Elective Induction of Labor: Safety and Harms

This guide summarizes clinical evidence comparing the safety of elective induction of labor (induction at term without a medical indication) with expectant management (waiting for spontaneous labor in a term pregnancy). This guide offers information about maternal and fetal outcomes when elective induction of labor is used. It does not address induction of labor for medical indications, such as preeclampsia, postdates pregnancy, or oligohydramnios. It also does not cover labor augmentation. This guide does not compare the effectiveness of different labor induction methods.

Clinical Issue

Labor induction rates more than doubled between 1990 and 2005 to an all-time high of 22 percent. This increase reflects not only a rise in induction for maternal and fetal indications but also broader use of elective induction.

Reasons for wanting elective induction at term might include a woman's physical discomfort, scheduling issues, or concern for rapid progression of labor away from the hospital. Some clinicians may recommend elective induction due to concern about future complications. Some providers may also induce labor for their own scheduling convenience. However, the benefits and harms of elective induction are not well understood.

The evidence base regarding elective induction has several shortcomings (see page 3 for details about the studies). Despite the limitations of the studies done to date, this guide offers information to help inform decisions about elective induction. Women and their providers should consider both maternal and fetal outcomes when choosing whether to induce labor electively at term or expectantly manage their pregnancies.

Clinical Bottom Line

Evidence is insufficient to determine whether elective induction of labor leads to higher or lower rates of cesarean delivery than expectant management.

Among women undergoing induction, women with their first pregnancies have a higher rate of cesarean delivery than women with prior vaginal births. Cesarean rates vary by clinical practice and have increased over time.

Level of Confidence: ●●●

Cervical status has an important effect on cesarean rates with induction: the more favorable the cervical status, the lower the rate of cesarean birth.

Level of Confidence: ●●○

Elective induction does not appear to increase rates of adverse neonatal outcomes. However, the data are relatively limited.

Confidence Scale

The confidence ratings in this guide are derived from a systematic review of the literature. The level of confidence is based on the overall quantity and quality of clinical evidence.

HIGH ●●● There are consistent results from good quality studies. Further research is very unlikely to change the conclusions.

MEDIUM ●●○ Findings are supported, but further research could change the conclusions.

LOW ●○○ There are very few studies, or existing studies are flawed.

Assessing Risk of Harms With Elective Induction of Labor

Risk of Cesarean Delivery

Some providers believe that elective induction of labor may increase the length of labor and the risk of cesarean section. Others believe it poses a minimal risk and may be clinically useful in preventing complications that may arise at a later gestational age. The most immediate measure of the potential harm of elective induction is whether it increases the likelihood that a cesarean section will be performed. While there are not sufficient data from the available studies to conclude whether elective induction increases this risk, there is evidence about the clinical circumstances in which cesarean section is more likely to occur. This evidence comes from studies looking at induction of labor at term for non-elective reasons.

Overall Rates of Cesarean Delivery

It is important to recognize that many of the following data come from studies done at a time when the overall rate of cesarean delivery was much lower than it is today. The National Center for Health Statistics reported an all-time high cesarean delivery rate of 32 percent in 2007, the most recent year for which figures are available.

Parity

Among women undergoing induction of labor, women with their first pregnancies have a higher rate of cesarean delivery than do women who have had prior vaginal births.

Level of Confidence: ●●●

Gestational Age

Among women undergoing induction of labor, there is a trend toward increasing rates of cesarean delivery with increasing gestational age at term.

Level of Confidence: ●●○

Based on nonrandomized studies, the risk of cesarean delivery is lower for women who have their labor induced at 40 weeks of gestation or less than for women induced at 41 weeks gestation.

Cervical Status

Cervical status has an important effect on cesarean rates with induction of labor: the more favorable the cervical status, the lower the rate of cesarean birth.

Level of Confidence: ●●○

The Bishop score is a measure of cervical status or readiness for labor. The measure is an additive score of five factors, including dilation and effacement of the cervix. The lower the score, the less favorable the cervix is for labor.

Bishop Score	0	1	2	3
Dilation (cm)	0	1–2	3–4	5–6
Effacement (%)	0–30	31–50	51–79	80–100
Fetal descent	-3	-2	-1, 0	+1, +2
Cervix consistency	Firm	Medium	Soft	NA
Cervix position	Posterior	Middle	Anterior	NA

Adapted from *Obstet Gynecol* 1964;24:266–8.

Almost 30 percent of women with a Bishop score of 3 or less at the time of labor induction have a cesarean delivery, compared with 15 percent of those with a Bishop score of greater than 3. Only 4 percent of women with a Bishop score of 8 or more at the time of labor induction have a cesarean birth.

Fetal/Neonatal Considerations

There is evidence that meconium-stained amniotic fluid is present more often among women who have expectant management compared with those who have elective induction. However, the risk of meconium aspiration syndrome is not higher among infants of women who are managed expectantly.

