

Self Study Module:  
Exploring an  
Obstetric Event  
Leading to Adverse  
Outcomes  
for Mother and  
Neonate

Prisma Health Richland Hospital  
Midlands Perinatal Systems  
Perinatal Education  
Programs 2021

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HEALTH**

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## DISCLOSURE:

"Please note that this Power Point presentation is an educational tool that is general in nature. It is not intended to be an exhaustive review of the subject matter or the opinion of Prisma Health. Materials presented in this presentation should not be considered a substitute for actual statutory or regulatory language. Always refer to your legal counsel and the current edition of a referenced statute, code and/or regulation for precise language."

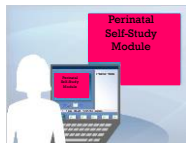
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## MODULE DIRECTIONS

- In order to receive credit for this module, you must complete the self-study module. There are few new features to this module.
- Upon completion of the module, there will be a link for an on-line post test & course evaluation. You will receive your CE certificate upon completion of these steps.

### HELPFUL HINTS

- This self study module has been created to be interactive.
- You will be asked questions and you will need to click on an answer before moving to the next slide.
- When you see this symbol, click to advance to the next slide.
- There are times when you will need to use the enter button or the arrows to advance through images.
- There are interactive questions placed in the case studies. When you see a question, you will need to select an answer then follow the prompts on the slides.



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## COURSE OBJECTIVES

- Overall Purpose/Goal: Perinatal nurses understand potential adverse outcomes for the pregnant/postpartum woman and her neonate in order to anticipate potential risk of injury and timely interventions thus improving outcomes and teamwork.
- Objectives:
  - By the end of the program, participants will be able to recognize potential adverse maternal outcomes related to an obstetric event, shoulder dystocia, and provide appropriate interventions.
  - By the end of the program, participants will be able to recognize potential adverse neonatal outcomes related to an obstetric event, shoulder dystocia, and provide appropriate interventions.

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**NORMAL  
LABOR  
REVIEW**

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## MECHANICS OF LABOR

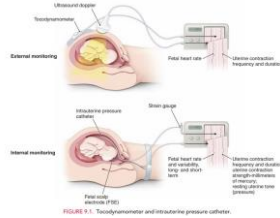
- Not a passive process
- Fetus must successfully negotiate the pelvis
- Dependent upon 3 variable
  - Uterine activity - Powers
  - Fetus - Passenger
  - Maternal pelvis - Passage



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## POWER – UTERINE ACTIVITY

- Powers: the forces generated by the uterine musculature
- Uterine activity is characterized
  - Frequency
  - Duration
  - Intensity
  - Resting Tone



London, Mark, et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies* 8th Edition 2021 Elsevier

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## PASSENGER – FETUS FETAL SIZE



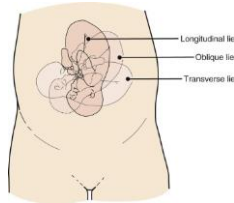
<http://rhr.org/fetalgrowthcalculator/#/>

London, Mark, et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies* 8th Edition 2021 Elsevier

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## PASSENGER – FETUS FETAL LIE



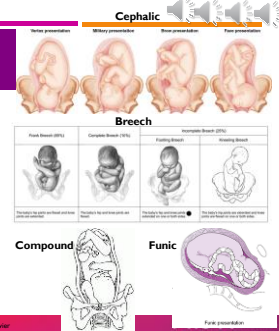
- Fetal lie refers to the longitudinal axis of the fetus relative to the longitudinal axis of the uterus
- Longitudinal
- Oblique
- Transverse

London, Mark, et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies* 8th Edition 2021 Elsevier

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## PASSENGER – FETUS FETAL PRESENTATION

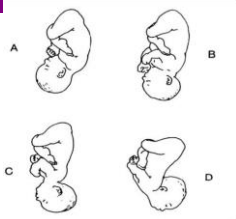


- The fetal part that directly overlies the pelvic inlet.
  - Cephalic (vertex)
  - Breech
  - Compound
  - Funic
  - Malpresentation

London, Mark, et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies* 8th Edition 2021 Elsevier

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## PASSENGER – FETUS FETAL ATTITUDE

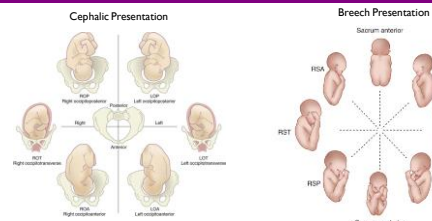


London, Mark, et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies* 8th Edition 2021 Elsevier

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## PASSENGER – FETUS FETAL POSITION



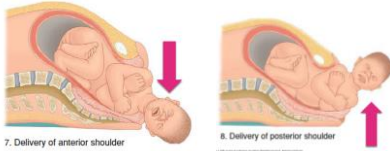
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## CARDINAL MOVEMENTS



Expulsion

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This video clip is a good graphic to visualize the normal labor process and cardinal movements of labor. If video does not play please use this link: <https://www.youtube.com/watch?v=Xa7h4Q0R9NE>

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## SPONTANEOUS VAGINAL DELIVERY

The goals of clinical assistance:

Reduction of maternal trauma; Prevention of fetal injury; & Initial support of the newborn

When the fetal head crowns and delivery is imminent, gentle pressure should be used to maintain flexion of the fetal head and to control delivery, potentially protecting against perineal injury.

Once the fetal head is delivered, external rotation (restitution) is allowed<sup>18</sup>.

<sup>18</sup>During restitution, nuchal and umbilical cord loops should be identified and reduced. In cases in which simple reduction is not possible, the body can be delivered through and the loop reduced after delivery, or in rare cases, the cord can be doubly clamped and transected.

The anterior shoulder should then be delivered by gentle downward traction in concert with maternal expulsive efforts<sup>19</sup>.

<sup>19</sup>These movements should be performed with the minimal force possible to avoid perineal injury and traction injuries to the neonatal brachial plexus.

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## PROGRESS OF LABOR

1<sup>st</sup> Stage

Labor onset to full dilation of cervix  
• Latent Phase: Onset of Labor – slow rate of cervical change  
• Active Phase: Greatest rate of dilation occurs

2<sup>nd</sup> Stage

Full dilation to delivery of the baby

3<sup>rd</sup> Stage

Delivery of the baby to delivery of the placenta

Parameter	Mean	50th Percentile
<b>Nulliparas</b>		
Latent labor	7.3–8.5 h	17–21 h
First stage	6–13 h	16.6–30 h
Second stage	36–57 min	122–197 min
Second stage, epidural	79 min	326 min
<b>Multiparas</b>		
Latent labor	4.1–5.3 h	12–54 h
First stage	5.7–7.5 h	12.5–13.7 h
Second stage	17–19 min	17–61 min
Second stage, epidural	45 min	255 min

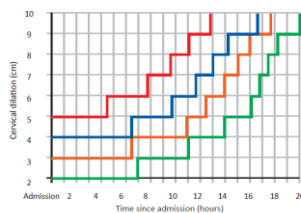
Table 11.2 Summary of Means and SDs. Percentiles for Duration of First and Second Stage Labor (Data from references 46, 47, 48, 49, 50, 51, 52)

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## PARTOGRAM FOR CONTEMPORARY NULLIPARAS PRESENTING IN ACTIVE LABOR

This revision of the Friedman curve recognizes that labor progresses more slowly <6 cm dilation, and faster after that point



Adjunct chart shows rates of progression of normal labor (at the upper 95 percentile) for women presenting at each of the following cervical dilation.

- Patients presenting at 5 cm
- Patients presenting at 4 cm
- Patients presenting at 3 cm
- Patients presenting at 2 cm

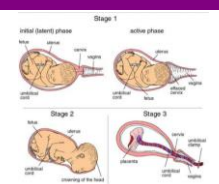
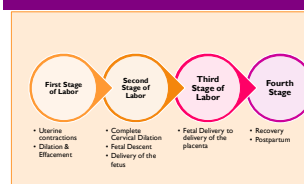
Healthy Connections  
MOM & BABIES

Zhang, Obstet Gynecol. 2010 December; 116(6): 1281-1287.

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## NORMAL LABOR



[https://www.upToDate.com/content/view\\_full-normal-labor-and-protraction-and-arrest-disorder/source/search\\_result?search=normal%20labor&selectedTitle=1-150](https://www.upToDate.com/content/view_full-normal-labor-and-protraction-and-arrest-disorder/source/search_result?search=normal%20labor&selectedTitle=1-150)

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## WHAT HAPPENS WHEN LABOR DOES NOT PROGRESS NORMALLY?



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## SHOULDER DYSTOCIA



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## WHAT IS SHOULDER DYSTOCIA



Defined by Gabbe's Obstetrics

- Shoulder dystocia occurs when the fetal shoulders are obstructed at the level of the pelvic inlet
- The most commonly accepted definition of shoulder dystocia occurs when there is failure of delivery of the fetal shoulder(s) after initial attempts at extraction-oriented traction or when ancillary obstetrical maneuvers are required to effect delivery of the shoulders
- "Turtle Sign"

Defined by ACOG (American College of Obstetrics and Gynecology)

- A birth complication that requires additional maneuvers to relieve impaction of the fetal shoulder

London, Mark, et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies*. 8th Edition. 2021. Elsevier.

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## WHAT IS THE INCIDENCE OF SHOULDER DYSTOCIA?



- Study of publications since 2000 in the US give a rate of 0.7% of vaginal births
- The trunk and particularly the chest grow larger relative to the head
- The percentage of deliveries complicated by shoulder dystocia for unassisted births not complicated by diabetes has been reported:
  - 5.2% for infants weighing 4000 to 4250 g
  - 9.1% for those 4250 to 4500 g
  - 14.3% for those 4500 to 4750 g
  - 21.1% for those 4750 to 5000 g
- Remember - approximately 50% to 60% of shoulder dystocias occur in infants weighing less than 4000 g
- Moreover, even if the birthweight of the infant is more than 4000 g, shoulder dystocia will complicate only 3.3% of the deliveries

London, Mark, et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies*. 8th Edition. 2021. Elsevier.

