MATERNAL911

Shoulder Dystocia

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Course Description:

Shoulder dystocia cannot always be predicted, but one can prepare for this obstetrical emergency should it occur. This course will explain how to prepare for this situation and what to expect.

Approximate Time to Complete: 25 minutes

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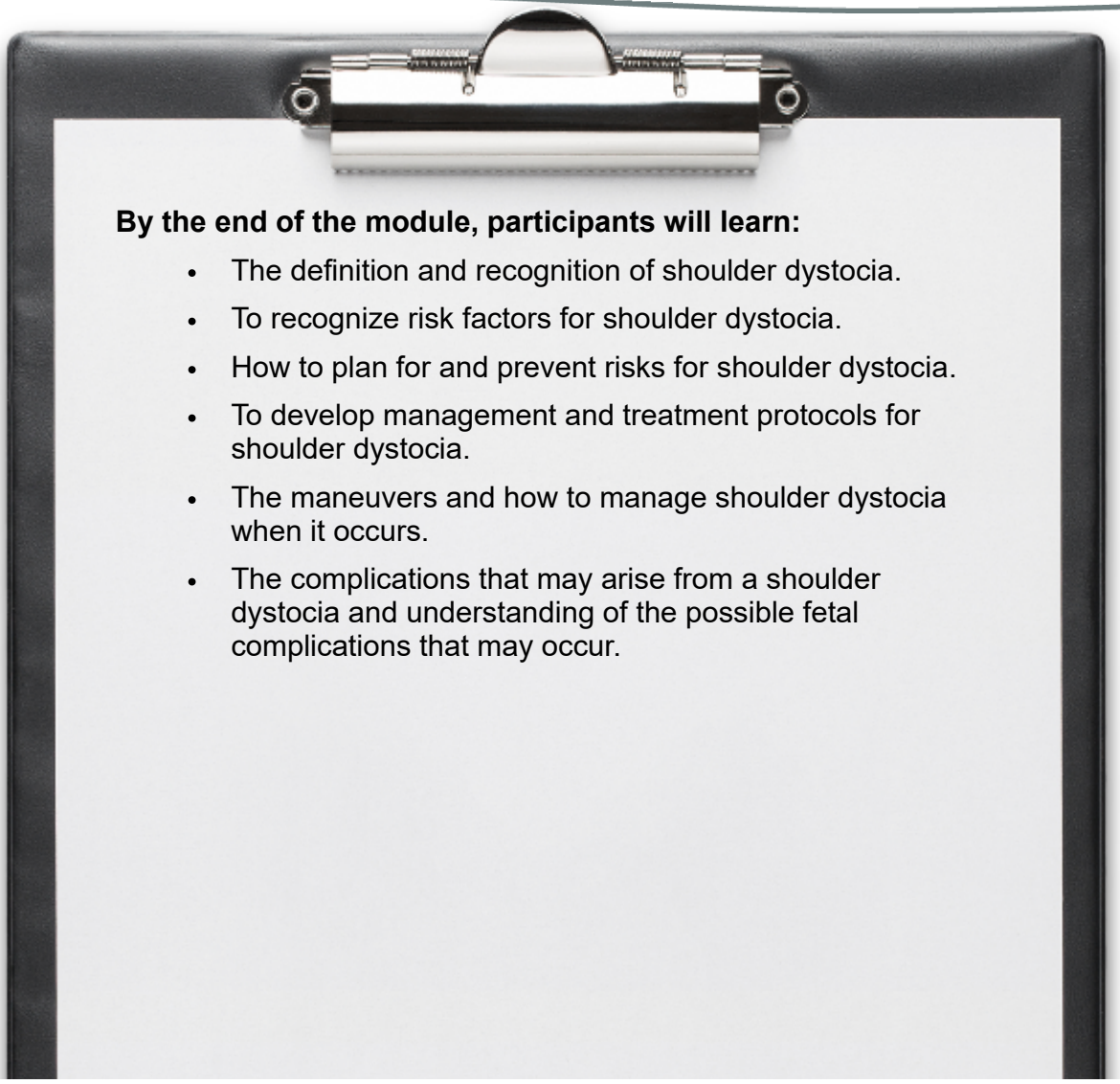


By the end of the module, participants will learn:

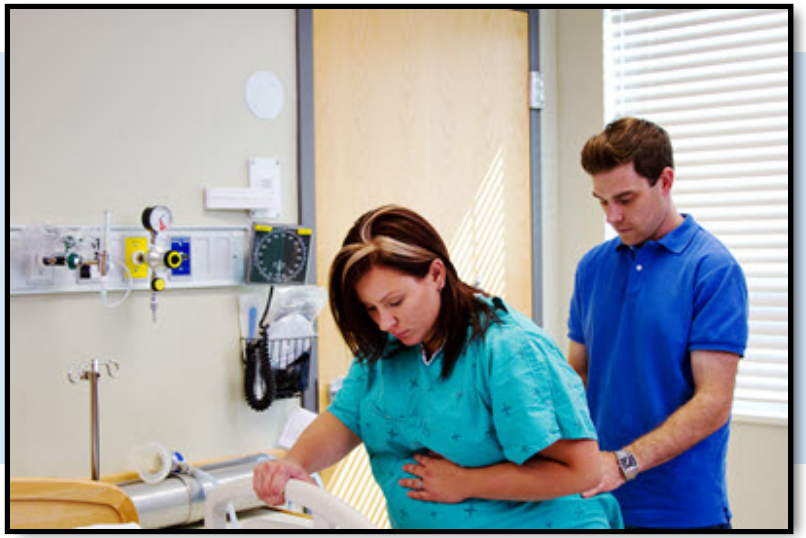
- The definition and recognition of shoulder dystocia.
- To recognize risk factors for shoulder dystocia.
- How to plan for and prevent risks for shoulder dystocia.
- To develop management and treatment protocols for shoulder dystocia.
- The maneuvers and how to manage shoulder dystocia when it occurs.
- The complications that may arise from a shoulder dystocia and understanding of the possible fetal complications that may occur.

MATERNAL911

Shoulder Dystocia

Shoulder dystocia is defined as implementing additional obstetric maneuvers, beyond mild traction, to deliver the fetal shoulders and achieve a vaginal birth. Preventing fetal asphyxia, permanent Erb's palsy, bone fracture, maternal trauma, and death are the goals of management [1].

