

Midwives' Association of Washington State CLINICAL GUIDELINE FOR LABOR AFTER CESAREAN IN THE COMMUNITY SETTING

1. INTRODUCTION:

Rates of attempted vaginal birth after cesarean (VBAC) across the US have increased from 15.3% in 2010 to 21.7% in 2020 (Bruno et al., 2023) This trend is reflected in Washington State, as many individuals with previous surgical births express interest in community birth, which includes birth at home and in free-standing birth centers. These guidelines present the current evidence regarding laboring after cesarean (LAC), provide resources for informed consent about LAC, and offer a guide to clinical decision-making regarding LAC for midwives licensed in Washington State.

Numerous high-quality studies indicate that, in the absence of contraindications, LAC is a safe choice for individuals. One seminal study found that the absolute risk of an adverse perinatal outcome for a person with a history of one prior low–transverse cesarean section is approximately the same as the background risk for any nulliparous client (Rozen et al., 2012). However, maternal and fetal risks are still generally perceived to be increased in LAC. Concerns about the appropriate place of birth, safety, and medico-legal issues influence the discussions shaping practices and access to laboring options. Midwives often face hostility from the medical community if they consider attending LAC in the community setting. Lack of malpractice coverage for LAC has also made this a difficult choice in the past; yet a growing body of evidence on the relative safety of LAC has improved the environment, allowing more providers to offer care and more insurers to cover this care in the state of Washington.

Although there is an abundance of literature about LAC and elective repeat cesarean section (ERCS), there are many flaws inherent in the research and deficiencies in the literature about the risks and benefits of LAC versus ERCS for low-risk, healthy individuals. The ambiguous conclusions of the literature regarding the safety of LAC, particularly regarding site of delivery, have resulted in limited delivery choices for those with prior cesarean births. However, recent research studies have found that LAC under midwives, including in the home setting, have as much or higher success than LAC within hospitals and with OBs, and carry slightly less risk of morbidity and mortality (Bayrampour et al., 2021; Fore et al., 2020).

The studies, reports, and guidelines cited in this document were identified using multiple searches of the PubMed database, Cochrane systematic reviews, and from local and national experts. Search terms included: *vaginal birth after cesarean, safety, outcomes, trial of labor, out-of-hospital, clinical practice guidelines, uterine rupture, birth center, maternal and fetal morbidity, adverse effects.*

2. DEFINITIONS

Misuse of terms is prevalent in the literature when discussing VBAC versus LAC (and its associated term TOLAC). TOLAC implies that we are allowing a patient a “trial” without expecting a “successful” outcome. A better term would be to use LAC, a term specifically speaking to the action, not the judgment. A VBAC would be a vaginally delivered LAC, but many times the literature speaks of VBACs when they are speaking of the labor, not the result. While this guidance focuses on prior cesareans, the same considerations apply for other major uterine wall surgery.

ERCS - Elective Repeat Cesarean Section

Community birth - Home birth or birth in a freestanding birth center

HBAC - Home Birth After Cesarean

LAC - Labor After Cesarean or other uterine wall surgery

TOL - Trial of Labor

TOLAC - Trial of Labor after Cesarean

VBAC - Vaginal Birth After Cesarean

3. PREDICTORS OF VBAC SUCCESS/FAILURE

Reports of successful VBAC rates range from 60-85% (ACOG, 2019) but, to date, VBAC has not been extensively studied in community settings. One retrospective, population-based cohort study of 4,471 births in Canada (4180 planned hospital LAC, 516 planned home LAC) indicates that LAC in a home setting carries a 39% higher rate of VBAC and carried no higher risks of morbidity or mortality than hospital LAC attended by midwives (Bayrampour et al., 2021). Additional research found that, within hospitals, CNMs and OB/GYNs had nearly identical outcomes for LAC, with OB/GYNs having slightly higher adverse maternal outcomes (Fore et al., 2020).

When evaluating a client’s suitability for a LAC in a community setting, the midwife and client should closely examine those factors that may favorably impact the likelihood of success and minimize the risk of adverse perinatal outcomes.