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## RISK FACTORS

- #1: Shoulder dystocia remains unpredictable and unpreventable

### Recognized risk factors

- Fetal Macrosomia
- Maternal diabetes
- Excess maternal weight or weight gain
- Operative vaginal delivery
- Oxytocin use
- Multiparity
- Epidural use
- Prolonged second stage of labor
- History of previous shoulder dystocia



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## FETAL MACROSOMIA

- Two terms are applied to excessive fetal growth: "large for gestational age" (LGA) and "macrosomia."

### Large for Gestational Age (LGA)

- Implies a birth weight equal to or more than the 90th percentile for a given gestational age

### "Macrosomia"

- Implies growth beyond and absolute birthweight
- Historically 4,000 g or 4,500 g, regardless of the gestational age

ACOG Practice Bulletin # 216: Macrosomia - January 2020

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## FETAL MACROSOMIA

**Table 1. Birth Weight Percentiles for Gestational Age: U.S. 2011 Single Live Births to Resident Women Between 37 Completed Weeks of Pregnancy and 42 Completed Weeks of Pregnancy (Based on Best Obstetric Estimate of Gestational Age)**

Gestational Age	Birth Weight (g)		
	50th Percentile	90th Percentile	95th Percentile
37	3,025	3,612	3,818
38	3,219	3,799	3,995
39	3,374	3,941	4,135
40	3,499	4,057	4,232
41	3,600	4,167	4,340
42	3,686	4,290	4,474

Modified from Dunne EL, Hawkins JS, McIntire DD, Casey RM, Leveno KJ. A revised birth weight reference for the United States. *Obstet Gynecol* 2016; 124:16–22.

A retrospective cohort study using U.S. Vital Statistics from 2011 to 2013 noted that delivery at 37–39 weeks of gestation of a newborn with a birth weight that is 90% or more for gestational age but less than 4,000 g was associated with increased composite maternal and infant morbidity

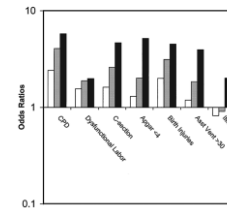
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## MORE ON MACROSOMIA

- Macrosomia divided into three categories – each with differing types and levels of risk:
  - 4,000g – 4,499g (white bars)
  - 4,500g – 4,999g (gray bars)
  - ≥ 5,000g (black bars)



**Figure 1. Increased risk of adverse outcomes by macrosomia category.** Odds Ratio. Category 1: 4,000–4,499 g; Category 2: 4,500–4,999 g; Category 3: ≥ 5,000 g. The reference group is 3,000–3,999 g. The odds ratios are adjusted for confounding factors. The odds ratios of 1 are significant at P < .05. Cesarean, Cesarean delivery; CSD, cesarean delivery; Hb, hemoglobin; PPH, postpartum hemorrhage; Stillborn, stillborn; ABO, ABO incompatibility. Reproduced from Baskin DS, Hawkins JS, McIntire DD, Casey RM, Leveno KJ. Macrosomia: A review of the literature. *Obstet Gynecol* 2016; 127:103–112.

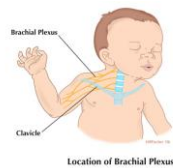
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## MACROSOMIA & SHOULDER DYSTOCIA – IS THERE A RELATIONSHIP?

- The fetal injuries most commonly associated with macrosomia and shoulder dystocia:
  - Fracture of the clavicle
    - Fracture of the clavicle complicates 0.4–0.6% of all births and typically resolves without permanent sequelae
    - For macrosomic newborns, the risk of clavicular fracture is increased approximately 10-fold
  - Damage to the nerves of the brachial plexus, specifically at vertebrae C5 and C6, which can produce Erb-Duchenne paralysis
- It is important to note that although macrosomia clearly increases risk, most instances of shoulder dystocia occur unpredictably among newborns of normal birth weight, and most macrosomic newborns do not experience shoulder dystocia.



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## RISK FACTOR: RECURRENT SHOULDER DYSTOCIA IN SUBSEQUENT PREGNANCY

- Recurrence risk is listed from 1–16.7%
  - True incidence is unknown because a number of providers and patients do not choose to attempt a trial of labor especially if there is a history of injured infant or complicated delivery.
- If there is a history of Shoulder dystocia in a previous pregnancy, the provider and patient should discuss:
  - Estimated fetal weight
  - Gestational age
  - Maternal glucose intolerance
  - Severity of prior neonatal injury
  - Future pregnancy plans
  - Patient preference
  - "Universal elective cesarean delivery is not recommended"



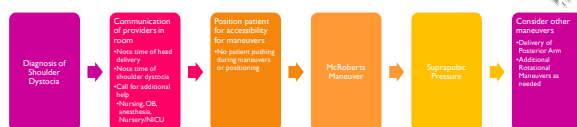
ACOG Practice Bulletin # 176: Shoulder Dystocia – May 2017

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## MANAGEMENT OF SHOULDER DYSTOCIA

- Systematic approach
  - Recall that maternal/infant complications are unpredictable and may not be avoidable



**75% of shoulder dystocia cases will be relieved within 4 minutes with McRoberts, Suprapubic Pressure and Delivery of the Posterior Arm**

ACOG Practice Bulletin # 176: Shoulder Dystocia – May 2017

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## CLOSER LOOK - MCRBERTS MANEUVER

- Should always be attempted first
- Two assistants grasp a maternal leg and sharply flex the thigh back against the abdomen
- Causes cephalad rotation of the symphysis pubis and flattening of the lumbar lordosis to free the impacted shoulder



**Fig. 14.4 The Least Invasive Maneuver to Disimpact the Shoulders is the McRoberts Maneuver.** Sharp ventral flexion of the maternal hips results in ventral rotation of the maternal pelvis and an increase in the useful size of the outlet.

ACOG Practice Bulletin # 176: Shoulder Dystocia – May 2017

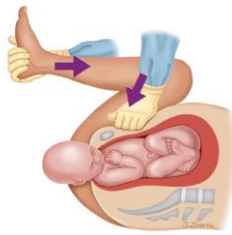
Image from: Gilman P et al.

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### CLOSER LOOK: SUPRAPUBIC PRESSURE

- Apply pressure suprapubically with the palm or fist, directing the pressure on the anterior shoulder both downward (to below the pubic bone) and laterally (toward the baby's face or sternum)
- Suprapubic pressure is supposed to adduct the shoulders or bring them into an oblique plane since the oblique diameter is the widest diameter of the maternal pelvis. It is most useful in mild cases and those caused by an impacted anterior shoulder.
- Is typically done in conjunction with McRoberts Maneuver



McRoberts maneuver and suprapubic pressure - UpToDate  
<https://www.uptodate.com/contents/mcroberts-manipulation?itp=share&itp=share>

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### CLOSER LOOK: DELIVERY OF THE POSTERIOR ARM

- The delivering clinician's hand is placed in the vagina and the humerus of the posterior fetal arm is traced from the shoulder to the elbow
- Once the forearm is grasped, it is swept across the fetal chest and the arm is pulled out of the vagina

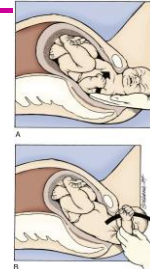


Fig 145 - The Operator Inserts a Hand and Sweeps the Posterior Arm Across the Chest and Over the Perineum. Care should be taken to distribute the pressure evenly across the humerus to avoid unnecessary fracture.

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### CLOSER LOOK: ADDITIONAL MANEUVERS

- Rubin**
  - Place fingers behind the anterior scapula and attempt to rotate the baby forward so that the shoulders are more likely in an oblique position
- Woods Screw Maneuver**
  - If Rubin is unsuccessful place fingers from the other hand in front of the fetal arm on the other side to promote rotation in the same direction
- Reverse Woods Screw Maneuver**
  - Place fingers behind the posterior scapula. Attempt to rotate the fetal body in the opposite direction



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### CLOSER LOOK: ADDITIONAL MANEUVERS

- Gaskin - Roll over to "all fours" position:**
  - Move the woman to "all fours" appears to increase the effective pelvic dimensions allowing the fetal position to shift; this may disimpact the shoulders
  - With gentle downward pressure on the posterior shoulder the anterior shoulder may become more impacted (with gravity), but will facilitate the freeing up of the posterior shoulder
  - Also, this position may allow easier access to the posterior shoulder for rotational maneuver or removal of the posterior arm



Figure 10 - Gaskin maneuvers with rotation of posterior shoulder

Chapter 13 - Shoulder Dystocia (gloem.com)  
<https://www.gloem.com/pdf/ap520/ap520chapter1320shoulder520dystocia.pdf>

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### CLOSER LOOK: ADDITIONAL MANEUVERS

- Zavanelli**
  - This maneuver involves reversing the cardinal movements of labor
  - The head is rotated to occiput anterior, flex, push up, rotate to transverse, disengage, and perform a cesarean section



Figure 12 - Zavanelli maneuver

Image from: Chapter 13 - Shoulder Dystocia (gloem.com)  
<https://www.gloem.com/pdf/ap520/ap520chapter1320shoulder520dystocia.pdf>

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### CLOSER LOOK: ADDITIONAL MANEUVERS

- Break Neonatal Clavicle**

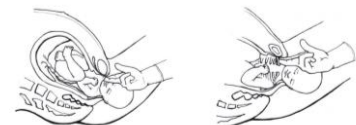


Figure 11 - Breaking the clavicle

Chapter 13 - Shoulder Dystocia (gloem.com)  
<https://www.gloem.com/pdf/ap520/ap520chapter1320shoulder520dystocia.pdf>

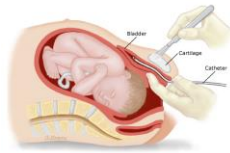
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## CLOSER LOOK: ADDITIONAL MANEUVERS

- **Symphysiotomy**
  - The cartilage of the symphysis pubis may be surgically divided to increase the size of the pelvic outlet

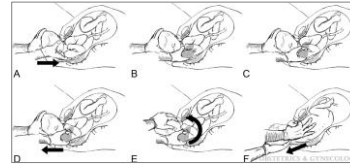


Images from: Symphysiotomy to divide maternal pubis symphysis - UpToDate <https://www.uptodate.com/contents/symphysiotomy-to-divide-maternal-pubis-symphysis>

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## New Maneuver: Shoulder Shrug



Video link:

<https://www.youtube.com/watch?v=ZvLchZIdFk>

Shoulder Shrug Maneuver to Facilitate Delivery During Shoulder Dystocia

Sancetta, Ronald, Khanzade, Hiba, Leana, Ricardo. Obstetrics & Gynecology 133(6):1178-1181, June 2019.

