Instrumental vaginal birth

**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

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Mid cavity</strong></td>
<td>• 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</td>
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<tr>
<td><strong>Low cavity</strong></td>
<td>• 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</td>
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<tr>
<td><strong>Outlet</strong></td>
<td>• 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)</td>
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**Indications and contraindications for instrumental vaginal birth**

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<tr>
<th>Aspect</th>
<th>Consideration</th>
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<tr>
<td><strong>Indications</strong></td>
<td>• Women with a live fetus with cephalic presentation in second stage labour where²: o There is inadequate progress in active second stage in the presence of adequate uterine activity [refer to Queensland Clinical Guideline: Normal birth³] o Maternal effort is contraindicated (e.g. cardiac conditions, hypertensive crisis⁴) o Fetal compromise is suspected⁴,⁵</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>• 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</td>
</tr>
</tbody>
</table>

**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 application⁶,⁹ o Prolonged second stage⁷,⁹ [refer to Queensland Clinical Guideline: Normal birth³] o Higher station at the time of application⁶,¹⁰ (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/m² reported as AOR 2.65, (CI 1.57 to 4.49)¹¹ |

* AOR (adjusted odds ratio) adjusted for age, race and education level CI: confidence interval
Principles of safe instrumental vaginal birth

<table>
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| 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

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</table>
| 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)  
  • 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\(^{20}\) |
| Consensus recommendation   | • 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

<table>
<thead>
<tr>
<th>Outcome/complication</th>
<th>Any vacuum type</th>
<th>Any forceps type</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Failure of attempt (7 studies, n=2419, RR 0.65, 95% CI 0.45 to 0.94)(^22)</td>
<td>Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>*Third or fourth degree tears (10 studies, n=2810, RR 1.89, 95% CI 1.51 to 2.37)(^22)</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>*Vaginal trauma (8 studies, n=2443, RR 2.48, 95% CI 1.59 to 3.87)(^22)</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>*Flatus trauma/alterected continence (1 study, n=130, RR 1.77, 95% CI 1.19 to 2.62)(^22)</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>Levator avulsion (7 studies; n=977, OR 4.45, 95% CI 3.09 to 6.42)(^23)</td>
<td>Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>Subgaleal haemorrhage (SGH) Rate per 1000 instrumental births</td>
<td>3 to 7.6/1000(^{24})</td>
<td>1.6/1000(^{25})</td>
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<tr>
<td>*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</td>
<td>No significant difference</td>
<td></td>
</tr>
<tr>
<td>*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</td>
<td>No significant difference</td>
<td></td>
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*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.\(^22\)

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Vacuum</th>
<th>Forceps</th>
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</table>
| 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

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| **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

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| **Baby care** | - Perform neonatal surveillance according to risk for SGH [refer to RANZCOG statement on Subgaleal haemorrhage in the newborn\(^22\)]<br>- Collect paired cord blood gas samples at birth\(^5\)<br>  
  o If increased risk of SGH established at birth, collect cord blood for full blood count<br>- Notify paediatrician/neonatologist of instrumental birth (if not already notified during labour)<br>- Administer Vitamin K prophylaxis as soon as practical after birth\(^32\)<br>- Minimum surveillance for all babies post instrumental vaginal birth (level 1 surveillance)<br>  
  o Baseline neonatal observations<br>  
  o Avoid hats and bonnets so changing head shape or size can be identified\(^32\)<br>  
  o Assess for signs and symptoms of instrument-related injury<br>  
  o Refer to Queensland Clinical Guideline Routine newborn assessment\(^33\)<br>  
  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<br>  
  o Instrumental birth associated with higher rates of perineal injury\(^34\)<br>  
  o Refer to Queensland Clinical Guideline: Perineal care\(^31\) for recommendations about:<br>  
    o Perineal recovery, hygiene and healing<br>  
    o Pelvic floor muscle exercises, self-care and referral recommendations after OASIS<br>  
  o Refer to a women’s health physiotherapist as per local protocol |
| **Bladder care** | - Monitor and document frequency and volume of voiding after birth<br>  
  o Risk of postpartum urinary retention is increased after instrumental birth\(^35\)<br>  
  o If voiding has not occurred within six hours\(^35,36\) or urinary retention is suspected, consider post-void residual and/or indwelling catheter<br>  
  o Refer to continence advisor/physiotherapist as required |
| **Antibiotics** | - No high level evidence to support routine use of prophylactic antibiotics\(^37\) |
| **Analgesia** | - Offer regular rectal non-steroidal anti-inflammatory agents and paracetamol\(^38\)<br>  
  o 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<br>  
  o Refer to Queensland Clinical Guideline: Venous thromboembolism prophylaxis in pregnancy and the puerperium\(^39\) |
| **Psychological care** | - Offer an opportunity to discuss the indications for the instrumental birth, the management of any complications and implications for future births<br>  
  o Instrumental birth is associated with fear of subsequent birth and post-traumatic stress\(^40\)<br>  
  o Ask about psychological wellbeing in the postnatal period and offer referral if indicated |
References


