MATERNAL911®

Shoulder Dystocia

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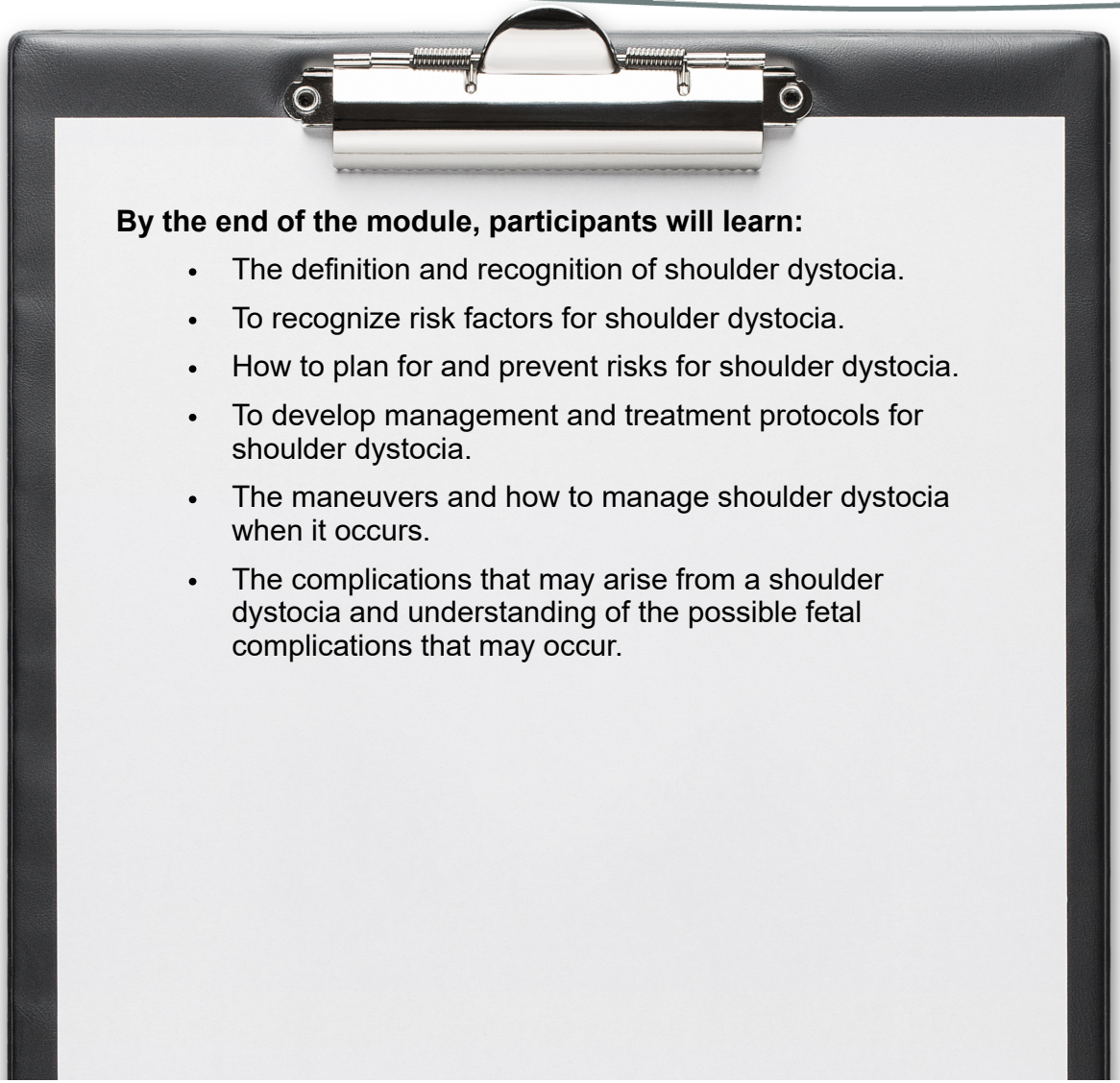
Course Description:

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

Click here to download a print version of this course.



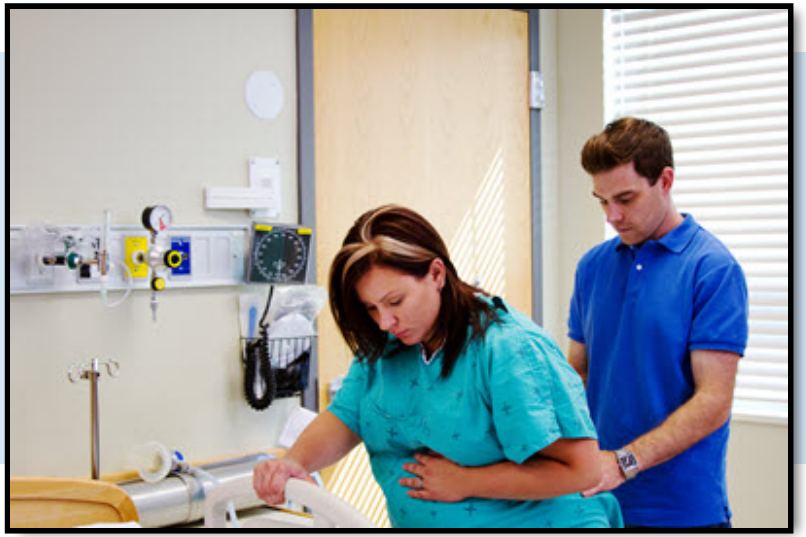
By the end of the module, participants will learn:

- 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.

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].

- 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.



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 Body Mass Index (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.

- Shoulder dystocia is an obstetrical emergency occurring in 0.2 to 3% of all births [1, 26].
- There are no accurate models to predict or prevent shoulder dystocia [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].

