MATERNAL911

Shoulder Dystocia

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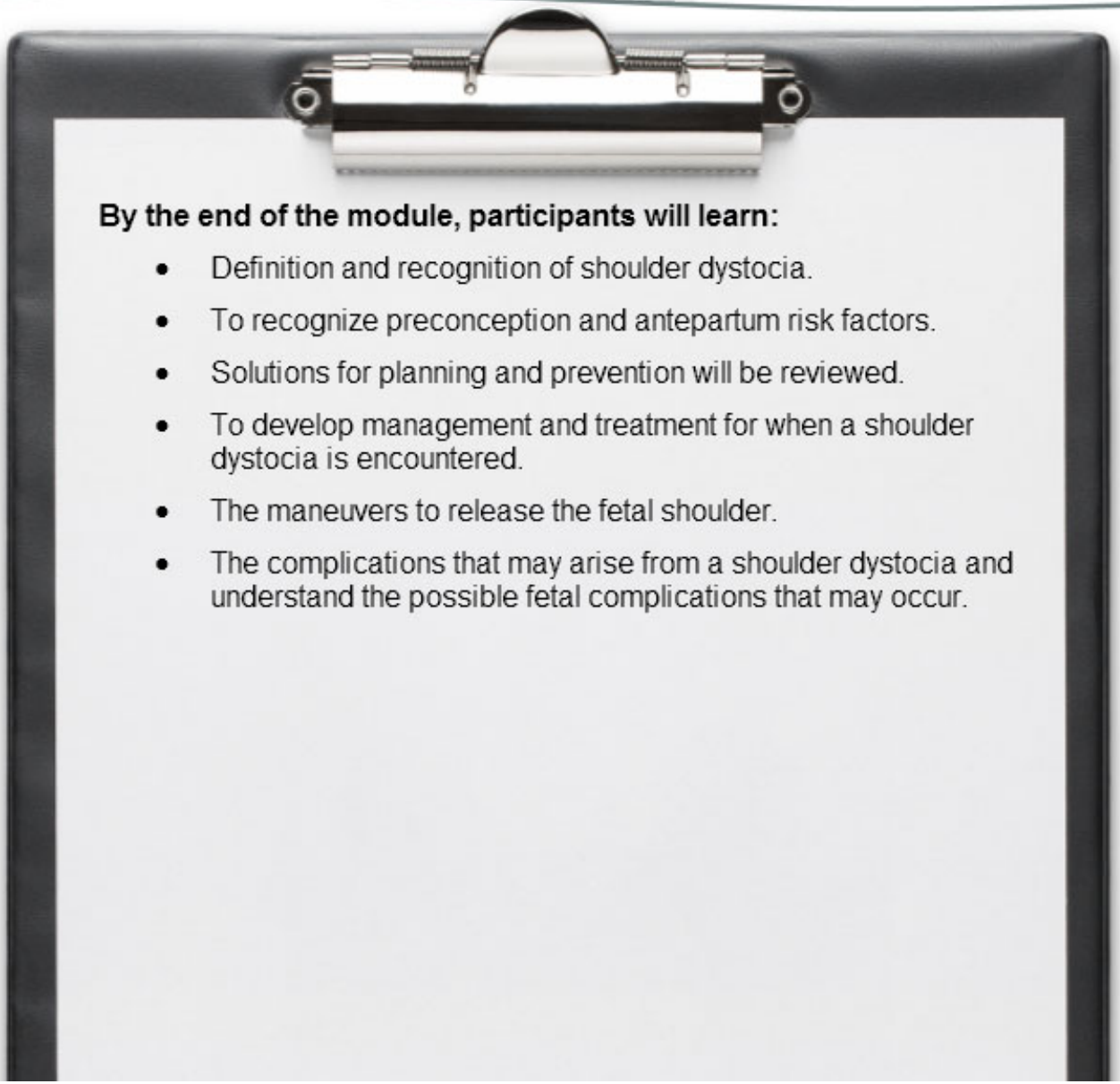
Course Description:

Shoulder dystocia is something that cannot be predicted, but one can prepare for this obstetrical emergency. This course will explain how to prepare and what to expect. Participants will gain confidence so that when they are faced with these situations in the future, they will be more prepared.

