Scripted Obstetrical Hemorrhage Simulation highlighting Quantitative and Cumulative Blood Loss techniques

FPQC OHI 2.0 Mid-Initiative Meeting

22 April 2026

Objectives

01	Demonstrate Communication of Pre-Birth Risk Assessment
02	Describe QBL communication at key intraoperative times: after delivery of the baby, after closure of the uterine incision and/or Scarpa's fascia, after skin closure and after placement of the surgical dressing
03	Initiate escalating interventions for progressive, ongoing hemorrhage
04	Calculate ongoing cumulative QBL in the immediate PP Phase and upon admission to the postpartum unit

Glossary

• AMTSL	• Active management third stage of labor
• Alert phrase	• "Ob CAT" is an alert phrase that recruits additional personnel to the operating room and includes the nursing supervisor, critical care medicine specialist, anesthesiologist (if not already present), and advanced gyn surgeon (if available)
• EtCO2	• End-tidal carbon dioxide
• EFM	• Electronic Fetal Monitor
• MSAF	• Meconium—stained amniotic fluid
• Safe-phrase	• "Anesthesia, please increase your IV fluids" (communication phrase to indicate anticipated, intraoperative hemorrhage)

- Narrator (Narr) John Caravello, MD
- Patient (Pat) Maria Boyd, RN
- Surgical Technician Heather Finley, RN
- Support person (SP) Leomar White, MPH
- CRNA/Anesthesia (CRNA) Kimberly Fryer, MD
- Circulating RN (PCN) Margie Boyer, RN
- Surgeon (Ob) Vanessa Hux, MD
- Charge RN (LRN) Samantha Rooney, RN
- Doula Catherine Eppes, MD

Clinical history for Ms. Susan Jones

- 40-year-old African American person, G2 P1001, who presents for **induction of labor**
- Secondary infertility. Conception occurred after in vitro fertilization producing a **dichorionic, diamniotic twin gestation** (cephalic presentation times two)
- Past medical history is notable for:
  - Asthma, controlled with daily fluticasone propionate/salmeterol and as needed albuterol metered dose inhaler
  - Iron deficiency **anemia** due to pregnancy
  - No self-reported allergies
  - A—positive blood type
- Group B Streptococcus screen at 35 weeks' gestation is negative

