

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 | <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Rotation of 45° or less from the occiput anterior (OA) position Rotation of more than 45° including the occiput posterior (OP) position |
| Low cavity | <ul style="list-style-type: none"> Leading point of the skull (not caput) is at or below station plus 2 cm and above the pelvic floor Two subdivisions: <ul style="list-style-type: none"> Rotation of 45° or less from the OA position Rotation of more than 45° including the OP position |
| Outlet | <ul style="list-style-type: none"> 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 45°) |

Indications and contraindications for instrumental vaginal birth

| Aspect | Consideration |
|---|---|
| Indications | <ul style="list-style-type: none"> Women with a live fetus with cephalic presentation in second stage labour where²: <ul style="list-style-type: none"> There is inadequate progress in active second stage in the presence of adequate uterine activity [refer to Queensland Clinical Guideline: <i>Normal birth</i>³] Maternal effort is contraindicated (e.g. cardiac conditions, hypertensive crisis⁴) Fetal compromise is suspected^{4,5} |
| Contraindications | <ul style="list-style-type: none"> Head is above the ischial spines or 2/5th or more palpable abdominally above the symphysis pubis¹ Known or suspected fetal bone demineralising conditions or bleeding disorders¹ |
| Risk factors for unsuccessful instrumental birth | <ul style="list-style-type: none"> Limited and low-level evidence to identify risk factors influencing failure of the attempt—may include: <ul style="list-style-type: none"> Estimated fetal weight over 4000 g or a clinically 'big baby'⁶⁻⁹ OP position at the time of application⁶⁻⁹ Prolonged second stage^{7,9} [refer to Queensland Clinical Guideline: <i>Normal birth</i>³] Higher station at the time of application^{6,10} (compared to outlet) Higher body mass index (BMI)—in one population-based case control study, AOR* increased with increasing BMI—BMI of 40+ kg/m² 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 | <ul style="list-style-type: none"> The clinician performing the instrumental birth (or the clinician's supervisor in attendance) has the knowledge, experience and skill to¹²: <ul style="list-style-type: none"> Safely perform the procedure Manage complications that may arise A clinician trained in neonatal resuscitation is required at the birth^{1,4} |
| If clinical uncertainty | <ul style="list-style-type: none"> Contact an experienced clinician without delay if there is clinical uncertainty about: <ul style="list-style-type: none"> Accuracy of fetal or maternal assessment (e.g. degree of fetal caput or moulding, fetal presentation or station) Performance of the procedure (e.g. decision for CS or selection of instrument) Other clinical concern/uncertainty If assessment of fetal head station/position is uncertain, ultrasound (transabdominal or transperineal) may assist¹³ <ul style="list-style-type: none"> Follow local protocols regarding use |
| Communication | <ul style="list-style-type: none"> Provide information about the indications for and potential risks and benefits of instrumental birth antenatally¹ (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 pathway¹⁴) to accurately record the indications for instrumental vaginal birth and details of the procedure |
| Setting | <ul style="list-style-type: none"> If difficulty is anticipated, perform in operating theatre to facilitate access to immediate CS¹ |
| Sequential instrumentation | <ul style="list-style-type: none"> Associated with increased rates of maternal^{15,16} and neonatal¹⁶ morbidity Balance risks of sequential instrumentation with the risks of CS in second stage of labour Maintain low threshold for CS after unsuccessful forceps¹⁷ |

