

CHAPTER 13

SHOULDER DYSTOCIA

Learning Objectives

By the end of this chapter, the participant will:

1. Identify the signs of shoulder dystocia at delivery.
2. Describe the ALARMER approach to management of shoulder dystocia.
3. Recall the four Ps to avoid when confronted with a shoulder dystocia.

Definition

- Inability of the shoulders to deliver spontaneously

Following the delivery of the head, there is impaction of the anterior shoulder on the symphysis pubis in the anteroposterior diameter, in such a way that the remainder of the body cannot be delivered by usual methods.¹ Less commonly, shoulder dystocia can result from impaction of the posterior shoulder on the sacral promontory. The head may be tight against the perineum. This is known as the “turtle” sign. Spontaneous restitution may fail to occur.

Incidence

The overall incidence ranges from 0.2% to 2% (Gherman, 2006). The estimated incidence for non-diabetic women delivering infants $\geq 4,000$ grams is 4% and for those $\geq 4,500$ grams is 10%. For diabetics delivering infants $\geq 4,000$ grams, the estimated incidence may be as high as 15% and 42% in infants $\geq 4,500$ grams (Langer et al, 1991; Johnstone et al, 1998; Rouse et al, 1999). Macrosomic infants have an increased incidence of prolonged labour, operative vaginal delivery, and emergency cesarean section compared with normal weight babies. These complications are more pronounced in nulliparous compared with parous women. However, shoulder dystocia occurs with equal frequency in nulliparous and parous women. Multiparity may be related to other risk factors such as maternal obesity and diabetes, and with previous shoulder dystocia. When considering assisted vaginal delivery in the presence of suspected fetal macrosomia, it is important to anticipate shoulder dystocia.

Significance

Shoulder dystocia is associated with trauma to both the woman and her fetus. Complications of shoulder dystocia include:

Fetal and neonatal

- Hypoxia or asphyxia and sequelae
- Birth injuries
 - Fractures: clavicle, humerus
 - Brachial plexus palsy
- Death

Maternal

- Postpartum hemorrhage
 - Uterine atony
 - Maternal lacerations
- Uterine rupture
 - 3rd or 4th degree tears

Fetal asphyxia may result in permanent neurological damage and even death. In shoulder dystocia, unlike in total cord occlusion, there may be some preservation of maternal–fetal circulation. Therefore, there may be a less rapid drop in pH. This underscores the consideration for not routinely cutting a nuchal cord in the presence of shoulder dystocia. (Wood et al, 1973)

A 3rd or 4th degree tear or fetal trauma can occur even during appropriate management. In some cases, they may deliberate, for example when choosing to break the fetal clavicle in an attempt to deliver the baby. These injuries are preferable to fetal asphyxia or death.

Brachial plexus injury may be associated with exogenous, clinician-applied, extreme lateral traction on the fetal head. However, recent mathematical modeling suggests that endogenous (maternal and uterine) forces compressing the base of the fetal neck against the symphysis pubis during the second stage of labour may substantially contribute to brachial plexus injury (Gonik et al, 2000; Gonik et al, 2003). Case reports of brachial plexus injuries after non-traumatic births have also led to exploration of prelabour intrauterine causes. It has been shown that in about 51% of macrosomic babies, brachial plexus injuries are not related to shoulder dystocia (Lerner, 2006). Nerve root damage most commonly involves the origins at the C5 and C6 level. These nerve roots supply the forearm flexors and supinators. Thus the elbow is extended and wrist pronated (waiter’s tip sign), resulting in the classical Erb-Duchenne palsy. This brachial plexus injury is of varying degree and fortunately, rarely results in permanent damage. When the damage involves C8 and T1, it is called the Klumpke’s type brachial plexus palsy (claw hand sign).

Predisposing Factors

Over 50% of shoulder dystocia are not predictable and have no risk factors (O’Leary, 1990). Therefore, the health care provider must be prepared for shoulder dystocia to occur at every vaginal delivery. The following associated risk factors that may assist the clinician in preparing for shoulder dystocia:

- Suspected fetal macrosomia
- Maternal diabetes (Rouse, 1999)
- Post-term pregnancy
- Multiparity
- Obesity (Schwartz and Dixon, 1958; Seigworth, 1966)
- Excessive weight gain (more than 20 kg gain showed an increase in shoulder dystocia from 1.4% to 15.2%)(Boyd, 1983)
- Previous shoulder dystocia (recurrence rate of 10% to 13.8%)(Smith et al, 1994; Lewis et al, 1995)
- Prolonged labour
- Operative vaginal delivery

Many health care providers assume that diabetes is the major risk factor for shoulder dystocia because of the greater possibility of a larger baby. However, diabetes is unlikely to be a factor, unless the disease is poorly controlled and associated with maternal obesity. Maternal obesity and post-term pregnancy are the most commonly present factors in cases of shoulder dystocia.