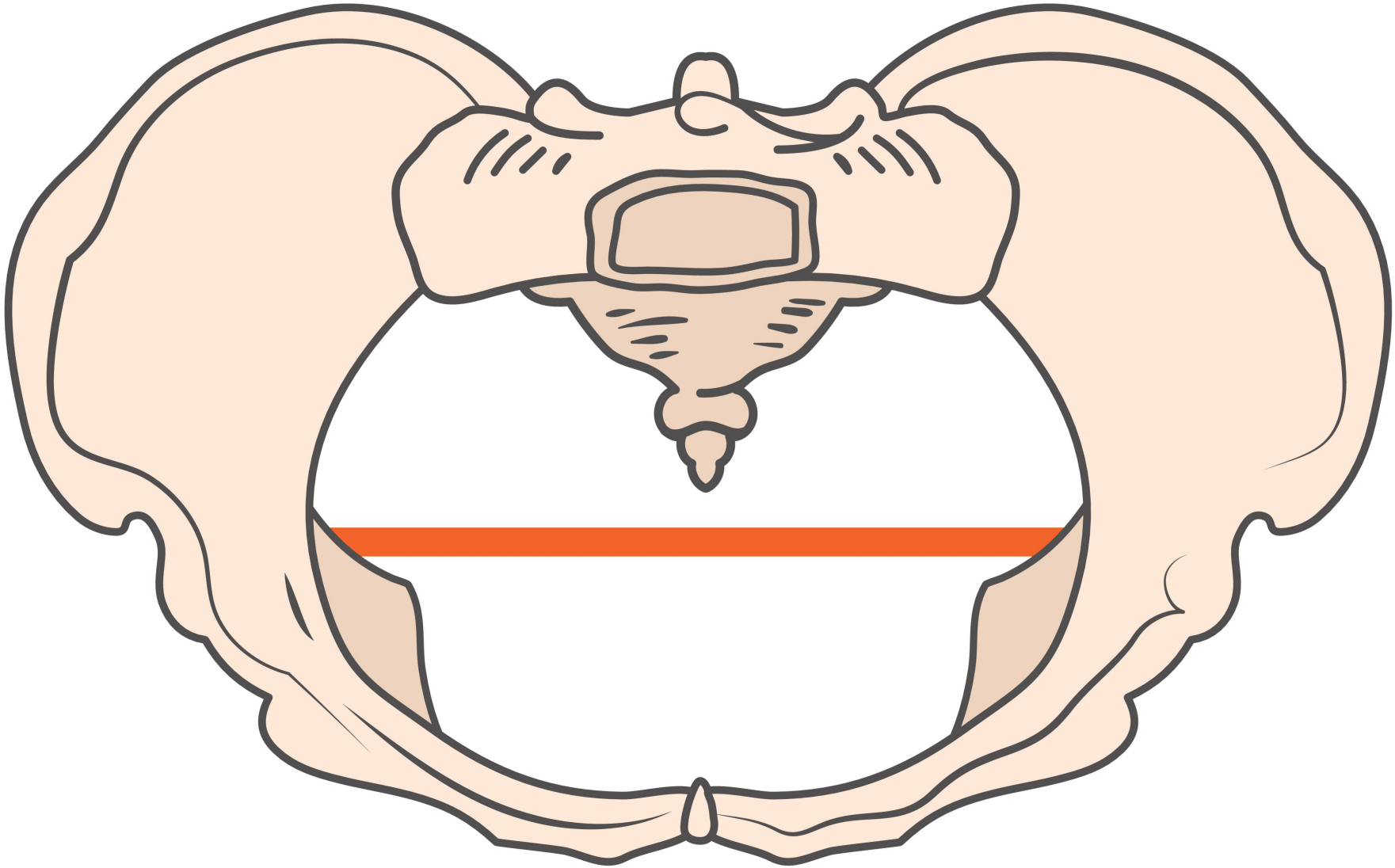
- The fetal shoulders do not deliver spontaneously.
- Shoulder dystocia is caused by the impaction of the anterior fetal shoulder behind the maternal pubic symphysis.
- It can also occur from impaction of the posterior shoulder on the sacral promontory.
- This is an unpredictable and unpreventable obstetrical emergency.



Preconception Risk Factors

- Maternal pelvic diameter is platypelloid
- Maternal pelvic shape/size
- Mother herself was born weighing > 4000g
- History of delivering another child with shoulder dystocia
  - It is predicted that at least 10% of women have a recurrent episode of shoulder dystocia [18].
- Diabetes prior to pregnancy
- A history of a prior macrosomic infant
  - Including history of gestational diabetes in a previous pregnancy
- Short stature
- Maternal obesity
- Multiparity
- Advanced maternal age or first child at an older age [5]

Click the arrows to view all the risk factors.



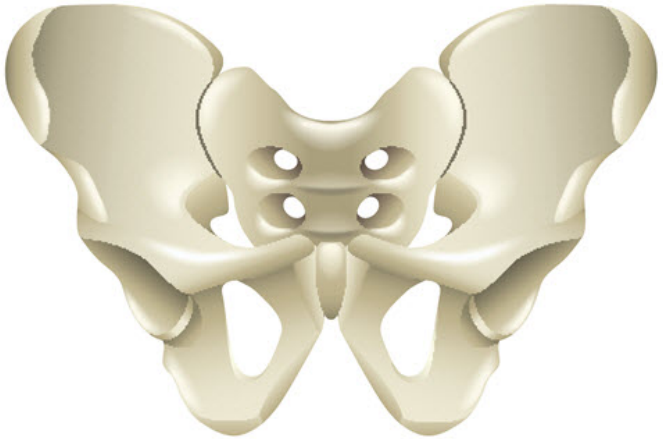
Antepartum Risk Factors

- Diabetes or gestational diabetes
- Excessive maternal weight gain [8,9].
- Maternal obesity and extreme obesity [8,9].
- As birth weight increases to over 4000gms so does the risk of shoulder dystocia [2,10-13].
- Significant risk is associated with birth weight if ≥ 4500 g [14, 15].
- Suspected macrosomia
  - Macrosomia is not an indicator for induction of labor
  - Induction of labor neither prevents shoulder dystocia nor brachial plexus injury
- Male fetus, because 70% of those > 4500gms were male and 51% of all births are male [15].
- Post dates
- Advanced maternal age related to increased occurrence of higher maternal weight and diabetes [16,17].
- Shoulder dystocia recurs in 10% of subsequent pregnancies [18].

