POSTPARTUM HEMORRHAGE PREVENTION IN BIRTH CENTERS

HELLO!

BETSY ARREGUIN, CNM, DNP

CNM AT BIRTH CENTER OF DENVER

BETSYARREGUIN@GMAIL.COM

SESSION OBJECTIVES

At the end of the session the learner will be able to:

- Interpret evidence for developing and implementing a postpartum hemorrhage prevention bundle.
- Identify evidence-based postpartum hemorrhage prevention care bundle components.
- Relate benefits of TXA for PPH prevention & treatment.
- Explain strategies to implement quantitative blood loss assessment in a free-standing birth center.
- Discuss how active management can be implemented in a shared decision-making model.
- Describe how to use postpartum hemorrhage risk assessment in practice.

PPH STATISTICS

BACKGROUND INFO

- PPH = >1000ML BLOOD LOSS FOLLOWING BIRTH

MORBIDITY/MORTALITY

- 8-11 MILLION AFFECTED EACH YEAR
- 1 IN 4 MATERNAL DEATHS WORLDWIDE
- USA MATERNAL MORTALITY RATE IS ON THE RISE

CONTRIBUTING FACTORS

- INHERENT RISK FACTORS
- FACILITY FACTORS
- PROVIDER FACTORS

Acog 2017; Carol, et al., 2016; Global Burden of Disease 2015 Maternal Mortality Collaborators, 2016; Main et al., 2015b

PPH STATISTICS

MORE CONSEQUENCES OF PPH...

Fear of dying

Higher EPDS scores

anxiety

DEPRESSION

Negative memories of birth

Anemia

PTSD

fatigue

Delays in lactation

Carrol, et al., 2016; Guven, Holm, Rosthoej, & Langhoff-Roos, 2018; Hancock, Weeks & Lavender, 2015

POSTPARTUM HEMORRHAGE CARE BUNDLES

CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE

PREGNANCY-RELATED MORTALITY IN CALIFORNIA: CAUSES, CHARACTERISTICS, AND IMPROVEMENT OPPORTUNITIES PREVENTABLE FACTORS IN PPH RELATED DEATHS (MAIN ET AL,, 2015B)

- **Preventable factors identified in PPH related deaths ☹**
  - delayed response to clinical warning signs
  - lack of immediate access to hemorrhage medications
  - lack of protocols
  - failures in interdisciplinary team communication

POSTPARTUM HEMORRHAGE CARE BUNDLES

CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE

REDUCTION OF SEVERE MATERNAL MORBIDITY FROM HEMORRHAGE USING A STATE PERINATAL QUALITY COLLABORATIVE (MAIN ET AL., 2017)

- ✓ 20.8% reduction in maternal morbidity
- ✓ Diagnosis of PPH increased
- ✓ Less use of blood products and D&C procedures

POSTPARTUM HEMORRHAGE CARE BUNDLES

CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE BUNDLE

Readiness

- Quick access to meds
- Protocols
- Drills

Recognition & Prevention

- Risk assessment
- QBL assessment
- Active management

Response

- Emergency response plan
- Support for patients and families

Reporting

- Debriefing
- OB hemorrhage measures for hospitals

Lyndon & Lagrew, 2015; Main et al., 2015a

POSTPARTUM HEMORRHAGE CARE BUNDLES

OTHER SUPPORTIVE LITERATURE

- INCREASED RECOGNITION OF PPH
- INCREASED USE OF UTEROTONICS
- DECREASE IN D&C PROCEDURES
- DECREASED USE OF BLOOD PRODUCTS
- DECREASED INCIDENCE OF POSTPARTUM HYSTERECTOMIES

Einerson, Miller and Grobman, 2015; Shields, Weisner, Fulton & Pelletreau, 2015

REVIEW OF LITERATURE: PPH RISK ASSESSMENT

WU ET AL., 2015

- ACCURATE PREDICTION OF THOSE AT RISK FOR INCREASED BLEEDING
- GREATER TEAM PREPARATION

AHMADZIA ET AL., 2019

- REDUCED BLOOD LOSS >1000ML
- REDUCED NEED FOR BLOOD TRANSFUSION
- INCREASED USE OF PROPHYLACTIC PITOCIN

REVIEW OF LITERATURE: QBL ASSESSMENT

KAHR ET AL., 2018

- ACCURATE/OBJECTIVE BLOOD LOSS ASSESSMENT INCREASES RECOGNITION OF ABNORMAL BLEEDING
- INACCURATE ASSESSMENT LEADS TO TREATMENT DELAYS

HANCOCK, WEEKS & LAVENDER, 2015

- ESTIMATING BLOOD LOSS TENDS TO BE INACCURATE BY 45-75%

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Prophylactic Pitocin

MASUZAWA ET AL., 2018; INTEGRATIVE REVIEW

- 64% REDUCTION IN PPH

BEGLEY ET AL., 2019; COCHRANE REVIEW

- 50% REDUCTION IN POSTPARTUM ANEMIA
- REDUCED INCIDENCE OF BLEEDING >500ML

YILDRIN ET AL., 2016

- SHORTER DURATION OF 3RD STAGE OF LABOR
- REDUCED RISK FOR POSTPARTUM DEPRESSION

GALLOS ET AL., 2018

- REDUCED BLOOD LOSS >500ML (RR 0.62)
- REDUCED NEED FOR BLOOD TRANSFUSION (RR 0.75)

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Prophylactic Pitocin: Best time to administer?

anterior shoulder?

within the first 5 minutes?

after pulsation ceases?

after placenta?

Poll time!

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Prophylactic Pitocin: Best time to administer?

anterior shoulder?

within the first 5 minutes?

after pulsation ceases?

after placenta?

"little to no difference in Pitocin timing" AWHONN practice guideline, 2015

Soltani, Hutchson & Poulose, 2010; Cochrane Review of 3 trials

- Route included IV or IM pitocin, data separated by route and timing

✓ Timing did not change outcomes of PPH or length of third Stage

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Pitocin & Breastfeeding

Gomes et al., 2018: Intrapartum synthetic oxytocin and breastfeeding: A retrospective cohort study

- n=201
- impact of intrapartum oxytocin on breastfeeding outcomes
- All women included desired to breastfeed, were not working at 3 months and Baby Friendly© principles followed

- **Oxytocin use during labor impaired breastfeeding initiation in the first hour (OR 2.4)**
- **Breastfeeding at 3 months not significantly affected**
- **Did exclude women with c/s, forceps assisted birth, twin birth, premature birth or low apgars**
- **High BMI seemed to be have the biggest impact on breastfeeding rates**

Gaps: study of women who needed IOL/augmentation, does not analyze oxytocin strictly given for AMTSL or account for how much/duration of oxytocin

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Pitocin & Breastfeeding

Morillo et al., 2019: Cessation of breastfeeding with oxytocin administration and type of birth: A prospective cohort study

- analyzed method of birth, oxytocin administration and breastfeeding rates
- n=529
- Setting: Baby Friendly© hospital in Spain, all desired to exclusively breastfeed and had active management
- Study groups: IOL/vaginal birth, spontaneous vaginal birth, planned c/s without labor/oxytocin, c/s with oxytocin during labor
  - ➢ **Planned c/s group had lowest rate of breastfeeding at 1, 3 and 6 months PP**
  - ➢ **No association found between breastfeeding and oxytocin given during labor or during the postpartum period**

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Tranexamic Acid (TXA)

What is it?