The presence of predisposing factors is not by itself an indication for cesarean section or induction of labour. If a woman is considered at risk for shoulder dystocia, it is helpful to provide predelivery education about the steps that might be required if the shoulders are difficult to deliver. Preparing the woman and her partner for the possibility of the use of McRoberts position and the potential for requesting that the woman roll over onto all fours can increase co-operation and understanding during the event. Placing a stool on the side of the bed corresponding to the fetal back helps to indicate to the health care team the location for suprapubic pressure, if required. This action also communicates to the woman a clear caring by her health care team.

However, in women with a history of prior shoulder dystocia, the estimated fetal weight, gestational age, maternal glucose intolerance, and the severity of the prior neonatal injury should be evaluated, and the route of delivery discussed with the woman. Ultrasound is a poor predictor of fetal weight. Inducing labour for suspected large babies increases the intervention rate and does not decrease the incidence of shoulder dystocia; it is not recommended. (Weeks, 1995) In this situation, the health care team may want to consider reviewing the increased possibility of shoulder dystocia with the woman not only during the prenatal period, but again during her labour. Planning the role of each member of the health care team at the time of labour will potentially reduce stress for the woman, her family, and the health care providers involved. In addition, reviewing the management plan will increase the probability of successful resolution of this complication. A health care provider competent at neonatal resuscitation should be present at all births. When a woman has experienced shoulder dystocia in the past, wherever possible, a health care provider should be present at the birth whose sole responsibility is the immediate care of the newly born infant.

Diagnosis

Immediate recognition of shoulder dystocia is essential. Signs include:

- Head recoils against perineum, the “turtle” sign
- Spontaneous restitution does not occur
- Failure to deliver with expulsive effort and usual manoeuvres

Management Protocol

Avoid the 4 P's. **DO NOT!**

1. Pull
2. Push
3. Panic
4. Pivot (i.e. severely angulating the head, using the coccyx as a fulcrum)

Given the inability to predict the occurrence of shoulder dystocia reliably, health care providers should be prepared for shoulder dystocia at all deliveries. Therefore, a management protocol must be in place and well known to all care givers. The **ALARMER** mnemonic has been developed to assist in the appropriate and consistent management of this unexpected complication.

- A** Ask for help
- L** Lift/hyperflex Legs
- A** Anterior shoulder disimpaction
- R** Rotation of the posterior shoulder
- M** Manual removal posterior arm
- E** Episiotomy
- R** Roll over onto “all fours”

Shoulder dystocia is not a maternal soft tissue problem. However, an episiotomy may facilitate the performance of the above manoeuvres by allowing for additional access. When shoulder dystocia is recognized, it is important to instruct the woman to delay pushing until manoeuvres to relieve the obstruction are carried out. Recent computer simulations using a model of a fetus whose shoulder is blocked by the maternal pelvis have demonstrated that some of the greatest brachial plexus stretching occurs with maternal pushing alone (Gonik et al, 2000; Gonik et al 2003).

Ask for help

Planning

- Set up unique systems for calling for help in obstetric emergencies to assure that appropriate equipment and personnel are available consistent with local circumstances.
- Establish and practice a management protocol that includes all available health care providers. Post the protocol in the labour area so it is available to refer to during an emergency.

During the emergency

- Ask for help from the woman, her husband or partner, relatives, or doula,
- Notify your assistant or backup to enlist other appropriate health care providers, including those health care providers skilled in neonatal resuscitation.

Lift the legs

- Remove pillows from behind woman and help her move to a flat position in bed. Lower head of bed if elevated.
- Hyperflex both legs (McRobert's manoeuvre, Figure 1).
- Shoulder dystocia is often resolved by this manoeuvre alone. Figures 2 and 3 demonstrate the changes in the pelvic dimensions when the legs are flexed against the abdomen.



