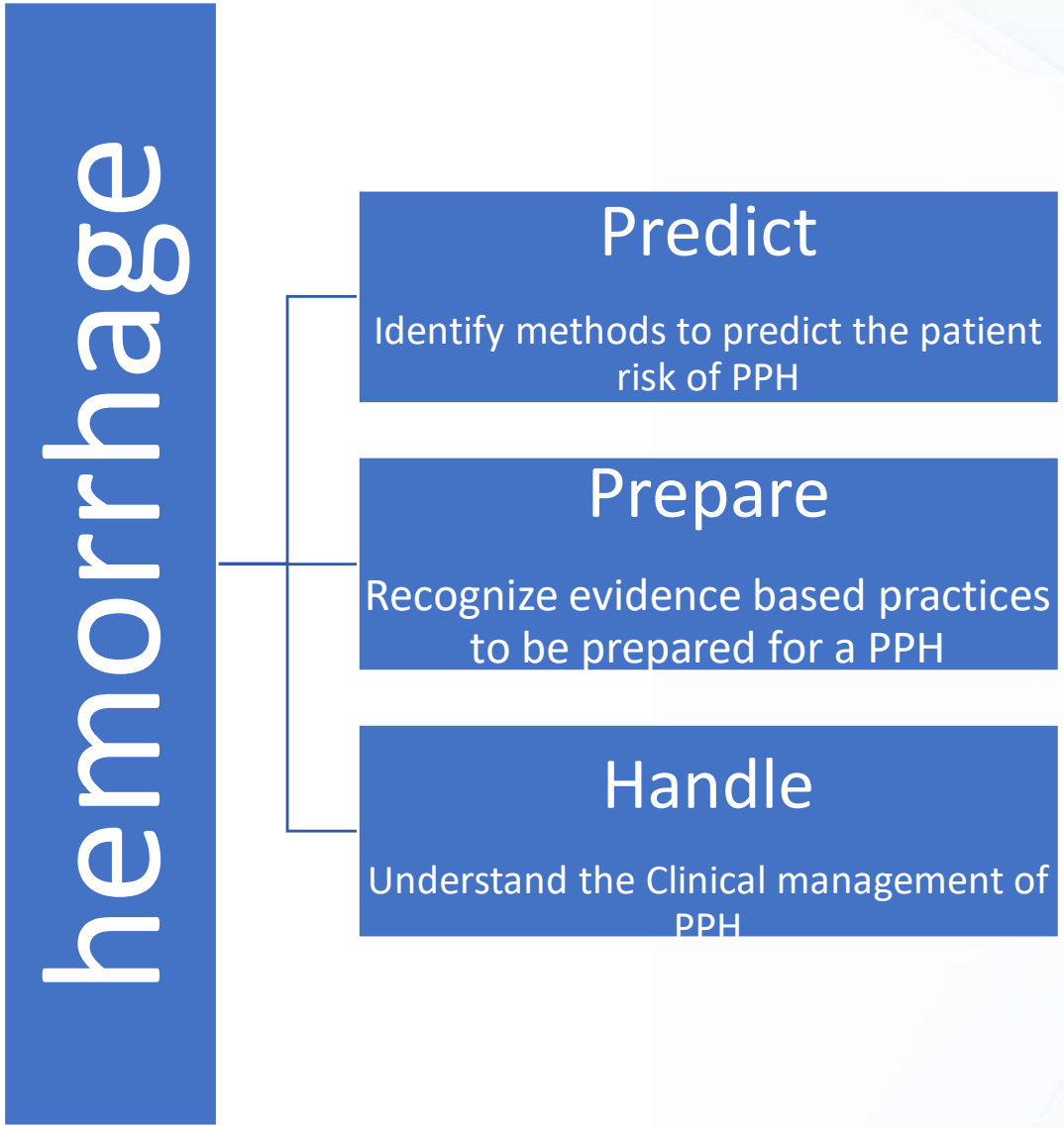
OBSTETRICAL EMERGENCIES
Hemorrhage

PPH- **P**redict-**P**repare-**H**andle

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Objectives

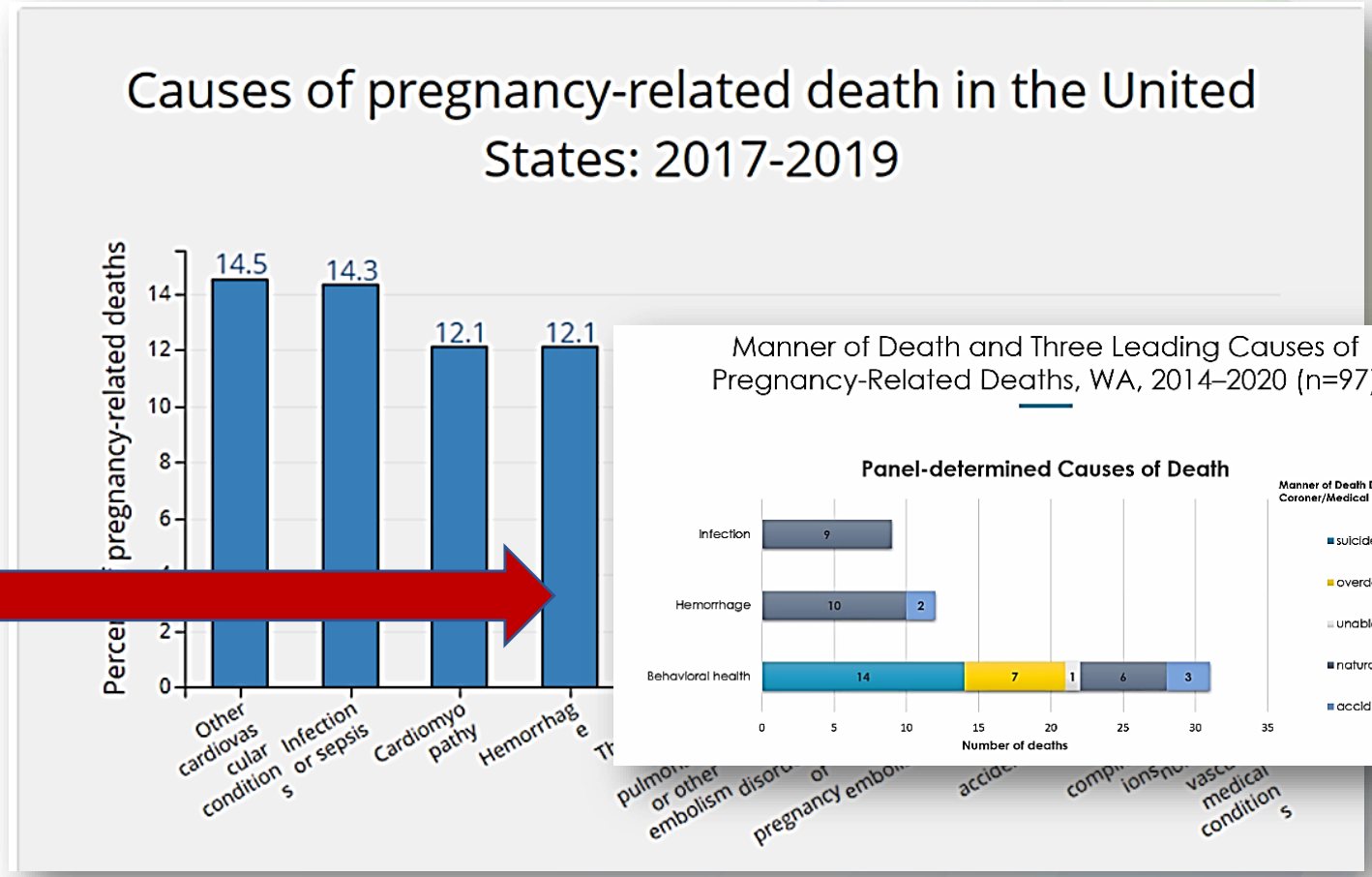


Add disclosure

The Why

- Hemorrhage is a leading and most preventable cause of severe maternal morbidity and mortality (SMM)
- 1-3%- 10% of all births
- 12.1 of pregnancy related deaths
- Rates are increasing
- Leading cause of ICU admissions
- High rate of preventability

- **Reducing the likelihood of harm related to *Maternal Hemorrhage*** is now a Joint Commission Standard of care



[Pregnancy Mortality Surveillance System | Maternal and Infant Health | CDC]

PREDICT:

Definitions:

- **Primary** or Early: 1st 24h after birth
- **Secondary** or Late: 24h to 12 weeks post birth
- > 500-1000cc
- > 10 point drop in HCT or need for blood transfusion

Organization	Definition of PPH
World Health Organization[1]	▪ Blood loss ≥500 mL within 24 hours after birth. ▪ Severe PPH: Blood loss ≥1000 mL within the same time frame.
American College of Obstetricians and Gynecologists[2]	▪ Cumulative blood loss ≥1000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process (includes intrapartum loss) regardless of route of delivery.
Royal College of Obstetricians and Gynaecologists[3]	▪ Minor PPH (500 to 1000 mL) and major PPH (>1000 mL). Subdivisions of major PPH include moderate (1001 to 2000 mL) or severe (>2000 mL).
International expert panel[4]	▪ Active bleeding >1000 mL within the 24 hours following birth that continues despite the use of initial measures, including first-line uterotonic agents and uterine massage.
Society of Obstetricians and Gynaecologists of Canada[5]	▪ Any amount of bleeding that threatens the patient's hemodynamic stability.
California Maternal Quality Care Collaborative[6]	▪ Stage 0: Every woman in labor/giving birth. ▪ Stage 1: Blood loss >500 mL after vaginal or >1000 mL after cesarean delivery; or change in vital signs >15% or heart rate ≥110 beats/minute, blood pressure ≤85/45 mmHg, O_2 saturation <95%. ▪ Stage 2: Continued bleeding with total blood loss <1500 mL. ▪ Stage 3: Total blood loss >1500 mL or >2 units packed red cells transfused; or unstable vital signs; or suspicion of disseminated intravascular coagulation.

1.References:World Health Organization. WHO recommendations for the prevention and treatment of postpartum hemorrhage. Geneva: World Health Organization; 2012.
2.American College of Obstetricians and Gynecologists. ACOG Practice Bulletin Number 183, October 2017: Postpartum hemorrhage. Obstet Gynecol 2017; 130:e168.
3.Prevention and management of postpartum haemorrhage: Green-top guideline No. 52. BJOG 2017; 124:e106.
4.Abdul-Kadir R, McLintock C, Ducloy AS, et al. Evaluation and management of postpartum hemorrhage: Cnsensus from an international expert panel. Transfusion 2014; 54:1756.
5.Leduc D, Senikas V, Lalonde AB, et al. Active management of the third stage of labour: Pevention and treatment of postpartum hemorrhage. J Obstet Gynaecol Can 2009; 31:980.
6.CMQCC. www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit (Accessed on May 17, 2017).