- antifibrinolytic agent

How does it work?

- stops the breakdown of fibrin, which controls or prevents excessive bleeding by helping the blood clot.

Side effects?

- Most common: nausea, vomiting, diarrhea, can cause hypotension if given too quickly IV
- Limited evidence, however no increase risk of thrombolytic events has been found

Novikova, Hofmeyr & Cluver, 2015; Saccone et al., 2020

POLL TIME!

Tranexamic Acid (TXA)

Does your birth center have TXA on hand?

REVIEW OF LITERATURE: PPH & TXA

World Maternal Antifibrinoltic Trial (WOMAN Trial; 2017)

- Analyzed the effect of early TXA administration on mortality and morbidities r/t PPH
- N=20,000 worldwide
- Double-blinded, RTC among 196 hospitals across 21 countries
- 70% vaginal birth and 30% cesarean birth
- Follow up of participants 42 days after giving birth

- **Reduced death due to bleeding by 19%**
- **Reduced death by 31% when given within 3 hours of birth**
- **Decreased laparotomy to control bleeding**
- **No increased risk of thrombolytic events**
- **Minimal serum concentrations in breast milk, unlikely to have antifibrinolytic effects on baby**

Conclusion: TXA reduces death due to bleeding/PPH with no adverse effects. TXA should be given as soon as possible after bleeding onset

REVIEW OF LITERATURE: PPH & TXA

WHO (2017) Recommendations

- Administration of TXA should be considered as part of the standard PPH treatment package and be administered as soon as possible after onset of bleeding and within 3 hours of birth

- TXA should be used in all cases of PPH, regardless of whether the bleeding is due to genital tract, trauma, or other causes.

- TXA should be administered at a fixed dose of 1 g in 10 mL (100 mg/mL) IV at 1 mL per minute (i.e., administered over 10 minutes), with a second dose of 1 g IV if bleeding continues after 30 minutes

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Prophylactic Tranexamic Acid

Alam & Choi, 2015; Prophylactic use of tranexamic acid for postpartum bleeding outcomes: A systematic review and meta-analysis of randomized controlled trials.

- **decreased incidence of PPH after birth (OR 0.32; 95% CI, 0.17-0.59; P = .0006)**
- **reduction in mean blood loss by 149.1mL (95% CI, 112.9-185.2; P < .00001)**
- **reduction in blood transfusions (OR, 0.28; 95% CI, 0.15-0.49; P < .00001)**
- **reduction in the use of additional uterotonics (OR, 0.45; 95% CI, 0.30-0.66; P < .00001)**

Conclusion: although TXA may be associated with improved peripartum bleeding, evidence is insufficient based on quality of the included studies; all rated low to moderate quality

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Prophylactic TXA + Pitocin

Saccone et al., 2019; Prophylactic use of tranexamic acid after vaginal delivery reduces the risk of postpartum hemorrhage

- Review of 4 RCTs, n= 4671
- TXA 1 g IV given within 10 min after vaginal birth in addition to oxytocin for PPH prevention at term
- PPH defined as blood loss ≥500 mL in the first 24 h following vaginal birth

➢ **significantly lower incidence of primary PPH, 8.7 vs 11.4%; RR 0.61**

➢ **lower mean blood loss, mean difference -84.74 ml**

Conclusion: prophylactic tranexamic acid 1 g IV within 10 min after vaginal delivery reduces the risk of primary PPH

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Prophylactic PO TXA + Buccal Misoprostol

Shady et al., 2019: The effect of prophylactic oral tranexamic acid plus buccal misoprostol on blood loss after vaginal delivery: A randomized controlled trial

- N=360
- 3 groups: active management with misoprosol, misoprostol + TXA, oxytocin+TXA
- 1g PO TXA + 600mcg buccal misoprostol given

- **lower hgb level and higher blood loss in the misoprostol group, p=.0001**
- **higher hgb level and lower blood loss in the TXA plus misoprostol group compared with the oxytocin group (p = .004 and .043)**
- **PPH occurred in 16.7% of women in the misoprostol group, 1.7% in the oxytocin group and no cases of PPH in the TXA plus misoprostol group (p = .0001)**

Conclusions: In settings like rural area or home delivery in which oxytocin is not available, alternative oral TXA plus buccal misoprostol may be considered as an effective line in prevention of PPH.

POLL TIME!

Tranexamic Acid (TXA)

Are you currently using TXA for treatment, active management, both! Or neither?

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Cord Traction

Summary of Evidence: Cochrane Review, 2015

- **No difference in blood loss >1000mL**
- **Slight reduction in blood loss >500mL (RR 0.93)**
- **Reduction in manual removal of placenta (RR 0.62)**
- **No clear difference in use of therapeutic uterotonics, blood transfusions or maternal morbidity/mortality**

