# Getting Back to TOLAC

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# No Disclosures

# Objectives

- Review the history of Cesarean section and Trial of Labor after Cesarean Section (TOLAC)/Vaginal birth after Cesarean Section (VBAC)
- Review current and historical TOLAC and VBAC trends
- Review risks and benefits of TOLAC and VBAC
- Examine appropriate tools to employ in TOLAC counseling to offer direction for patient selection
- Discuss TOLAC methods and related clinical guidance

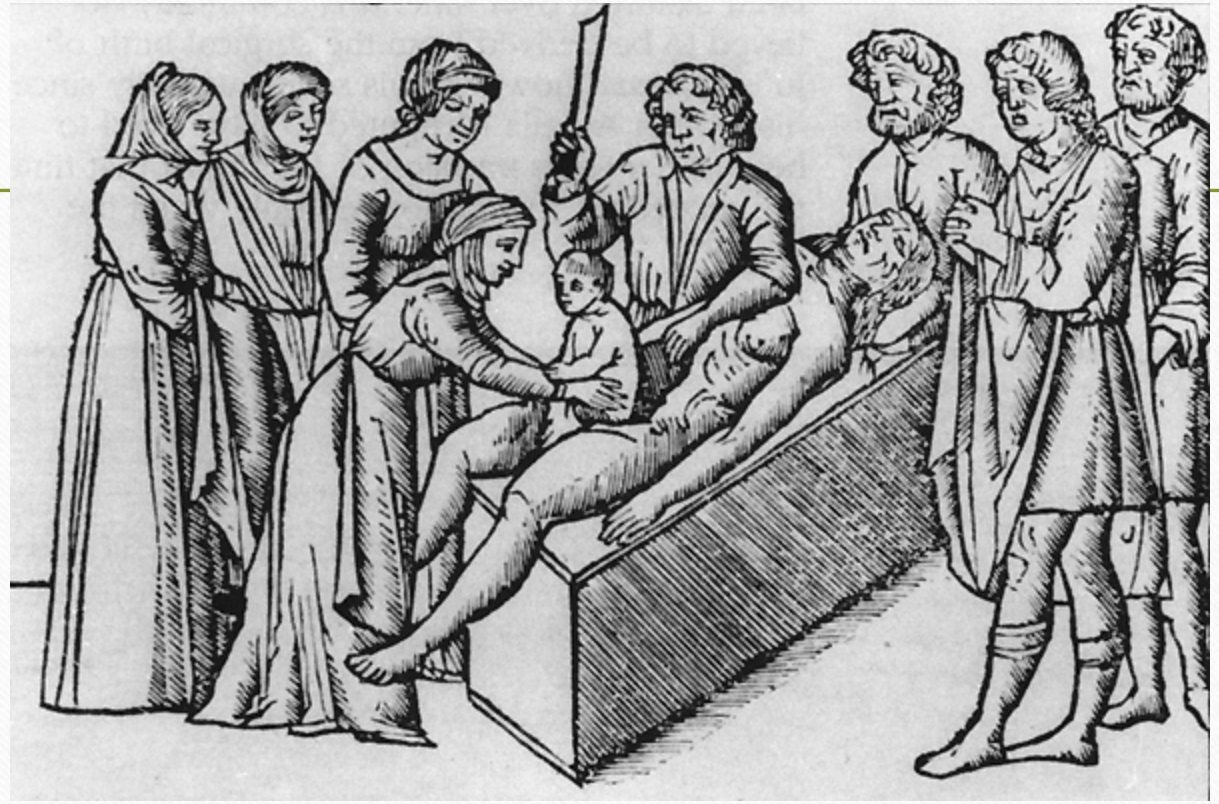
# History of Cesarean Section & TOLAC

# CESAREAN SECTION--
# A BRIEF HISTORY

Plate XLII from Scultetus' *Armamentaerium chirurgicum bipartitum*, 1666

A Brochure to Accompany an Exhibition
on the History of Cesarean Section at the
NATIONAL LIBRARY OF MEDICINE
30 April 1993 - 31 August 1993

**By Jane Eliot Sewell, Ph.D.**
**for The American College of Obstetricians and Gynecologists**



From Suetonius' *Lives of the Twelve Caesars*, 1506 woodcut.

# History of TOLAC

- 1916: Dr. Cragin declared: "once a cesarean section, always a cesarean section."

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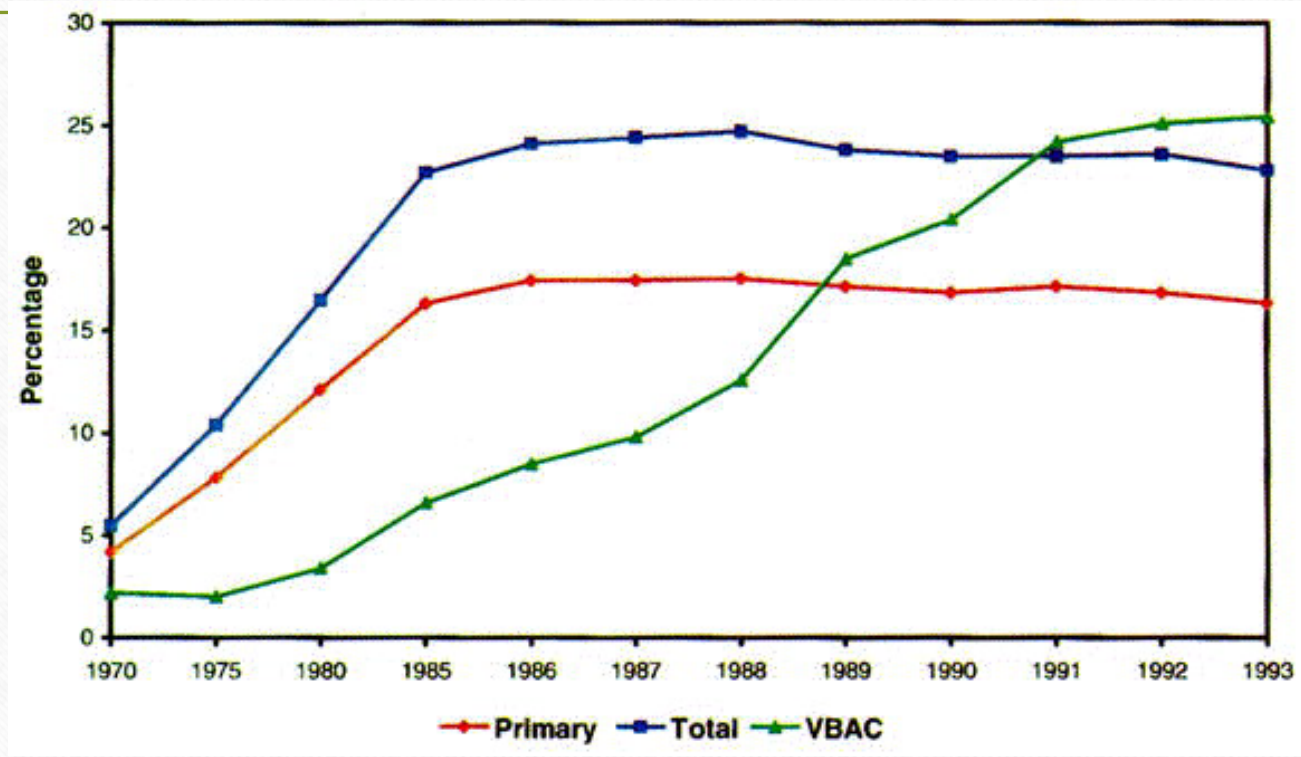
- 1923: First reported Vaginal Birth after Cesarean Section was reported in medical literature.
- 1950: Dr. Eastman described a 30-percent post-cesarean vaginal delivery rate at Johns Hopkins Hospital. He also reported a 2-percent uterine rupture rate and associated 10-percent maternal mortality rate.
- 1960's: Dr. Pauerstein reviewed observational studies that suggested TOLAC was a reasonable option.