Click the arrows to view all the risk factors.

Intrapartum Risk Factors

- Dysfunctional labor contraction pattern, insufficient contractions, myometrial dysfunction, or ineffective pushing efforts for appropriate descent.
- Malposition
- Maternal pelvic structure or soft tissue affects fetal descent into the pelvis.
- The fetal anterior shoulder fails to rotate and becomes impacted behind the mother's symphysis pubis, or the posterior shoulder becomes impacted behind the mother's sacral promontory.
- Macrosomia
- Operative vaginal delivery, vacuum and forceps use are independent risk factors for shoulder dystocia [19].
- Induction of labor
- Epidural analgesia



Click the arrows to view all the risk factors.

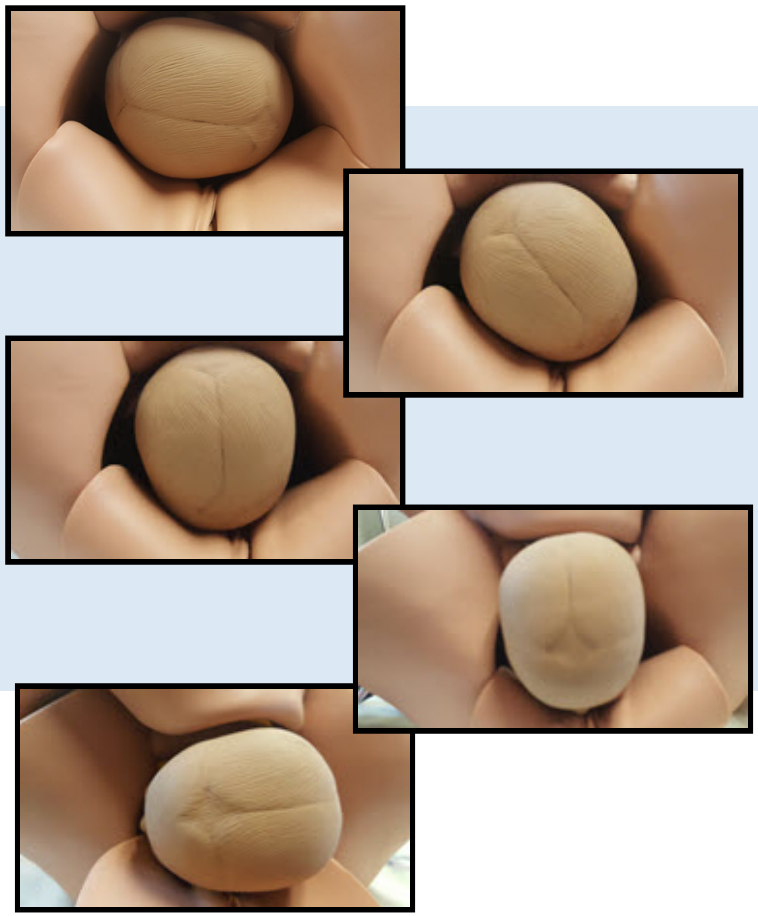
- Shoulder dystocia is an obstetrical emergency occurring in 0.2 to 3% of all births [1].
- In a 1992 population study, the rate of shoulder dystocia increased by 35% in a non-diabetic population in the presence of assisted vaginal birth [2].
- Nearly 50% of all shoulder dystocia occurs in women having no risk factors [2-4].
- Being prepared for this high risk, low occurring event is essential to prevent poor outcomes.

- A moderate number of brachial plexus injuries are not related to shoulder dystocia [1].
- Nearly 4% of brachial plexus injuries occur following a cesarean delivery [1].

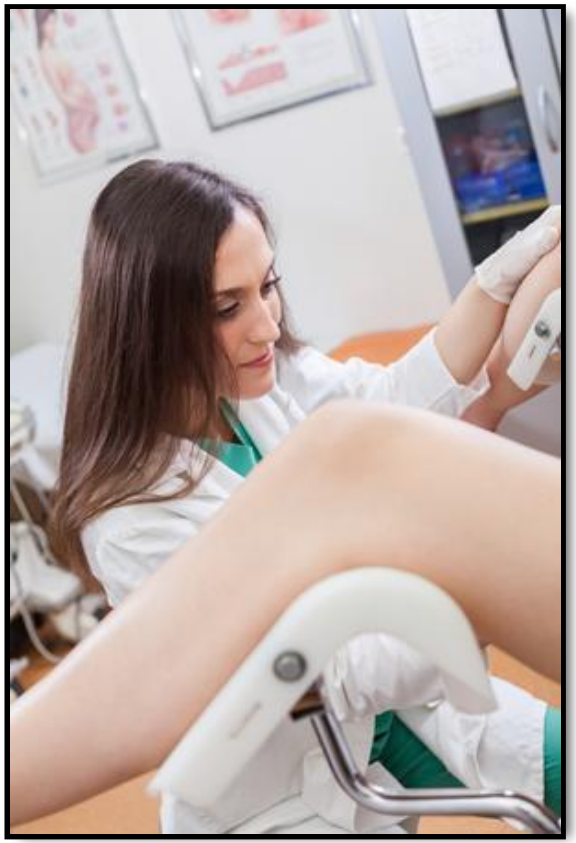
The most common factors associated with cases of shoulder dystocia are [6-7]:

- Macrosomia
- Maternal obesity
- Post-term pregnancy
- Diabetes

- When the fetal shoulders enter the pelvis at an oblique angle, the posterior shoulder is ahead of the anterior one.
- The shoulders then rotate to an anterior-posterior position at the pelvic outlet with external rotation of the fetal head.
- When this occurs, the anterior shoulder will deliver under the symphysis pubis.
- When the anterior-posterior position of the shoulders simultaneously descends into the pelvic inlet, the anterior shoulder can become impacted behind the symphysis pubis or the posterior shoulder may be impacted by the sacral promontory.
- Impaction anteriorly is more common.



