Fast Facts:

- The United States birth rate by cesarean section in 2021 was 32.1%, more than 1.3 million cesarean sections, and 22.4% were primary cesarean sections (Centers for Disease Control and Prevention, 2022).
- In 2021, the number of births in Texas amounted to 373,594 births, of which a third were delivered by cesarean. Indeed, the cesarean delivery rate in Texas stood at 34.8 percent (Yang, 2023).
- Approximately 2.5% of all Cesarean Births in the US are by maternal request (American College of Obstetricians and Gynecologists, 2019).
- The cost of a cesarean section can range from $5000 to $10000 more than vaginal birth, increasing costs to insurers, employers, taxpayers, and the government (California Maternal Quality Care Collaborative, 2022).
- The repeat cesarean rate is over 90% for women with a prior cesarean (Barber et al., 2011).
- The consensus statement by the American College of Obstetricians and Gynecologists (ACOG), there are approximately four deaths for every 100,000 women after vaginal deliveries and about 13 deaths for every 100,000 women after cesareans (American College of Obstetricians and Gynecologists, 2014).
- Studies comparing women whose labor is induced to those who begin labor spontaneously have nearly double the cesarean delivery rates among the induction group (Kjerulff et al., 2017).
- Induction rates have steadily increased in the United States. Beginning in 1989, birth certificates included induction data, and the induction rate was approximately 9%. In 2020, the induction rate has nearly tripled and was calculated at 31.3% (Simpson, 2022).
- A recent study revealed that approximately one in three nulliparous women with singleton pregnancies were induced. In the induction group, 35.9% delivered by cesarean compared to only 18.9% who experienced spontaneous labor (Kjerulff et al., 2017).

Review of indications for a Cesarean Section (Sung & Mahdy, 2023)

Maternal

- Previous Cesarean Section
- Cephalopelvic disproportion
- Previous perineal trauma
- Previous pelvic or anal/rectal reconstructive surgery
- Active Herpes Simplex lesions
- HIV infection
- Cerebral aneurysm or arteriovenous malformations
- Pathology requiring concurrent intraabdominal surgery
- Maternal request
- Perimortem cesarean section

Uterine/Anatomic

- Abnormal placentation (Placenta Accreta Spectrum disorders)
- Placental abruption
- Prior classical hysterotomy
- Prior full-thickness myomectomy
- History of uterine incision rupture
- Invasive cervical cancer
- Prior trachelectomy
- Genital tract obstructive mass
- Permanent cerclage

Fetal Indications

- Nonreassuring fetal status (abnormal umbilical cord Doppler study) or abnormal fetal heart tracing
- Umbilical cord prolapse
- Failed operative vaginal delivery
- Malpresentation
- Macrosomia
- Congenital anomaly
- Thrombocytopenia
- Prior neonatal birth trauma

Maternal Consequences of Cesarean Birth

- Increased risk of hemorrhage, uterine rupture in subsequent pregnancies, abnormal placentation, and cardiac events.
- VBAC in the US is less than 15%; therefore, first cesarean increases subsequent c-sections.
- With each Cesarean, there is an increase in abdominal adhesions, uterine rupture, and placenta spectrum disorders.
- Patients experience longer hospital stays, increased pain, slower return to normal activity, and increased stress and anxiety.

Neonatal Consequences of Cesarean Birth

- There may be an increase in NICU admissions due to respiratory compromise
- Delayed first feeding and breastfeeding success
- Delay in infant-mother bonding

(California Maternal Quality Care Collaborative, 2022)

