



Evidence on: Induction for Gestational Diabetes

Gestational diabetes mellitus (GDM) is defined as high blood glucose (high blood sugar) that develops during pregnancy (ADA, 2018). We cover the evidence on diagnosing GDM in a separate Evidence Based Birth[®] article [here](http://evidencebasedbirth.com/diagnosinggdm) (<http://evidencebasedbirth.com/diagnosinggdm>).

Two of the main questions that come up in caring for pregnant people with GDM are the following:

Should labor be induced? And, if induction is chosen, when should it occur?

With GDM, the main alternative to labor induction is *expectant management*. Choosing expectant management means you decline elective induction for now, and instead plan to wait for labor to start on its own. With expectant management, you could also be induced later if complications develop, or you could be induced electively further along in the pregnancy.

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What is gestational diabetes?

We encourage you to read the beginning of the Evidence Based Birth[®] Signature Article on [Diagnosing GDM](#). There, we define several important terms and explain what's going on in the body when someone has GDM.

DISCLAIMER: Nothing in this article shall be construed as advice from a healthcare provider (i.e. midwife, nurse, nurse practitioner, doctor or physician assistant). This article is strictly intended to provide general information regarding its subject-matter and may not apply to you as an individual. It is not a substitute for your own healthcare provider's medical care or advice and should not be relied upon by you other than upon the advice of your treating provider. If you need someone to examine you or discuss your pregnancy or baby's health, see a midwife, nurse practitioner, or doctor.



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Gestational diabetes is a complex topic, so we reached out to experts in the field for help describing the condition. The background information in the [Diagnosing GDM article](http://evidencebasedbirth.com/diagnosinggdm) (<http://evidencebasedbirth.com/diagnosinggdm>) will give you a basic understanding before moving on to the evidence on induction for GDM. Pre-existing diabetes (Type 1 and Type 2) are managed differently from GDM and are not covered in this article.

What problems can result from gestational diabetes?

In the Evidence Based Birth® Signature Article on Diagnosing GDM, we discuss the “Hyperglycemia and Adverse Pregnancy Outcomes” (HAPO) study in detail. This study is the most important research that has ever been done on the link between maternal blood sugar and risk of poor birth outcomes ([HAPO, 2008](#)). The key finding from the HAPO study was that the relationship between a mother’s blood sugar levels and the risk of poor birth outcomes is *continuous*. This means that there is no specific cutoff for risk—the risk of poor outcomes increases step-by-step with every small increase in blood sugar levels, even at levels not considered to be GDM.

The HAPO study and other studies have linked GDM to higher rates of: ([HAPO, 2008](#); [England et al., 2009](#); [Tobias et al., 2017](#); [Clausen et al., 2009](#))

- Pre-eclampsia
- Fetal high blood sugar
- First-time Cesarean
- Premature birth
- Higher birth weight/having a large baby
- Shoulder dystocia or birth injury
- Newborn intensive care
- Newborn jaundice
- Newborn low blood sugar
- The mother developing diabetes and/or heart disease later in life
- The baby developing excess body weight and/or diabetes later in life

How common is induction for gestational diabetes?

There is very little data on how often people with GDM are induced because of their diagnosis. In the U.S., birth certificates do not accurately track labor induction. Birth certificates also do not provide accurate info about the reasons for induction ([Declercq et al., 2013](#); [Dublin et al., 2014](#)).

We found one retrospective study that looked at more than 330,000 births in the U.S. from 2001 to 2007 and described trends in labor induction ([Dublin et al., 2014](#)). The people in the study came from six health insurance plans, many different hospitals and regions, and represented a large and diverse population. The health insurance plan data was linked to birth certificate data in order to improve accuracy compared to using birth certificate data alone. The researchers stated that induction occurred if it was documented either in the health insurance plan records or birth certificate data. One limitation of this study is that all of the participants were insured, and less than 6% were enrolled in Medicaid, so the findings may differ for those without private insurance.

Overall, 30% of labors were induced. When they looked at reasons for induction, 59% of the labors were induced for an accepted medical reason and 41% were considered to be elective inductions. There is no official definition of elective induction, so the researchers defined an elective induction as an induction that occurred before 40 completed weeks of pregnancy without one of the listed medical indications. They did not consider a suspected big baby to be a valid medical indication.



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The researchers found that diabetes (gestational diabetes or pre-existing diabetes) was the medical reason given for 10% of the medically indicated inductions. The authors did not distinguish between GDM and diabetes that was present before the pregnancy, so we don't know how many of those inductions were specifically for GDM.

Does gestational diabetes always mean induction of labor?

Since people with GDM and their babies are at increased risk of pregnancy complications, some care providers encourage women with GDM to plan an early birth (usually elective induction) at or near term instead of waiting for labor to start on its own. However, it's important that we have evidence to show that planned early birth actually benefits mothers with GDM and their babies before recommending medical inductions as routine.