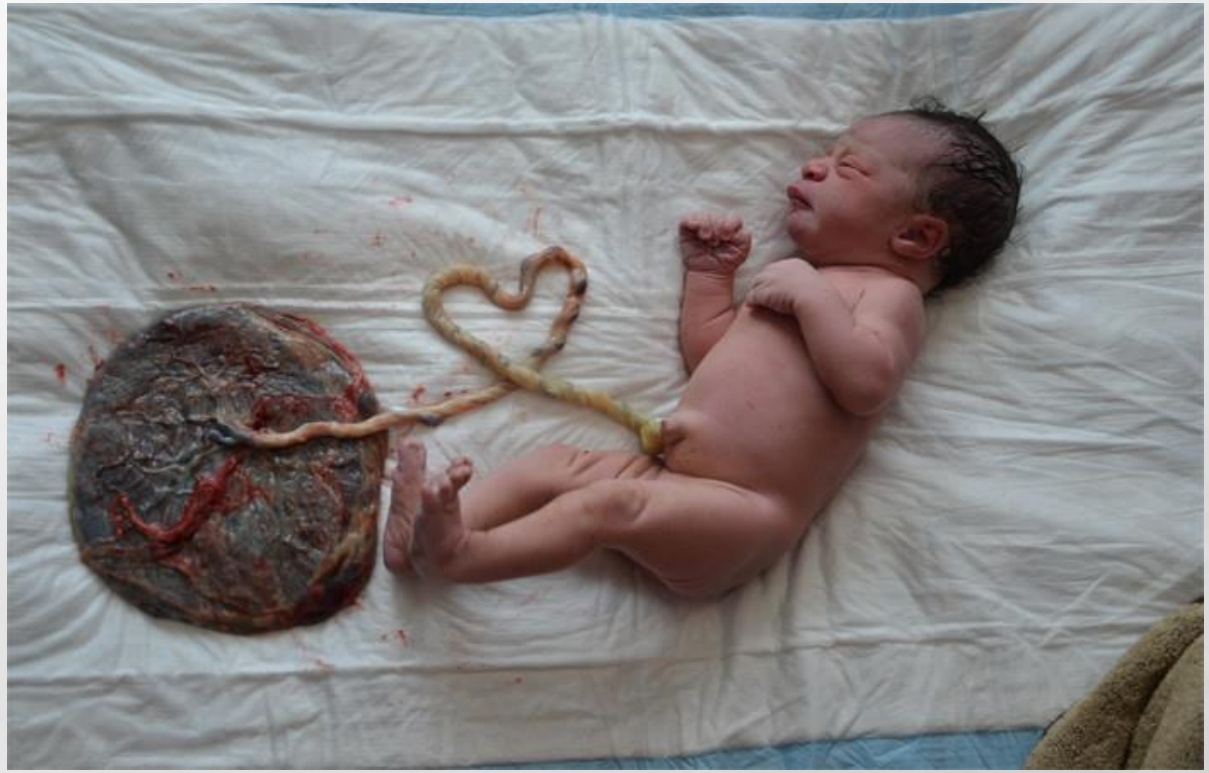
➢ **Limitation: studies included cord traction as part of AMTSL "package," therefore, difficult to separate outcomes r/t cord traction alone**

Hofmeyr, Mshweshwe & Gulmezoglu, 2015

REVIEW OF LITERATURE: ACTIVE MANAGEMENT

Cord Clamping

No difference in PPH outcomes between early vs delayed cord clamping



Masuzawa, 2018

Image: Tyagi, 2016

REVIEW OF LITERATURE: SUMMARY

PPH risk assessment + QBL assessment + Pitocin for AMTSL

- 20.8% REDUCTION IN MATERNAL MORBIDITY
- INCREASE RECOGNITION OF PPH
- REDUCED USE OF BLOOD PRODUCTS
- REDUCTION IN EMERGENCY PROCEDURES INCLUDING DILATION & CURETTAGE, AND POSTPARTUM HYSTERECTOMIES

Main et al., 2017, Shields et al, 2017, Einerson et al., 2015

- ONLY FREESTANDING HOSPITAL-OWNED BIRTH CENTER IN COLORADO
- OPENED IN DECEMBER 2018
- ~20 EDDS EACH MONTH
- CLINICAL TEAM: 4.5 CNMS, 2.5 RNS

BIRTH CENTER OF DENVER QI

GOAL: IMPLEMENT PPH PREVENTION PLAN TO DECREASE TOTAL POSTPARTUM BLOOD LOSS

- DNP CAPSTONE PROJECT
- QI PROJECT RAN FROM 3/2019-10/2019
- DATA COLLECTED FOR 1 YEAR
- METHODS: PDSA CYCLES

IHI, 2019

AIMS AND STRATEGIES

Primary

Decrease total postpartum bleeding at 4 hours by 20% from median of 450mL to 360mL

Key Elements:

- Accurate blood loss assessment through quantitative blood loss (QBL) assessment
- Increase use of active management of the third stage of labor
- Use of PPH risk assessment to aid in team preparedness

Secondary

80% of clients will accept active management after receiving counseling

Key Elements:

- Increase staff knowledge
- Implement education
- Implement use of postpartum hemorrhage risk assessment for every client

PPH bundle utilization to be at 80% by month 5 of implementation

Key Elements:

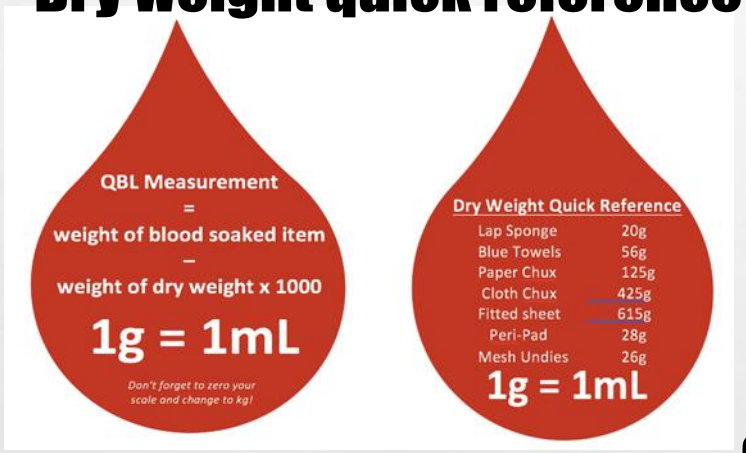
- QBL utilization at every birth
- PPH risk assessment for every client
- Active Management recommended to every client

QBL Assessment!

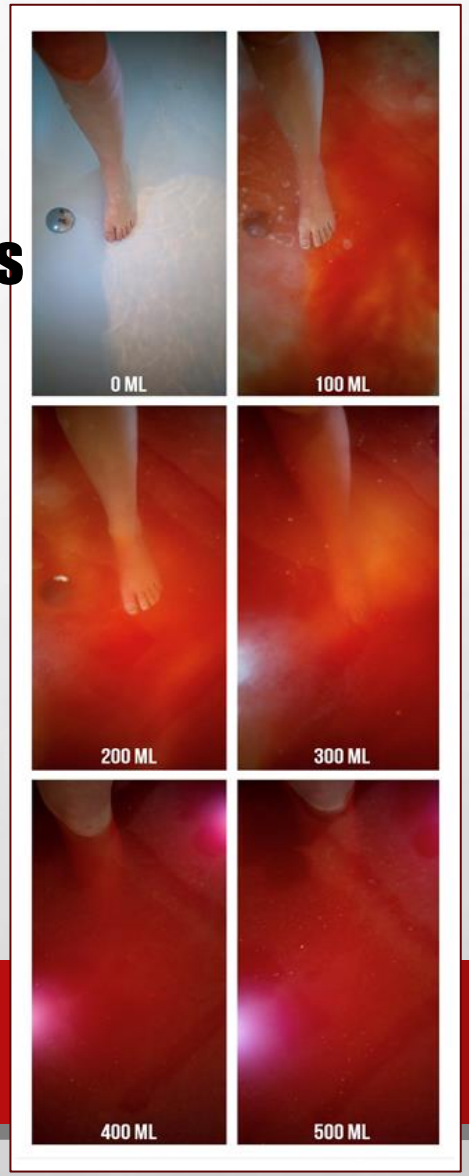
- Establish accurate baseline for blood loss
- Shift practice norm from EBL to QBL
- Detect impact of other interventions

