

Vaginal Birth - Assisted or Instrumental



Immediate Actions

- Consideration of performing high risk births in the operating theatre
- Consultant must be present (or enroute) for all high risk births
- In the event of a failed vacuum extraction, a forceps delivery should only be attempted by a skilled operator. Delivery by Caesarean section should be considered
- A pudendal block may be appropriate where there is no regional block in place, especially where there is a need for urgent delivery. Perineal infiltration alone is rarely adequate except for some outlet vacuum extractions
- Attempted vaginal delivery should be abandoned where:
 - There is no evidence of progressive descent with traction with each pull
 - For vacuum extraction, there is disengagement of the cup two times
 - When the birth is not imminent following traction over three consecutive contractions of a correctly applied instrument by an experienced operator

1. Purpose

This guideline informs clinicians of the safe practice strategies that should be employed when an instrumental birth is considered the most appropriate mode of birth. Instrumental birth is performed to expedite the vaginal birth of the infant when the risks of the procedure are less than the risks of waiting for spontaneous vaginal birth, and the conditions necessary for the procedure (below) are present. Instruments used are obstetric forceps or vacuum cup (ventouse). Occasionally a combination of both instruments is required to complete the birth.

Where processes differ between campuses, those that refer to the Sandringham campus are differentiated by pink text or have the heading **Sandringham campus**.

2. Definitions

Engagement of the fetal head: defined as the maximum diameter of the presenting part has entered the pelvic inlet. This is determined by abdominal palpation as well as vaginal examination².

Favourable presentation: a vertex, deflexed vertex or face presentation. The latter is a contraindication to vacuum birth.

Subgaleal haemorrhage: is a potentially lethal condition in new-borns resulting from bleeding into the space between the epicranial aponeurosis and the periosteum. Morbidity and mortality are associated with subgaleal haemorrhage due to the large potential space beneath the aponeurosis. Blood loss can be significant and life-threatening. It is important to differentiate between subgaleal haemorrhage and other neonatal cerebral fluid collections such as caput succedaneum and cephalhaematoma. *Symptomatic subgaleal haemorrhage is a medical emergency.*

Classification of Types of Assisted Vaginal Birth:

- **Outlet forceps or vacuum delivery:**
 - Fetal scalp is visible without parting the labia
 - Fetal head is at, or on the perineum
 - Fetal skull has reached the pelvic floor
 - Sagittal suture is in the antero-posterior diameter, or right or left occipito-anterior or posterior position (rotation does not exceed 45°)
- **Low forceps or vacuum delivery:**
 - Leading point of the skull (not caput) is at or below station +2cms and not on the pelvic floor

Vaginal Birth - Assisted or Instrumental



- Sagittal suture is rotated 45° or less from the midline
- (b) Sagittal suture is rotated more than 45° from the midline

• Mid-cavity forceps or vacuum delivery:

- Consider the need for a trial of vaginal birth in the operating theatre with obstetric consultant back-up
- Fetal head should have no more than 2 cms (1/5) palpable per abdomen
- On vaginal examination the leading point of the fetal skull is above station +2cm but not above the ischial spines

3. Responsibilities

Medical staff are responsible for obstetric care determined by the clinical situation including obtaining consent, assessment of the new-born for trauma and documentation. The choice of instrument is selected based on the clinician's training and competence in the procedure, clinical experience and clinical circumstances ².

Midwifery staff are responsible for the midwifery care of the woman undergoing the procedure including:

- Palpating contraction pattern and determining fetal heart rates, communicating same to accoucheur
- monitoring the duration and number of pulls and relating this information to the accoucheur
- assisting the accoucheur as required
- ensuring a neonatologist is requested to attend
- ensuring neonatal resuscitation equipment is available and working
- assisting with collection of cord gases after the birth
- initiating standard neonatal observations and observations for subgaleal haemorrhage in cases of difficult birth (see section Observation for Subgaleal Haemorrhage)

4. Guideline

4.1 Principles of care

- Reasonable anticipation of successful outcome
- Operator must have the knowledge, experience and skill to use the instrument correctly
- Operator must have the ability to anticipate and manage potential complications
- Adequate facilities and backup personnel available, including those skilled in neonatal resuscitation should be available
- A back-up plan in case of failure to deliver should be available
- A consultant obstetrician must be present for all attempts at mid-cavity or rotational forceps, and all 'trials of forceps' in theatre
- In the event of a failed vacuum extraction, a forceps delivery should only be attempted by a skilled operator. Delivery by Caesarean section should be considered
- Paired umbilical cord, blood gas samples will be processed following all attempts at an assisted vaginal birth and the results recorded in the birth documentation

4.2 Indications for Assisted Vaginal Birth ¹

In general no indication is absolute. Actions should relate to the individual case and with regard to station, degree of fetal compromise and the number of risk factors present. With few exceptions, the same indications apply to both vacuum and forceps delivery. Indications can be classified as standard (low) risk and special (moderate risk or trial) ¹. The same selection criteria should be applied to a second twin as for the first twin.