Admission Vital Signs

Blood pressure 116/75 mmHg

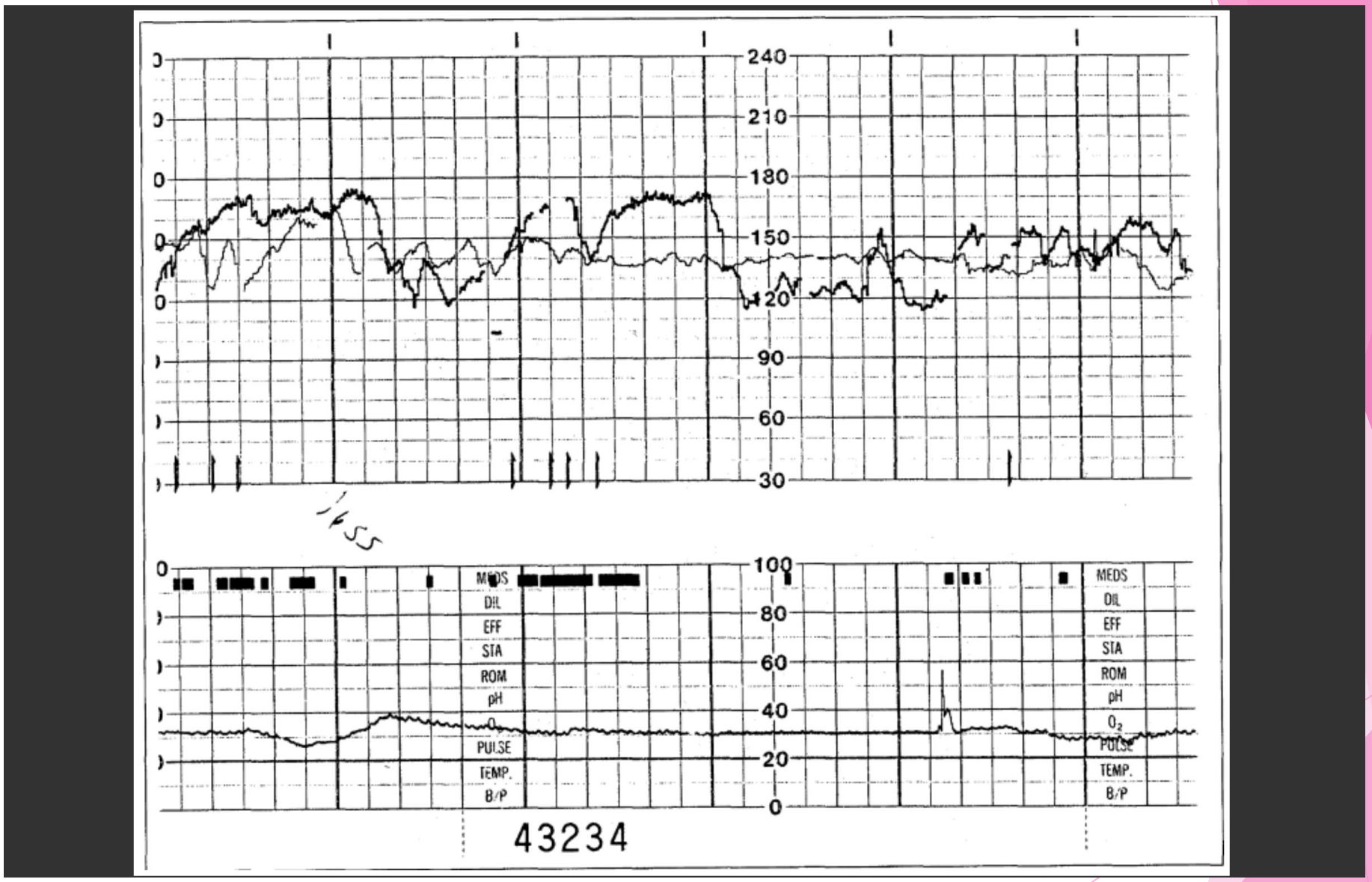
Pulse 82

Respirations 20 with SpO2 98% on room air

Maternal Temperature 36.8°C

EFM category 1 for both babies

External uterine tocodynamometry shows irregular contractions



Deborah J Eganhouse.*JOGNN* (1992); 21(1): 17—27

Intrapartum course

Admission labs:

Hemoglobin 10.1 grams per deciliter

Platelet count 106,000

Type and cross for 2 Units packed red blood cells ordered

Bishops score 10 [3 cm dilation/80% effacement /(-2) station, soft consistency, posterior position]

Low-dose Pitocin protocol started

Intrapartum course continued

- Pain management: continuous labor epidural placed at 5 cm dilation
- Persistent, severe range blood pressures observed
  - PROMPT, acute management IV labetalol started per protocol with satisfactory response
  - **IV magnesium sulfate** started per protocol
- Repeat CBC shows no significant change
- Complete metabolic panel shows normal BUN, normal serum creatinine, and serum transaminase levels 1.5 to 2 times the upper normal limit
- Random urine protein to creatinine ratio measures 0.47

Intrapartum course continued

Acute chorioamnionitis

- Blood pressure 142/95 mmHg
- Pulse 102
- Respirations 24 with SpO2 98% on room air
- Maternal temperature 38.4°C

Labor progress

- EFM: 170 baseline times two, moderate variability times two, and variable heart rate decelerations (not significant)
- Uterine contractions are irregular
- Cervical exam: 7 cm, 100% effacement, (-1) station with SROM revealing light meconium-stained amniotic fluid (MSAF)

Interventions performed

Maternal

Acetaminophen, 1000 mg times one dose by oral route

Ampicillin, 2 grams IV times one dose

Gentamicin, 4 mg/kg IV times one dose

Fetal

Lateral positioning

500 mL normal saline IV fluid bolus with temporary resolution of variable fetal heart rate deceleration

IUPC placed and Pitocin titrated per protocol

Pre-operative counseling

Two hours later:

- Progressive, clinically significant variable decelerations are present
- Cervical dilation remains unchanged

Primary cesarean delivery recommended

- Risk for perioperative bleeding discussed
- Ms. Jones agrees to blood transfusion, if needed