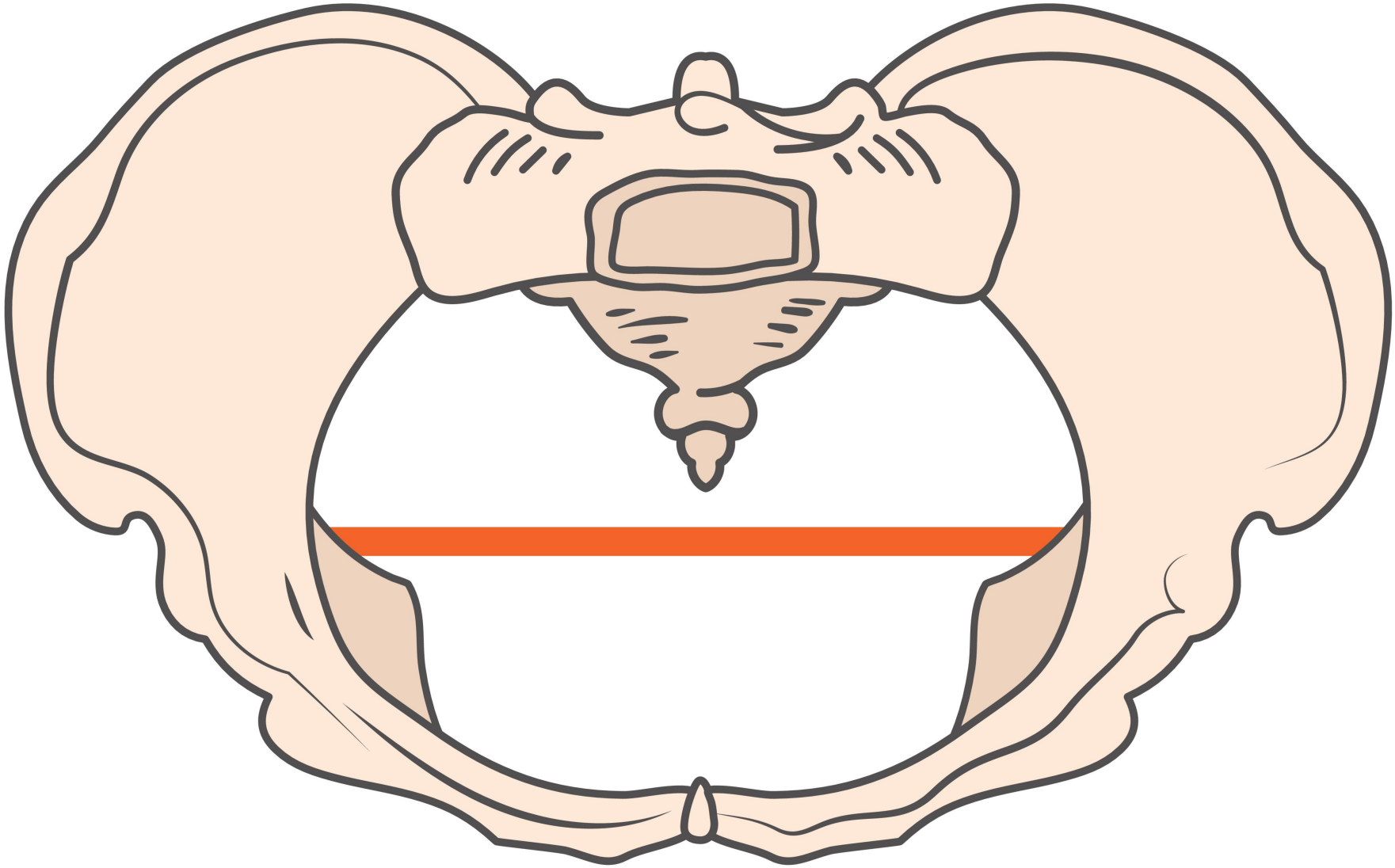
The most common factors associated with cases of shoulder dystocia are [6-7]:

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

Preconception Risk Factors

- Platypelloid maternal pelvis
- Maternal pelvic shape/size
- Maternal personal birth weight > 4000g
- Prior shoulder dystocia
  - It is predicted that at least 10% of women have a recurrent episode of shoulder dystocia [12].
- Pre-gestational diabetes
- Prior macrosomic infant
  - History of gestational diabetes
- Short stature
- Maternal obesity
- Multiparity
- Advanced maternal age [5].

Click the arrows to view all the risk factors.



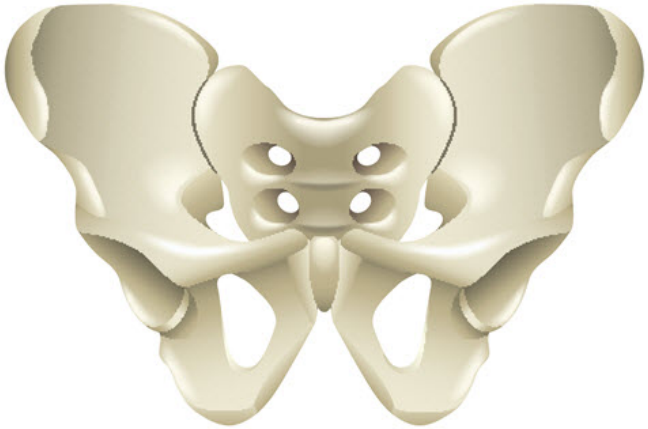
Antepartum Risk Factors

- Pre-gestational or gestational diabetes
- Excessive maternal weight gain [8,9].
- Maternal obesity and extreme obesity [8,9].
- Suspected macrosomia, particularly with estimated fetal weight >4500 g
- Male fetus, because 70% of those > 4500g were male and 51% of all births are male [11].

Click the arrows to view all the risk factors.