# History of TOLAC

- Electronic fetal monitoring
- Decline of vaginal breech delivery
- Operative vaginal delivery training
- Shorter labor duration expectations
- Repeat cesarean sections
- Safety of cesarean section
- Medical-legal concerns
- Convenience

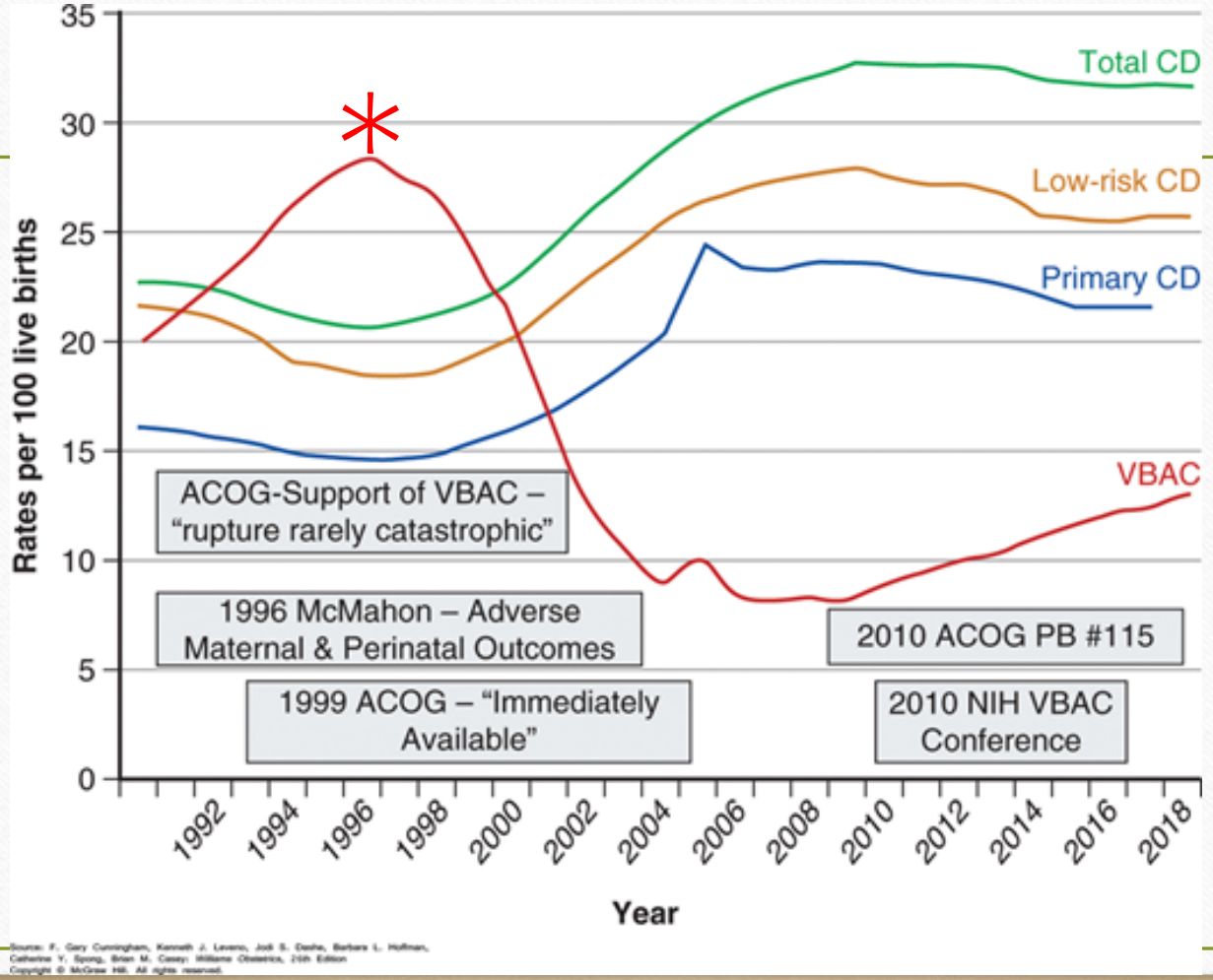



Porreco, AJOG 1996.

# History of TOLAC

- 1980's: National Institutes of Health (NIH) Consensus Development Conference on Vaginal Birth After Cesarean (1981) was convened.

# History of TOLAC



# History of TOLAC

The NEW ENGLAND JOURNAL of MEDICINE

CURRENT ISSUE SPECIALTIES TO

SOUNDING BOARD

## The Risks of Lowering the Cesarean-Delivery Rate

**Authors**: Benjamin P. Sachs, M.B., B.S., D.P.H., Cindy Kobelin, M.D., Mary Ames Castro, M.D., and Fredric Frigoletto M.D. Author Info & Affiliations

Published January 7, 1999 | N Engl J Med 1999;340:54-57 | DOI: 10.1056/NEJM199901073400112
VOL. 340 NO. 1 | Copyright © 1999

## ONCE A CESAREAN, ALWAYS A CONTROVERSY

*Bruce L. Flamm, MD*

**For most of this century, "once a cesarean, always a cesarean" was the rule in the United States. In the 1980s, vaginal birth after cesarean grew in popularity and the pendulum began to swing away from routine repeat cesarean delivery. Recently, the wisdom of this transition has been questioned. As the 20th century comes to a close, the treatment of the patient with a prior cesarean delivery remains controversial. (Obstet Gynecol 1997;90:312–5. © 1997 by The American College of Obstetricians and Gynecologists.)**

# History of TOLAC

The NEW ENGLAND JOURNAL of MEDICINE

CURRENT ISSUE SPECIALTIES TOPICS

ORIGINAL ARTICLE

## Comparison of a Trial of Labor with an Elective Second Cesarean Section

**Authors**: Michael J. McMahon, M.D., M.P.H., Edwin R. Luther, M.D., Watson A. Bowes, Jr., M.D., and Andrew F. Olshan, Ph.D. Author Info & Affiliations

Published September 5, 1996 | N Engl J Med 1996;335:689-695 | DOI: 10.1056/NEJM199609053351001

VOL. 335 NO. 10 | Copyright © 1996

**CONCLUSIONS**

Among pregnant women who have had a cesarean section, major maternal complications are almost twice as likely among those whose deliveries are managed with a trial of labor as among those who undergo an elective second cesarean section.