Pre-operative vital signs

Blood pressure 136/75 mmHg

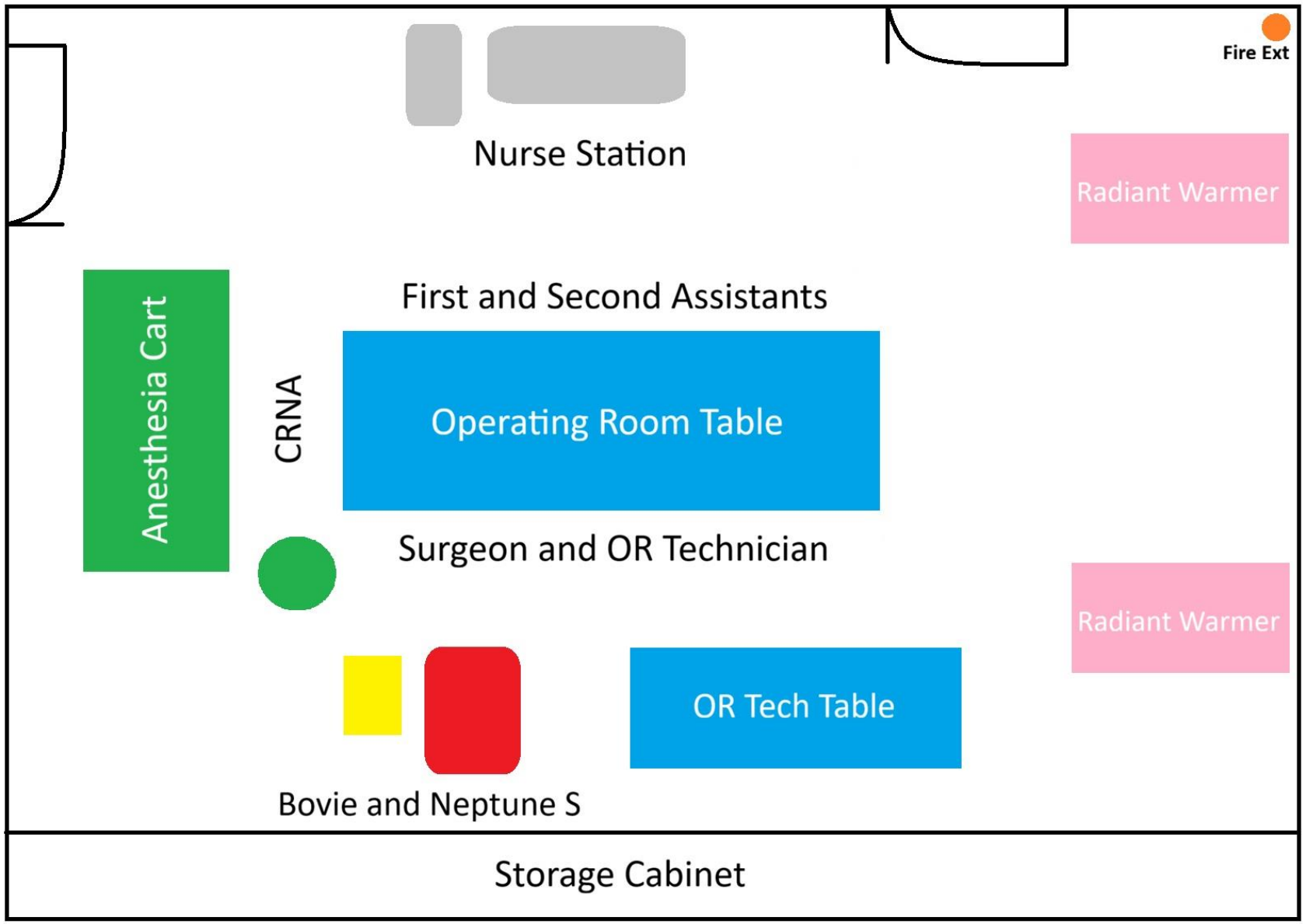
Pulse 92

Respirations 20 with SpO2 98% on room air

Maternal temperature 37.8°C

Urine output (Foley catheter) 250 mL, amber color

Intraoperative fetal heart tones measure 135 beats per minute


Fire Ext
Nurse Station
Radiant Warmer
First and Second Assistants
Anesthesia Cart
CRNA
Operating Room Table
Surgeon and OR Technician
Radiant Warmer
OR Tech Table
Bovie and Neptune S
Storage Cabinet

09:02 AM

Initial Vital Signs, 09:05 AM

Awake, alert

BP 116/65 mmHg

Pulse 92

Maternal Temperature 37.1°C

Resp 20 with SpO2 100% on 2L NC, EtCO2 40 mmHg

Hysterotomy, 09:07 AM

Ob Alert phrase

- "Anesthesia, please increase your IV fluids"

Intraoperative Vital Signs

- Awake, alert
- BP 123/75 mmHg
- Pulse 96
- Maternal Temperature 36.9°C
- Resp 24 with SpO2 100% on 2L NC, EtCO2 39 mmHg

Delivery of babies 

Twin A

- Vigorous female 0909
- 3076 grams
- Apgar scores 9^{1} and 9^{5}
- Delayed umbilical cord clamping performed