Click on any of the photos above to view a video explanation of the cardinal movements.



- Most occurrences of shoulder dystocia will not be predicted or prevented, as most present without risk factors.
- There is no method to identify which fetus will experience shoulder dystocia as ultrasound measurements for macrosomia are estimates and have limited accuracy.
- Delivery room staff must anticipate and recognize shoulder dystocia and proceed through a step-by-step algorithm to accomplish delivery.
- Delivery must occur within an effective time frame to prevent injury to mother, fetus, or both.
- The nurse assigned to a laboring woman who is considered at risk for a shoulder dystocia, based upon preconception, antepartum, or intrapartum risk assessment, should be prepared for this event.
- A discussion with the woman and her support person(s) should include education on the possibility of shoulder dystocia and the maneuvers to dislodge an impacted shoulder.
- A woman who understands may be more receptive to the team leaders' instructions for the different maneuvers.

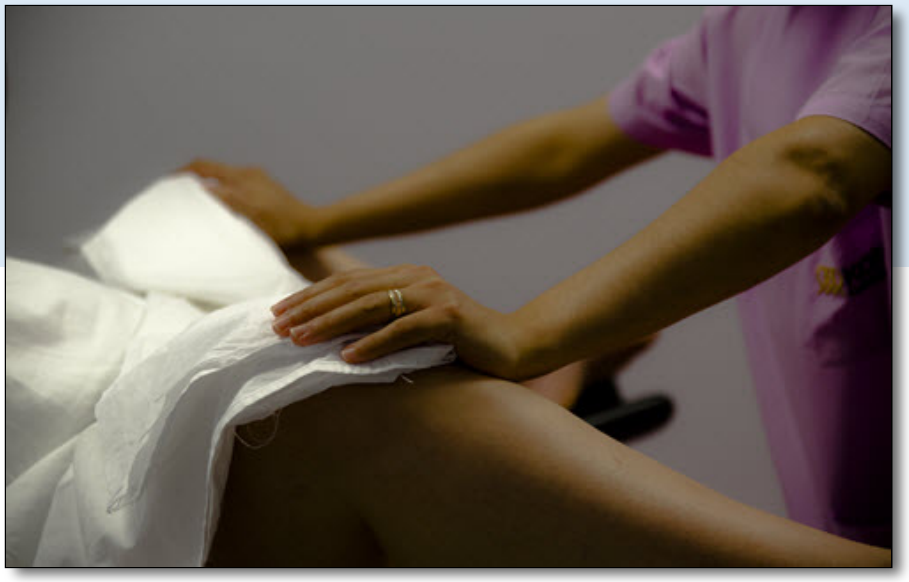
- The health care team may observe the recognizable turtle sign when the presenting head extends and retracts on the mother's perineum with contractions and pushing efforts.
  - Also, spontaneous restitution does not occur and delivery is delayed with good pushing efforts and use of usual maneuvers.
- As soon as the fetal position is identified, a stool should be placed on the side of the bed corresponding to the fetal back.
  - This will alert other team members to apply suprapubic pressure in the direction to the fetal nose causing a decrease in shoulder diameter.

Turtle sign may be present when the presenting head extends and retracts on the mother's perineum with contractions and pushing efforts. This retraction is caused by the baby's anterior shoulder being caught on the maternal pubic bone or the posterior shoulder being caught on the sacral promontory. This presentation is similar to a turtle pulling its head back into its shell.

Click here to watch a video.

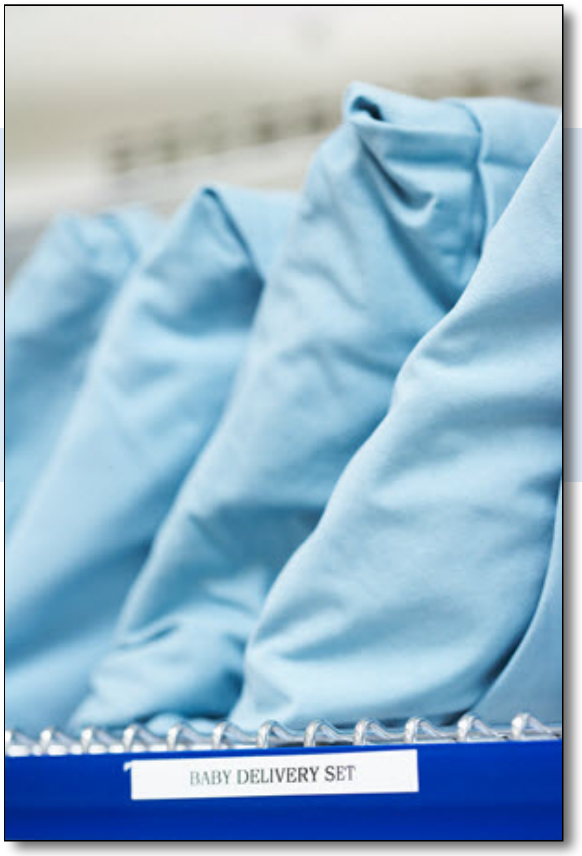
https://www.youtube.com/watch?v=_t4o6G6zoDw

- From the time of fetal head delivery, the clinician has 4 minutes to deliver a previously well-oxygenated term infant until risk of asphyxia occurs [20].
- These maneuvers are intended to displace an impacted anterior shoulder which is behind the maternal symphysis pubis.
- This is accomplished by rotating the fetal torso, which rotates the anterior shoulder, or delivering the posterior arm and shoulder if the fetal torso is not successful in delivery.



- The goal of management, in regards to fetal outcomes, is to prevent asphyxia and umbilical cord compression, avoid physical injury, including but not limited to bone fractures or Erb's palsy, and to prevent death.
- Goal management for the mother includes prevention of injury, including bone fracture or extensive tissue trauma.
- Maternal trauma, however, may occur to prevent permanent injury to her child.

- As with any delivery, the nurse should have standard delivery room equipment set-up and ready for use.
- The set-up and equipment must include:
  - Radiant warmer on and warm
  - Additional linen for use following initial drying
  - Resuscitation equipment checked and ready for use
  - Neonatal medication available for immediate use as needed
  - Supplies to obtain cord blood gases, to document acid-base status of the infant at the time of birth



- Initial steps of management should be implemented when delivery room personnel suspect shoulder dystocia.
- If not already present in the delivery room, additional staff including nurses, anesthesia, obstetric, and pediatric personnel should be summoned.
- Neonatal intensive care unit (NICU) or nursery staff should be alerted to the situation.
- Surgical staff should be notified of the possibility of an emergency cesarean section delivery.

