EXTENSION OF REVIEW DATE

RELEVANT TO	Instrumental vaginal birth clinical guideline
DATE OF EXTENSION	18 September 2023
NEW REVIEW DATE	December 2024
CONTENT AFFECTED	Date of review only. No other amendments
RATIONALE	• Original review date (December 2023) will be exceeded • Content remains current • Review in progress
AUTHORISED BY	Queensland Clinical Guidelines Steering Committee

Instrumental vaginal birth

IMPORTANT: *Consider individual clinical circumstances. Read the full disclaimer at* www.health.qld.gov.au/qcg

Classification of instrumental vaginal birth

Instrumental vaginal births are classified according to the station of the vertex and the degree of rotation of the sagittal suture from the midline.[1]

Classification	Description
Mid cavity	• Fetal head is no more than 1/5th palpable abdominally above the symphysis pubis • Leading point of the skull (not caput) is at or below the ischial spines and above station plus 2 cm • Two subdivisions: o Rotation of 45º or less from the occiput anterior (OA) position o Rotation of more than 45º including the occiput posterior (OP) position
Low cavity	• Leading point of the skull (not caput) is at or below station plus 2 cm and above the pelvic floor • Two subdivisions: o Rotation of 45º or less from the OA position o Rotation of more than 45º including the OP position
Outlet	• Fetal skull (not caput) has reached the pelvic floor • Fetal scalp visible without separating the labia • Sagittal suture is in the antero-posterior diameter or right or left OA or OP (rotation does not exceed 45º)

Indications and contraindications for instrumental vaginal birth

Aspect	Consideration
Indications	• Women with a live fetus with cephalic presentation in second stage labour where[2]: o There is inadequate progress in active second stage in the presence of adequate uterine activity [refer to Queensland Clinical Guideline*: Normal birth*[3]] o Maternal effort is contraindicated (e.g. cardiac conditions, hypertensive crisis[4]) o Fetal compromise is suspected[4,5]
Contraindications	• Head is above the ischial spines or 2/5th or more palpable abdominally above the symphysis pubis[1] • Known or suspected fetal bone demineralising conditions or bleeding disorders[1]
Risk factors for unsuccessful instrumental birth	• Limited and low-level evidence to identify risk factors influencing failure of the attempt—may include: o Estimated fetal weight over 4000 g or a clinically 'big baby'[6-9] o OP position at the time of application[6-9] o Prolonged second stage[7,9] [refer to Queensland Clinical Guideline: *Normal birth*[3]] o Higher station at the time of application[6,10] (compared to outlet) o Higher body mass index (BMI)—in one population-based case control study, AOR* increased with increasing BMI—BMI of 40+ kg/m^2 reported as AOR 2.65, (CI 1.57 to 4.49)[11] • Use clinical judgement and consider individual circumstances

*AOR (adjusted odds ratio) adjusted for age, race and education level CI: confidence interval

Principles of safe instrumental vaginal birth

Aspect	Consideration
Clinician skill	• The clinician performing the instrumental birth (or the clinician's supervisor in attendance) has the knowledge, experience and skill to[12]: o Safely perform the procedure o Manage complications that may arise • A clinician trained in neonatal resuscitation is required at the birth[1,4]
If clinical uncertainty	• Contact an experienced clinician without delay if there is clinical uncertainty about: o Accuracy of fetal or maternal assessment (e.g. degree of fetal caput or moulding, fetal presentation or station) o Performance of the procedure (e.g. decision for CS or selection of instrument) o Other clinical concern/uncertainty • If assessment of fetal head station/position is uncertain, ultrasound (transabdominal or transperineal) may assist[13] o Follow local protocols regarding use
Communication	• Provide information about the indications for and potential risks and benefits of instrumental birth antenatally[1] (e.g. during antenatal education or during antenatal visits), including the role of neonatal vitamin K prophylaxis • When instrumental birth is contemplated, provide clear explanation to woman and support people to facilitate understanding and informed consent • Inform other members of the health care team prior to procedure (e.g. paediatrician) • Use standard documentation formats (e.g. assisted vaginal birth clinical pathway[14]) to accurately record the indications for instrumental vaginal birth and details of the procedure
Setting	• If difficulty is anticipated, perform in operating theatre to facilitate access to immediate CS[1]
Sequential instrumentation	• Associated with increased rates of maternal[15,16] and neonatal[16] morbidity • Balance risks of sequential instrumentation with the risks of CS in second stage of labour • Maintain low threshold for CS after unsuccessful forceps[17]