PDSA I : QBL IMPLEMENTATION

- **Dry weight quick reference**



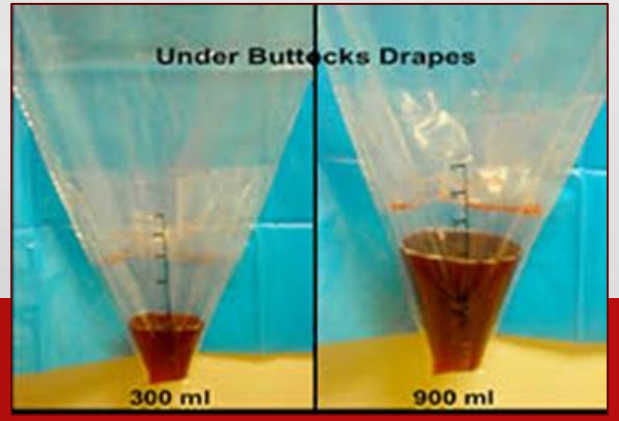
- **Visual tool for estimating blood loss in the water →**



- **Staff training**

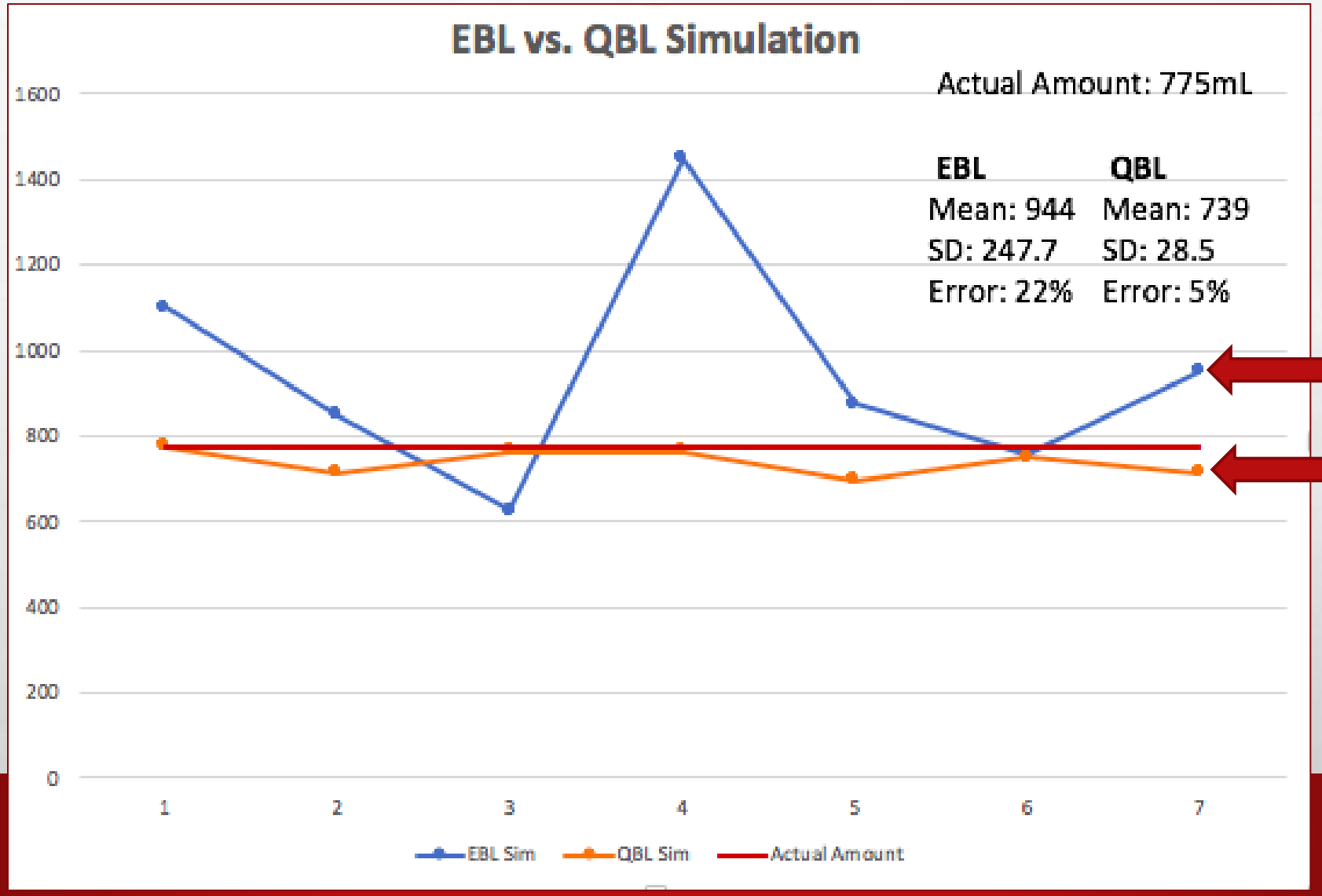
- **Food scales with bowls**
  - **$25/scale**