Figure 1- McRobert's manoeuvre

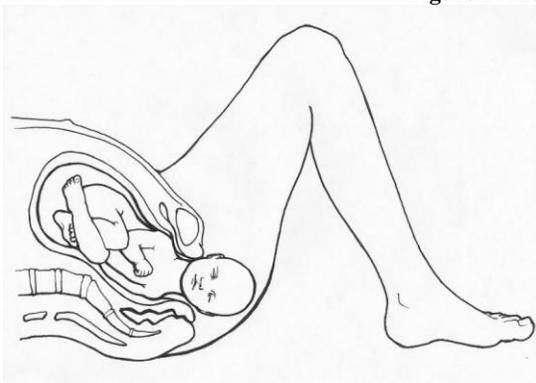


Figure 2

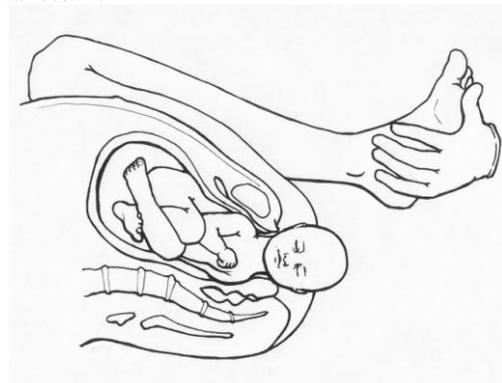


Figure 3

Changes to the Pelvic Dimensions when the legs are hyperflexed

Anterior disimpaction

- Abdominal approach:** Suprapubic pressure applied with the heel of clasped hands from the posterior aspect of the anterior shoulder to dislodge it (Mazzanti manoeuvre). Apply a steady pressure first and, if unsuccessful, apply a rocking pressure. Do NOT use fundal pressure. In combination with the McRoberts manoeuvre, this will deliver the baby in 91% of cases (Lurie et al., 1994). It is useful to understand the lay of the baby, so as to apply pressure from the correct side and be most effective. It is also useful to have a stool in delivery area to facilitate this manoeuvre. It is important to be above the woman when performing suprapubic pressure.



Figure 4 - Mazzanti manoeuvre

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- Vaginal approach:** Adduction of the anterior shoulder by pressure applied to the **posterior aspect of the shoulder**. The shoulder is pushed towards the chest, or pressure is applied to the scapula of the anterior shoulder Rubin manoeuvre.(Rubin, 1964)

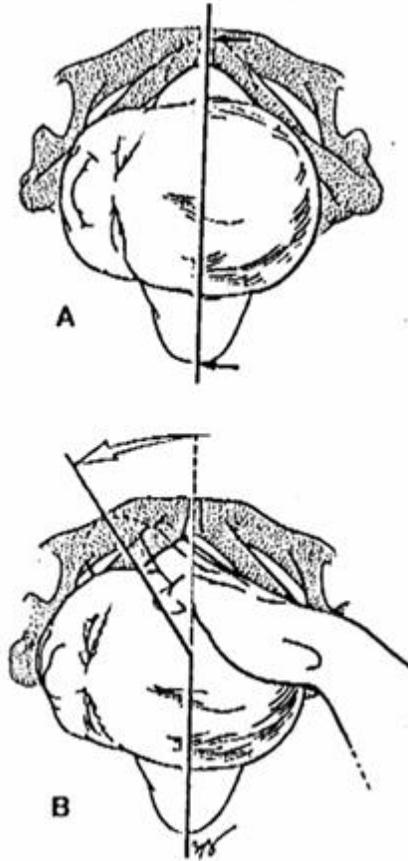


Figure 5 - Rubin manoeuvre

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 In: Cunningham et al. Williams obstetrics. 22nd ed. 2005.

These manoeuvres attempt to position the shoulders to utilize the smallest possible diameter of the fetus through the largest diameter of the woman.

Rotation of the posterior shoulder

Woods' manoeuvre is a screw-like manoeuvre. Pressure is applied to the **anterior** aspect of the posterior shoulder, and an attempt is made to rotate the posterior shoulder to the anterior position. Success of this manoeuvre allows easy delivery of that shoulder once past the symphysis pubis. In practice, the anterior disimpaction manoeuvre and Woods' manoeuvre may be done simultaneously and repetitively to achieve disimpaction of the anterior shoulder (Woods, 1943).