- One nurse will have the sole responsibility of documenting events:
  - Healthcare staff present in the delivery room
  - Time of head delivery
  - Time each maneuver is implemented
  - Time the shoulders are delivered
  - Clear and concise instructions should be verbalized while all staff present in the delivery room remains calm.

- Pushing efforts by the mother should be stopped immediately upon recognition of shoulder dystocia while maneuvers are implemented to reposition the fetus.
- The provider should not provide excessive neck rotation or head or neck traction as these practices may result in stretching and injuring the fetal brachial plexus nerve and further impacting the shoulders.

Initial Stages of Management

"Hands Off"

- A protocol should involve teaching a "hands off" approach involving:
  - avoidance of maternal pushing
  - no traction on the fetal head
  - immediately proceeding to the oblique suprapubic rotation before utilizing any other maneuver

- Fundal pressure is NOT an obstetric maneuver used but with shoulder dystocia its use could lead to further impaction of the shoulders, fractured fetal clavicle, or uterine rupture.
- The maternal bladder should be emptied if distended.
- No one single maneuver is more effective than another but it is suggested to use the least invasive maneuver first.
- The provider will make this decision based upon the fetal presentation and assessment of shoulder dystocia.

Hi! I'm Freda and I'm here to help resolve shoulder dystocia. The next page will give the details of each maneuver.

The maneuvers to assist in resolution of a shoulder dystocia are taught with **FREDA'S HELP**.

- **F** = flex the hips or McRoberts maneuver.
- **R** = rotate the posterior fetal shoulder
- **E** = evaluate for an episiotomy
- **D** = deliver the posterior shoulder (swimmers move)
- **A** = move her onto all fours
- **S** = have suprapubic pressure applied with each maneuver
- **HELP** - call for help once recognized and have help when risk factors present

Deliver Posterior Shoulder

Diagonal orientation of symphysis makes shoulder delivery difficult

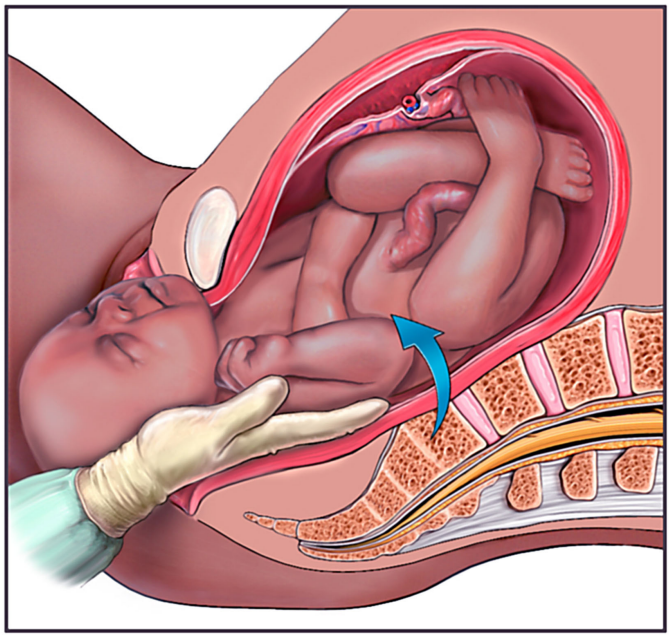
Pelvis tilts, orienting symphysis more horizontally to facilitate shoulder delivery

McRoberts maneuver (hip flexion) is performed first as this is the least invasive and may be all that is needed to dislodge the impacted shoulder [1].

- McRoberts maneuver requires two persons, each holding a maternal leg and flexing the thigh back against the maternal abdomen.
- This maneuver causes cephalad rotation of the symphysis pubis and flattening of the sacrum which removes the sacral promontory as an obstruction site and brings the pelvic inlet into the plane perpendicular to the maximum expulsive force improving pushing efforts.
  - The plane of the maternal pelvis is changed but not the dimensions.
    - This maneuver does not change the measurements of the maternal pelvis.
  - McRoberts position alone has successfully alleviated the shoulder in nearly half of all occurrences of shoulder dystocia [21].
- If McRoberts maneuver is unsuccessful at dislodging the anterior shoulder, it is followed with the addition of suprapubic pressure.
- Where suprapubic pressure and hip flexion (McRobert's) are unsuccessful to resolve the shoulder dystocia, delivery of the posterior arm can be considered as the next maneuver. The delivery of the posterior arm has a high degree of accomplishing the delivery [35,36].
  - Often the posterior arm can be delivered by grasping and flexing this arm onto the fetal chest.
  - When this fails, a soft 12-14 French catheter may be threaded around the posterior arm and then pressure applied to help deliver the posterior shoulder, thus resolving the shoulder dystocia. Some refer to this as the swimmer's move.

Click the gray arrows to learn more about different maneuvers.

1.



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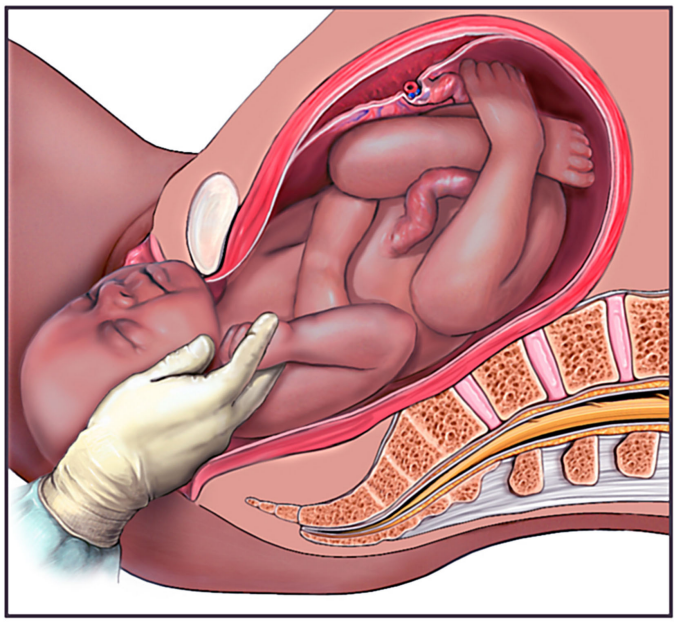