- **Calibrated drapes**
  - **$3.92/drape**



- **Fake blood for simulation!**

PDSA I: TRAINING OUTCOMES

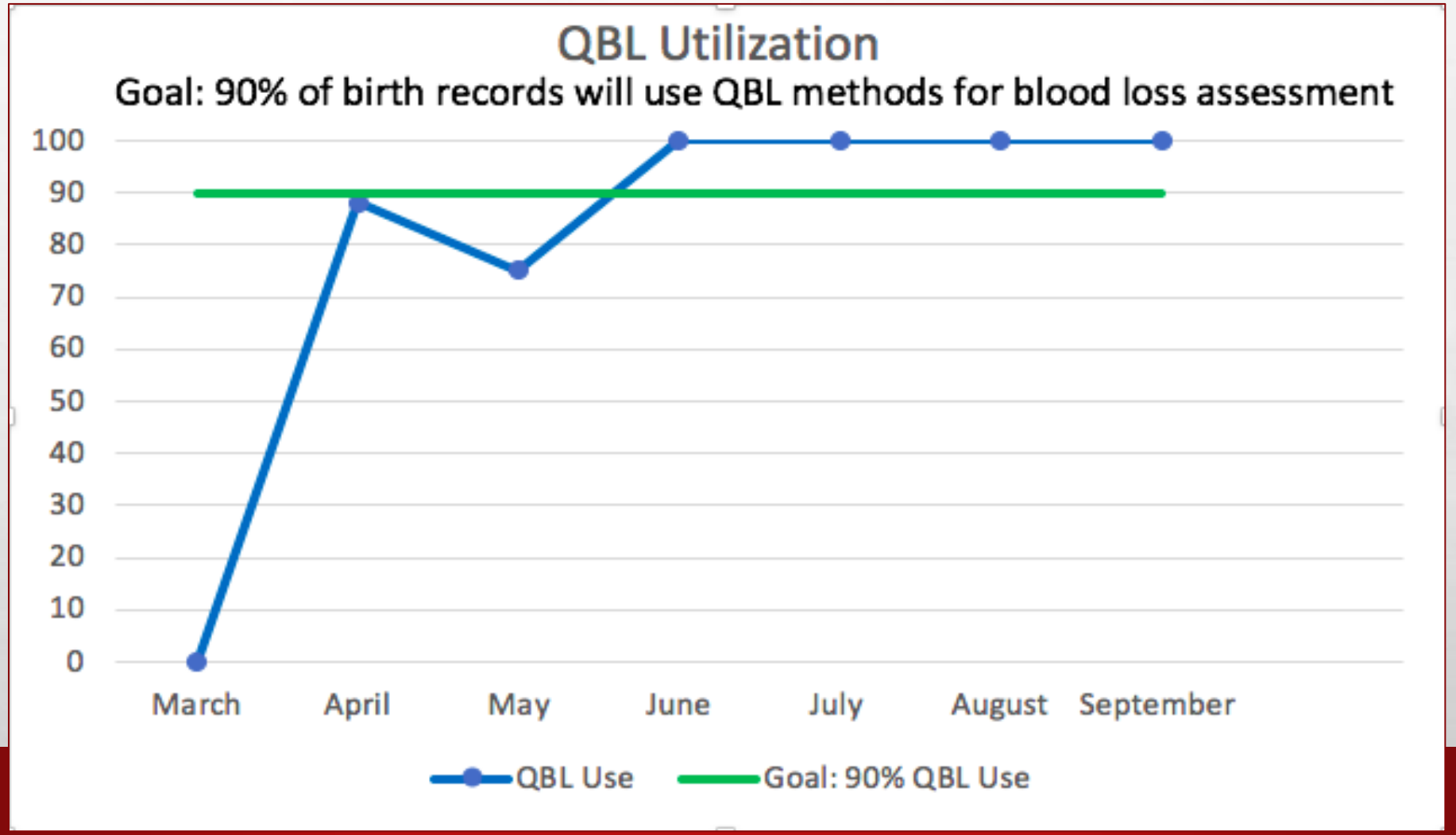


EBL

QBL

! ! !

PDSA I: QBL OUTCOMES



NEXT…

✓Accurate blood loss assessment

Interventions to target blood loss

- Active Management
- PPH Risk Assessment

PDSA 2: INCREASE USE OF ACTIVE MANAGEMENT

- STAFF EDUCATION
- PROTOCOL DEVELOPMENT
- CLIENT EDUCATION PLAN
  - HAND OUT
  - INDIVIDUAL COUNSELING USING RISK ASSESSMENT
  - CLASS

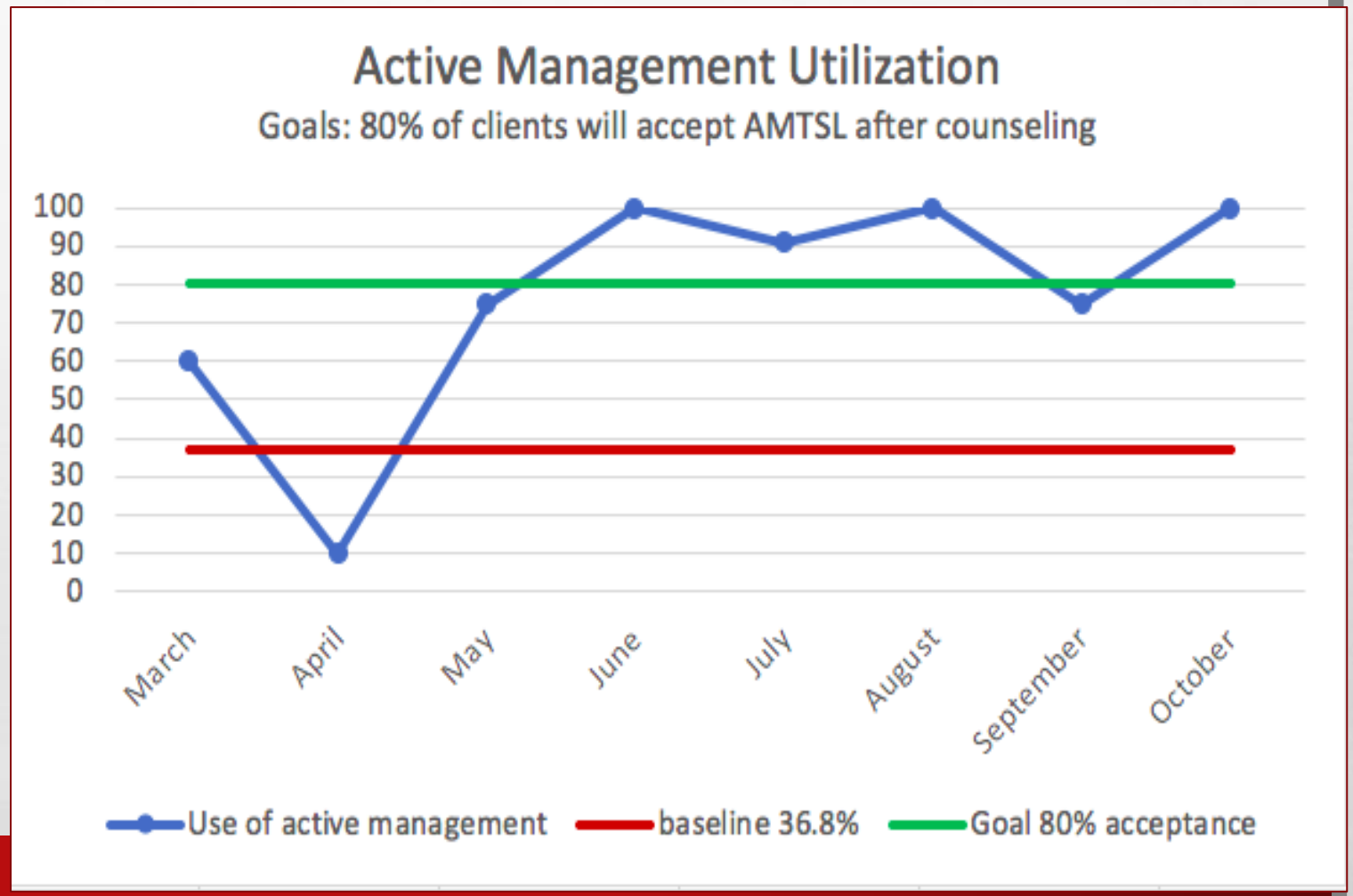
Modified PPH risk tool

Low Risk	Moderate Risk	High Risk
• < 4 previous births • No history of postpartum hemorrhage • No previous uterine surgery • Normal blood count • No known bleeding disorders	• Labor >18 hours • >2 hours of pushing • Anemia • > 4 previous births • Uterine Fibroids • Large baby (>4kg) • Previous uterine surgery • Rapid birth (< 3 hours) • Family history of postpartum hemorrhage (1st degree relative)	• Personal history postpartum hemorrhage • Known bleeding disorder • Low lying placenta • 2 or more moderate risk factors