PREDICT: Risk Assessments

AWHONN

POSTPARTUM HEMORRHAGE (PPH) RISK ASSESSMENT TABLE • 1.1

CLINICIAN GUIDELINES:

- Each box ❑ represents ONE risk factor. Treat patients with 2 or more medium risk factors as high risk.
- Prenatal risk assessment is beyond the scope of this document, however performing a prenatal hemorrhage risk assessment and planning is highly recommended. Early identification and management preparation for patients with special considerations such as placental previa/accreta, bleeding disorder, or those who decline blood products will assist in better outcomes.
- Adjust blood bank orders based on the patient's most recent risk category. When a patient is identified to be at high risk for hemorrhage verify that the blood can be available on the unit within 30 minutes of a medical order.
- Plan appropriately for patient and facility factors that may affect how quickly the blood is delivered to the patient. For example,
  - Patient issues: Pre-existing red cell antibody
  - Facility issues: Any problems at your facility related to the blood supply and obtaining blood

RISK CATEGORY: ADMISSION

	Low Risk	Medium Risk (2 or More Medium Risk Factors Advance Patient to High Risk Status)	High
	❑ No previous uterine incision	❑ Induction of labor (with oxytocin) or Cervical ripening	❑ Has 2 or More Medium R
	❑ Singleton pregnancy	❑ Multiple gestation	❑ Active bleeding more tha
	❑ ≤4 Previous vaginal births	❑ >4 Previous vaginal births	❑ Suspected placenta accr
		❑ Prior cesarean birth or prior uterine incision	❑ Placenta previa, low lying
	❑ No known bleeding disorder	❑ Large uterine fibroids	❑ Known coagulopathy
	❑ No history of PPH	❑ History of one previous PPH	❑ History of more than one
		❑ Family history in first degree relatives who experienced PPH (known or unknown etiology with possible coagulopathy)	❑ Hematocrit <30 AND oth
		❑ Chorioamnionitis	❑ Platelets <100,000/mm3
		❑ Fetal demise	
		❑ Polyhydramnios	

Anticipatory Interventions
Monitor patient for any change in risk factors at admission and implement anticipatory interventions as indicated.

❑ Blood Bank Order: Change blood bank orders as needed if risk category changes	❑ Clot Only (Type and Hold)	❑ Obtain Type and Screen	❑ Obtain Type and Cross (
		❑ Notify appropriate personnel such as the Provider (OB MD/CNM), Anesthesia, Blood Bank, Charge Nurse, Clinical Nurse Specialist	❑ Notify appropriate person (OB MD/CNM), Anesthesi Clinical Nurse Specialist
			❑ Consider delivering at a appropriate level of care a high risk mother

Postpartum Hemorrhage (PPH) Risk Assessment Table is exemplary and does not include all possible patient complaints or conditions. The PPH Risk Ass guide clinical decision-making but does not replace clinical judgment.
To access the full 3 page Risk Assessment Tool, users may visit www.AWHONN.org and enroll in the Postpartum Hemorrhage online education course.

Appendix 2. Reprinted with permission from The AWHONN Postpartum Hemorrhage Project. Postpartum hemorrhage (PPH) risk assessment table 1.0. Available at: https PPH_Risk_Assessment_Table-7-17-15. Retrieved September 18, 2019. The authors provided this information as a supplement to their article.

CMQCC

Obstetric Hemorrhage Emergency Management Plan: Checklist Format

Revision 9/10/14

Stage 0: All Births – Prevention & Recognition of OB Hemorrhage
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

Verify Type & Antibody Screen from prenatal record
If not available,
❑ Order Type & Screen (lab will notify if 2nd specimen needed for confirmation)
If prenatal or current antibody screen positive (if not low level anti-D from Rho-GAM),
❑ Type & Crossmatch 2 units PRBCs
All other patients,
❑ Send specimen to blood bank

❑ Evaluate for ***Risk Factors*** on admission, throughout labor, and postpartum. (At every handoff)
If medium risk:
❑ Order Type & Screen
❑ Review Hemorrhage Protocol
If high risk:
❑ Order Type & Crossmatch 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

Ongoing Risk Assessment

❑ **Evaluate for development of additional risk factors in labor:**
- Prolonged 2nd Stage labor
- Prolonged oxytocin use
- Active bleeding
- Chorioamnionitis
- Magnesium sulfate treatment

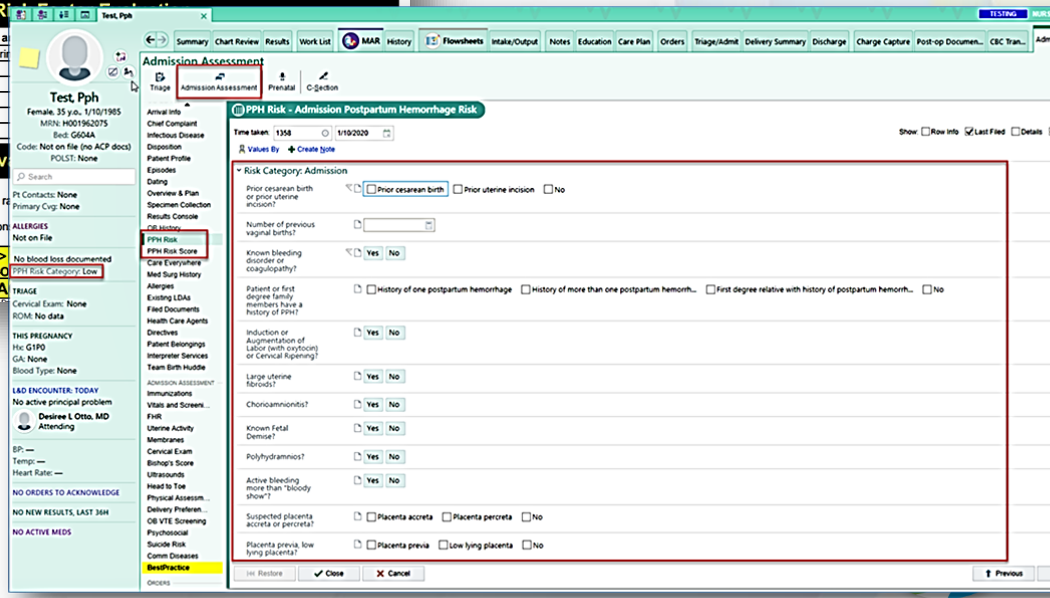
❑ **Increase Risk level** (see below) **and convert to Type & Screen or Type & Crossmatch**
❑ **Treat multiple risk factors as High Risk**
❑ **Monitor women postpartum for increased bleeding**

Admission Hemorrhage Ri

Low (Clot only)	Medium (Type a
No previous uterine incision	Prior cesarean birth(s) or uteri
Singleton pregnancy	Multiple gestation
≤ 4 previous vaginal births	> 4 previous vaginal births
No known bleeding disorder	Chorioamnionitis
No history of PPH	History of previous PPH
	Large uterine fibroids

All Births – Prophylactic Oxytocin, Quantitative Ev

Active Management of Third Stage
❑ Oxytocin infusion: 10-40 units oxytocin/1000 ml solution titrate infusion r
Ongoing Quantitative Evaluation of Blood Loss
❑ Using formal methods, such as graduated containers, visual comparison
Ongoing Evaluation of Vital Signs
If: Cumulative Blood Loss > 500ml vaginal birth or >
Vital signs > 15% change or HR ≥ 110, BP ≤ 85/45, O2 sat < 95% -O
proceed to STA



PREDICT: Identify Patients at Risk

Etiology of Postpartum Hemorrhage

Tone

Overdistention
Multiple Gestation
Polyhydramnios
Macrosomia

Uterine Fatigue
Prolonged labor
Induction/ Augmentation
Prior PPH

Chorioamnionitis
Prolonged ROM

Uterine Abnormality
Fibroids
Placenta Previa

Medication
Beta mimetics
Magnesium sulfate
Anesthetic drugs

Tissue

Accreta/Increta/Percreta
Prior Uterine Surgery
Placenta Previa
Multiparity

Retained Placenta/Membranes
Manual Placental Removal

Thrombin

Preexisting Clotting Abnormalities
History of Coagulopathy
Liver Disease

Acquired in Pregnancy
Sepsis

DIC
FDIU

HELLP
Hemorrhage

Trauma

The "4 Ts"

Laceration
Precipitous delivery
Macrosomia
Shoulder Dystocia
Operative Delivery
Episiotomy

Uterine Rupture
Prior Uterine Surgery

Uterine Inversion
Fundal Placenta
Grand Multiparity
Excessive Traction on Umbilical Cord

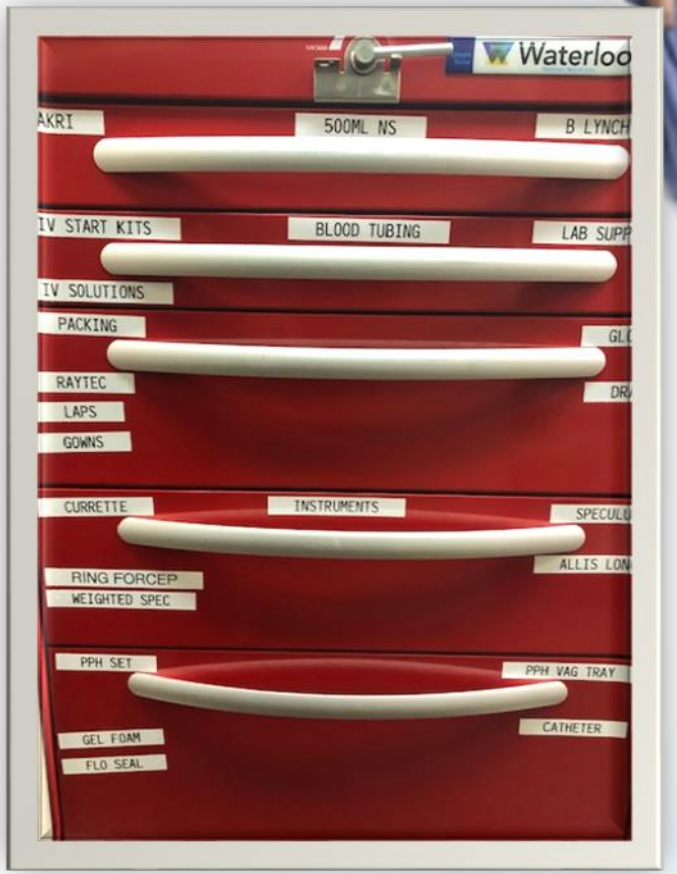
Devine (2008)

PREPARE to prevent: Active Management of the 3rd stage

- Oxytocin IVPB or IM with delivery of anterior shoulder or prior to placenta infant or placenta
- Cord clamping not delayed beyond 2 min
- Vigorous fundal massage (at least 15 sec) after placenta
- Controlled cord traction
- Saves blood loss at delivery