Lower risk

- Suspected fetal compromise
 - or increasing scalp lactate measurement less than 4.7
- Failure to progress in second stage with the head at the pelvic outlet, at low station or in mid pelvis
 - Nulliparous women: lack of continuing progress for 3 hours with epidural, or 2 hours without epidural (passive + active second stage labour)
 - Multiparous women: lack of continuing progress for 2 hours with epidural, or one hour without epidural (passive + active second stage labour)

Vaginal Birth - Assisted or Instrumental



- Maternal fatigue/ exhaustion
- To shorten the duration of second stage for maternal indications
 - E.g. severe cardiac disease, hypertensive disorders, cerebral vascular disease/ uncorrected cerebral vascular malformations, myasthenia gravis, spinal cord injury

Higher risk

This classification applied to any condition that makes it unsafe for the fetus to remain in the uterus during second stage.

- Evidence of fetal compromise and head not visible
 - Abnormal CTG
 - Scalp lactate sample greater than 4.7
- Failure to progress in second stage with a malposition, a big baby +/- suspected fetal compromise
- Inadequate uterine contractions and maternal exhaustion
- Fetal gestation greater than 34 weeks but less than 36 weeks
- Abruptio placenta in second stage
- Cord prolapse in second stage (multigravida)

4.3 Relative Contraindications ¹

- Severe fetal compromise and head not visible
 - The widest diameter of the fetal head has not yet passed through the most resistant part of the birth canal ¹
- Birth of second twin when head not engaged or cervix not fully dilated
- Combined presence of low or moderate risk indications
- Fetal head not fully engaged
- Cervix not fully dilated
- Risk of vertical transmission of Hepatitis C and HIV. Avoidance of acquired infection as a result of an increased chance of facial or scalp abrasions. Forceps are the instrument of choice if necessary

4.4 Absolute Contraindications

Vacuum¹

- Fetal predisposition to fractures (e.g. osteogenesis imperfecta)
- Fetal bleeding disorders, e.g. alloimmune thrombocytopenia, haemophilia, von Willebrand's disease
- *Face presentation
- *Prematurity of <34 weeks gestation

**In these circumstances non-rotational low or outlet forceps may be permissible after consultant discussion.*

Forceps

- Fetal predisposition to fractures (e.g. osteogenesis imperfecta)

4.5 Precautions prior to undertaking assisted delivery

- In primigravidas, the use of oxytocin to augment labour should be considered for managing delay in the second stage of labour before the fetal head reaches the pelvic floor, rather than initiating early instrumental intervention

Vaginal Birth - Assisted or Instrumental



- The use of oxytocin at this stage in women who have previously had a baby has the potential to cause uterine rupture

Assisted vaginal births with an anticipated higher rate of failure should be considered a trial and conducted in the operating theatre.

Higher rates of failure are associated with:

- maternal body mass index greater than 30
- estimated fetal weight greater than 4000 g or clinically big baby
- occipitoposterior position
- Mid-cavity delivery or when 1/5 head palpable per abdomen (consider the need for a trial of vaginal birth in the operating theatre with obstetric consultant back-up)

4.6 Assessment

Vaginal Examination

- Cervix fully dilated
- Membranes ruptured
- Station of presenting part - the vertex must be at or below the ischial spines (beware of caput and moulding in assessing the station)
- Knowledge of the exact position of the fetal head aids appropriate and safe placement of instrument
- Pelvis deemed to be adequate

Maternal

- Provide explanation of procedure
- Obtain informed (verbal) consent
- Empty maternal bladder
- Indwelling catheter should be removed or have balloon deflated
- Ensure anaesthesia/ analgesia is adequate for the procedure. For mid-cavity rotational deliveries (irrespective of instrument) this will usually be a regional block
- A pudendal block may be appropriate where there is no regional block in place, especially where there is a need for urgent delivery. Perineal infiltration alone is rarely adequate except for some outlet vacuum extractions
- [Aseptic techniques](#)