Risk of adverse maternal and neonatal outcomes by mode of delivery

Outcome	Risk	
	Vaginal delivery	Cesarean delivery
Maternal		
Overall severe morbidity and mortality[a]	8.6% 0.9%	9.2%[a] 2.7%
Maternal mortality[b]	3.6:100,000	13.3:100,000
Amniotic fluid embolism[c]	3.3-7.7:100,000	15.8:100,000
Third- or fourth-degree perineal laceration[117]	1.0-3.0%	NA (scheduled delivery)
Placental abnormalities[d]	Increased with prior cesarean vs vaginal delivery, and risk continues to increase with each subsequent cesarean delivery	
Urinary incontinence[6]	No difference between cesarean and vaginal delivery at 2 y	
Postpartum depression[117]	No difference between cesarean and vaginal delivery	
Neonatal		
Laceration[2]	NA	1.0-2.0%
Respiratory morbidity[2]	<1.0%	1.0-4.0% (without labor)
Shoulder dystocia	1.0-2.0%	0%

NA, not available.

[a] Defined as ≥1 of following: death, postpartum bleeding, genital tract injury; wound disruption, wound infection, or both; systemic infection; [b] Defined as any 1 of following: death, hemorrhage requiring hysterectomy or transfusion; uterine rupture; anesthetic complications; shock; cardiac arrest; acute renal failure; assisted ventilation venous thromboembolic event; major infection; in-hospital wound disruption, wound hematoma, or both. Data from Liu et al[7]; [c] Data from Deneux-Tharaux C et al[115]; [d] Data from Abenhaim et al[116]; [e] Data from Silver et al.[8]

ACOG. Safe prevention of primary cesarean delivery. Am J Obstet Gynecol 2014.

First Obstetric Care Consensus

In 2014, the American College of Obstetricians and Gynecologists with the Society of Maternal-Fetal Medicine published the first Obstetric Care Consensus, "Safe Prevention of the Primary Cesarean Delivery" with recommendations to decrease cesarean deliveries, including:

- Allowing prolonged latent (early) phase labor.
- Considering cervical dilation of 6 cm (instead of 4 cm) as the start of active phase labor.
- Allowing more time for labor to progress in the active phase.
- Allowing women to push for at least two hours if they have delivered before, three hours if it's their first delivery, and even longer in some situations. For example, with an epidural.
- Using techniques to assist with vaginal delivery, which is the preferred method when possible. This may include the use of forceps, for example.
- Encouraging patients to avoid excessive weight gain during pregnancy.

(American College of Obstetricians and Gynecologists, 2014)

A recent update to these guidelines from the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine recommends:

- If the maternal and fetal status allows, cesarean births for failed induction of labor in the latent phase can be avoided by allowing longer durations of the latent phase (up to 24 hours or longer).
- Oxytocin should be administered for at least 12–18 hours after membrane rupture before the induction is deemed a failure.

Steps to drive change

Step 1. Create a Culture of Change

1. Create an Influential Team to Drive Change
2. Involve hospital leadership
    a. Team of Nurse Leaders, Practice leaders, CMO, Chief of Staff, Patient Risk Management Team
3. Improve the culture of Awareness and Education

Step 2. Identify Obstacles and Provide Opportunity for Change

1. What is the hospital and individual Primary Cesarean Section rate?
2. Do you offer Trial of Labor after Cesarean Section (TOLAC)?
3. Does your hospital of practice offer TOLAC?
4. Do you have 24/7 anesthesia coverage?
5. Does your hospital have a current Vaginal Birth After Cesarean Section (VBAC) policy?
6. What are the guidelines and protocol for elective induction?

Step 3. Define and Refine Policy

1. Induction Protocol
    a. Hard Stop for all Elective Inductions less than 39 weeks.
    b. Review all c-sections and assess for 100% policy compliance.
    c. Zero tolerance for noncompliance – 100% peer review.
    d. Re-education plan for providers on non-elective induction less than 39 weeks.