Discontinuation

Aspect	Consideration
Context	• No high-level evidence on the maximum number of attempts, detachments[18] or pulls[1,4,19] • In this guideline, traction applied during one contraction is considered to be the equivalent of one pull (even if there are multiple maternal 'pushes' within a contraction)
Consensus recommendation	• Maintain situational awareness that: o Abandoning the procedure may be a safer option than prolonged, repeated or excessive traction efforts[1] o The traction applied is an adjunct to the mother's expulsive effort, not the primary force to overcome resistance to descent[20] ***With a correctly applied instrument, consider discontinuation**:* • With vacuum: o After two detachments o Descent is inadequate (full diameter of cup not visible at the perineum with three pulls[1]) o Duration of application of the vacuum cup reaches 20 minutes[21] • With forceps: o Blades cannot be applied easily, handles do not easily approximate or rotation not easily achieved—all without undue force o Descent is inadequate or birth is not imminent following three pulls

Comparison of outcome by instrument

Outcome/complication	Any vacuum type	Any forceps type
*Failure of attempt (7 studies, n=2419, RR 0.65, 95% CI 0.45 to 0.94)[22]	Higher	Lower
*Third or fourth degree tears (10 studies, n=2810, RR 1.89, 95% CI 1.51 to 2.37)[22]	Lower	Higher
*Vaginal trauma (8 studies, n=2443, RR 2.48, 95% CI 1.59 to 3.87)[22]	Lower	Higher
*Flatus incontinence/altered continence (1 study, n=130, RR 1.77, 95% CI 1.19 to 2.62)[22]	Lower	Higher
Levator avulsion (7 studies; n=977, OR 4.45, 95% CI 3.09 to 6.42)[23]	Lower	Higher
Subgaleal haemorrhage (SGH) Rate per 1000 instrumental births	3 to 7.6/1000[24]	1.6/1000[25]
*Other maternal outcomes[22]: blood loss, pain on day four, caesarean section (CS), vulval trauma, episiotomy or perineal tear requiring suturing with or without pudendal analgesia	No significant difference	
*Other neonatal outcomes[22]: any neonatal injury, Apgar score at 5 minutes, intubation, mean umbilical artery pH, scalp injury, facial injury, intracranial injury, cephalohaematoma, retinal haemorrhage, jaundice, admission to neonatal intensive care unit	No significant difference	

*32 RCT (n=6597 women). Not all comparisons included data on all outcomes. Outcome definitions varied among studies. Heterogeneity between some studies. CI confidence interval; n: number; RR: risk ratio; OR odds ratio.

Instrument by type (vacuum or forceps)

Instrument selection is dependent on the individual clinical circumstances, the woman's preference, the clinician's skill and experience, and the resources available.[22]

Aspect	Vacuum	Forceps
Indication	• May be preferred: o By clinician o If no indication for a specific instrument[22] • Used for OA, OT or OP position	• May be preferred o By clinician o If rotation required[26] • Used for OA, OT or OP position (straight or curved according to intention to rotate)
Contraindication	• Non-vertex presentation (e.g. face, brow)[22] • Less than 34+0 weeks gestation[1,19]	• If OT position, blades that cross at the articulation midpoint[17]
Relative contraindication	• 34+0 to 36+0 weeks gestation[1,4,19]	
Procedural considerations	• For both vacuum and forceps o Apply steady traction only during a contraction and with maternal effort[1] o Plan for potential complications (e.g. shoulder dystocia, PPH, perineal trauma)	
	• Minimise shearing forces on the scalp (i.e. avoid 'rocking')[1] • Ensure no maternal tissue trapped under cup after application of suction • No difference in clinical outcomes between rapid application of negative pressure and stepwise application[27]	• Perform the following ONLY between contractions[1]: o Application of instrument o Correction of asynclitism o Rotation of fetal head