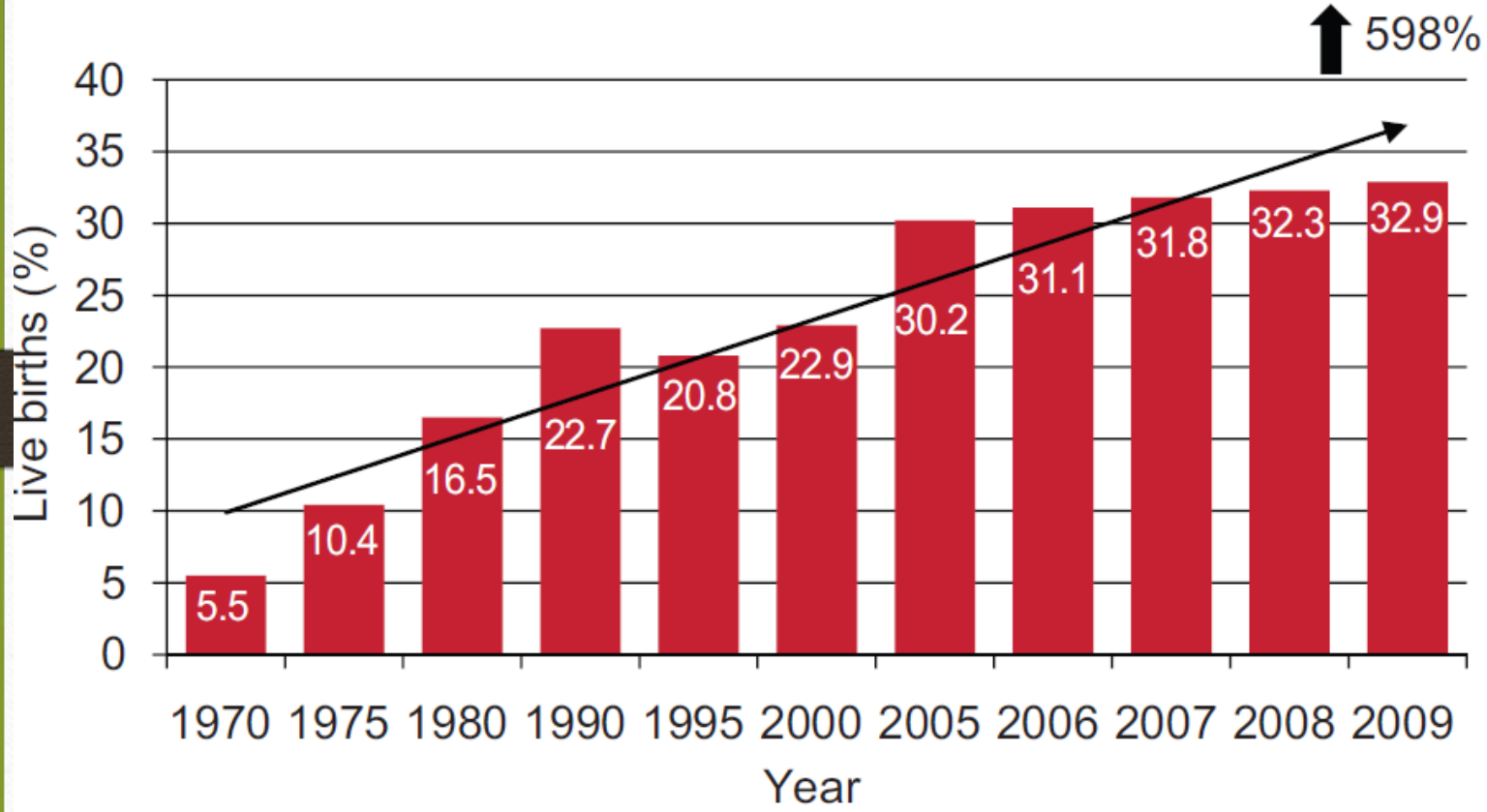



**Fig. 1.** Cesarean delivery rates from 1970 to 2009. (Data from http://www.cdc.gov/nchs/nvss.htm, courtesy of Caroline Signore, MD, MPH.)

*Scott. VBAC: A Common-Sense Approach. Obstet Gynecol 2011.*

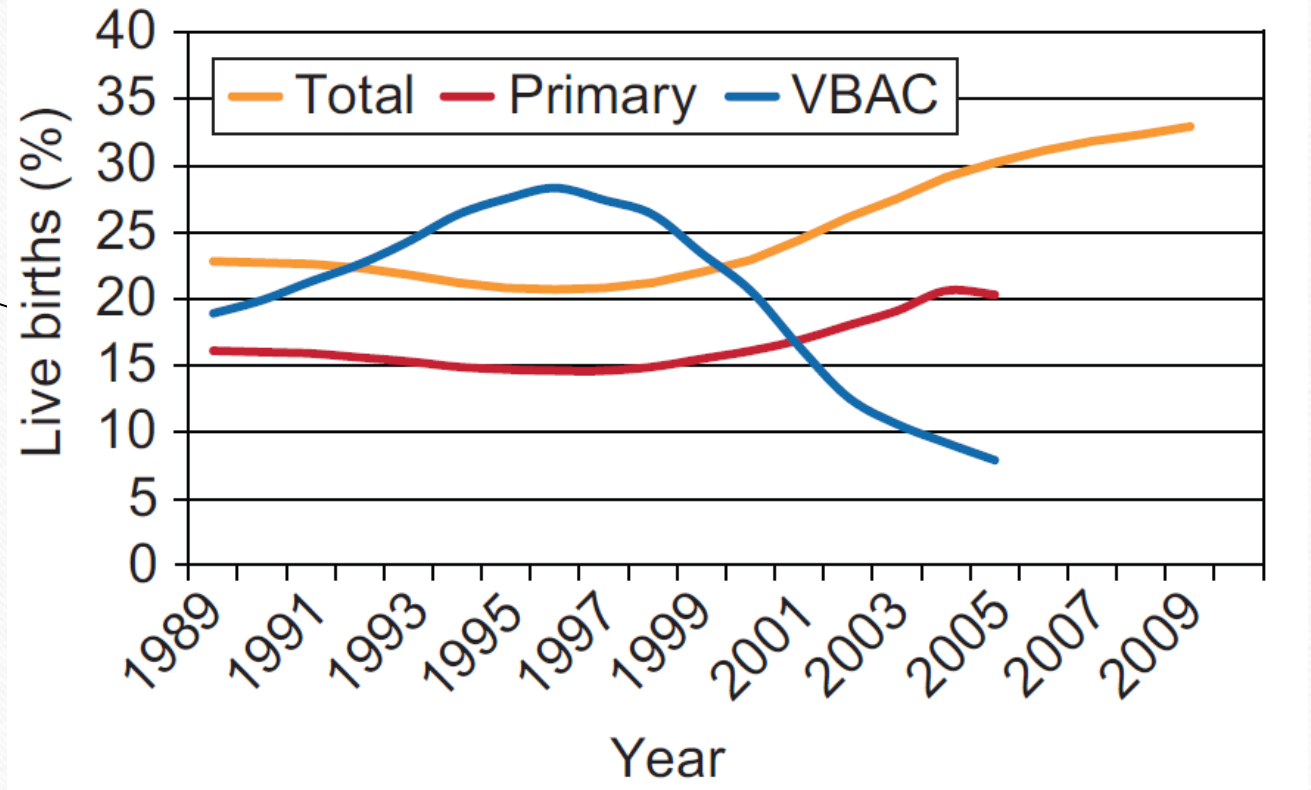



**Fig. 2.** Rates of total cesarean deliveries (1998–2009), primary cesarean deliveries (1998–2007), and vaginal births after cesarean (VBAC) (1998 to 2007). (Data from http://www.cdc.gov/nchs/nvss.htm, courtesy of Caroline Signore, MD, MPH.)

*Scott. VBAC: A Common-Sense Approach. Obstet Gynecol 2011.*

# History of TOLAC

Review > NIH Consens State Sci Statements. 2010 Mar 10;27(3):1-42.