2. Elective Inductions
    a. Hard Stop for all Elective Inductions less than 39 weeks
        i. OB ultrasound < 20 weeks
        ii. Documentation for Fetal Heart Tones (FHT) for at least 30 weeks
        iii. Proof of positive pregnancy test 36 weeks before induction

    b. Induction Policy
        i. Patient consents to discharge if there is no labor after 24 hours of initiation of induction.
        ii. Bishop score assessment to determine if cervical ripening is necessary before induction. Use Cervical ripening if Bishop score <5.
        iii. Confirmation for fetal presentation.
        iv. Allow latent phase for 24 hours if necessary.
        v. If Oxytocin is used, allow 12 – 18 hours of use and rupture of membranes prior to labeling a patient a failed induction.
        vi. Use ACOG/SMFM guidelines for the diagnosis of labor arrest or descent disorders once the patient is in the active phase of labor.

vii. Cervical Ripening
1. Consider Misoprostol administration for induction of labor.
2. Cook or Foley Balloon use.

3. Trial of Labor after Cesarean Section
   a. Patient qualification
   b. Hospital policy and if allowed, then marketing to the public
   c. OB Hospitalist service as a backup

Step 4. Identify Educational Needs

1. Patient
   a. Improve Quality and Access to childbirth education
   b. Improve communication and encourage a shared decision-making process between the provider and the patient
   c. Birthing classes as an educational source
      i. Handouts

2. Provider
   a. Enhance Knowledge and improve skills gaps
   b. Mechanical/medications for induction
   c. Redefine labor arrest disorders
   d. Reeducation of Fetal Distress
   e. Definition for Macrosomia
   f. Operative delivery techniques
   g. Appropriate Management of labor Abnormalities (See First and second stage labor management, 2024)
      i. The definition for CPD used as “failed induction”
      ii. Interventions for Labor Dystoci
   h. Appropriate choice for Labor Induction
   i. Appropriate interventions for Fetal heart rate Patterns and uterine activity (see resource)

First and second stage labor management (ACOG, 2024). https://www.acog.org/clinical/clinical-guidance/clinical-practice-guideline/articles/2024/01/first-and-second-stage-labor-management

Step 5. Supporting Vaginal Birth

1. Encourage supportive care from loved ones
2. Incorporation of Doulas and Nursing Team
3. Improve pain management strategies
4. Supportive care with Latent phase (Labor Lounges)

Step 6. Data Analysis to implement quality improvement change

1. Establish a committee for ongoing C-section rates and process improvements

Step 7. Consider Alternative payment models (APMs)

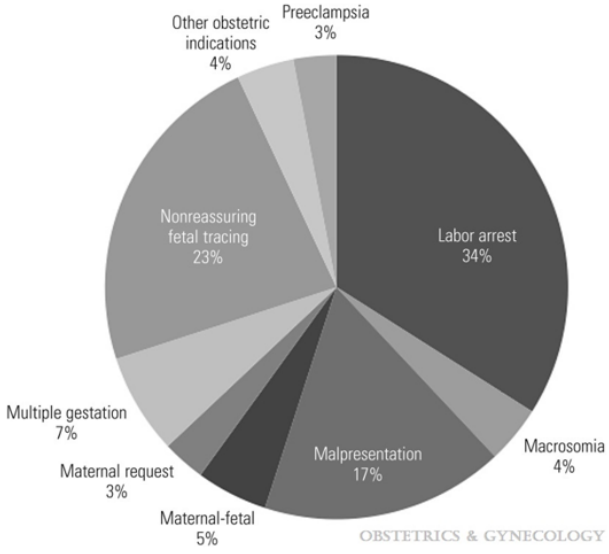
1. Reward quality rather than payment models for volume

Step 8. Consider Laborist Models

1. Provide on-site readiness and safety to laboring patient
2. Remove time constraints and incentives to perform Cesareans

Resources

Indications for Primary Cesarean Section



Obstetric Care Consensus No. 1: Safe Prevention of the Primary Cesarean Delivery

Obstetrics & Gynecology123(3):693-711, March 2014.

doi: 10.1097/01.AOG.0000444441.04111.1d

Indications for primary cesarean delivery. (Data from Barber EL, Lundsberg LS, Belanger K, Pettker CM, Funai EF, Illuzzi JL. Indications contributing to the increasing cesarean delivery rate. Obstet Gynecol 2011;118:29–38.)