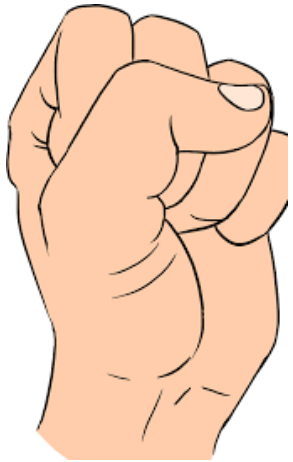
PREPARE with Risk Factors

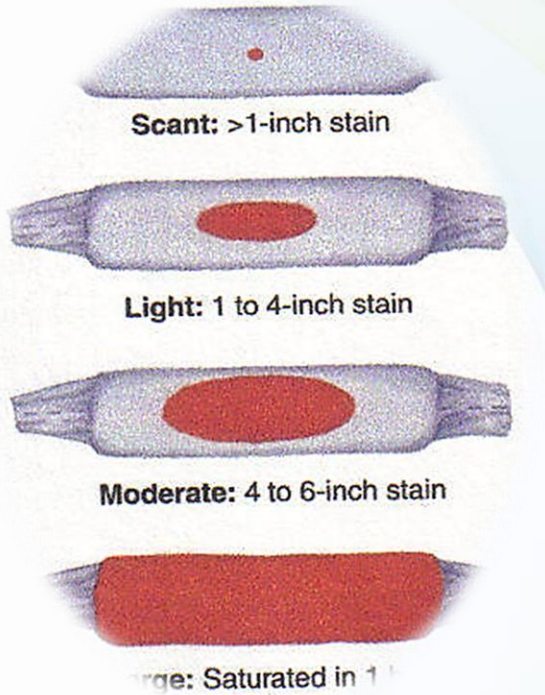
- QBL 1G=1ml
- Confirm T & S done
- Confirm status of blood availability
- 2nd IV
  - Confirm blood availability
  - Have uterotonics readily available



PREPARE: Quantify Blood Loss

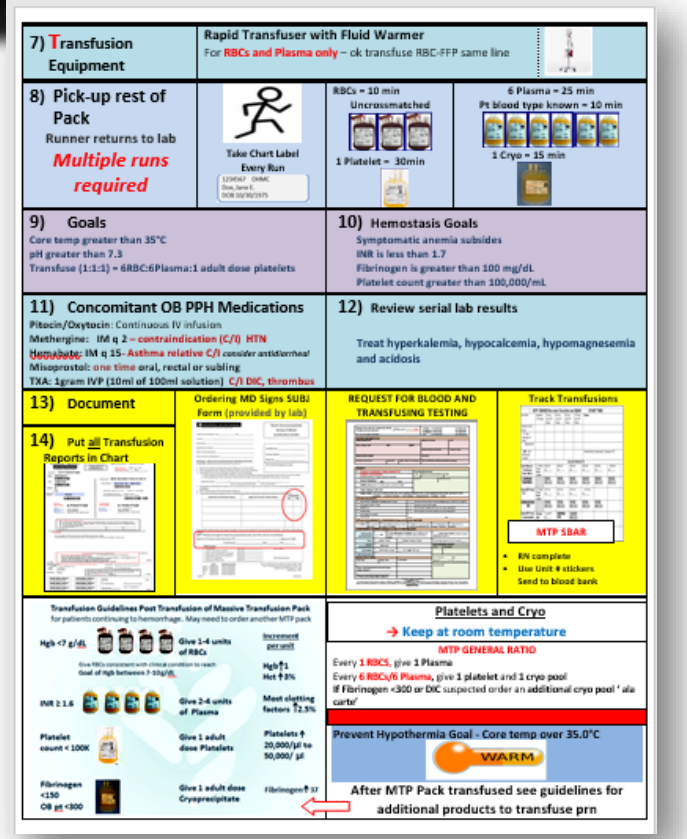
EBL vs QBL





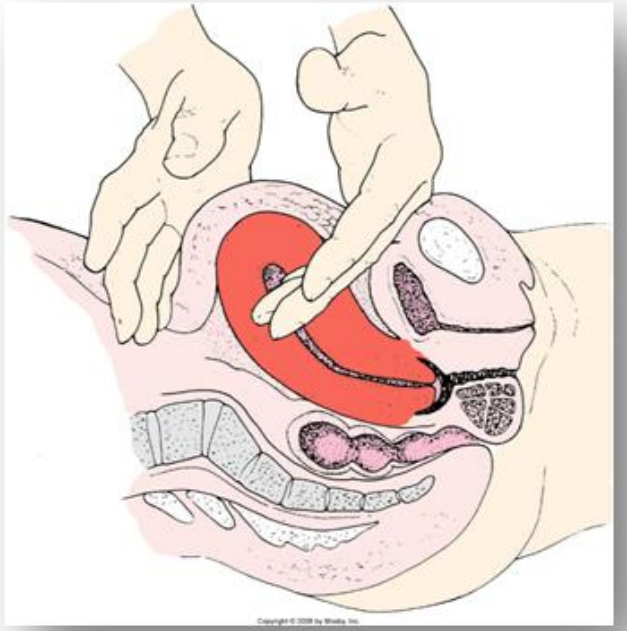
PREPARE:

- ❑ Policies and practices
- ✓ Algorithm for identification and treatment
- ✓ People- response team, roles & responsibilities
- ✓ Equipment-
- ✓ Drills



HANDLE: Clinical Management

- Don’t Deny or Delay
- Etiology-Identify and treat the cause (4 T’s)
- Control hemorrhage
- Replace fluids/blood
- Monitor closely
- Anticipate going to the OR



6…. 600…. 60….?

HANDLE: Interventions for PPH

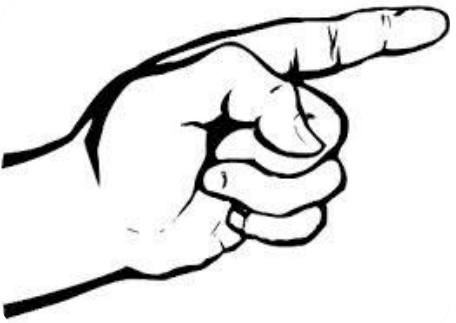
- ❑ Get help- Name the emergency
- ❑ HOB down, Fundal massage
- ❑ Record VS, O2 sat every 5 minutes
- ❑ Record QBL
- ❑ Empty bladder
- ❑ IV and 2nd IV
  - ❑ obtain labs (DIC panel) with IV start
- ❑ Increase intravenous fluid
- ❑ Increase or start oxytocin
- ❑ Medications (uterotonics and TXA)
- ❑ Confirm blood availability
  - ❑ Order 2 units RBCs if ongoing bleeding
- ❑ I & O: hourly urine output
- ❑ Maintain adequate ventilation
- ❑ Keep warm

DRUG	AMOUNT/ROUTE	RATE	CONTRAINDICATIONS
Oxytocin **(Pitocin)** **First- line agent**	30 units in 500 mL **IV** fluid or 10 units **IM** (if no IV access)	125-999 ml/hr on pump (wide open if hemorrhage) Titrate to uterine tone	Potential fluid overload at total dose exceeding 80 units. **DO NOT ADMINISTER IV push**
Methergine **(Methylergonovine)** **Second-line agent**	0.2 mg (200mcg) **IM** Deltoid preferred route	Every 2-4 hours, up to 5 doses: *If bleeding continues after one dose, move immediately to next agent*	Contraindicated with HTN disorders including preeclampsia due to potential for sudden hypertension and CVA. **DO NOT ADMINISTER IV**
Hemabate **(Carboprost)** **Third-line agent** *OR second-line agent after oxytocin if methergine is contraindicated*	250 micrograms **IM** or intramyometrial	Every 15-90 minutes, up to 8 doses: *If bleeding continues after third dose, move immediately to next intervention*	Asthma is relative contraindication **DO NOT ADMINISTER IV** Combine (LOMOTIL) tablet 1-2 tab PO Q6H PRN Diarrhea, x24 hours to cover prostaglandin-related diarrhea
Misoprostol **(Cytotec)** *Alternate to hemabate if contraindicated.* *If bleeding continues after one dose, move immediately to next intervention.*	Tablet(s) 800 mcg **SL** (rapid action) 800-1000 mcg **Rectally Do Not Use Lubricant** (delayed absorption)	X1 dose *If bleeding continues after one dose, move immediately to next intervention.*	**No contraindication**- use only if Hemabate is contraindicated **Side effects:** Fever and Rigors Works most effectively when used with other medications listed in this table (synergistic action).
Tranexamic acid **(TXA)**	1 gram **IVP** Ideally within 3h of hemorrhage	Infused over 10 minutes, up to 2 doses *If bleeding persists after 30 minutes may be repeated with provider order*	Renal Failure, DIC, Subarachnoid Hemorrhage, Thrombus **Caution:** do not mix with blood, heparin or give through line with blood or solutions containing penicillin or ampicillin

HANDLE: Close Monitoring

Hypotension is a LATE sign

Estimated Blood Loss (ml)	Heart Rate	Systolic Blood Pressure	Respiratory Rate	Signs and Symptoms
1000	Normal	Slight ↓	Normal	Palpitations, dizziness Normal urine output
1500	Over 100	Narrowed pulse pressure	20-30	Diaphoresis, Weakness Urine output 20-30 ml/hr
2000	Over 120	Narrowed pulse pressure	30-40 SOB	Restlessness, Pallor, Cool extremities Urine output 5-15 ml/hr
>2500	Over 140	Profound hypotension	Over 40	Anuria, Altered consciousness

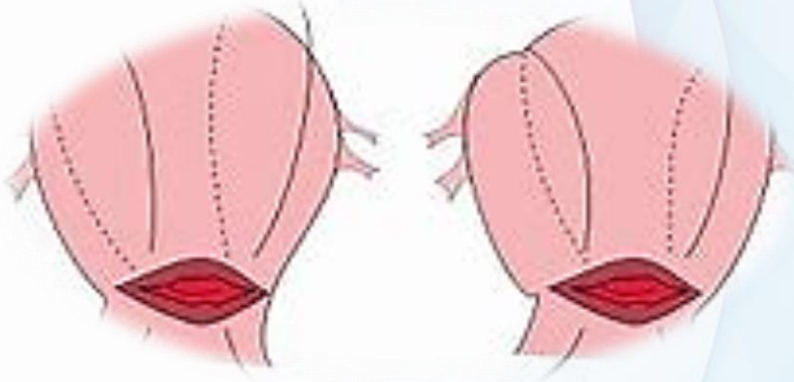


HANDLE: To the OR

- If uterotonics and bedside interventions do not control the bleeding-
- **Move to the OR**
  - Consider D&C, intrauterine balloon, or other surgical intervention
  - Labs – CBC and coag studies repeat every 30 minutes with ongoing bleeding
  - Repeat hemabate as often as every 15 mins
  - Order blood products- transfuse as clinically indicated

HANDLE: Treatment Options

- If **retained placenta** :D&C
- If **trauma**: visualize and repair
- If uterine **atony:** tamponade balloon, Jada, packing
- If needed, move to **interventional radiology, hysterectomy**
- If **C/S**: b-lynch suture, uterine artery ligation, tamponade balloon
- **If vital signs are worse than estimated or measured blood loss:** possible uterine rupture or broad ligament tear with internal bleeding; **move to laparotomy**



HANDLE

Be vigilant in appreciating:

- PPH RISK Assessment
- HR > 110
- QBL > 1000
- Blood Pressure ≤85/45 (>15% drop)
- Oxygen Saturation <95%
- Trust your gut
- Don't wait for labs to transfuse

"The clinical symptoms of blood loss (low blood pressure, fast pulse, pallor and sweating, signs of hypovolemia and impeding shock) are often the primary indicators for intervention. However, relying on the onset of such symptoms may lead to delayed intervention, resulting in increased morbidity and mortality."