3.1 VBAC PREDICTOR ALGORITHMS

Historically, VBAC prediction algorithms have exhibited implicit biases and have not accurately predicted the likelihood of a failed LAC. Their implicit biases made it difficult to interpret predictions for people in certain groups, for example, those with BMI>30, Black and Latinx ethnicity, and initial cesareans due to labor arrest. Although abundant research indicates disparate outcomes for minorities, especially Black/African-American and Native American/Alaska Natives, those outcomes have been traced to the weathering effect of systemic racism, not biology (Maddorman et al., 2023). The National Institute of Child Health and Human Development hosts a VBAC calculator without race and ethnicity, which has demonstrated equivalent accuracy as past models (available at

<https://mfmunetwork.bsc.gwu.edu/web/mfmunetwork/vaginal-birth-after-cesarean-calculator>) (Grobman et al., 2021). This calculator uses an algorithm based on maternal age, height, pre-pregnancy weight, BMI, obstetric history, indication for previous cesarean, and the presence of treated chronic hypertension (Grobman et al., 2021). All calculators are better at predicting success (when the odds are calculated as 60% or higher) than they are at predicting failure.

3.2 PREDICTORS OF INCREASED VBAC SUCCESS

Although few studies currently exist for community LAC with midwives, the evidence is favorable, including:

- Odds of a successful VBAC were 39% greater when planned at home and attended by midwives than when labor was started in a hospital (Bayrampour et al., 2021)
- LACs in the hospital setting have similar outcomes whether attended by CNMs or OBGYNs (Fore et al., 2020)
- Community labors are not induced or augmented with oxytocin or prostaglandins, which may elevate the risk of uterine rupture (Tanos & Toney, 2019)

A 2019 study by Wu et al. analyzed 94 studies with 239,000 pregnancies and 163,000 LACs. Several factors in this study were identified as predictors of VBAC success:

- Prior vaginal delivery or VBAC
- White race (due to the weathering effect of experiencing racism and implicit bias resulting in negative treatment by care providers)
- Maternal age <35 years
- Higher Bishop score ≥ 5
- Spontaneous labor (not induced or augmented)
- Non-recurrent reason for the prior cesarean section (breech presentation, multiple gestation or placenta previa)
- Pre-pregnancy BMI < 30
- Neonatal birth weight <4000 grams (8lb 13oz).

3.3 PREDICTORS OF DECREASED VBAC SUCCESS

The 2019 Wu systematic review identified the following factors as being associated with an increased likelihood of a LAC resulting in a repeat cesarean:

- Maternal age >35
- Maternal BMI >30
- Diabetes (pre-existing or gestational)
- Non-white race (due to the weathering effects of systemic racism)
- Fetal macrosomia >4000 grams
- Hypertensive disorders of pregnancy
- Labor induction

- Cephalopelvic disproportion, labor dystocia, or failed induction as indicators for the previous cesarean

Other factors identified in studies identifying a decreased likelihood of VBAC success:

- More than one prior cesarean delivery (ACOG, 2019)
- No previous vaginal delivery (Place et al., 2019)
- Premature rupture of membranes without spontaneous labor (Uno et al., 2020).

Evidence on timing of delivery is mixed: While Uno et al. found increased risk of cesarean if delivery occurred after 40 weeks gestational age, Wu's systematic review found no differences between birth at 39, 40, or 41 weeks (2020, 2019). ACOG restates that "although the likelihood of success may be lower in more advanced gestations, gestational age greater than 40 weeks alone should not preclude TOLAC" (2019).

3.4 OTHER CONSIDERATION OF MORBIDITY/MORTALITY IN LAC

Uterine rupture, an outcome that is potentially fatal to both parent and fetus, is the most significant concern when planning a LAC. Thus, midwives should consider factors that influence the risk of uterine rupture when deciding whether to offer LAC to an individual.

Factors associated with increased risk of uterine rupture during LAC:

- Birth weight >4000 grams (8lb 13 oz) (Thisted et al., 2015)
- Postpartum hemorrhage or infection in initial birth (Salman et al., 2018)
- BMI >30 (Tanos & Toney, 2019)
- Maternal age \geq 40 (Tanos & Toney, 2019; Wu et al., 2019)
- Two or more previous cesareans (ACOG, 2019; Tanos & Toney, 2019)

Factors associated with decreased risk of uterine rupture during LAC:

- Interdelivery interval > 24 months (Tanos & Toney, 2019; Thisted et al., 2015)
- Previous vaginal delivery (Nahum-Yerushalmy et al., 2022; Thisted et al., 2015)
- Both prior vaginal birth and prior successful VBAC have been confirmed as being protective for uterine rupture (Wu et al., 2019)

Contrary to previous belief, method of repair (single versus double layer) may not be associated with increased risk of uterine rupture (Tanos & Toney, 2019; Thisted et al., 2015). However, ACOG and other professional groups list previous classical or T incisions as absolute contraindications to VBAC.