Intrapartum Risk Factors

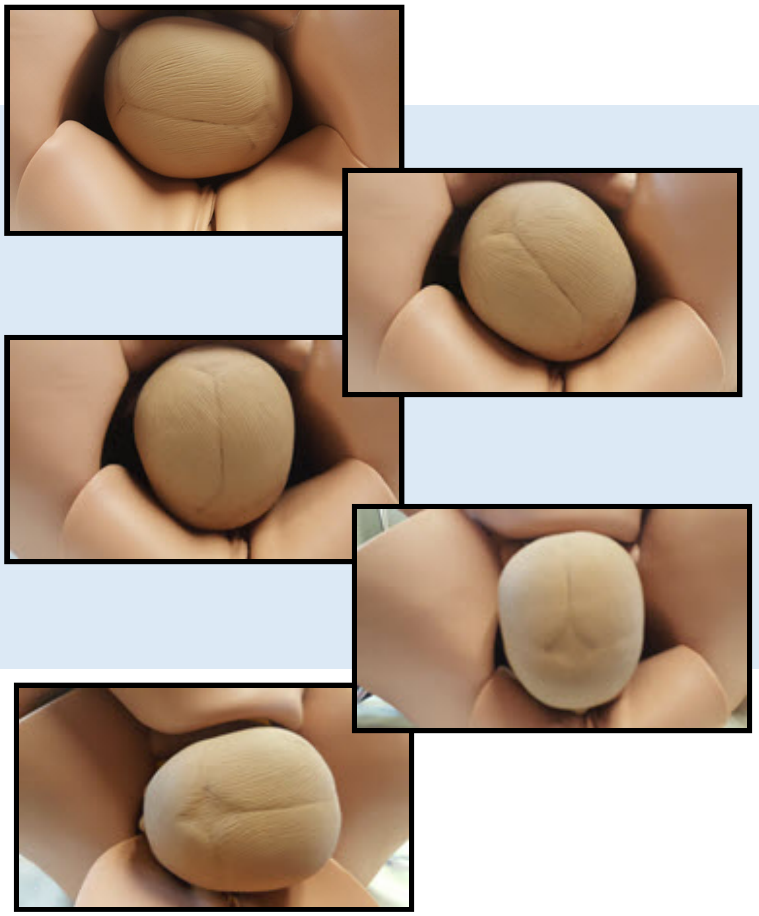
- Induction of labor
- Malpresentation
- Epidural anesthesia
- Dysfunctional labor
- Prolonged second stage
- Operative vaginal delivery [13].



(Note: some of these risks only occur in the hospital setting)

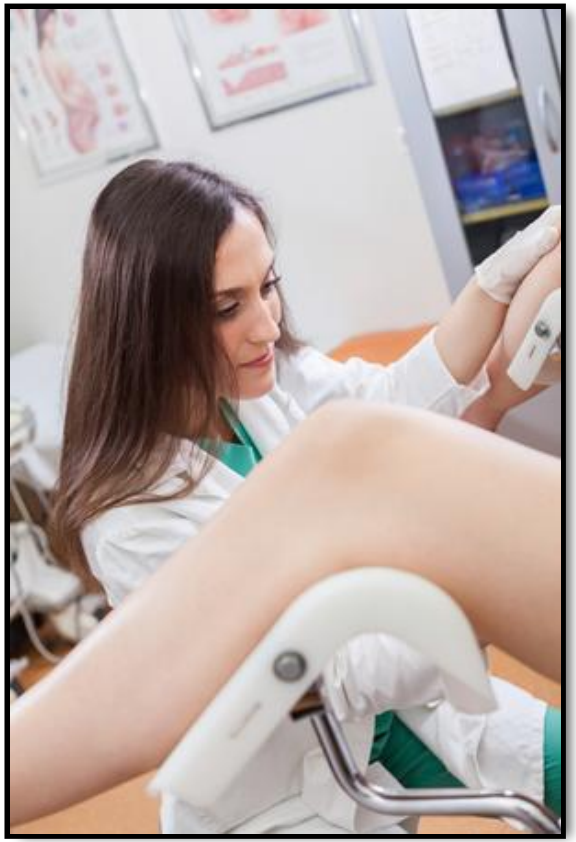
Click the arrows to view all the risk factors.

- 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.
- Anterior impaction is more common.



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

https://youtu.be/a8E-ntFzabY



- 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.
- Delivering 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.

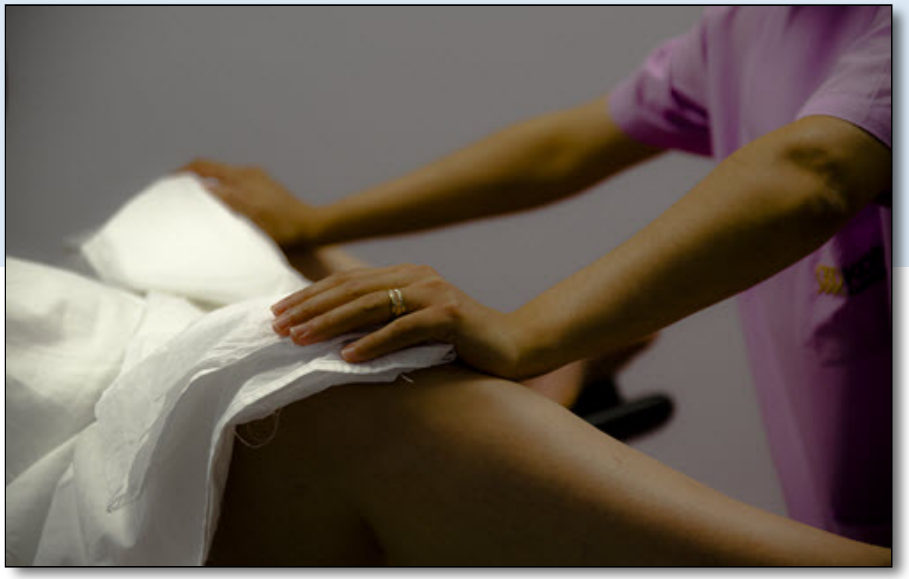
- The health care team may observe the recognizable turtle sign when the presenting head extends and retracts on the mother's perineum with contractions and pushing efforts.
  - Additional evidence of shoulder dystocia includes lack of spontaneous restitution and delayed delivery despite good pushing efforts and use of usual manuevers.
- 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.
- If shoulder dystocia is suspected, consider draining the maternal bladder.

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=XA0Vn8zGbt0

- 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 [14].
- Specific maneuvers are performed in order to displace an impacted anterior shoulder.