B.S. Kodkany and R.J. Derman. Pitfalls in Assessing Blood Loss and Decision to Transfer

HANDLE: Transfusion Considerations

Correction of tissue hypo perfusion

- Volume replacement with crystalloid

Correction of hypothermia

- Use blood warmer
- Use patient warming device

Correction of anemia/coagulopathy

- Assess labs & signs/symptoms
- Labs may lag behind clinical signs
- Transfuse platelets and FFP as well as PRBCs

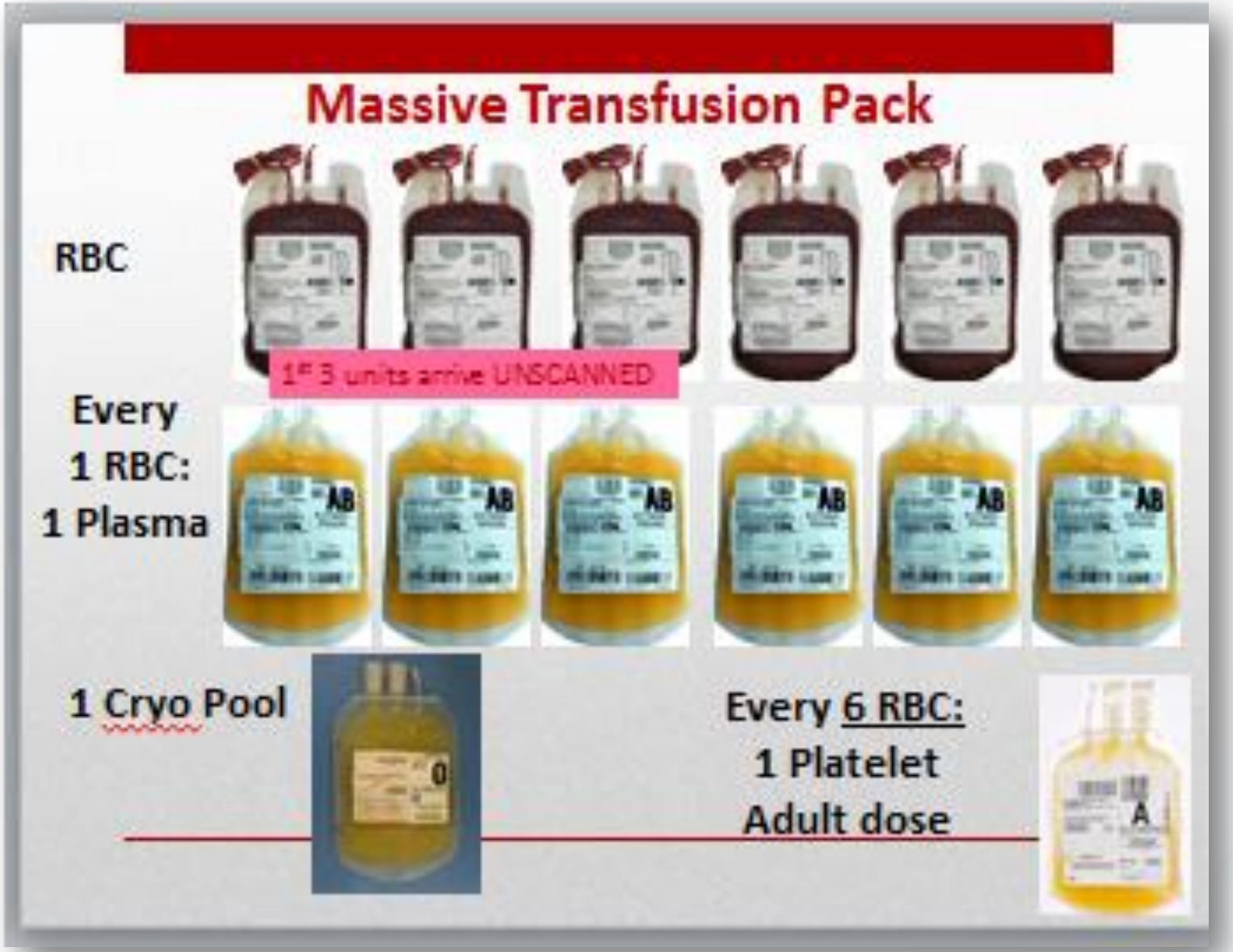
Blood products

Packed Red Blood Cells (PRBC)	**Best first line product for blood loss** 1 unit typically increases Hbg 1 g/dL If antibody positive, may take 1-24 hours for cross match
Plasma (FFP)	**Active bleeding or risk of bleeding due to coagulation factor deficiency.** After the first two units of PRBC's, early transfusion with plasma is correlated with improved survival from hemorrhage after trauma Highly desired if > 2 units PRBCs given Expect corrected aPTT, PT and INR Approx. 10-20 mins to thaw
Cryoprecipitate (CRYO)	**Priority for women with Fibrinogen levels < 100** Use for DIC with low fibrinogen and don't need volume replacement Caution: 1 pool contains 5 units, each from a separate donor. Infection risk is proportionate to the number of donors. Patient typically receives 1-2 pools. Approx. 10-20 mins to thaw
Platelets (PLTS)	**Priority for women with Platelets < 50,000, with ongoing bleeding** Apheresis unit provides 10,000-60,000/uL increase in platelets

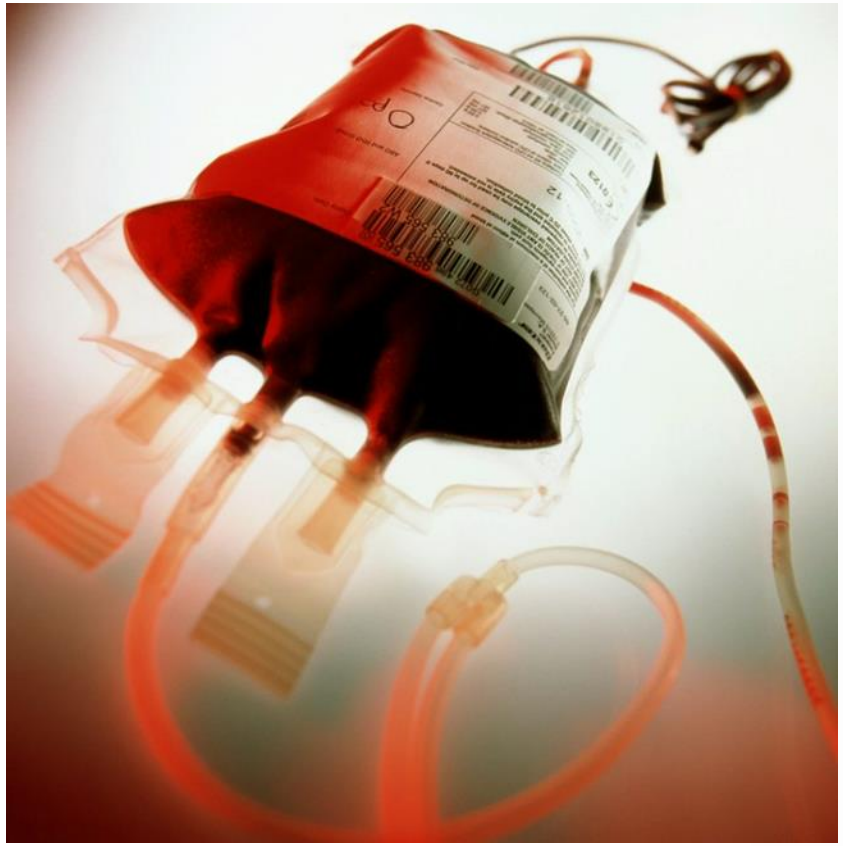
Blood Products

Product	Uses/Effect
Red Blood Cells (1 unit= About 350 mL)	1 unit increases: Hematocrit by 3 percentage points Hemoglobin by 1 g/dL
Fresh Frozen Plasma (1 unit = 200 to 300 mL)	1 unit FFP increases fibrinogen by 7 to 10 mg/dL
Cryoprecipitate (1 unit= 10 to 20 mL, dose is 2 bags of 5 pooled units/ bag) 100-200 ml total	1 unit -Increases plasma fibrinogen by about 45 mg/dL
Adult Standard Platelets (1 unit= 200 to 300 mL)	1 Adult standard dose of platelets raises platelet count by about 30,000/microL

HANDLE: Typical MTP pack



MTP Products



Disseminated intravascular Coagulation:
Thrombohemorrhagic disorder with concurrent activation of the coagulation and fibrinolytic pathways, resulting in simultaneous fibrin clot formation and lysis

Debrief

Important but often missed following an untoward event

- What went well
- Opportunities
- Barriers
- System issues
- Action Items: *based on lessons learned to alter the plan next time*
- Risk Management?

Complications of PPH

- Blood Component transfusion reactions/complications
- Acute Renal Injury/kidney failure
- Anemia
- Fluid overload (pulmonary edema, dilutional coagulopathy)
- Sepsis
- Sherman's Syndrome (intrauterine scaring/adhesions)
- Infertility
- PTSD
- Death

Knowledge check

The 4 “T’s of PPH are:

A. Trauma
B. Toxins
C. Torsion
D. Tissue
E. Tears
F. Thrombin
G. Tone

Knowledge Check

The normal blood flow through the placental site each minute is 600-800 mls per minute.

A. True

B. False

References

American College of Obstetricians and Gynecologists. (2006). ACOG Practice Bulletin: Clinical management guidelines for obstetrician-gynecologists, Number 76. Postpartum Hemorrhage

AWHONN (2014). Quantification of blood loss: AWHONN Practice Brief Number 1

Belfort, M. (2023) Overview of postpartum Hemorrhage. UpToDate

Birch, L., Jones, N., Doyle, P. M., Green, P., Mclaughlin, A., Champney, C.,… Taylor, K. (2007). Obstetric skills drills: evaluation of teaching methods. *Nurse education today, 27*(8), 915-922.

California Maternal Quality Care Collaborative (2022). OB Hemorrhage toolkit

Committee on Practice Bulletins-Obstetrics. Practice Bulletin No. 183: Postpartum Hemorrhage. Obstet Gynecol 2017; 130:e168.

CMQCC (2015). Cumulative Quantitative Assessment of Blood Loss version 2.0

Council on Patient Safety (2019). Obstetric Hemorrhage (+AIM). https://safehealthcareforeverywoman.org/patient-safety-bundles/obstetric-hemorrhage/

Devine, P.C. (2009). Obstetric hemorrhage. *Semin perinatol, 33,* 76-81.

