Assisted Vaginal Birth

Assisted Vaginal Birth (AVB)
- Using vacuum or forceps to achieve a vaginal delivery

Station
- Level of leading edge of the skull in centimeters above or below the level of the ischial spines
- Careful distinction from the caput is important

Engagement
- When biparietal diameter of the head enters the plane of the pelvic inlet
- When the leading edge of the skull is at or below the ischial spines (station 0)

Classification of Assisted Vaginal Birth

Outlet
- Scalp visible at the introitus without separating labia
- Fetal skull has reached pelvic floor
- Sagittal suture is in AP diameter or right/left occiput anterior or posterior position (rotation not > 45°)
- Fetal head is at or on perineum

Low
- Leading point of skull is at station ≥ + 2 and not on the pelvic floor
- Two subdivisions:
  - rotation is ≤ 45°
  - rotation is > 45°

Mid
- Head is engaged
- Leading position of the skull is above station +2

Incidence
- Forceps
  - 6.8% (2001)
  - 4.6% (2004/5)
  - 3.2% (2010/11)
- Vacuum
  - 20.6% (2001)
  - 9.6% (2010/11)
- Regional variations apply
Assisted Vaginal Birth

**Forceps vs Vacuum - Maternal**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Forceps (n=2750)</th>
<th>Vacuum (n=1900)</th>
<th>Risk Ratio</th>
<th>Risk Ratio (95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Likely to Fail Delivery</td>
<td>179/2750</td>
<td>193/1900</td>
<td>0.90 (0.85, 0.94)</td>
<td></td>
</tr>
<tr>
<td>Caesarean Section</td>
<td>20/2750</td>
<td>16/1900</td>
<td>1.26 (0.91, 3.28)</td>
<td></td>
</tr>
<tr>
<td>Vaginal Trauma</td>
<td>144/2750</td>
<td>110/1900</td>
<td>1.30 (0.98, 3.67)</td>
<td></td>
</tr>
<tr>
<td>2nd &amp; 4th Stage</td>
<td>180/1858</td>
<td>100/1044</td>
<td>1.80 (1.29, 2.52)</td>
<td></td>
</tr>
<tr>
<td>Anal Stitches</td>
<td>332/1069</td>
<td>340/1069</td>
<td>0.99 (0.84, 1.16)</td>
<td></td>
</tr>
<tr>
<td>General Anesthesia</td>
<td>85/855</td>
<td>75/855</td>
<td>1.15 (0.94, 1.41)</td>
<td></td>
</tr>
<tr>
<td>Placenta Previa / Placental Abnormality</td>
<td>20/201</td>
<td>21/201</td>
<td>1.00 (0.82, 1.08)</td>
<td></td>
</tr>
</tbody>
</table>

0.1 Favors forceps | 1 Favors vacuum | 10

**Effect of Mode of Delivery in Nulliparous Women on Neonatal Intracranial Injury**

<table>
<thead>
<tr>
<th>Delivery Method</th>
<th>ICH Rate</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS without Labour</td>
<td>1 per 2750</td>
<td>0.04</td>
</tr>
<tr>
<td>SVD</td>
<td>1 per 1900</td>
<td>0.05</td>
</tr>
<tr>
<td>Intrapartum CS</td>
<td>1 per 907</td>
<td>0.11</td>
</tr>
<tr>
<td>Vacuum Assist</td>
<td>1 per 860</td>
<td>0.12</td>
</tr>
<tr>
<td>Forceps Assist</td>
<td>1 per 664</td>
<td>0.15</td>
</tr>
<tr>
<td>CS after Assist</td>
<td>1 per 334</td>
<td>0.33</td>
</tr>
<tr>
<td>Vacuum &amp; Forceps</td>
<td>1 per 256</td>
<td>0.39</td>
</tr>
</tbody>
</table>

ICH = Intracranial Hemorrhage

**Manual Rotation**

- 2013 Prospective Trial
  - manual rotation at full dilatation - ↓ rate of operative delivery
- UK Study 2013
  - no difference in perineal trauma between manual or forceps rotation
  - less perineal trauma if delivered OA

