

Vaginal Operative Delivery

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Key Amendments

Date	Amendments	Approved by
March 2021	Categorisation of instrumental deliveries, use of post-delivery antibiotics, use of ultrasound.	Maternity Governance Meeting

Classification for operative vaginal delivery

- Outlet:** Fetal scalp visible without separating the labia.
Fetal skull has reached the pelvic floor
Sagittal suture is in the antero-posterior diameter or right or left occiput anterior or posterior position (rotation does not exceed 45 degrees)
Fetal head is at or on the perineum
- Low:** Leading point of the skull (not caput) is at station plus 2 cm or more and not on the pelvic floor
Two subdivisions:
(a) rotation of 45 degrees or less from the OA position
(b) rotation more than 45 degrees from the OA position (including OP)
- Mid-cavity:** Fetal head is no more than 1/5 palpable per abdomen
Leading point of the skull is above station plus 2 cm but not above the ischial spines
Two subdivisions:
(a) rotation of 45 degrees or less from the OA position
(b) rotation more than 45 degrees from the OA position (including OP)

Indications for operative vaginal delivery

Operators should be aware that no indication is absolute and each case should be considered individually.

Operative intervention is used to shorten the second stage of labour.

Type Indication

- Fetal: Presumed fetal compromise
- Maternal: Medical indications to avoid Valsalva (e.g. cardiac disease Class III or IV, a hypertensive crises, cerebral vascular disease, particularly uncorrected cerebral vascular malformations, myasthenia gravis, spinal cord injury)
- Inadequate progress:

- For nulliparous women delay should be diagnosed if birth is not imminent 2 hours after commencing active second stage. Seek medical review and aim to delivery within the next hour.
- For Multips delay should be diagnosed if birth is not imminent 1 hour after commencing active stage. Seek medical review and aim to deliver within the next hour.

- Maternal fatigue/exhaustion

Instrumental delivery of fetal head during caesarean section:

- Wrigley's forceps / Caesarean specific Kiwi cup may be required to assist in the delivery of fetal head. This should only be attempted by an experienced operator as there is risk of uterine and fetal trauma.
- The type of instrument used should clearly be documented in the notes.

Contraindications for operative vaginal delivery

- Fetal bleeding disorders (e.g. alloimmune thrombocytopenia) or a predisposition to fracture (e.g. osteogenesis imperfecta) are relative contraindications to operative vaginal delivery. However, there may be considerable fetal risk if the head has to be delivered abdominally from deep in the pelvis.
- Blood borne viral infections of the mother are not an absolute contraindication to assisted vaginal birth. The risk of vertical transmission of hepatitis C virus appears to be related to the level of viraemia in the pregnant mother and not to the route of delivery. However, it is sensible to avoid difficult operative delivery where there is an increased chance of fetal abrasion or scalp trauma, as it is to avoid fetal scalp clips or blood sampling during labour.
- The vacuum extractor is contraindicated with a face presentation.
- RCOG recommends avoiding the use of vacuum below 32 weeks because of the susceptibility of the preterm infant to cephalohaematoma, intracranial haemorrhage and neonatal jaundice. There is insufficient evidence to establish the safety of the vacuum at gestations between 32 and 36 weeks. From 36 weeks onwards, it is safe to perform a vacuum delivery.
- Forceps and vacuum extractor deliveries before full dilatation of the cervix are contraindicated. There are a few exceptions which include a prolapsed cord at 9 cm in a multiparous woman or a second twin.

Essential criteria for safe operative vaginal delivery

Safe operative vaginal delivery requires a careful assessment of the clinical situation, clear communication with the mother and healthcare personnel and expertise in the chosen procedure.

Prerequisites for operative vaginal delivery:

- Staff:
- The operator must have the knowledge, experience and skills necessary to use the instruments and manage complications that may arise. Operator must be of ST4 or above grade to perform the procedure independently.
 - For all the trials of instrumental deliveries in theatre Senior obstetrician (consultant / staff grade doctor or ST6/7) should be present in theatre as there is a high risk of failure and complicated delivery. During normal working hours (0800 till 2000 during the week, and 0800 till 1300 at weekends), the consultant should be present in theatre for all trials.
 - Adequate facilities and back-up personnel are available.
 - Back-up plan in place in case of failure to deliver.
 - Anticipation of complications that may arise (e.g. shoulder dystocia, postpartum haemorrhage).
 - Personnel present who are trained in neonatal resuscitation.
- Full abdominal and vaginal examination:
 - Vertex presentation.
 - Head is $\leq 1/5$ palpable per abdomen.
 - Station at level of ischial spines or below.
 - Cervix is fully dilated and the membranes ruptured.
 - Determination of the exact position of fetal head is crucial in application of any instrument and traction. The fontanelles and sutures are used to determine the position.
- Mother:
 - **Informed consent must be obtained and a clear explanation given. Written consent to be taken in most cases unless there is an acute emergency where verbal + consent will suffice.**
 - Appropriate analgesia is in place, for mid-cavity rotational deliveries this will usually be a regional block. A pudendal block may be appropriate, particularly in the context of urgent delivery.
 - Maternal bladder has been emptied recently. Indwelling catheter should be removed or balloon deflated.
 - Regular uterine contractions are required so the traction can be applied during contractions.
 - Aseptic techniques.