4. RISKS/BENEFITS

For the individual with a prior uterine scar, neither ERCS nor LAC is risk-free. When VBAC occurs, it is associated with less morbidity than repeat cesarean birth (Metz, 2023). However, when LAC results in a repeat cesarean, maternal morbidity is often higher (Metz, 2023). It is

critical that clients have a clear understanding about the risks and benefits of LAC and VBAC compared with ERCS, and the issues specific to the community setting.

4.1 BENEFITS OF VAGINAL BIRTH AFTER CESAREAN

Compared to ERCS, VBAC results in:

- Decreased maternal morbidity and mortality (Lazarou et al., 2021; Metz, 2023)
- Avoidance of complications associated with multiple cesareans, including bowel or bladder injury, abnormal placentation, and hysterectomy (Metz, 2023)
- Lower rates of postpartum infection (Metz, 2023)
- Lower rates of thromboembolism (ACOG, 2019)
- Shorter hospital stays
- Less postpartum discomfort & faster recovery (ACOG, 2019)
- Increased initiation and duration of breastfeeding (Li et al., 2021)

4.2 RISKS OF LABORING AFTER CESAREAN

There are no controlled trials that compare all maternal and fetal/neonatal risks amongst spontaneous LAC, induced or augmented trials of labor, and ERCS. Known risks of TOLAC (including those that ended in cesarean) to the newborn include higher rates of:

- Neonatal sepsis (suspected sepsis 5% vs 2%; proven sepsis 1% vs 0%) (Metz, 2023)
- NICU admission (Metz, 2023)
- Perinatal and neonatal mortality (0.13 vs 0.05%), though the absolute risk is very low in either scenario (Metz, 2023)

It should be noted that, though those who have a successful VBAC have the lowest risk of morbidity (0.2%), in the subgroup of individuals who have a LAC that results in cesarean, studies consistently report a higher rate of maternal morbidity (3.8%) than in those having an ERCS (0.8%) (Metz, 2023).

The most-discussed risk for LAC is uterine rupture. The risk of uterine rupture in a person with no prior cesarean is about 0.0033%, or 3.3 in 100,000; it is 0.47% or 1 in 200 for those with a prior cesarean (Thisted et al., 2015; Metz, 2023). It is important, though difficult, to distinguish between symptomatic uterine rupture and asymptomatic uterine dehiscence. Symptomatic uterine rupture is most often characterized by FHR disturbances or maternal bleeding, and it can only be definitively diagnosed upon cesarean section (Metz, 2023). Table 1 details other risks of TOLAC as opposed to ERCS.

Table 1: Maternal Outcomes from TOLAC vs ERCS (Metz, 2023)

Maternal outcome	LAC (95% CI)	ERCS (95% CI)
Hysterectomy	0.17% (0.12-0.26)	0.28% (0.12-0.76)
Infection*	4.6% (.015-13.5)	3.2% (1.3-7.3)
Maternal death	0.004% (0.01-0.015)	0.013% (0.004-0.042)
Transfusion	0.9% (0.4-2.0)	1.2% (0.5-2.6)
Uterine rupture	0.47% (0.28-0.77)	0.026% (0.009-0.082)

*Only people in labor are subject to the risk of intrapartum chorioamnionitis. ERCS has a higher risk of postpartum infection than VBAC; LAC resulting in cesarean carries the highest risk of postpartum infection.

When symptomatic uterine rupture does occur, it can be a catastrophic event for both birthing parent and baby, and it requires emergency medical and surgical intervention. Significant risks to the birthing parent include hemorrhage, uterine repair, hysterectomy (14-33%), and maternal death (Metz, 2023; Tanos & Toney, 2019). Each subsequent cesarean carries a higher risk of uterine rupture (Metz, 2023).

Consequences of uterine rupture to the baby may include 5-minute Apgar score <5, neurological injury, and death (5%) (Metz, 2023; Thisted et al., 2015). The risk of neonatal death can be mitigated by delivering the infant within 20 minutes of uterine rupture (Al-Zirqi et al., 2018).