Discontinuation

| Aspect | Consideration |
|---------------------------------|---|
| Context | <ul style="list-style-type: none"> No high-level evidence on the maximum number of attempts, detachments¹⁸ 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 | <ul style="list-style-type: none"> Maintain situational awareness that: <ul style="list-style-type: none"> Abandoning the procedure may be a safer option than prolonged, repeated or excessive traction efforts¹ The traction applied is an adjunct to the mother's expulsive effort, not the primary force to overcome resistance to descent²⁰ With a correctly applied instrument, consider discontinuation: <ul style="list-style-type: none"> With vacuum: <ul style="list-style-type: none"> After two detachments Descent is inadequate (full diameter of cup not visible at the perineum with three pulls¹) Duration of application of the vacuum cup reaches 20 minutes²¹ With forceps: <ul style="list-style-type: none"> Blades cannot be applied easily, handles do not easily approximate or rotation not easily achieved—all without undue force 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 | <ul style="list-style-type: none"> May be preferred: <ul style="list-style-type: none"> By clinician If no indication for a specific instrument²² Used for OA, OT or OP position | <ul style="list-style-type: none"> May be preferred <ul style="list-style-type: none"> By clinician If rotation required²⁶ Used for OA, OT or OP position (straight or curved according to intention to rotate) |
| Contraindication | <ul style="list-style-type: none"> Non-vertex presentation (e.g. face, brow)²² Less than 34+0 weeks gestation^{1,19} | <ul style="list-style-type: none"> If OT position, blades that cross at the articulation midpoint¹⁷ |
| Relative contraindication | <ul style="list-style-type: none"> 34+0 to 36+0 weeks gestation^{1,4,19} | |
| Procedural considerations | <ul style="list-style-type: none"> For both vacuum and forceps <ul style="list-style-type: none"> Apply steady traction only during a contraction and with maternal effort¹ Plan for potential complications (e.g. shoulder dystocia, PPH, perineal trauma) | <ul style="list-style-type: none"> Perform the following ONLY between contractions¹: <ul style="list-style-type: none"> Application of instrument Correction of asynclitism Rotation of fetal head |
| | <ul style="list-style-type: none"> 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 application²⁷ | |

Pre-intervention care

| Aspect | Consideration |
|---|---|
| Bladder care | <ul style="list-style-type: none"> • Ensure bladder empty—if required catheterise (in/out) • If indwelling catheter insitu, deflate balloon or remove |
| Abdominal and vaginal assessment | <ul style="list-style-type: none"> • Perform an abdominal and vaginal assessment to confirm ALL of the following^{1,2,4,17,19} <ul style="list-style-type: none"> ○ Vertex presentation ○ Head is 1/5th or less palpable abdominally ○ Estimated fetal weight (EFW) considered ○ Clinical assessment that pelvis is adequate for vaginal birth ○ Cervix fully dilated and membranes ruptured ○ Assessment of caput and moulding (for accurate assessment of station) ○ Head position (OA, OT, OP) is known for correct placement of instrument |
| Analgesia/ anaesthesia | <ul style="list-style-type: none"> • Provide adequate analgesia prior to procedure <ul style="list-style-type: none"> ○ Insufficient evidence to support any particular analgesic agent or method of administration²⁸ • Considerations²⁹: <ul style="list-style-type: none"> ○ More analgesia usually required for forceps than for vacuum ○ If analgesia required, perineal infiltration is often sufficient for vacuum births ○ Pudendal block effective for most low and outlet forceps births ○ Regional block required for some low and most mid-cavity forceps birth |
| Episiotomy | <ul style="list-style-type: none"> • Evidence about episiotomy and reducing the risk of perineal injury is unclear—use clinical judgement for each birth^{1,2,19,30} <ul style="list-style-type: none"> ○ Refer to Queensland Clinical Guidelines: <i>Perineal care</i>³¹ • Strongly consider episiotomy if first vaginal birth and forceps are used³¹ <ul style="list-style-type: none"> ○ If episiotomy is indicated, perform mediolateral |
| Maternal and fetal observation | <ul style="list-style-type: none"> • Provide continuous one-to-one midwifery support • Monitor vital signs as per second stage of labour and according to clinical circumstances <ul style="list-style-type: none"> ○ Refer to Queensland Clinical Guideline <i>Normal birth</i>³ • Auscultate FHR prior to procedure and between contractions <ul style="list-style-type: none"> ○ Refer to Queensland Clinical Guideline: <i>Intrapartum fetal surveillance</i>⁵ |