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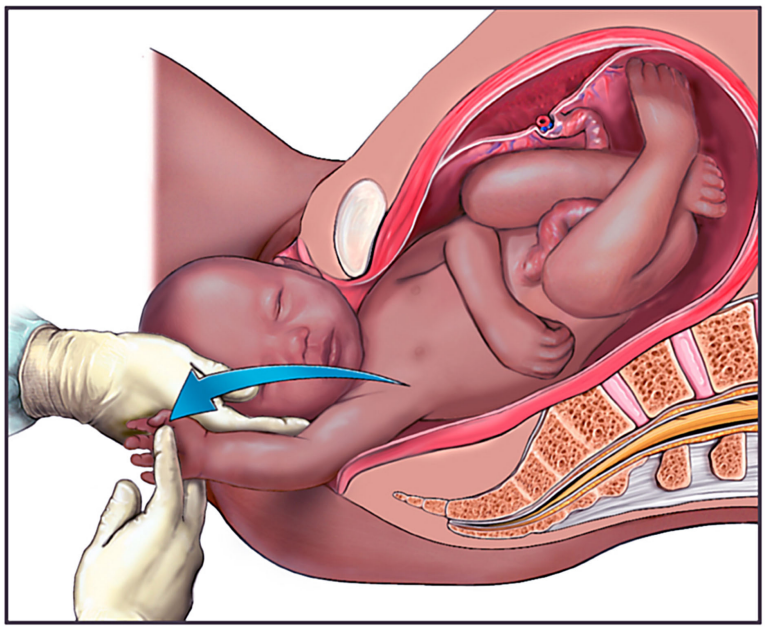
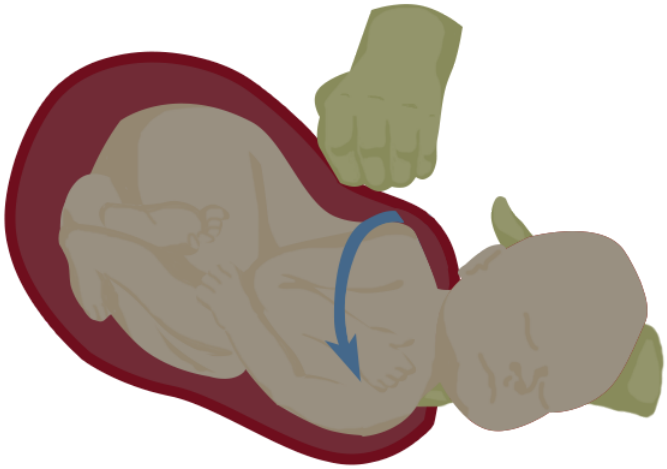
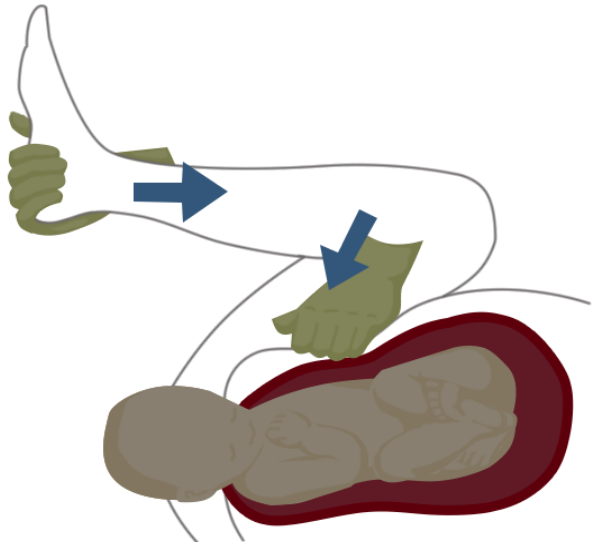




Suprapubic Pressure

- Suprapubic pressure is applied 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), and in conjunction with McRoberts maneuver.
- Suprapubic pressure is supposed to adduct the baby's 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.

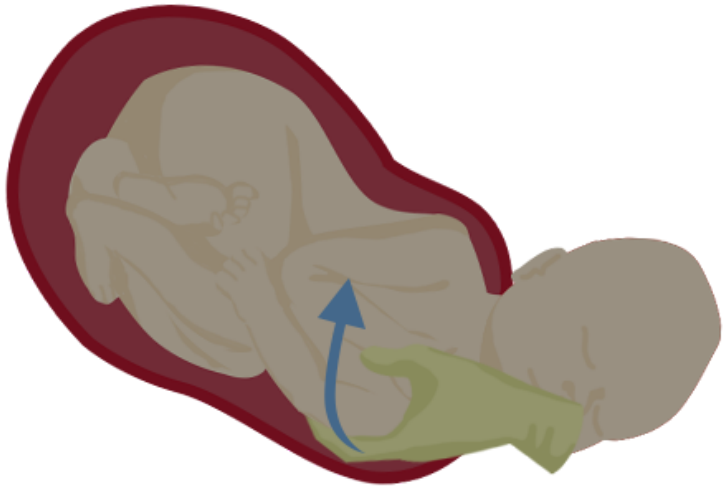
Click the gray arrows to learn more about different maneuvers.



Suprapubic pressure + McRoberts maneuver

- McRoberts maneuver and suprapubic pressure is generally used simultaneously as they are simple, rapid, and effective in dislodging an impacted anterior shoulder.
- Separation of the symphysis pubis, transient femoral nerve injury, or sacroiliac joint dislocation from aggressive hyperflexing of the maternal thigh can occur with these maneuvers [22].
- Fetal injury is unlikely.

Click the gray arrows to learn more about different maneuvers.



