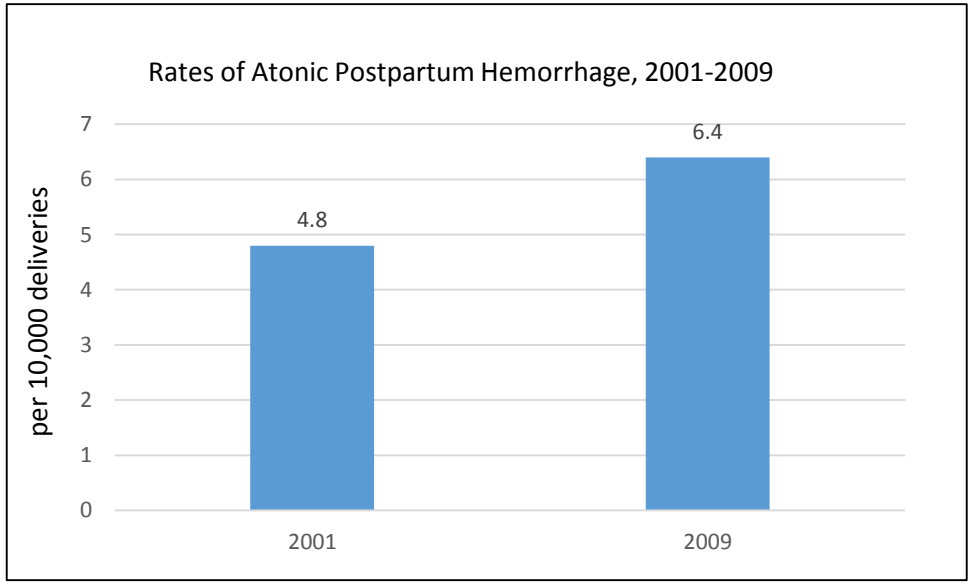
- No large national studies
- Excluded from comparative studies
- Most data derived from state studies
  - WI: Increased OR of PPH (2.07), GDM (2.27), Preeclampsia
  - Washington:
    - Pregnancy Associate Mortality Rate: 196.2 per 100,000 births
    - Pregnancy Related Mortality Ratio: 84.4-46.5 in Non-Hispanic native women

Creanga 2014
WA Maternal Mortality Review, 2017

PPH: Implications

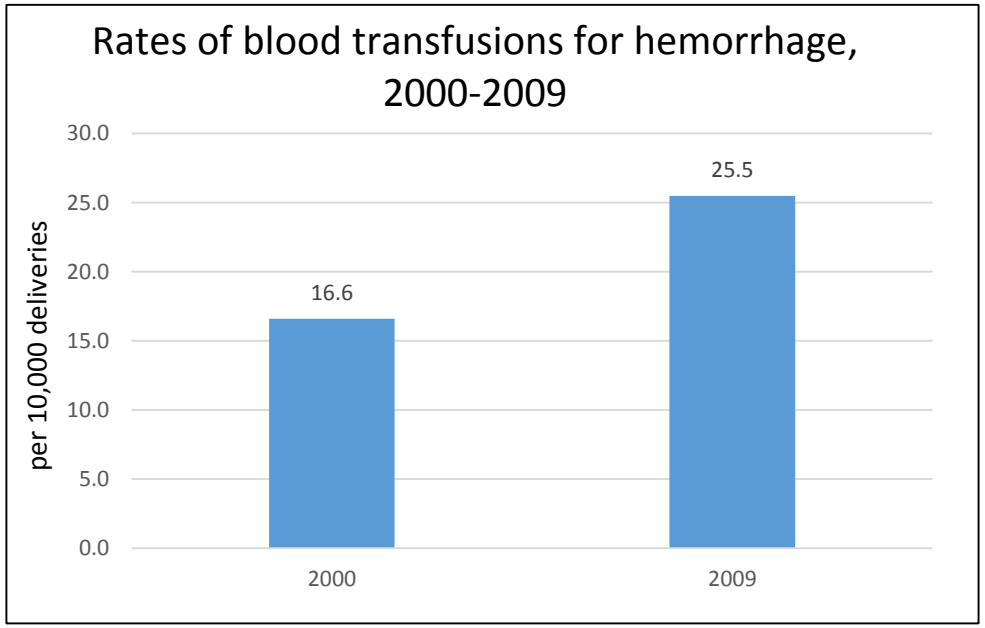
- One of the leading cause of maternal mortality worldwide
- 3th leading cause of maternal death in the US
- Rates have been increasing since 1994





Mehrabadi 2013
ACOG PB, 2018

PPH: Implications



- 70% of deaths related to postpartum hemorrhage were preventable
- Rates of atony are increasing
- We need protocols to address it

Mehrabadi 2013
Dunsmoor Su 2018

PPH: Definitions

- Cumulative Blood loss of 1,000 ml accompanied by signs and symptoms of hypovolemia in 24 hours after birth process
- Post-delivery HCT drop > 10%
- Tachycardia, Hypotension concerning for blood loss >25% total blood volume, 1500 cc

Trauma Assessment of Blood Loss

Class	Blood Loss Volume	Total Deficit	Signs/Symptoms
I	<1000 mL	15%	Orthostatic Tachycardia
II	<1500 mL	15-25%	Resting tachycardia, orthostatic hypotension
III	<2,500 mL	25-40%	Resting hypotension, oliguria
IV	>2,500 mL	>40%	Obtunded, Cardiovascular collapse

The Case:

- 30 G6P3023 at 38.1
  - gHTN, GDMA1, HSV on ppx, anemia (Iron infusions x3)
  - OB History
    - PPH x2, 1 transfusion (2014, last delivery)

- HPI: Presented from clinic with gHTN, no PEC
  - Admitted for induction
  - Hx PPH on problem list of admission H&P
    - 2 IVs, active management at 3rd stage
    - Written Pitocin 40 u and miso at delivery
    - Started on miso for IOL

PPH: Risk Stratification

- Risk Assessment tools: Identify 60-86% of patients who experience PPH
- Validation study of 10,000 women
  - Sensitivity of 80%, Specificity of 60%
  - 1% in low risk group had severe postpartum hemorrhage