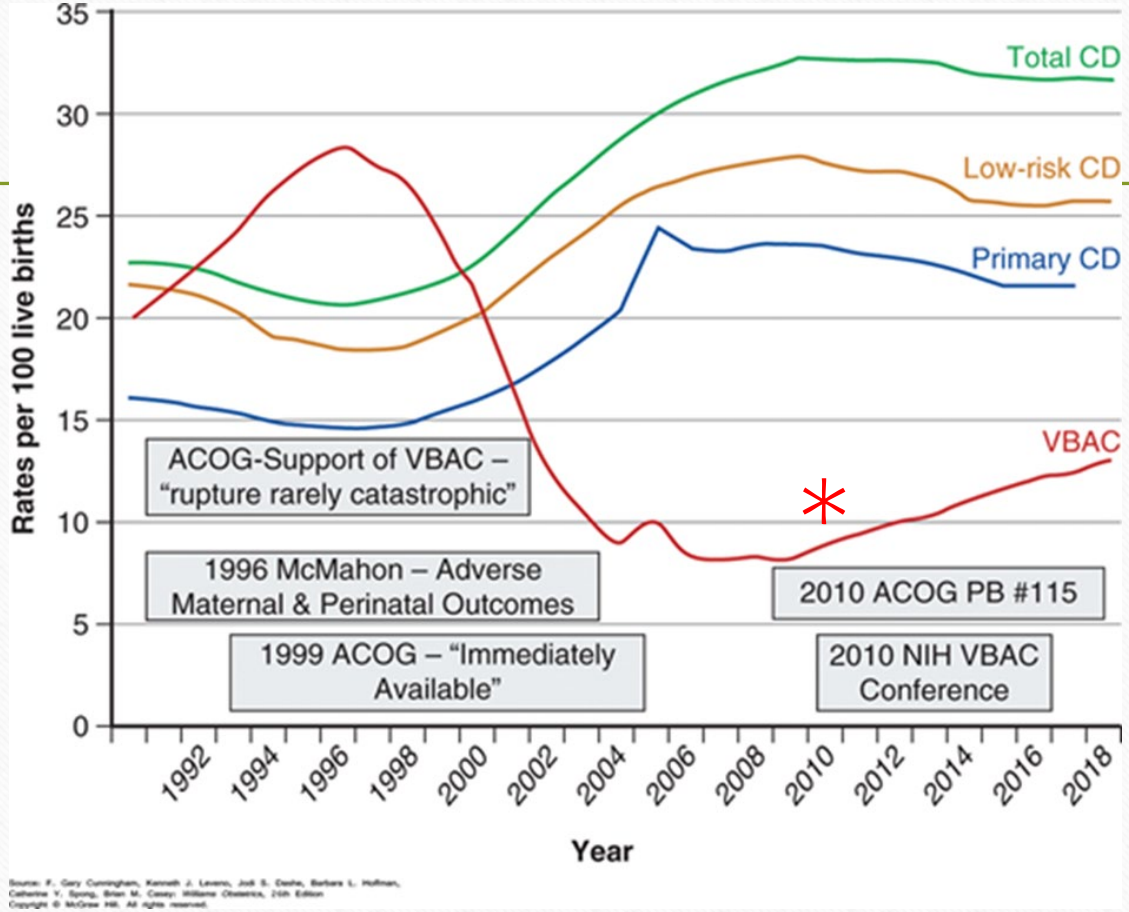
## NIH consensus development conference draft statement on vaginal birth after cesarean: new insights

F Gary Cunningham [1], Shrikant I Bangdiwala, Sarah S Brown, Thomas Michael Dean, Marilynn Frederiksen, Carol J Rowland Hogue, Tekoa King, Emily Spencer Lukacz, Laurence B McCullough, Wanda Nicholson, Nancy Frances Petit, Jeffrey Lynn Probstfield, Adele C Viguera, Cynthia A Wong, Sheila Cohen Zimmet

# History of TOLAC

- **Main 2010 panel conclusions:**
- Trial of labor is a reasonable option for many pregnant individuals with one prior low transverse uterine incision.
- One of the panel's major goals is to support pregnant individuals with one prior transverse uterine incision to make informed decisions about trial of labor compared with elective repeat cesarean delivery.
- When trial of labor and elective repeat cesarean delivery are medically equivalent options, a shared decision making process should be adopted and, whenever possible, the patient's preference should be honored.
- Facilities should improve access for TOLAC.
- Medical-legal considerations add to, and in many instances exacerbate, these barriers to trial of labor.

# History of TOLAC



# To TOLAC or Not to TOLAC?

# Who are not candidates for TOLAC?

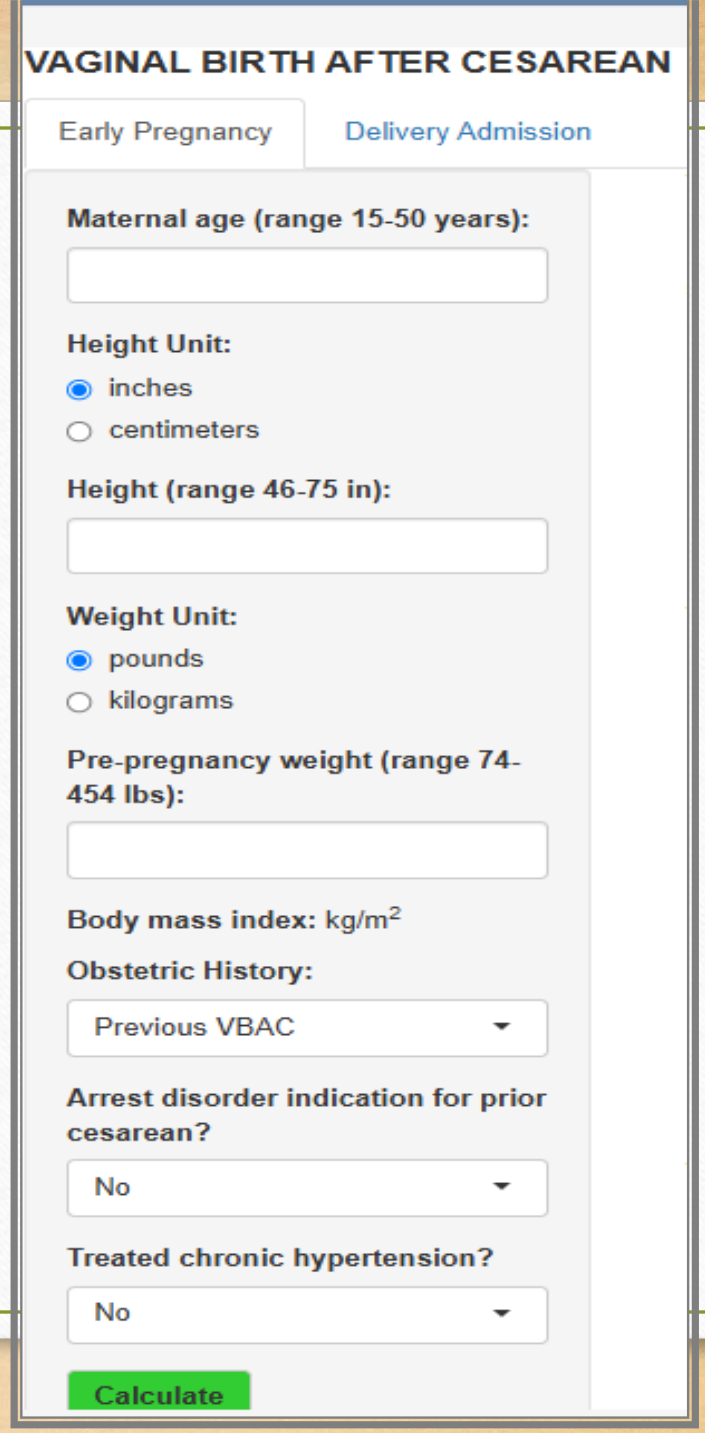
- Prior classical or T uterine incision (risk of rupture 4-9%)
- Prior uterine rupture (risk of rupture ~10%)
- Prior myomectomy with entry into endometrium or full thickness myometrial disruption
- Placenta previa or accreta
- Vasa previa
- Active genital herpes
- Fetal malpresentation
- Cord prolapse