Pre-intervention care

Aspect	Consideration
Bladder care	• Ensure bladder empty—if required catheterise (in/out) • If indwelling catheter insitu, deflate balloon or remove
Abdominal and vaginal assessment	• Perform an abdominal and vaginal assessment to confirm ALL of the following[1,2,4,17,19] o Vertex presentation o Head is 1/5th or less palpable abdominally o Estimated fetal weight (EFW) considered o Clinical assessment that pelvis is adequate for vaginal birth o Cervix fully dilated and membranes ruptured o Assessment of caput and moulding (for accurate assessment of station) o Head position (OA, OT, OP) is known for correct placement of instrument
Analgesia/ anaesthesia	• Provide adequate analgesia prior to procedure o Insufficient evidence to support any particular analgesic agent or method of administration[28] • Considerations[29]: o More analgesia usually required for forceps than for vacuum o If analgesia required, perineal infiltration is often sufficient for vacuum births o Pudendal block effective for most low and outlet forceps births o Regional block required for some low and most mid-cavity forceps birth
Episiotomy	• Evidence about episiotomy and reducing the risk of perineal injury is unclear—use clinical judgement for each birth[1,2,19,30] o Refer to Queensland Clinical Guidelines: *Perineal care*[31] • Strongly consider episiotomy if first vaginal birth and forceps are used[31] o If episiotomy is indicated, perform mediolateral
Maternal and fetal observation	• Provide continuous one-to-one midwifery support • Monitor vital signs as per second stage of labour and according to clinical circumstances o Refer to Queensland Clinical Guideline *Normal birth*[3] • Auscultate FHR prior to procedure and between contractions o Refer to Queensland Clinical Guideline: *Intrapartum fetal surveillance*[5]

Post-intervention care

Aspect	Consideration
Baby care	• Perform neonatal surveillance according to risk for SGH [refer to RANZCOG statement on *Subgaleal haemorrhage in the newborn*[32]] o Use Neonatal Early Warning Tool (NEWT) or similar to record observations[33] • Collect paired cord blood gas samples at birth[5] o If increased risk of SGH established at birth, collect cord blood for full blood count • Notify paediatrician/neonatologist of instrumental birth (if not already notified during labour) • Administer Vitamin K prophylaxis as soon as practical after birth[32] • Minimum surveillance for all babies post instrumental vaginal birth (level 1 surveillance) o Baseline neonatal observations o Avoid hats and bonnets so changing head shape or size can be identified[32] o Assess for signs and symptoms of instrument-related injury o Refer to Queensland Clinical Guideline *Routine newborn assessment*[34] o In the presence of poor feeding, pallor or other concerns, increase frequency of monitoring and seek timely medical review[32]
Maternal observations	• Routine postnatal observations as per individual clinical circumstances/local protocols
Perineal care	• Perform a comprehensive perineal assessment o Instrumental birth associated with higher rates of perineal injury[35] • Refer to Queensland Clinical Guideline: *Perineal care*[31] for recommendations about: o Perineal recovery, hygiene and healing o Pelvic floor muscle exercises, self-care and referral recommendations after OASIS • Refer to a women's health physiotherapist as per local protocol
Bladder care	• Monitor and document frequency and volume of voiding after birth o Risk of postpartum urinary retention is increased after instrumental birth[36] • If voiding has not occurred within six hours[36,37] or urinary retention is suspected, consider post-void residual and/or indwelling catheter • Refer to continence advisor/physiotherapist as required
Antibiotics	• Consider antibiotic prophylaxis against postpartum infectious morbidity[1,38] • Evidence (mainly from single study (n=3420) in a high income country[39]) found that a single dose of prophylactic antibiotic reduced[39]: o Superficial perineal wound infection (RR 0.53; 95% CI 0.4 to 0.69) o Deep perineal wound infection (RR 0.46; 95% CI 0.31 to 0.69) o Wound breakdown (RR 0.52; CI 0.43 to 0.63) • Largest study used following regimen[39] o Single dose of amoxicillin 1 g and clavulanic acid 200 mg IV within 6 hours of birth in women not allergic to penicillin[39]
Analgesia	• Offer regular rectal non-steroidal anti-inflammatory agents and paracetamol[40] • If pain not relieved by analgesia, perform a clinical assessment to exclude complications (e.g. haematoma or infection)
Venous thromboembolism (VTE) prophylaxis	• Perform a risk assessment and consider prophylactic measures for VTE o Refer to Queensland Clinical Guideline: *Venous thromboembolism prophylaxis in pregnancy and the puerperium*[41]
Psychological care	• Offer an opportunity to discuss the indications for the instrumental birth, the management of any complications and implications for future births o Instrumental birth is associated with fear of subsequent birth and post-traumatic stress[42] • Ask about psychological wellbeing in the postnatal period and offer referral if indicated

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