Goals of Management

- Fetal
  - Prevent asphyxia
  - Alleviate umbilical cord compression
  - Avoid physical injury
  - Prevent death
- Maternal
  - Attempt to avoid injury
  - Maternal injury may occur in order to prevent more serious injury to the fetus

- One person should 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.

Management of Shoulder Dystocia

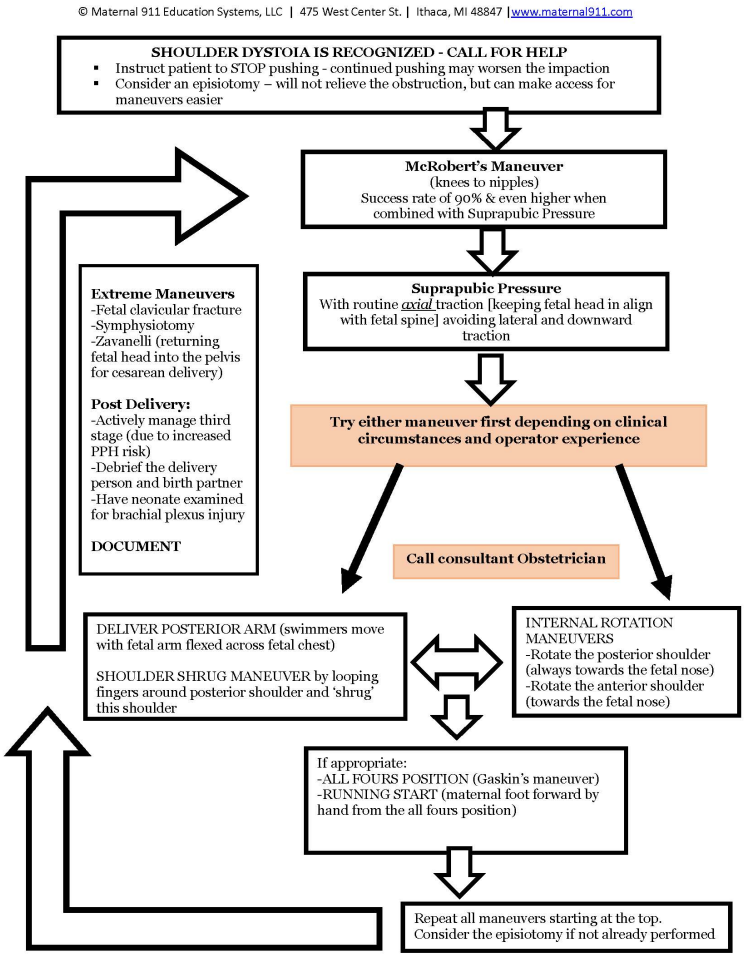
Once a shoulder dystocia is identified, implement the following initial steps:

- Instruct the patient to stop pushing
- Avoid traction on the fetal head
- Ask assistant to apply suprapubic pressure directing the force from the fetal back towards the face, which will decrease the diameter of the fetal shoulders

Management of Shoulder Dystocia

- Fundal pressure is contraindicated in the setting of shoulder dystocia
  - Use of this maneuver can lead to further impaction of the fetal shoulders, clavicular fracture or uterine rupture
- 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

Click the picture for a full sized version of the Maternal 911 Shoulder Dystocia Algorithm.



Shoulder Dystocia Algorithm

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- Instruct patient to STOP pushing - continued pushing may worsen the impaction
- Consider an episiotomy – will not relieve the obstruction, but can make access for maneuvers easier

McRobert's Maneuver
(knees to nipples)
Success rate of 90% & even higher when combined with Suprapubic Pressure

Suprapubic Pressure
With routine *axial* traction [keeping fetal head in align with fetal spine] avoiding lateral and downward traction

Try either maneuver first depending on clinical circumstances and operator experience

Call consultant Obstetrician

DELIVER POSTERIOR ARM (swimmers move with fetal arm flexed across fetal chest)

SHOULDER SHRUG MANEUVER by looping fingers around posterior shoulder and 'shrug' this shoulder

INTERNAL ROTATION MANEUVERS
-Rotate the posterior shoulder (always towards the fetal nose)
-Rotate the anterior shoulder (towards the fetal nose)

If appropriate:
-ALL FOURS POSITION (Gaskin's maneuver)
-RUNNING START (maternal foot forward by hand from the all fours position)

Repeat all maneuvers starting at the top.
Consider the episiotomy if not already performed

Extreme Maneuvers
-Fetal clavicular fracture
-Symphysiotomy
-Zavanelli (returning fetal head into the pelvis for cesarean delivery)

Post Delivery:
-Actively manage third stage (due to increased PPH risk)
-Debrief the delivery person and birth partner
-Have neonate examined for brachial plexus injury

DOCUMENT

McRoberts Maneuver

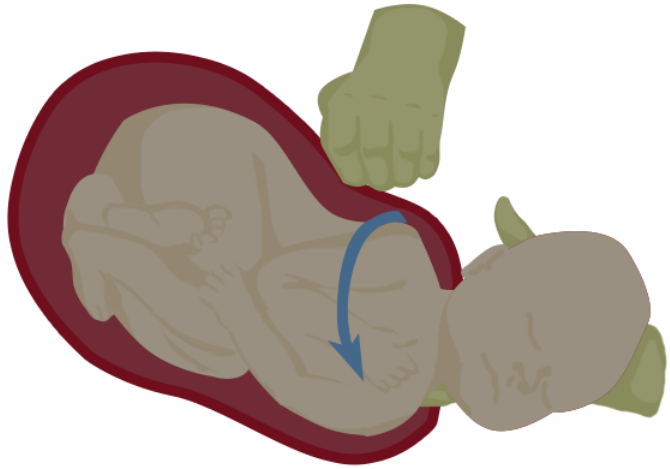
Click the blue arrows to learn more about different maneuvers.

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].