Table 2. Example of Risk Assessment Tool

Low Risk	Medium Risk	High Risk
Singleton pregnancy	Prior cesarean or uterine surgery	Previa, accreta, increta, percreta
Less than four previous deliveries	More than four previous deliveries	HCT <30
Unscarred uterus	Multiple gestation	Bleeding at admission
Absence of postpartum hemorrhage history	Large uterine fibroids	Known coagulation defect
	Chorioamnionitis	History of postpartum hemorrhage
	Magnesium sulfate use	Abnormal vital signs (tachycardia and hypotension)
	Prolonged use of oxytocin	

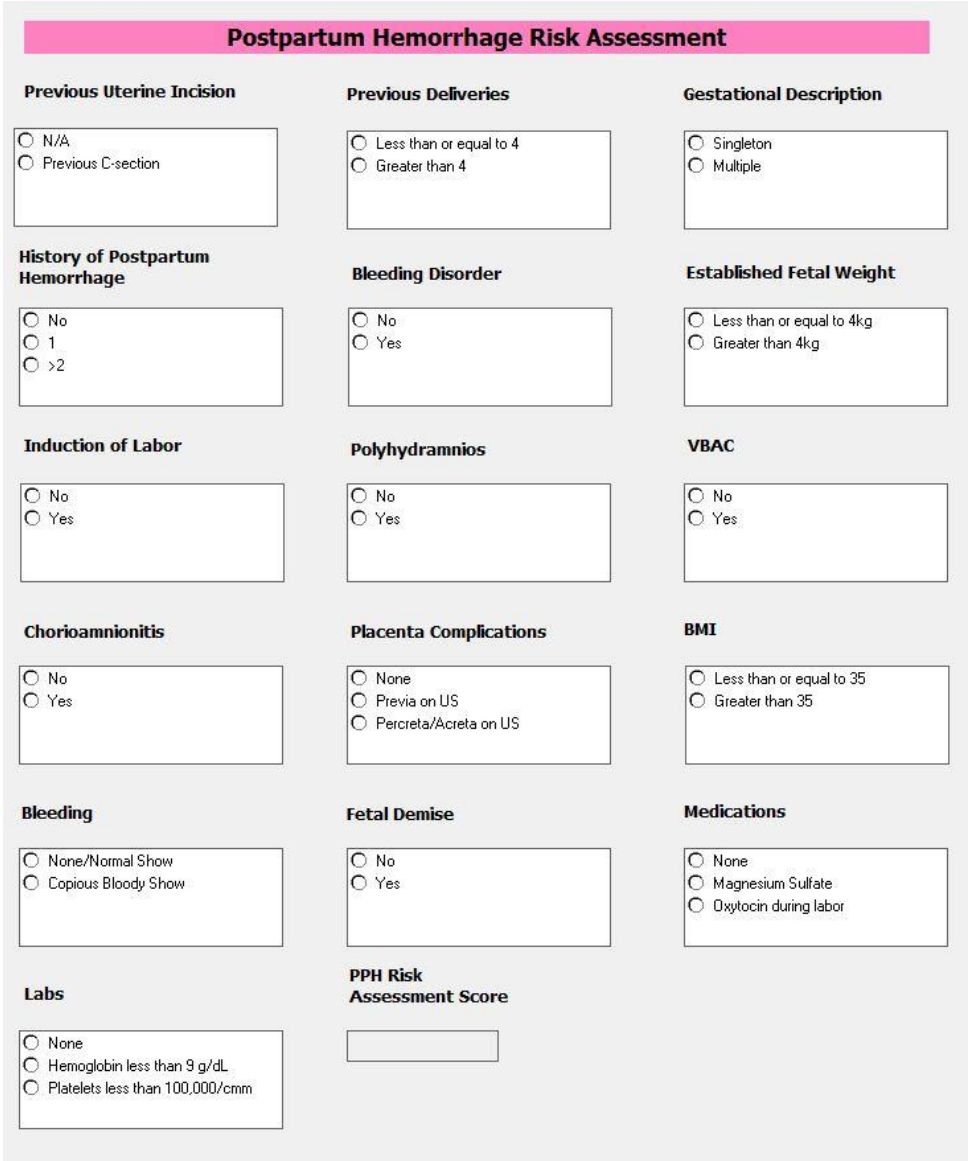
Abbreviation: HCT, hematocrit.

Modified from Lyndon A, Lagrew D, Shields L, Main E, Cape V, editors. Improving health care response to obstetric hemorrhage version 2.0. A California quality improvement toolkit. Stamford (CA): California Maternal Quality Care Collaborative; Sacramento (CA): California Department of Public Health; 2015.

YKHC Risk Calculator

- Risk Assessments:
  - h/o PPH, bleeding disorder
  - Multiparity, IUFD

- Calculates Risk
  - 0: Low risk
  - 1-2: Moderate Risk
  - >2: High risk



PPH: Risk Stratification

1/3 of women with > 1000 ml NO risk factors

- Population based Cohort study in France (N=4,550)
- Severe PPH: 20.9%
- Risk factors:
  - Delay in starting oxytocin after pph diagnosed
    - >10 minutes: 38%
    - >20 minutes: 86%
    - Manual examination of the uterine cavity more than 20 minutes: OR 1.83
  - Call for assistance >10 minutes: OR 1.61

PPH: Additional Risk factors

Table 1. Antenatal and Intrapartum Risk Factors for Postpartum Hemorrhage

Etiology	Primary Problem	Risk Factors, Signs
Abnormalities of uterine contraction—atony	Atonic uterus	Prolonged use of oxytocin High parity Chorioamnionitis General anesthesia
	Over-distended uterus	Twins or multiple gestation Polyhydramnios Macrosomia
	Fibroid uterus	Multiple uterine fibroids
	Uterine inversion	Excessive umbilical cord traction Short umbilical cord Fundal implantation of the placenta
Genital tract trauma	Episiotomy Cervical, vaginal, and perineal lacerations Uterine rupture	Operative vaginal delivery Precipitous delivery
Retained placental tissue	Retained placenta Placenta accreta	Succenturiate placenta Previous uterine surgery Incomplete placenta at delivery
Abnormalities of coagulation	Preeclampsia Inherited clotting factor deficiency (von Willebrand, hemophilia) Severe infection Amniotic fluid embolism Excessive crystalloid replacement Therapeutic anticoagulation	Abnormal bruising Petechia Fetal death Placental abruption Fever, sepsis Hemorrhage Current thromboembolism treatment

Modified from New South Wales Ministry of Health. Maternity—prevention, early recognition and management of postpartum haemorrhage (PPH). Policy Directive. North Sydney: NSW Ministry of Health; 2010. Available at: http://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2010_064.pdf. Retrieved July 24, 2017. Copyright 2017.