Fetal Heart Rate Categories

Three-Tiered Fetal Heart Rate Interpretation System

Category I

- Category I FHR tracings include all of the following:
- Baseline rate: 110–160 beats per minute
- Baseline FHR variability: moderate
- Late or variable decelerations: absent
- Early decelerations: present or absent
- Accelerations: present or absent

Category II

Category II FHR tracings includes all FHR tracings not categorized as Category I or Category III. Category II tracings may represent an appreciable fraction of those encountered in clinical care. Examples of Category II FHR tracings include any of the following:

Baseline rate

- Bradycardia not accompanied by absent baseline variability
- Tachycardia

Baseline FHR variability

- Minimal baseline variability
- Absent baseline variability with no recurrent decelerations
- Marked baseline variability

Accelerations

- Absence of induced accelerations after fetal stimulation

Periodic or episodic decelerations

- Recurrent variable decelerations accompanied by minimal or moderate baseline variability
- Prolonged deceleration more than 2 minutes but less than10 minutes
- Recurrent late decelerations with moderate baseline variability
- Variable decelerations with other characteristics such as slow return to baseline, overshoots, or "shoulders"

Category III

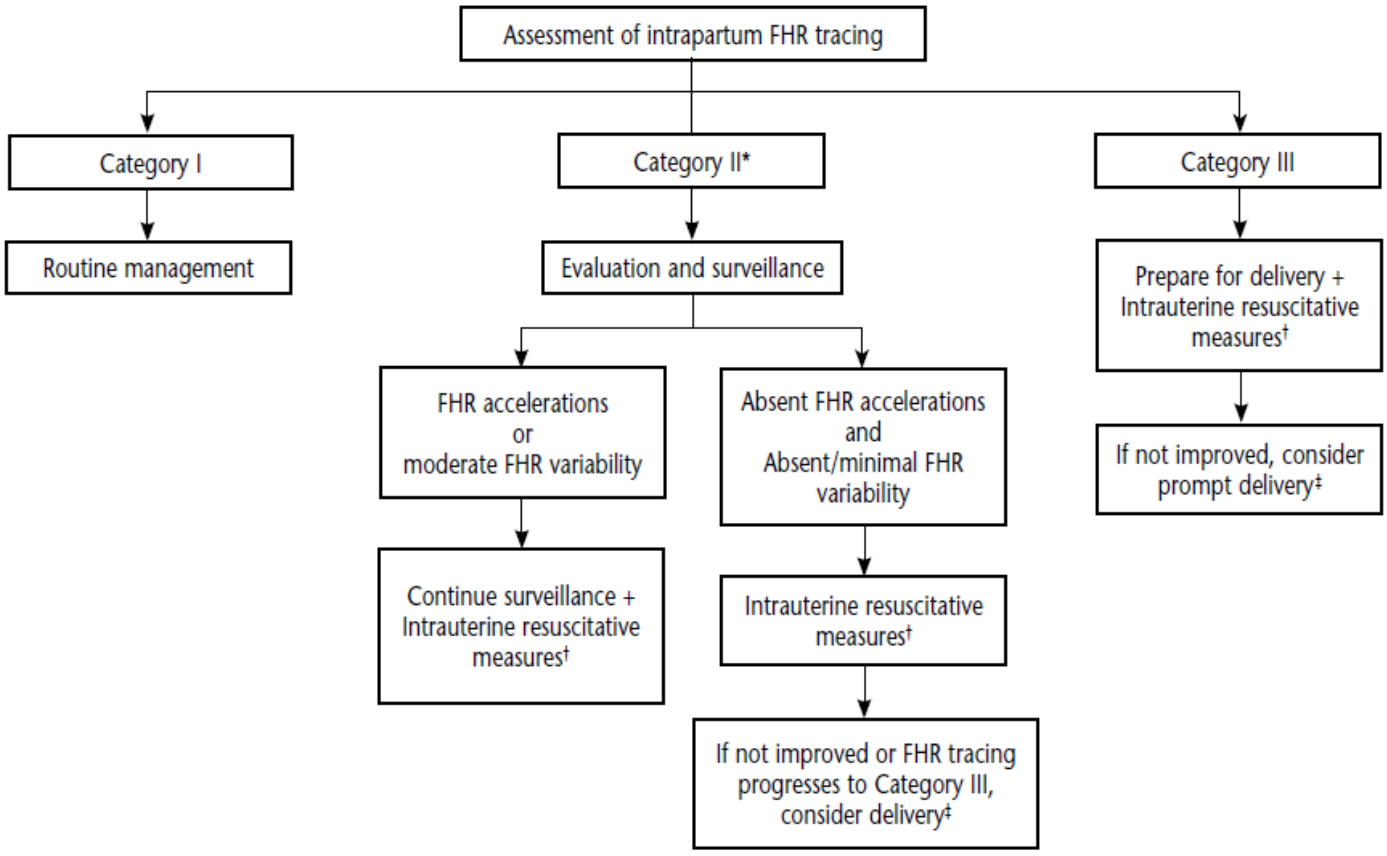
Category III FHR tracings include either

