SHOULDER DYSTOCIA

DEFINITION

Shoulder dystocia is defined as a birth which requires additional manoeuvres to release the shoulders after the head has been born and routine axial traction has failed.¹

It occurs due to impaction of the anterior shoulder against the maternal symphysis pubis, or less commonly the posterior shoulder impacted against the sacral promontory.²



INCIDENCE

Incidences of 0.1% to 3% vaginal births have been reported.^{1,7}

RISK FACTORS

The following antenatal and intrapartum characteristics have been reported to be associated with shoulder dystocia¹

Pre-Labour

- Fetal macrosomia* > 4.500 g
- Diabetes
- Gestational age (Increased fetal size the greater the gestational age)
- Maternal BMI > 30kg/m2
- Induction of Labour
- Previous shoulder dystocia (1-25% recurrence rate¹)

Intrapartum

- Prolonged first stage
- Oxytocin augmentation
- Secondary arrest in labour
- Prolonged second stage
- Assisted vaginal birth

*Although there is a link between fetal size and shoulder dystocia (especially those of mothers with diabetes) 48% of incidences occur in infants with a birth weight less than 4000 g^2 .

Shoulder dystocia is often an unpredictable and unpreventable event. The large majority of cases occur in the infants of women with no risk factors. In cases of shoulder dystocia resulting in infant morbidity, only 16% had identified risk factors¹.

Clinicians should be aware of existing risk factors but must also be alert to the possibility of shoulder dystocia at any birth.

COMPLICATIONS

Shoulder dystocia is an obstetric emergency that may lead to complications for both the woman and her baby including¹:

MATERNAL

- Postpartum haemorrhage (11%)
- Increased rates of 3rd and 4th degree tears (3.8%)
- Uterine rupture
- Bladder rupture
- Symphyseal separation
- Sacro-iliac joint dislocation
- Postpartum haemorrhage
- Psychological distress/trauma
- Lateral femoral cutaneous neuropathy

NEONATAL

- Brachial plexus injuries (BPI) (eg. Erb's, Klumpke's palsies, Total BPI) (2.3-16%)¹
- Clavicular and humeral fractures
- Hypoxic ischaemic encephalopathy and cerebral palsy
- Pneumothoraces
- Fetal/neonatal death

PREVENTION

Infants of mothers with diabetes have a 2-4 fold increased risk of shoulder dystocia compared with infants of the same birth weight born to mothers without diabetes¹.

A decision-analysis model estimated that in women with diabetes with an EFW >4.5kg, 443 caesarean sections would need to be performed to prevent one permanent BPI. In comparison, 3695 Caesarean sections would be required to prevent one permanent BPI in the non-diabetic population¹.

The following recommendations are for specific situations:

In cases of suspected macrosomia:

- With diabetes and estimated fetal weight > 4.500 g or > 95th Centile on Customised Growth Chart: elective caesarean section may be considered following discussion with Consultant Obstetrician¹
- Without diabetes: consider offering elective caesarean section if EFW is > 5 kg or > 99th centile on Customised Growth Chart, following discussion with Consultant Obstetrician

In cases of maternal diabetes:

- Maintain tight glycaemic control
- Growth scans to estimate fetal weight, and interval growth at (28) 32, 36 weeks gestation to be plotted on customized growth chart.
- Monitor weight gain during preconception and pregnancy care

In cases of previous shoulder dystocia

A discussion with a Consultant Obstetrician should be offered (as per Ministry of Health 2012 referral guidelines code 3016¹⁹). A decision for either caesarean section or vaginal birth may be appropriate after taking into consideration:

- The severity of previous shoulder dystocia
 - Manoeuvres required
 - Maternal trauma
 - Maternal incontinence
 - Neonatal morbidity
- Fetal size in this pregnancy
- Maternal choice
- Maternal mental health particularly PTSD (Post Traumatic Stress Disorder)
- Risk of repeat shoulder dystocia reported rates are 1- 25%¹ (rates may be underestimated as caesarean sections are performed for many women with prior shoulder dystocia or BPI's).

Regular training for all health professionals attending births is essential for the prevention and reduction of the complications from shoulder dystocia¹. Training needs to not just be knowledge based and should include recognizing that shoulder dystocia is an emergency, calling for appropriate help and participating in hands on skills and team work practice.