Twin B

- Vigorous male 0910
- 3274 grams
- Apgar scores 7^{1} and 8^{5}
- Delayed umbilical cord clamping performed

Third stage of labor, 09:13 AM

Intraoperative Vital Signs

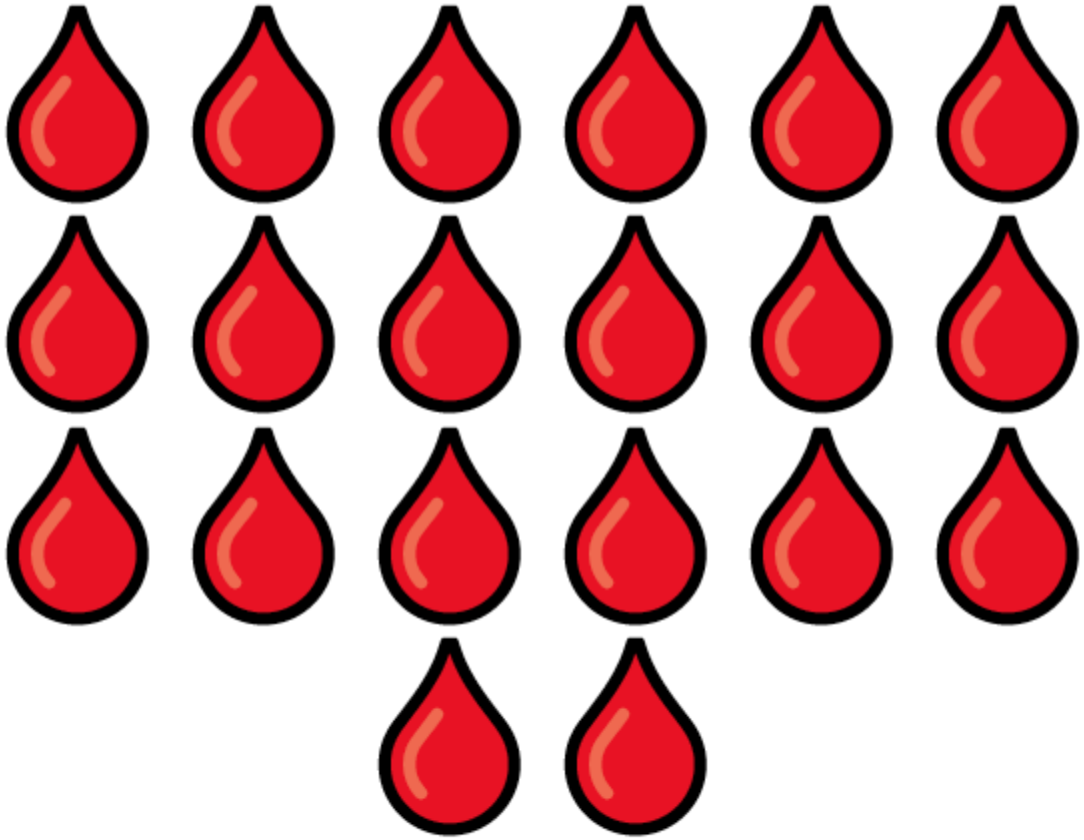
- Awake, alert
- BP 105/69 mmHg
- Pulse 85
- Maternal Temperature 37.1ºC
- Resp 24 with SpO2 98% on 2L NC, EtCO2 38

First QBL

- (a) Initial Neptune—S volume at delivery of both babies: 700 mL
- (b) Neptune—S volume zeroed after suctioned amniotic fluid
- (c) Neptune—S volume now reads **434 mL**
- **Stage 0 postpartum hemorrhage** (PPH)

Hysterotomy repair begins, 09:12 AM

- Uterine atony recognized despite AMTSL
- Medical management challenged with CUS
- Increase Pitocin to 60 Units in 500 mL minibag
- Proceed with surgical management
- Escalation of care



Intraoperative care continues, 09:19 AM

Intraoperative Vital Signs

- Lethargic, moderate distress with vomiting
- BP 85/45 mmHg
- Pulse 115
- Maternal temperature 36.7°C
- Resp 28 with SpO2 94% on 2L NC, EtCO2 24mmHg

Anesthesia prescribes phenylephrine, 250 mcg to support blood pressure

Request for second QBL

- Empiric transfusion of two units packed red blood cells ordered based upon vital sign triggers

Second Cumulative QBL Calculation

Total Neptune—S volume: 976 mL

Total laps wet weight:1045g – Dry 422g (Dry weight: 18 laps x 21g +2 sponge counters x 22g = 422g) = **623g**