- Absent baseline FHR variability and any of the following:
  - —Recurrent late decelerations
  - —Recurrent variable decelerations
  - —Bradycardia
- Sinusoidal pattern

Abbreviation: FHR, fetal heart rate.

Macones GA, Hankins GD, Spong CY, Hauth J, Moore T. The 2008 National Institute of Child Health and Human Development workshop report on electronic fetal monitoring: update on definitions, interpretation, and research guidelines. Obstet Gynecol 2008;112:661–6.

Management Algorithm for Fetal Heart Rate Categories



*Given the wide variation of FHR tracings in Category II, this algorithm is not meant to represent assessment and management of all potential FHR tracings, but provide an action template for common clinical situations.

†See Table 2 for list of various intrauterine resuscitative measures

‡Timing and mode of delivery based on feasibility and maternal–fetal status

Figure 1. Management algorithm of intrapartum fetal heart rate tracings based on three-tiered category system. Abbreviation: FHR, fetal heart rate.

Recommendations for the Safe Prevention of the Primary Cesarean Section

First stage of labor	
A prolonged latent phase (eg, >20 h in nulliparous women and >14 h in multiparous women) should not be indication for cesarean delivery.	1B Strong recommendation, moderate-quality evidence
Slow but progressive labor in first stage of labor should not be indication for cesarean delivery.	1B Strong recommendation, moderate-quality evidence
Cervical dilation of 6 cm should be considered threshold for active phase of most women in labor. Thus, before 6 cm of dilation is achieved, standards of active-phase progress should not be applied.	1B Strong recommendation, moderate-quality evidence
Cesarean delivery for active-phase arrest in first stage of labor should be reserved for women ≥6 cm of dilation with ruptured membranes who fail to progress despite 4 h of adequate uterine activity, or at least 6 h of oxytocin administration with inadequate uterine activity and no cervical change.	1B Strong recommendation, moderate-quality evidence
Second stage of labor	
A specific absolute maximum length of time spent in second stage of labor beyond which all women should undergo operative delivery has not been identified.	1C Strong recommendation, low-quality evidence
Before diagnosing arrest of labor in second stage, if maternal and fetal conditions permit, allow for following: • At least 2 h of pushing in multiparous women (1B) • At least 3 h of pushing in nulliparous women (1B) Longer durations may be appropriate on individualized basis (eg, with use of epidural analgesia or with fetal malposition) as long as progress is being documented. (1B)	1B Strong recommendation, moderate-quality evidence

Recommendations for the Safe Prevention of the Primary Cesarean Section (cont.)