Identifying PPH: How much is too much?

- Shock Index:
  - HR/SBP
  - Ex: HR: 120
  - BP: 100/80
  - What is the shock index?

  - Shock Index of 0.9-1.0 is normal
  - >1.1: strong predictive value surgical intervention
  - 1.5: 87% specific for transfusion
  - 1.7: 97% specific for ICU admit

Trauma Assessment of Blood Loss

Class	Blood Loss Volume	Total Deficit	Signs/Symptoms
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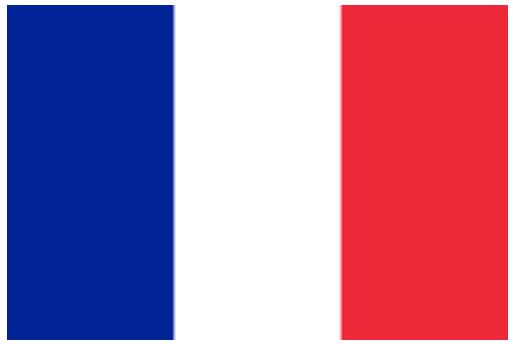
Natham 2014
Le Bas 2014

Case

- HD #1:
  - Limited response to Misoprostol x2, declined Foley
  - Started Pitocin at 0500
  - 24 hours into induction
    - SVE: 3/60/-2
- HD #2:
  - Limited response: Pitocin d/c'ed for Foley 2200
  - Foley out, SVE: 4/100/-2, restarted Pitocin 0630
- HD #3:
  - AROM 0550, IUPC placed
  - SVD at 0656
  - 40 u oxytocin, 800 mcg rectal miso given
  - Cord clamped at 1 min due to risk of maternal hemorrhage
  - QBL: <500 cc

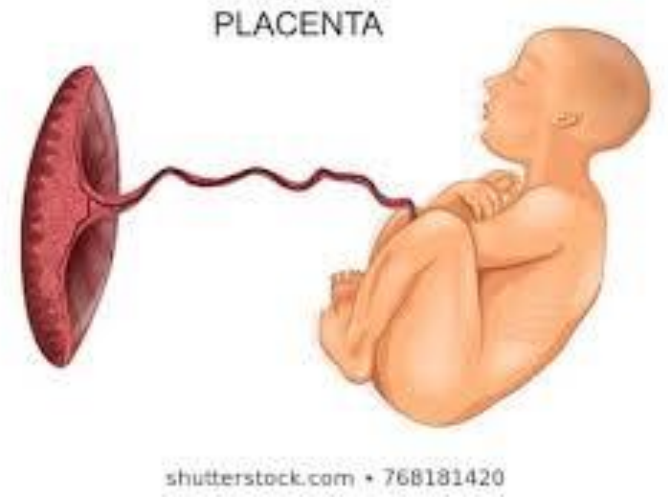
Active Management of 3rd Stage:
Role of Cord Traction



- 5 center study
- Cord traction did not decrease risk of PPH
- Benefits:
  - Reduced need for manual placenta removal (4.2% vs 6.1%, RR: 0.69%)
  - Shortened 3rd stage duration >15 minutes (4.5% vs 14.3%, RR 0.31%)
  - Women reported significantly less discomfort
  - No increased risk of uterine inversion

Deneux-Tharaux 2013

PPH: Timing of Oxytocin



- RCT
- N= 1,486 patients of similar EGA, fetal weight, labor duration, parity, age, parity, ethnicity (BIAS ALERT!)
- 20 u in 500 cc bolus at delivery of anterior shoulder or placenta
- No difference of incidence of PPH (5.4% vs 5.8%)
- No difference of incidence of retained placenta (2.4% vs 1.6% CI 0.72-3.08)

Jackson 2001

Oxytocin: High vs Low Dose

Cesarean Deliveries

- 10 u or 80 u in 500 ml
- Trial of 321 women undergoing CS
  - 39% of women on low dose oxytocin required 2nd uterotonic agent

Vaginal Deliveries

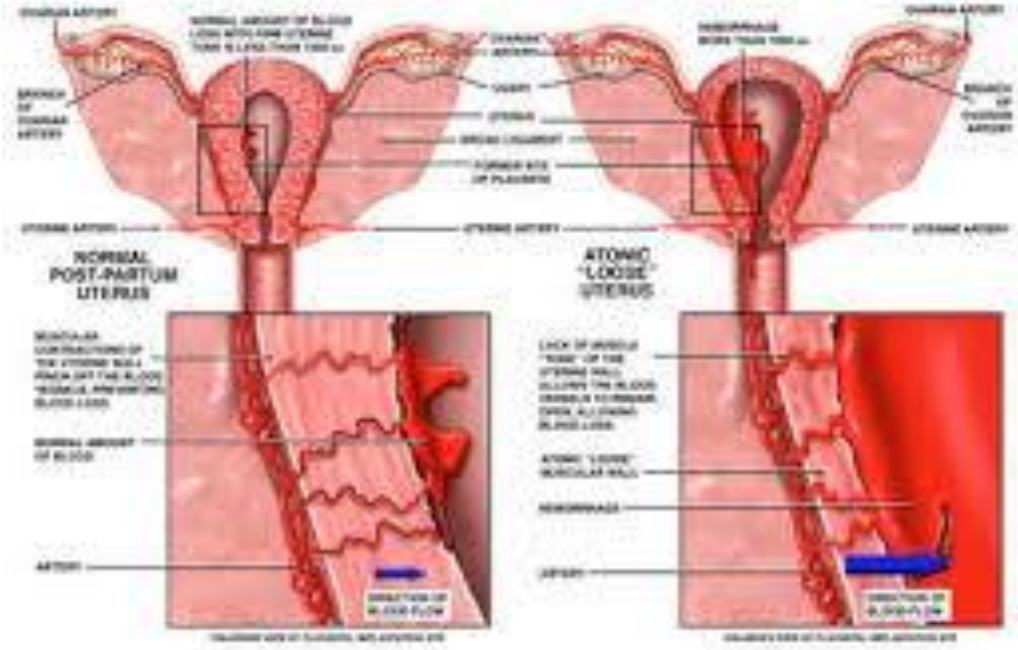
- Double blind, RCT 3,000 women with 10 u vs 80 u in 500 cc
- Increased oxytocin did not lower rate of PPH (6% vs 7%)