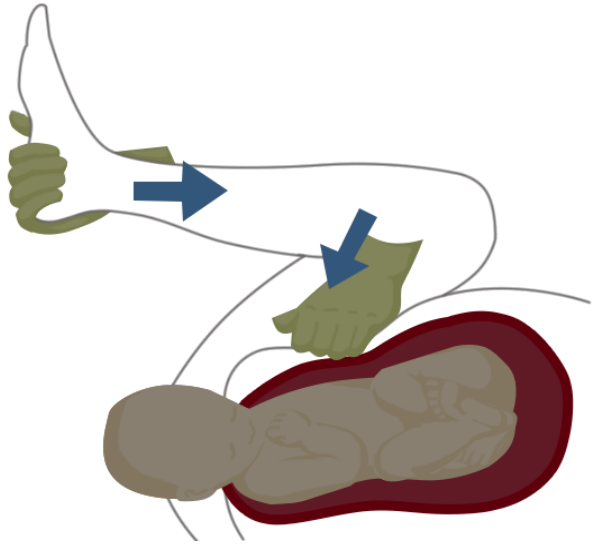
- McRoberts maneuver may require two persons (if the patient cannot pull back her own legs) each holding a maternal leg and flexing the thigh back against the maternal abdomen.
- This maneuver causes cephalad rotation of the symphysis pubis and flattening of the sacrum which removes the sacral promontory 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 [15].
- If McRoberts maneuver is unsuccessful at dislodging the anterior shoulder, it is followed with the addition of suprapubic pressure.



Click the blue arrows to learn more about different maneuvers.

Suprapubic Pressure

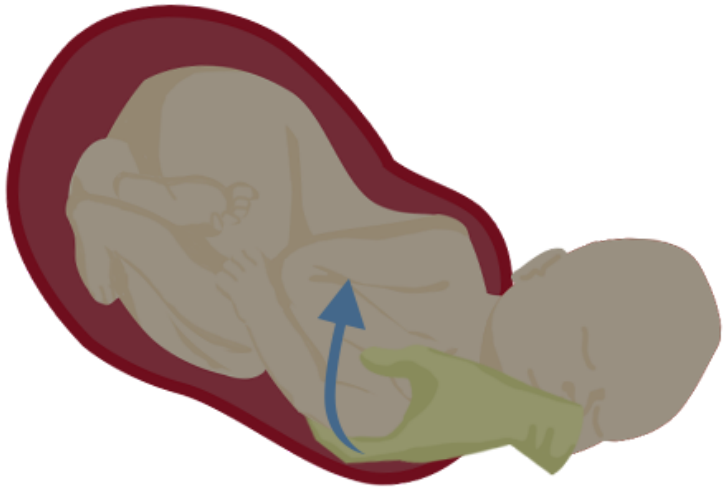
- Suprapubic pressure is applied with the palm or fist, directing the pressure on the anterior shoulder both downward (to below the pubic bone) and laterally (toward the baby's face or sternum), and in conjunction with McRoberts maneuver.
- Suprapubic pressure is supposed to adduct the baby's shoulders 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 blue 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.
- Potential complications associated with these maneuvers include:
  -Separation of the symphysis pubis
  -Transient femoral nerve injury
  -Sacroiliac joint dislocations [16].
- Fetal injury is unlikely.



Click the blue 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.

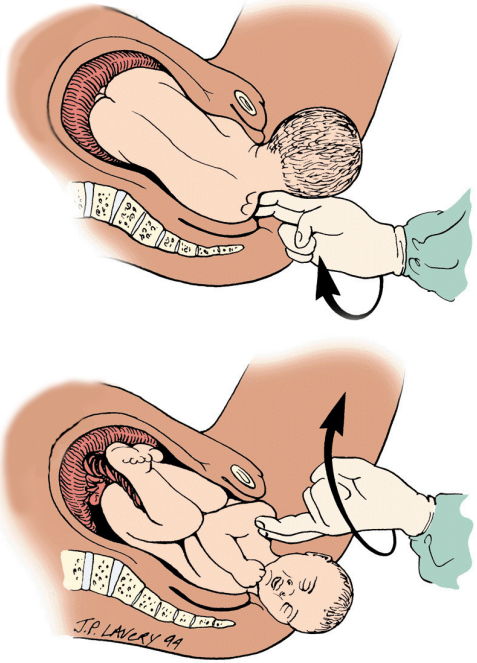
Rotate Fetal Shoulder - Rubin's Maneuver

- 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 back side of the posterior fetal shoulder with attempted rotation anteriorly towards the fetal face.
- 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.

Rotate Fetal Shoulder - Woods Screw Maneuver

Click the blue 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 [17].



Click the blue arrows to learn more about different maneuvers.

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 [29, 30].

- 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.

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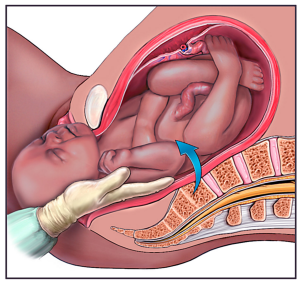

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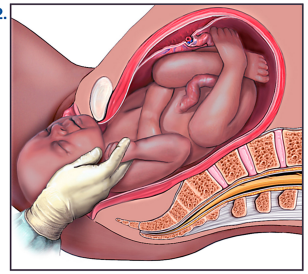

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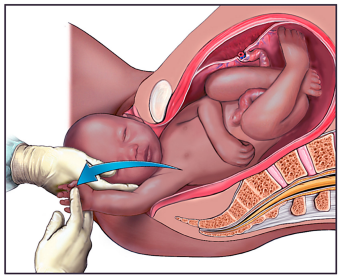

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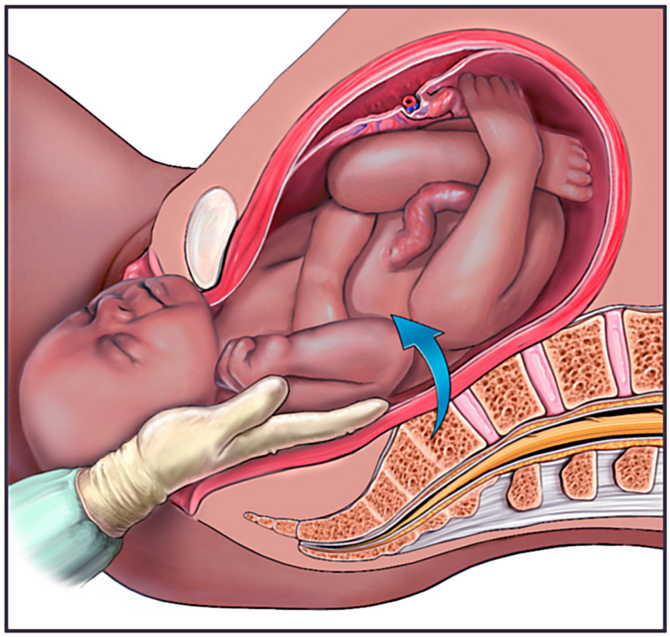