# Risk Stratification for TOLAC candidates

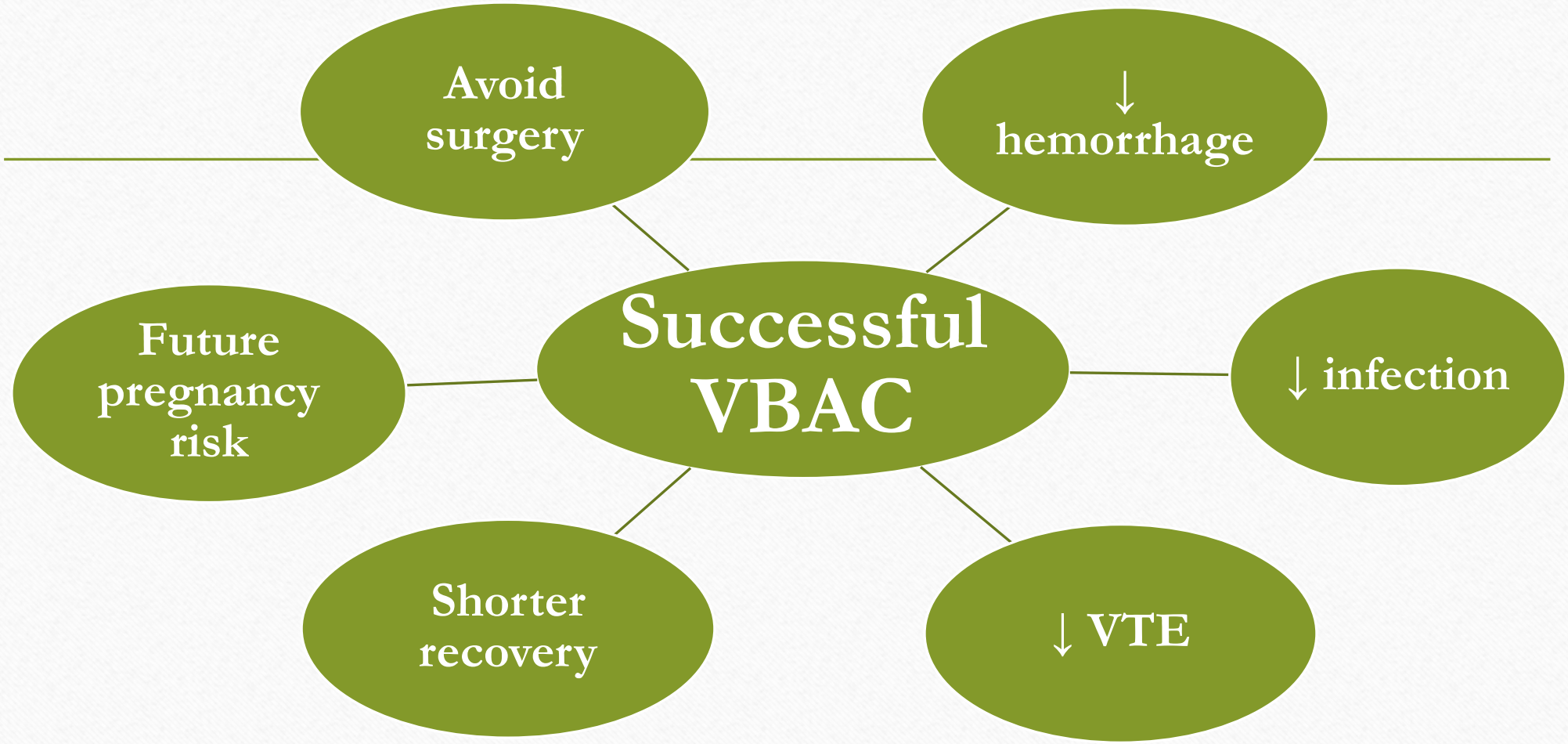
- Increased success rate
  - Nonrecurring indication for first cesarean delivery
  - Spontaneous labor
  - Younger maternal age
  - Low BMI
  - Gestational age ≤ 40 weeks
  - Normal birth weight
  - Prior vaginal delivery
- Decreased success rate
  - Recurring indication for first cesarean delivery
  - Induction of labor
  - Older maternal age
  - Higher BMI
  - Gestational age > 40 weeks
  - Higher birth weight/Macrosomia
  - Short interdelivery interval (<19 months)
  - Preeclampsia

# To TOLAC or Not to TOLAC?

- MFMU VBAC calculator
- No RCT exist for maternal or neonatal outcomes for TOLAC vs. Repeat C/S



# Benefits of successful TOLAC



# Risks of TOLAC

**Table 1.** Composite Maternal Risks From Elective Repeat Cesarean Delivery and Trial of Labor After Previous Cesarean Delivery in Term Patients

| Maternal Risks | ERCD (%) [One CD] | TOLAC (%) |
|---|---|---|
| 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 |
| Maternal death | 0.0096 | 0.0019 |

Abbreviations: CD, cesarean delivery; ERCD, elective repeat cesarean delivery; TOLAC, trial of labor after cesarean delivery.

Surgical Injury: Defined differently and variably reported on in trials. Rate of surgical injury may be increased with TOLAC but definitive studies are lacking.

Infectious Morbidity: Defined as fever, infection, endometritis, and chorioamnionitis

Data from Guise JM, Eden K, Emeis C, Denman MA, Marshall N, Fu R, et al. Vaginal birth after cesarean: new insights. (Archived) Evidence Report/Technology Assessment No.191. AHRQ Publication No. 10-E003. Rockville (MD): Agency for Healthcare Research and Quality; 2010.



Practice bulletin Vaginal birth after Cesarean Delivery, 2019.

# Risks of TOLAC

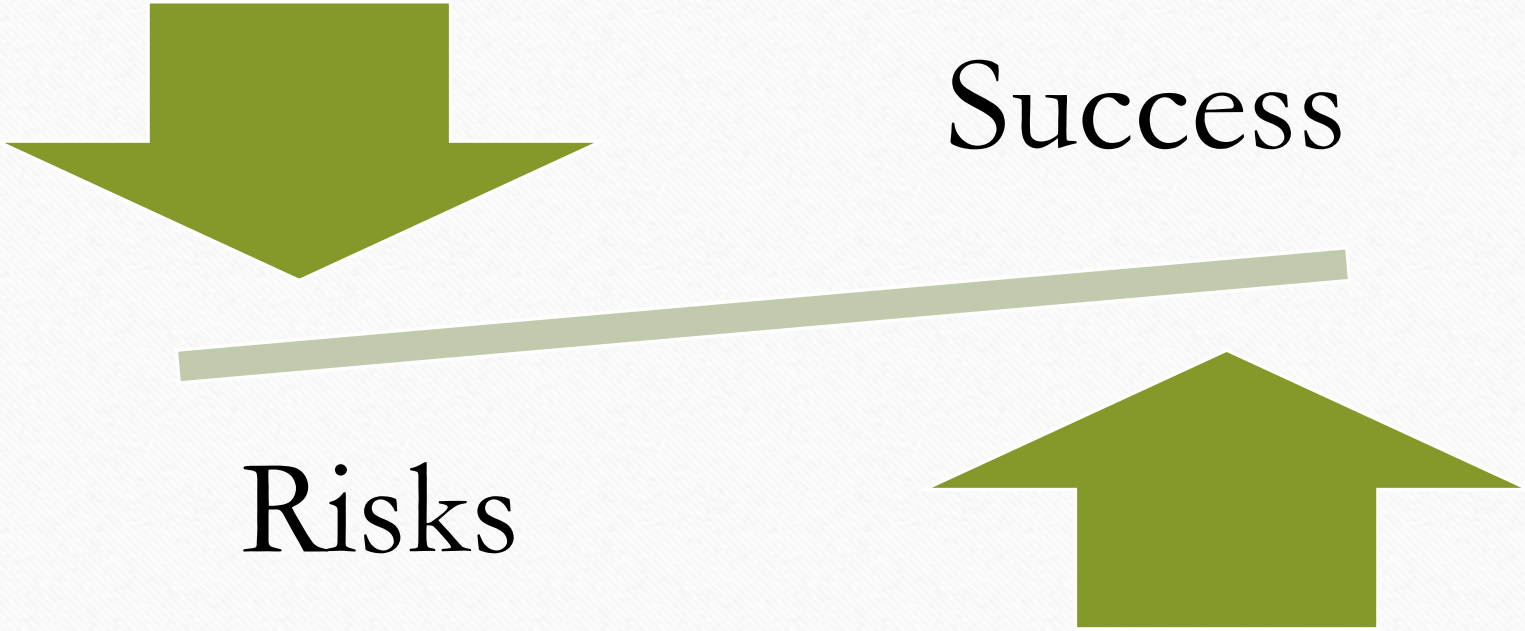
**Table 2. Composite Neonatal Morbidity From Elective Repeat Cesarean Delivery and Trial of Labor After Previous Cesarean Delivery in Term Infants**

| Neonatal Risks | ERCD (%) | TOLAC (%) |
|---|---|---|
| Antepartum stillbirth | 0.21 | 0.10 |
| 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 |

Abbreviations: ERCD, elective repeat cesarean delivery; HIE, hypoxic ischemic encephalopathy; NICU, neonatal intensive care unit; TOLAC, trial of labor after cesarean delivery.

Practice bulletin Vaginal birth after Cesarean Delivery, 2019.