<u>UpToDate, ACOG Recommend max dose of 40 u if dx with PPH</u>

Munn 2001
Tita 2012

Case

- 0900:
  - MD called to bedside for ongoing bleed
  - Additional 40 units Pitocin in 500 cc given
  - Hemabate at bedside
  - HROB contacted
  - HR: 100-110
  - BP: 136/83
  - QBL: 1,000 cc



Stage 1: QBL of 500 cc, ongoing bleeding

- Increase Oxytocin to 40 units
- Insert 2nd IV
- Vigorous Massage
- Empty Bladder
- Oxygen supplementation
- Warm blankets
- Administer 2nd line uterotonic

Stage 1

500 mL loss after vaginal delivery or 1000 mL after cesarean OR increased bleeding during recovery

- Notify charge nurse
- Notify attending physician or on call physician
- Insert IV if not previously done
- Increase oxytocin
- Vigorous fundal massage
- Methergine 0.2 mg IM if not hypertensive
- Misoprostol 400 mcg SL or Hemabate250 mcg IM are alternatives
- Apply pulse oximeter
- Vital signs and O2 sat every 15 minutes
- Empty bladder
- T&C 2 units if not already done
- Oxygen to keep O2 sat >95%
- Warm blankets or Bair Hugger

2nd Line Uterotonics

- Hemabate, Miso, Methergine
- ACOG
  - Injectables more effective then misoprostol
  - Rapid time of onset:
    - Methergine: 2-5 min (IM), immediate if IV
    - Hemabate: 2-3 minutes (IM), q 15-90 min, $$$$
    - Misoprostol: 15 minutes (sublingual)

What does the data say?

Misoprostol- Evolving Attitudes

Cochrane Reviews 2012

- " Compared to injectable uterotonics, oral miso associated with higher risk of severe PPH RR: 1.33
- Neither IM oxytocin nor misoprostol are preferable to injectable

Cochrane Review 2013

- Misoprostol does not appear to increase or reduce severe morbidity or mortality

Cochrane 2014

- Among women who received oxytocin for treatment of primary PPH, adjunctive use of misoprostol confers no added benefit

Tuncalp 2013
Hofmeyr 2013
Mousa 2014

Protocols in Practice

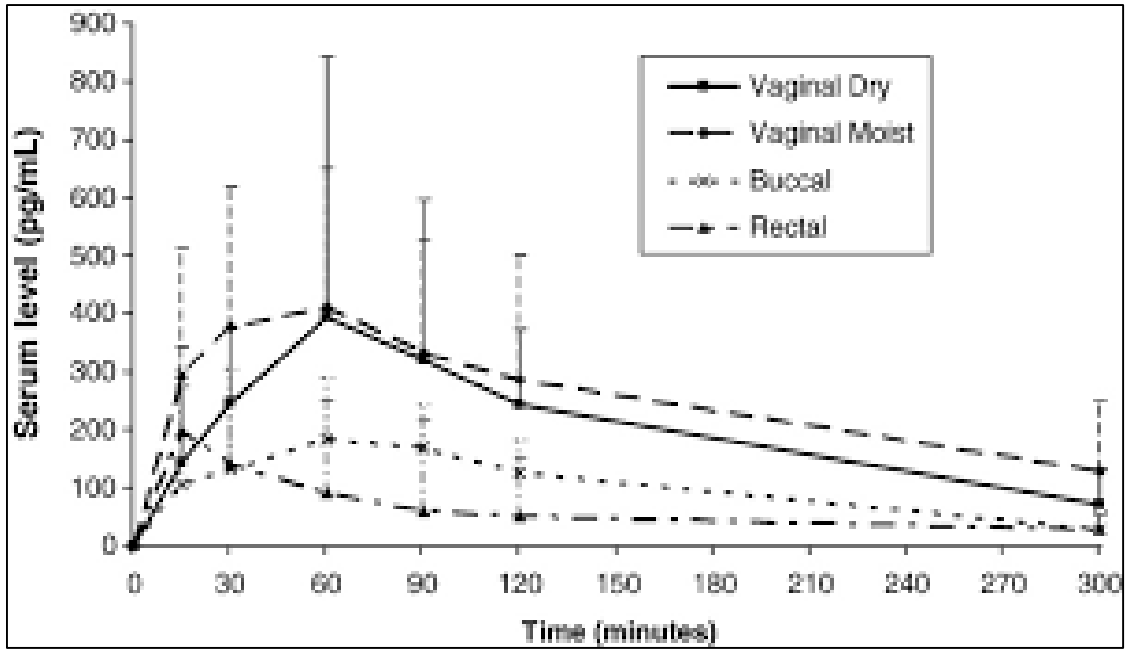
CMQCC
California Maternal Quality Care Collaborative

Medication Recommendations 2.0

Prevention	Treatment
Oxytocin or 10-40 international units/500-1000 mL IV infusion titrated to uterine tone OR Oxytocin 10 units IM when no IV access	Rapid infusion of IV oxytocin 10-40 IU/500-1000 mL at ≥ 500 mL/hour, titrated to response
	<u>Choose a standard second line agent</u> Methergine 0.2 mg IM Misoprostol 600 mcg orally or 800 mcg sublingually Hemabate 250 mcg IM or intramyometrially

Misoprostol in Practice

- Preferred Route:
  - Sublingual: 400-800 mcg
  - Oral 400-600 mcg



Key facts

Route	Onset of action	Duration of action
Oral	8 min	~2 h*
Sublingual	11 min	~3 h
Vaginal	20 min	~4 h
Rectal	100 min	~4 h

*After oral administration, uterine tonus develops, which is not followed by uterine contractions, unless repeated doses are given.