Post-intervention care

| Aspect | Consideration |
|---|--|
| Baby care | <ul style="list-style-type: none"> • Perform neonatal surveillance according to risk for SGH [refer to RANZCOG statement on <i>Subgaleal haemorrhage in the newborn</i>³²] • Collect paired cord blood gas samples at birth⁵ <ul style="list-style-type: none"> ○ 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 birth³² • Minimum surveillance for all babies post instrumental vaginal birth (level 1 surveillance) <ul style="list-style-type: none"> ○ Baseline neonatal observations ○ Avoid hats and bonnets so changing head shape or size can be identified³² ○ Assess for signs and symptoms of instrument-related injury ○ Refer to Queensland Clinical Guideline <i>Routine newborn assessment</i>³³ ○ In the presence of poor feeding, pallor or other concerns, increase frequency of monitoring and seek timely medical review³² |
| Maternal observations | <ul style="list-style-type: none"> • Routine postnatal observations as per individual clinical circumstances/local protocols |
| Perineal care | <ul style="list-style-type: none"> • Perform a comprehensive perineal assessment <ul style="list-style-type: none"> ○ Instrumental birth associated with higher rates of perineal injury³⁴ • Refer to Queensland Clinical Guideline: <i>Perineal care</i>³¹ for recommendations about: <ul style="list-style-type: none"> ○ Perineal recovery, hygiene and healing ○ Pelvic floor muscle exercises, self-care and referral recommendations after OASIS • Refer to a women's health physiotherapist as per local protocol |
| Bladder care | <ul style="list-style-type: none"> • Monitor and document frequency and volume of voiding after birth <ul style="list-style-type: none"> ○ Risk of postpartum urinary retention is increased after instrumental birth³⁵ • If voiding has not occurred within six hours^{35,36} or urinary retention is suspected, consider post-void residual and/or indwelling catheter • Refer to continence advisor/physiotherapist as required |
| Antibiotics | <ul style="list-style-type: none"> • No high level evidence to support routine use of prophylactic antibiotics³⁷ |
| Analgesia | <ul style="list-style-type: none"> • Offer regular rectal non-steroidal anti-inflammatory agents and paracetamol³⁸ • If pain not relieved by analgesia, perform a clinical assessment to exclude complications (e.g. haematoma or infection) |
| Venous thromboembolism (VTE) prophylaxis | <ul style="list-style-type: none"> • Perform a risk assessment and consider prophylactic measures for VTE <ul style="list-style-type: none"> ○ Refer to Queensland Clinical Guideline: <i>Venous thromboembolism prophylaxis in pregnancy and the puerperium</i>³⁹ |
| Psychological care | <ul style="list-style-type: none"> • Offer an opportunity to discuss the indications for the instrumental birth, the management of any complications and implications for future births <ul style="list-style-type: none"> ○ Instrumental birth is associated with fear of subsequent birth and post-traumatic stress⁴⁰ • Ask about psychological wellbeing in the postnatal period and offer referral if indicated |

