



# SMFM Special Statement: Operative vaginal delivery: checklists for performance and documentation

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The frequency of operative vaginal delivery has been declining, even though it can be an attractive alternative to cesarean delivery in selected cases. Performance of operative vaginal delivery required consideration of many indications, contraindications, and prerequisites. Optimal documentation of operative vaginal delivery requires the recording of several specific elements that are unique to forceps or vacuum delivery. A cognitive aid such as a checklist is well suited to this situation in which there are numerous elements to consider, a low frequency of performance, and teams with variable expertise. We propose 2 checklists to help ensure that all relevant elements are considered for every operative vaginal delivery: (1) a checklist for preparation and performance of the procedure and (2) a checklist for documentation. We suggest practical tips to help facilities adapt these checklists to their own circumstances and implement them on their units.

**Key words:** checklist, forceps delivery, implementation, operative vaginal delivery, vacuum extraction

## Introduction

Reducing the rate of primary cesarean delivery is a major maternal safety goal in contemporary obstetrics.<sup>1</sup> Operative vaginal delivery is an attractive alternative to cesarean delivery in selected cases during the second stage of labor, including arrest of descent, protracted descent, suspicious fetal heart rate patterns, or maternal exhaustion. However, the use of forceps and vacuum extraction in the United States has declined steadily in recent decades, from 9.1% in 1992 to 3.3% in 2013.<sup>2</sup>

US obstetrics and gynecology residents who completed training in 2019 reported that they had performed a median of only 14 vacuum extraction deliveries and 4 forceps deliveries during training.<sup>3</sup> Forceps delivery, in particular, has been termed “a species on the brink of extinction” because it is used in only 0.5% of deliveries,<sup>4</sup> and some residents perform zero forceps deliveries during their training.<sup>3</sup> Experts have recommended high-fidelity simulation to teach the judgment and technical skills required to perform operative delivery.<sup>4–6</sup>

The American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin No. 219 lists 10 prerequisites and 3 indications for operative vaginal delivery.<sup>2</sup> For medicolegal reasons, optimal documentation requires the recording of several specific elements that are unique to forceps or

vacuum delivery.<sup>7,8</sup> Physicians are expected to know and consider all prerequisites and documentation elements, but reliance on memory alone may result in 1 or more elements being overlooked. Moreover, operative delivery is performed in a team environment. Even if the physician is familiar with all of the relevant elements, it is possible that the nursing staff and other personnel may have less experience, familiarity, and comfort with operative vaginal delivery.

A cognitive aid such as a checklist is well suited to this situation in which there are numerous elements to consider, a low frequency of performance, and teams with variable expertise.<sup>9</sup> We propose 2 checklists to help ensure that all relevant elements are considered for every operative vaginal delivery: (1) a checklist for preparation and performance of the procedure and (2) documentation. We also suggest practical tips to help facilities adapt these checklists to their own circumstances and implement them on their units.

## Checklist for Preparation and Performance

A sample preparation and performance checklist is shown in Figure 1. The checklist was developed as a task list or step-by-step listing of items to be completed in order. For checklist design, we followed the guidance of Project Check’s *Checklist for Checklists*.<sup>10</sup> For example, the checklist is presented in a nonserif font, avoids the use of color, and clearly shows the version date. Each item is phrased as a question to be read aloud, with the intent that a

**FIGURE 1****Example of a preparation and performance checklist for operative vaginal delivery****Operative Vaginal Delivery: Checklist for Preparation and Performance****SAMPLE VERSION:** Should be modified to fit requirements of local institution**Preparation and Prerequisites**