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Failure of progression due to shoulder dystocia.

A - Flex the neck toward the anterior shoulder, then slide hand behind the posterior shoulder

B - Clamp the thumb and index finger around the posterior shoulder

C - With the thumb and index finger, form a pincer grip through the axilla, resembling an "OK" sign

D - Retract the posterior shoulder toward the shrug position (elevation of the shoulder) - Arrow represents movement of the posterior shoulder to the shrug position

E - Restore the head toward the body's axis to form the head-shoulder unit and rotate this unit 180 degrees in the direction of the chest. Arrow represents counterclockwise rotation of the head and shoulder unit

F - On rotation, the anterior shoulder is now posterior and has advanced from the dystocia; normal delivery now proceeds with minimal forward traction. Arrow represents delivery of the neonate

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## MATERNAL COMPLICATIONS



Image from: Caritis, C. (2017). Shoulder Dystocia. In H. Olsen (Ed.), *Obstetric Green* (pp. 84-95). Cambridge: Cambridge University Press. doi:10.1017/9781108222711.011

- Shoulder dystocia has been shown to be associated with:
  - Increased risk of postpartum hemorrhage
  - Higher degree perineal lacerations
  - Maternal symphyseal separation
  - Lateral femoral cutaneous neuropathy
  - Increased risk of obstetric anal sphincter injuries (OASIS)
- "It should be noted that the performance of certain "heroic" maneuvers in cases of catastrophic shoulder dystocia, such as the Zavanelli maneuver and symphysiotomy, have a high incidence of significant maternal morbidity, such as cervicovaginal lacerations, uterine rupture, urethral injury, and bladder lacerations."

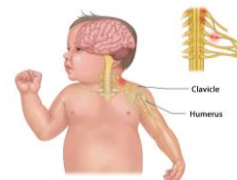
ACOG Practice Bulletin # 178: Shoulder Dystocia, May 2017

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## NEONATAL COMPLICATIONS

- Brachial Plexus Injury
  - Erb's Palsy
  - Klumpke Palsy
- Fracture
  - Clavicle or Humerus
- Hypoxic-Ischemic Encephalopathy



"Although the rate of transient brachial plexus injuries after shoulder dystocia varies, most series report a 10–20% injury rate immediately after the delivery."

ACOG Practice Bulletin # 178: Shoulder Dystocia, May 2017

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## ADDITIONAL NOTES

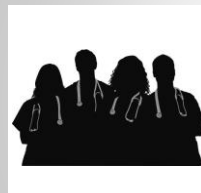
- Importance of being Prepared!
- Simulation



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## SCENARIO



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## INTERACTIVE SCENARIO

Patient presents to hospital with complaints of contractions

- G3P2002
- GA: 39 4/7
- SVE: 4/90/-1; membranes intact
- Vital Signs:
  - HR: 90
  - B/P: 120/75
  - RR: 12
  - T: 98.3°F
- Ht: 5'2" Wt: 230 BMI: 42.1
- No significant medical history
  - Previous deliveries were uncomplicated vaginal deliveries
  - She received adequate prenatal care



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## SCENARIO CONTINUED



- Upon the urge to push, the nurse and OB provider are at the bedside coaching the woman.
- She is making slow but good progress
- The head delivers, then the provider notes a retraction of the head on the perineum

The nurse and the provider are concerned about shoulder dystocia, with continued pushing efforts by the woman and no further progression of delivery the next step should be:

A. Call for help, then the nurse and an assistant perform McRoberts maneuver

B. The nurse and an assistant perform McRoberts Maneuver while the woman continues pushing efforts

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## CORRECT!

A. Call for help, then the nurse and an assistant perform McRoberts maneuver

- The correct answer is "A" - Call for help, then the nurse and an assistant perform McRoberts maneuver
  - The nurse must first call for additional help to be able to perform assistance with appropriate maneuvers
  - Recall that McRoberts Maneuver is the least invasive step and increases the size of the pelvic outlet



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## INCORRECT

B. The nurse and an assistant perform McRoberts Maneuver while the woman continues pushing efforts

- The correct answer is "A" - Call for help, then the nurse and an assistant perform McRoberts maneuver
  - While the McRoberts maneuver is correct, the nurse should initially call for help in the delivery room
  - Pushing efforts by the woman should be done under the direction of the obstetric provider may attempt pushing efforts



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## SCENARIO CONTINUED



- There continues to be no further delivery of the baby, 30 seconds have elapsed. The next appropriate intervention should be:

A. The provider should have the patient to stop pushing and begin rotational maneuvers

B. The provider should have the patient to stop pushing and request an assistant to apply suprapubic pressure in the apply pressure in the direction of the fetal face.

## INCORRECT

A. The provider should have the patient to stop pushing and begin rotational maneuvers

- While it is correct that the provider should have the woman stop pushing efforts the next appropriate step after McRoberts Maneuver should be to apply suprapubic pressure prior to rotational maneuvers.
- The correct answer is "B".
  - Recall that application of suprapubic pressure should be in the direction of the fetal face in order to attempt to rotate or dislodge the anterior shoulder under the symphysis pubis



PRISMA HEALTH

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## CORRECT

B. The provider should have the patient to stop pushing and request an assistant to apply suprapubic pressure in the apply pressure in the direction of the fetal face.

- The correct answer is "B".
- Recall that application of suprapubic pressure should be in the direction of the fetal face in order to attempt to rotate or dislodge the anterior shoulder under the symphysis pubis



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## SCENARIO CONTINUED



- Without further progress of delivery, the provider then decides to attempt \_\_\_\_\_\_. This maneuver has been shown to be effective in delivery with shoulder dystocia. While delivering, the provider should use care to not apply \_\_\_\_\_.

A. Delivery of the Posterior Arm, Downward Traction

B. Woods Screw Maneuver, Fundal Pressure

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## CORRECT

A. Delivery of the Posterior Arm, Downward Traction

Without further progress of delivery, the provider then decides to attempt **Delivery of the Posterior Arm**. This maneuver has been shown to be effective in delivery with shoulder dystocia. While delivering, the provider should use care to not apply **Downward Traction**.

- The correct answer is "A"
- Recall delivery of the posterior arm delivery required the least amount of force to effect delivery and resulted in the lowest amount of brachial plexus stretch
  - Providers should always avoid downward traction thus putting additional strain on the brachial plexus nerve bundle.
  - As the provider delivers the posterior shoulder, gentle upward traction while maintaining neutral alignment for the fetus.
- If McRoberts, Suprapubic pressure & Delivery of the Posterior Arm do not allow for delivery of the fetus, then the provider may attempt other rotational maneuvers such as the Woods Screw Maneuver.
- Providers should never apply fundal pressure, this can lead to further impact of the anterior shoulder as well as add additional uterine pressure that could lead to uterine rupture

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## INCORRECT

B. Woods Screw Maneuver, Fundal Pressure

Without further progress of delivery, the provider then decides to attempt **Delivery of the Posterior Arm**. This maneuver has been shown to be effective in delivery with shoulder dystocia. While delivering, the provider should use care to not apply **Downward Traction**.

- The correct answer is "A"
- Recall delivery of the posterior arm delivery required the least amount of force to effect delivery and resulted in the lowest amount of brachial plexus stretch.
  - Providers should always avoid downward traction thus putting additional strain on the brachial plexus nerve bundle.
  - As the provider delivers the posterior shoulder, gentle upward traction while maintaining neutral alignment for the fetus.
- If McRoberts, Suprapubic pressure & Delivery of the Posterior Arm do not allow for delivery of the fetus, then the provider may attempt other rotational maneuvers such as the Woods Screw Maneuver.
- Providers should never apply fundal pressure, this can lead to further impact of the anterior shoulder as well as add additional uterine pressure that could lead to uterine rupture.

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## SCENARIO CONTINUED

- In this scenario, the provider is unable to deliver the posterior arm. The provider then attempts to rotate the fetus using Woods Screw, Reverse Woods Screw and the Rubin Maneuvers.
- The labor & delivery nurse auscultates at intervals.
- The fetal heart rate at 100 bpm, the woman continues to pushing efforts as directed by the provider.
- The labor & delivery nurse calls out for the neonatal resuscitation team to attend the delivery.
- It has been 4 minutes since delivery of the fetal head. The provider then attempts a second time to deliver the posterior arm and is successful.
- The fetus is delivered at 4 minutes and 30 seconds after the delivery of the fetal head.



## SCENARIO



- The neonate delivers and is handed off to the awaiting neonatal resuscitation team.
- You perform a rapid assessment of the newborn and find the infant to be the expected gestational age, hypotonic and apneic
- Infant is placed in preheated warmer. The infant's head is positioned in the sniffing position and then infant is suctioned with a bulb syringe (mouth then nose). The team is drying and stimulating the infant. Wet blankets removed, team continues to dry and stimulate with fresh dry blankets. Infant is now 1 minute old and continues to be cyanotic, apneic, hypotonic and heart rate is 40 bpm.

What should be your next step with resuscitation?

A. Start PPV with 21% oxygen, place pulse oximeter on right hand or wrist, and place ECG monitors on.

B. Continue to dry and stimulate, place pulse oximeter on left foot, place ECG monitors on.

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## CORRECT!

A. Start PPV with PIP (Peak inspiratory pressure) of 20-25, place pulse oximeter on right hand or wrist, and place ECG monitors on.