ACOG recommends continuous auscultation during LAC (2019), but research has not supported any particular heart rate tracings as clearly indicating concern for uterine rupture (Abdulmane et al., 2023). This is consistent with general research that does not support continuous auscultation over intermittent auscultation to improve fetal outcomes in general. Fetal heart abnormalities are seen in 66% of cases with uterine rupture, but these same abnormalities are commonly seen in labors that do not result in uterine rupture (Abdulmane et al., 2023).

Signs of uterine rupture include uterine tachysystole, a sudden change in contraction patterns, decreased baseline uterine tone, vaginal bleeding, hemorrhage, recession of the presenting fetal part, fetal bradycardia and heartrate abnormalities (Raichle, 2021; Gruenberg, 2008). Symptoms may include shock, loss of uterine contractility, and severe abdominal pain that seems different in quality or location than pain from labor contractions, though this symptom only occurs in 22% of uterine ruptures (Gruenberg, 2008).

Often a planned repeat cesarean is recommended primarily due to risk of uterine rupture. As evidenced above, uterine rupture is a rare but serious obstetrical emergency, both for the birthing person and for the fetus. However, even without a prior cesarean, giving birth inherently carries risks. Other obstetrical emergencies with similar or higher risks are accepted as rare enough that they do not require a planned cesarean. This includes, umbilical cord prolapse (.16 % of labors) (Behbehani et al., 2016), postpartum hemorrhage (3.0% of births) (Corbetta-Rastelli et al., 2023) and shoulder dystocia (2.46% of labors, increasing with fetal weight) (Youssefzadeh et al., 2023).

4.3 BENEFITS OF ELECTIVE REPEAT CESAREAN BIRTH

The benefits of ERCS include:

- Decreased maternal morbidity compared to LACs that result in cesarean (Metz, 2023)
- Possibility of decreased psychological trauma associated with triggering events that may be associated with TOL, although the cesarean may also carry triggers for the birthing person.
- Choice of provider and timing when planning an ERCS

4.4 RISKS OF ELECTIVE REPEAT CESAREAN BIRTH

The risks of ERCS include the same as risks associated with all cesarean delivery (Metz, 2023). The risk of complications including placenta accreta, hysterectomy, transfusion, cystotomy, and bowel injury increases significantly as numbers of cesareans increase (Metz, 2023).

Maternal risks include:

- Nearly twofold risk of hysterectomy that increases with number of cesareans (Metz, 2023)
- Higher mortality for ERCS than for successful VBAC (0.013% vs 0.004%) (Lazarou et al., 2021). Though the absolute risk is quite low, the risk of maternal death after ERCS is 3x that of a VBAC.
- Increased infectious morbidity (Metz, 2023)
- Abnormal placental implantation in future pregnancies, which may affect the ability to LAC and increases risk of hemorrhage and hysterectomy (Metz, 2023)
- Longer hospital stay (Metz, 2023)

Maternal risks of repeat cesareans that increase with each additional cesarean:

- Increasing risk of abnormal placentation, hemorrhage, and hysterectomy (Metz, 2023)
- Increasing risk of adhesions in internal organs resulting in chronic pain (Uno et al., 2020)
- Postoperative infections (though intrapartum cesarean has the highest rates) (Metz, 2023)

Risks to the infant include:

- A higher rate of transient tachypnea of the newborn (4.2% vs 3.6%) (Metz, 2023)
- Compromised neurological, cardiovascular, and respiratory outcomes including childhood asthma and obesity (Keag et al., 2018; Uno et al., 2020)

5. CONSIDERATIONS FOR PRACTICE

As the issue of LAC has political implications in modern obstetrics, the community birth midwife choosing to offer LAC services is charged with additional responsibilities for themselves, their clients, and the midwifery community.

5.1 SHARED DECISION-MAKING

Shared decision making is a key component of midwifery philosophy and practice. Anyone involved in the pregnancy or birth, including partner(s), support people, and family members, will have opinions and therefore must be considered when making the decision to LAC. For this reason the midwife must consider all the people involved in the family's care when deciding whether to accept a patient into care for LAC. When deciding whether to provide care to the family, consider including:

- Full disclosure of the midwife's experience with community LAC and that of any attending birth assistant .
- Thorough documentation of shared decision-making, including the extent of patient education around the risks and benefits of LAC.
- Consideration that not all families are appropriate for LAC in the community setting; some will not understand and truly accept the risks and responsibilities for the decision to LAC. Each potential LAC client should receive ACOG's most current statement regarding VBAC and the MAWS VBAC Guideline.
- A signed statement in which the client outlines, in their own words, their understanding of the risks and benefits of LAC and reasons for choosing community LAC.
- A consultation between the client and an OB physician consisting of a discussion of the risks and benefits of community LAC versus the risks and benefits of ERCS.
- A request for and review of surgical records to investigate the circumstances surrounding the prior cesarean section and the surgery itself.