Friedman, A.M., Campbell, M.L., Kline, C.R., Wiesner, S., D'Alton, L.E. & Shields,L. E. (2018). Implementing obstetric early warning systems. American Journal of Perinatology, 8, e79-84

Jeffries, p. R., Bambini, D., Hensel, D., Moorman, M., & Washburn, J. (2009). Constructing maternal-child learning experiences using clinical simulations. *JOGNN: journal of obstetric, gynecologic & neonatal nursing, 38*(5), 613-623.

Joint Commission (2019). R^3 Report. Requirement, Rationale, Reference. Provision of care, treatment and service standards for maternal safety. Issue 24.

Joint commission on accreditation of healthcare organizations. (2010). *Preventing maternal death.* (Sentinel event alert issue #44).

Main, E. Et al. National Partnership on Maternal Safety- Concensus bundle on obstetric hemorrhage

Main, E.K., McCain, C.L., Morton, C.H., Hotlby, S & Lawton, E.S. (2015). Pregnancy-related mortality in California: Causes, characteristics and improvement opportunities. *Obstetrics and Gynecology*, 125. 938-47

Lagrew D, McNulty J, Sakowski C, Cape V, McCormick E, Morton CH (2022). Improving Health Care Response to Obstetric Hemorrhage, a California Maternal Quality Care Collaborative Toolkit, 2022.

Oyelese, y. & Ananth, C.V. (2010). Postpartum hemorrhage: epidemiology, risk factors, and causes. *Obstet gynecol, 53(1),* 147-156.

Robertson, B., Schumacher, L., Gosman, G., Kanfer, R., Kelley, M., & Devita, M. (2009). Simulation-based crisis team training for multidisciplinary obstetric providers. *Simulation in healthcare: the journal of the society for simulation in healthcare, 4* (2), 77-83.

Shields. L.E. , Wiesner, S., Klein, C.,, Pelletreau, B. & Hedriana, H.L.(2016) Use of maternal early warning trigger tool reduces maternal morbidity. *Journal of Obstetrics and Gynecology*

WOMAN Trial Collaborators (2017). Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum hemorrhage (WOMAN): an international, randomized, double-blind, placebo-controlled trial. Lancet

World Health Organization (WHO): Department of making pregnancy safer. (2009). *WHO recommendations for the prevention of postpartum hemorrhage*.

Shoulder Dystocia

OBSTETRICAL EMERGENCIES

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PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Objectives

- Identify known and recognize limitations of risk factors for shoulder dystocia
- Standardize the team approach to this emergency
  - What to do
  - What not to do
- Know the important information to be recorded in the medical record after a shoulder dystocia

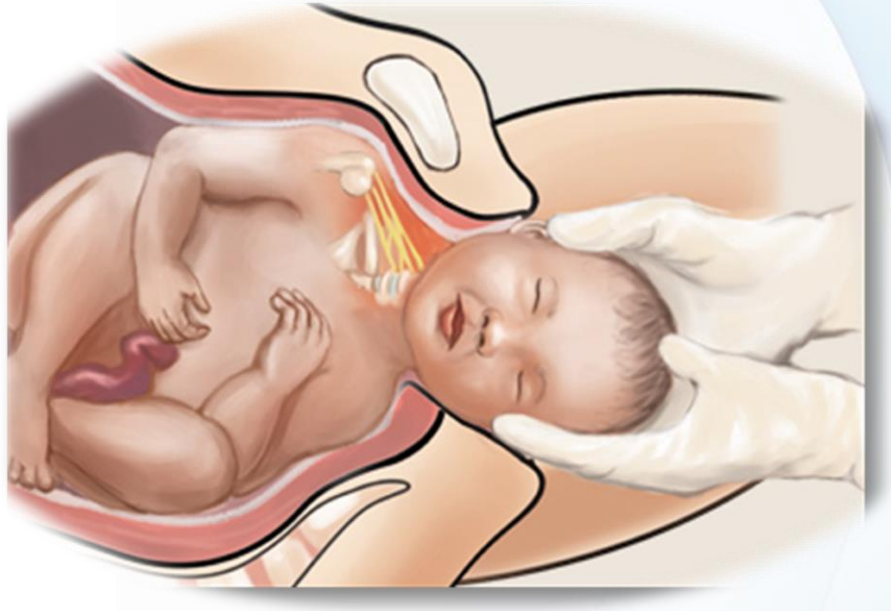
Definition

Definition : Shoulder dystocia is defined as failure of the shoulders to spontaneously traverse the pelvis after delivery of the fetal head.

"A delivery that requires additional obstetric maneuvers following failure of gentle downward traction on the fetal head to effect delivery of the shoulders"

Shoulders enter the pelvis in an anterior-posterior position rather than oblique

- Anterior shoulder is behind the public bone
- Fetal brachial plexus nerves stretch



ACOG Practice bulletin 2002 (reaffirmed in 2013) definition of "shoulder dystocia"

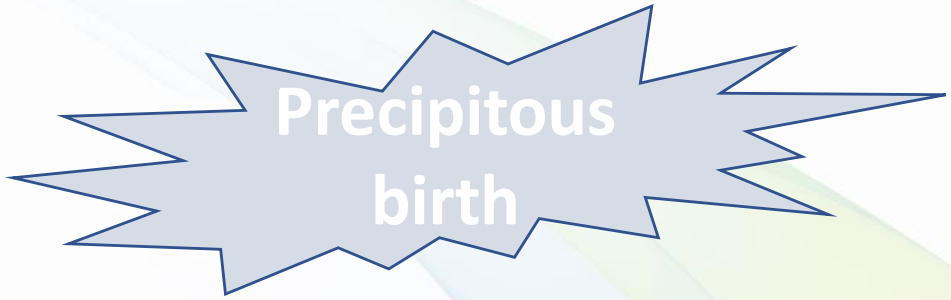
Risk Factors

- TRUTH: Shoulder Dystocia cannot be accurately predicted or prevented

- Although many cases are unanticipated, we can heighten our readiness and response
  - Promptly recognize when gentle traction alone is inadequate for delivery
  - Proceed through an orderly sequence of maneuvers

Risk Factors

- Birth weight: > 4000gm
- Diabetes
- Previous SD- recurrence 10%
- Maternal Obesity, increased weight gain
- Abnormal progress of labor
- Post term
- OVD



Incidence of shoulder dystocia by birth weight in pregnancies with and without maternal diabetes

Birth weight (g)	Shoulder dystocia in nondiabetic pregnancies (%)	Shoulder dystocia in diabetic pregnancies (%)
Less than 4000	0.1 to 1.1	0.6 to 3.7
4000 to 4499	1.1 to 10.0	4.9 to 23.1
4500 or more	2.7 to 22.6	20.0 to 50.0

https://www.uptodate.com/

Delivery Decision? Shared Decision Making

- Planned Cesarean?
  - Hx of prior SD with
    - Hx of severe neonatal injury
    - EFW > 4500 (diabetes- 15% risk) or 5000 grams (w/o diabetes- < 20% risk)
- Trial of labor?
  - Multip w/o hx of difficult birth
  - Spontaneous labor at 39 weeks
  - EFW < 4000gm
- Prolonged Second stage and > EFW

At least 50 percent of pregnancies complicated by shoulder dystocia have no identifiable risk factors and most risk factors are weakly predictive of morbidity from shoulder dystocia

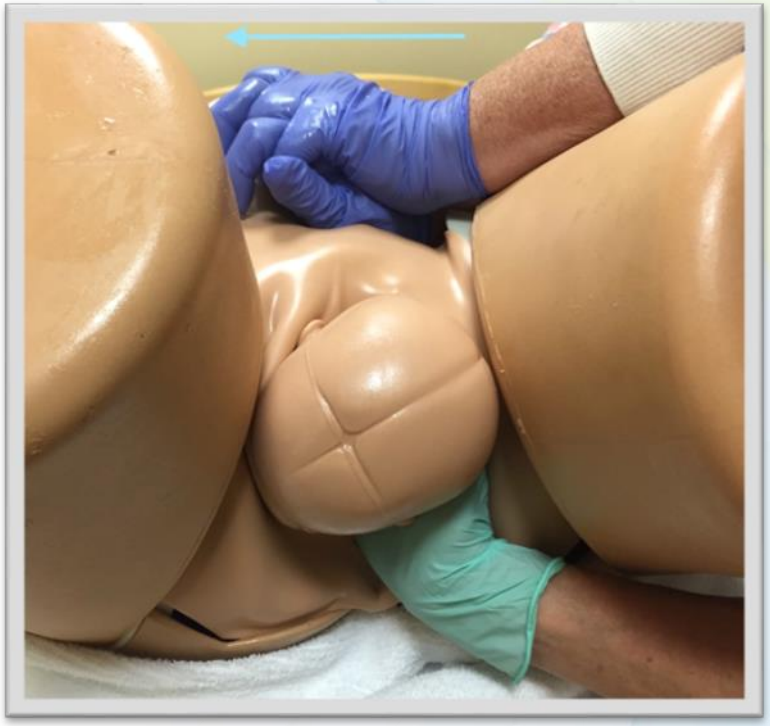
Response

Quick Identification

- Call for help

Prompt Interventions:

- DISCOURAGE PUSHING- Coach breathing
- Maneuvers
  - **McRoberts** –tilts the pelvis
  - **Suprapubic Pressure-** External rotation
  - **Posterior arm-** sweeps posterior arm across chest to rotate anterior shoulder backward
  - **Rubin-**adducts shoulders
  - Wood's screw-rotates shoulders anteriorly
  - **Gaskin –**all fours
  - **Zavenelli**



"To the window, to the wall"

KEY POINT

NO PUSHING & NO PROVIDER DOWNWARD GUIDANCE UNTIL DYSTOCIA IS RESOLVED ACOG Practice Bulletin 178 May 2017

Documentation

- Delivery of head
- Delivery of Shoulders
- Sequence of maneuvers
- Pushing discouraged
- No fundal Pressure
- All staff present
  - The team called and when they arrived
  - NICU/Neo/RT
  - Hospitalist
  - Anesthesia
  - Additional Help (supervisor)
- FHR

Documentation Management after the Delivery

Obtain Cord gases

Inform pediatric provider

Document fully

Discuss with parents

Documentation debrief

- Maternal complications
  - Cervical/vaginal/perineal lacerations
  - Hematoma
  - Separation of symphysis
  - PPH
  - Endometritis
  - Birth trauma
- Newborn exam
  - Fracture of clavicle/humerus
  - Disruption/evulsion of nerve roots
  - Increased intracranial pressure

Knowledge Check

What part of the baby is given suprapubic pressure?

A. Anterior aspect of posterior arm
B. Anterior aspect of anterior arm
C. Posterior aspect of anterior arm
D. Posterior aspect of posterior arm
E. Clavical

Knowledge Check

- How many shoulder dystocia cases are not predicted

A. 30%

B. 40%

C. 50 %

D. 60%

E. Who Knows?

References

ACOG Practice Bulletin, Shoulder Dystocia, Number 40, (2014)

ACOG, Neonatal brachial plexus palsy task force report (July 2013)

Committee on Practice Bulletins—Obstetrics. Practice Bulletin No 178: Shoulder Dystocia. Obstet Gynecol 2017; 129:e123. Reaffirmed 2019.

