

Indications for VAB include:

1. Prolonged second stage: In settings with pudendal analgesia: birth is not completed after >3 hours for primigravida and >2 hours for multipara. In settings without pudendal analgesia: birth is not completed after >2 hours for primigravida and >1 hour for multipara. If prolonged labor is the only indication for a VAB, rapidly assess the four "P"s (Patient-Passenger-Power-Passage) to identify the cause of prolonged labor and decide if VAB is the most appropriate intervention. The differential diagnosis of prolonged second stage is:

- Misdiagnosis of second stage
- CPD / obstruction
- Malposition/malpresentation
- Ineffective uterine contractions
- Maternal causes (e.g. anxiety/stress,
- Exhaustion, dehydration, ineffective
- Birthing position or technique, full bladder).

After the assessment, quickly decide what care she needs and on the mode of childbirth. More information about this topic can be found in the Provider guide of HMBS Prolonged & Obstructed Labor. [3]

2. Fetal distress in second stage: Listen to the FHR for a minimum of 1 minute. Listen during a contraction and continue for at least 30 seconds after the contraction. Or observe FHR continuously with the Moyo fetal heart rate monitor. Compare the FHR with the maternal heart rate, and consider making an ultrasound to confirm your findings.

- Signs of fetal distress are very slow fetal heart rate (<100 bpm) or rapid fetal heart rate (≥ 160 bpm) between contractions or persisting after contractions throughout at least three contractions.
- Fetal distress can be reversible or irreversible. A rapid comprehensive maternal and labour assessment could differentiate between the causes and facilitate further management and mode of delivery.
- Irreversible causes include uterine rupture, placental abruption and cord prolapse and require immediate termination of delivery. VAB can be considered if criteria are met and contraindications are ruled out otherwise emergency c-section should be performed.
- Reversible causes include hypotension, uterine hyperstimulation, dehydration. FHR can improve after appropriate actions are taken such as

intravenous fluid infusion, changing position, giving oxygen or stopping oxytocin in case of augmentation. It is important to reassess the FHR, the mother and progress of labour. Immediate termination of delivery is often not needed.

- The WHO provides algorithms for monitoring and managing fetal heart rate bradycardia, late decelerations and tachycardia during labour in low-risk pregnant women in labour with singleton cephalic term pregnancies [14].

3. Maternal exhaustion in the second stage.

4. Maternal conditions that require a shortened second stage or when strong pushing is contra-indicated, including severe anaemia, cerebral vascular diseases, cardiac diseases like severe heart failure and severe pulmonary diseases.

NOTE:

The last indication conditions should have been identified prior to the second stage of labour. A vacuum cup can be applied if the criteria for VAB are met and all contraindications for a VAB have been ruled out.

The following are relative contraindications for VAB and may require c-section:

- GA < 34 weeks or unsure GA
- Baby is <2500g or >4000g or unsure
- There are signs of CPD / Obstruction: Vulvar / cervical edema and/or presence of Bandl's ring with empty bladder and/or secondary arrest of descent / no descent with at least 3 contractions/10 minutes, each lasting at least 40 seconds and/or 3+ caput and/or 3+ molding
- There is a malpresentation / malposition that requires a cesarean birth (chin posterior position; transverse lie; shoulder, brow, footling breech, or arm presentation; complete or frank breech with a poorly flexed fetal head)
- Non-cephalic presentation
- Non-occiput position
- Head unengaged (descent 3-5/5 palpable above the upper level of the pubic symphysis / -1 to -4 station)
- Above the upper level of the pubic
- Symphysis / -1 to -4 station)