- ☐ What is the primary indication for operative delivery?
  - ☐ Prolonged second stage
  - ☐ Fetal compromise (suspected or potential)
  - ☐ Maternal benefit (such as medical problem or exhaustion)
- ☐ Is the estimated fetal weight reasonable for vaginal delivery? Record weight \_\_\_\_\_ g
- ☐ Is the cervix fully dilated and retracted?
- ☐ Are the maternal pelvis dimensions judged to be adequate for vaginal delivery?
- ☐ Is the fetal head engaged? Record station \_\_\_\_\_
- ☐ Is the fetal head position known (for example, occiput anterior) Record position \_\_\_\_\_
- ☐ Are the fetal membranes ruptured?
- ☐ Is there a known or suspected fetal contraindication (for example, thrombocytopenia, hemophilia, von Willebrand disease, osteogenesis imperfecta)?
- ☐ Have benefits and risks been discussed with patient and has she agreed to the procedure?
- ☐ Where should procedure be performed (delivery room or operating room)?
- ☐ Have the following people been notified?
  - ☐ L&D nursing staff (charge nurse, others as needed)
  - ☐ Obstetrics attending (if procedure to be performed by trainee)
  - ☐ Anesthesiology
  - ☐ Pediatrics (NICU, pediatrician, or neonatal team)

**Pre-Procedure Time Out**

- ☐ Are all team members present (OB, nursing, anesthesia, pediatrics)?
- ☐ Does the patient identity match the chart?
- ☐ Will vacuum extraction be performed?
  - ☐ Is gestational age at least 34 weeks?
  - ☐ What pressure will be used?
  - ☐ Will we follow our usual stopping rules (stop if 3 pop-offs, stop if not making progress with each pull, stop after 15 minutes, no changing to forceps if vacuum unsuccessful)
- ☐ Will forceps delivery be performed?
  - ☐ Will we follow our usual stopping rules (stop if not making progress with each pull, stop after 15 minutes, no changing to vacuum if forceps unsuccessful)?
- ☐ Are contingencies in place for cesarean delivery if vaginal delivery is unsuccessful?
- ☐ Is anesthesia adequate for the procedure?
- ☐ Has the patient's bladder been emptied?
- ☐ What will be the indications to perform episiotomy?
- ☐ What preparations have been made for possible postpartum hemorrhage?
- ☐ Will we give a prophylactic antibiotic after procedure?
- ☐ Record time of placement of instrument \_\_\_\_\_

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nurse or assistant will ask each question, and the physician will respond (challenge-response model). This model encourages team performance.

This checklist is presented as an example because each institution will likely modify it to fit its own particular circumstances. Most of the items in the preparation and performance checklist are based on the list of indications and prerequisites in ACOG Practice Bulletin No. 219.<sup>2</sup> These items should not be modified. Items that may need discussion and modification are listed as follows:

1. Discussion of risks and benefits and agreement of patient. Some institutions require written, signed informed consent; others accept verbal assent from the patient. If signed consent is required, it should be specified in the checklist.
2. Consideration of appropriate site for the procedure. Operative vaginal delivery fails in up to 10% of cases,<sup>11–13</sup> and risk factors do not reliably predict failure.<sup>13</sup> In the event of a failed attempt, cesarean delivery is generally recommended<sup>2</sup> because sequential use of forceps followed by the use of a vacuum device, or vice versa, is associated with a higher rate of maternal and neonatal morbidity.<sup>14,15</sup> Some institutions require that all operative deliveries be performed in an operating room; if so, the checklist should be modified to reflect this requirement. Other institutions allow operative deliveries to be performed in a labor room. Our intent in placing this item on the checklist is to encourage contingency planning in case the attempt at operative vaginal delivery fails.
3. Appropriate team members present for delivery. Some institutions do not require an anesthesiologist to be present for an operative vaginal delivery if adequate anesthesia (such as epidural) has already been established. In this case, “anesthesiology” can be removed from this line on the checklist. Nonetheless, the anesthesiologist should still be informed that operative delivery will be attempted because cesarean delivery will likely be needed if the attempt fails. Thus, we do not recommend deleting anesthesiology from the earlier line item covering personnel to be notified.
4. Confirmation that patient identity matches the chart. Although this item may seem superfluous for a procedure in which the patient will most likely be awake, we note that confirmation of the correct patient is part of the Joint Commission’s universal protocol for preventing wrong-patient, wrong-site procedures.<sup>16</sup> We believe that the universal protocol should be uniformly applied to all procedures to promote consistency. Furthermore, although it is unlikely that this type of procedure will involve the wrong patient, it is possible that the wrong chart will be brought to the room (or loaded into the computer). Therefore, confirming that the chart matches the patient is an important safety step.
5. Details for vacuum extraction. First, institutions should decide whether to prohibit the use of vacuum extraction prior to 34 weeks of gestation and, if so, to insert stronger language here. The American College of Obstetricians and Gynecologists Practice Bulletin No. 219 states that “vacuum extraction has been discouraged for gestational age less than 34 weeks, although a safe lower limit for gestational age has not been established.”<sup>2</sup> Second, prior to performing the procedure, we recommend that all team members agree to the desired negative pressure to be used. Pressures near the upper end of the green arc on the pressure gauge (500–600 mm Hg) are considered safe and will minimize the number of pop-offs.<sup>17</sup> Moreover, reaching the desired pressure rapidly will shorten the procedure duration compared with stepwise increases in negative pressure.<sup>18</sup> Third, each institution should develop standardized rules for stopping the procedure and should educate staff about their importance. The checklist text should be modified as needed to provide a brief synopsis of the stopping rules. Having the team state the stopping rules aloud just prior to the procedure may help ensure the team’s compliance.
6. Details for forceps delivery. As for vacuum extraction, standardized stopping rules should be developed by each institution. The rules should be recorded in the checklist and stated aloud before each procedure.
7. Preparations for postpartum hemorrhage. Although delivery teams should be prepared for postpartum hemorrhage with every delivery, operative vaginal delivery carries an increased risk for hemorrhage because of its associations with other hemorrhage risk factors: prolonged labor, vaginal lacerations, and third- and fourth-degree perineal lacerations. Peripartum blood transfusion was used in 9.8% of forceps deliveries in one large study,<sup>17</sup> a 4-fold increase compared with spontaneous deliveries. Thus, we suggest that the delivery team confirm that the blood bank has a current sample for blood type and antibody screen. If there are additional hemorrhage risk factors, consideration can be given to having packed red blood cells on hold.
8. Prophylactic antibiotics. Two randomized controlled trials found that a single dose of prophylactic antibiotics given after operative vaginal delivery reduced the risk of maternal postpartum infection.<sup>18,19</sup> The larger trial excluded women with a third- or fourth-degree perineal laceration because antibiotic prophylaxis is already recommended for these women.<sup>20</sup> Until a guideline from ACOG or the Society for Maternal-Fetal Medicine (SMFM) is issued, we believe it is reasonable for institutions to review the data and to decide whether to routinely recommend antibiotics for all operative vaginal deliveries (in which case the text should be modified to reflect this recommendation); to leave the decision to the discretion of the individual provider (the text can stand as written); or to recommend antibiotics only for third- or fourth-degree lacerations (the text should be modified.)

FIGURE 2

**Example of a documentation checklist for operative vaginal delivery****Operative Vaginal Delivery: Elements of Documentation****SAMPLE VERSION: Should be modified to fit requirements of local institution**

- ☐ Standardized format for documentation
- ☐ Indication for the procedure
- ☐ Specific statement that contraindications were reviewed and were absent
- ☐ Relevant history, synopsis of labor progress, fetal heart tracing
- ☐ Pre-procedure maternal evaluation: Cervical dilatation, adequacy of pelvis
- ☐ Pre-procedure fetal evaluation: Estimated weight, station and position of fetal head
- ☐ Anesthesia used
- ☐ Clock times at which instrument was applied and removed
- ☐ Number of contractions during which instrument was used
- ☐ For vacuum extraction:
  - ☐ instrument name
  - ☐ maximum negative pressure
  - ☐ number of pulls
  - ☐ number of dislodgements (pop-offs)
- ☐ For forceps:
  - ☐ instrument name
  - ☐ number of pulls
  - ☐ degree of effort (easy, moderate, difficult)
  - ☐ degrees of rotation (if any)
  - ☐ classification (see box)
- ☐ Newborn: Any noted marks or trauma from instruments
- ☐ Complications and their management (for example, lacerations, hemorrhage, shoulder dystocia)
- ☐ If operative vaginal delivery was unsuccessful, include all the above elements in cesarean note.