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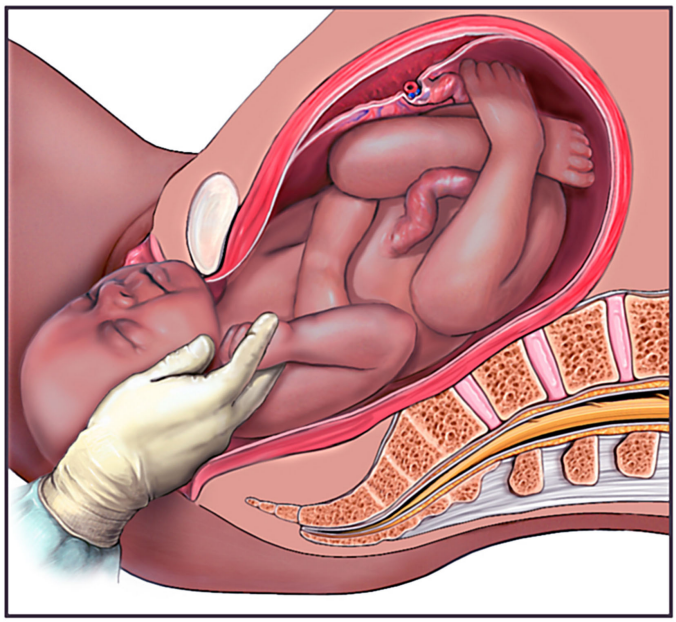

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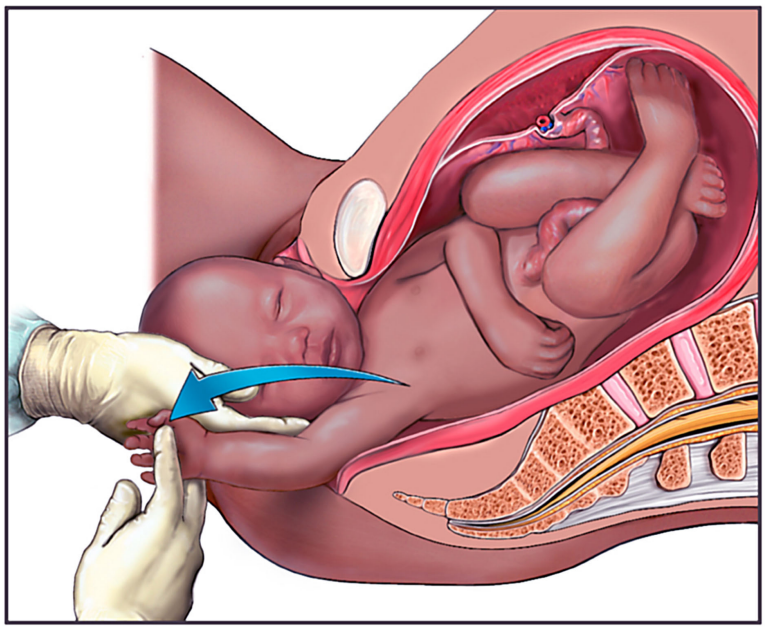


Click the blue arrows to learn more about different maneuvers.

Additional Maneuvers

- 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."
- Shoulder shrug is another option where the pointer finger and thumb make a ring around the shoulder then apply pressure to release the shoulder.

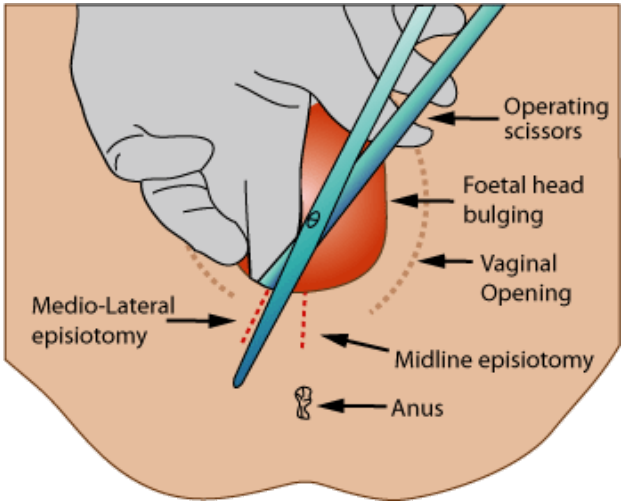
Gaskin's Maneuver (All Fours)

Click the blue arrows to learn more about different maneuvers.

- 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 [18, 19].
- 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.

Episiotomy:

- As an isolated measure, episiotomy itself will not relieve a shoulder dystocia given that it is not caused by maternal soft tissue.
- Should be considered at any time in management when increased access to the fetus would be of benefit.
- Will create more room for the provider to insert his or her hand to perform maneuvers such as delivery of the posterior shoulder.



[Running Start Position for Vertex or Breech]

Last resort procedures [20, 21]:

- Gunn-Zavanelli-O'Leary maneuver involves replacing the fetal head back into the pelvis followed by a cesarean.
- A low transverse hysterotomy may be performed for transabdominal manual rotation of the anterior shoulder then delivering the fetus vaginally.
- Symphysiotomy allows pubic bone separation, increasing the size of the pelvic opening, allowing for vaginal delivery.
- These maneuvers are last resort due to significant maternal morbidity.