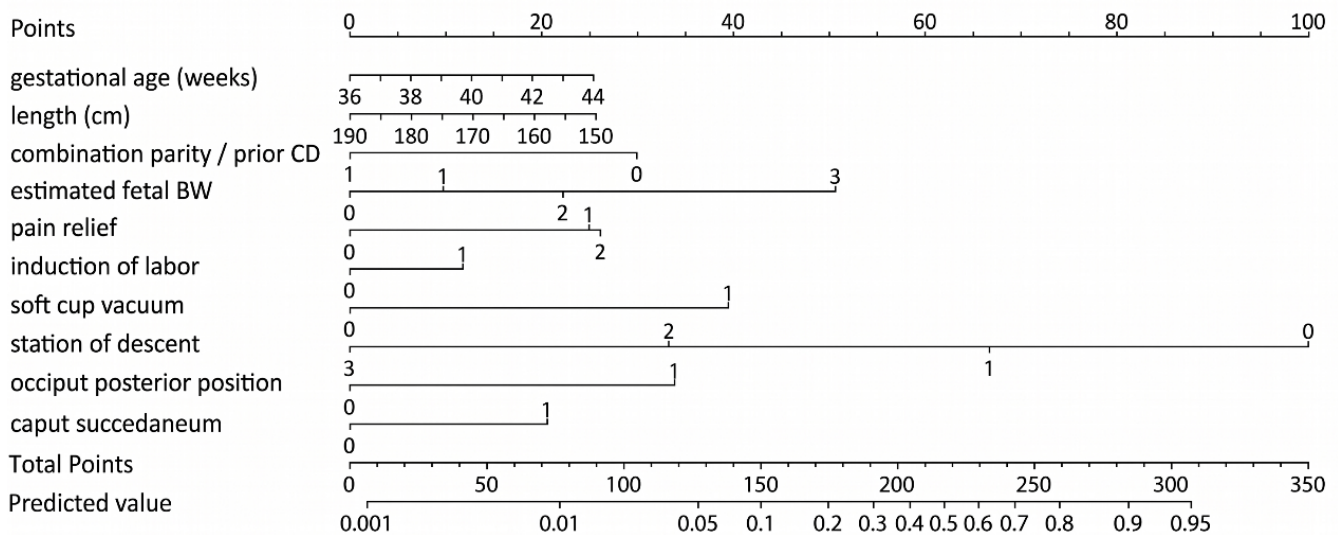


Fig. 3. Nomogram

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Label: As an example, a 175 cm tall nulliparous woman, 37 weeks pregnant of a child with EFW above 3750 g, no pain relief, no indication for vacuum assisted delivery failure to progress, no Malmström m cup usage, no descent of the fetal head, occiput posterior position and no presence of caput succedaneum has a risk of vacuum-assisted delivery that is equal to $1/(1 + \exp(-2.60 + 0.104 \cdot 37 - 0.0210 \cdot 175 + 0.981 \cdot 0 - 0.255 \cdot 0 + 0.317 \cdot 0 + 0.729 \cdot 0 + 1.66 \cdot 1 + 0.816 \cdot 0 + 0.855 \cdot 0 + 0.384 \cdot 0 + 1.29 \cdot 0 - 1.09 \cdot 0 + 1.11 \cdot 1 + 0.674 \cdot 0)) = 58\%$.

A similar chance can be found when the nomogram is used: we get 3 points for gestational age of 37 weeks, 9 points for the height of 175 cm, 30 points for being nulliparous, 50 points for an EFW above 3750 g, 100 points for no descent of the fetal head, 34 points for the occiput posterior position, and 0 points for the other characteristics, which adds up to a total of 226 points, corresponding to a predicted risk of failure of vacuum-assisted delivery of approximately 58%.

Reference: Verhoeven CJ, Nuij C, Janssen-Rolf CRM, Schuit E, Bais JMJ, Oei SG, et al. Predictors for failure of vacuum-assisted vaginal delivery: a case-control study. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 2016 May;200:29–34. doi:10.1016/j.ejogrb.2016.02.008

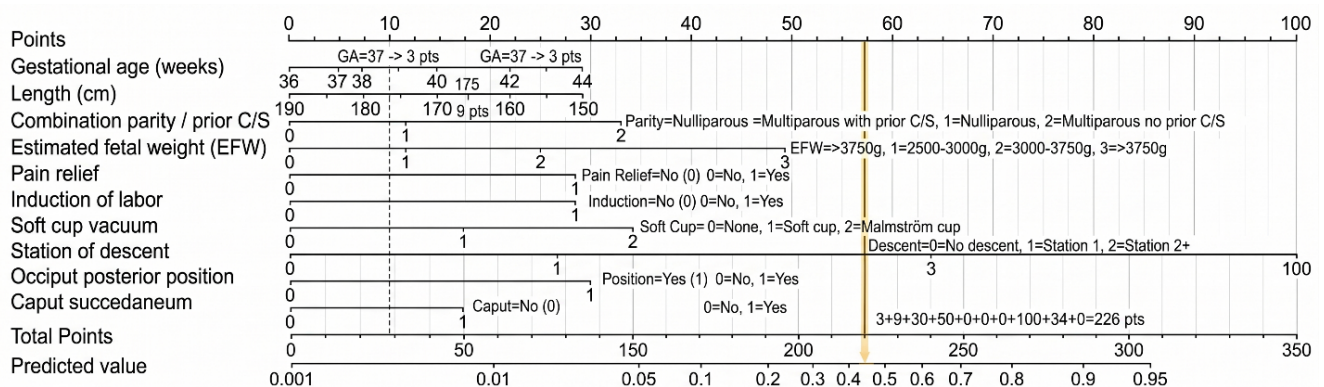


Fig. 3. Nomogram and Calculation Example.

A clean illustration of the sum calculation from the example: (GA (3 pts) + Height (9 pts) + Nulliparous (30 pts) + EFW (50 pts) + Descent-No (100 pts) + Position-OccPosterior (34 pts)) = 226 Points. Example: a 175 cm tall nulliparous woman, 37 weeks pregnant of a child with EFW above 3750 g, no pain relief, no indication for vacuum-assisted delivery failure to progress, no Malmström cup usage, no descent of the fetal head, occiput posterior position and no presence of caput succedaneum has a risk of vacuum-assisted delivery failure that is equal to $1/(1 + \exp(-2.60 + 0.104 \cdot 37 - 0.0210 \cdot 175 - 0.981 \cdot 0 - 0.255 \cdot 0 + 0.317 \cdot 0 + 0.729 \cdot 0 + 1.66 \cdot 1 + 0.816 \cdot 0 + 0.855 \cdot 0 + 0.384 \cdot 0 + 1.29 \cdot 0 - 1.09 \cdot 0 + 1.11 \cdot 1 + 0.674 \cdot 0)) = 58\%$. Similar chance can be found when the nomogram is used: we get 3 points for gestational age of 37 weeks, 9 points for the height of 175 cm, 30 points for being nulliparous, 50 points for an EFW above 3750 g, 100 points for no descent of fetal head, 34 points for the occiput posterior position, and 0 points for the other characteristics, which adds up to a total of 226 points, corresponding to a predicted risk of failure of vacuum-assisted delivery of approximately 58%.