Figure 6 - Rotation of posterior shoulder: Step 1

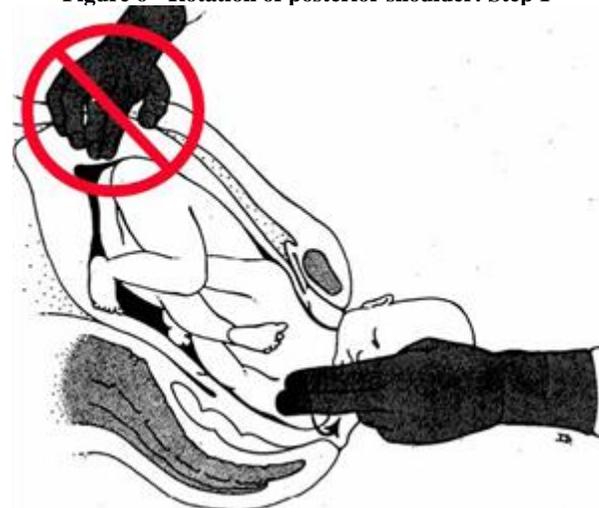


Figure 7 - Rotation of posterior shoulder: Step 2

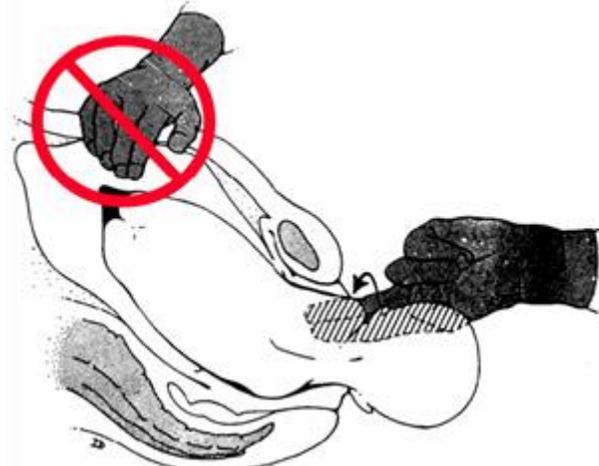


Figure 8 - Rotation of posterior shoulder: Step 3

Manual removal of the posterior arm

The arm is usually flexed at the elbow. If it is not, pressure in the antecubital fossa can assist with flexion. The hand is grasped, swept across the chest and delivered, as shown in Figure 9. This may lead to humeral fracture, which does not cause permanent neurological damage.

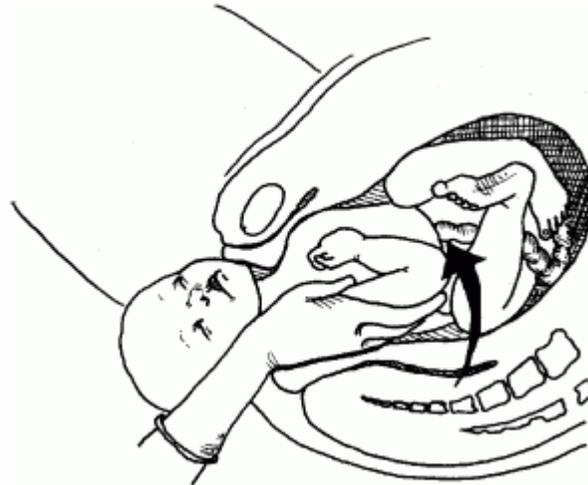


Figure 9 - Manual removal of the posterior arm

Reproduced from: *Managing complications in pregnancy and childbirth: a guide for doctors and midwives*. Geneva: World Health Organization; 2000.

http://www.who.int/reproductive-health/impac/Symptoms/Shoulder_dystocia_S83_S85.html

Roll over to “all fours” position: Gaskin manoeuvre

Moving 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 manoeuvres or removal of the posterior arm (Bruner, et al, 1998; Baskett, 2004). Prior experience with delivery in this position is an asset (Lurie et al, 1994). This manoeuvre, as shown in Figure 10, may be considered earlier.