RECOGNITION

Timely management requires prompt recognition of the shoulder dystocia. These warning signs may occur:

- Difficulty with birth of face and chin
- When the head is born it remains tightly applied to the vulva or retracting into the perineal body (turtle-neck sign)
- Delay or failure of restitution of fetal head

However, shoulder dystocia should be declared when gentle routine, axial* traction does not free the shoulder.

*axial traction: in line with the fetal spine



MANAGEMENT

Flowchart for the management of shoulder dystocia is included below.

This flowchart begins with simple measures and leads to more invasive manoeuvres. The order of these actions may differ according to clinical circumstances (e.g. maternal obesity, maternal ability to change position, existing or available analgesia/anaesthesia). However, as a general principle do the simple measures first and do them well as the incidence of maternal and fetal trauma is higher in those births where internal manoeuvres are performed.

Do not delay. Fetal hypoxia will worsen the longer the delay between the birth of the head and the birth of the body (approximate drop in blood pH of 0.01 per minute).

Studies have demonstrated an increasing head to body interval time and drop in cord arterial pH was related to prior abnormal fetal heart rate and subsequent increased incidence of hypoxic-ischaemic encephalopathy (HIE) ^{9, 10.}

The three crucial manoeuvres for the resolution of shoulder dystocia can be summarised as below. It is recommended that we instigate the least intervention manoeuvres first, then progress through to internal manoeuvres. Repeat the cycle if necessary.



'The 3 P's': Position, Pressure, Per Vaginum (PV)

Te Whatu Ora Health New Zealand

Waitaha Canterbury

MATERNITY GUIDELINE

FLOWCHART FOR THE MANAGEMENT OF SHOULDER DYSTOCIA



Refer to guideline detail below (GLM0011)

MATERNITY GUIDELINE

MANAGEMENT OF SHOULDER DYSTOCIA DETAIL (FLOWCHART ABOVE)

CALL FOR HELP/INITIAL ACTIONS

- Activate red bell in room/ Birthing Suite emergency bell
- Call the Obstetric and Neonatal teams
- Note the time of birth of the head
- Inform the woman and her support people of the situation
- Discourage maternal pushing
- Avoid excessive traction on fetal head
- Declare the emergency: "This is a shoulder dystocia" to teams entering room
- Request a timekeeper/ documenter- use proforma in drawer in every birthing room
- Prepare for neonatal resuscitation
- Prepare for postpartum haemorrhage
- Call for advanced help- obstetric, anaesthetic, if not arrived with emergency bell

In secondary/tertiary unit

- Activate red bell 'in room' /Birthing Suite emergency bell, to immediately call those on same floor
- Obstetric Emergency and Neonatal Emergency:
 - Dial 777/Inform operator: "obstetric emergency" and "neonatal emergency"
 - Request obstetric emergency team and neonatal team
 - Advise location e.g. Birthing Suite, Room number #.
 - This will bring: Obstetric Registrar, Anaesthetic Registrar, Birthing Suite ACMM, Maternity Ward ACMM, Obstetric House Officer, Neonatal ACNM and Neonatal Registrar or Clinical Nurse Specialist.
 - Neonatal Consultant to be requested as required and as decided by Neonatal team present.

In primary unit

Fast page on 777 – ACMM and/or obstetric team

Dial 111 for ambulance and state "Code One" (lights and siren)

THE 3 P'S: POSITION PRESSURE PV (PER VAGINUM)

1 **P**OSITION

Aim

- To Increase functional size of bony pelvis
- Dislodge fetal shoulder due to pelvic movement

Once the position has been changed use of axial traction in any of the following positions must be slow, gentle and in line with the fetal spine.

The choice of which position to use to relieve the shoulder dystocia will depend on what position the woman has adopted to birth and whether or not she has had a regional block.

i) Knees to shoulders (McRoberts' Manoeuvre) (Figure 1)

Lie the bed flat, ask and/or assist the woman to move her buttocks to edge of bed and to bend her knees towards her shoulders so her buttocks are tilted up and off the bed.

Practitioner must avoid excessive pushing back of the woman's legs, particularly if she has a dense epidural/spinal block and cannot report hip pain.