References

1. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Instrumental vaginal birth. College Statement C-Obs 16. [Internet]. 2016 [cited 18 January 2018]. Available from: <https://www.ranzcog.edu.au/>
2. The Society of Obstetricians and Gynaecologists of Canada. Operative vaginal birth Clinical Practice Guideline No. 148. J Obstet Gynaecol Can 2018;40(2):e74-e80.
3. Queensland Clinical Guidelines. Normal birth. Guideline No. MN17.25-V3-R22. [Internet]. Queensland Health. 2017. [cited 2018 July 10]. Available from: <http://www.health.qld.gov.au>
4. Royal College of Obstetricians and Gynaecologists. Operative vaginal delivery. Green-top Guideline No. 26. [Internet]. 2011 [cited 18 January 2018]. Available from: <http://www.rcog.org.uk/>.
5. Queensland Clinical Guidelines. Intrapartum fetal surveillance. Guideline No. MN15.15-V4-R20. [Internet]. Queensland Health. 2015. [cited 2018 January 15]. Available from: <http://www.health.qld.gov.au>
6. Ahlberg M, Norman M, Hjelmstedt A, Ekéus C. Risk factors for failed vacuum extraction and associated complications in term newborn infants: a population-based cohort study. The Journal of Maternal-Fetal Neonatal Medicine 2016;29(10):1646-51.
7. Aiken CE, Aiken AR, Brockelsby JC, JG. S. Factors influencing the likelihood of instrumental delivery success. Obstetrics and Gynaecology 2014;123(4):796-803.
8. Ben-Haroush A, Melamed N, Kaplan B, Yogev Y. Predictors of failed operative vaginal delivery: a single-center experience. American Journal of Obstetrics and Gynecology 2007;197(3):308.e1-e5.
9. Shinde K, Karale A, Shekhawat G. Factors influencing the likelihood of vacuum delivery success. International Journal of Reproduction, Contraception, Obstetrics and Gynecology 2017;Sep 6(9):3818-22.
10. Palatnik A, Grobman W, Hellendag M, Janetos T, Gossett D, Miller E. Predictors of failed operative vaginal delivery in a contemporary obstetric cohort. American Journal of Obstetrics and Gynecology 2016;Supplement to January 2016:S165.
11. Gopalani S, Bennett K, Critchlow C. Factors predictive of failed operative vaginal delivery. Am J Obstet Gynecol 2004;191(3):896-902.
12. Therapeutic Goods Administration (TGA). Focus on skills for vacuum-assisted births. Medical devices safety update volume 6, number 3. [Internet]. May 2018 [cited 2018 June 24]. Available from: <https://www.tga.gov.au/publication-issue/medical-devices-safety-update-volume-6-number-3-may-2018>.
13. Ghi T, Eggebø T, Lees C, Kalache K, Rozenberg P, Youssef A, et al. Intrapartum ultrasound. International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) Practice Guidelines. Ultrasound in Obstetrics & Gynecology 2018;52(1):128-39.
14. Queensland Health. Assisted vaginal birth clinical pathway. v1.00-05/2017. Mat. No.:10353102. SW351. [Internet]. 2017 [cited 2018 June 10]. Available from: www.health.qld.gov.au.
15. Barata S, Cardoso E, Santo S, Clode N, Graca L. Maternal and neonatal immediate effects of sequential delivery. J. Matern.-Fetal Neonatal Med. 2012;25(7):981-3.
16. Gardella C, Taylor M, Benedetti T, Hitti J, Critchlow C. The effect of sequential use of vacuum and forceps for assisted vaginal delivery on neonatal and maternal outcomes. Am J Obstet Gynecol 2001;185(4):896-902.
17. Vayssières C, Beucher G, Dupuis O, Feraud O, Simon-Toulza C, Sentilhes L, et al. Instrumental delivery: Clinical Practice Guidelines from the French College of Gynaecologists and Obstetricians. Eur J Obstet Gynecol Reprod Biol 2011;159(1):43-8.
18. Ghidini A, Stewart D, Pezzullo JC, Locatelli A. Neonatal complications in vacuum-assisted vaginal delivery: are they associated with number of pulls, cup detachments, and duration of vacuum application? Arch Gynecol Obstet 2017;295(1):67-73.
19. The American College of Obstetricians and Gynaecologists. Operative vaginal delivery. Practice Bulletin No. 154. Obstetrics & Gynaecology 2015;126(5):e56-65.
20. Vacca A. Vacuum assisted delivery improving patient outcomes and protecting yourself against litigation. OBG management 2004;February(Supplement):S1-S12.