Approximate Time to Complete: 25 minutes

Shoulder Dystocia
print version



By the end of the module, participants will learn:

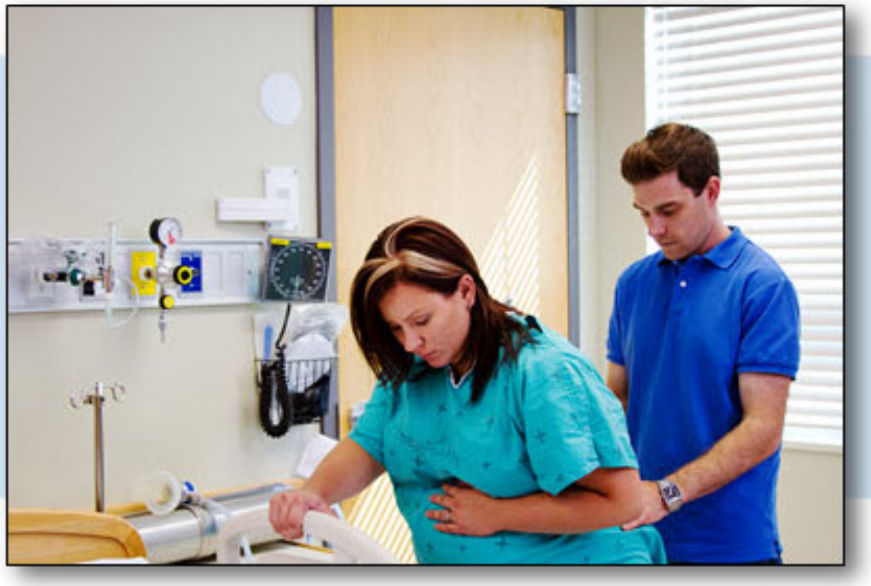
- Definition and recognition of shoulder dystocia.
- To recognize preconception and antepartum risk factors.
- Solutions for planning and prevention will be reviewed.
- To develop management and treatment for when a shoulder dystocia is encountered.
- The maneuvers to release the fetal shoulder.
- The complications that may arise from a shoulder dystocia and understand the possible fetal complications that may occur.

Objectives

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 is the goal 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 pubis symphysis.
  - It can also occur from impaction of the posterior shoulder on the sacral promontory.
- This is an unpredictable and unpreventable obstetrical emergency.



- 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

Occurrence Rates

Preconception Risk Factors

- Maternal pelvic diameter is platypelloid
- Mother herself was born weighing > 4000gms
- History of delivering another child with shoulder dystocia
  - It is predicted that at least 10 percent of women have a recurrence episode of shoulder dystocia [18].
- A history of a prior macrosomic infant
- Diabetes prior to pregnancy, including gestational diabetes
  - 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]

Antepartum Risk Factors

- Maternal pelvic shape/size
- Diabetes or gestational diabetes
- Excessive maternal weight gain [8, 9]
- Maternal obesity and extreme obesity [8, 9]
- As birth weight increases to over 4000 g so does the risk of shoulder dystocia [2, 10-13].
- Significant risk is associated with birth weight is equal to or > 4500 g [14, 15].
- Suspected macrosomia
  - Macrosomia is not an indicator for induction of labor
  - Induction of labor neither prevents shoulder dystocia or brachial plexus injury
- Male fetus as 70 percent of those > 4500 g were male and 51 percent of all births are male [15].
- Post dates
- Advanced maternal age related to increased occurrence of higher maternal weight and diabetes [16, 17].
- Recurs in 10 percent of subsequent pregnancies [18]