- The correct answer is "A"
- If a baby is not breathing or has gasping respirations, PPV should be started. If a baby has not taken a spontaneous breath, the first few assisted breaths may require higher than usual pressure to move fluid out of the air spaces and inflate the alveoli. NRP recommends starting with a PIP of 20-25. For the initial resuscitation of newborn greater than or equal to 35 weeks gestation, set the blender to 21% oxygen. If the baby has not responded to the initial steps within the first minute of life, it is not appropriate to continue to provide only tactile stimulation. Ventilation of the baby's lungs is the most important and effective action during neonatal resuscitation.
- The heart and brain receive blood from an artery that attaches to the aorta before the ductus arteriosus. This is often referred to as pre-ductal blood. To measure the oxygen saturation of the pre-ductal blood that is perfusing the heart and brain, place the pulse oximeter sensor on the right hand or wrist. The left arm and both legs may have lower oxygen saturation because they may receive blood from the aorta after it has mixed with poorly oxygenated venous blood shunted from the right side of the heart through the ductus arteriosus (post-ductal).

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## INCORRECT

B. Continue to dry and stimulate, place pulse oximeter on left foot, place ECG monitors on.

- The correct answer is "A"
- If a baby is not breathing or has gasping respirations, PPV should be started. If the baby has not responded to the initial steps within the first minute of life, it is not appropriate to continue to provide only tactile stimulation. Ventilation of the baby's lungs is the most important and effective action during neonatal resuscitation.
- The heart and brain receive blood from an artery that attaches to the aorta before the ductus arteriosus. This is often referred to as pre-ductal blood. To measure the oxygen saturation of the pre-ductal blood that is perfusing the heart and brain, place the pulse oximeter sensor on the right hand or wrist. The left arm and both legs may have lower oxygen saturation because they may receive blood from the aorta after it has mixed with poorly oxygenated venous blood shunted from the right side of the heart through the ductus arteriosus (post-ductal).

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## SCENARIO

- You give 30 seconds of PPV with 21% oxygen (infant does not have good chest rise and fall). You check your heart rate on the ECG monitor and the heart rate is not increasing. Pre-ductal saturation is 40%. Infant remains apneic, cyanotic and hypotonic

What should be your next step?

A. You should perform the 6-ventilation corrective steps: MR, SOPA. Mask adjustment, Reposition airway, Suction mouth and nose, Open mouth, Increase Pressure, Alternative airway

B. Infant needs to be intubated and chest compressions started. Oxygen concentration should be increased to 100%.

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## CORRECT!

A. You should perform the 6-ventilation corrective steps: MR, SOPA. Mask adjustment, Reposition airway, Suction mouth and nose, Open mouth, Increase Pressure, Alternative airway

- The correct answer is "A"
- The most important indicator of successful PPV is a rising heart rate.
- The most likely reasons for ineffective mask ventilation are (1) Leak around the mask, (2) airway obstruction, and (3) insufficient ventilating pressure.
- The 6 ventilation corrective steps address these common problems. You may use the mnemonic "MR, SOPA" to remember the 6 steps in order: (1) Mask adjustment (2) Reposition head (3) Suction airway (4) Open mouth (5) Increase Pressure (6) Alternative airway

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## INCORRECT

B. Infant needs to be intubated and chest compressions started. Oxygen concentration should be increased to 100%.

- The correct answer is "A"
- The most important indicator of successful PPV is a rising heart rate.
- The most likely reasons for ineffective mask ventilation are (1) Leak around the mask, (2) airway obstruction, and (3) insufficient ventilating pressure.
- The 6 ventilation corrective steps address these common problems. You may use the mnemonic "MR, SOPA" to remember the 6 steps in order: (1) Mask adjustment (2) Reposition head (3) Suction airway (4) Open mouth (5) Increase Pressure (6) Alternative airway

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## SCENARIO

- You give effective PPV (infant has good chest rise and fall) via bag mask for 30 seconds after MR, SOPA. The infant's heart rate is 40, pre-ductal saturations are 40%. What is your next step?

A. You need to continue to provide PPV with 21% oxygen, for another 30 seconds and reassess the heart rate after the 30 seconds.

B. Infant needs to be intubated and chest compressions started. Oxygen concentration should be increased to 100%.

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## INCORRECT

A. You need to continue to provide PPV with 21% oxygen, for another 30 seconds and reassess the heart rate after the 30 seconds.

- The correct answer is "B"
- If the heart rate remains less than 60 bpm despite at least 30 seconds of PPV that inflates the lungs (chest movement), insertion of an alternative airway (endotracheal tube or laryngeal mask) is strongly recommended and call for additional help.
- Increase the oxygen concentration to 100% and begin chest compressions.

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## CORRECT!

B. Infant needs to be intubated and chest compressions started. Oxygen concentration should be increased to 100%.

- The correct answer is "B"
- If the heart rate remains less than 60 bpm despite at least 30 seconds of PPV that inflates the lungs (chest movement), insertion of an alternative airway (endotracheal tube or laryngeal mask) is strongly recommended and call for additional help.
- Increase the oxygen concentration to 100% and begin chest compressions.

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## SCENARIO

- The infant is successfully intubated (equal bilateral breath sounds heard and carbon dioxide detector has color change to yellow). The infant is now 2 minutes old.
- You provide chest compressions (compression depth is approximately one-third of the anterior-posterior diameter of the chest with coordinated compressions and ventilations: 3 compressions + 1 ventilation every 2 seconds) for 1 minute with 100% oxygen and recheck heart rate after the 1 minute. The infant is now 3 minutes old.
- The heart rate is 120 bpm and pre-ductal saturation is 80%. The baby remains apneic.

What should be your next step with resuscitation?

A. Stop chest compressions. Continue to provide PPV via endotracheal tube at a rate of 40-60 breaths per minute. Decrease oxygen to 90% and continue to wean as oxygen saturations permit.

B. Continue chest compressions with 100% oxygen and provide PPV at a rate of 40-60 breaths per minute.

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## CORRECT!

A. Stop chest compressions. Continue to provide PPV via endotracheal tube at a rate of 40-60 breaths per minute. Decrease oxygen to 90% and continue to wean as saturations permits.

- The correct answer is "A"
- Stop chest compressions when the heart rate is 60 bpm or higher.
- Once chest compressions are stopped, return to giving PPV at the faster rate of 40-60 breaths per minute. Count out loud to help maintain the correct rate. Use the rhythm, Breathe, Two, Three; Breathe, Two, Three.
- Baby is on 100% oxygen during chest compressions. Guided by pulse oximetry, adjust the oxygen concentration to maintain the baby's minute-specific oxygen saturation within the target range. The goal is to prevent hypoxia without using excess oxygen and exposing the newborn to the potential risks of hyperoxia.

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## INCORRECT

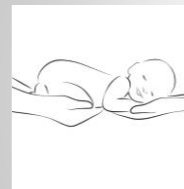
B. Continue chest compressions with 100% oxygen and provide PPV at a rate of 40-60 breaths per minute.

- The correct answer is "A"
- Stop chest compressions when the heart rate is 60 bpm or higher.
- Once chest compressions are stopped, return to giving PPV at the faster rate of 40-60 breaths per minute. Count out loud to help maintain the correct rate. Use the rhythm, Breathe, Two, Three; Breathe, Two, Three.
- Baby is on 100% oxygen during chest compressions. Guided by pulse oximetry, adjust the oxygen concentration to maintain the baby's minute-specific oxygen saturation within the target range. The goal is to prevent hypoxia without using excess oxygen and exposing the newborn to the potential risks of hyperoxia.

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## NEONATAL RESUSCITATION



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[www.ncbi.nlm.nih.gov/pmc/articles/PMC2991653](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2991653)

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## NRP 8<sup>TH</sup> EDITION

American Academy of Pediatrics  
DEDICATED TO THE HEALTH OF ALL CHILDREN



- In June 2021, the American Academy of Pediatrics and American Heart Association will release the 8<sup>th</sup> Edition of the Neonatal Resuscitation Program
- The NRP 8<sup>th</sup> edition material may be used beginning in June 2021; however, NRP 7<sup>th</sup> edition material may be used until December 31, 2021. NRP 8<sup>th</sup> edition materials must be implemented by January 1, 2022.

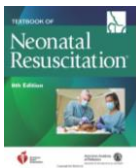
<https://download.aap.org/DOCS/NRP/2021/2021NRP%20Program%20June%202021.pdf>

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Figure 1

Neonatal Resuscitation Program® 8th Edition Algorithm



<https://download.aap.org/DOCS/NRP/2021/2021NRP%20Program%20June%202021.pdf>

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## NRP 8<sup>TH</sup> EDITION PRACTICE CHANGES THE CURRICULUM: NRP ESSENTIALS AND NRP ADVANCED

- The NRP steering committee made the decision to offer two course options so that NRP providers could excel in the course material most relevant to their role and personnel resources
- Each organization will decide who should be NRP Essential providers and who should be NRP Advanced providers
- If a licensed healthcare professional is unsure about which NRP level to take, they should probably choose NRP Advanced.



<https://download.aap.org/DOCS/NRP/2021/2021NRP%20Program%20June%202021.pdf>

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## NRP ESSENTIALS VS NRP ADVANCED

### NRP Essentials:

- For anyone involved in the care of a newborn
- The participant will be responsible for the material in Lessons 1 through 4 only
- NRP Essentials is most appropriate for those assigned responsibility for the newborns at birth when there are no apparent perinatal/neonatal risk factors and for those who care for healthy newborns at birth
- NRP Essentials may not be appropriate for health care professionals who will participate in resuscitation beyond positive-pressure ventilation

### NRP Advanced:

- For anyone expected to participate in resuscitation beyond PPV
- The participant will be responsible for the material in Lessons 1 through 11.
- NRP Advanced is suited for health care professionals who serve as members of the resuscitation team in the delivery room or in other settings where complex neonatal resuscitation is required
- NRP Advanced may also be appropriate for health care professionals in smaller hospital facilities with fewer personnel where most health care professionals who attend births or care for newborns are expected to participate in newborn resuscitation

<https://download.aap.org/DOCS/NRP/2021/2021NRP%20Program%20June%202021.pdf>

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## PROVIDER COURSE FORMAT

- The NRP Provider course requirements include an online exam, skills evaluation, and simulation and debriefing.
  - The 8<sup>th</sup> edition does not include eSim cases.
- The NRP 8<sup>th</sup> edition suggests the use of two course formats, suitable for Essentials and Advanced learners.