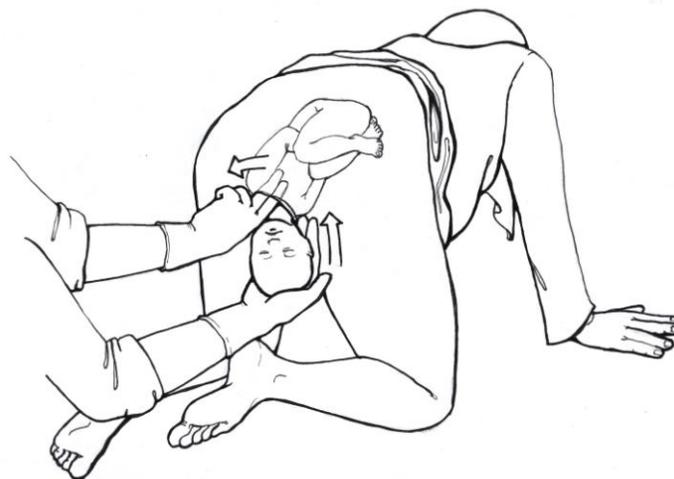


Figure 10 - Gaskin manoeuvre with rotation of posterior shoulder

Episiotomy

Episiotomy is an option that may facilitate the Woods' manoeuvre or manual removal of the posterior arm by creating more room for the accoucheur's hand.

After McRobert's manoeuvre, the sequence of manoeuvres may be individualized.

Other Manoeuvres

If nothing has worked to this point and all the procedures have been tried again, then some health care providers have suggested:

1. *Deliberate fracture of the clavicle, as shown in Figure 11*

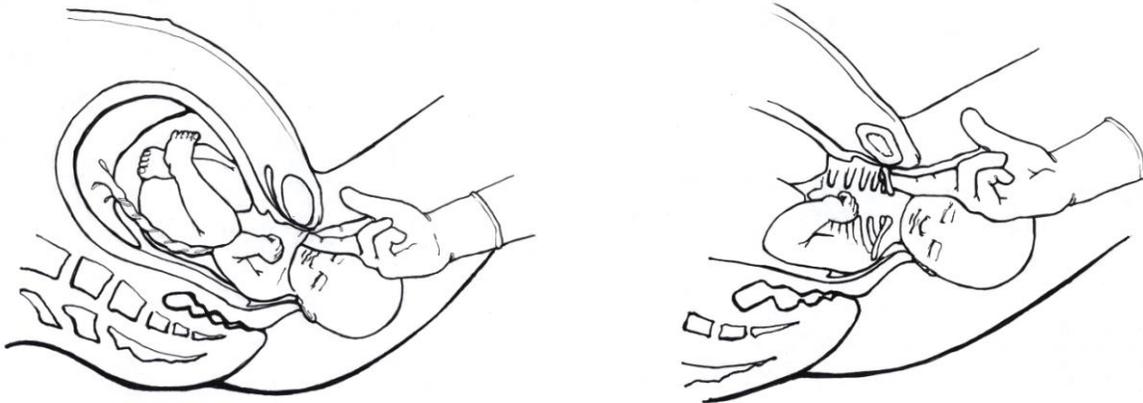


Figure 11 - Breaking the clavicle

2. **Symphiotomy**

The cartilage of the symphysis pubis (where the pubic bones come together) may be surgically divided to increase the size of the pelvic outlet (Menticoglou, 1990). This procedure is described in detail in Chapter 4, Management of Labour and Obstructed Labour.

3. **Zavenelli manoeuvre: cephalic replacement**

This manoeuvre involves reversing the cardinal movements of labour. The head is rotated to occiput anterior, as shown in Figure 12. Flex, push up, rotate to transverse, disengage, and perform a cesarean section. (Sandberg, 1999)