Operative vaginal delivery in second stage of labor by experienced and well-trained physicians should be considered safe, acceptable alternative to cesarean delivery. Training in, and ongoing maintenance of, practical skills related to operative vaginal delivery should be encouraged.	1B Strong recommendation, moderate-quality evidence
Manual rotation of fetal occiput in setting of fetal malposition in second stage of labor is reasonable intervention to consider before moving to operative vaginal delivery or cesarean delivery. To safely prevent cesarean deliveries in setting of malposition, it is important to assess fetal position in second stage of labor, particularly in setting of abnormal fetal descent.	1B Strong recommendation, moderate-quality evidence
Fetal heart rate monitoring	
Amnioinfusion for repetitive variable fetal heart rate decelerations may safely reduce rate of cesarean delivery.	1A Strong recommendation, high-quality evidence
Scalp stimulation can be used as means of assessing fetal acid-base status when abnormal or indeterminate (formerly, nonreassuring) fetal heart patterns (eg, minimal variability) are present and is safe alternative to cesarean delivery in this setting.	1C Strong recommendation, low-quality evidence

ACOG. Safe prevention of primary cesarean delivery. Am J Obstet Gynecol 2014. *(continued)*

Recommendations for the Safe Prevention of the Primary Cesarean Section (cont.)

Recommendations	Grade of recommendations
Induction of labor	
Before 41 0/7 wks of gestation, induction of labor generally should be performed based on maternal and fetal medical indications. Inductions at ≥41 0/7 wks of gestation should be performed to reduce risk of cesarean delivery and risk of perinatal morbidity and mortality.	1A Strong recommendation, high-quality evidence
Cervical ripening methods should be used when labor is induced in women with unfavorable cervix.	1B Strong recommendation, moderate-quality evidence
If maternal and fetal status allow, cesarean deliveries for failed induction of labor in latent phase can be avoided by allowing longer durations of latent phase (up to ≥24 h) and requiring that oxytocin be administered for at least 12-18 h after membrane rupture before deeming induction failure.	1B Strong recommendation, moderate-quality evidence
Fetal malpresentation	
Fetal presentation should be assessed and documented beginning at 36 0/7 wks of gestation to allow for external cephalic version to be offered.	1C Strong recommendation, low-quality evidence
Suspected fetal macrosomia	
Cesarean delivery to avoid potential birth trauma should be limited to estimated fetal weights of at least 5000 g in women without diabetes and at least 4500 g in women with diabetes. Prevalence of birth weight of ≥5000 g is rare, and patients should be counseled that estimates of fetal weight, particularly late in gestation, are imprecise.	2C Weak recommendation, low-quality evidence
Excessive maternal weight gain	
Women should be counseled about IOM maternal weight guidelines in attempt to avoid excessive weight gain.	1B Strong recommendation, moderate-quality evidence

Recommendations for the Safe Prevention of the Primary Cesarean Section (cont.)

Twin gestations	
Perinatal outcomes for twin gestations in which first twin is in cephalic presentation are not improved by cesarean delivery. Thus, women with either cephalic/cephalic-presenting twins or cephalic/noncephalic presenting twins should be counseled to attempt vaginal delivery.	1B Strong recommendation, moderate-quality evidence
Other	
Individuals, organizations, and governing bodies should work to ensure that research is conducted to provide better knowledge base to guide decisions regarding cesarean delivery and to encourage policy changes that safely lower rate of primary cesarean delivery.	1C Strong recommendation, low-quality evidence

IOM, Institute of Medicine.

ACOG. Safe prevention of primary cesarean delivery. Am J Obstet Gynecol 2014.

References

1. Barber, E. L., Lundsberg, L. S., Belanger, K., Pettker, C. M., Funai, E. F., & Illuzzi, J. L. (2011, July). Indications contributing to the increasing cesarean delivery rate. Obstetrics and gynecology. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3751192/

2. Centers for Disease Control and Prevention. (2023, June 8). FastStats - Births - method of delivery. Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/fastats/delivery. htm

3. Centers for Disease Control and Prevention. (2022, February 25). Stats of the states - cesarean delivery rates. Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/pressroom/sosmap/cesarean_births/cesareans.htm