<https://download.aap.org/DOCS/NRP/2021/2021NRP%20Program%20June%202021.pdf>

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## CORE DEFINITIONS

- Hypoxic  
limitation of oxygen in the tissues
- Ischemic  
limitation of blood flow in the tissues/brain/organs
- Encephalopathy  
brain injury/disease
- All may happen around the time of birth

Zavits S et al. Pediatrics July 18, 2018 <https://www.pediatrics.com>

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## OTHER TERMS FOR HIE

Birth Injury	Birth Asphyxia	Neonatal Encephalopathy	Perinatal Asphyxia
<ul style="list-style-type: none"> <li>Brachial plexus</li> <li>Bone fracture (clavicle)</li> <li>Decrease oxygen to brain</li> <li>Failure to notice fetal distress</li> <li>Obstruction of oxygen/blood to/from placenta</li> <li>Damage to facial nerve</li> </ul>	<ul style="list-style-type: none"> <li>Decrease oxygen and CO<sub>2</sub> exchange</li> <li>Acidosis</li> <li>Increase deaths/long term disabilities</li> </ul>	<ul style="list-style-type: none"> <li>Seizures</li> <li>Altered LOC</li> <li>Abnormal respiratory effort</li> </ul>	<ul style="list-style-type: none"> <li>Conception-28 days of life</li> </ul>

Zavits S, MD et al. Pediatrics July 18, 2018  
Politis E & Bower C. Pediatric Research (2018) 84:574

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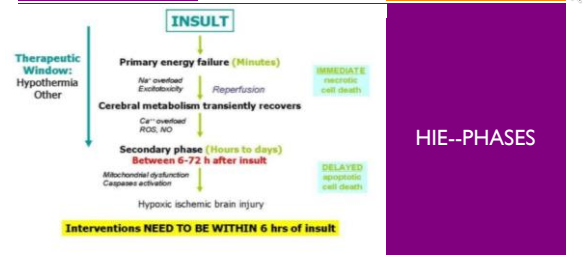
## INCIDENCE OF HIE

Occurs in 1.5-2.5/1,000 live births	Mortality rate 25-50% (term infants)	Morbidity 25%	Incidence of cerebral palsy 15-28%
-------------------------------------	--------------------------------------	---------------	------------------------------------

Savina A Zavits, MD. Pediatrics July 2018

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Allen, K. et al. FAAN Newborn and Infant Nursing Review, 2011 Sept 1 (1) 125-133

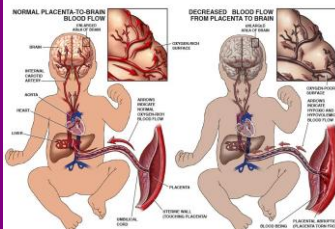
Lita T Worden, MD, and Shannon L. Massey, MD, PGCE. Practical Neurology March 2020

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## ACUTE PERINATAL

- Maternal/fetal hemorrhage
- Blood clotting disorders
- Abruption
- Umbilical Cord
- Knots/clots
- Prolapse/compression
- Trauma during delivery
- Shoulder dystocia
- Cardiac arrest



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## CRITERIA FOR NEONATAL THERAPEUTIC HYPOTHERMIA

- Candidates for Whole Body Cooling
- ≥ 36 weeks Gestation
- ≥ 1800 grams
- pH ≤ 7 or base deficit > 16 mmol/L
- Acute Perinatal event
- Apgar ≤ 5 at 10 minutes after birth
- Continued need for PPV or intubated at 10 minutes of birth
- Abnormal neurological clinical exam

## CANDIDATE FOR THERAPEUTIC / NEUROPROTECTIVE HYPOTHERMIA CHECKLIST

Clinical Information	Criteria	Checklist
Birth date	≥ 36 weeks gestation	<input type="checkbox"/>
Weight	≥ 1800 grams	<input type="checkbox"/>
pH	pH ≤ 7.0	<input type="checkbox"/>
Base deficit	Base deficit > 16 mmol/L	<input type="checkbox"/>
Acute perinatal event	Acute perinatal event (check all that apply)	<input type="checkbox"/>
Apgar	Apgar ≤ 5 at 10 minutes	<input type="checkbox"/>
Continued need for PPV or intubated	Continued need for PPV or intubated at 10 minutes	<input type="checkbox"/>
Abnormal neurological clinical exam	Abnormal neurological clinical exam	<input type="checkbox"/>

© 2015 The U.S.A.A.S. Hypothermia - 4th edition. Reproduced with permission. www.hypothermia.org

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Differential		Dx	
<b>Sedatives</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms
<b>Seizures</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms
<b>Lowest of concern</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms
<b>Spontaneous</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms
<b>Prostate</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms
<b>Tumor</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms
<b>Prostate</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms
<b>Autonomic system</b>	None	Common history of alcohol use	Unlikely, given no significant recent changes in symptoms

Figure 3. Neurological exam to establish confidence for diagnosis; neurological exam for diagnosis.

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# EXCLUSION CRITERIA

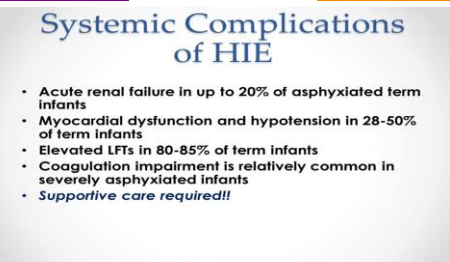
- Birth weight < 2000g
- Gestational age < 36 weeks
- Inability to initiate cooling by 6 hours
- Chromosomal/congenital anomaly
- Severe Intrauterine Growth Retardation

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CLINICAL STAGES OF HIE: SARNAT GRADING SCALE			
TABLE 1: SARNAT SCORING OF NEONATAL ENCEPHALOPATHY, CLINICAL FEATURES*			
Category	Mild Encephalopathy (Stage 1)	Moderate Encephalopathy (Stage 2)	Severe Encephalopathy (Stage 3)
<b>Central Nervous System</b>			
Level of consciousness	Hypertensive	Lethargic or obtunded	Stuporous or coma
Seizures	None	Common	Variable
<b>Primitive Reflexes</b>			
Suck	Weak	Weak or incomplete	Absent
Moro	Strong	Weak or incomplete	Absent
Oculo-vestibular	Normal	Overactive	Weak or absent
<b>Autonomic System</b>			
Pupils	Dilated	Constricted	Variable; poor light response
Heart rate	Tachycardia	Bradycardia	Variable
Severities	Normal	Excessive	Variable
Gastrointestinal motility	Normal or mildly decreased	Increased	Variable
<b>Neuroanatomical</b>			
Tone	Normal	Hypotonia	Absent
Posture	Mild distal flexion	Spontaneous distal flexion	Decerebrate (intermittent)
Myeloclonus	Present	Flaccid	Flaccid

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# Systemic Complications of HIE

- Acute renal failure in up to 20% of asphyxiated term infants
- Myocardial dysfunction and hypotension in 28-50% of term infants
- Elevated LFTs in 80-85% of term infants
- Coagulation impairment is relatively common in severely asphyxiated infants
- *Supportive care required!!*

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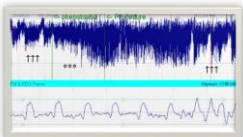
Zurull, L MD Messages July 2018

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# ASSESSMENT TOOLS

- Electroencephalogram (EEG)
  - "Gold standard"
  - Insight about brain function
  - Detects neonatal seizures
- Amplitude integrated Electroencephalography (aEEG)
  - Distinguishes mild from moderate neonatal seizures



"Saw-tooth" appearance due to frequent seizures (arrows) and moderately abnormal aEEG trace after phenobarbital (paracetamol).

Orman, A, et al. *International Journal of Neurology Research*; Vol 4 No1 (2018)

Ahame, C., et al. *World Journal of Clinical Pediatrics*, 2014 Feb 8; 3(1):87-74

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# ASSESSMENT TOOLS

Neuroimaging

- Magnetic Resonance Imaging (MRI)
  - Detects early changes
- CT Scan
- Cranial Ultrasound
  - Less sensitive to structural abnormalities




Figure 17-47 and 17-48 Pathways & Clinical Neurosciences, 10th Edition, Copyright 2014 Elsevier Inc. 978-0-323-07642-2

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## LABORATORY TESTS

- Electrolytes
- Complete Blood Count with Differential
- Arterial blood gas
- Liver and Cardiac Enzymes
  - Serum Creatinine
- Blood Cultures
- Coagulation Studies



Yoonis Wu, MD, MPH  
Clinical features, diagnosis, and treatment of neonatal encephalopathy

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## COOLING TO TREAT HIE

- Temperature 33.5 degrees Celsius
  - Temperature is sustained for 72 hours
- Decrease metabolic rate
- Brain cells recover



Priya Chugta, W PhD, CRNP et al., Academy of Pediatrics Volume 36 Number 10, October 2015, www.aapress.org

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## MECHANISM OF ACTION

- Reduction in brain metabolic rate
- Reduces adverse effects on cerebral blood flow
- Reduce threshold for oxygen delivery/glucose utilization
- Blocks excitotoxic mechanisms
- Preserves protein synthesis
- Ameliorate inflammation
- Reduce Apoptosis

Yong-Jian, Suk, et al. Neuroprotection by Therapeutic Hypothermia.  
Frontiers in Neurosciences 2019 Jun 11;13:586

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## THERAPEUTIC NEUROPROTECTIVE HYPOTHERMIA

- |                        |                         |
|------------------------|-------------------------|
| ▪ Passive              | ▪ Active                |
| ▪ Referral Facility    | ▪ Transport Team        |
| ▪ No special equipment | ▪ Specialized Equipment |
| ▪ Monitor              | ▪ Receiving Facility    |
|                        | ▪ Monitor               |

Chang, M. et al., Pediatrics and Neurology REVIEW ARTICLE VOLUME 58, ISSUE 6, P475-483, DECEMBER 01, 2017  
Rabin Mousli, Journal of Clinical Neurology 2012 Apr-Jun 1(2): 101-106 Whole Body Cooling for Infants with Hypoxic-Ischemic Encephalopathy