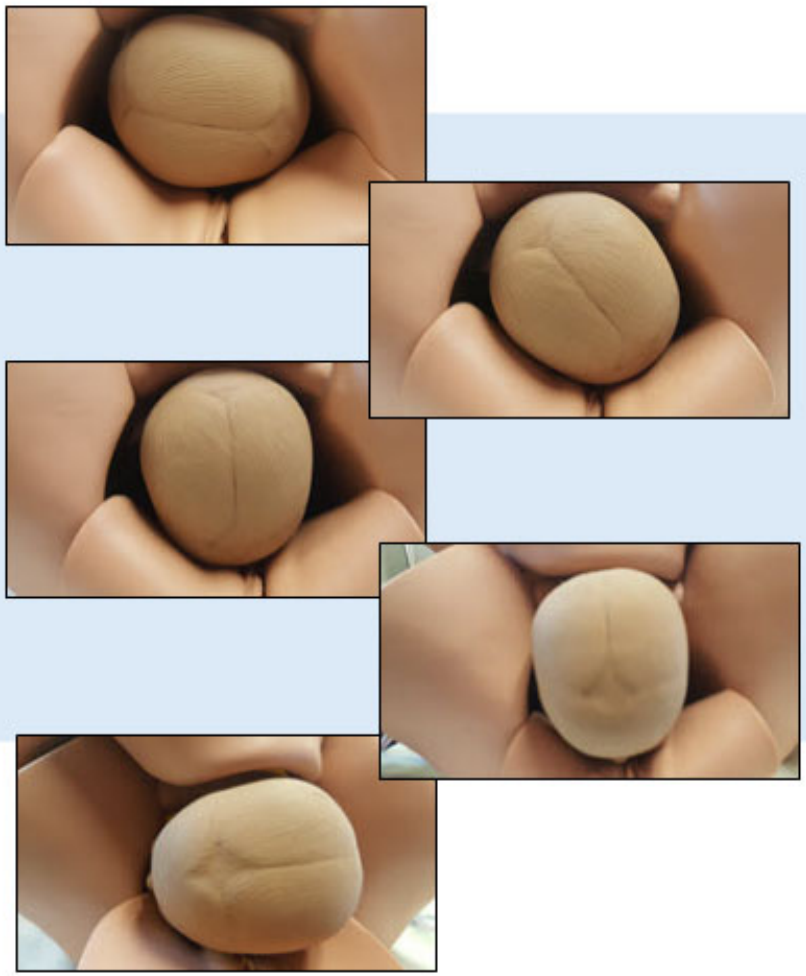
Preconception Risk Factors Cont'd

Intrapartum Risk Factors

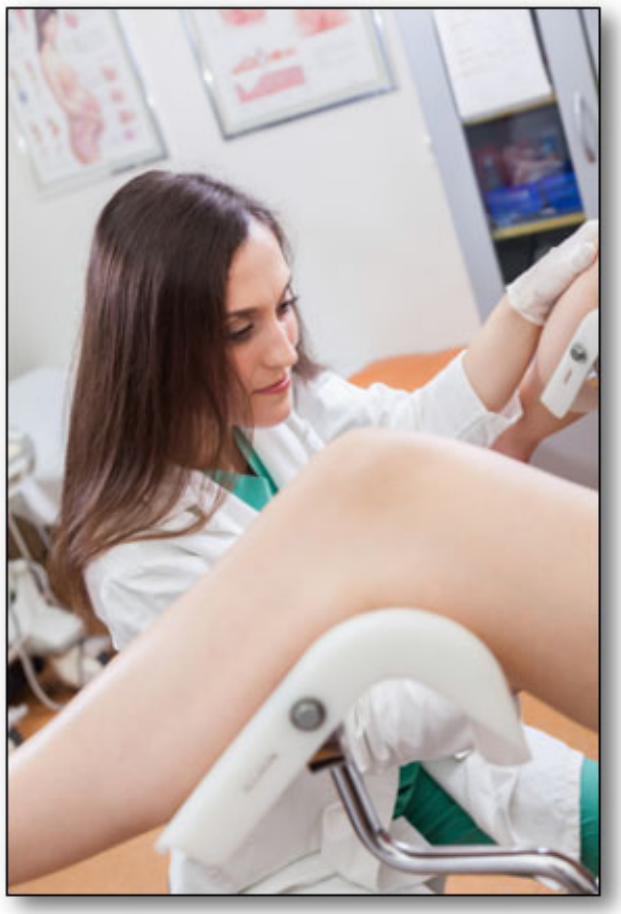
- Dysfunctional labor contraction pattern, insufficient contractions, myometrial dysfunction, or ineffective pushing efforts for appropriate descent
- Malposition
- Maternal pelvic structure or soft tissue affects fetal descend into the pelvis
  - The fetal anterior shoulder fails to rotate and becomes impacted behind the mother's symphysis pubis or 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

Preconception Risk Factors Cont'd

- 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.



Etiology



- 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 cooperative in the team leaders' instructions for the different maneuvers.

History and Initial Exam

- 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.