Where should operative vaginal delivery take place?

Operative vaginal births that have a higher risk of failure should be considered a trial and conducted in operation theatre.

An experienced operator (consultant or a senior middle grade doctor) should be present from the outset for all attempts at rotational or trial of instrumental deliveries.

Higher rates of failure are associated with:

- Maternal body mass index greater than 30

- Estimated fetal weight greater than 4000g or clinically big baby
- Occipito-posterior position
- Mid-cavity delivery or when 1/5 head palpable per abdomen
- Head circumference > 95th centile.

Categorisation of operative vaginal delivery:

When going for a trial in theatre, the consultant or registrar taking the trial should clarify the urgency category of the trial as follows:

Category 1 trial: Aiming for delivery within 30 minutes for presumed fetal compromise or APH, switchboard should be called and the room stated for Cat 1 trial in theatre.

Category 2 trial: Aiming for delivery within 75 minutes e.g failure to progress, maternal exhaustion or malposition. However, always aim to perform these as quickly as possible particularly in cases of fetal compromise that do not fulfil the criteria for CAT 1 delivery.

Communication with theatre team is vital so everyone knows what is planned.

A Cat 1 delivery should involve the WHO team brief being done in theatre alongside the patient, and the caesarean section equipment being set up in anticipation of a failed trial.

Any failed trial should automatically be categorised as Cat 1 CS.

Role of USS to determine position?

- Clinicians should be aware that ultrasound assessment of the fetal head position prior to assisted vaginal birth is more reliable than clinical examination.

What instruments should be used for operative vaginal delivery?

- The operator should choose the instrument most appropriate to the clinical circumstances and their level of skill. Forceps and vacuum extraction are associated with different benefits and risks.
- Forceps should be used for the aftercoming head of the breech and in situations where maternal effort is impossible or contraindicated.
- **Rotational delivery:** The options available for rotational delivery include Kielland forceps, manual rotation followed by direct traction forceps or rotational vacuum extraction. Rotational deliveries should be performed by experienced operators, the choice depending upon the expertise of the individual operator
- Rotational delivery with the Kielland forceps carries additional risks and requires specific expertise and training.

Alternatives to Kielland forceps include manual rotation followed by direct traction forceps or rotational vacuum extractor.

The Kiwi OmniCup® (Clinical Innovations, Murray, UT) vacuum device has been reported to be both safe and effective for rotational and non-rotational operative vaginal delivery in non-trial settings.

The relative merits of vacuum extraction and forceps have been evaluated in a Cochrane systematic review of nine RCTs, involving 2849 primiparous and multiparous women.

Vacuum extractor compared with forceps is:

- more likely to fail at achieving vaginal delivery OR 1.7; 95% CI 1.3–2.2
- more likely to be associated with cephalhaematoma OR 2.4; 95% CI 1.7–3.4
- more likely to be associated with retinal haemorrhage OR 2.0; 95% CI 1.3–3.0
- more likely to be associated with maternal worries about baby OR 2.2; 95% CI 1.2–3.9
- less likely to be associated with significant maternal
- perineal and vaginal trauma OR 0.4; 95% CI 0.3–0.5
- no more likely to be associated with delivery by caesarean section OR 0.6; 95% CI 0.3–1.0
- no more likely to be associated with low 5-minute Apgar scores OR 1.7; 95% CI 1.0–2.8
- no more likely to be associated with the need for phototherapy OR 1.1; 95% CI 0.7–1.8.

The careful well-trained operator will select the instrument best suited to the individual circumstances.

The conventional ventouse cup is a possible option and a RCT comparing Kiwi and conventional cup concluded:

The Kiwi Omnicup is less successful than conventional ventouse in achieving vaginal delivery in routine clinical practice. However, it remains a highly convenient instrument, with single-use disposable characteristics and no need for cumbersome vacuum pumping machinery. As such it may be appropriate to consider its use for uncomplicated low cavity 'lift-out' deliveries, but relying on it as the only ventouse cup available may lead to a rise in caesarean section rates at full dilatation.