4.7 Management

Clinical Requirements - general

- Choice of instrument is dependent on the skills and preference of the operator and the clinical situation
- The clinician has received appropriate training in use of the chosen instrument
- Trainees are supervised by an experienced obstetrician
- The need for instrumental birth is associated with the potential for shoulder dystocia. Refer to the Women's guideline: [Shoulder Dystocia](#)
- The need for mediolateral episiotomy is generally required
- Neonatologist to be present for the delivery where neonatal morbidity can be reasonably anticipated, including but not limited to all cases of suspected fetal compromise, mid-cavity and rotational deliveries

Vaginal Birth - Assisted or Instrumental



- Attempted vaginal delivery should be abandoned where:
 - There is no evidence of progressive descent with traction with each pull
 - For vacuum extraction, there is disengagement of the cup two times
 - When the birth is not imminent following traction over three consecutive contractions of a correctly applied instrument by an experienced operator

Clinical requirements- vacuum

- Use of 'anterior' cups should be restricted to non-rotational, low vacuum deliveries
- 'Posterior' cups should be used for occipitoposterior and occipitotransverse deliveries
- Vacuum devices that incorporate a traction handle should be held with the bar cradled in the distal interphalangeal joints of the fingers. Sufficient traction can be generated in most cases by flexing the fingers¹
- Vacuum pressure should be between 60-80kPa (450-600 mmHg)¹
- Some progress should be made with each pull. In malpositions the initial progress may be some rotation as well as descent. Reassessment of the decision to deliver should be made after 3 consecutive 'pulls' with no progress
- Cup detachments cause injury to the fetal scalp and the procedure should be abandoned if there are 2 cup detachments¹
- The vacuum cup should be on for no longer than 10 minutes for multipara and 20 minutes for primipara¹
- Providing there is good descent the maximum number of pulls should be no more than 6

Clinical requirements- Neville-Barnes/Wrigley's forceps²

- Cervix is fully dilated
- The bladder is emptied
- Lithotomy position
- Medio-lateral episiotomy
- Favourable position of the vertex: occipito-anterior position of the vertex

Rotational forceps² - Kielland's

Use of Kielland's forceps is reserved for those fetuses where asphyxia is not a dominant feature. In considering Kielland's it is appropriate to have first attempted manual rotation prior to proceeding.

All Kielland's forceps must occur in an operating theatre equipped for caesarean section. *The threshold for proceeding to caesarean section is low; the procedure should be abandoned if the forceps cannot be easily applied.*

- Clinicians must receive appropriate training and maintain experience if they are to perform rotational births
- Rotation must only be attempted with the uterus relaxed

Clinical requirements²

As above plus:

- Allowance should be made for extensive caput and/or moulding
- The uterus must be relaxed for rotation; attempted only between contractions
- Consideration can be given to using a short-acting tocolytic such as glyceryl trinitrate to ensure adequate uterine relaxation
- The threshold for abandoning the procedure is low
 - The forceps cannot be easily applied
 - The handles do not approximate easily

Vaginal Birth - Assisted or Instrumental



- The rotation is not easily effected with gentle pressure

4.8 Potential and Relative Complications of Assisted Vaginal Birth

	Maternal Complications	Neonatal Complications
Forceps	Associated with a greater incidence in 3rd and 4th degree lacerations. Increase in the severity of genital tract trauma thereby increasing the likelihood of postpartum haemorrhage.	Has a greater association with external ocular injuries and facial nerve palsies.
Vacuum extraction	Associated with reductions in severe genital tract trauma. Associated with an increase in anterior vaginal trauma. More likely to fail at achieving vaginal delivery. Mother more likely to be worried about baby.	Associated with an increase in mild scalp lacerations, cephalhaematoma and retinal haemorrhage. Increased risk of subgaleal haemorrhage.

The use of two operative interventions for delivery is more likely to result in a serious injury to the neonate than a single intervention.