**Indications for AVB**

- Atypical or abnormal FHR pattern
- Valsalva contraindicated
- Inadequate progress of labour
- Lack of effective maternal expulsive efforts

**Specific indication for forceps delivery**

- Correction of fetal head position or attitude

**CAUTION:**

Use of the vacuum to move the fetal head from the mid-pelvis to the low pelvis and then application of forceps to complete the delivery must be re-evaluated, as it is associated with a greater risk of fetal intracranial injury.
Assisted Vaginal Birth

Contraindication for AVB
- Fetal conditions (e.g. bleeding disorder, demineralization disorder)
- Any contraindication to vaginal delivery
- Non cephalic or brow presentation

Contraindications specific to vacuum
- Less than 34 wks
- Need for rotation
- Face presentation

Prerequisites for all Assisted Vaginal Births
- Informed consent
- No contraindications
- Anaesthesia, bladder empty
- Head engages, Cx fully dilated, knowledge of fetal head position
- Adequate contractions, membranes ruptured
- Experience operator, adequate facilities
- Reasonable chance of success, backup plan
- Ongoing fetal and maternal assessment
- Skilled personnel for neonatal resuscitation

Vacuum Extraction

Vacuum
- Designed to produce traction upon the fetal scalp to assist the maternal expulsive effort
- Not for applying rotational forces
- Outlet, low and mid applications
- May be used judiciously to correct attitude
  ✓ Should not be regarded as an easier alternative to forceps, or for use by less skilled operators

Vacuum Cup Application
- Application over sagittal suture. Cup has to centered over the flexion point

Axis of Parturition
Vacuum Application / Traction

Incorrect

Correct

Vacuum Pop-off Causes
- Poor seal causing vacuum leak
- Excessive traction force
  - unrecognized CPD
  - mid-pelvic application
  - OP presentations
  - deflexed attitude
  - paramedian application
- Improper angle of traction causing shearing
- Impingement of maternal soft tissue

When to Halt
- Properly positioned cup, up to 2 pulls, no progress
- If delivery not imminent after 4 contractions, reassess
- 3 pop-offs, without obvious cause
- 20 minutes elapsed time (delivery not imminent)

- If these limits are reached and
  - delivery not imminent
  - no progress
  - scalp trauma present

Abandon vacuum procedure

Forceps Delivery

Function of Forceps
- Traction
- Rotation
- Flexion
- Extension

- These functions cause fetal head compression
- Proper use minimizes this compressive force

Checking the Application – “Position For Safety”
- Posterior fontanelle midway between the blades and one fingerbreadth above the plane of the shanks with the lambdoid sutures equal distance from the forceps blades
- Fenestrations of the blades should be barely felt and equal on each side; no more than a finger tip should be able to be inserted between the blade and the fetal head
- Sagittal suture perpendicular to the plane of the shanks
When to Halt

- Failure of proper application
- Failure of rotation, if required
- Inadequate descent with traction

Forceps Application

Positioning the blade

Incorrect (Ouch!)

Correct

Episiotomy

- Routine episiotomy is not an effective way to shorten the second stage
- May expedite vaginal birth when perineum is preventing delivery
- Not an essential part of AVB
- Midline episiotomies ↑ 3rd & 4th degree tears
- Liberal but not routine medio lateral episiotomy reduces rate of OASIS
Care After Assisted Vaginal Birth

- Active third stage management
- Umbilical arterial and venous blood gas analysis
- Examination for maternal trauma
- Examination for neonatal trauma:
  - scalp trauma
  - signs of cerebral irritation (poor sucking, listless)
  - signs of scalp swelling, cephalohematoma or subaponeurotic bleeds
- Review birth with the family

Documentation of Operative Delivery

- Clear, complete and contemporaneous
- Must include the indications for the procedure and a description of the operative technique employed
  - Need for intervention must be:
    - convincing, compelling, consented to, documented

Summary

AVB requires

- Assessment of clinical indications and contraindication
- Appropriate selection of the method
- Back up plan
- Consent
- Maternal and newborn assessment
- Thorough documentation