Evidence from randomized controlled trials

Biesty et al. (2018) published a Cochrane review in which they searched for randomized controlled trials that compared planned early birth (elective induction or Cesarean) at or near term (37 to 40 weeks' gestation) versus expectant management for people with GDM. Unfortunately, they found only one randomized controlled trial to include in the review ([Alberico et al., 2017](#)).

Side note: In an earlier version of this Evidence Based Birth® article, we cited another trial on this topic (Kjos et al., 1993), but that study was not included in the Cochrane review because it included women with pre-existing Type 2 diabetes as well as those with GDM.

The large Alberico et al. (2017) trial (called the GINEXMAL trial) took place at eight hospitals across Italy, Slovenia, and Israel. The participants all had GDM as diagnosed by the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria and no other maternal or fetal medical problems. The IADPSG diagnostic criteria are described in [our Signature Article on Diagnosing GDM](#). In the GINEXMAL trial, 214 participants were randomly assigned to an induction of labor between 38 weeks, 0 days and 39 weeks, 0 days of pregnancy (i.e., early term induction). The other 211 participants were assigned to wait for labor to start on its own until 41 weeks, 0 days, as long as no medical problems developed (i.e., expectant management). They received fetal monitoring tests twice per week until birth.

When they compared the groups at baseline (right after randomization), fewer people in the early term induction group used medication to manage their GDM, compared with those in the expectant group (56% used medication in the early term induction group versus 76% in the expectant management group). This means that the groups weren't completely similar to begin with. However, the number of people with well-controlled blood sugar levels was the same between the groups, so the authors think it probably didn't affect the study results ([Alberico et al., 2017](#)).

The researchers found that for babies, there were no differences between groups in the number of large babies (more than 8 pounds, 13 ounces, or 4,000 grams), or the risk of shoulder dystocia, breathing problems, low blood sugar, or intensive care. More babies in the early term induction group experienced jaundice (10% versus 4%).

For mothers, there was no difference between groups in the risk of Cesarean, birth with forceps/vacuum, postpartum hemorrhage, intensive care, or intact perineum. No deaths occurred among mothers or babies in the study.



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The quality of the evidence from this study was considered low to very low because of high risk of bias (women and their care providers were not blinded). Also, the study was too small to look at differences in rare outcomes, such as death ([Biesty et al., 2018](#)). There was a small amount of crossover between groups, when people didn't stick with their random group assignments: 11% of people assigned to early term induction were not induced as intended and 9% of people assigned to expectant management actually received an early elective induction. Regardless, the researchers concluded that the amount of crossover was not significant enough to change the results ([Alberico et al., 2017](#)).

Not surprisingly, early term induction was linked to overall lower birth weights for newborns. However, the decrease in birth weights with early term induction did not make a difference for any of the clinically important outcomes, including the number of babies more than 8 pounds, 13 ounces (4,000 grams), Cesareans, or shoulder dystocia. In the study, shoulder dystocia occurred in three births in the early induction group and one birth in the expectant management group and this difference was not significant. All four cases of shoulder dystocia were resolved without any problems.

In theory, a reduction in birth weights could reduce the risk of shoulder dystocia, but since shoulder dystocia was so infrequent, a larger randomized trial would be needed to study this outcome. Also, it would likely take a very large number of women with GDM to 'treat' with early term induction in order to prevent one event of shoulder dystocia. In the same way, it would take a very large number of women with GDM to determine if early term induction would prevent one event of stillbirth, as we will discuss further on.

Evidence from observational studies

Given that there is only one randomized, controlled trial on this topic, it is important to look at observational studies. In observational studies, there is no random "assignment" to an induction or expectant management—instead, researchers usually look back in time at what happened when women and their care providers decided to induce or use a policy of expectant management.

We searched PubMed for non-randomized studies that compared early induction at or near term versus expectant management for people with GDM. We restricted the search to studies published since 2010, since earlier studies usually included people with pre-existing Type 2 diabetes in addition to those with GDM ([Witkop et al., 2009](#)).

We found four studies that looked specifically at birth outcomes after early induction versus expectant management for people with GDM. **Table 1 (page 11)** provides details about these four observational studies. We will also summarize their results below, starting with what the studies found about outcomes for mothers, and then what they found for babies.

Maternal Outcomes with Elective Induction vs. Expectant Management

The largest study to look at maternal outcomes included over 8,000 pregnant people with GDM. They found that inducing labor at 38 or 39 weeks for GDM is linked to a lower rate of Cesareans, less pre-eclampsia/hypertension, and more epidural use compared to expectant management at those times ([Melamed et al., 2016](#)). When they looked exclusively at first-time mothers, there was no benefit to inducing labor at 38 weeks; only 39-week induction was linked to a lower rate of Cesareans compared to following expectant management to 40+ weeks (19.6% versus 22.9%).