Joint Commission on Accreditation of Healthcare Organizations. www.jcaho.org

Rodis, J.F. (2023). Shoulder dystocia: Intrapartum diagnosis, management and outcome

Barbieri, R.(2013),.The natural history of obstetric brachial plexus injury. *OBG Management* Clark et al.(2008) Reducing Obstetric Litigation Through Alterations in Practice Patterns. *Obstetrics & Gynecology, 6*, 112

Grobman, W., Hornbogen, A., Burke, C., Costello, R.(2010) Development and implementation of a team-centered shoulder dystocia protocol. Simulation in Healthcare, Hoffman et al.(2011) A comparison of obstetric maneuvers for the acute management of shoulder dystocia, *Obstetrics & Gynecology,* 117, 6

Sepsis

OBSTETRICAL EMERGENCIES

AWHONN
PROMOTING THE HEALTH OF WOMEN AND NEWBORNS

Objectives

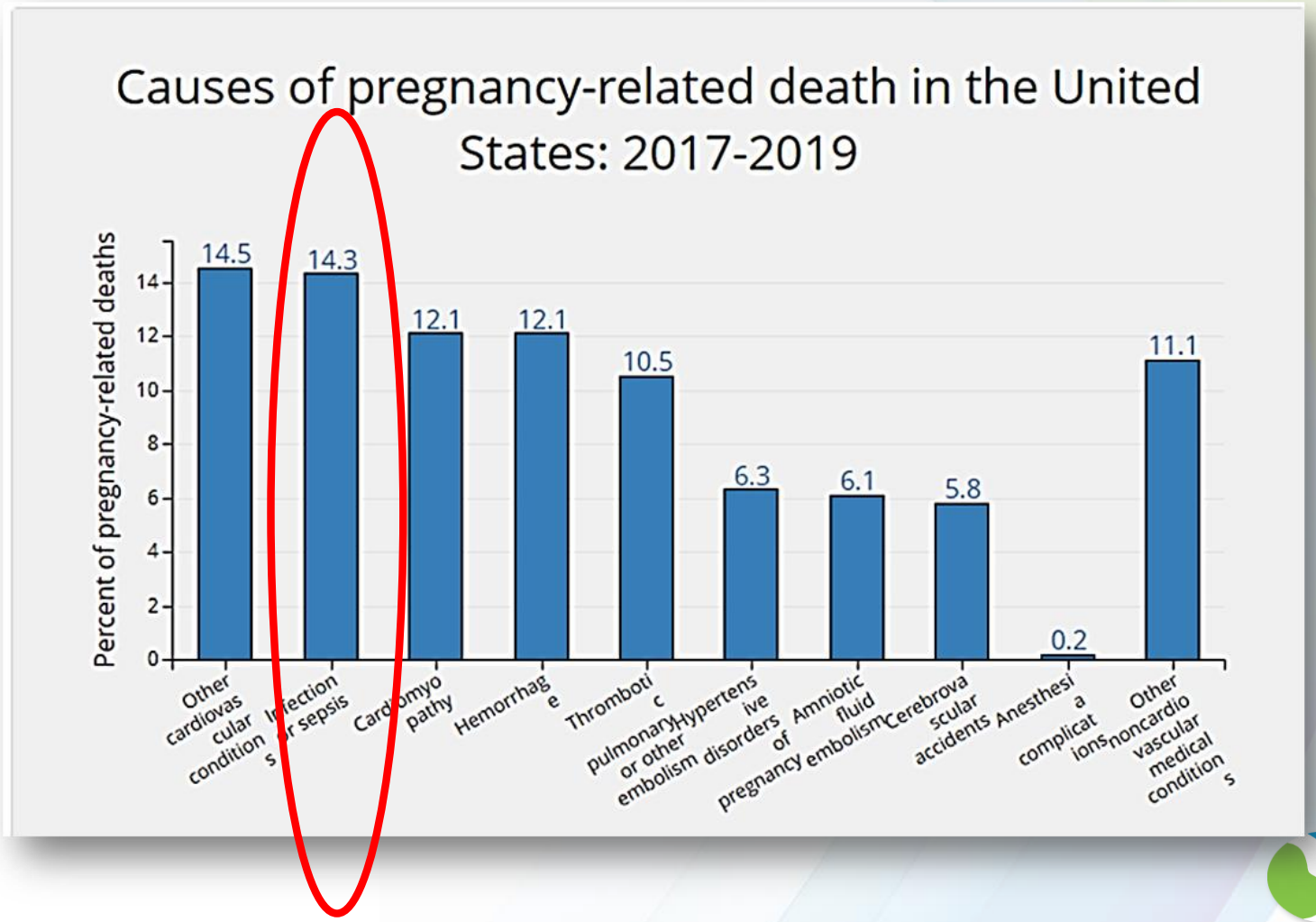
- Recognize rational for including the OB population into standard sepsis quality improvement work
- Name three sepsis considerations that are unique to perinatal population

QUESTION

How many of you have adopted OB Sepsis protocol at your organization ?

Did you know?

- Maternal sepsis causes at least 261,000 maternal deaths every year worldwide.
- A recent analysis found that 23% of all maternal deaths in the U.S. are related to sepsis.
- According the CDC, 14.3% pregnancy related deaths between 2017-2019 were due to infection/sepsis.
- Infection/sepsis is the 2nd leading cause of pregnancy related death
- Black women have more than twice the risk of severe maternal sepsis as compared to their white counterparts



Did you know?

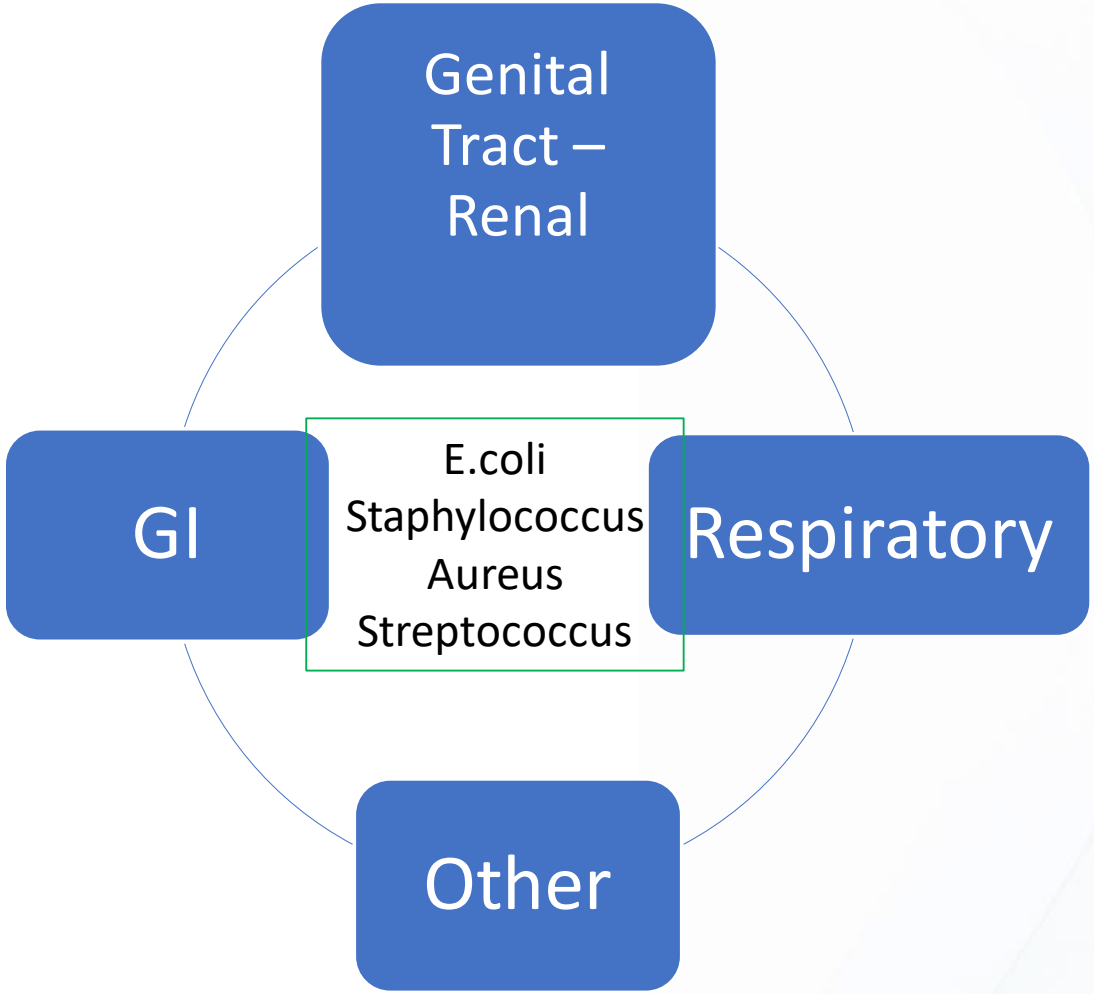
- Maternal sepsis causes at least 261,000 maternal deaths every year worldwide.
- A recent analysis found that 23% of all maternal deaths in the U.S. are related to sepsis.
- According the CDC, 12.5% pregnancy related deaths between 2011-2018 were due to infection/sepsis.
- Infection/sepsis is the 2nd leading cause of pregnancy related death
- Black women have more than twice the risk of severe maternal sepsis as compared to their white counterparts

Increasing Trend

- Advancing maternal age Obesity
- Diabetes
- Cesarean Birth
- ART
- Multiple Gestation
- Long labor

Pathogens and Sources

Genital/Renal:
- Intraamniotic infection (Chorio)
- Endometritis
- Wound Infection
- C/S Birth