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## BLANKETROL III UNIT



Ganther Medical Products

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## COOLING PROCESS

- Within 6 hours of birth
- Whole body cooling therapy
- Core body temperature between 33.5°C and 34.5°C
- Cool for 72 hours
- Supportive Care
- Documentation

Rabin Mousli, Journal of Clinical Neurology 2012 Apr-Jun 1(2): 101-106 Whole Body Cooling for Infants with Hypoxic-Ischemic Encephalopathy

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## WHAT TO EXPECT

- Infants will feel cool
- Increased blood pressure
- Lower cardiac output
- Lower heart rate
- Lab work

Kula Msaal, Journal of Clinical Neurology 2012 Apr-Jun 10(1): 151-156  
Whole Body Cooling for Infants with Hypoxic-Ischemic Encephalopathy

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## REWARMING PROCESS

- Begin after 72 hours of cooling
- Slow rewarming
  - Temperature goal 36.5°C
- Monitor/Document

Kula Msaal, Journal of Clinical Neurology 2012 Apr-Jun 10(1): 151-156  
Whole Body Cooling for Infants with Hypoxic-Ischemic Encephalopathy

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## REFERRING FACILITY RESPONSIBILITIES

- Early Determination
  - Perinatal event
  - Abnormal neurological exam
  - Acid base status
- Early Consultation with RPC
- Stabilization
- Arrange for transport
- Passive cooling



Wabara Price-Douglas, PhD, CRNP and Caraculio J. Fernandez, MD, MBBS, FAAP.  
Academy of Pediatrics Volume 96 Number 10, October 2015. [www.aapublications.com](http://www.aapublications.com)

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## TECOTHERM



Cooling—using TECOTHERM NEO in transport. Starship Child Health 26 January 2021

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## PROGNOSTICATION AND FOLLOW-UP

### Prognosis

- Motor, behavioral, neurological outcomes improved
- Reduces outcome of death at 18 months to 2 years

### Follow-up

- MRI and EEG
- Programs

World Journal of Clinical Pediatrics 2018 Feb 8(3):1-7

Gu Y, Winkler, MD, and Shawcross L, Masey MD, MDCE, Pediatric Neurology March 2020

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## ADDITIONAL THERAPIES

- Antiepileptic drugs
- Erythropoietin
- Melatonin
- Xenon

Hypothermia and Neonatal Encephalopathy COMMITTEE ON FETUS AND NEWBORN  
Pediatrics June 2014;133(6):1146-1150 DOI:10.1542/peds.2014-0899

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## CONCLUSION

- Early detection/diagnosis
- Begin cooling therapy (passive/active)
- Monitor/Document

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## SCENARIO CONTINUED

- While the neonate was being cared for, the Obstetric provider and the labor & delivery nurse remained at the bedside of the woman.
- 15 minutes after delivery the nurse notes that the uterine fundus is boggy and notes a large amount of bleeding with fundal massage
- The nurse weighs the chux pad and notes 600 gm of blood (1ml = 1gm)
- The nurse also notes that there was a 400 ml blood loss at delivery.

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## SCENARIO

- Answer the following statement as True or False:  
"The patient's cumulative blood loss is consistent with the definition of postpartum hemorrhage."

A. True

B. False

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## CORRECT!

"The patient's cumulative blood loss is consistent with the definition of postpartum hemorrhage."

A. True

- The correct answer is "A" – True
  - The current blood loss of 600 ml plus 400 ml yields a cumulative blood loss of 1000ml.
- ACOG's definition of Postpartum Hemorrhage is: "A blood loss of greater than or equal to 1,000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process regardless of route of delivery"

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## INCORRECT

"The patient's cumulative blood loss is consistent with the definition of postpartum hemorrhage."

B. False

- The correct answer is "A" – True
  - The current blood loss of 600 ml plus 400 ml yields a cumulative blood loss of 1000ml.
- ACOG's definition of Postpartum Hemorrhage is: "A blood loss of greater than or equal to 1,000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process regardless of route of delivery"

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## POSTPARTUM HEMORRHAGE



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## DEFINING POSTPARTUM HEMORRHAGE

- "The American College of Obstetricians and Gynecologists' (ACOG) reVITALize program defines **postpartum hemorrhage** as cumulative blood loss greater than or equal to 1,000 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."



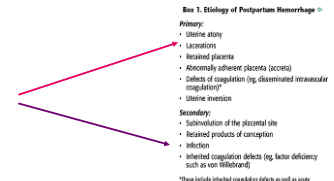
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## CAUSES FOR POSTPARTUM HEMORRHAGE

- It is important when assessing blood loss to determine the etiology in order to appropriately respond to the hemorrhage.



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## RISK FACTORS

Table 1. Antepartum and Intrapartum Risk Factors for Postpartum Hemorrhage<sup>1</sup>

Etiology	Primary Problem	Risk Factors, Signs
Abnormalities of uterine contraction—atony	Atonic uterus	Prolonged use of oxytocin High parity Chorioamnionitis General anesthesia Twin or multiple gestation Polyhydramnios Macrosomia
	Over-distended uterus	
	Fibroid uterus	Multiple uterine fibroids
	Uterine inversion	Excessive umbilical cord traction Short umbilical cord Rapid retraction of the placenta
Cervical tract trauma	Episiotomy Cervical, vaginal, and perineal lacerations	Operative vaginal delivery Precipitous delivery
Retained placental tissue	Retained placenta Placenta accreta	Subchorionic placenta Previous uterine surgery Incompetent placenta at delivery
Abnormalities of coagulation	Preeclampsia Inherited clotting factor deficiency (von Willebrand, hemophilia) Severe infection Anesthetic fluid embolism Excessive cryoprecipitant replacement Thrombotic thrombocytopenic syndrome	Neutropenia Fever Fetal death Placental abruption Fetus, signs Hemorrhage Current thrombocytopenia treatment

Modified from New South Wales Ministry of Health. Maternity—prevention, early recognition and management of postpartum hemorrhage (PMH). Risk factors. South Sydney. NSW Ministry of Health. 2016. Available at: [http://newswest.health.nsw.gov.au/pmh/clinical/PMH/PMH\\_094.pdf](http://newswest.health.nsw.gov.au/pmh/clinical/PMH/PMH_094.pdf). Retrieved July 24, 2017. Copyright 2017.

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## RISK ASSESSMENT TOOLS

- This tool is from CMQCC (California Maternal Quality Care Collaborative)

*Risk Assessment should be repeated throughout labor and postpartum period*

Table 2. Example of Risk Assessment Tool<sup>1</sup>

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	WCT > 30
Uncomplicated uterine	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	

Abbreviations: WCT, hematocrit.

Modified from London A, Lapeere D, Shih M, et al. Improving health care response to obstetric hemorrhage version 2.0. A California quality improvement toolkit. San Francisco, California: California Maternal Quality Care Collaborative, Department of Public Health; 2015.

- Additional risk factors that may develop in labor include:**
  - Prolonged second stage
  - Prolonged oxytocin use
  - Active bleeding
  - Chorioamnionitis
  - Magnesium sulfate treatment
- Additional third stage/postpartum risk factors for hemorrhage stemming from the birth process include:**
  - Vacuum- or forceps-assisted birth
  - Cesarean birth (especially urgent/emergent cesarean)
  - Retained placenta

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CMQCC—California Maternal Quality Care Collaborative

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## MATERNAL ADAPTATION TO HEMORRHAGE

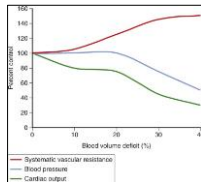


Fig. 18. Relationships Between Systemic Vascular Resistance, Blood Pressure, and Cardiac Output in the Face of Progressive Blood Volume Deficit.

- Loss of 10% of circulatory blood volume
- Vasoconstriction occurs in both the arterial and venous compartments
- Maintains blood pressure and preserves blood flow to essential organs

- Blood loss exceeds 20% of the total blood volume
- Increased systemic vascular resistance can no longer compensate for the lost intravascular volume
- Blood pressure will decrease with a rise in heart rate
- Cardiac output falls due to loss in preload
- Can result in poor end-organ perfusion and maternal shock if the intravascular volume is not replaced

London, Mark, et al. Gable's Obstetrics: Normal and Problem Pregnancies 8th Edition 2021 Elsevier

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## CLASSIFICATION OF HEMORRHAGE & PHYSIOLOGIC RESPONSE

Class	Amount of Blood Loss	% Lost	Physiologic Response
1	1000 mL	10-15	Dizziness, Palpitations, Minimal blood pressure change
2	1500 mL	20-25	Tachycardia, Tachypnea, Sweating, Weakness, Narrowed pulse pressure
3	2000 mL	30-35	Significant tachycardia and tachypnea, Restlessness, Pallor, Cool extremities, Hypotension
4	≥ 2500 mL	40	Shock, Air hunger, Oliguria or anuria

Adapted from Gabbe's Obstetrics Table 18.1

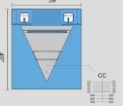
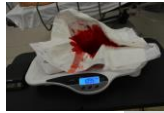
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## QUANTIFICATION OF BLOOD LOSS

- "Accurate measurement of blood loss is essential for 1) recognizing potentially life-threatening hemorrhage and 2) managing blood product replacement."<sup>1</sup>
- "QBL is an objective method used to evaluate excessive bleeding. Methods to quantify blood loss, such as weighing, are significantly more accurate than EBL. The use of a calibrated drape had an error rate of less than 15%. QBL reduces the likelihood that clinicians will underestimate the volume of blood lost and delay early recognition and treatment."<sup>2</sup>



1. ACOG Committee Opinion # 794: Quantitative Blood Loss in Obstetric Hemorrhage, December 2019

2. AMYCHIN Practice Brief - Quantification of Blood Loss, AMYCHIN Practice Brief Edition 1

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## QUANTIFICATION OF BLOOD LOSS

- The American College of Obstetricians and Gynecologists makes the following recommendations and conclusions:<sup>1</sup>
- Quantitative methods of measuring obstetric blood loss have been shown to be more accurate than visual estimation in determining obstetric blood loss.
- Studies that have compared visual estimation to quantitative measurement have found that visual estimation is more likely to underestimate the actual blood loss when volumes are high and overestimate when volumes are low.
- Although quantitative measurement is more accurate than visual estimation for identifying obstetric blood loss, the effectiveness of quantitative blood loss measurement on clinical outcomes has not been demonstrated.
- Implementation of quantitative assessment of blood loss includes the following two items: 1) use of direct measurement of obstetric blood loss (quantitative blood loss) and 2) protocols for collecting and reporting a cumulative record of blood loss postdelivery.
- Interprofessional protocols for the assessment of blood loss, including quantitative assessment, for both vaginal and cesarean births are best developed by a multidisciplinary team.
- Successful obstetric hemorrhage bundle implementation is associated with improved outcome measures related to obstetric hemorrhage. However, further research is necessary to better evaluate the particular effect of quantitative blood loss measurement in reducing maternal hemorrhage-associated morbidity in the United States.