HAYDOM LUTHERAN HOSPITAL | DEPARTMENT OF OB/GY

Standard operating procedure for safe vacuum extraction (VE) births

Purpose

The purpose of this document is to ensure safe VE births at HLH. The document will enable its users to adhere to best practices and consistency during VE.

Roles and Responsibilities

VE at HLH is conducted by **trained doctors** (obstetricians and registrars) and **senior midwives** and supported by junior midwives and medical attendants working in the labor ward. **Teamwork is essential for the success of VE**

Resources

- Functioning VE equipment should always be ready
- The theatre team should be kept alert for possible C/Section if VE fails
- A newborn resuscitation kit should be prepared
- Suturing kit should be ready for possible tears/ episiotomy
- Infection prevention and control guidelines should be followed

Indications

- Prolonged second stage: >3hrs for prime and 2hrs for multipara
- Fetal distress in second stage
- Maternal exhaustion in second stage
- Mothers with medical conditions in pregnancy at the second stage: heart failure, severe anemia, asthma

Prerequisites

These are the minimum criteria that need to be fulfilled in order to perform VE:

- Cervix fully dilated
- Descent: 2/5, 1/5, 0/5 or stations 0, +1, +2
- Empty bladder
- Contractions: 3 or more in 10 minutes, if not, augment with oxytocin
- Gestational age: > 34 weeks
- Estimated fetal weight: >2.5kg to < 4.0kg

Precautions

The team needs to weigh the risks and benefits associated with VE before embarking on the procedure

Procedure

a) Getting ready

1. Prepare the necessary equipment and make sure assistants are available – **preferably 4 people**.
2. Obtain oral consent and provide continual emotional support and reassurance, as feasible.
3. Review to ensure that the indications and prerequisites for vacuum extraction are present, and any contraindication is excluded.
4. Put on personal protective gears.

b) Pre-procedure tasks

1. Wash hands thoroughly with soap and water and dry.
2. Put sterile surgical gloves on both hands.
3. Clean the vulva with an antiseptic solution (non-alcoholic) and place a drape under the woman's buttocks and over her abdomen.
4. Catheterize the bladder, if necessary.
5. Check all connections on the vacuum extractor and test the vacuum on a gloved hand

c) Vacuum extraction steps

1. Assess the station and position of the fetal head by feeling the sagittal suture line and fontanelles.
2. Identify the posterior fontanelle.
3. Apply the chosen cup often 50mm size (medium), with the center of the cup over the flexion point, 3 cm anterior to the posterior fontanelle if possible.
4. Check the application and ensure that there is no maternal soft tissue (cervix or vagina) within the rim of the cup.
5. Have the assistant create a vacuum of 0.2 kg/cm² negative pressure with the pump and check the application of the cup if any tissue is trapped, release the pressure and restart.
6. Increase the vacuum to 0.8 kg/cm² negative pressure and check the application of the cup.
7. After maximum negative pressure has been applied, start traction in the line of the pelvic axis and perpendicular to the cup.

8. With each contraction, apply traction in a line perpendicular to the plane of the cup rim: Place a gloved finger on the scalp next to the cup during traction to assess potential slippage and descent of the vertex.
9. Between each contraction have an assistant check: Fetal heart rate.
10. With progress, continue the “guiding” pulls for a maximum of 15 minutes.
11. When the head stretches the perineum, assess whether an episiotomy might be indicated, especially in a nulliparous woman.
12. If the cap pops off 3 times during the procedure stop the procedure and move on to c-section to deliver the baby.
13. When the head has been delivered, release the vacuum, remove the cup and complete the delivery as in assisting a normal birth including active management of the third stage of labor.
14. Carefully check the birth canal for any tears following delivery.
15. Repair any episiotomy or tears as per guidelines.
16. Provide immediate postpartum and newborn care.

d) Post-procedure tasks

1. Before removing gloves, dispose of waste materials in a leak-proof container or plastic bag.
2. Place instruments in 0.5% chlorine solution for 10 minutes for decontamination.
3. Remove gloves by turning them inside out and placing them in a leak-proof container or plastic bag.
4. Wash hands thoroughly with soap and water and dry.
5. Document the procedure – descent, position, numbers of pulls, no. pop-offs, episiotomy, oxytocin dose used.
6. If the vacuum failed, write down the possible reason.
7. Have a short debrief talk with all the team members after VE.

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