Can be used with suprapubic pressure to increase success

"Repeat McRoberts" may also assist: take the woman's legs into a straight position and then returning knees to shoulders, as further movement of the maternal pelvis may dislodge a fetal shoulder that did not move at first McRoberts attempt.





Figure 1

Special note

- Some practitioners also perform prophylactic McRoberts. Whilst this does increase the woman's pelvic dimensions there is no evidence that doing it 'in anticipation' is of benefit.
- It is important to alert the attending team to be ready to perform a McRoberts' Manoeuvre in the event that restitution does not follow, and a shoulder dystocia occurs.

ii) Roll over to all fours

(hands and knees or facing prone move thighs to abdomen/chest)

Ask the woman to roll over facing the floor so that she is supporting herself on her hands with her hips flexed and knees bent.

Or lean forward so chest and head are on the floor and hips and knees flexed and splayed. Buttocks are raised in the air.

Apply routine axial traction to attempt to deliver the baby.



Figure 2: All fours



Figure 3: Thighs to abdomen/chest

iii) Running start

While in hands and knees position, ask the woman to place one foot flat in front of her, with knee bent and hip flexed. This is a modified 'one-sided' McRoberts manoeuvre.





iv) Side lying

Ask the woman and/or assist her into a side-lying (lateral) position with upper leg raised and pulled back towards her shoulder





2 **P**RESSURE

Applied suprapubically – above the symphysis pubis

Aim

To decrease the bisacromial (shoulder to shoulder) diameter by adduction of shoulders. To rotate the anterior shoulder to the wider oblique diameter of the pelvis.

To free the anterior shoulder to slip underneath the symphysis pubis with the aid of routine axial traction.

- Mother's legs maintained in the 'knee to shoulder' (McRoberts) position
- Determine position of fetal back by abdominal palpation Apply pressure on same side as fetal back to allow the shoulders to 'scrunch' (adduct) in towards the fetal chest.
- Position yourself above the abdomen to be able to use your upper body effectively.
- Place hands in "CPR position" just above the symphysis pubis, onto the back of baby's anterior shoulder
- Apply direct firm pressure <u>downwards</u> to shift the baby's shoulder towards the maternal spine which may be enough to slide the shoulders through the pelvic brim.
- Simultaneously direct firm pressure <u>laterally</u> (towards the floor and away from yourself) to reduce the bisacromial diameter by curling the baby's shoulder over towards its chest and also by rotating the shoulder away from the anterior pelvic position and into a more oblique position to allow a better diameter for birthing.
- Provide firm constant and/or rocking pressure (no evidence one is more successful than the other).
- A second practitioner to perform gentle axial traction to the baby's head and if the shoulder has dislodged to safely deliver the baby.



3 Per vaginum (pv) for internal manoeuvres

Aim

Change relationship of bisacromial diameter with the bony pelvis (i.e. rotate) Allow more space for internal manoeuvres to be performed

- Advise woman of need to perform internal manoeuvres and gain verbal consent.
- The decision as to which manoeuvre to make will depend on the clinical circumstances.
- Make hand as small as possible, as though inserting hand into a tube or putting on a solid bracelet/bangle. *Figures 4, 5 and 6*
- Consider a second practitioner to gently tilt the baby's head up and out of the way allowing more space to get a hand into the vagina. Take care to avoid excessive strain on nerves and tissues.
 Fig 7
- Insert whole hand per vaginum entering posteriorly.
- If unable to insert whole hand, consider episiotomy. A systematic review¹¹ showed no evidence supporting the routine use of episiotomy in preventing or managing a shoulder dystocia. Nor does it decrease the risk of brachial plexus injuries (BPI).¹² The only indication for use would be to facilitate access to the pelvis in the setting of a tight perineum.
- Inserting the whole hand is more likely to allow reach of the axilla or posterior arm rather than using the two fingers most commonly used for vaginal examination.
- There is likely to be ample space once whole hand is in the sacral hollow.
- Once hand rests in sacral hollow, reach along posterior vaginal wall to find fetal landmarks.











Figure 6

Figure 7

Depending on what is found on PV proceed to either removal of the posterior arm or axillary traction. If neither of these works then proceed to internal rotational manoeuvres.

Posterior arm removal

- a) If baby's arm is lying flexed across its chest ', grasp hand and wrist and gently sweep the arm across the baby's chest and face.
- b) If the hand is not lying across the chest, i.e. arm is straight by fetal side; slide your hand along the fetal arm and bend it at the elbow, by pressing on the antecubital fossa (front of elbow). Sweep the baby's arm across chest and then grasp wrist and remove.



