NNEPQIN
NORTHERN NEW ENGLAND
PERINATAL QUALITY IMPROVEMENT NETWORK

Vaginal Birth after Cesarean (VBAC) Guidelines

Final Revision June 2024

Posted to NNEPQIN Website December 2024

The following guidelines are intended as a general educational resource for hospitals and clinicians, and are not intended to reflect or establish a standard of care or to replace individual clinician judgment and medical decision making for specific healthcare environments and patient situations

Guideline Summary

- **The goal of the current NNEPQIN guideline is to safely increase the availability of vaginal birth after cesarean (VBAC) services throughout the region. All recommendations align with the American College of Obstetricians and Gynecologists (ACOG)[1] and the American College of Nurse Midwives (ACNM)[2] guidance, as well as that of the American Academy of Family Physicians.[3]**
  - **Prior NNEPQIN VBAC Guidelines devised a stratification system: "low", "medium" and "high" risk (largely focused on risk for uterine rupture) making recommendations for obstetric and anesthesia staffing based on this risk stratification.**
    - Pregnant patients requiring induction of labor and/or augmentation were categorized as "medium risk", with recommendations for in-house obstetrics and anesthesia in the active phase.
    - Currently high labor induction rates have resulted in decreased VBAC availability in some community-based hospitals who cannot meet NNEPQIN's "medium risk" staffing recommendations.
- **The current NNEPQIN VBAC Guidelines no longer recommend the prior risk stratification system, and instead recommend incorporation of the antepartum "early pregnancy" Maternal Fetal Medicine Unit (MFMU) VBAC calculator into patient counseling, to be used as an aid in shared decision-making regarding mode of delivery and planned location of delivery.**
  - The intent is not to use the calculator as a means to prohibit VBAC access in those with low success probabilities, but to discuss alternatives based on each hospital's resources and capabilities for some pregnant patients, transfer of prenatal care for ultimate delivery at a higher maternity level hospital may be appropriate.
  - The MFMU calculator should be used early in pregnancy for counseling and to set expectations as early as possible.
    - **Multiple studies have shown an MFMU VBAC Calculator score ≥60% to result in reduced risk of maternal morbidity and similar neonatal risks with trial of labor after cesarean (TOLAC) compared to elective repeat cesarean delivery (ERCD).**
  - Use of the calculator should not preclude ongoing risk assessment based on other factors (such as predicted fetal size, other pregnancy complications, etc.).
  - Induction or labor augmentation in isolation should not be used to modify care plans (e.g., availability of TOLAC) made earlier in pregnancy.
- **The ultimate decision to attempt TOLAC should reside with the pregnant patient. When there are no contraindications to TOLAC, every attempt should be made to care for the patient at their preferred birthing hospital. TOLAC-associated risks (below) highlight the importance of patient autonomy/choice:**
  - The risk of delivery-related fetal/neonatal death associated with TOLAC is similar to the rates associated with laboring nulliparous individuals.[4,5]
  - The risk of maternal death is higher in those undergoing elective repeat cesarean delivery (ERCD) compared to those attempting TOLAC 13.4 per 100,000 with ERCD vs. 3.8 per 100,000 with).[6]
- **Risk of uterine rupture is often the driver of hospital VBAC policy, however the risk of other obstetric emergencies requiring urgent/emergent cesarean delivery are together much more frequently encountered than are uterine ruptures, regardless of whether labor was induced or augmented.**
  - Level 1 maternity centers/hospitals should have the capability to begin an emergency cesarean in an appropriate timeframe given the often unpredictability of need for an unplanned procedure in any laboring patient.

Background and Rationale:
Guidelines for provision of VBAC services for NNEPQIN member hospitals were first published in 2004 in response to changes in ACOG recommendations for the "immediate availability" of personnel able to perform an emergency cesarean delivery in the event of uterine rupture. The guidelines were then revised in 2019 which came out of an iterative collaboration of NNEPQIN member hospitals in Maine, New Hampshire and Vermont, and was based on updated evidence and recommendations, including modification by ACOG of the prior "immediate availability" statement.