Turtle Sign

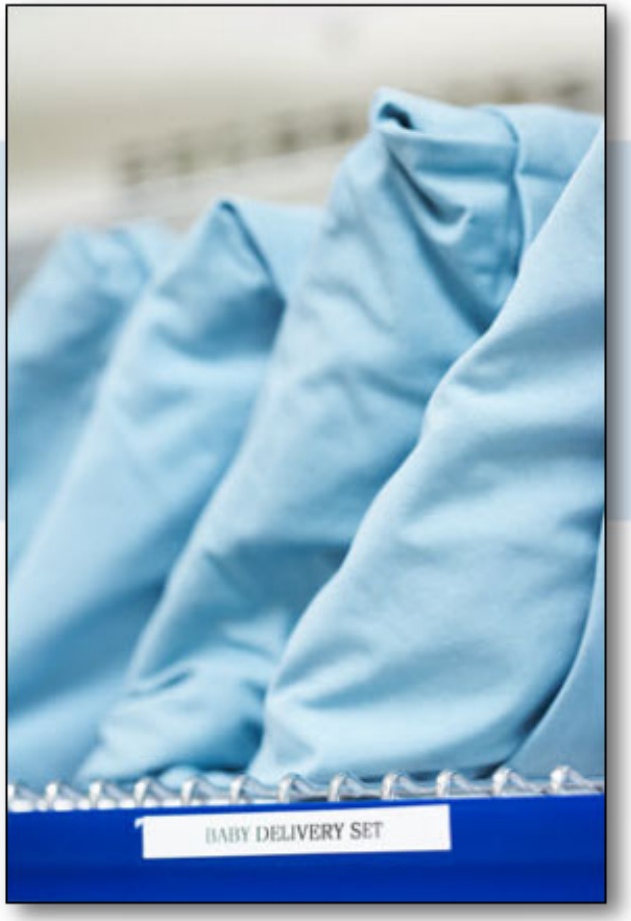
- Shoulder dystocia cannot be predicted solely based upon antenatal risk factors or labor abnormalities.
- Delivery room personnel should be alert, while in attendance at all vaginal deliveries, for the possibility of shoulder dystocia and be prepared to initiate the various maneuvers identified as effective for delivery of impacted fetal shoulders.
- 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 fetal torso is not successful in delivery.

Management and Treatment

- 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.

Goal of Management

- 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



Delivery Room Setup

- 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.

Management

- 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

Delivery

- 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 injury to the fetal brachial plexus nerve and further impact the shoulders.

Initial Stages of Management

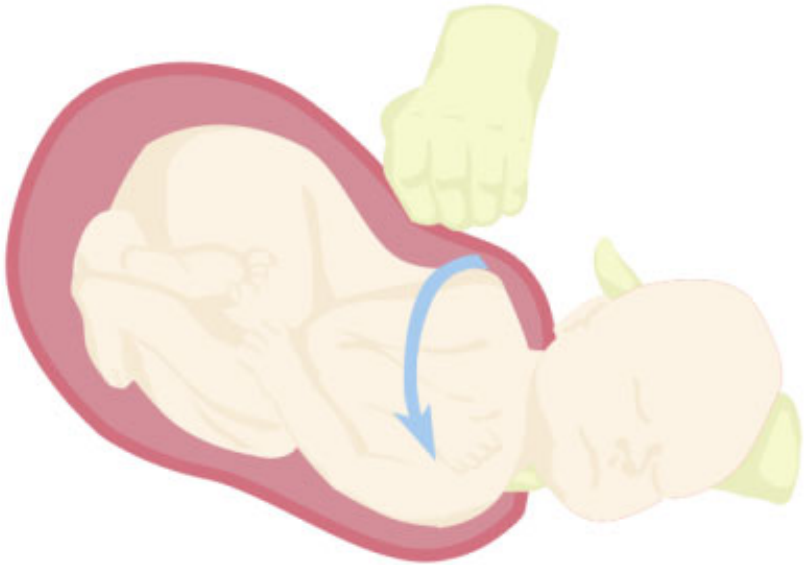
- Fundal pressure is NOT an obstetric maneuver used but with shoulder dystocia its use could lead to further impaction of the shoulders, fractured fetal clavicle, or uterine rupture.
- The maternal bladder should be emptied if distended.
- No one single maneuver is more effective than another but it 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.

Fundal pressure used with shoulder dystocia could lead to further impaction of the shoulders or uterine rupture.