MATERNITY GUIDELINE

Axillary traction¹⁵ (photos used with permission by Lesley Ansell⁶)



Enter posteriorly – slide hand along fetal head to neck

Grasp posterior shoulder

Grasp – circle first finger and thumb around axilla 2^{nd} finger placed on top of arm – keep arm firmly against chest and apply traction through axilla **only**

Apply axillary traction to follow the curve of the sacrum

Firm traction may be needed

Anterior shoulder 'PIVOTS' around symphysis – posterior shoulder delivered first

Special notes

- Another manoeuvre called *posterior axillary sling traction* (PAST⁹) has been proposed for intractable shoulder dystocia. This manoeuvre which involves the use of a sling (often suction tubing) is not recommended by RANZCOG 2020⁸ as "there is no real reliable evidence to support its wide use". It is also known to cause significant morbidity, one study showed one third of liveborn cases sustained a brachial plexus injury employing this technique and 15% sustained a fractured humerus⁹.
- There is insufficient evidence for CDHB to recommend the practice of 'follow through' or delivering through' in anticipation of shoulder dystocia, where the body is delivered immediately after the head without waiting for restitution to prevent shoulder dystocia. It is possible that by interrupting the normal mechanism of birth this manoeuvre may actually lead to impaction of the shoulders which may not have otherwise occurred.

Internal rotation^{4&5}

Apply pressure to fetal shoulder(s) in order to rotate in a clockwise or anticlockwise direction into the larger oblique diameter of the pelvis. The posterior shoulder will be most accessible.



PLEASE NOTE: a manoeuvre called 'shoulder shrug' has been published in 2019¹⁷. However, the paper was based on 3 cases only with no reports of severe outcomes i.e. only 1st & 2nd degree perineal tears and a brachial plexus injury which resolved by 2 weeks. There is insufficient evidence to recommend this manoeuvre as there is no clear evidence for safety and efficacy.

MATERNITY GUIDELINE

If position, pressure and PV manoeuvres have not been successful, consider 'last resort' manoeuvres and call for senior help to attend (if on site) or for telephone assistance (in community setting), including obstetric, anaesthetic and neonatal practitioners.

Continue to reattempt the "3 P's" in a cycle whilst awaiting advanced help arrival or transfer.



FURTHER INTERVENTION

There are several 'last resort' manoeuvre options. They are rarely used in a high resource setting. In a consecutive series of 17,000 births in the UK all shoulder dystocia's were resolved, using the national guideline, without the need for last resort manoeuvres¹⁸.

Some manoeuvres are more common in low resource countries, especially when there is no ready access to caesarean section.

Cleidotomy

This internal pelvic manoeuvre is the only non-surgical manoeuvre in this 'last resort' group It is the quickest to perform and least traumatic for the mother, so could be attempted whilst set up for the surgical manoeuvres.

- Upward pressure with fingers onto the baby's clavicle to cause a fracture
- This decreases the bisacromial diameter

Symphysiotomy

This manoeuvre which divides the symphysis pubis to increase the diameter of the pelvic outlet is primarily used in low resource countries

- Local anaesthetic injected over symphysis
- Insert a Foley catheter
- Vaginal hand displaces urethra laterally
- Skin incision down to symphysis
- Scalpel blade to divide the anterior fibres of the symphyseal ligament
- Assistant should support the pelvis on either side to prevent excessive traction
- Symphysis will then spread, allowing delivery.

- Support pelvis postpartum with a binder or support belt.
- High incidence of serious maternal morbidity and poor neonatal outcome¹⁶

Zavanelli manoeuvre

Replacement of the fetal head back into the vagina followed by emergency caesarean delivery

- Acute tocolysis will be required. Options are; terbutaline 0.25 mcg sub cutaneous injection, sublingual glyceryl trinitrate. (Acute Tocolysis with Terbutaline (Ref.2401299))
- Flex the fetal head to replace.
- Place fingers of one hand over fetal maxilla (cheek bones) and the other on the fetal occiput.
- Push the maxillae towards and up into the vagina whilst flexing the occiput.
- Replacement success rates vary
- High proportion of fetuses will have irreversible hypoxic acidosis by this stage
- This manoeuvre may not reduce the incidence of BPI's.