The midwife may also recommend the client read other midwifery and obstetrical guidelines on VBAC as they explore their options and contact International Cesarean Awareness Network (ICAN) and other VBAC support services in order to be as fully informed as possible.

5.2 EVIDENCE BASED PRACTICE

Any midwife offering community LAC must remain current with the latest research regarding LAC. The midwife can then incorporate this information into discussions with clients and update protocols accordingly.

5.3 PROFESSIONAL LIABILITY (MALPRACTICE) COVERAGE

The Washington State Professional Liability (malpractice) insurance carrier (JUA) presently excludes coverage of VBAC in the community setting. Clients must be informed of this, preferably via a signed disclosure statement.

Other malpractice insurers may cover LAC with certain stipulations and/or additional fees, and clients should be informed of those requirements. Extra fees not covered by insurance may be charged separately using an Advanced Beneficiary Notice or Non-Covered Services Agreement.

5.5 DISTANCE TO THE NEAREST HOSPITAL

Consideration must be given to distance and time required for transport when planning a community LAC. Increased morbidity/mortality occurs when cesarean section is delayed with a uterine rupture. The client must understand that an emergency cesarean delivery may not be available in an appropriate timeframe to guarantee a healthy outcome for either patient. Midwives and clients should also consider factors such as weather, traffic, and the resources and staffing available at the nearest hospital. At the time of writing, birth centers in Washington are prohibited from accepting clients for LAC; however, we anticipate that this may change in future years. In this event, midwives with clients who live 20 minutes or more from the nearest hospital should encourage their clients to labor at birth centers in nearby proximity to a hospital with emergency cesarean capability for the rare but serious scenario of a complication necessitating swift cesarean delivery.

5.6 CONSULTATION/TRANSFER OF CARE

Because midwives attending community LAC may be interfacing with an unsupportive medical community or personnel, they will best be prepared to deal with adversity if they consult according to the MAWS document “Indications for Discussion, Consultation and Transfer in an Out-of-Hospital Midwifery Practice” and utilize the MAWS document “Planned Out-of-Hospital Birth Transport Guideline.” Midwives should consider that transfer generally tends to be easier if they accompany their client to the hospital.

5.7 DIAGNOSTIC TESTING

Diagnostic testing is of limited value when assessing likelihood of a VBAC. Measurement of uterine segment thickness, estimated fetal weight, and sonographic head measurement have all been studied. Studies are often inconclusive or contradictory.

5.8 INDUCTION OF LABOR

Pharmacologic induction or augmentation of labor has been found to decrease the likelihood of VBAC (ACOG, 2019). Other non-pharmacological methods commonly employed by midwives for induction purposes including but not limited to castor oil, evening primrose oil or herbs have not been adequately studied in LAC candidates. AROM as a method has been studied and shown to be an effective and safe method of

induction (Dick et al., 2022). Other methods including hydrosopic dilators and foley balloons have been studied and have not shown adverse outcomes, but larger numbers of participants would be required to accurately demonstrate efficacy (Dick et al., 2022). Given the “lack of compelling data,” these methods are not contraindicated per ACOG (2019).

6. RECOMMENDATIONS FOR PRACTICE

Midwives should consider their own level of preparedness and available support in the community before deciding to take on LAC clients. Midwives prioritize evidence-based practice along with mutual trust and respect in client relationships. To that end, safe midwifery practices develop practice protocols grounded in evidence, which guide the midwife’s clinical judgment. The following recommendations are based on expert opinion of MAWS committee members based on the evidence cited above.

Consider the following:

- **Malpractice**: Will your malpractice carrier cover LAC? Will they charge an additional fee? If so, will you pass that fee on to your clients?
- **Relationship with EMS**: Can EMS be supportive and help facilitate your need for immediate emergent transfer in the event of an obstetrical emergency like uterine rupture?
- **Relationship with local hospital**: Does your local hospital support your desire to provide LAC services? Do they support clients who wish to LAC? Will they support laboring after transfer or require immediate cesarean delivery?
- **Travel distance**: What is the travel distance and time to the closest available hospital with immediate emergency cesarean capability?
- **Political environment**: Will you be well supported? Are you following local standards about when to transfer in other situations? Will the clinicians at the hospital respect your decision making?