Respiratory:
- Pneumonia
- TB

GI:
- Ruptured Appendix
- Cholecystitis

Other:
Mastitis
Septic pelvic thrombophlebitis
Necrotizing Fascitis

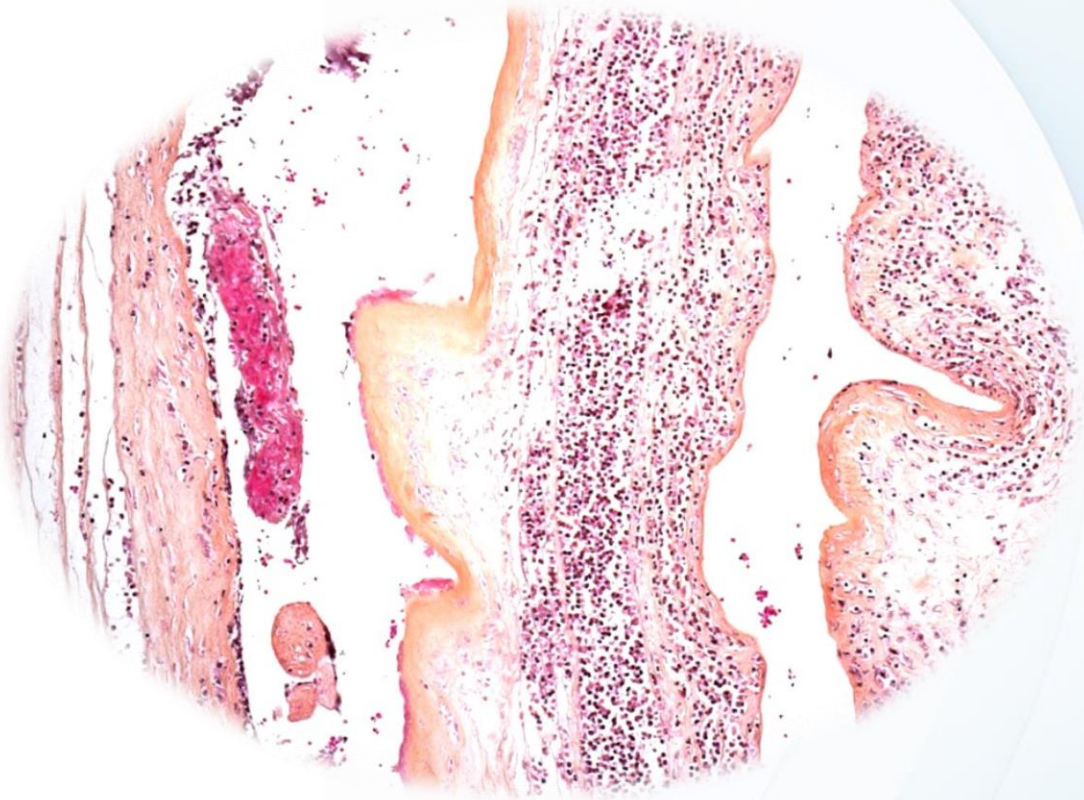
Intraamniotic Infection(Chorioamnionitis)

Most common

- 3.9% all births
- 40-70% PTB due to PTL; PPROM

Risk Factors:

- Length of labor
- Duration of rupture of membranes
- Multiple cervical exams
- Internal monitoring/procedures
- GBS
- STI
- Mec
- Previous IAI
- Alcohol/Tobacco use



Presentation- *Dx is usually made on clinical findings alone*

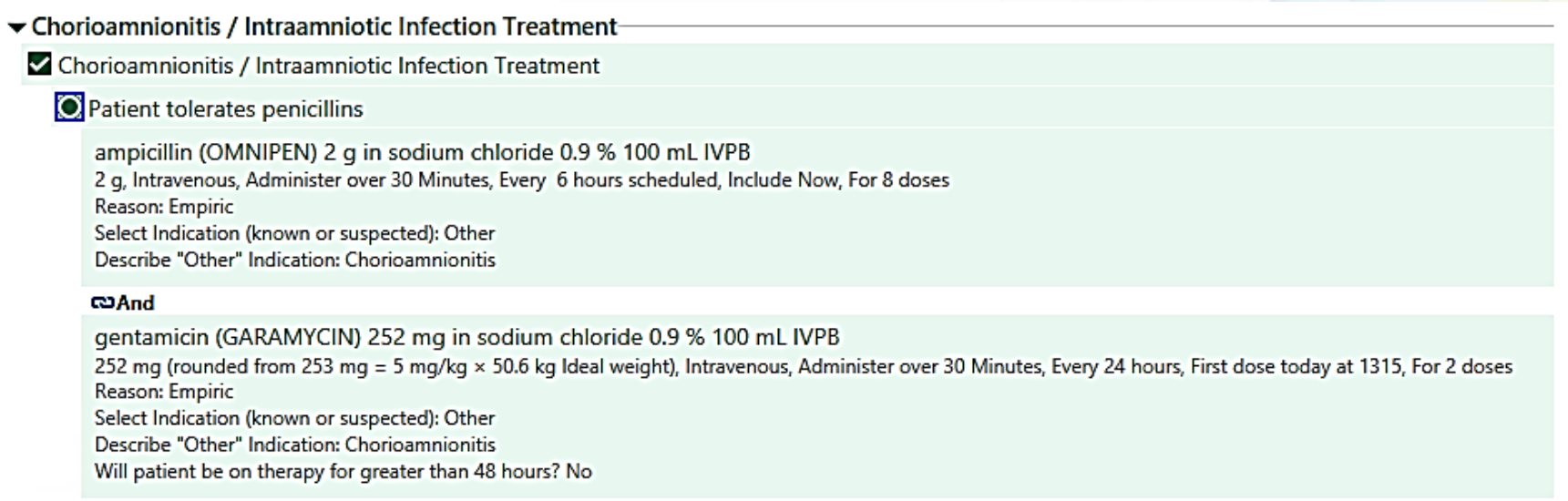
- Fever (100%)
  - ≥39 x1
  - 38-38.9 on 2 more measurements 30 minutes apart

  PLUS one or more:
- Elevated WBC > 15,000(70-90%)
- Birthing Patient Tachycardia >100/min (50-80%)
- Fetal Tachycardia > 160/min (40-70%)
- Decreased FHR variability
- Uterine tenderness(4-25%)
- Bacteremia(5-10%)
- Purulent or malodorous amniotic fluid

PLACENTA TO PATHOLOGY! Confirmation: Evidence of infection and/or inflammation in placenta, membranes, or umbilical cord. Amniotic fluid- positive gram stain, low glucose level, positive culture, high WBC count

Chorio key points

- Give Antibiotics
- Give Tylenol
- Deliver-***d****oes not necessarily indicate C/S Birth*
- Increased risk for:
  - Dysfunctional labor
  - Cesarean birth
  - Uterine atony
  - PPH
  - Blood transfusion
  - Localized PP infection
  - Sepsis



What's Unique about Maternal Sepsis

- Uncommon
- Typically Young & Healthy
- Limited studies
- Challenges to identification
- SIRS Criteria
- Scoring tool(s):
- NOT validated for the pregnant population

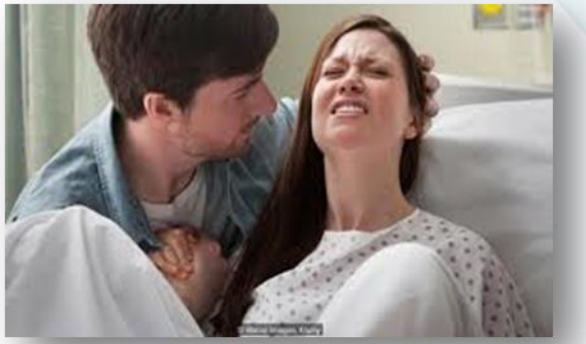
"SHE LOOKED SO GOOD" !!!!

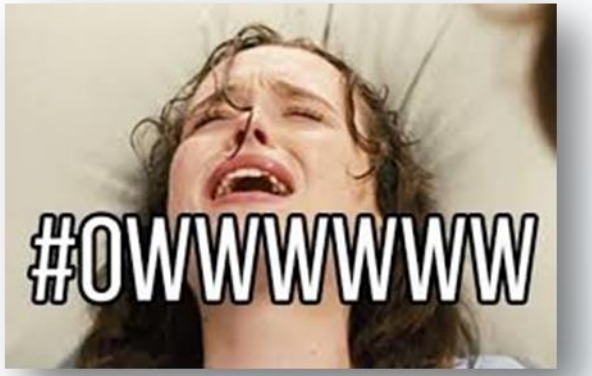
Unique OB Physiology

- **Normal OB physiology mimics SIRS:**
  - WBC higher
  - HR increases
  - RR Increases

- **Effect of Labor**
  - HR, RR: pain and pushing
  - Temp: dehydration, epidural
  - Hypotension with epidural
  - Altered mental status

- **Postpartum**
  - Fatigue



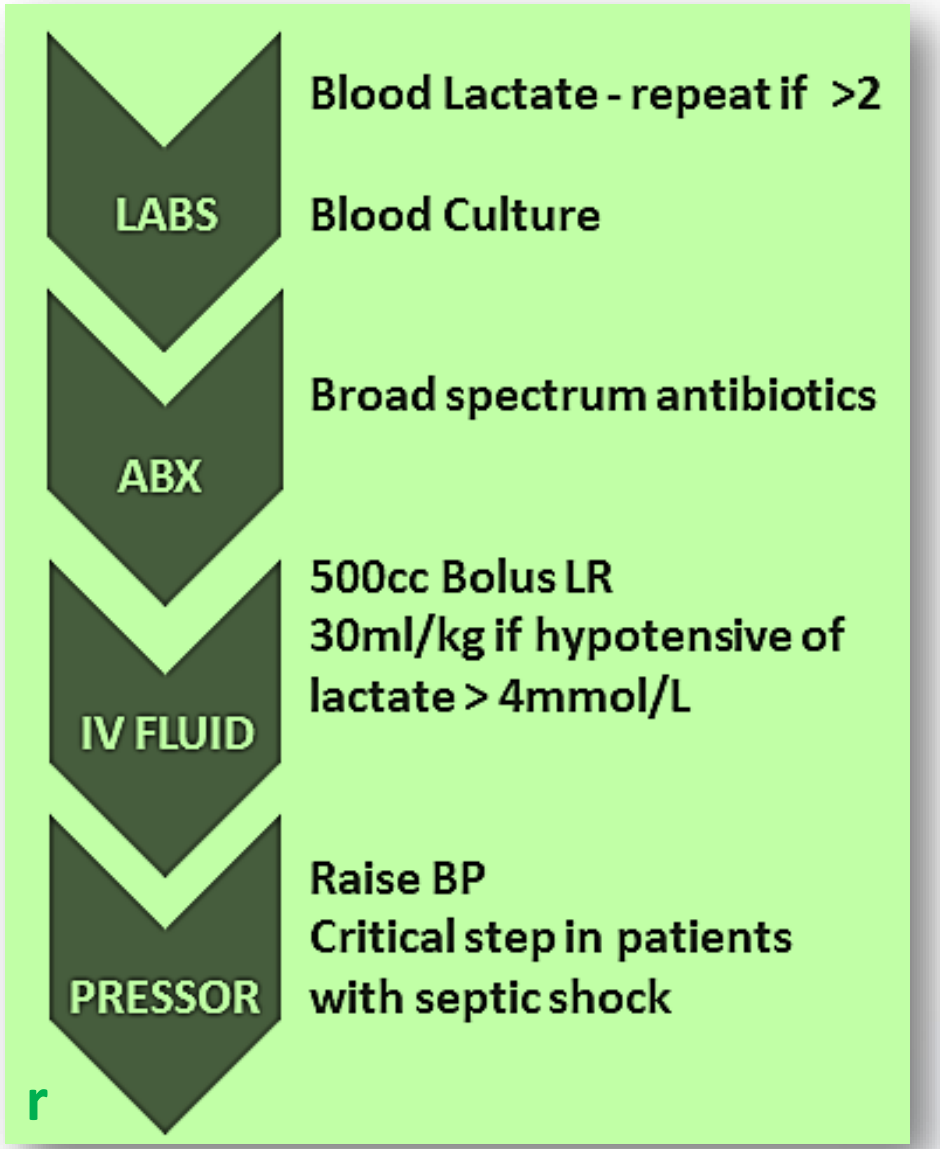


SEPSIS Definition: *The presence of 2 or more SIRS criteria with a presumed or confirmed infectious process*