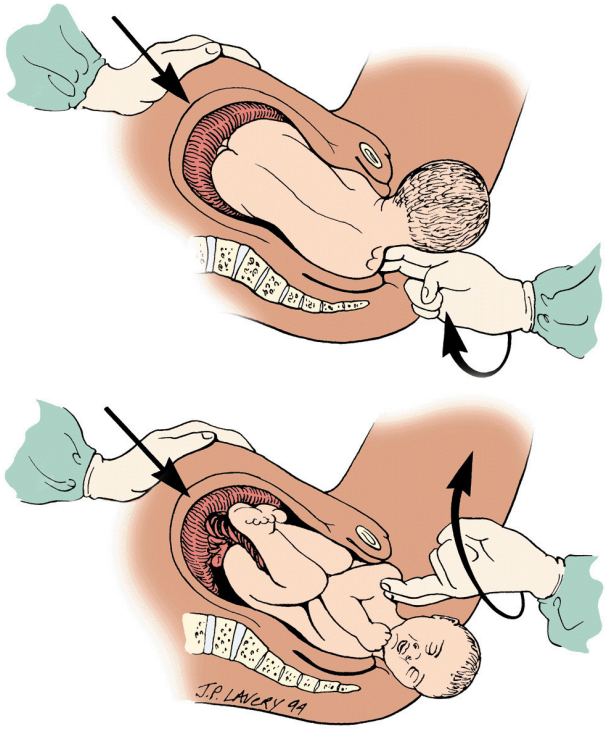
The delivering provider will place one hand into the vagina behind the fetal posterior shoulder and rotate it towards the fetal face in an anterior movement. The hand the provider uses will be based upon fetal spine position; provider's right had if the fetal spine is on the maternal left or left hand if the fetal spine in on the maternal right.

Rotate Fetal Shoulder

- If external attempts with suprapubic pressure do not adduct the anterior shoulder, use Rubin maneuver as the vaginal approach to accomplish this adduction.
- Pressure is applied to the posterior aspect of the anterior shoulder, pushing the shoulder towards the chest, causing adduction.
- The provider can accomplish this by uses two fingers, palm, or fist.
- This decreases the distance between the shoulders, which decreases the dimension that must fit through the maternal pelvis.

Click the gray arrows to learn more about different maneuvers.

- Wood's maneuver may be the next maneuver used if the anterior shoulder has not been dislodged with internal adduction.
- Wood's maneuver is a progressive rotation of the posterior shoulder in a screw-like fashion to release the impacted anterior shoulder.
- The provider applies pressure to the anterior aspect of the posterior shoulder and an attempt is made to rotate this shoulder to an anterior oblique position.
- Once the shoulder is past the symphysis pubis, the shoulder can most often be delivered easily.
- To dislodge the impacted anterior shoulder, the provider may perform the Rubin maneuver simultaneously with the Wood's maneuver [23].

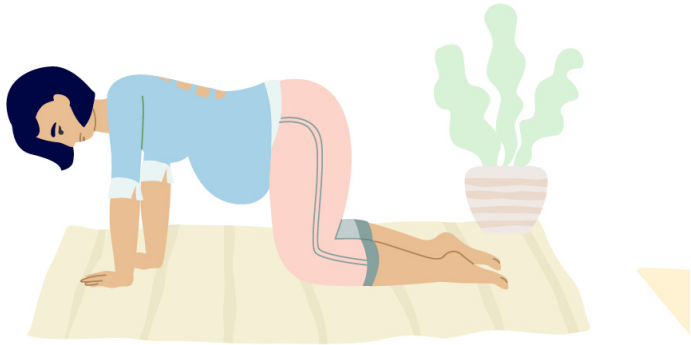


Click the gray arrows to learn more about different maneuvers.

- The clavicle can be intentionally fractured by pulling the anterior clavicle outward, but can be difficult to perform.
- A sling can be used to exert traction on the posterior shoulder.
- Grasping the fetal hand:
  - The fetal arm is generally flexed at the elbow.
  - If not, the provider can apply pressure to the antecubital fossa to assist with flexion.
  - The fetal hand is then grasped, swept across the fetal chest, and delivered.
  - This procedure can lead to humeral fracture but does not cause permanent neurological damage.
- If internal maneuvers, including rotation or delivery of the posterior arm are ineffective, the provider will then have the woman position on "all fours."

Click the gray arrows to learn more about different maneuvers.

Gaskin's Maneuver (All Fours)