Fundal Pressure

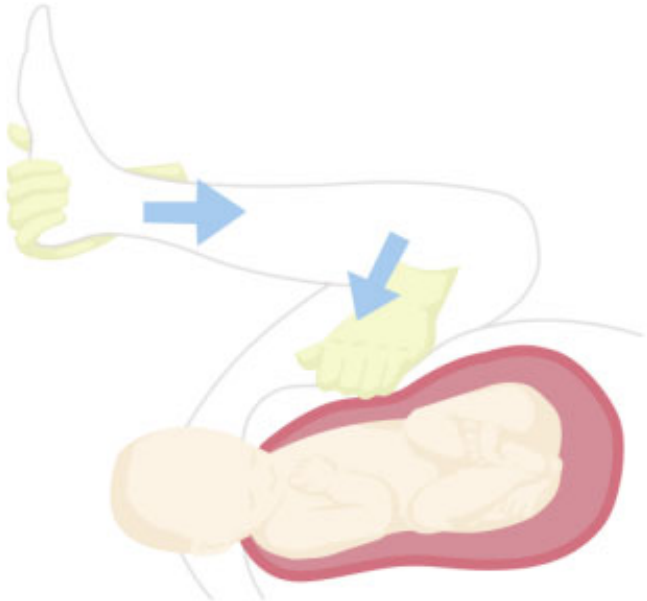
- McRoberts maneuver is performed first as this is the least invasive and may be all that is needed to dislodge the impacted shoulder [1].
  - This is followed by suprapubic pressure.
- McRoberts maneuver requires two persons, each holding a maternal leg and flexing the thigh back against the maternal 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 shoulder dystocias [21].

Maneuvers



- 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.

Maneuvers Cont'd



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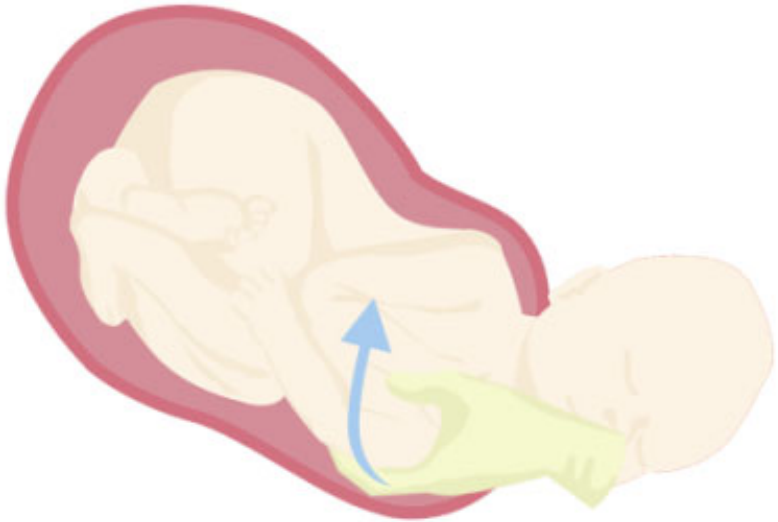
- McRoberts maneuver and suprapubic pressure is generally used simultaneously as they are simple, rapid, and effective in dislodging an impacted anterior shoulder
- Separation of the symphysis pubis, transient femoral nerve injury. or sacroiliac joint dislocation from aggressive hyperflexing of the maternal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

Maneuvers Cont'd



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 maternal right.

- If external attempts with suprapubic pressure does not adduct the anterior shoulder, Rubin maneuver is 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

Maneuvers Cont'd

- 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].

Maneuvers Cont'd

- 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 and may be used when other methods fail.
- 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.
- 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."

Maneuvers Cont'd

Gaskin's Maneuver

- 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 procedure is no 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].