The need for revision of the 2019 guideline was largely recognized in the context of increasing rates of labor induction for fetal and/or maternal indications and after publication of the ARRIVE Trial in 2018.[1,7] In the context of extremely high rates of labor induction in contemporary US obstetric care, the 2019 VBAC guidelines unintentionally resulted in barriers to VBAC availability for an increasing number of patients, as labor induction was used to stratify TOLAC patients as "medium risk", and as such resulted in a the need for a higher acuity of staffing and resource availability

Nationally, repeat cesarean remains the leading indication for cesarean delivery, and the VBAC rate remains low both nationally and regionally. The Healthy People 2020 Goals included increasing the US VBAC rate to 18.3%, though the 2021 national VBAC rate was 14.2%.[8]. The VBAC rate in the NNEPQIN member states ranged from 15.4% to 23.1% in 2021.[9] Pregnant people residing in rural areas appear to have lower access to VBAC than do those living in urban areas.[10] This is of particular relevance to NNEPQIN, as Vermont and Maine were ranked 1st and 2nd, and New Hampshire 9th, by the U.S. Census Bureau in 2020 for the greatest percentage of the population living in rural areas.[11] **The goal of this current NNEPQIN guideline is to contextualize the risks of TOLAC relative to other OB labor-related risks, and in doing so, support increased availability of VBAC services throughout the NNEPQIN region. Specific focus is given to Level 1 Maternity hospitals (using ACOG's criteria), which make up the majority of maternity hospitals in NNEPQIN's overwhelmingly rural landscape.**

This guideline revision is again the result of an iterative collaboration of NNEPQIN member hospitals, and incorporates guidelines from ACOG and contemporary evidence from the medical literature, with emphasis on use of the Maternal Fetal Medicine Units Network VBAC success prediction calculator.

Candidates for Trial of Labor after Cesarean (TOLAC):
Individuals with a prior classical or "T" incision, prior uterine rupture, history of extensive transfundal surgery, and those with any contraindication to vaginal delivery (e.g., placenta previa, placenta accreta spectrum, etc.) are not candidates for TOLAC. In contrast, most pregnant people with one previous cesarean delivery using a low-transverse incision are candidates for and "should be counseled about and offered TOLAC", as stated in the ACOG Vaginal Birth After Cesarean Delivery Practice Bulletin.[5] Induction of labor, augmentation of labor, 2 prior low transverse cesareans, suspected macrosomia, twin gestation, maternal obesity, and unknown prior uterine incision are not contraindications to TOLAC, and TOLAC should be discussed and offered in these circumstances, with appropriate discussion of risks and benefits.

Stratification of Candidates and Prediction of VBAC Success:
Most published series have demonstrated the rate of vaginal delivery in those undergoing-TOLAC to be approximately 70%.[5,12] While the likelihood of achieving a VBAC for any specific individual varies, use of

a validated VBAC success prediction calculator is an important tool for providers and patients to better estimate and understand both VBAC success and risk of maternal and neonatal morbidity. The most widely used and best-validated VBAC success prediction calculator was developed by the Maternal Fetal Medicine Unit Network, and NNEPQIN recommends use of this calculator. Free access web-based calculator based on this nomogram can be found at:
Vaginal Birth After Cesarean Calculator - mfmunetwork - portal (MFMU) (gwu.edu)

The web-based calculator includes both an "early pregnancy" calculator which can be used at any time in the pregnancy to predict VBAC success, and a "delivery admission" calculator, which predicts VBAC success based on additional factors assessed at the time of admission for delivery. Importantly, the calculated VBAC success score not only predicts the chance of VBAC with 95% confidence intervals, but has also been shown to be associated with risk of maternal and neonatal morbidity. Multiple studies have demonstrated that the those with a 60-70% probability of achieving VBAC, experience the same or less maternal morbidity than those who have an elective repeat cesarean. Conversely, those with <60% predicted VBAC probability are more likely to experience morbidity compared to those undergoing elective repeat cesarean. Similarly composite neonatal morbidity appears to be similar between TOLAC and elective repeat cesarean when the VBAC success score is >70%.[1,13,14] Finally, patients with a prior vaginal delivery appear to have the highest chance of VBAC success with the lowest rates of morbidity.[15] While ACOG recommends against using the calculator to restrict access to TOLAC, the VBAC success prediction score, in addition to prior obstetric history, may aid patients and smaller hospitals in making shared decisions around intended mode of delivery and delivery hospital.