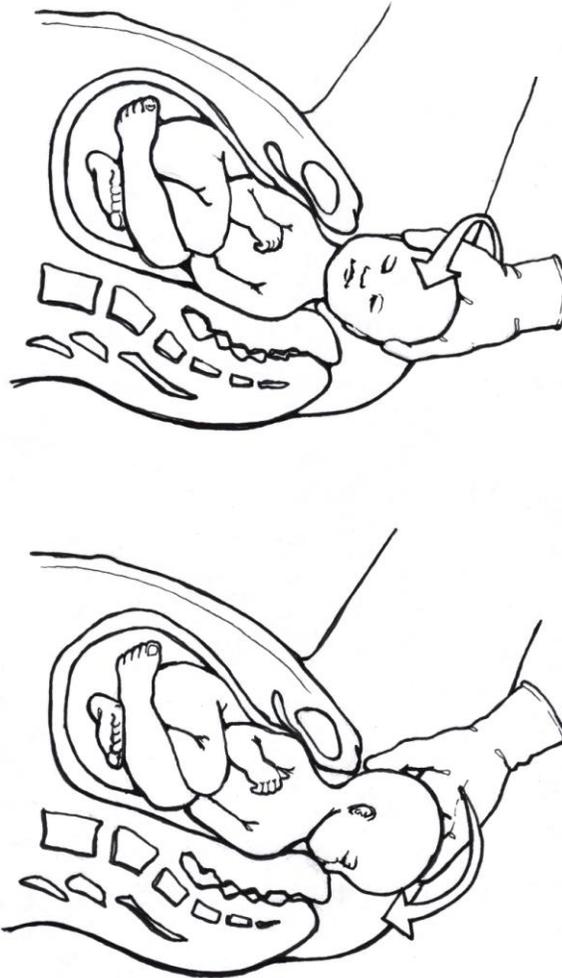


Figure 12 - Zavenelli manoeuvre

After Shoulder Dystocia

1. Remember the **SIGNIFICANT** risk of maternal injury (tears) and postpartum hemorrhage.
2. Actively manage the third stage. Apply active management of the third stage of labour.
3. Inspect for and repair tears or lacerations.
4. Do cord blood gases, if this is the policy of your institution.
5. Ensure appropriate neonatal resuscitation and assessment; document all actions taken to resuscitate the newborn.
6. Examine the newborn for evidence of trauma. Document the occurrence of shoulder dystocia in the baby's chart. Document Apgar scores and any bruising or injuries found on the initial newborn exam.
7. Re-examine the baby within 24 hours or at any time after the birth if concerns develop.
8. Document and describe the manoeuvres used, and, if possible, the time between the birth of the head to completion of the birth in both the mother's and the baby's charts.
9. Explain to the woman and all those involved in the delivery exactly what occurred and what management steps were taken. Advise her that she is at risk for another shoulder dystocia for her next pregnancy (15% recurrence after one dystocia and 30% after two shoulder dystocias).

Documentation

This is a suggested format for a chart note. Detailed notes should be incorporated into both the woman's and the baby's charts. This format may also serve as a template to dictate a delivery summary. If the woman was referred from another lower-level health care facility, this information should be included in a report letter to be sent to the referral facility.

- Date and time of birth
- Name of health care provider
- Delivery of the head: spontaneous or operative. If operative, forceps or vacuum?
- Type of analgesia or anesthesia present when the shoulder dystocia was recognized and any additional anesthesia given (if any)
- Description and order of manoeuvres used to deliver baby
- Estimation of traction forces used
- Use of episiotomy, description and timing, details of repair
- Estimated time from birth of head to complete birth of baby
- Apgar scores
- Results of cord blood analysis, if done
- Neonatal resuscitation activities, if needed
- Indicate which shoulder was impacted: left or right
- Description of maternal and neonatal injuries (if any)
- Recommendations for future deliveries

Suggestion for Applying the Sexual and Reproductive Rights Approach to this Chapter

During antenatal care, discuss with women what major emergencies may occur during labour and birth, and how these are usually managed. In this way, women will have a better understanding what to expect; this may help to decrease anxiety. At the same time, such discussion will increase confidence in health care providers. After an incidence, such as shoulder dystocia, it is important to take time to talk to the woman and whoever else was present at the birth about the events that have occurred. It is important that the woman understand why the complication may have happened, and why certain procedures were done to help her and her baby. Provide the woman and her family with advice for her next pregnancy and delivery.



Key Messages

1. Shoulder dystocia occurs most often without any identifiable risk factors and can result in significant neonatal and maternal complications.
2. Don't panic. Be prepared. Adopt a systematic approach such as ALARMER to ensure success.
3. Remember that ongoing care includes a clear explanation of events to the parents of what has occurred and timely and accurate documentation.

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ALARMER MNEMONIC

- A** **ASK** for help
- L** **LIFT** and hyperflex **LEGS**
- A** **ANTERIOR** shoulder disimpaction
- R** **ROTATION**
- M** **MANUAL** removal posterior arm
- E** **EPISIOTOMY**
- R** **ROLL** over onto ‘all fours’

IF THESE MANEUVERS DO NOT WORK Consider:

1. Deliberate fracture of the clavicle
OR
2. Perform symphysiotomy
OR
3. Perform Zavenelli manoeuvre if you have immediate access to cesarean section