Considerations during client history taking and follow up:

- **Previous deliveries**: Number of previous cesarean sections and previous vaginal deliveries impact success rates. Ideal candidates have had only one prior cesarean and at least one vaginal birth. Complications are higher for candidates who have had a cesarean for stalled labor.
- **Interval**: Length of time since cesarean delivery. Research shows labor sooner than 24 months post-surgery significantly increases morbidity/mortality.
- **Surgical records**: Obtain and review surgical records to confirm low transverse incision was made, there was no tearing of the uterus during the cesarean, the reason for the cesarean, and that there was no hemorrhage or post-operative infection.
- **Comorbidities**: BMI >30 and maternal age >40 increases the risk of uterine rupture.
- **Consider the use of a VBAC Calculator**: Note that it is most accurate when the result is a value over 60%; charting results could be helpful; however, ACOG notes that “A VBAC calculator score should not be used as a barrier to TOLAC” (Kimal et al., 2021).

Consideration during antenatal care:

- Initial and ongoing informed consent: Discussions should involve the client and partner, who must be supportive of and equally involved in every aspect of decision making. All relevant informed consent documents should be co-signed by the partner.
- Initial informed consent must include information about timing of emergency transfer to the nearest hospital with the ability to perform cesarean surgery. The midwife must communicate that the timing of the cesarean section is critical if a uterine rupture occurs and that in most cases, the distance to the nearest hospital is still further than the distance from a hospital room to the operating room. Emergency services should ideally be no more than 20 minutes away and this still does not guarantee a healthy outcome in the context of a catastrophic birth emergency.
- Consider obtaining written informed consent in the client's own words of their understanding of the risks and benefits of community LAC, reasons for choosing it, and their agreement to transfer care at any point should any of the team (including midwife or support people) deem it necessary or advisable.
- Consider revisiting the discussion and decision for community LAC at the beginning of the third trimester, including alternative options (ie hospital LAC, or ERCS). This provides time to transfer non-urgently in preparation for the desired birth location and method, should it have changed.
- Clinical ultrasounds: Order an anatomy scan ultrasound in the second trimester to assess placenta location. Consider a third trimester ultrasound as an adjunct to Leopold's maneuvers in determining fetal weight.
- Assessing for excessive weight gain and S>D: Pregnancies that result in infants >4000 grams are shown to have decreased VBAC success and increased risk of uterine rupture.
- Research supports that the best chance of VBAC success without complications is spontaneous labor at term; however, mechanical dilation and cervical ripening have been shown safe in research studies.
- Timing of delivery: Postdates pregnancy is associated with a higher risk of uterine rupture and lower VBAC success rate.

Considerations of labor management:

- Consider alternate policies for monitoring both maternal and fetal vital signs in labor. Because fetal heart rate abnormalities, particularly late decelerations followed by bradycardia, are associated with uterine rupture, the midwife may choose to auscultate fetal heart tones more frequently.
- Assess frequently for signs of progress and consider a lower threshold for transfer when labor progress slows or stalls. Though many midwives assume a sudden absence of contractions can be an indication of uterine rupture often there is no change in contraction pattern.
- The client may face emotional distress at the point where a cesarean section became indicated in their previous birth. Care should be given with this sensitivity in mind.
- Monitor and assess for the following signs of uterine rupture:

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- fetal heart rate abnormalities, especially bradycardia or suspicions of late decelerations. Remember that a rising baseline is an abnormal fetal heart rate finding.
 - increased uterine contractions or cessation of previously efficient uterine contractions
 - change in abdominal contour and inability to detect fetal heart rate at old site
 - acute onset scar tenderness
 - shortness of breath
 - vaginal bleeding and/or hematuria
 - loss of fetal station
 - severe abdominal pain, particularly between contractions
 - new onset of intense uterine pain
 - shoulder or chest pain
 - signs of maternal shock.
- Consider establishing IV access upon admission.
 - Consider carrying TXA for suspected uterine rupture, pending transfer.
 - Consider whether your community hospital would appreciate communication about when your LAC patients are laboring and delivering to inform them of potential transfers as well as successful community VBACs.
 - Consider offering active management of the third stage of labor. Retained placenta may indicate accreta at the scar site. Hesitate before deciding to do a manual removal.
 - It is critical that midwives give report to the hospital and follow up closely in the event of a transfer during labor. To the best of their ability, midwives should accompany clients to the hospital.