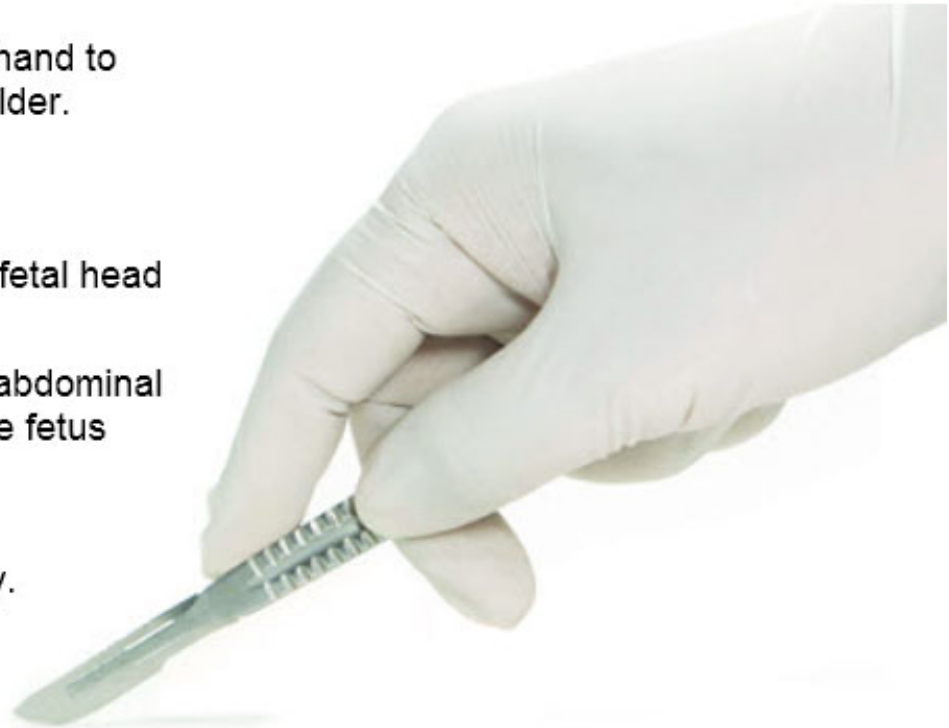
- This maneuver may be difficult if the woman has received epidural analgesia and is unable to roll over or maintain the position.
- Additional staff may be needed for this maneuver for support of the woman.

An episiotomy:

- By itself will not relieve a shoulder dystocia as maternal soft tissue is not the cause of this situation.
- 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.

Last resort procedures [26, 27]:

- Gunn-Zavanelli-O'Leary maneuver invloves 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 have significant maternal morbidity.