Tang 2007
Caliskan 2002

Case: Part III

- 0910:
  - HROB arrives at the bedside
  - HR: 100-140
  - BP: 158/100
  - PE: no lacerations, hematomas. No signs of DIC.
  - Blood bank alerted
  - Manual sweep performed.
  - TXA given: 1 g IV
  - Nursing continued measuring QBL, >1500 cc
  - Bakri balloon placed
  - Bleeding resolved
  - QBL: 1977 cc

Stage 2: Bleeding 1,000-1,500 cc, unstable VS

- HROB at the bedside
- Vital signs every 5-10 minutes
- Give 3rd uterotonic:
  - such as Misoprostol 800 mcg SL or Hemabate 250 mcg IM
- TXA if <3 hours since delivery
- Bimanual massage
- Consider Bakri
- 2u pRBC at bedside, 2u FFP thawed
- Foley with urimeter

Stage 1
500 mL loss after vaginal delivery or 1000 mL after cesarean OR increased bleeding during recovery
- Notify charge nurse
- Notify attending physician or on call physician

Stage 2
Continued bleeding or unstable vital signs, loss between 1000 -1500 mL
- HROB to bedside
- Activate Rapid Response Team
- Consider whether to call in OR team
- Vital signs every 5-10 minutes, announce to room
- QBL ongoing every 10-15 minutes, announce to room
- Give another uterotonic such as misoprostol 400 mcg SL or Hemabate 250 mcg IM
- Tranexemic Acid 1 gram IV may be considered if < 3 hours since delivery
- Vigorous bimanual uterine massage ongoing
- Intrauterine balloon tamponade should be considered
- 2 units of PRBC to bedside with 2 units of FFP getting thawed, transfuse first unit. DO NOT wait for lab results
- Apply Bair Hugger
- Insert foley with urimeter

Tranxemic Acid

- WOMAN Trial
  - International, Multicenter RCT
- Reduced risk of death by 31%
- Reduced risk of death from atony: 26%
- No difference in medication adverse events
- Early studies show benefit in prophylaxis and treatment
  - **<u>TXA should not be regarded as alternative therapy and is given concomitantly with other drugs and procedures</u>**

Roberts 2017
Novikova 2015
Shakur 2018

Tranxemic Acid

- Mechanism:
  - Anti-fibrinolytic agent: inhibits protolytic activity of plasmin and decreases fibrinolysis
  - IV more bioavailable (oral: 45%)
  - Time to peak: 2.5 hours (range: 1-5 hours)
  - Antifibrinolytic effect lasts up 7-8 hours in serum
- Administration
  - 1 g IV over 10-20 minutes
  - Repeat dose at 30 minutes
  - Rapid infusion (>1 ml/minute can cause hypotension)

Interventional Management

- Bakri Balloon vs Foley vs Compression and Packing
  - 86% of women who had balloon tamponade did not require further procedures or surgeries
  - Volume: around 350 cc
  - Kept in place from 12 hrs -24 hours
    - For removal: remove tamponade 50 cc at a time over 30 minute observation
    - If bleeding resumes, can refill prior to OR but should be removed
- Compresssion Gauze:
  - Impregnated with Thrombin Activator
  - Not as effective but can be used in low resource settings
  - Antibiotics required

Likis 2015

Case: Part IV

- 1430: Bakri balloon expelled
- No further bleeding
- Hgb at 24 hours: 7.9
- Asymptomatic
- Offered IV iron, patient declined
- Discharged to follow up in 1-2 days

Timing of Transfusion

- 2 units of PRBC to bedside with 2 units of FFP getting thawed, transfuse first unit. DO NOT wait for lab results
- Apply Bair Hugger

- For women with ongoing bleeding >1500 cc or more
- Unstable VS
- High for DIC
  - depletion of coagulation factors- common to develop consumptive coagulopathy
  - PEC known risk factor for coagulopathy

- Per our guideline:
  - 2 u pRBC with 2 u FFP thawed
  - Ratio pRBC: FFP is 1:1
  - Ratio of pRBC: FFP: platelet: 4:4:1

Sequelae of Transfusion in PPH

- Risk of Massive Transfusion
  - Hyperkalemia, Hypocalcemia
  - Hypothermia
- Crystalloid Resuscitation
  - Dilutional coagulopathy
  - Pulmonary Edema
- Other reactions
  - Febrile nonhemolytic: 8 per 10,000
  - Hemolytic transfusion rxn: 1.9/10,000
  - TRALI: 1 per 10,000 (ARDS analogue)
  - Transfusion assocated reactions: HIV, West Nile, Chagas, Malaria 1 per 100,00- to 1 million