Last, research on LAC is evolving quickly, and MAWS guidelines are not continuously updated. Midwives who provide LAC have a responsibility to stay up to date on research, regularly participate in peer review, and adjust their practice protocols accordingly.

References

- Abdulmane, M. M., Sheikhali, O. M., Alhowaidi, R. M., Qazi, A., & Ghazi, K. (2023). Diagnosis and Management of Uterine Rupture in the Third Trimester of Pregnancy: A Case Series and Literature Review. *Cureus*. <https://doi.org/10.7759/cureus.39861>
- ACOG. (2019). *ACOG PRACTICE BULLETIN Clinical Management Guidelines for Obstetrician-Gynecologists*.
- Al-Zirqi, I., Daltveit, A. K., & Vangen, S. (2018). Infant outcome after complete uterine rupture. *American Journal of Obstetrics and Gynecology*, *219*(1), 109.e1-109.e8. <https://doi.org/10.1016/j.ajog.2018.04.010>
- Bayrampour, H., Lisonkova, S., Tamana, S., Wines, J., Vedam, S., & Janssen, P. (2021). Perinatal outcomes of planned home birth after cesarean and planned hospital vaginal birth after cesarean at term gestation in British Columbia, Canada: A retrospective population-based cohort study. *Birth*, *48*(3), 301–308. <https://doi.org/10.1111/birt.12539>

- Behbehani, S., Patenaude, V., & Abenhaim, H. A. (2016). Maternal risk factors and outcomes of umbilical cord prolapse: A population-based cohort study. *Journal of Obstetrics and Gynecology of Canada*, 38(1).
- Bruno, A. M., Allshouse, A. A., & Metz, T. D. (2023). Trends in attempted and successful trial of labor after cesarean delivery in the United States from 2010 to 2020. *Obstetrics & Gynecology*, 141(1), 173–175.
- Cheng, Y. W., Eden, K. B., Marshall, N., Pereira, L., Caughey, A. B., & Guise, J.-M. (2011). *Delivery After Prior Cesarean: Maternal Morbidity and Mortality*.
<https://doi.org/10.1016/j.clp.2011.03.012>
- Corbetta-Rastelli, C. M., Friedman, A. M., Sobhani, N. C., Arditi, B., Goffman, D., & Wen, T. (2023). Postpartum hemorrhage trends and outcomes in the United States, 2000-2019. *Obstetrics and Gynecology*, 141(1), 152–161.
- Dick, A., Gutman-Ido, E., Chill, H. H., Karavani, G., Ryvkin, I., Porat, S., & Rosenbloom, J. I. (2022). Artificial rupture of membranes as a mode for induction of labor in women with a previous cesarean section- a retrospective cohort study. *BMC Pregnancy and Childbirth*, 22(1). <https://doi.org/10.1186/s12884-022-05237-2>
- Fore, M. S., Allshouse, A. A., Carlson, N. S., & Hurt, K. J. (2020). Outcomes of trial of labor after cesarean birth by provider type in low-risk women. *Birth*, 47(1), 123–134.
<https://doi.org/10.1111/birt.12474>
- Grobman, W. A., Sandoval, G., Rice, M. M., Bailit, J. L., Chauhan, S. P., Costantine, M. M., Gyamfi-Bannerman, C., Metz, T. D., Parry, S., Rouse, D. J., Saade, G. R., Simhan, H. N., Thorp, J. M., Tita, A. T. N., Longo, M., & Landon, M. B. (2021). Prediction of vaginal birth after cesarean delivery in term gestations: a calculator without race and ethnicity. *American Journal of Obstetrics and Gynecology*, 225(6), 664.e1-664.e7.
<https://doi.org/10.1016/j.ajog.2021.05.021>
- Gruenberg, B. U. (2008). *Birth emergency skills training*. Birth Muse Press.
- Keag, O. E., Norman, J. E., & Stock, S. J. (2018). *Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis*. <https://doi.org/10.1371/journal.pmed.1002494>
- Kimal, A. J., Caughey, A. B., Gandhi, M., Moniz, M., Ralston, S., & Villavicencio, J. (2021). Counseling regarding approach to delivery after cesarean and the use of a vaginal birth after cesarean calculator practice advisory. *American College of Obstetrics and Gynecology*, 115(6). <https://doi.org/10.1097/AOG.0b013e3181e459e5>
- Lazarou, A., Oestergaard, M., Netzl, J., Siedentopf, J. P., & Henrich, W. (2021). Vaginal birth after cesarean (VBAC): Fear it or dare it? An evaluation of potential risk factors. *Journal of Perinatal Medicine*, 49(7), 773–782. <https://doi.org/10.1515/jpm-2020-0222>
- Li, L., Wan, W., & Zhu, C. (2021). Breastfeeding after a cesarean section: A literature review. In *Midwifery* (Vol. 103). Churchill Livingstone. <https://doi.org/10.1016/j.midw.2021.103117>
- Macdorman, M. F., Thoma, M., Declercq, E., & Howell, E. A. (n.d.). *Racial and Ethnic Disparities in Maternal Mortality in the United States Using Enhanced Vital Records, 2016-2017*. <https://doi.org/10.2105/AJPH.2021.306375>
- Metz, T. D. (2023). *Choosing the route of delivery after cesarean birth*. UpToDate.
<https://www.uptodate.com/contents/choosing-the-route-of-delivery-after-cesarean-birth/print>