1. ACOG Committee Opinion # 794: Quantitative Blood Loss in Obstetric Hemorrhage, December 2019

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## QBL



### Box 1. Tips for Quantification of Blood Loss During Vaginal Delivery

Quantification of maternal blood loss is a team effort.

1. Create a list of all attempts to estimate blood loss. Include blood soaked pads, dressings, and any loss to collection blood loss.
2. Begin quantification of blood loss immediately after the placenta and membranes delivery of the placenta and uterus and record the amount of fluid collected in a calibrated under-belly drape. There is no need to add the fluid collected under the drape to the placenta in the drape. Add the fluid volume collected in the drape to the blood volume measured by weighing soaked pads to determine the cumulative volume of blood loss or quantification of blood loss.
3. Weigh all blood-soaked materials and add to cumulative volume (2 gram weight = 1 mL after blood clotting).
4. Measure the postpartum fluid volume from the postpartum drape. Add the volume to the cumulative volume of blood loss. Do not use the drape. Measure the fluid volume from the drape. Add the fluid volume to the cumulative volume of blood loss.
5. The expected total volume of blood loss is 500 mL. The expected total volume of blood loss is 500 mL. The expected total volume of blood loss is 500 mL.
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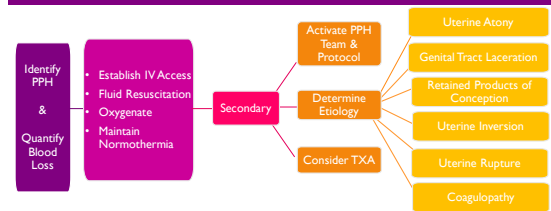
### Box 2. Tips for Quantification of Blood Loss During Cesarean Birth

1. Begin the process of quantification of blood loss after the amniotic membranes are ruptured or after the fetus is born.
2. Suction and measure of amniotic fluid within the suction canister or collection fluid before delivery of the placenta.
3. After removal of the placenta, measure the amount of fluid in the suction canister and add to the amount of fluid in the drape. The amount of fluid in the drape will be accounted for. Add the fluid volume to the cumulative volume of blood loss.
4. Before adding irrigant fluid, ensure that the suction canister is empty. If irrigant fluid is added, the amount of irrigant fluid will be accounted for. Add the fluid volume to the cumulative volume of blood loss.
5. One of two methods can be used to measure the irrigant fluid. Measure the volume of irrigant fluid in the suction canister. Add the volume to the cumulative volume of blood loss. Measure the volume of irrigant fluid in the suction canister. Add the volume to the cumulative volume of blood loss.
6. Weigh all blood-soaked materials and add to cumulative volume (2 gram weight = 1 mL after blood clotting).
7. In the end of the surgery, with the volume of amniotic fluid collected by weight with its volume of quantified fluid in the suction canister to determine total quantification of blood loss.
8. Add the fluid volume to the cumulative volume of blood loss. Add the fluid volume to the cumulative volume of blood loss. Add the fluid volume to the cumulative volume of blood loss.
9. The expected total volume of blood loss is 500 mL. The expected total volume of blood loss is 500 mL. The expected total volume of blood loss is 500 mL.
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Committee Opinion # 794: Quantitative Blood Loss in Obstetric Hemorrhage, December 2019

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## ALGORITHM FOR MANAGEMENT OF GENERAL POSTPARTUM HEMORRHAGE



Adapted from Figure 18.12 Algorithm for Management of General Postpartum Hemorrhage, Landon, et al., Gable's Obstetrics: Normal and Problem Pregnancies 9th Edition 2021, Elsevier

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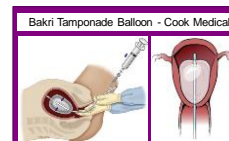
## OB HEMORRHAGE MEDICATIONS

Drug	Dose	Frequency	Contraindication	Adverse Effects	Storage
Pitocin (Oxytocin)	IV: 10-40 units per 500-1000 mL as continuous infusion Or: 10 units	Continuous	Rare: Hypersensitivity to Drug	Usually none. Nausea, vomiting, hypotension with prolonged duration. Hypotension can result from IV push which is not recommended	Room Temp
Methergine (Methylergonovine)	IM: 0.2 mg	Q2-4 hours	Hypertension, Preeclampsia, Cardiovascular disease, hypersensitivity to drug	Nausea, vomiting, severe hypertension particularly when given IV which is not recommended	Refrigerate Protect from light
Hemabate (15-methyl PGF <sub>2</sub> )	IM: 0.25 mg	Every 15-90 minutes, eight doses maximum	Asthma. Relative contraindication for hypertension, or active hepatic, pulmonary or cardiac disease	Nausea, vomiting, diarrhea, fever (transient), headache, chills, shivering, hypertension, bronchospasm	Refrigerate
Cytotec (Misoprostol)	600-1000 micrograms oral, sublingual or rectal	One time	Rare, hypersensitivity to medication or to prostaglandins	Nausea, vomiting, diarrhea, fever (transient), headache	Room Temp
Transcervical Acid (TXA)	1 gram IV over 10 minutes.	One time, may be repeated one time after 30 minutes.			

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## UTERINE TAMPONADE

- Intrauterine tamponade balloons have largely replaced traditional uterine packing
- Multiple balloon types have been used
- Once inserted, it is inflated with sterile saline (maximum of 500 mL)
- The inflated balloon should adapt to the uterine configuration so that adequate tamponade of endometrial surface occurs
- The intrauterine catheter allows drainage from within the uterus so that ongoing assessment of blood loss can take place



Landon, Mark, et al., Gable's Obstetrics: Normal and Problem Pregnancies 9th Edition 2021, Elsevier

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## NEW! JADA SYSTEM

- "Jada establishes a vacuum within the uterus, causing the uterus to collapse onto itself, and the inner uterine walls compress the bleeding vessels. In a clinical study, collapse of the uterus was observed within minutes, with control of bleeding and uterine contraction following soon thereafter."

- Video: <https://youtu.be/9Pnb7GDNppl>



<https://www.alydiahealth.com/jada>

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## ANOTHER NEW DEVICE FOR POSTPARTUM HEMORRHAGE: SPONGE SYSTEM

- Highly compressed medical sponges in a light-weight applicator.
- Use in Trauma: In a bleeding wound, the mini-sponges rapidly absorb blood and expand filling the wound cavity and providing a nearly immediate hemostatic effect
- To use Obstetrics – Needs of Research:
  - Adapt device for uterine deployment
  - Show efficacy in postpartum hemorrhage



Rodriguez MI, Jensen JT, Gregory K, et al. A novel tamponade agent for management of post partum hemorrhage: adaptation of the Jada mini-sponge applicator for obstetric use. BMC Pregnancy Childbirth. 2017;17(1):187. Published 2017 Jun 13. doi:10.1186/s12884-017-1373-x

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## Obstetric Hemorrhage Checklist

Complete all items in this stage plus current stage regardless of stage which the patient presents.

**Postpartum hemorrhage is defined as cumulative blood loss of greater than or equal to 1,000 mL, or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours. However, blood loss greater than 500 mL vaginal delivery is abnormal, and should be investigated and managed as outlined in Stage 1.**

## Recognition:

- Call for assistance (Obstetric Hemorrhage Team)
- Stage 1: ☐ Team leader ☐ Checklist reader/recorder ☐ Primary RN
- Assess: ☐ Cumulative blood loss ☐ Vital signs ☐ Determine stage

**Stage 1: Blood loss >500 mL, after delivery with normal vital signs and lab values. Vaginal delivery.**

## Normal Signs:

- Ensure A&S or A&S IV Access
- Increase IV fluid (crystalloid without electrolyte)
- Reassess bleeding primary culture
- Hand massage

## Medications:

- Ensure appropriate medications given patient history
- Increase oxytocin, additional oxytocin

## Basic Labs:

- Confirm action type and screen and consider crossmatch of 4 units PRBCs

## Actions:

- Determine etiology and treat
- Prepare OR, if clinically indicated (systemic resuscitation/evaluation)

## Oxytocin (Pitocin):

- 10 uL units per 1000 cc, solution

## Methylergonovine (Methergine):

- 0.2 mg tablets (0.2 mg/mL)

## Avoid with hypertension

## Carboprost (Hemabate, Carboprost):

- 250 mcg/mL (0.25 mg/mL) in 10 mL ampules, maximum 6 (6 mg) Avoid with asthma, use with caution with hypertension

## Misoprostol (Cytotec):

- 0.2 mg tablets (0.2 mg/mL) in 10 mL ampules, maximum 6 (6 mg) Avoid with asthma, use with caution with hypertension

## Tone (i.e., atony):

- Tonus (i.e., atony)
- Tonus (i.e., atony)
- Tonus (i.e., atony)

## Thrombin (i.e., coagulation dysfunction):

- Thrombin (i.e., coagulation dysfunction)

\*Use your enter or arrow keys to advance through the images

<https://www.acog.org/-/media/Project/Longways/cyberform/ob-hemorrhage-checklist.pdf>  
Revised 09/2020

Click the "play" button to advance to the next slide.