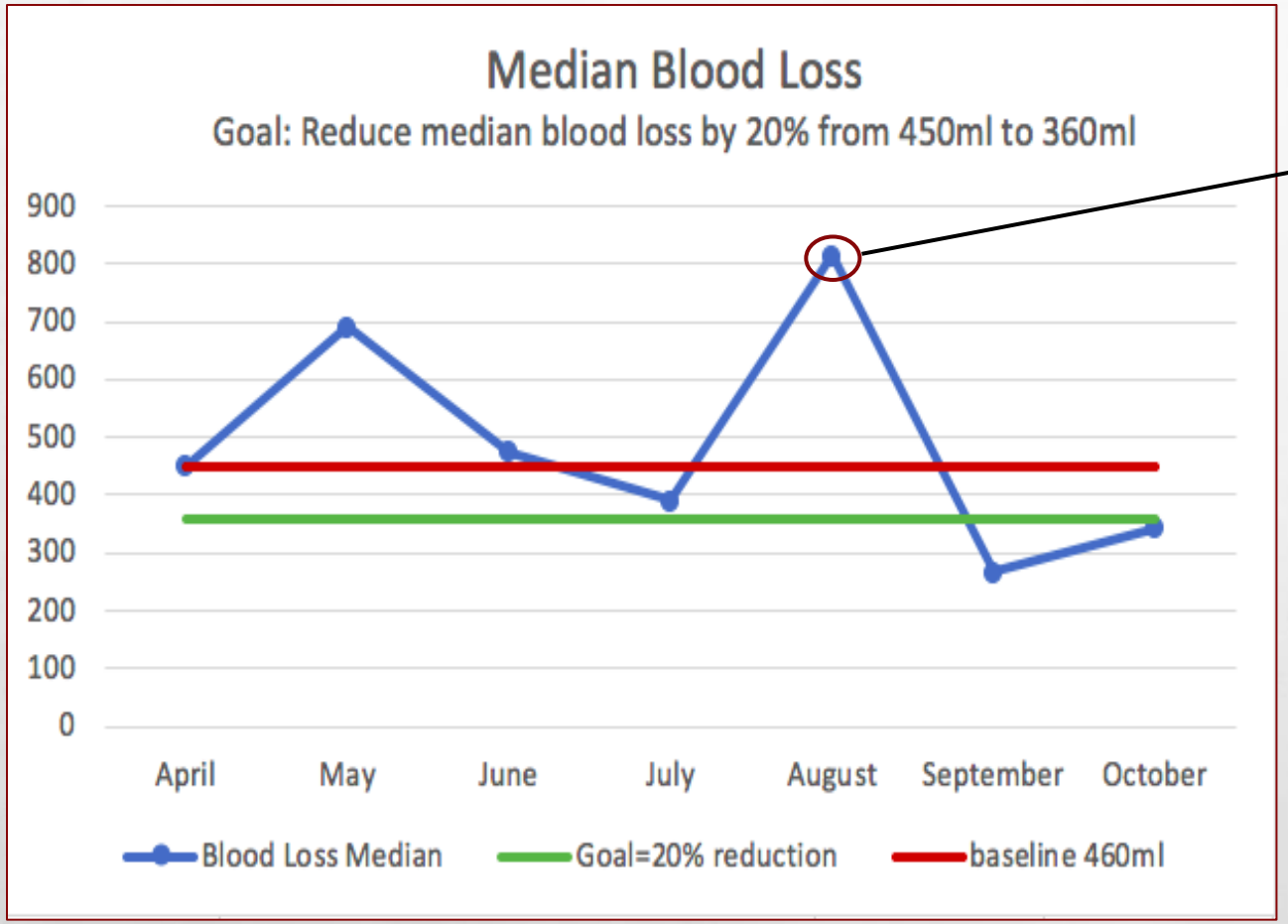
Wu,et al, 2015; AWHONN, 2015

PDSA 2: ACTIVE MANAGEMENT OUTCOMES

- 100% of clients received postpartum hemorrhage prevention education
- Overall client acceptance for active management was 88.2%
  - (3/34 declined, 1/34 missing data)
- Clients declining classified as low PPH risk during prenatal counseling
- All clients who were classified as high PPH risk received active management



PDSA 3: IMPROVING RISK ASSESSMENT



Why did blood loss spike?!

- All August births had mod/high PPH risk
- In chart review, actual PPH risk at time of birth did not match the prenatal PPH risk