Level of Confidence: ●●○

Evidence is insufficient to determine whether elective induction affects the rates of fetal intolerance of labor, fetal acidemia, or breastfeeding.

It does not appear that there are differences in the rates of transient tachypnea of the newborn, suspected or proven neonatal sepsis, seizures, hypoglycemia, jaundice, or low 5-minute Apgar scores (less than 7) among neonates who are born to mothers who had elective induction compared with expectant management. However, there are relatively limited data on these outcomes.

Randomized controlled trials have found that rates of macrosomia (infant birthweight in excess of 4,500 grams) are higher among infants of mothers who have expectant management than those who have elective induction.

Risk of Premature Delivery

A potential harm of elective induction of labor is unexpected neonatal prematurity. Current guidelines do not recommend elective induction prior to 39 weeks of gestation. The studies included in the systematic review used for this guide did not include elective induction prior to 39 weeks or pregnancies with uncertain dating.

Other Maternal Harms

Evidence is insufficient to determine whether there are differences in length of labor, postpartum hemorrhage, or maternal infection for women who have elective induction compared with women who have expectant management.

No high-quality studies have compared how often women use epidural analgesia or other pain medications in elective induction versus expectant management.

Several studies have found that increased maternal body mass index (BMI) is a predictor of cesarean delivery among women who have induction.

Considerations

Women should have a conversation with their caregivers about the potential for harms and benefits of any elective procedure. The following may be items that you wish to highlight for individual women when discussing elective induction of labor:

- Parity
- Gestational age
- Cervical status

Few studies give detailed information about infant outcomes after elective induction of labor. Elective induction does not appear to increase rates of adverse neonatal outcomes. However, many of these outcomes are uncommon, and evidence is insufficient to determine whether choosing either elective induction or expectant management affects neonatal outcomes.

About the Studies

Most of the research compares women undergoing elective induction with women at the same gestational age who have spontaneous onset of labor. However, the most appropriate comparison group would be women of the same gestational age at the beginning of the study who were followed prospectively to see if they went into labor on their own or required induction.

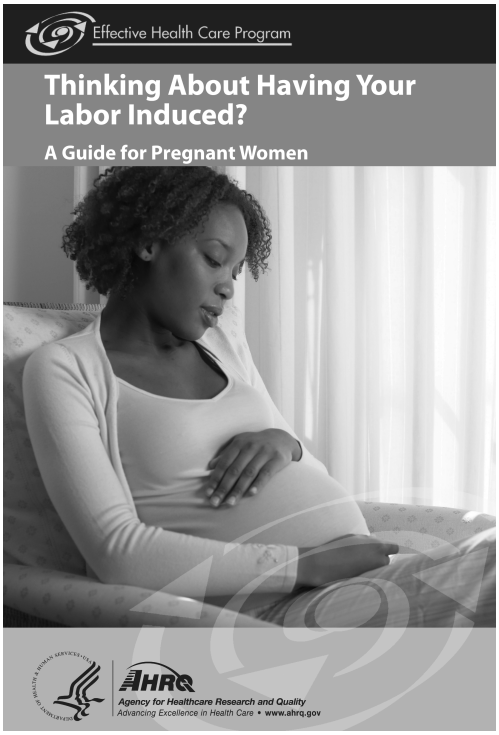
Many different induction methods have been used in the published studies, making it difficult to determine whether some methods are more effective or less risky than others. Also, the cesarean delivery rate has varied significantly over time and for different practice settings, making some studies clinically irrelevant if their reported cesarean rates are on the higher or lower end.

Due to a paucity of studies looking directly at elective induction, much of the data regarding patient characteristics and risk for cesarean delivery (e.g., parity, cervical status) are from studies of induction at term for a variety of clinical indications.

Resource for Patients

Thinking About Having Your Labor Induced? A Guide for Pregnant Women is a companion to this clinician guide. It can help women talk with their health care professional about elective induction. It provides information about:

- The benefits and harms of elective induction compared with expectant management.
- Seeking advice from a health care professional when making a decision about elective induction of labor.



For More Information

For electronic copies of the consumer guide, this clinician guide, and the full systematic review, visit this Web site: **www.effectivehealthcare.ahrq.gov**

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Source

The source material for this guide is a systematic review of 76 research studies originally published between 1964 and 2007. The review, *Maternal and Neonatal Outcomes of Elective Induction of Labor: A Systematic Review and Cost-Effectiveness Analysis* (2008), was prepared by the Stanford University-UCSF Evidence-based Practice Center. The Agency for Healthcare Research and Quality (AHRQ) funded the systematic review and this guide. The guide was developed using feedback from clinicians who reviewed preliminary drafts. The full systematic review is available at **www.effectivehealthcare.ahrq.gov**.

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