Complication of Operative vaginal delivery:

- Operative vaginal delivery should not be attempted unless the criteria for safe delivery have been met.
- Vacuum and forceps delivery can be associated with significant complications, both maternal and fetal. Two maternal deaths have been described in association with tearing of the cervix at vacuum delivery and a further maternal death recorded following uterine rupture in association with forceps delivery.

- Neonatal intracranial and subgaleal haemorrhage are life-threatening complications of particular concern. However, risks increased significantly among babies exposed to attempts at both vacuum and forceps delivery.
- Adverse outcomes, including unsuccessful forceps or vacuum delivery, should trigger an incident report as part of effective risk management processes.
- Paired cord blood samples should be processed and recorded following all attempts at operative vaginal delivery.

Is there a place for sequential use of instruments?

- If there is an obvious descent of the head with the ventous but the cup becomes dislodged or suction appears to be lost forceps may be applied to assist in delivery of the head.
- The use of sequential instruments is associated with an increased risk of trauma to the infant. However, the operator must balance the risks of a caesarean section following failed vacuum extraction with the risks of forceps delivery following failed vacuum extraction.
- The use of outlet forceps following failed vacuum extraction may be judicious in avoiding a potentially complex caesarean section.
- The sequential use of instruments should not be attempted by an inexperienced / junior operator without direct supervision and should be avoided wherever possible.

When should vacuum assisted birth be discontinued and how should a discontinued vacuum procedure be managed?

- Discontinue vacuum- assisted birth where there is no evidence of progressive descent with moderate traction during each pull of a correctly applied instrument by an experienced operator.
- Complete vacuum- assisted birth in the majority of cases with a maximum of three pulls to bring the fetal head on to the perineum. Three additional gentle pulls can be used to ease the head out of the perineum.
- Discontinue vacuum- assisted birth if there have been two 'pop offs' of the instrument. Less experienced operators should seek senior support after one 'pop off' to ensure the woman has the best chance of a successful assisted vaginal birth.

When should attempted forceps birth be discontinued and how should a discontinued forceps procedure be managed?

- Where the forceps cannot be applied easily, the handles do not approximate easily or if there is a lack of progressive descent with moderate traction.
- If birth is not imminent after 3 pulls by experienced user, Less experienced operators should stop and seek a second opinion if no descent after 1 or 2 pulls.
- Consider abandoning the procedure when there is no descent of the fetal head after appropriate traction with the instrument

- If an operative vaginal delivery is abandoned, and conversion to Caesarean section occurs, doctors trained in using the Fetal Pillow should consider inserting the device prior to performing the Caesarean section.

What is the role of episiotomy for operative vaginal delivery?

- A multicentre pilot randomised controlled study failed to provide conclusive evidence for routine episiotomy. The incidence of obstetric anal sphincter injury was similar in both groups where there was routine and restrictive use of episiotomy. The anal sphincter tears rate was low overall for vacuum deliveries.
- In a UK study episiotomy did not appear to protect against obstetric anal sphincter injury in vacuum extraction (4.3% with episiotomy versus 5.5% without episiotomy) and forceps delivery (11.7% versus 10.6%). However, episiotomy was associated with a greater incidence of postpartum haemorrhage.
- In the absence of robust evidence to support routine use of episiotomy in operative vaginal delivery, restrictive use of episiotomy, using the operator's individual judgement, is supported.

Prophylactic antibiotics after OVD:

- A single prophylactic dose of intravenous Co-amoxiclav 1.2 g should be recommended following assisted vaginal birth as it significantly reduces confirmed or suspected maternal infection compared to placebo.
- For women with a non-severe allergy to penicillin: 1.5g cefuroxime IV and 500mg IV metronidazole should be given.
- For women reporting a severe allergy to penicillin use: 1g IV vancomycin and 3mg/kg gentamicin (use booking weight) and 500mg IV metronidazole.
- Good standards of hygiene and aseptic techniques are recommended.

Documentation

In addition the following should be clearly documented:

- Indication and place of instrumental delivery
- All that is included in essential criteria above (all separately documented)
- Type of instrument used
- If sequential instruments used
- If the suction cup was removed or it came off spontaneously
- Number of tractions
- Evidence of descent with traction

- Pressure during vacuum tractions
- Any obvious trauma to baby (bruise / laceration)
- Time of delivery of baby's head
- Condition of baby at birth
- Paired cord gases
- Estimated blood loss
- Plan for postnatal care
- Information for counselling in relation to subsequent pregnancies

Post OVD Care

- Regular paracetamol and ibuprofen should be considered after an operative vaginal delivery in the absence of contraindications.
- The timing and volume of the first void should be monitored and documented