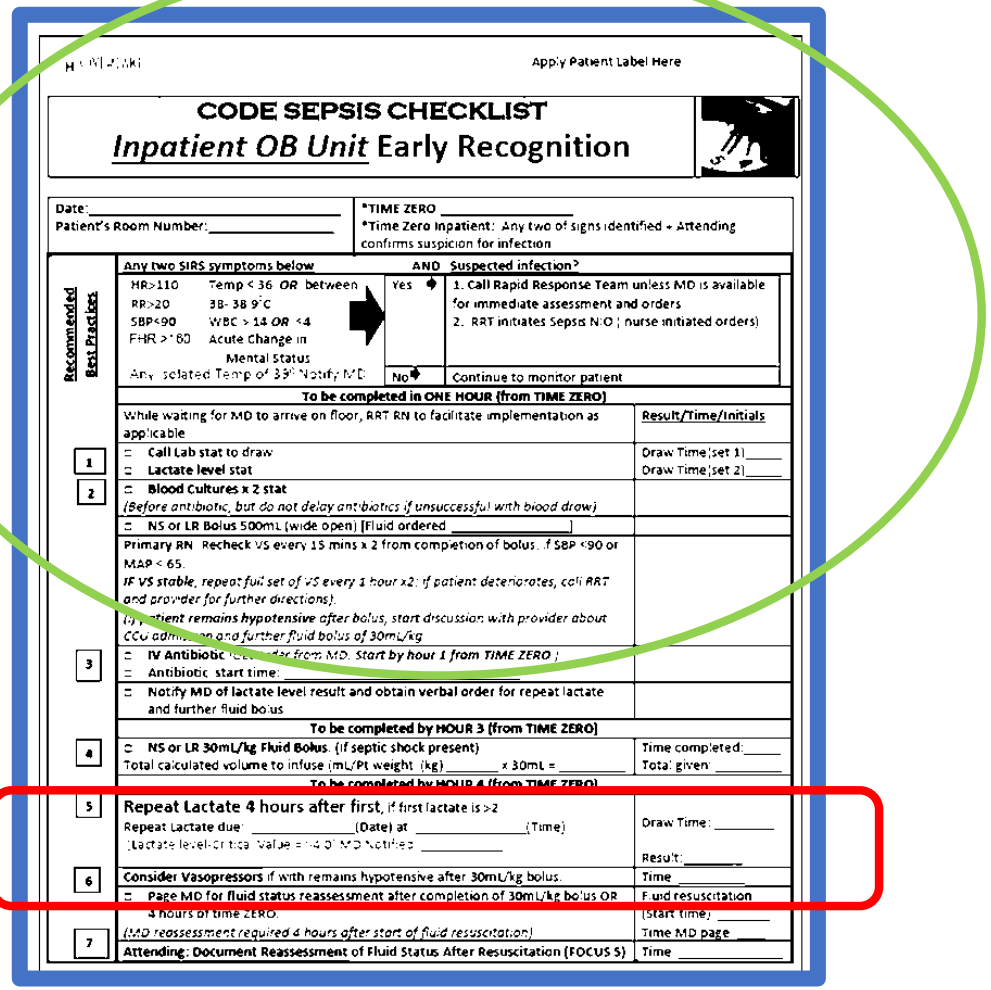
Adult Screening Criteria	OB Population
• Temp > 38°C (100.4°F) or < 36°C (96.8°F) • *HR > 90* • *RR> 20* • WBC >12,000, < 4,000 or >10% Bands •*New mental status change* •Blood glucose > 140 mg/dl in the absence of diabetes	Temp > 38°C (100.4°F) or < 36°C (96.8°F) **HR >110** ***WBC > 14,000* or < 4,000 or** ***> 10 % bands*** ***Subtle changes in mental status*** •Blood glucose > 140 mg/dl in absence of diabetes

KEY POINT- Unlike IAI - FEVER is not a REQUIRED criteria

Maternal Sepsis Standard Work



Maternal Sepsis Standard Work



Apply Patient Label Here

CODE SEPSIS CHECKLIST
***Inpatient OB Unit* Early Recognition**

Date: _____
Patient's Room Number: _____

*TIME ZERO _____
*Time Zero Inpatient: Any two of signs identified + Attending confirms suspicion for infection

Recommended Best Practices

Any two SIRS symptoms below — AND Suspected infection?

HR>110 Temp < 36 *OR* between 38- 38.9°C
RR>20 WBC > 14 *OR* <4
SBP<90 Acute Change in Mental Status
FHR > 160

Yes → 1. Call Rapid Response Team unless MD is available for immediate assessment and orders
2. RRT initiates Sepsis N:O (nurse initiated orders)

Any isolated Temp of 39° Notify MD

No → Continue to monitor patient

To be completed in ONE HOUR (from TIME ZERO)

While waiting for MD to arrive on floor, RRT RN to facilitate implementation as applicable — Result/Time/Initials

1. ☐ **Call Lab stat to draw** — Draw Time[set 1]____
   ☐ **Lactate level stat** — Draw Time[set 2]____
2. ☐ **Blood Cultures x 2 stat**
   (Before antibiotic, but do not delay antibiotics if unsuccessful with blood draw)
   ☐ NS or LR Bolus 500mL (wide open) [Fluid ordered _____]
   Primary RN Recheck VS every 15 mins x 2 from completion of bolus. If SBP <90 or MAP < 65.
   IF VS stable, repeat full set of VS every 1 hour x2; if patient deteriorates, call RRT and provider for further directions).
   If patient remains hypotensive after bolus, start discussion with provider about CCU admission and further fluid bolus of 30mL/kg
3. ☐ **IV Antibiotic** [illegible] *from MD. Start by hour 1 from TIME ZERO.)*
   ☐ Antibiotic start time: _____
   ☐ Notify MD of lactate level result and obtain verbal order for repeat lactate and further fluid bolus

To be completed by HOUR 3 (from TIME ZERO)

4. ☐ **NS or LR 30mL/kg Fluid Bolus.** (If septic shock present) — Time completed:____
   Total calculated volume to infuse (mL/Pt weight (kg) _____ x 30mL = _____ — Total given: _____

To be completed by HOUR 4 (from TIME ZERO)

5. **Repeat Lactate 4 hours after first,** if first lactate is >2
   Repeat Lactate due: _____(Date) at _____(Time) — Draw Time: _____
   (Lactate level-Critical Value = >4.0 MD Notified _____) — Result: _____
6. **Consider Vasopressors** if with remains hypotensive after 30mL/kg bolus. — Time _____
   ☐ Page MD for fluid status reassessment after completion of 30mL/kg bolus OR 4 hours of time ZERO. — Fluid resuscitation (Start time) _____
   (MD reassessment required 4 hours after start of fluid resuscitation) — Time MD page ____
7. **Attending: Document Reassessment** of Fluid Status After Resuscitation (FOCUS 5) — Time _____

- ✓ Lactate Level
- ✓ Blood Cultures x2
- ✓ LR Bolus 500cc
- ✓ IV Antibiotics

IMPLEMENT THE BUNDLES…Goal within 1hour

In the setting of Septic shock
LR 30ml/kg Fluid Bolus to be completed by 3hours

MD assessment for fluid status reassessment after completion of 30ml/kg bolus 4hour of time zero
* This is a core measure

Story…. Before OB SEPSIS PROTOCOL

Postpartum Day 1: Primip OVD

Reported feeling " very tired", pain well controlled with current meds, ambulating well, tolerating reg diet. Baby doing well, BF well

WBC 16.4 T 36.2 BP 118/71 Pulse 115 RR: 18

3 Hours Later:

Pain 9/10 **not** well controlled with current medications: Crying from exhaustion and pain, limited coping mechanisms. C/O Cramping stiches, hemorrhoids. Developed chest pain, right shoulder pain, SOB, N/V, dizziness

T: 38.7 HR: 120-156 BP: 95/45- 76/34 RR: 40-47

WBC=*1.7 repeat 1.6

Mother comments that this is not her typical response to pain or stress

Rapid Response Team:

CT Scan, Pulmonary angiogram, Abdominal Ultrasound

Transferred to Critical Care Unit:

BP: **68/40** P:**155-160** Sa02 **87% on 6L Lactate 4.8**

- CT Angiogram- No PE
- Sepsis protocol initiated
- IV antibiotics (Unasyn, Clindamycin, Vancomycin)
- Fluid Volume Resuscitation
- Vasopressor Support
- 02 requirement up to 45L/min
- Respiratory failure, increasing pulmonary edema/pleural effusions. Intubated for respiratory support
- Decreased Urine output

Major Goals of sepsis management were met: *She was treated emergently with fluid resuscitation, antibiotic administration….*

What else?

Postpartum Day 3:

To OR for Surgery: TAH, APPY, and Abdominal washout. Uterus was "mushy" and tissue friable

- **4** liters of purulent Ascites
- *Positive for GAS*
- Remained ventilated 9 days (ARDS)

Postpartum Day18: Discharged Home

T: 36.5, BP: 127/75 P: 88 RR: 16 Sao2 100%

Knowledge Check

A fever is necessary in the diagnosis of sepsis in the OB population?

A. True
B. False

Knowledge check

How quickly should the 30ml/kg fluid bolus be administered?

A. Within your shift
B. 3 hours
C. 6 hours
D. Until the patient is normotensive

References

ACOG (2022). Committee Opinion No. 712: Intrapartum Management of Intraamniotic Infection. Obstet Gynecol 2017; 130:e95. Reaffirmed 2022.

Anderson, B.L. (2014). Puerperal Group A Streptococcal Infection: Beyond Semmelweis. *Obstetrics & Gynecology, 123*.

Barton & Sibai (2012). Severe sepsis and septic shock in pregnancy. *Obstet Gynecol*. 120:689-706.

Chen, K.T. (2023) Postpartum endometritis. Up-to-date.

CMQCC (2022). Improving diagnosis and treatment of maternal sepsis

Knowles, S.J.,O'Sullivan,N.P., Meenan, A.M., Hanniffy, R., Robson,M. (2014). Maternal Sepsis incidence, etiology and outcome for mother and fetus: a prospective study. *Royal College of Obstetrics and Gynecologists*. DOI: 10, 1111/1471-0528.12892.

Kumar, A. (2006). Duration of Hypotension Prior to Initiation of Antimicrobial Therapy. *Crit Care Med* ,34,1589-96

Neligan, P.J. & Laffey, J. (2011). Clinical review: Special populations-critical illness and pregnancy. Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2012, 3rd Ed publication (CCM, 2013; 41(2):580-637)

Society for Maternal-Fetal Medicine (SMFM). Electronic address: pubs@smfm.org, Plante LA, Pacheco LD, Louis JM. SMFM Consult Series #47: Sepsis during pregnancy and the puerperium. Am J Obstet Gynecol 2019; 220:B2.

Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2012, 3rd Ed publication (CCM, 2013; 41(2):580-637)

Thevenet, A. (2023). Intraminiotic infection (Clinical Chorioamnionitis). UpToDate