# To TOLAC or Not to TOLAC?



# To TOLAC or Not to TOLAC?

- Cesarean deliveries
- PAS


https://app.morningcoach.com/blog/worrying-about-the-future-and-how-to-stop-it

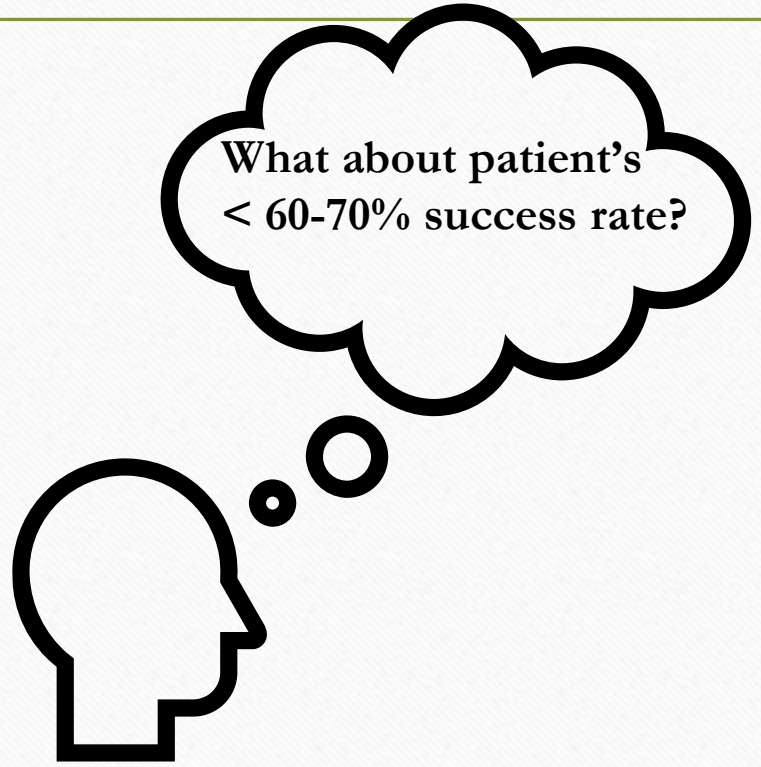
# To TOLAC or Not to TOLAC?

60-70% likelihood of VBAC success

=

Similar maternal morbidity as ERCS

# To TOLAC or Not to TOLAC?



# To TOLAC or Not to TOLAC?

Patient's with more than one cesarean section

## Risk of Uterine Rupture With a Trial of Labor in Women With Multiple and Single Prior Cesarean Delivery

*Mark B. Landon, MD, Catherine Y. Spong, MD, Elizabeth Thom, PhD, John C. Hauth, MD, Steven L. Bloom, MD, Michael W. Varner, MD, Atef H. Moawad, MD, Steve N. Caritis, MD, Margaret Harper, MD, MS, Ronald J. Wapner, MD, Yoram Sorokin, MD, Menachem Miodovnik, MD, Marshall Carpenter, MD, Alan M. Peaceman, MD, Mary J. O'Sullivan, MD, Baha M. Sibai, MD, Oded Langer, MD, John M. Thorp, MD, Susan M. Ramin, MD, Brian M. Mercer, MD, and Steven G. Gabbe, MD, for the National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network**

Obstetrics and Gynecology, Vol 108, No. 1, July 2006

# To TOLAC or Not to TOLAC?

## Patient's with more than one cesarean section

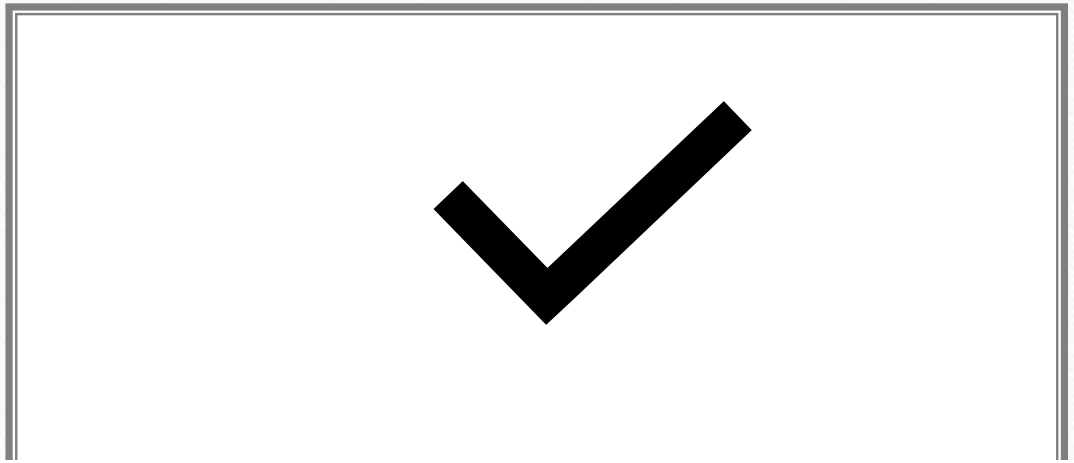
**Table 2. Maternal and Perinatal Outcomes**

| Outcome | Multiple (n = 975) | Single (n = 16,915) | OR (95% CI) | *P* |
|---|---|---|---|---|
| Uterine rupture | 9 (0.9) | 115 (0.7) | 1.36 (0.69–2.69) | .37 |
| Endometritis | 30 (3.1) | 485 (2.9) | 1.08 (0.74–1.56) | .70 |
| Hysterectomy | 6 (0.6) | 35 (0.2) | 2.99 (1.25–7.12) | .023 |
| Transfusion | 31 (3.2) | 273 (1.6) | 2.00 (1.37–2.92) | < .001 |
| Thromboembolic disease* | 1 (0.1) | 6 (0.04) | 2.90 (0.35–24.09) | .32 |
| Operative injury† | 4 (0.4) | 60 (0.4) | 1.16 (0.42–3.19) | .78 |
| Maternal death | 0 (0.0) | 3 (0.02) | – | 1.00 |
| Maternal composite‡ | 71 (7.3) | 829 (4.9) | 1.53 (1.19–1.96) | .001 |
| Term NICU admission§ | 75 (11.2) | 1321 (9.0) | 1.28 (1.00–1.63) | .05 |
| Term intrapartum stillbirth§ | 0 (0.0) | 2 (0.01) | – | 1.00 |
| Term neonatal death§ | 1 (0.15) | 12 (0.08) | 1.83 (0.24–14.08) | .44 |
| Term HIE§ | 0 (0.0) | 12 (0.1) | – | 1.00 |

# To TOLAC or Not to TOLAC?

## Patient's with twin gestation

Studies have demonstrated similar outcomes to singleton gestations without increased risk