Lethal Coagulopathy Triad

Dilution

Hypothermia

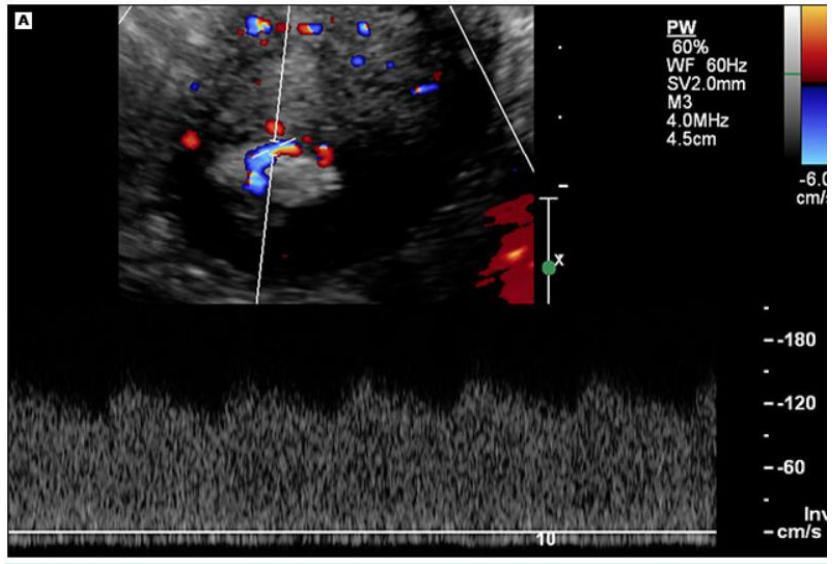
Acidosis

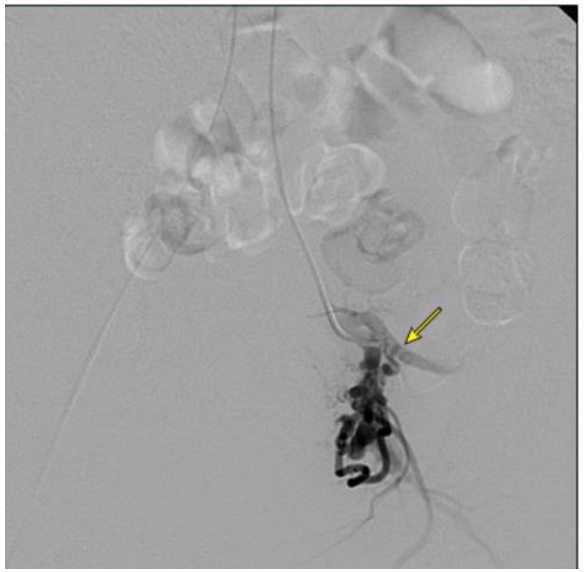
PPH as Independent Risk factor for VTE

- Swedish birth/discharge registries: 82,378 deliveries
- Increased risk of VTE in women with preeclampsia and placenta abruption
- **However……**
  - WOMAN trial:
    - 0.3% of women with PPH had thromboembolic event within 42 days
    - Patients receiving blood transfusions should receive thromboprophylaxis and continue until discharge

Secondary Postpartum Hemorrhage

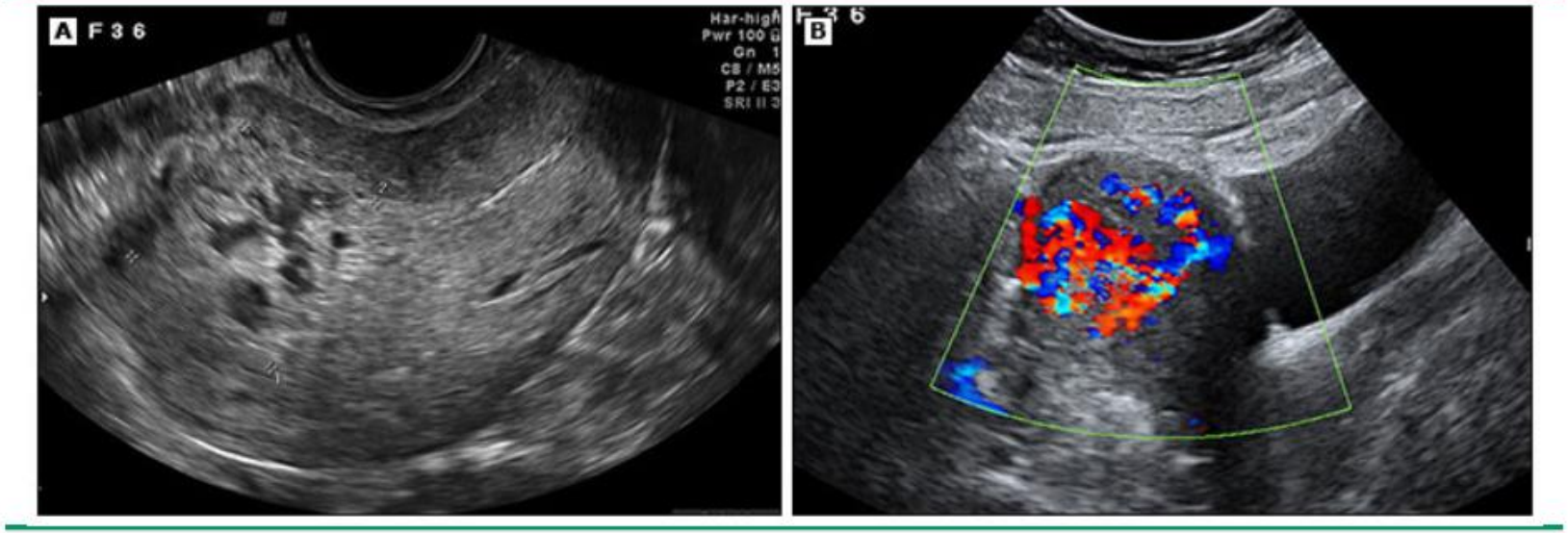
- PPH between 24 hours and 12 weeks postpartum
- Incidence:
  - 0.2-2%
- Peak incidence is 1-2 weeks postpartum
- Risk Factors: Previous PPH
- Most common causes:
  - Retained POCs
  - Infection
  - Subinvolution of placental bed





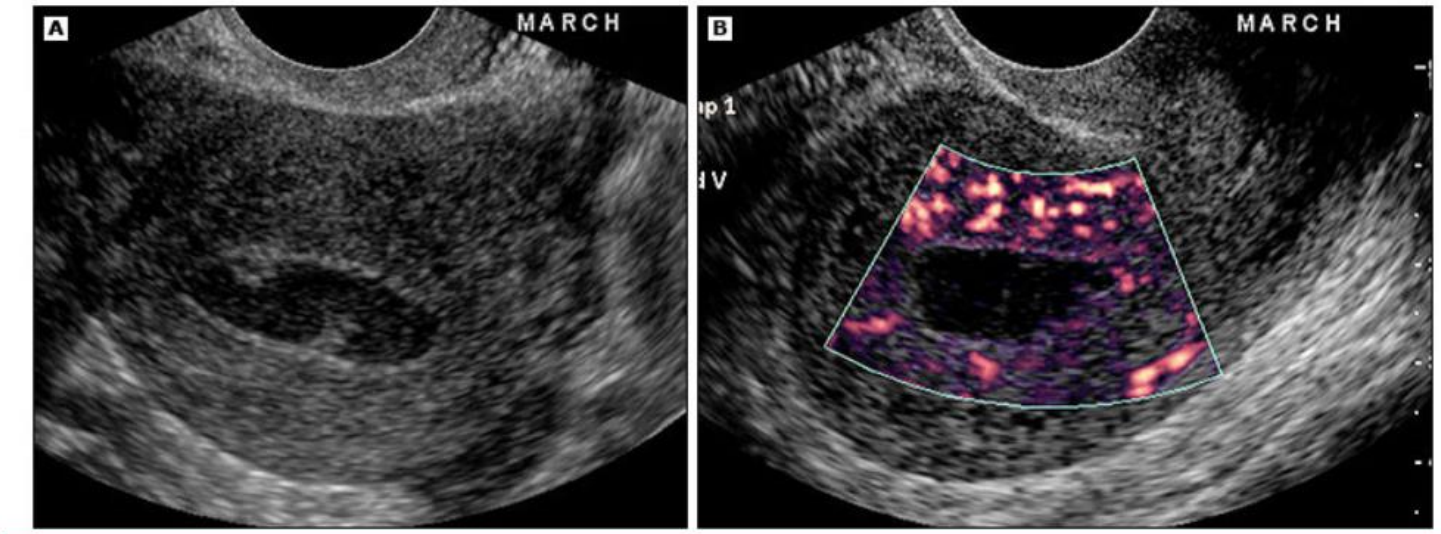
Levine 2018

Vascularized retained products of conception with secondary postpartum hemorrhage