Unit Structure and Resource Availability:
Each hospital should develop policy and procedure guidelines that reflect the resources and ability of the delivery unit to respond to emergent situations that may develop, as is the case for any laboring patient. Because the risks associated with TOLAC, including uterine rupture, can be unpredictable, ACOG recommends that "TOLAC be attempted in facilities that can provide cesarean delivery for situations that are immediate threats to the life of the woman or fetus", as would be the expected standard an any Level 1 Obstetric Care Hospital.[5,16] **There is currently no published recommendation for 24-hour "immediate availability" of specific providers, including anesthesia providers.** The risk of uterine rupture after a single prior low-transverse cesarean delivery is 0.7-1%. With induction without use of prostaglandins, the risk is 1.5-1.8%, though a 2015 retrospective study demonstrated no increased risk of uterine rupture with induction when compared to ongoing expectant management.[17] The risk of other obstetric emergencies requiring emergency cesarean delivery (i.e., placental abruption, cord prolapse, and non-reassuring fetal heart rate tracing) are together much more frequently encountered than are uterine ruptures. As such, Level 1 maternity centers/hospitals should have the "capability to begin emergency cesarean delivery within a time interval that best incorporates maternal and fetal risks and benefits" to allow for the safe care of pregnant people given the often general unpredictability of need for an unplanned procedure.[16] **Institutional VBAC availability policies should not be tied to the need for labor induction/augmentation.** Finally, it is important for providers and hospitals administrators to recognize that the risk of delivery-related fetal/neonatal death associated with TOLAC is similar to the rates associated with laboring nulliparous individuals.[4] Additionally, the risk of maternal death is higher in those undergoing elective repeat cesarean delivery (ERCD) compared to those attempting TOLAC 13.4 per 100,000 with ERCD vs. 3.8 per 100,000 with TOLAC).[6]

Prenatal Care Recommendations for patients with prior cesarean:
The "early pregnancy" MFMU VBAC calculator should be used to counsel patients on both chance of success and risk of morbidity: Vaginal Birth After Cesarean Calculator - mfmunetwork - portal (MFMU) (gwu.edu) early in the pregnancy to allow ongoing discussion.

- Completion and documentation of a shared decision-making process between the patient and their obstetrical care provider(s). Each institution should create their own standardized documentation of counseling and shared decision-making. This may be in the form of chart documentation (an electronic medical record shortcut), or via a VBAC consent document that is reviewed and signed during prenatal care. In either case, the risks and benefits of both successful and unsuccessful trial of labor after cesarean should be discussed and the discussion documented. Additionally, discussion should include:
    - The willingness and ability of the institution to care for the patient, based on their risk level.
        - The process of transfer care prenatally to allow for delivery in an institution with a higher level of care if needed (preferably transfer of care prior to 30-34 weeks)
    - If the primary OB provider cannot perform a cesarean section, consultation with provider privileged to perform a cesarean section should occur prior to 32 weeks.
    - Consideration and discussion of intended family size and the risk associated with additional cesarean deliveries.
    - Utilization of the antepartum MFMU VBAC Calculator should be used as a counseling tool to allow pregnant individuals to make informed choices about their own obstetric care, not to remove VBAC as an option for those individuals choosing trial of labor despite low success prediction. However, some Level 1 hospitals may choose to utilize a specific score threshold at which consideration of MFM consult for further discussion, and/or transfer of prenatal care to a higher-level maternity hospital is offered/recommended to allow for VBAC access and/or continued counseling.
        - Any such threshold should be shared with the pregnant individual early in pregnancy.
        - Ultimate need for induction of labor or augmentation of labor should NOT be used to risk stratify, when possible, as doing so results in late transfers of care and greatly reduces patient autonomy.

Additional Prenatal Care Recommendations for patients with prior cesarean

First Trimester	Second Trimester	Third Trimester

• Review records of prior deliveries, including type of uterine incision and indication for the cesarean. Evaluate history of previous uterine surgery.
• Perform a first trimester ultrasound (preferably 5 to 7 weeks) with particular attention to the relationship of the gestational sac to the area of the uterine scar.
  ○ Any concern for a cesarean scar pregnancy should be referred to a provider/institution with experience in treating and managing cesarean scar ectopic pregnancies
	• Perform a second trimester fetal anatomic survey, with specific attention to placental location and +/- evidence of placenta previa and/or placenta accreta spectrum (PAS)
	  ○ Concern for PAS should prompt referral to an AIUM certified tertiary care imaging center for further evaluation and management
		• Anesthesia consultation/evaluation per institution guidelines.
		• If the primary OB provider cannot perform a cesarean section, consultation with provider privileged to perform a cesarean section should occur prior to 32 weeks.

<u>Intrapartum Care Recommendations for all TOLAC -eligible patients:</u>

- Review with the patient the risks/benefits of proceeding with TOLAC on admission.
- Obtain peripheral IV access
- Lab/Blood Bank Preparation
- Type and Screen, or Type and Cross depending on the institution's blood bank availability in off hours
- In Active Labor (6 cm dilation)
  - Continuous Electronic Fetal Monitoring (if not already ongoing- e.g., IOL or augmentation).
  - Provider on hospital campus who is credentialed to perform a cesarean section
  - All patients attempting VBAC should have their labor progress monitored carefully to ensure adequate progress. Arrest of labor is associated with decreased VBAC success and uterine rupture. Patients with a macrosomic fetus (EFW > 4000 gm), especially those with no previous vaginal birth, are more likely to experience outcomes related to arrest of labor, and require careful monitoring.