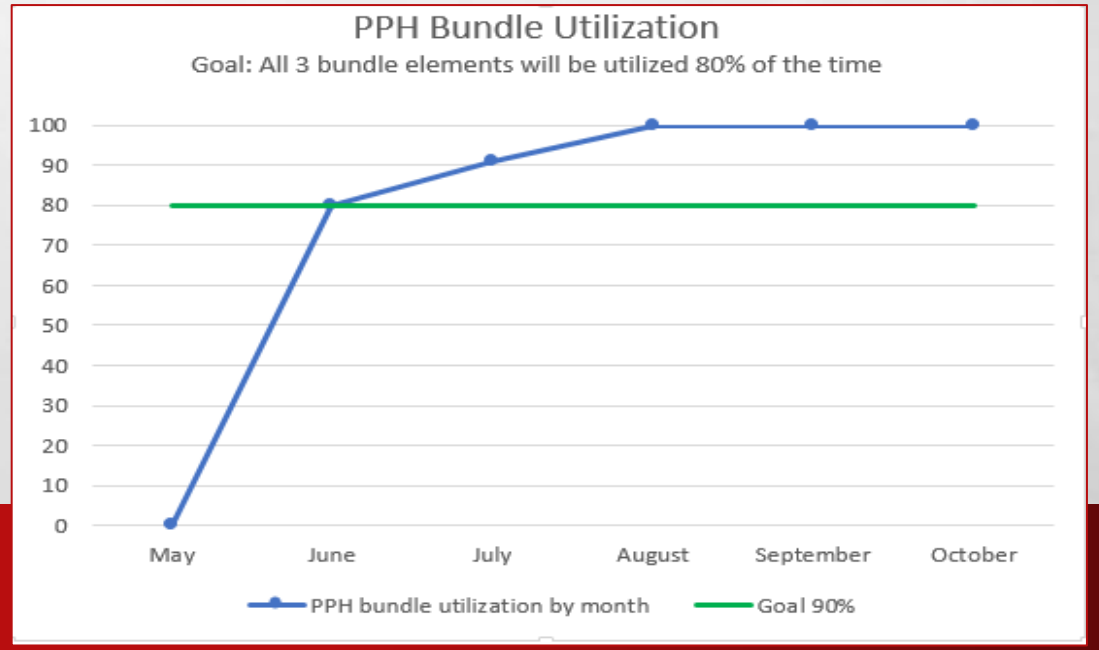
PDSA 3: IMPROVING RISK ASSESSMENT

- PPH risk added to EMR templates

✓ Prenatal PPH risk aids in client decision making

✓ True capture of the PPH risk in real time aids in provider decision making

75% of birth notes had PPH risk documented following updates



RESULTS

Month	*Mar	*Apr	May	June	July	Aug	Sept	Overall
Total Births:	10	9	4	5	11	6	8	53
Land	80%	66.67%	100%	80%	73%	100%	75%	79%
Water	20%	33.33%	0%	20%	27%	0%	25%	21%
Avg. Blood Loss at 4 Hours	355mL (EBL)	569mL	736mL	572mL	426mL	637mL	269mL	569ml -> 528ml
Median Blood Loss at 4 Hours	300mL (EBL)	450mL	786mL	475mL	390mL	814mL	250mL	450ml -> 432ml
EBL Use	100%	12%	25%	0%	0%	0%	0%	100% to 0%
QBL Use	0%	88%	75%	100%	100%	100%	100%	0% to 100%
AMTSL Use	60%	11%	75%	100%	90.9%	100%	75%	36.8% -> 88.2%
PPH Rate	0%	11% (1)	0%	0%	0%	0%	0%	1.8%
Avg. PP Pain with Pitocin	2.2/10	0/10	3/10	1.4/10	0.6/10	0.5/10	0/10	0.9/10
Avg. PP Pain without Pitocin	1.3/10	1.4/10	4/10	___	4/10	___	1/10	1.4/10

ANOVA: Blood Loss/Risk Category/Active vs. Expectant Management

Coded Values:

Intervention:
0 = no intervention
1= intervention

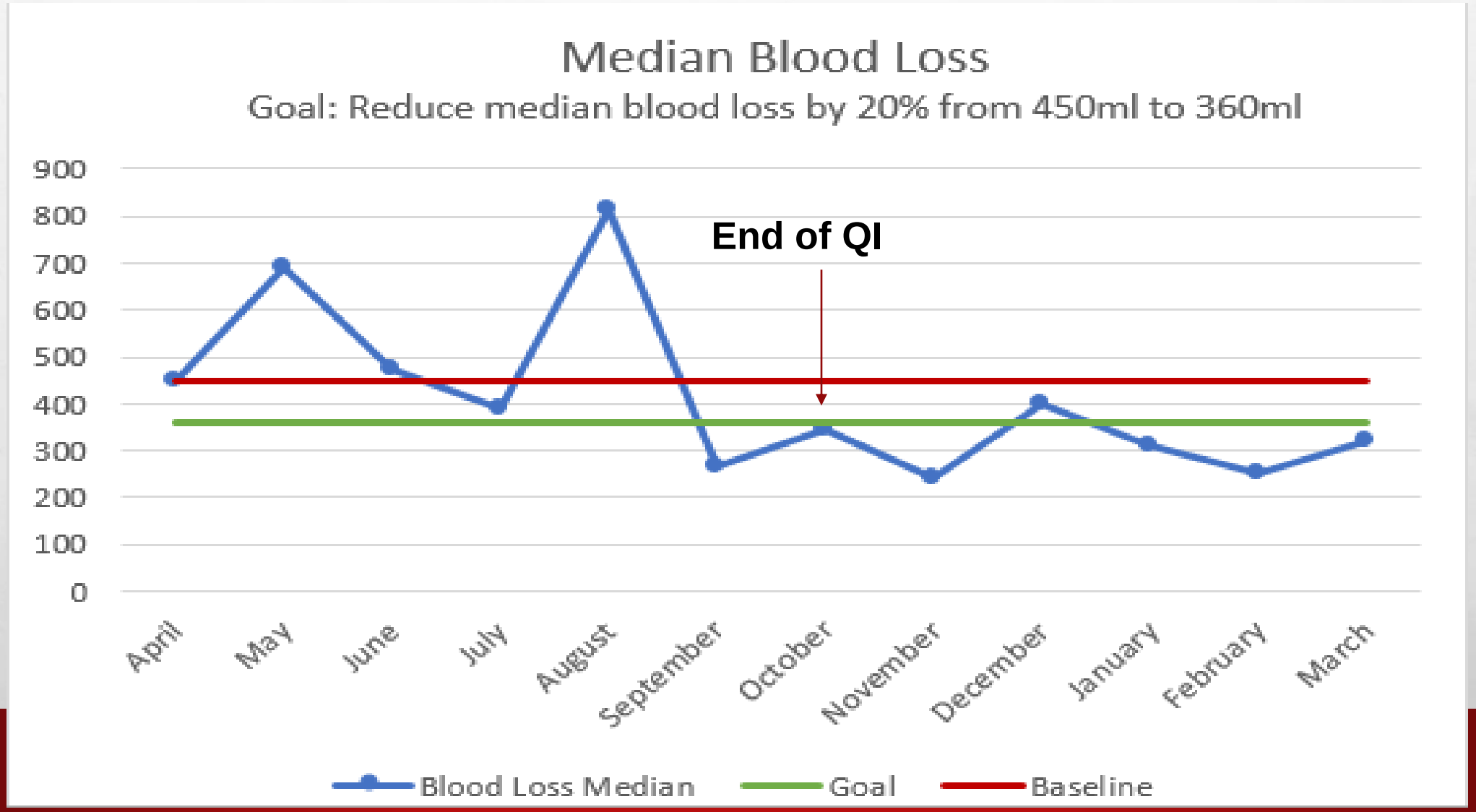
Risk:
0 = low risk
1 = moderate/high risk

Regression equation: Blood loss = 453.71 – 44.45*(intervention) + 142.07*(risk)

Variable	Estimate	Std. Error	P-Value
Intercept	453.72	112.38	0.000245
Intervention (1)	-44.45	117.28	0.706715
Risk (1)	142.07	106.08	0.188246

Blood Loss Regression Model	Low Risk	Mod/High Risk
Active Management	409.27 ml (95% CI, 239-580)	551.43 ml (95% CI, 390-713)
Expectant Management	453.72 ml (95% CI, 226-681)	595.79 (95% CI, 368-823)

QI RESULTS: BLOOD LOSS



QI RESULTS: BLOOD LOSS

1 year of data

3/2019-3/2020

Blood Loss Regression Model	Low Risk	Mod/High Risk
Active Management	289 ml (95% CI: 229.1681, 365.7478)	353 ml (95% CI: 272.9605, 457.3637)
Expectant Management	410 ml (95% CI: 282.8009, 593.0116)	500 ml (95% CI: 332.3544, 751.5675)