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A sample documentation checklist for operative vaginal delivery is presented in [Figure 2](#). This checklist is structured as a task list, that is, a simple listing of items to be completed in order. Because this list is intended only for the physician preparing the delivery note, we list each item rather than phrasing in a question-answer, challenge-response format.

We consider this checklist to be an example because each institution will likely need to modify it to fit its own particular circumstances. Most of the elements in this checklist are from guidelines of the Royal College of Obstetricians and Gynaecologists<sup>7</sup> and the Society of

Obstetricians and Gynaecologists of Canada.<sup>8</sup> Practice Bulletin No. 219 from ACOG<sup>2</sup> does not discuss elements of documentation except to propose that documentation of fetal station and position at the time of instrument application might be used as a performance measure. We believe that thorough documentation is important for both quality assurance and medicolegal reasons.

Most of the items in the checklist are self-explanatory. For some items, additional considerations may apply:

1. Standardized format for documentation. For some institutions, a detailed template for documentation of operative vaginal delivery may be available within the

**BOX****Classification of forceps deliveries****Outlet forceps**

- Scalp visible at the introitus without separating the labia
- Fetal skull at the pelvic floor
- Fetal head at or on the perineum
- Sagittal suture in anteroposterior diameter or right or left occiput anterior or posterior position
- Rotation 45 degrees or less

**Low forceps**

- Leading point of fetal skull at station +2 cm or more and not on the pelvic floor
- Without rotation: Rotation 45 degrees or less (right or left occiput anterior to occiput anterior, or right or left occiput posterior to occiput posterior)
- With rotation: rotation is greater than 45 degrees

**Midforceps**

- Station above +2 cm but head engaged

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electronic health record (EHR). Each center should review the EHR template and modify it as needed to ensure that it includes all of the items in the checklist. For centers that do not have an electronic template, a fill-in-the-blank paper template can be considered. Alternatively, a dictated delivery note may be a more time-efficient way for physicians to document these elements rather than a hand-written note.

2. Statement regarding the absence of contraindications. For medicolegal purposes, it is useful to have a brief statement such as, "We used a checklist to ensure that there were no contraindications to operative vaginal delivery." Alternatively, if a template is used, it could include checkboxes listing various contraindications and a statement that each was considered and found to be absent.
3. Forceps classification (see [Box](#)). This classification scheme is recommended by ACOG for forceps deliveries. Each institution should consider whether to adopt this classification for vacuum extraction deliveries.

### Suggestions for Implementation

For checklists to be useful, they must be used. Merely making them available for providers does not ensure their use. Techniques for successful deployment of checklists are discussed in the toolkit *Implementing Quality Improvement Projects* by the Council on Patient Safety in Women's Health Care.<sup>21</sup>

Key steps are the following: ensuring support from departmental and institutional leadership; identifying clinical champions to drive the project; assembling a team of relevant stakeholders; and setting SMART goals (an acronym for Specific, Measurable, Attainable, Relevant, and Time Bound).

A recent study evaluating the use of surgical checklists in US hospitals and ambulatory surgical centers found that

the factors associated with the successful implementation were a smaller facility size, leadership support, and dedicated time to train the staff. The factors associated with less successful implementation included resistance among clinical providers, the lack of an implementation champion, and unsatisfactory content or design of the checklist.<sup>22</sup>

A team approach to implementation is recommended. The team should be led by at least one clinical "champion" who has passion for the project and can communicate the value of using checklists to reduce errors of omission. To help guide the implementation of the operative vaginal delivery checklists, we recommend both a physician and a nurse champion because the preparation and performance checklist is designed to be performed by physicians and nurses together.