Cesarean section may be recommended if an individual's risk status increases, and provider services cannot be increased and maintained until delivery.

Caveats and Special Circumstances:

- As the pregnancy progresses, providers should consider additional factors (suspected macrosomia, poorly controlled A2 gestational diabetes, as examples) that may increase risk for TOLAC and will need to be considered on an individual basis.
    - If the decision is made to transfer prenatal care on such a basis, this should be done as early as possible and generally not later than 34-36 weeks
    - Intrapartum transfers should be avoided- ultimately the patient has the right to decline a cesarean and the contemporaneous documentation of counseling conversations in the chart is paramount.
- Misoprostol is associated with a high rate of uterine rupture and should not be used when a living fetus is still in-utero. It may be used after delivery for uterine atony.
- External cephalic version (ECV) is a safe option in VBAC candidates wishing to attempt a trial of labor. ECV should be offered in this scenario.[5]
- There are limited data regarding the safety of a trial of labor in women with more than 2 prior cesarean sections. Each institution should have management plans in this scenario to ensure equitable and transparent patient care. If a higher level of care is recommended, this transfer of care should occur prior to 30-34 weeks.
- Intrapartum circumstances may result in a patient no longer being a safe candidate for TOLAC, as in the case of:
    - Recurrent clinically significant deceleration (variable, late or prolonged fetal heart rate decelerations) not responsive to clinical intervention
    - Significant bleeding of uterine origin
    - New onset of severe abdominal pain disproportionate to labor
    - Inadequate labor progress, as defined by ACOG.[18]

Patient Autonomy:

Finally, the ultimate decision to attempt TOLAC should reside with the pregnant patient. When there are no contraindications to TOLAC, every attempt should be made to care for the patient at their preferred birthing hospital. Denying a pregnant person the opportunity to attempt a VBAC may have a profound impact on future reproductive risk, as well as risk of future maternal morbidity and even mortality. This is particularly true in those planning additional pregnancies (see Table 2). As such, every attempt should be made to allow for patient autonomy in decision-making.

Both ACOG and the American College of Nurse-Midwives (ACNM) have published statements specific to patient autonomy in the context of VBAC:

ACOG: “Consistent with the principle of respect for patient autonomy, patients should be allowed to accept increased levels of risk: however, patients should be clearly informed of the potential increases in risk and management alternatives.”

ACNM: “Regardless of their geographic location, socio-economic status, or type of medical care coverage, women should have access to qualified maternity care providers and birth setting that offer VBAC and possess the capability to respond in a timely manner should complications occur. Professional liability carrier and institutional decision makers should not prohibit maternity care providers or facilities from providing care to women who are candidates for labor after cesarean.”

Table 1. Composite Maternal and Neonatal Risk, ERCD versus TOLAC in Term Patients

Risk/Complication	ERCD (%)	TOLAC (%)
Maternal		
Infectious morbidity	3.2	4.6
Surgical injury	0.30-0.60	0.37-1.3
Blood transfusion	0.46	0.66
Hysterectomy	0.16	0.14
Uterine rupture	0.02	0.71
Death	0.0096	0.0019
Neonatal		
Intrapartum Stillbirth	0-0.004	0.01-0.04
HIE	0-0.32	0-0.89
Perinatal mortality	0.05	0.13
Neonatal mortality	0.06	0.11
NICU admission	1.5-17.6	0.8-26.2
Respiratory morbidity	2.5	5.4
Transient tachypnea	4.2	3.6

Data from Guise JM, Eden K, Emeis C, Denman MA, Marshall N, Fu R, et al. Vaginal birth after cesarean: new insights, 2010.[19]

Table 2. Risk of Complications Associated with Multiple Cesarean Deliveries

Number of Cesarean Births	Risk of Complications (%)				
	Placenta Accreta	Hysterectomy	Transfusion	Cystotomy	Bowel Injury
1 (Primary cesarean birth)	0.24	0.65	4.05	0.13	0.11
2	0.31	0.42	1.53	0.09	0.06
3	0.57	0.90	2.26	0.28	0.13
4	2.13	2.41	3.65	1.17	0.34
5	2.33	3.49	4.26	1.94	0.00
6	6.74	8.99	15.73	4.49	1.12

Silver et al., *Obstet Gynecol 2006; 107:1226*[20]

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