ELSEVIER

American Journal of Obstetrics and Gynecology

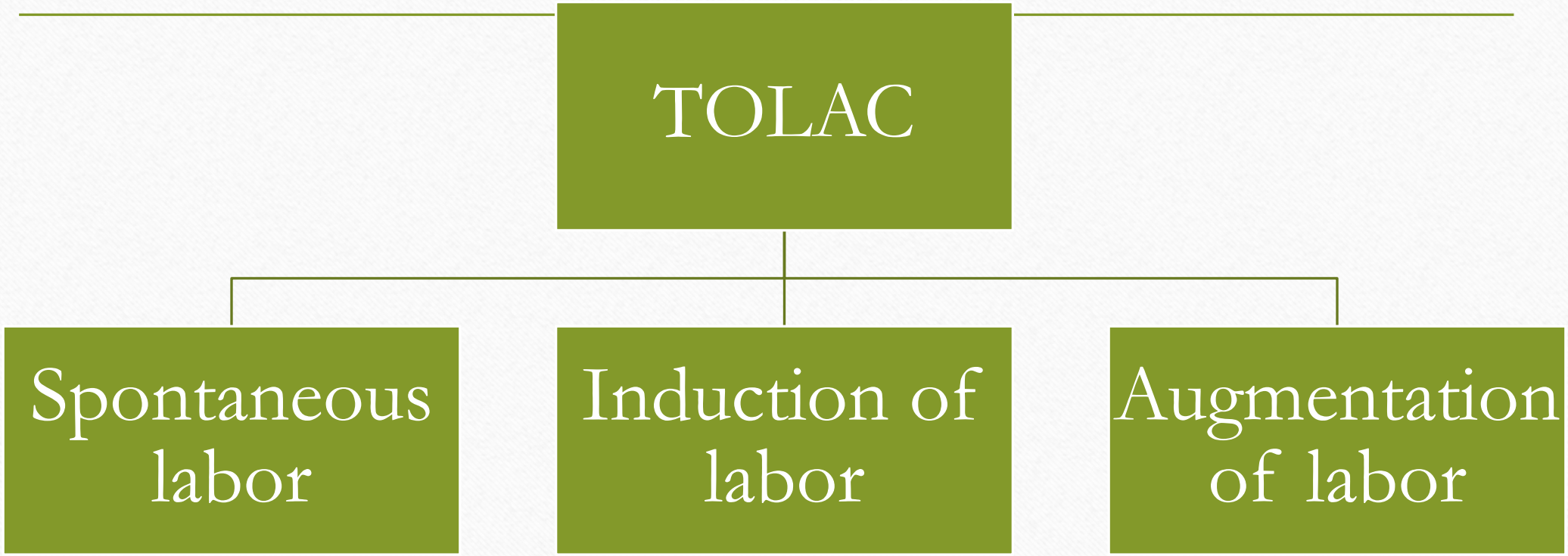
Volume 193, Issue 3, Supplement, September 2005, Pages 1050-1055

Transactions of the Twenty-Fifth Annual Meeting of the Society for Maternal-Fetal Medicine

### Vaginal birth after cesarean (VBAC) attempt in twin pregnancies: Is it safe?

Alison Cahill MD [a], David M. Stamilio MD, MSCE [a], Emmanuelle Paré MD, FRCSC [a b], Jeffrey P. Peipert MD, MPH [e], Erika J. Stevens MS [a b], Deborah B. Nelson PhD [b c], George A. Macones MD, MSCE [a b c d]

# Let's TOLAC


TOLAC
Spontaneous labor
Induction of labor
Augmentation of labor

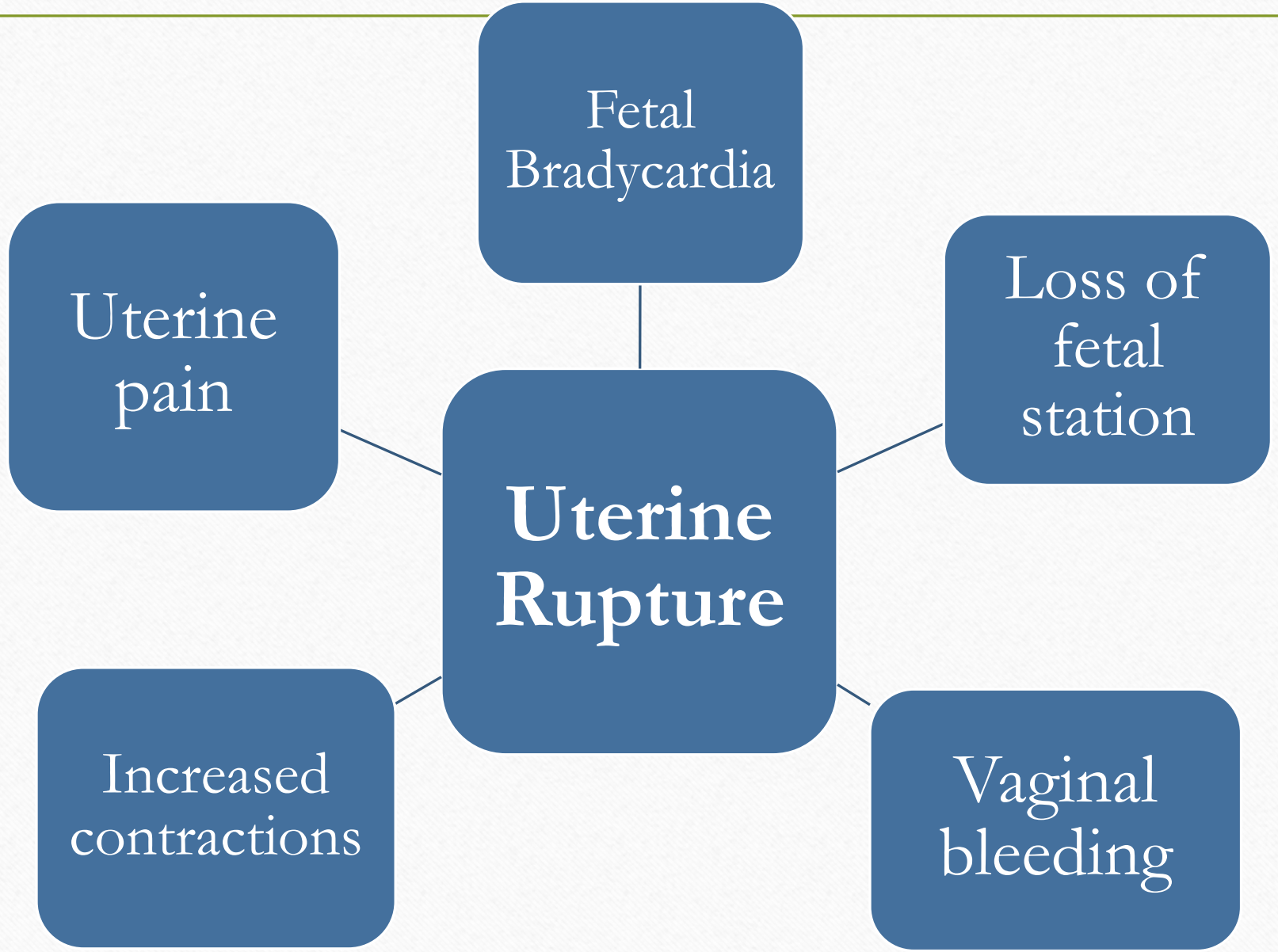
# Let's TOLAC

- -Spontaneous labor is associated with an increased likelihood of achieving a VBAC.

- Induction of labor at 39-41 weeks gestation is associated with a lower odds of cesarean section when compared to expectant management

# Let's TOLAC

| | |
|---|---|
| **Fetal monitoring** | • External continuous monitoring |
| **Cervical ripening** | • Oxytocin and mechanical but avoid misoprostol |
| **External cephalic version** | • Not contraindicated<br>• Similar success rates |
| **Epidural** | • Shared decision making |
| **Location** | • Level 1 hospital or higher<br>• Ability to perform emergent deliveries |


Fetal Bradycardia
Uterine pain
Loss of fetal station
Uterine Rupture
Increased contractions
Vaginal bleeding