4.9 Documentation

This **MUST** be documented by the accoucheur within the Progress Notes and the Instrumental Birth Form and should include the following:

- Indication for intervention
- A record of discussion with the woman of the risks, benefits of the procedure and her options
- Description of fetal CTG and contractions
- Abdominal palpation: position of fetus & station of fetal head
- Consultation with senior medical officer

Instrumental Delivery Summary

The findings of vaginal examinations including:

- Station and position of the fetal head
- Amount of caput and moulding present
- Assessment of maternal pelvic capacity
- Indication for the operative birth
- Type of analgesia used
- Choice of instrument
- The number of attempts and ease of application of instrument
- The duration of traction and force required
- A description of maternal and neonatal injuries and their management
- Record of the paired umbilical cord gases (venous and arterial)
- Parkville: If an instrumental birth occurs in theatre, the Instrumental Birth Form in MCIS (GE) must be completed. Refer to this form in the operative notes in ORMIS. Estimated blood loss and post-op orders must be included in the ORMIS report for the PACU staff

Vaginal Birth - Assisted or Instrumental



- Sandringham: document in medical record.

4.10 Post Birth Management

- **Repair of perineal trauma:** refer to the Women's guideline: [Perineal Trauma Assessment, Repair and Safe Practice](#)
- Urinary output should be monitored for at least 24 hours post birth to detect postpartum urinary retention. A post-void residual urine should be measured if retention is suspected
- For a woman who has experienced an assisted birth/ **prolonged labour/ epidural anaesthesia**, consider an indwelling urinary catheter for twelve hours following the birth to prevent asymptomatic bladder overfilling. Refer to the Women's guideline: [Bladder Management - Intrapartum and Postpartum](#)
- Women should be offered physiotherapy-directed strategies to prevent urinary incontinence
- **Analgesia:** If there are no contraindications provide diclofenac and paracetamol at regularly prescribed intervals. Icepacks can be applied to the perineum at regular intervals for up to 48 hours
- **Thromboprophylaxis:** Assess woman in relation to individual risk factors
- The accoucheur should review the woman prior to hospital discharge and discuss the indication for operative delivery, management of any complications and the prognosis for future deliveries

Neonatal Observation

- Unless there is the need for resuscitation, immediate skin-to-skin contact should be facilitated as per the guideline [Labour and Birth and the Early Puerperium - Care during](#)
- Observe neonate for signs of jaundice, infection and any concerns about tissue or nerve related injury
- Baseline set of post-birth observations including activity, colour, heart rate, respiratory rate and review of head noting head size and shape for location and nature of swelling at one hour of age
- Routine observations must be taken i.e. hourly for 4 hours
- Avoid hats so that changes in head shape or size are noted
- All neonates born by instrumental birth should have IM vitamin K prophylaxis as soon as practicable after birth (with parental consent)

Observation for subgaleal haemorrhage ³

- Subgaleal haemorrhages can behave in unpredictable ways and have devastating consequences
- Undue reliance should not be placed upon a clinical picture of haemodynamic stability alone as the clinical picture may be falsely reassuring. The progression to haemodynamic compromise (tachycardia and hypotension) with subgaleal haemorrhage is associated with high mortality
- Upon suspicion or diagnosis of subgaleal haemorrhage in a neonate, practitioners should be aware of the possible urgent need for blood products

If birth was felt to be difficult these post-birth observations should be continued for 12 hours

The infant should be reviewed by the neonatologist if:

Head shape changes i.e. diffuse boggy head swelling

Vitals signs change

There is ANY clinical suspicion of subgaleal haemorrhage

Where there is clinical suspicion or diagnosis of a subgaleal haemorrhage, the baby should be admitted to the NISC. Symptomatic subgaleal haemorrhage is a medical emergency with a high mortality rate.

Vaginal Birth - Assisted or Instrumental



5. Evaluation, monitoring and reporting of compliance to this guideline

Compliance to this guideline will be monitored, evaluated and reported through review of incidents reported on VHIMS.

6. References

1. Vacca A (2009) Handbook of vacuum Delivery in Obstetric Practice Third Edition *Vacca Research Australia*
2. RANZCOG (2016) Instrumental vaginal birth (C-Obs 16) <http://www.ranzcog.edu.au/the-ranzcog/policies-and-guidelines/college-statements/430-instrumental-vaginal-delivery-c-obs-16.html>
3. RANZCOG (2015) Prevention Detection and Management of Subgaleal Haemorrhage in the Newborn (C-Obs 28) [https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Prevention-detection-and-management-of-Subgaleal-Haemorrhage-\(C-Obs-28\)-Review-November-2015.pdf?ext=.pdf](https://www.ranzcog.edu.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20guidelines/Clinical-Obstetrics/Prevention-detection-and-management-of-Subgaleal-Haemorrhage-(C-Obs-28)-Review-November-2015.pdf?ext=.pdf)

7. Legislation related to this guideline

Not applicable.

8. Appendices

Not applicable.

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