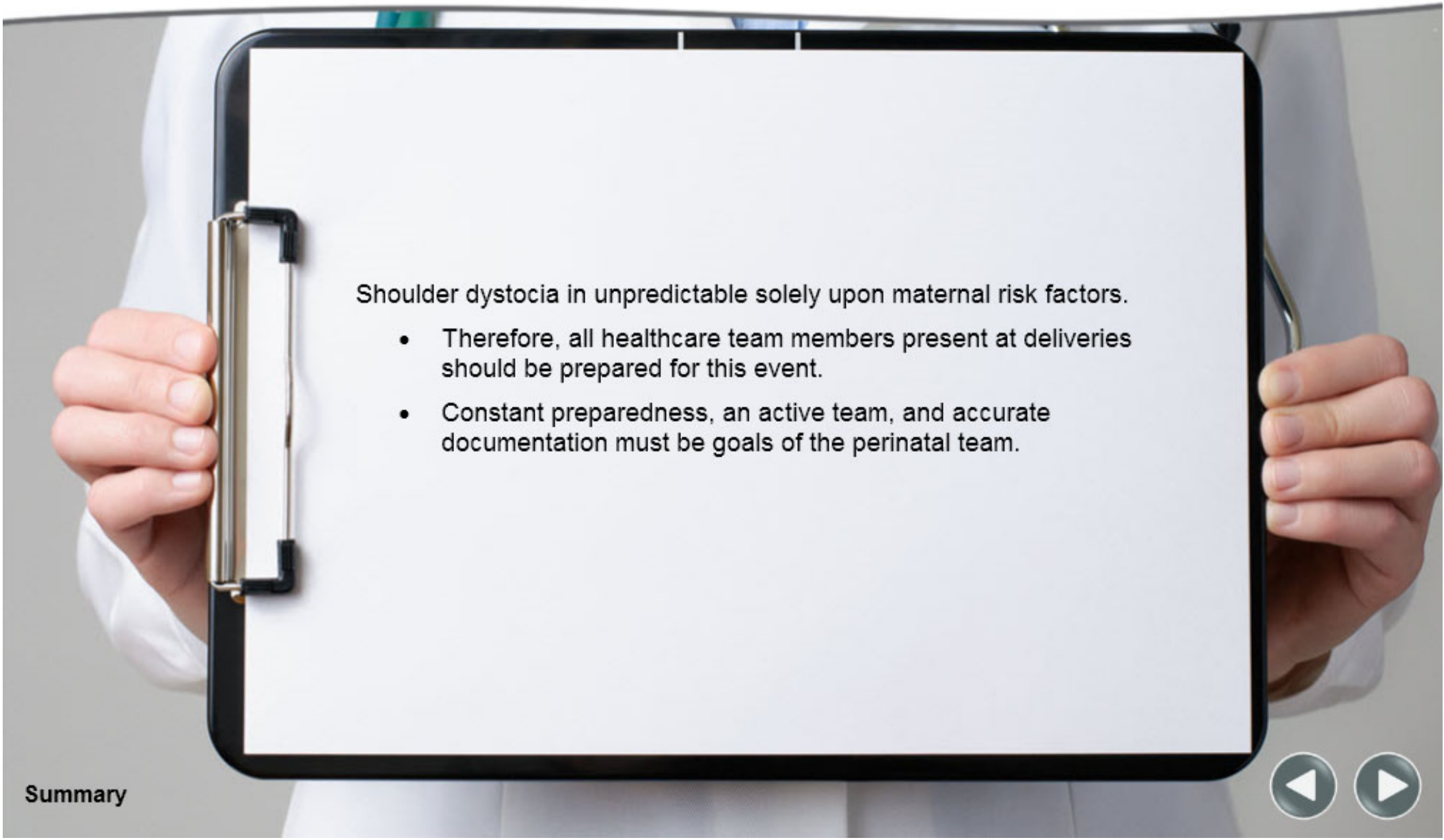
Maneuvers Cont'd

- 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 [28].
- 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 rotation before utilizing any other maneuver

Guidelines from Professional Organizations

- 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 at any point along the cord asphyxia may occur and their sequelae including death.
    - 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].

Complications


Shoulder dystocia in unpredictable solely 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.
Summary

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.
  - Woman 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 (the 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

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.

References

1. Committee on Practice Bulletins-Obstetrics. Practice Bulletin No 178. Shoulder Dystocia. Obstet Gynecol . 2017; 129:e123.

2. Nesbitt TS, Gilbert WM, Herrchen B. Shoulder dystocia and associated risk factors with macrosomic infants born in California. Am J Obstet Gynecol 1998; 179(2):476-80.

3. Geray M, McParland P, Johnson H, Stronge J. Shoulder dystocia—is it predictable? Eur J Obstet Gynecol Reprod Biol 1995; 62:15.

4. Ouzounian JG, Gherman RB. Shoulder dystocia: are historic risk factors reliable predictors? Am J Obstet Gynecol 2005; 192:1933.

5. Langer O, Berkus MD, Huff RW, Samueloff A. Shoulder dystocia: should the fetus weighing greater than or equal to 4000 grams be delivered by cesarean section? Am J Obstet Gynecol 1991; 165:831.

6. MacKenzie IZ, Shah M, Lean K, et al. Management of shoulder dystocia: trends in incidence and maternal and neonatal morbidity. Obstet Gynecol 2007; 110:1059.

7. Dandolu V, Lawrence L, Gaughan JP, et al. Trends in the rate of shoulder dystocia over two decades. J Matern Fetal Neonatal Med 2005; 18:305.

8. Kim SY, Sharma AF, Sappenfield W, et al. Association of maternal body mass index, excessive weight gain, and gestational diabetes mellitus with large-for-gestational-age births. Obstet Gynecol 2014; 123:737.

9. Zhang C, Wu Y, Li S, Zhang D. Maternal prepregnancy obesity and the risk of shoulder dystocia: a meta-analysis. BJOG 2018; 125:407.

References

10. Dildy GA, Clark SL. Shoulder dystocia: risk identification. Clin Obstet Gynecol 2000; 43:265.

11. Vidarsdottir H, Geirsson, RT, Hardardottir H, et al. Obstetric and neonatal risks among extremely macrosomic babies and their mothers. Am J Obstet Gynecol 2011; 204:423 e1.