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## TIMING OF TRANSFUSION THERAPY



- Initiation of transfusion therapy generally is based on estimated blood deficit and ongoing blood loss.
- Recall:
  - Acute changes in hemoglobin or hematocrit will not accurately reflect blood loss
  - Maternal vital signs typically do not change drastically until significant blood loss has occurred
  - Inadequate early resuscitation and hypoperfusion may lead to lactic acidosis, systemic inflammatory response syndrome with accompanying multiorgan dysfunction, and coagulopathy

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## BLOOD BANK:

## Massive Transfusion Protocol (MTP)

In order to provide safe obstetric care, institutions MUST:

- Have a minimum of 4 units of O-negative PRBCs
- Have the ability to obtain 4 units PRBCs & 4 units FFP (type specific) for a bleeding patient
- Have a mechanism in place to obtain platelets & additional products in a timely fashion

Blood transfusion or crossmatching should not be used as a negative quality marker & is warranted for certain obstetric events.

- 1. Patient currently bleeding & at risk for uncontrollable bleeding**
  - Activate MTP – call (800 NUMBER) & say "activate massive transfusion protocol"
  - Massive transfusion dose alert tabs – type & crossmatch – hemoglobin & platelet count, PT (INR), PTT, fibrinogen, & ABO (as needed)
- 2. Immediate need for transfusion (type & crossmatch not yet available)**
  - Give 2-4 units O-negative PRBCs
  - "OB Emergent Release"
- 3. ANTICIPATE ONGOING MASSIVE BLOOD NEEDS**
  - Obtain massive transfusion pack
  - Consider using coolers
  - Administer as needed in a 6-12 hr rate – 4 units PRBCs – 4 units FFP – 4 apheresis pack of platelets
- 4. INITIAL LAB RESULTS**
  - Normal + anticipate ongoing bleeding + repeat massive transfusion pack + bleeding controlled + discontinue MTP
  - Abnormal + repeat massive transfusion pack + repeat lab + consider crossmatching and consultation for alternative coagulation agents (Prothrombin Complex Concentrate (PCC), recombinant Factor VIIa, tranexamic acid)

## Safe Motherhood Initiative

<https://www.acog.org/-/media/Project/Longways/cyberform/ob-hemorrhage-checklist.pdf>

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## MASS TRANSFUSION PROTOCOL: SAMPLE FLOWSHEET

Prisma Health Midlands  
Massive Transfusion Protocol for Obstetrics

Patient ID: \_\_\_\_\_

1. Patient Name: \_\_\_\_\_, DOB: \_\_\_\_\_, MRN: \_\_\_\_\_, Room: \_\_\_\_\_, Bed: \_\_\_\_\_, Date: \_\_\_\_\_, Time: \_\_\_\_\_

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**MASS TRANSFUSION PROTOCOL: SAMPLE FLOW SHEET (FROM PRISMA HEALTH RICHMOND)**

Prisma Health Midlands  
Reactive Transfusion Treatment for Obstetrics

Patient ID: \_\_\_\_\_

**1. Initial Assessment**

Parameter	Value	Unit	Comments
A. Hemoglobin (Hgb)	_____	g/dL	
T. Temperature	_____	°C	
C. Coagulation Profile	_____		

**2. Transfusion Indications**

Indication for transfusion (e.g., Hgb < 7 g/dL, T > 38.5°C, C > 1.5x normal): \_\_\_\_\_

**3. Transfusion Orders**

Product: \_\_\_\_\_  
Volume: \_\_\_\_\_  
Rate: \_\_\_\_\_


**4. Transfusion Monitoring**

Time: \_\_\_\_\_  
Vital Signs: \_\_\_\_\_  
Comments: \_\_\_\_\_

3.08 4/24


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**BLOOD PRODUCTS - OB HEMORRHAGE**




**Packed Red Blood Cells (PRBC)**

- Approx. 150-200 mL volume
- Highly purified (if > 2 units PRBCs given, do for prolonged PT/PTT)
- 1 unit = 150 mL volume




**Fresh Frozen Plasma (FFP)**

- Approx. 150-200 mL volume
- Highly purified (if > 2 units FFP given, do for prolonged PT/PTT)
- 1 unit = 150 mL volume



**Platelets (PLTs)**

- Local variation in time to release may need to come from regional blood bank
- Priority for women with Platelets < 55,000
- Single-donor Apheresis unit (7-8 units of platelets concentration) provides 40-50% transient increase in platelets



**Cryoprecipitate (CRYO)**

- Approx. 10-15 mL volume
- Priority for women with Fibrinogen levels < 85-100 mg/dL (or 1 unit down) raise Fibrinogen 85-100 mg/dL
- Best for DIC with low fibrinogen and high blood volume replacement
- Caution: 10 units come from 10 different donors, so infection risk is proportionate

PRISMA HEALTH

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**SCENARIO CONTINUED**

- The initial quantification of blood loss in our scenario is at 1000 mL.
- Vital Signs:
  - HR: 115
  - RR: 24
  - T: 97.3
  - BP: 110/68
- She begins to complain of feeling light-headed and weak.

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**SCENARIO**

- The most appropriate next steps should include:

**A. Start IV Fluid Bolus**  
Obtain 2<sup>nd</sup> IV  
Collect Laboratory Specimens  
Ensure Empty Bladder  
Uterine Massage  
Administer Hemorrhage Medications

**B. Continue to Monitor Patient**  
Have Patient Get up to Bathroom  
Uterine Massage  
Assist Patient with Breast Pump

PRISMA HEALTH

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**CORRECT!**

**A. Start IV Fluid Bolus**  
Obtain 2<sup>nd</sup> IV  
Collect Laboratory Specimens  
Ensure Empty Bladder  
Uterine Massage  
Administer Hemorrhage Medications

- The correct answer is "A"
- As the patient has had both a cumulative blood loss and is beginning to show signs of hypovolemia, the providers should begin to assess the cause of the blood loss and begin appropriate interventions.

PRISMA HEALTH

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**INCORRECT**

**B. Continue to Monitor Patient**  
Have Patient Get up to Bathroom  
Uterine Massage  
Assist Patient with Breast Pump

- The correct answer is "A"
- Start IV Fluid Bolus, Obtain 2<sup>nd</sup> IV, Collect Laboratory Specimens, Ensure Empty Bladder, Uterine Massage, Administer Hemorrhage Medications
- As the patient has had both a cumulative blood loss and is beginning to show signs of hypovolemia, the providers should begin to assess the cause of the blood loss and begin appropriate interventions.

PRISMA HEALTH

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## SCENARIO

- The nurse notes that the patient's uterus is boggy and notes bright red blood continuing to flow.
  - The patient has a 2<sup>nd</sup> IV and a IV fluid bolus of LR is running
  - The OB Provider is now at the bedside
  - A 2<sup>nd</sup> nurse assists with QBL and notes an additional 50 ml of blood loss
  - Medications – 0.2 mg **Methylergonovine (Methergine)** IM given, 1000 mcg of **Misoprostol (Cytotec)** PR given
- As additional medications are considered to improve uterine tone another medication choice to consider is:

### A. Oxytocin (Pitocin)

### B. TXA – Tranexamic Acid

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**CORRECT!**

### B. Tranexamic Acid

- The correct answer is "B" – Tranexamic Acid
- Tranexamic acid (TXA) is an inhibitor of fibrinolysis and may reduce bleeding in the setting of coagulation abnormalities. Prior studies have shown minimal, if any, benefit for prophylactic use of TXA at cesarean section. The recent WOMAN international randomized controlled trial showed a 31% reduction in death from hemorrhage when 1g of TXA was administered intravenously within 3 hours after the diagnosis of PPH. This trial included over 20,000 women with PPH in a mix of low and high resource countries.<sup>1</sup>

CMQCC – Postpartum hemorrhage toolkit 2.0

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**INCORRECT**

### A. Oxytocin

- The correct answer is "B" – Tranexamic Acid
  - Tranexamic acid (TXA) is an inhibitor of fibrinolysis and may reduce bleeding in the setting of coagulation abnormalities. Prior studies have shown minimal, if any benefit for prophylactic use of TXA at cesarean section. The recent WOMAN international randomized controlled trial showed a 1% reduction in death from hemorrhage when 1g TXA was administered intravenously within 3 hours after the diagnosis of PPH. This trial included over 20,000 women with PPH in a mix of low and high resource countries.<sup>1</sup>
- In the setting of severe postpartum hemorrhage, oxytocin is usually used in the initial response to the hemorrhage as one of the first drugs. At this point in the scenario, other uterotonic medications have been given and giving TXA will help prevent the patient from losing too many of her clotting capacity.

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## DOCUMENTATION & DEBRIEF

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## NURSING DOCUMENTATION

- Nurses document their work and outcomes:
  1. To communicate with health care team
  2. Provide information for accreditation, credentialing, legal, regulatory and legislative, reimbursement, research, and quality activities



- Principles of Documentation Characteristics
  - High Quality Documentation: accessible, accurate, auditable, clear, legible, thoughtful, timely, reflective of nursing process & retrievable
  - All nurses are trained in technical elements of documentation
  - Nurses must be familiar with organization policies and procedures
  - Documentation systems have protection of patient information built in according to appropriate standards
  - Entries are accurate, valid and complete, truthful, dated legible/readable
  - Use standardized terminology

ANA's Principles for Nursing Documentation 2010 - <https://www.nursingworld.org/~42472/globalassets/docs/ana/ethics/principles-of-nursing-documentation.pdf>

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## DOCUMENTATION TIPS

- The process of preparing a complete record of a patient's care, documentation is a vital tool for effective communication among health care team members
  - Accurate, detailed documentation shows the extent and quality of the care that nurses provide, the outcomes of that care, and treatment and education that the patient still needs
  - Thorough, accurate documentation decreases the potential for miscommunication and errors
  - **Computer-based Documentation**
    - Specifically state in the body of your note the time that events occurred and the actions taken
    - Document time as required by your facility, using 24-hour military time or including "a.m." or "p.m."
    - Make sure that no one else can read the screen while you're documenting and log off when you're finished documenting
    - Never share your password
    - Know that most software programs establish an electronic signature based on your personal user password
    - Follow your facility's guidelines for correcting errors
  - **Completing the Procedure**
    - Document your care as soon as possible
    - Document only after provided and never in advance
    - Describe observations and behaviors of the patient
    - Don't offer opinions or use subjective statements or judgments
    - Use correct spelling and grammar
    - Use only approved abbreviations

Summarized from Lippincott Procedures

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