- Nahum-Yerushalmy, A., Walfisch, A., Lipschuetz, M., Rosenbloom, J. I., Kabiri, D., & Hochler, H. (2022). Uterine rupture risk in a trial of labor after cesarean section with and without previous vaginal births. *Archives of Gynecology and Obstetrics*, 305(6), 1633–1639. <https://doi.org/10.1007/s00404-021-06368-1>
- Place, K., Kruit, H., Tekay, A., Heinonen, S., & Rahkonen, L. (2019). Success of trial of labor in women with a history of previous cesarean section for failed labor induction or labor dystocia: a retrospective cohort study. *BMC Pregnancy and Childbirth*, 19(176). <https://doi.org/10.1186/s12884-019-2334-3>
- Rozen, G., Ugoni, A. M., & Sheehan, P. M. (2012). A new perspective on VBAC: A retrospective cohort study. *Women and Birth : Journal of the Australian College of Midwives*, 24(1), 3–9. <https://doi.org/10.1016/j.wombi.2010.04.001>
- Salman, L., Hirsch, L., Shmueli, A., Krispin, E., Wiznitzer, A., & Gabbay-Benziv, R. (2018). Complicated primary cesarean delivery increases the risk for uterine rupture at subsequent trial of labor after cesarean. *Archives of Gynecology and Obstetrics*, 298(2), 273–277. <https://doi.org/10.1007/s00404-018-4801-x>
- Tanos, V., & Toney, Z. A. (2019). Uterine scar rupture - Prediction, prevention, diagnosis, and management. In *Best Practice and Research: Clinical Obstetrics and Gynaecology* (Vol. 59, pp. 115–131). Bailliere Tindall Ltd. <https://doi.org/10.1016/j.bpobgyn.2019.01.009>
- Thisted, D. L. A., Mortensen, L. H., & Krebs, L. (2015). Uterine rupture without previous caesarean delivery: A population-based cohort study. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, 195, 151–155. <https://doi.org/10.1016/j.ejogrb.2015.10.013>
- Uno, K., Mayama, M., Yoshihara, M., Takeda, T., Tano, S., Suzuki, T., Kishigami, Y., & Oguchi, H. (2020). Reasons for previous Cesarean deliveries impact a woman's independent decision of delivery mode and the success of trial of labor after Cesarean. *BMC Pregnancy and Childbirth*, 20(1). <https://doi.org/10.1186/s12884-020-2833-2>
- Wu, Y., Kataria, Y., Wang, Z., Ming, W.-K., & Ellervik, C. (2019). Factors associated with successful vaginal birth after a cesarean section: a systematic review and meta-analysis. *BMC Pregnancy and Childbirth*, 13(360). <https://doi.org/10.1186/s12884-019-2517-y>
- Youssefzadeh, A. C., Tavakoli, A., Panchal, V. R., Mandelbaum, R. S., Ouzounian, J. G., & Matsuo, K. (2023). Incidence trends of shoulder dystocia and associated risk factors: A nationwide analysis in the United States. *International Journal of Gynecology and Obstetrics*. <https://doi.org/10.1002/ijgo.14699>