4. CMQCC. Toolkit to Support Vaginal Birth and Reduce Primary Cesareans. (2022). https://www.cmqcc.org/sites/default/files/Vbirth-Toolkit-with-Supplement_Final_11.30.22_2.pdf

5. Cesarean delivery on maternal request. ACOG. (2019, January). https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2019/01/cesarean-delivery-on-maternal-request

6. First and second stage labor management. ACOG. (2024, January). https://www.acog.org/clinical/clinical-guidance/clinical-practice-guideline/articles/2024/01/first-and-second-stage-labor-management

7. Grobman WA;Rice MM;Reddy UM;Tita ATN;Silver RM;Mallett G;Hill K;Thom EA;El-Sayed YY;Perez-Delboy A;Rouse DJ;Saade GR;Boggess KA;Chauhan SP;Iams JD;Chien EK;Casey BM;Gibbs RS;Srinivas SK;Swamy GK;Simhan HN;Macones GA; ; (2018, August 9). Labor induction versus expectant management in low-risk nulliparous women. The New England journal of medicine. https://pubmed.ncbi.nlm.nih.gov/30089070/ Retrieved March 25, 2024

8. Kjerulff, K. H., Attanasio, L. B., Edmonds, J. K., Kozhimannil, K. B., & Repke, J. T. (2017, September). Labor Induction and Cesarean Delivery: A prospective cohort study of first births in Pennsylvania, USA. Birth (Berkeley, Calif.). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6366839/#:~:text=Numerous%20studies%20comparing%20women%20whose%20labor%20is%20induced,the%20risk%20of%20cesarean%20delivery%20%289%20%E2%80%93%2015%29.

9. Management of Intrapartum Fetal Heart Rate Tracings. ACOG. (2010, November). https://www.acog.org/clinical/clinical-guidance/practice-bulletin/articles/2010/11/management-of-intrapartum-fetal-heart-rate-tracings

10. Nation's OB-Gyns take aim at preventing Cesareans. ACOG. (2014). https://www.acog.org/news/news-releases/2014/02/nations-obgyns-take-aim-at-preventing-cesareans

11. Nonmedically indicated early-term deliveries. Committee Opinion No. 561. American College of Obstetricians and Gynecologists. Obstet Gynecol 2013;121:911-5. Available at: https://journals.lww.com/greenjournal/fulltext/2013/04000/Committee_Opinion_No__561___Nonmedically_Indicated.46.aspx

12. Rice, Kathleen. (2022). Trends in Labor Induction in the United States, 1989 to 2020. The American Journal of Maternal/Child Nursing, 47(4), 235. https://doi.org/10.1097/NMC.0000000000000824

References

13. Safe prevention of the primary cesarean delivery. Obstetric Care Consesus No.1. American College of Obstetricians and Gynecologists. Obstet Gynecol 2014;123;696711. Available at : https://journals.lww.com/greenjournal/citation/2013/04000/committee_opinion_no__561__nonmedically_indicated.46.aspx Retrieved March 25, 2024

14. Sung, S., & Mahdy, H. (2023, July 9). Cesarean section. StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/books/NBK546707/

15. This document was developed jointly by the American College of Obstetricians and Gynecologists (the College) and the Society for Maternal-Fetal Medicine with the assistance of Aaron B. Caughey. (2014, March). Obstetric Care Consensus No. 1: Safe prevention of the... : Obstetrics & Gynecology. LWW. https://journals.lww.com/greenjournal/fulltext/2014/03000/obstetric_care_consensus_no__1__safe_prevention_of.41.aspx

16. Toolkit to support vaginal birth and reduce primary ... (2022, November). https://www.cmqcc.org/sites/default/files/Vbirth-Toolkit-with-Supplement_Final_11.30.22_2.pdf

17. Yang, J., & 30, N. (2023, November 30). U.S.: Preterm birth and cesarean delivery rates in Texas 2021. Statista. https://www.statista.com/statistics/206187/preterm-births-and-cesarean-delivery-in-texas/