POSTPARTUM CARE

- 1. Active management of 3rd stage.
- 2. Be prepared for postpartum haemorrhage
- 3. Be prepared for newborn resuscitation.
- 4. Perform thorough examination for perineal, vaginal and cervical injuries, with adequate pain relief.
- 5. Debrief the family/ whanau and team members involved.
- 6. Manage neonatal injuries in accordance with Neonatal Handbook (Ref.2402528)
- Do not transfer out of the tertiary/ secondary facility if maternal or fetal injury has occurred. This is to ensure appropriate post event care including opportunities for debrief and arrangement of follow-up.

DOCUMENTATION

- Complete the shoulder dystocia documentation form (Ref.2407295) (see Appendix 1)
- Complete a Safety First incident report.

SUMMARY

- Shoulder dystocia is a life-threatening situation
- Recognise risk factors and be alert at every birth
- Declare an emergency
- Stay calm and focussed
- Work through flowchart The 3 'P's
- Record timing of events and management on the Shoulder Dystocia Documentation form (Ref.2407295)
- Arrange debrief and follow-up for family/whanau and the team

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APPENDIX 1 SHOULDER DYSTOCIA DOCUMENTATION S Canterbury NHI WARD ... SURNAME н District Health Board FIRST NAME 0 Te Poari Hauora ō Waitaha DOB AGE U MATERNITY SERVICES (or affix patient label) L DOCUMENTATION/CHECKLIST FOR OBSTETRIC EMERGENCY D OBSTETRIC EMERGENCY: red bell and dial 777, ask for Obstetrics and Neonatal teams Е Shoulder Dystocia R PRACTITIONERS IN ATTENDANCE D Designation Designation Name Time Name Time Υ S т 0 С T Α Diagnosis D Time Time of delivery of head By: 0 С Mode of birth of head: Spontaneous Forceps Kiwi cup Ventouse (circle applicable) U Maternal position at time of shoulder dystocia diagnosis (circle applicable) М Semi-recumbent All fours Kneeling Side lying R L McRoberts Lithotomy Other Ε Baby's back is : on maternal left on maternal right other/unknown Ν (left shoulder anterior) (right shoulder anterior) Т Actions Α Activate emergency bell Time By: Т L Neonatal team called Time: By: 0 Ν 1. Position (Maternal) Perform routine axial traction with each position Epidural: Yes No McRoberts (knees to shoulders) Side-lying Other All fours Running Start Time: Order Pressure (Suprapubic) 2. TIME ΒY COMMENTS Constant and/or rocking pressure on back of anterior fetal shoulder 3. Per Vaginum (PV) Internal manoeuvres in any order, repeat if required - enter posteriorly Perform routine axial traction with each manoeuvre Axillary traction Right/Left arm Delivery of posterior arm Right/Left arm Rotation posterior shoulder Clockwise/anti-clockwise Rotation anterior shoulder Clockwise/anti-clockwise Episiotomy (if unable to gain internal access) Please continue documentation over page Ref.2407295 Approved by: Midwifery Educators/PROMPT Team Page 1 of 2 March 2021

Te Whatu Ora Health New Zealand

Waitaha Canterbury

MATERNITY GUIDELINE

NHI WARD SURNAME FIRST NAME						Sho	Shoulder Dystocia			
Further actions				TIME		BY	COMMENTS			
Notify theatre/anaesthetist										
Move to theatre										
Baby										
Time of birth of baby										
Noted on QMR44:	Resus	Apgar	s 🗆	Cord gases	[Weight				
Any sign of arm weakness?			🗆 No	Any sigr	n of pot	tential bony fr	acture?	🗌 Yes	🗌 No	
Baby admitted to NICU?		☐ Yes	🗆 No	Contact	Consu	ltant Neonato	ologist <i>(if required</i>)	🗌 Yes	🗆 No	
Follow up	1									
	Comments:									
Safety 1 st Debrief for team arrange Name:	d?	☐ Yes ☐ Yes	□ No □ No			Debrief date	:			
Designation:				Signatu	e:					
	Approved by:	Midwifery Educ	ators/PROM	IPT Team		Pa	ge 2 of 2	N	March 202	