IMPLEMENTING A PPH BUNDLE

- ✓ SETTING
- ✓ TEAM
- ✓ TIME

QUANTITATIVE BLOOD LOSS

Setting

- Tools

Team

- Team buy in
- Training
- Designating roles

Time

- Training
- Time frame of QBL

CHALLENGES: QBL

- **CONTAMINATION** ✓ Layering chucks pads, place calibrated drape after birth
- **KEEPING TOOLS UPDATED** ✓ designate a QBL tool champion
- **TEAM CONSISTENCY** ✓ establish a routine/roles, sent out reminders, gather feedback

PPH RISK ASSESSMENT

Setting

- Population

Team

- Designating roles
- Communication
- Documentation

Time

- When to assess
- Time commitment

Low Risk	Moderate Risk	High Risk
• < 4 previous births • No history of postpartum hemorrhage • No previous uterine surgery • Normal blood count • No known bleeding disorders	• Labor >18 hours • >2 hours of pushing • Anemia • > 4 previous births • Uterine Fibroids • Large baby (>4kg) • Previous uterine surgery • Rapid birth (< 3 hours) • Family history of postpartum hemorrhage (1st degree relative)	• Personal history postpartum hemorrhage • Known bleeding disorder • Low lying placenta • 2 or more moderate risk factors

***modified CMQCC tool**

CHALLENGES: RISK ASSESSMENT

- **MAKING RISK ASSESSMENT USEFUL**
  - ✓ prenatal AND intrapartum assessment, establish consistent process
- **DOCUMENTATION**
  - ✓ EMR prompts, smart phrases, include IT rep on QI team

ACTIVE MANAGEMENT

Setting

- Population
- Resources

Team

- Training
- Consistency
- Communication
- Documentation

Time

- Education clients
- Staff training
- When to administer
- Getting new supplies

CHALLENGES: ACTIVE MANAGEMENT

- **CULTURE SHIFT**
  - ✓ thorough team training
  - ✓ robust prenatal client education
  - ✓ stick to the process
- **INSTITUTION**
  - ✓ include all stakeholders in change ideas
  - ✓ provide evidence

✓ patience & persistence

ACTIVE MANAGEMENT EDUCATION IDEAS

Talking Points

Desired Outcome

AMTSL vs treatment of abnormal bleeding

Evidence

process

unknowns

Limitations of prenatal PPH risk assessment

SHARED DECISION MAKING

Evidence Based Birth

“A small qualitative study found that pregnant people are often given little or no information from their care providers about their options for birthing the placenta (Reed et al. 2019). When care providers did offer information, it tended to reflect their own preferences…”

(Dekker & Bertone,2020)

SHARED DECISION MAKING

ACNM (2017)

"Research is lacking regarding the potential effect of synthetic oxytocin administration, particularly as part of the AMTSL, on maternal endogenous oxytocin, mother-infant bonding, and breastfeeding initiation. It is the responsibility of midwives and other maternity care providers to discuss the benefits and potential risks of AMTSL with women so that they can make informed decisions regarding labor and birth."

ACTIVE MANAGEMENT EDUCATION IDEAS

- Classes
- Informed consent
- 3rd trimester ROB apt
- Written handout

SUMMARY

- ESTABLISHING A PPH PREVENTION PLAN ALIGNS WITH EVIDENCE-BASED PRACTICE
- A VALIDATED PPH PREVENTION PER THE CMQCC INCLUDES PPH RISK ASSESSMENT, AMTSL AND QBL ASSESSMENT
- SHARED DECISION MAKING SHOULD BE USED IN ANY PPH PREVENTION PLAN

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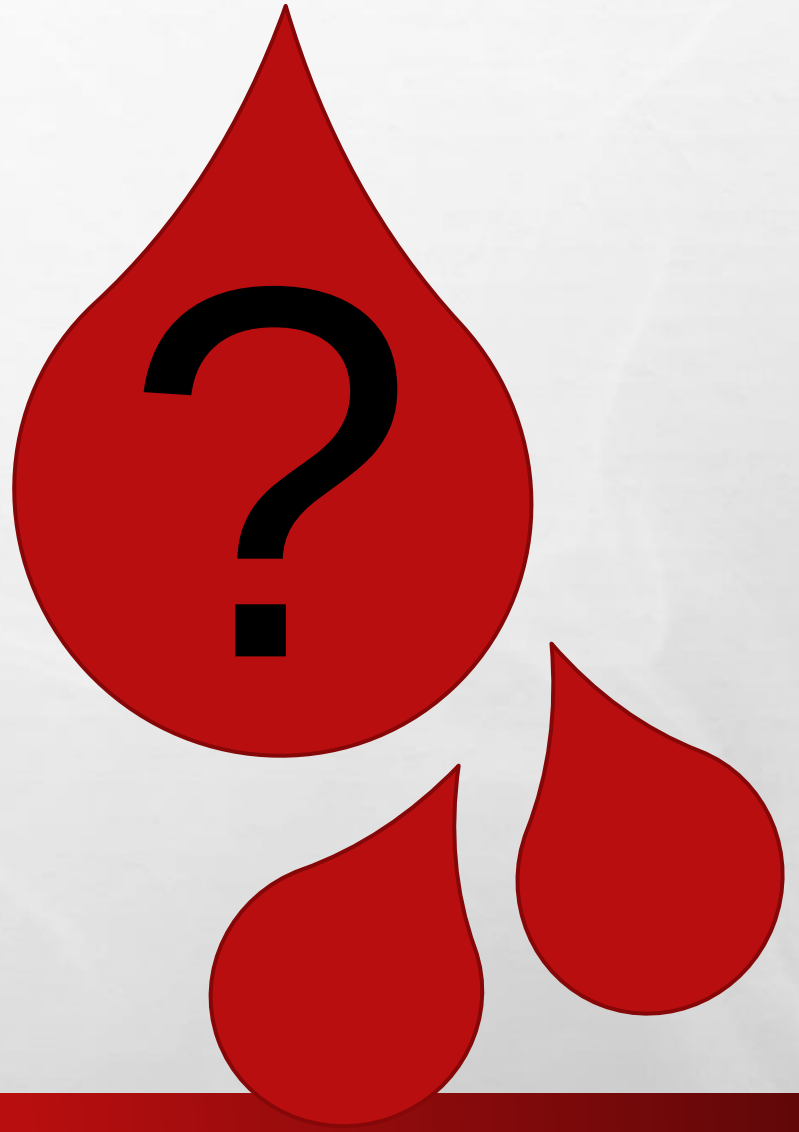
QUESTIONS



betsyarreguin@gmail.com