Other stakeholders on the team might include other members of the obstetrics department, labor and delivery nursing staff, and obstetric residents and fellows. If EHR templates are to be developed or modified, a member of the facility's information technology department should be included. Including a patient advocate on the team may be helpful in understanding the patient perspective.

Communication and coordination between the team leaders and other key facility leaders are important from the outset. For the project to move forward successfully, frequent reports should be made to the obstetrics department leadership and staff, obstetrics nursing management, labor and delivery staff, and facility administration. Project goals and a timetable should be announced early and updated regularly. The team should listen to the feedback provided by these various groups and adapt its approach as needed.

The first task of the team should be to scrutinize the content of the checklists and make any needed



additions, alterations, or deletions as appropriate to adapt the lists to the unique circumstances of the facility. We have made some suggestions mentioned in the previous text, for example, regarding alternative approaches to requirements for the presence of an anesthesiologist, moving the patient to an operating room, the use of prophylactic antibiotics, and the method of documentation. Other alterations and customizations can be considered and vetted by the team.

The next task is to decide where the checklists should be physically located to optimize their use. Some ideas include mounting a poster-sized version of the preparation and performance checklist on the wall in every delivery room, securing a paper copy of the checklist to the cover of each sterile instrument pack containing forceps or vacuum extractors, making a laminated copy readily available in each delivery room or operating room, loading the checklist into the EHR, or having the checklist available in multiple formats in multiple locations. Each of these ideas has advantages and disadvantages; different facilities may prefer different solutions, including other solutions not listed here.

The team should decide whether the preparation and performance checklist should be completed orally or whether a completed checklist should be included in the patient's chart, either on paper or in the EHR. If a paper chart document is desired, the form will need modification to include space for the patient label and provider signature, date, and time.

We believe that a chart document is not required. The critical task is to actually perform the checklist items, not to merely fill in the checkboxes. If it is decided that documentation of the checklist completion is required, the team can consider whether it is sufficient to add a line item, such as "Prior to the procedure, we completed the Checklist for Preparation and Performance of Operative Vaginal Delivery" to the Elements of Documentation checklist or to the EHR template.

Once the content and format have been confirmed, it is recommended that the team test the usability of the checklists by running a few simulated procedures. If any difficulties are encountered, the checklists should be modified as needed to resolve them.

The next step is the development of a plan to train the physicians and nurses to use the checklists. The facility leadership must determine whether the use of the checklists will be mandatory or optional. We strongly recommend that use should be mandatory to ensure consistency of care.

Training may be accomplished in a variety of ways: completing a brief simulation exercise, watching a video, attending a lecture, reading a document, taking a quiz, or a combination of some or all of these activities. Of these options, the simulation is likely to be most effective but is also the most time-consuming and logistically complex.

Once the checklists are introduced, a plan should be implemented to measure and monitor compliance. A chart audit might reveal the degree to which the suggested documentation elements are included in the delivery notes. The quality assurance process might identify outlier cases in which the procedure did not meet the guidelines and an adverse outcome occurred.

Another approach is to simply ask physicians and nurses whether they used the checklist in individual cases and, if not, why not. The team should designate personnel to track the compliance measure(s) and specify how often they will report back.

A typical pattern for the implementation of quality improvement projects is that compliance is less than ideal initially but gradually increases as new processes become integrated into the "safety culture" of the facility. Initially, a weekly or monthly compliance audit might be reasonable, with gradually decreasing frequency if compliance is found to be high.

Compliance issues may be unique to certain individuals or may reflect the need to revise the entire system of implementation and use. If compliance issues are identified, the team will need to consider how best to address the problems and find solutions. ■

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SMFM has adopted the use of the word “woman” (and the pronouns “she” and “her”) to apply to individuals who are assigned female sex at birth, including individuals who identify as men as well as nonbinary individuals who identify as both genders or neither gender. As gender-neutral language continues to evolve in the scientific and medical communities, SMFM will reassess this usage and make appropriate adjustments as necessary.

All questions or comments regarding the document should be referred to the SMFM Patient Safety and Quality Committee at [smfm@smfm.org](mailto:smfm@smfm.org).