Levine 2018

Blood clot in postpartum uterus



Patient with secondary postpartum bleeding

Levine 2018

Uptodate 2019

Interventions to address PPH

- California: Coordinated Quality Improvement
  - California Maternal Quality Care Collaborative
  - Mentor Model among 113 Hospitals
  - Implementation of Hemorrhage Bundle
- Outcomes:
  - Women in Collaborative Hospitals: 20.8% reduction in morbidity from PPH
  - Comparison Hospitals: 1.2% reduction
  - Maternal Morbidity reduction of 11.7%

CMQCC
California Maternal Quality Care Collaborative

Addressing the Problem: Protocols

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California Maternal Quality Care Collaborative

Obstetric Hemorrhage Safety Bundle

Readiness: (every unit)

- Hemorrhage Cart / with Procedural Instructions (balloons, compression stiches)
- Rapid access to hemorrhage medications (kit or equivalent)
- Establish a response team: multiple partnerships // unit education, drills, debriefs
- Establish MTP and 0-neg/uncrossmatched transfusion protocols

Recognition: (every patient)

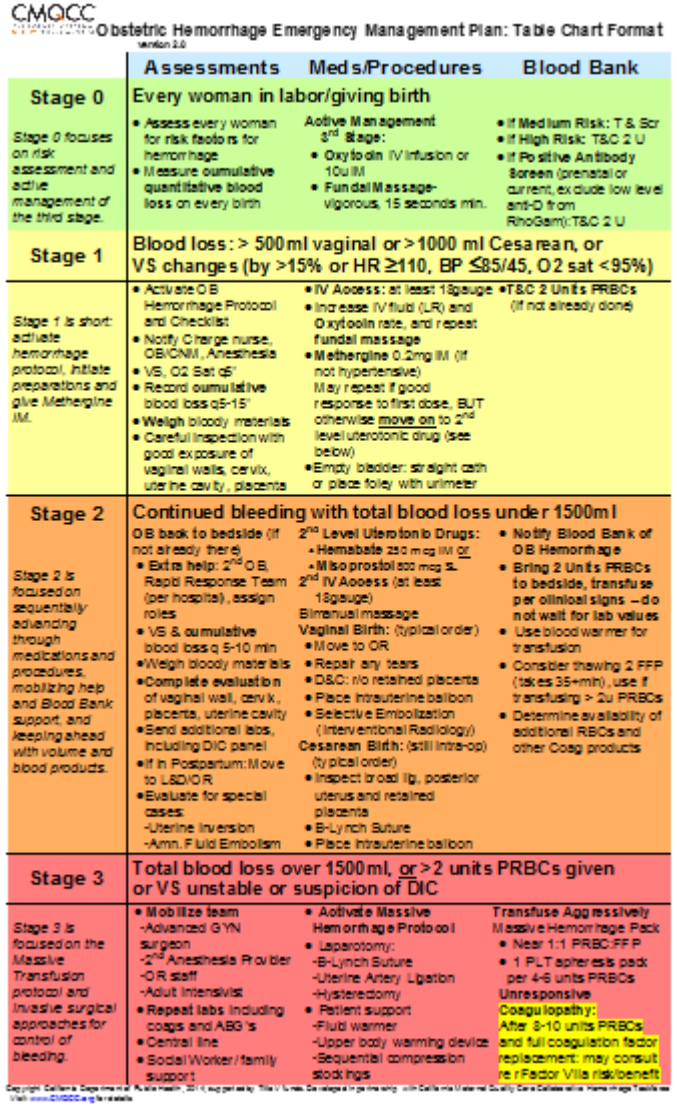
- Assessment of hemorrhage risk (prenatal, on admission, ongoing in labor & PP)
- Measurement of CUMMULATIVE blood loss
- Active Management of 3rd Stage (oxytocin after birth)

Response: (every hemorrhage)

- Unit-standard, stage-based OB Hemorrhage Emergency Management Plan w/checklist
- Support program for patients, families and staff

Reporting / Systems Learning: (every unit)

- Establish a culture of Huddles for high-risk patients and post-event debriefings
- Review all stage 3 hemorrhages for systems issues
- Monitor outcome and process metrics in perinatal QI committee