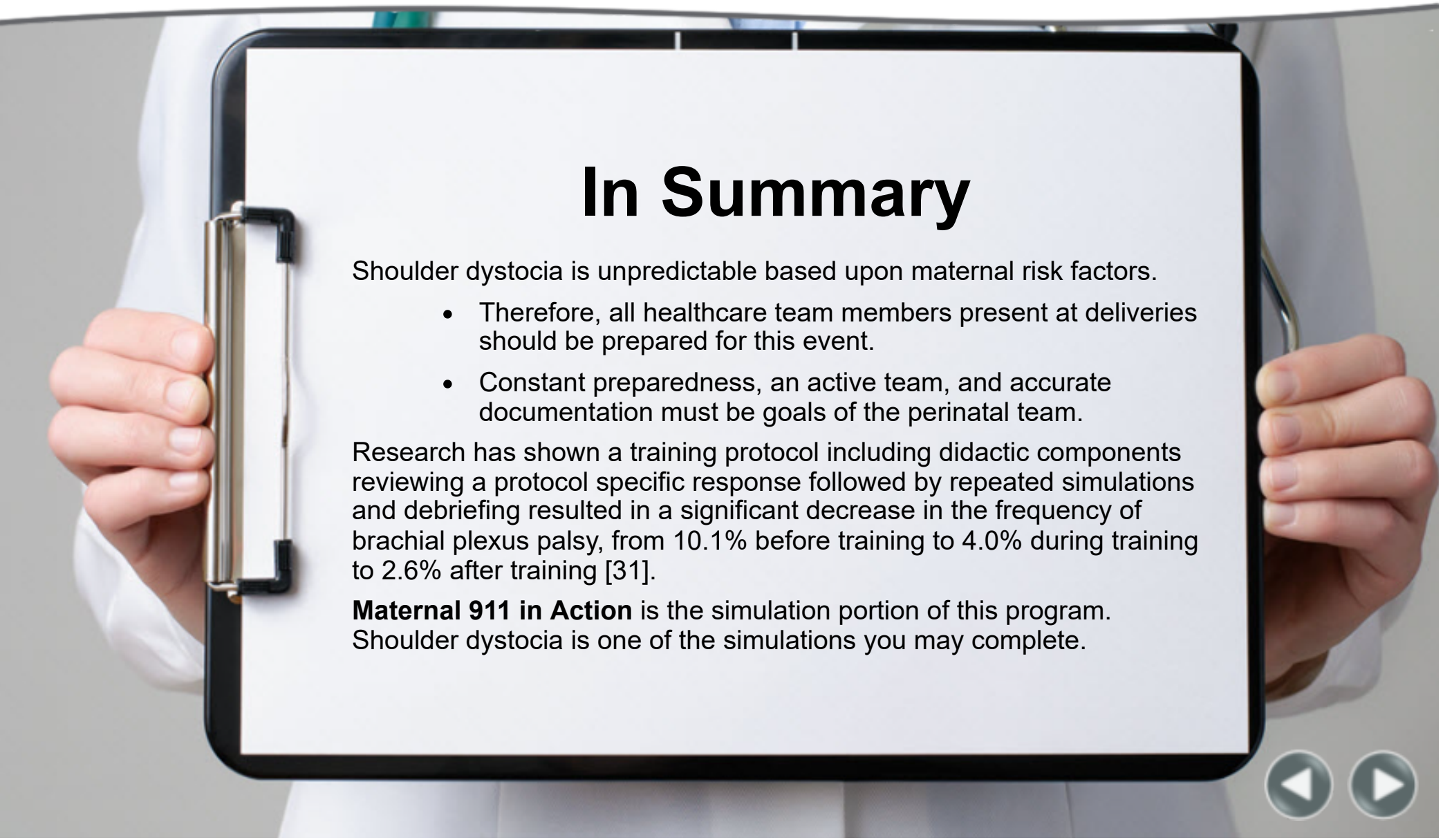
Summary

Melissa Gutierrez from Dallas, Texas, United States, CC BY-SA 2.0, via Wikimedia Commons

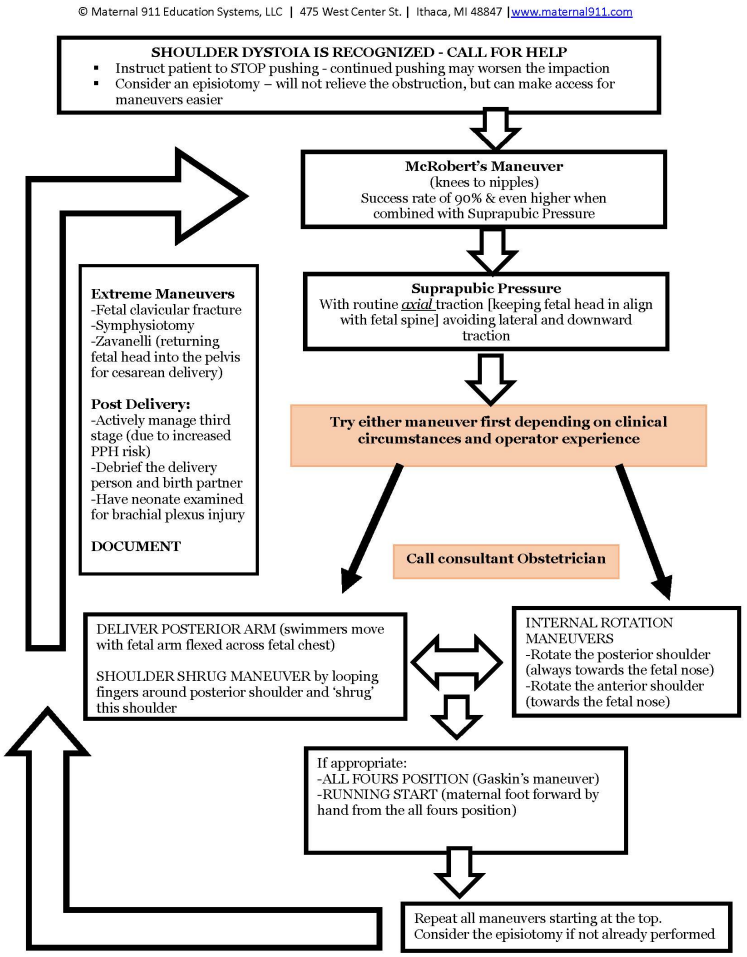
- This high acuity, low occurring clinical situation requires all healthcare providers who attend deliveries to have a level of awareness and be prepared for shoulder dystocia.
- Discussions, skill drills, and simulation labs, which include a team approach to shoulder dystocia, can facilitate delivery of the fetus with fewer negative outcomes for the fetus as well as the mother [1].
- A team having a shoulder dystocia protocol has found decreased diagnoses of brachial plexus injury at the time of delivery and at the time of discharge [22].
- 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

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 [23-25].
- Injury to the brachial plexus nerve can occur if the fetal shoulders remain impacted while the fetal head continues to descend [26, 27].
- 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 [28].
- Maternal injury has resulted in a fourth degree laceration in 3.8% of the cases [28].