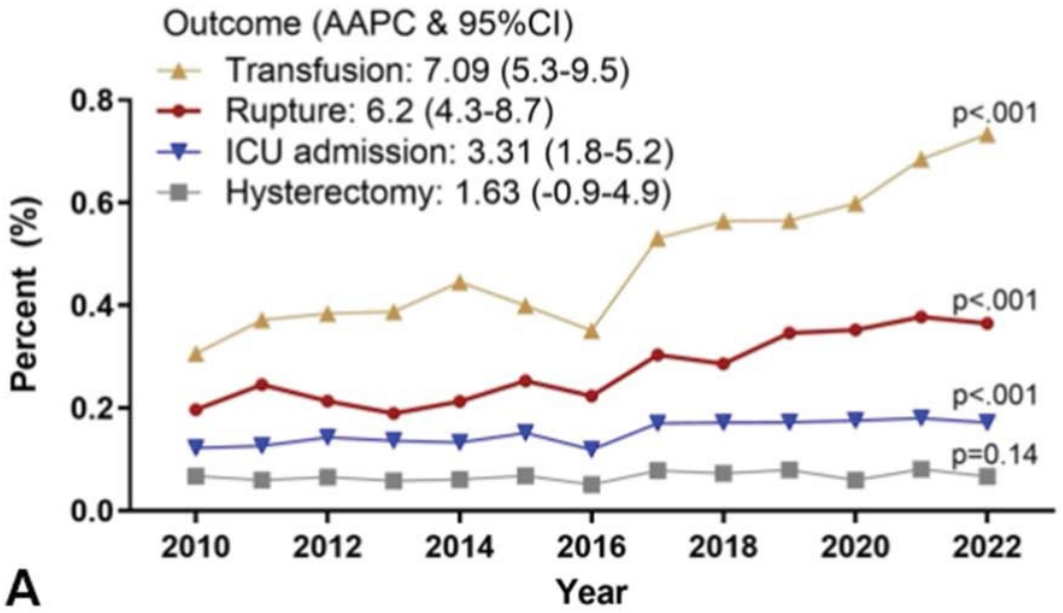
# Uterine rupture

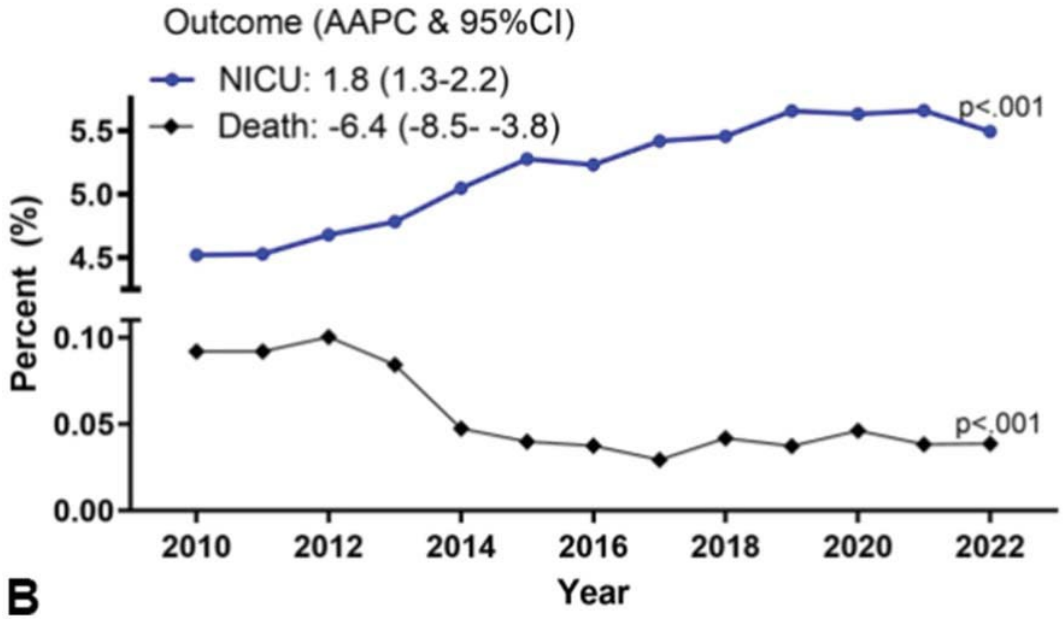
## Uterine Rupture Trends in Patients Pursuing Trial of Labor After Cesarean in the United States from 2010 to 2022

*Lillian H. Goodman, MD, MPH, Amanda A. Allshouse, MS, Torri D. Metz, MD, MS, and Ann M. Bruno, MD, MS*

Obstetrics and Gynecology. Vol. 145, No. 5, May 2025.

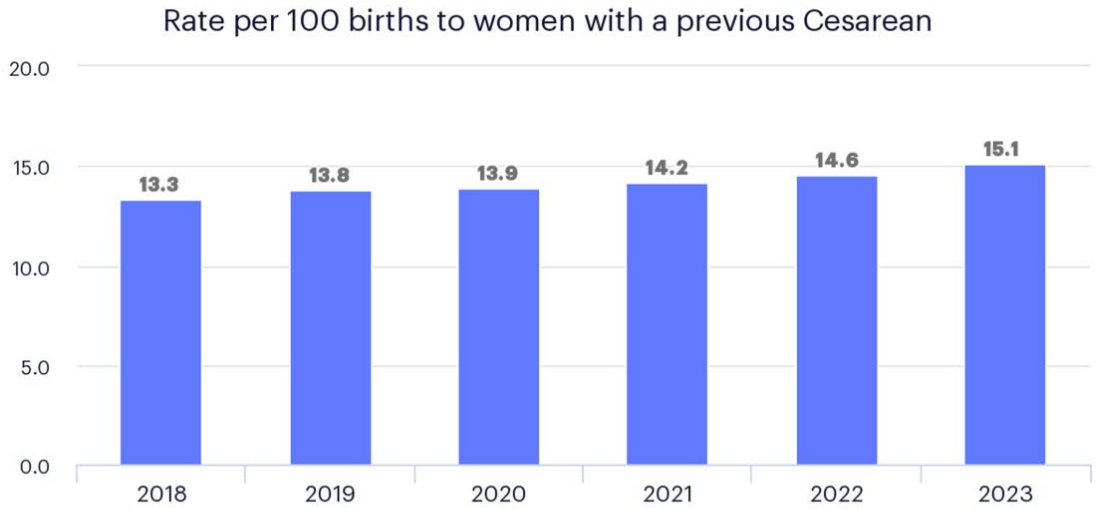
- Overall uterine rupture rate was 0.28%.
- Annual increase of 6.2% per year.



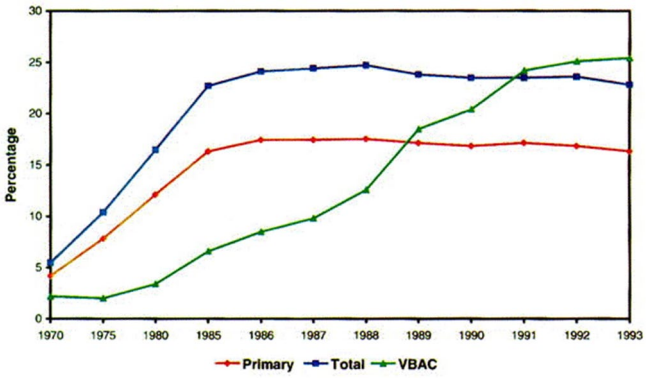
# VAGINAL BIRTH AFTER CESAREAN DELIVERIES

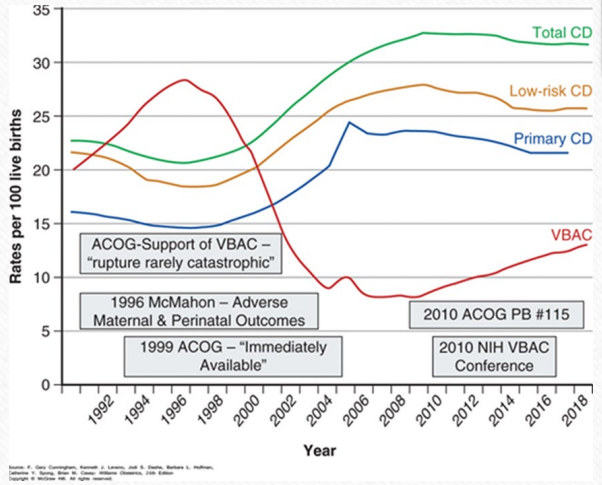
## United States, 2018-2023






MARCH OF DIMES



# Summary

- Patient's with one or two prior low transverse cesarean delivery should be counseled and offered TOLAC.
- The overall rate of maternal and neonatal morbidity is low for patient's attempting TOLAC.
- Delivery should occur at a level one facility or higher with the ability to perform emergent deliveries.
- Acceptable induction agents during TOLAC include mechanical and oxytocin but Misoprostol is contraindicated.
- Evidence is based on retrospective and observational studies but no RCT comparing maternal and neonatal outcomes exists.

# THANK YOU

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