CMQCC Obstetric Hemorrhage Emergency Management Plan: Table Chart Format

	Assessments	Meds/Procedures	Blood Bank
Stage 0 *Stage 0 focuses on risk assessment and active management of the third stage.*	**Every woman in labor/giving birth** • Assess every woman for risk factors for hemorrhage • Measure cumulative quantitative blood loss on every birth	**Active Management 3rd Stage:** • Oxytocin IV infusion or 10u IM • Fundal Massage- vigorous, 15 seconds min.	• If Medium Risk: T & Scr • If High Risk: T&C 2 U • If Positive Antibody Screen (prenatal or current, exclude low level anti-D from RhoGam): T&C 2 U
Stage 1 *Stage 1 is short: activate hemorrhage protocol, initiate preparations and give Methergine IM.*	**Blood loss: > 500 ml vaginal or > 1000 ml Cesarean, or VS changes (by >15% or HR ≥110, BP ≤85/45, O2 sat <95%)** • Activate OB Hemorrhage Protocol and Checklist • Notify Charge nurse, OB/CNM, Anesthesia • VS, O2 Sat q5' • Record cumulative blood loss q5-15' • Weigh bloody materials • Careful inspection with good exposure of vaginal walls, cervix, uterine cavity, placenta	• IV Access: at least 18gauge • Increase IV fluid (LR) and Oxytocin rate, and repeat fundal massage • Methergine 0.2mg IM (if not hypertensive) May repeat if good response to first dose, BUT otherwise move on to 2nd level uterotonic drug (see below) • Empty bladder: straight cath or place foley with urimeter	• T&C 2 Units PRBCs (if not already done)
Stage 2 *Stage 2 is focused on sequentially advancing through medications and procedures, mobilizing help and Blood Bank support, and keeping ahead with volume and blood products.*	**Continued bleeding with total blood loss under 1500ml** OB back to bedside (if not already there) • Extra help: 2nd OB, Rapid Response Team (per hospital), assign roles • VS & cumulative blood loss q 5-10 min • Weigh bloody materials • Complete evaluation of vaginal wall, cervix, placenta, uterine cavity • Send additional labs, including DIC panel • If in Postpartum: Move to L&D/OR • Evaluate for special cases: -Uterine Inversion -Amn. Fluid Embolism	2nd Level Uterotonic Drugs: • Hemabate 250 mcg IM or • Misoprostol 800 mcg SL 2nd IV Access (at least 18gauge) Bimanual massage **Vaginal Birth:** (typical order) • Move to OR • Repair any tears • D&C: r/o retained placenta • Place intrauterine balloon • Selective Embolization (Interventional Radiology) **Cesarean Birth:** (still intra-op) (typical order) • Inspect broad lig, posterior uterus and retained placenta • B-Lynch Suture • Place intrauterine balloon	• Notify Blood Bank of OB Hemorrhage • Bring 2 Units PRBCs to bedside, transfuse per clinical signs – do not wait for lab values • Use blood warmer for transfusion • Consider thawing 2 FFP (takes 35+min), use if transfusing > 2u PRBCs • Determine availability of additional RBCs and other Coag products
Stage 3 *Stage 3 is focused on the Massive Transfusion protocol and invasive surgical approaches for control of bleeding.*	**Total blood loss over 1500 ml, or > 2 units PRBCs given or VS unstable or suspicion of DIC** • Mobilize team -Advanced GYN surgeon -2nd Anesthesia Provider -OR staff -Adult Intensivist • Repeat labs including coags and ABG's • Central line • Social Worker / family support	• Activate Massive Hemorrhage Protocol • Laparotomy: -B-Lynch Suture -Uterine Artery Ligation -Hysterectomy • Patient support -Fluid warmer -Upper body warming device -Sequential compression stockings	**Transfuse Aggressively** Massive Hemorrhage Pack • Near 1:1 PRBC:FFP • 1 PLT apheresis pack per 4-6 units PRBCs **Unresponsive Coagulopathy:** After 8-10 units PRBCs and full coagulation factor replacement: may consult re rFactor VIIa risk/benefit

Copyright California Department of Public Health, 2011, except portions ... with California Maternal Quality Care Collaborative. Hemorrhage Toolkit ... Visit www.CMQCC.org for updates

Coming soon to a YK near you!

ED Deliveries: Code Stork

Prevention of Bleeding

- Active Management of the Third Stage of Labor:
- IV or IM oxytocin after delivery of the anterior shoulder (preferred), delivery of the baby (preferred) or delivery of the placenta
- Consider placement of misoprostol 400 mcg SL after placental delivery for any patient with history of PPH, grand multiparity, hemoglobin <9, or suspected chorioamnionitis

Measurement of Blood Loss:

- Quantification of blood loss (QBL) will be performed at all births
- This will be done by weighing all items used, 1 mL = 1 gram
- This must be done ongoing if increased bleeding is noted.

Stage 1

500 mL loss after vaginal delivery or 1000 mL after cesarean OR increased bleeding during recovery

- Notify charge nurse
- Notify attending physician or on call physician
- Insert IV if not previously done
- Increase oxytocin
- Vigorous fundal massage
- Methergine 0.2 mg IM if not hypertensive
- Misoprostol 400 mcg SL or Hemabate250 mcg IM are alternatives
- Apply pulse oximeter
- Vital signs and O2 sat every 15 minutes
- Empty bladder
- T&C 2 units if not already done
- Oxygen to keep O2 sat >95%
- Warm blankets or Bair Hugger

Stage 2

Continued bleeding or unstable vital signs, loss between 1000 -1500 mL

- HROB to bedside
- Activate Rapid Response Team
- Consider whether to call in OR team
- Vital signs every 5-10 minutes, announce to room
- QBL ongoing every 10-15 minutes, announce to room
- Give another uterotonic such as misoprostol 400 mcg SL or Hemabate 250 mcg IM
- Tranexemic Acid 1 gram IV may be considered if < 3 hours since delivery
- Vigorous bimanual uterine massage ongoing
- Intrauterine balloon tamponade should be considered
- 2 units of PRBC to bedside with 2 units of FFP getting thawed, transfuse first unit. DO NOT wait for lab results
- Apply Bair Hugger
- Insert foley with urimeter

Stage 3

QBL > 1500 mL

- Ensure Rapid Response Team is at bedside
- Active Massive Transfusion Protocol
- Tranexemic Acid should be given if < 3 hours since delivery
- All medical and surgical options should be considered in consultation with ANMC OB/GYN if needed
- Transfuse PRBC and FFP in a 1:1 ratio aggressively using rapid infuser
- Continue the ongoing QBL assessment, announce to room
- Continue vital signs with O2 sat every 5-10 minutes, announce to room
- Apply Bair Hugger if not done previously
- CBC, BMP, PT/PTT, fibrinogen, ionized calcium, ABG if O2 sat < 95%
- Apply SCDs (Sequential Compression Devices)
- Assign staff to family support

In Conclusion

- PPH is on the rise, but there are multiple modalities to address this issue
- Quick identification is crucial
- Active management of 3rd stage is important:
  - Cord traction
  - Oxytocin whenever you want it
  - Low threshold to utilize 2nd, 3rd Uterotonic if bleeding >1L
- TXA is an important adjunct that can save lives (QBL>1L)
- Ask for help and transfuse when VS unstable (QBL>1.5L)
- Coordinated care and teamwork are essential to reducing morbidity and disparities

Fin!

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Gratitude to fellow OB providers, for sharing their practices and cases

Grateful to patients, who trust us with their lives.

Questions?

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