MATERNAL911®
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 [31].
Maternal 911 in Action is the simulation portion of this program. Shoulder dystocia is one of the simulations you may complete.

Click the picture for a full sized version of the Maternal 911 Shoulder Dystocia Algorithm.



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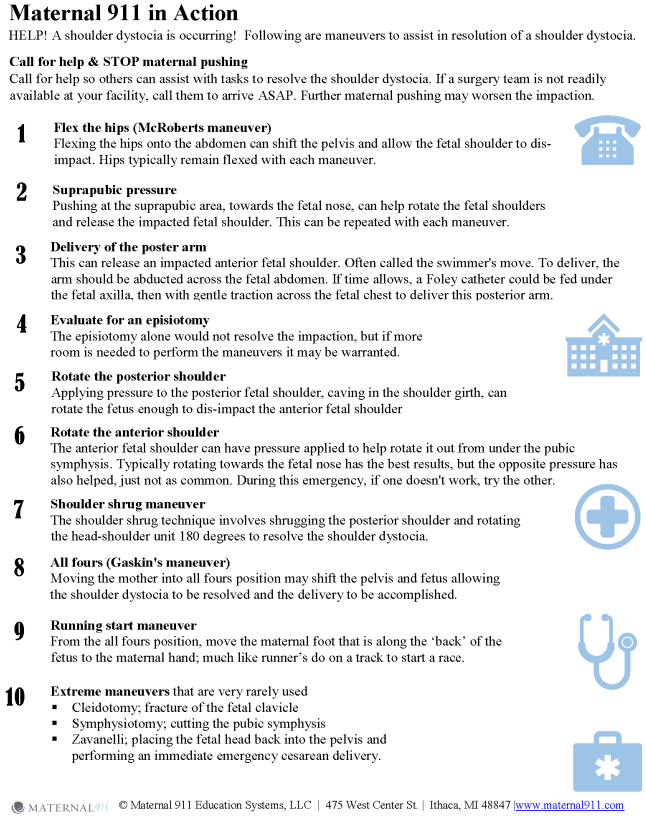
Extreme Maneuvers
-Fetal clavicular fracture
-Symphysiotomy
-Zavanelli (returning fetal head into the pelvis for cesarean delivery)

Post Delivery:
-Actively manage third stage (due to increased PPH risk)
-Debrief the delivery person and birth partner
-Have neonate examined for brachial plexus injury

DOCUMENT

Click the picture for a full sized version of the Maternal 911 Shoulder Dystocia Maneuvers document.



Maternal 911 in Action

HELP! A shoulder dystocia is occurring! Following are maneuvers to assist in resolution of a shoulder dystocia.

Call for help & STOP maternal pushing
Call for help so others can assist with tasks to resolve the shoulder dystocia. If a surgery team is not readily available at your facility, call them to arrive ASAP. Further maternal pushing may worsen the impaction.

1. **Flex the hips (McRoberts maneuver)**
   Flexing the hips onto the abdomen can shift the pelvis and allow the fetal shoulder to dis-impact. Hips typically remain flexed with each maneuver.
2. **Suprapubic pressure**
   Pushing at the suprapubic area, towards the fetal nose, can help rotate the fetal shoulders and release the impacted fetal shoulder. This can be repeated with each maneuver.
3. **Delivery of the poster arm**
   This can release an impacted anterior fetal shoulder. Often called the swimmer's move. To deliver, the arm should be abducted across the fetal abdomen. If time allows, a Foley catheter could be fed under the fetal axilla, then with gentle traction across the fetal chest to deliver this posterior arm.
4. **Evaluate for an episiotomy**
   The episiotomy alone would not resolve the impaction, but if more room is needed to perform the maneuvers it may be warranted.
5. **Rotate the posterior shoulder**
   Applying pressure to the posterior fetal shoulder, caving in the shoulder girth, can rotate the fetus enough to dis-impact the anterior fetal shoulder
6. **Rotate the anterior shoulder**
   The anterior fetal shoulder can have pressure applied to help rotate it out from under the pubic symphysis. Typically rotating towards the fetal nose has the best results, but the opposite pressure has also helped, just not as common. During this emergency, if one doesn't work, try the other.
7. **Shoulder shrug maneuver**
   The shoulder shrug technique involves shrugging the posterior shoulder and rotating the head-shoulder unit 180 degrees to resolve the shoulder dystocia.
8. **All fours (Gaskin's maneuver)**
   Moving the mother into all fours position may shift the pelvis and fetus allowing the shoulder dystocia to be resolved and the delivery to be accomplished.
9. **Running start maneuver**
   From the all fours position, move the maternal foot that is along the 'back' of the fetus to the maternal hand; much like runner's do on a track to start a race.
10. **Extreme maneuvers** that are very rarely used
    - Cleidotomy; fracture of the fetal clavicle
    - Symphysiotomy; cutting the pubic symphysis
    - Zavanelli; placing the fetal head back into the pelvis and performing an immediate emergency cesarean delivery.

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Print the last two documents Shoulder Dystocia Algorithm and Shoulder Dystocia Maneuvers, laminate back to back and place it with the the pack that attends deliveries.

Print Shoulder Dystocia Algorithm and Maneuvers Documents

MATERNAL911®

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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