QBL = 976 mL + 623 mL **(1,599 mL)**

Stage 3 PPH

Management of Stage 3 PPH, 09:19 AM

- Administer additional phenylephrine, 500 mcg by IV route
- Ordered additional 1 Unit packed red blood cells (3 total) and requested 2 Units of fresh frozen plasma
- Prescribe tranexamic acid, 1 gram over two minutes by IV route
- Escalation of care with “Ob CAT”
- Call for massive transfusion protocol
- Plan additional dose Ancef, 1 gram by IV route

Ongoing care, 09:29 AM

Intraoperative Vital Signs

- Lethargic but arousable
- BP 79/46 mmHg
- Pulse 132
- Maternal temperature 36.5°C
- Resp 30 with SpO2 95% on 4L NC, EtCO2 22 mmHg

Total phenylephrine prescribed, 700 mcg

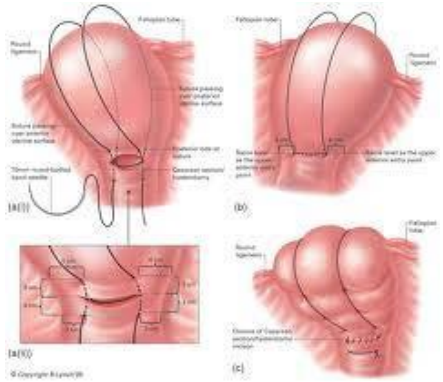
Closed loop communication for blood transfusion, IV Ancef, and TXA performed

I—STAT requested

Hysterotomy repair in progress, 09:45 AM

Bilateral uterine artery ligation

Intraoperative placement Bakri balloon



Completion of hysterotomy repair and placement of B-lynch suture

"Ob CAT" team arrives and decision was made to admit Ms. Susan Jones to step-down ICU for postoperative care

Ongoing intraoperative care

I—STAT Results

Ph7.31

Hemoglobin 8.1 g/dL

Intraoperative Vital Signs

Sedated

BP 117/67 mmHg

Pulse 105

Resp 22 with SpO2 100% on 2 L NC, Et CO2 33 mmHg

Urine output, 50 mL dark and concentrated

QBL Calculation at fascia closure, 09:56 AM

Total Neptune—S volume: 1,366 mL

Total laps: Dry weight 654g (28 X 21g + 3 x 22g)
Wet Laps: 1,236g – Dry Laps 654g = 582g

QBL = 1,366 mL + 582 mL **(1,948 mL)**

Stage 3 PPH

Closed loop communication, 09:56

1

Acknowledge almost stage 4 PPH

2

Order additional blood and prepare second MTP cooler

3

Prescribe additional TXA, 1 gram

Operation conclusion, 10:02 AM

- Awake, alert
- BP 123/76 mmHg
- Pulse 96
- Resp 21 with SpO2 99% on room air, EtCO2 38 mmHg
- Urine output 325 mL, clear
- Misoprostol, 1000 mcg given by rectal route

Final Cumulative QBL Calculation

Previous QBL: 1,948 mL

Bakri output: 50 mL

Total white chux = 181 grams – dry weight (n = 1 at 100 grams): 81 grams

QBL = 1,984 mL + 50 mL + 81g **(2,115 mL)**

Stage 4 PPH

Ongoing Cumulative QBL and patient brief, 11:25 AM

- PACU vital signs remain within baseline
- QBL 50 mL on peripad in 1.5 hours **(new cumulative QBL is 2,165 mL)**
- Gentle uterine massage shows a firm, palpable uterus just above the umbilicus
- Team debrief completed:
  - QBL ongoing was communicated
  - Identified roles clearly and had strong communication
  - Recognized rapid deterioration in the patient and requested escalating care efficiently
  - Recommended having blood available in a cooler in the operating room

Patient brief

- Describe the emergency
- Explain interventions performed during the emergency
- Discussed risk for repeat emergency in a future pregnancy
- Reviewed any potential long-term health consequences following the emergency
- Allowed time to answer patient questions and verified understanding through “teach back”

Final Cumulative QBL assessments

Prior to transfer to the mother and baby unit

Cumulative QBL shared at each clinician/shift report

Questions

References

- AWHONN Postpartum Hemorrhage Stages Algorithm V 1.4
- AWHONN PPH Risk Assessment Tool V1.3
- AWHONN QBL Process Map: www.AWHONN.org
- Jach, J. Measuring Our Way To Reduce Severe MM with QBL in Labor and Delivery in the Operating Room. OB *Nursing for Women's Health.2025; 29(3): (216-224)*