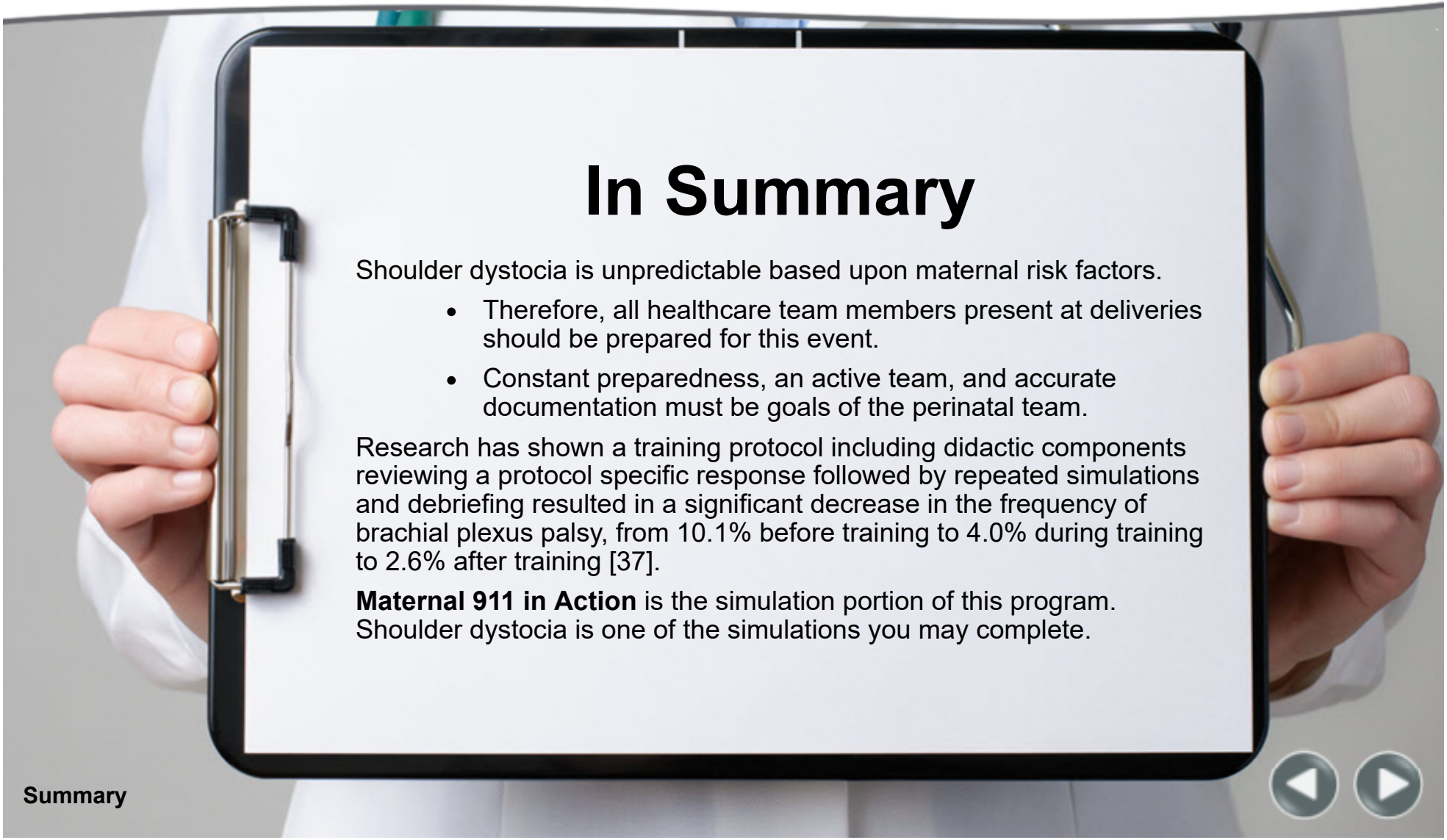


- Repositioning the woman onto "all fours" or her hands and knees, will increase the pelvic dimensions, and may allow the fetal position to shift. This is also known as knee-chest position.
- Shifting of the fetus may dislodge the impacted shoulder.
- If not, downward pressure on the posterior shoulder may allow for delivery of the posterior shoulder.
- This maneuver may impact the anterior shoulder slightly, related to the gravity created with the woman in this position.
- If not easily delivered, rotational maneuvers or removal of the posterior arm may be performed [24,25].
- This maneuver may be difficult if the woman has received epidural analgesia and is unable to roll over or maintain the position.
- Additional staff may be needed for this maneuver for support of the woman.

Click the gray arrows to learn more about different maneuvers.

Fetal injury present at birth can be related to the impacted shoulders alone or the provider's attempt to deliver the infant with or without maneuvers.

- Fractures of the fetal clavicle or humerus may occur [29-31].
- Injury to the brachial plexus nerve can occur if the fetal shoulders remain impacted while the fetal head continues to descend [32,33].
- Transient brachial plexus injury in 3.0 to 16.8% of newborns.
- Permanent brachial plexus palsy in 0.5 to 1.6% of this population.
- If the umbilical cord becomes compressed, either due to a tight nuchal cord or compression along any part of the cord, asphyxia may result.
  - This may occur during a prolonged period of time from fetal head delivery and delivery of the impacted shoulders.
- Maternal injury may include postpartum hemorrhage in as many as 11% of the women related to uterine atony, uterine rupture, or a fourth degree laceration [34].
- Maternal injury has resulted in a fourth degree laceration in 3.8% of the cases [34].



In Summary

Shoulder dystocia is unpredictable based upon maternal risk factors.

- Therefore, all healthcare team members present at deliveries should be prepared for this event.
- Constant preparedness, an active team, and accurate documentation must be goals of the perinatal team.

Research has shown a training protocol including didactic components reviewing a protocol specific response followed by repeated simulations and debriefing resulted in a significant decrease in the frequency of brachial plexus palsy, from 10.1% before training to 4.0% during training to 2.6% after training [37].

Maternal 911 in Action is the simulation portion of this program. Shoulder dystocia is one of the simulations you may complete.

Definitions

- **Macrosomia:** Fetal growth larger than expected for gestational age; >90th percentile or >4,500g.
- **Platypelloid:** this pelvis shape is described as flat.
  - The opening in the middle is not an open circle but more like a compressed oval shape.
  - Women with this type of pelvis are not able to easily have a vaginal birth.
  - Less than 3% of all women have this pelvis shape.
- **Obesity:** Defined by the National Institutes of Health (NIH) as a BMI of 30 and above.
  - A BMI of 30 is about 30 pounds overweight.
- **Post dates:** Pregnancy > 42 weeks' gestation.
- **Restitution:** Also known as external rotation.
  - This is the spontaneous realignment of the head with the shoulders.
- **Asphyxia:** A condition in which an extreme decrease in the concentration of oxygen in the body accompanied by an increase in the concentration of carbon dioxide leads to death.
- **Uterine atony:** Failure of the myometrium to contract after delivery of the placenta; associated with excessive bleeding from the placental implantation site.

FREDA's Shoulder Dystocia Maneuvers

- **Call for HELP!**
- **F**lex her hips and apply **S**uprapubic pressure
- **R**otate the fetal shoulder towards the fetal nose; if the shoulder is not dislodged then rotate the shoulder the other way
- Evaluate for **E**pisiotomy
- **D**eliver the posterior arm (swimmer's move)
- Move her onto **A**ll fours
- An assistant should apply **S**uprapubic pressure with each maneuver’s attempt, pushing towards the fetal nose each time.

FREDA

Maneuvers

- Call for HELP!
- McRoberts - flexing hips
- Suprapubic pressure - pressure towards the fetal nose above the pubic bone
- Rubin maneuver - rotating the posterior fetal shoulder from the vaginal approach
- Wood's maneuver - pushing on the anterior aspect of the posterior shoulder in a corkscrew fashion to dislodge the impacted anterior shoulder
- Delivery of the posterior fetal arm
- Fetal clavicular fracture, pulling on the anterior clavicle, but this can be difficult
- Gaskin’s Maneuver - transition the woman to all fours
- Episiotomy

Congratulations!

You have successfully completed this module.

Click on the above 'X' to take the post-test for this course. If you do not attain a passing score after two attempts at the post-test the entire program must be repurchased.

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