21. New South Wales Clinical Excellence Commission. Vacuum assisted births – are we getting it right? [Internet]. 2014 [cited 2018 June 24]. Available from: http://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0010/258247/c-f-report-vacuum-assisted-births-are-we-getting-it-right.pdf.
22. O'Mahony F, Hofmeyr GJ, V M. Choice of instruments for assisted vaginal delivery. Cochrane Database of Systematic Reviews. [Internet]. 2010 [cited 18 January 2018]; Issue 11. Art. No.: CD005455. DOI:10.1002/14651858.CD005455.pub2.
23. Friedman T, Eslick G, Dietz HP. Instrumental delivery and the risk of avulsion: a meta-analysis. Int Urogynecol J 2017;28(S1): S26-S27.
24. Colditz MJ, Lai MM, Cartwright DW, Colditz PB. Subgaleal haemorrhage in the newborn: a call for early diagnosis and aggressive management. J Paediatr Child Health 2015;51(2):140-6.
25. Swanson AE, Veldman A, Wallace EM, Malhotra A. Subgaleal hemorrhage: risk factors and outcomes. Acta Obstet Gynecol Scand 2012;91(2):260-3.
26. Al Wattar HB, Wattar AB, Gallos MI, Pirie MA. Rotational vaginal delivery with Kielland's forceps: a systematic review and meta-analysis of effectiveness and safety outcomes. Current Opinion in Obstetrics and Gynecology 2015;27(6):438-44.
27. Suwannachat B, Lumbiganon P, M L. Rapid versus stepwise negative pressure application for vacuum extraction assisted vaginal delivery. Cochrane Database of Systematic Reviews. [Internet]. 2012 [cited 18 January 2018]; Issue 8. Art. No.:CD006636 DOI:10.1002/14651858.CD006636.pub3.
28. Nikpoor P, Bain E. Analgesia for forceps delivery. Cochrane Database of Systematic Reviews. [Internet]. 2013 [cited 18 January 2018]; Issue 9. Art. No.:CD008878. DOI:10.1002/14651858.CD008878.pub2.
29. Baskett TF. Assisted Vaginal Delivery. In: Baskett TF, Calder AA, Arulkumaran S, Ramsden I, Calder AA, editors. Operative Obstetrics. Twelfth edition ed. Edinburgh: Edinburgh : Saunders Elsevier; 2014.
30. Murphy D, Macleod M, Bahl R, Goyder K, Howarth L, Strachan B. A randomised controlled trial of routine versus restrictive use of episiotomy at operative vaginal delivery: a multicentre pilot study. BJOG 2008;115:1695–703.
31. Queensland Clinical Guidelines. Perineal care. Guideline No. MN18.30-V3-R23. [Internet]. Queensland Health. 2018. [cited 2018, June 10]. Available from: <http://www.health.qld.gov.au>
32. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Prevention, detection, and management of subgaleal haemorrhage in the newborn. College Statement C-Obs 28. [Internet]. 2015 [cited 08 June 2018]. Available from: <https://www.ranzcog.edu.au/>
33. Queensland Clinical Guidelines. Routine newborn assessment Guideline No. MN14.4.V4.R19. [Internet]. Queensland Health. 2014. [cited 2018 February 26]. Available from: <http://www.health.qld.gov.au>
34. Gurol-Urganci I, Cromwell D, Edozien L, Mahmood T, Adams E, Richmond D. Third- and fourth-degree perineal tears among primiparous women in England between 2000 and 2012: time trends and risk factors. BJOG 2013;120(12):1516-25.
35. Mulder FE, Schoffemeer MA, Hakvoort RA, Limpens J, Mol BW, van der Post JA, et al. Risk factors for postpartum urinary retention: a systematic review and meta-analysis. BJOG 2012;119(12):1440-6.
36. Lim JL. Post-partum voiding dysfunction and urinary retention. Aust N Z J Obstet Gynaecol 2010;50(6):502-5.
37. Liabsuetrakul T, Choobun T, Peeyananjarassri K, Islam Q. Antibiotic prophylaxis for operative vaginal delivery. Cochrane Database Systematic Review. [Internet]. 2017 [cited 28 January 2018]; Issue 8. Art. No.:CD004455 DOI:10.1002/14651858.CD004455.pub4.
38. Wuytack F, Smith V, Cleary B. Oral non-steroidal anti-inflammatory drugs (single dose) for perineal pain in the early postpartum period. Cochrane Database Systematic Review. [Internet]. 1999 [cited 2018 April 09]; Issue 7. Art. No.:CD011352 DOI:10.1002/14651858.CD011352.pub2.
39. Queensland Clinical Guidelines. Venous thromboembolism (VTE) prophylaxis in pregnancy and the puerperium. Guideline No. MN14.9-V5-R19. [Internet]. Queensland Health. 2014. [cited Available from: <http://www.health.qld.gov.au>
40. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychological Medicine 2016;46(6):1121-34.