12. Acker DB, Sachs BP, Friedman EA. Risk factors for shoulder dystocia. Obstet Gynecol 1985; 66:762.

13. Sandmire HF, O'Halloin TJ. Shoulder dystocia: its incidence and associated risk factors. Int J Gynaecol Obstet 1988; 26:65.

14. Boulet SL, Alexander GR, Salihu HM, Pass M. Macrosomic births in the united states: determinants, outcomes, and proposed grades of risk. Am J Obstet Gynecol 2003; 188:1372.

15. Zhang X, Decker A, Platt RW, Kramer MS. How big is too big? The perinatal consequences of fetal macrosomia. Am J Obstet Gynecol 2008; 198:517.e1.

16. Kim SY, Sharma AJ, Sappenfield W, et al. Association of maternal body mass index, excessive weight gain, and gestational diabetes mellitus with large-for-gestational-age births. Obstet Gynecol 2014; 123:737.

17. Zhang C, Wu Y, Li S, Zhang D. Maternal prepregnancy obesity and the risk of shoulder dystocia: a meta-analysis. BJOG 2018; 125:407.

18. Bingham J, Chauhan SP, Hayes E, et al. Recurrent shoulder dystocia: a review. Obstet Gynecol Surv 2010; 65:183.

19. Dall'Asta A, Ghi T, Pedrazzi G, Frusca T. Does vacuum delivery carry a higher risk of shoulder dystocia? Review and meta-analysis of the literature. Eur J Obstet Gynecol Reprod Biol 2016; 204:62.

References

20. Lerner H, Durlacher K, Smith S, Hamilton E. Relationship between head-to-body delivery interval in shoulder dystocia and neonatal depression. Obstet Gynecol. 2001 Nov;118(5):1184.

21. Gherman RB, Goodwin TM, Souter I, Neumann K, Ouzounian JG, Paul RH. The McRoberts' maneuver for the alleviation of shoulder dystocia: how successful is it? Am J Obstet Gynecol 1997;176(3):656-61.

22. Heath T, Gherman RB. Symphyseal separation, sacroiliac joint dislocation and transient lateral femoral cutaneous neuropathy associated with McRoberts' maneuver. A case report. J Reprod Med 1999; 44:902.

23. Woods CE. A principle of physics as applicable to shoulder delivery. Am J Obstet Gynecol 1943; 45:796-804.

24. Baskett TF. Shoulder dystocia. In: Essential management of obstetric emergencies. 4th ed. Bristol: Clinical Press; 2004. p.134-40.

25. Bruner JP, Drummond SB, Meenan AL, Gaskin IM. All-fours maneuver for reducing shoulder dystocia during labor. J Reprod Med 1998; 43(5):439-43.

26. O'Leary JA, Cuva A. Abdominal rescue after failed cephalic replacement. Obstet Gynecol 1992; 80:514.

27. O'Shaughnessy MJ. Hysterectomy facilitation of the vaginal delivery of the posterior arm in a case of severe shoulder dystocia. Obstet Gynecol 1998; 92:693.

28. Shoulder dystocia. [Green-top guideline no 42]. 2nd ed. London: Royal College of Obstetricians and Gynaecologists; 2013. Available: http://www.rcog.org.uk/womens-health/clinical-guidance/shoulder-dystocia-green-top-42.

29. Gherman RB, Ouzounian JG, Goodwin TM. Obstetric maneuvers for shoulder dystocia and associated fetal morbidity. Am J Obstet Gynecol 1998; 178(6):1126-30.

References

30. Acker DB, Sachs BP, Friedman EA. Risk factors for shoulder dystocia. Obstet Gynecol 1985;66(6):762-8.

31. Draycott TJ, Crofts JF, Ash JP, Wilson LV, Yard E, Sibanda T, et al. Improving neonatal outcome through practical shoulder dystocia training. Obstet Gynecol.

32. Gherman RB, Chauhan S, Ouzounian JG, et al. Shoulder dystocia: the unpreventable obstetric emergency with empiric management guidelines. Am J Obstet Gynecol 2006; 195:657.

33. Hoffman MK, Bailit JL, Branch DW, et al. A comparison of obstetric maneuvers for the acute management of shoulder dystocia. Obstet Gynecol 2011; 117:1272.

34. Gherman RB, Goodwin TM, Souter I, et al. The McRoberts' maneuver for the alleviation of shoulder dystocia: how successful is it? Am J Obstet Gynecol 1997; 176:656.