In another study, researchers also reported cervical ripeness and whether the mother had given birth before ([Feghali et al., 2016](#)). These researchers found that people with GDM who had had a previous





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vaginal birth significantly increased their risk of Cesarean by attempting induction before 39 weeks, especially with an unripe cervix. Therefore, based on this and the Melamed et al. (2016) study, it appears that 38-week elective induction for GDM should not be routinely recommended to first-time or experienced mothers. In the Feghali et al. (2016) study, induction at 39 weeks' gestation resulted in a similar Cesarean rate compared to expectant management at that time. After 40 weeks' gestation, everyone experienced an increase in Cesareans, regardless of whether their labors were induced or spontaneous.

A study by Sutton et al. (2014) also found no difference in the Cesarean rate with elective induction at 39 weeks compared to expectant management at that time. And similarly, they found that the rate of Cesareans significantly increased with gestational age. However, contrary to the previous study by Feghali et al. (2016), this result was seen only among people who had their labors induced, not those who went into labor spontaneously.

To summarize these findings on the Cesarean rate, the largest study found a lower Cesarean rate with 39-week induction and the other two found no difference between 39-week induction and expectant management at that time. Overall, the Cesarean rate among people with GDM appears to increase with gestational age after 40+ weeks with both induction and spontaneous labor.

Why might Cesareans go up after 40 weeks? Perhaps continuing a pregnancy to 40+ weeks leaves more time for potential medical problems to develop. In other words—the pregnant person is more likely to become “high-risk.” It could also be that care providers are quicker to recommend Cesarean at later gestational ages (they may be less patient with the labor before labeling it as “failed.”)

Some researchers suggest that an increase in the baby's weight could contribute to an increase in Cesarean at a later gestational age. However, it could also be the provider's perception that the risk of having a big baby has gone up—leading to an increased risk of Cesarean, even if the baby is born a normal weight. (See our [article on Big Babies](#) for research on how the suspicion of a big baby—not big babies themselves—leads to higher Cesarean rates.) There is also limited evidence from animal studies that diabetes during pregnancy can harm the growth and function of the placenta, which could make it more difficult for a baby to cope with labor as gestational age increases ([Vambergue and Fajardy, 2011](#)).

Newborn Outcomes with Elective Induction vs. Expectant Management

The largest observational study on GDM and induction found that newborns of mothers who are induced during their 38th week of pregnancy tend to have more health problems than newborns of mothers who are induced during their 39th week of pregnancy. Compared to expectant management, 38-week induction is linked to fewer babies with birth weight above 4,000 grams (fewer large babies), but higher rates of intensive care unit admission, jaundice, and low blood sugar ([Melamed et al., 2016](#)).

On the other hand, compared to expectant management at that time, 39-week induction is linked to fewer cases of birth weight above 4,000 grams (fewer large babies) and fewer cases of breathing problems, without an increase in intensive care unit admission, jaundice, or low blood sugar. The risk of intensive care unit admissions goes up again after 41 weeks among people who have their labors induced at that time ([Sutton et al., 2014](#)).

We found one study that focused on the risk of stillbirth and infant death for people with GDM who give birth at different gestational ages ([Rosenstein et al., 2012](#)). This study is important, because many women have reached out to us at Evidence Based Birth® and stated that their care providers told them they should be induced for GDM because of the risk of stillbirth and infant death (when a fetus dies





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in utero or within one year of life), also called *perinatal death*. When care providers suggest that early induction reduces perinatal death among people with GDM they are probably referencing findings from the large retrospective study by Rosenstein et al. (2012), which looked back in time at birth outcomes among people with GDM. This study found that expectant management at 39 and 40 weeks carried an 80% higher *relative risk* of perinatal death compared to giving birth at that time.

Relative risk is a useful way of comparing risk in one group to another. However, we're talking about very rare events, so the relative risk tends to cause people to overestimate the effect— in this case, overestimating the risks of continuing the pregnancy (Noordzij et al., 2017). The *absolute risk* of perinatal death, or the actual chance of the event occurring, is very low whether a woman with GDM chooses to be induced or follow expectant management.

At 39 weeks, the absolute risk of stillbirth or newborn death was 9 deaths per 10,000 for people who gave birth versus 15 deaths per 10,000 with expectant management for one more week. At 40 weeks, the absolute risk for those who gave birth was 10 deaths per 10,000 who gave birth versus 17 deaths per 10,000 for those who followed expectant management for one more week. The *number needed to treat*, or the number of women who would need to be treated with induction to prevent one death at 39 or 40 weeks' gestation was very high—around 1,500 and 1,300 women with GDM, respectively.

Other Research on Induction for GDM

We wanted to briefly mention two other studies that have been published since 2010. These studies also looked at induction with GDM, but not according to whether people chose early induction versus expectant management.

A *decision analysis* that created a theoretical (made-up) group of 100,000 women with diet-controlled GDM found that inducing everyone at 38 weeks or 39 weeks of gestation would reduce overall perinatal death without increasing Cesarean rates (Niu et al., 2014). This computer-based study used risk estimates from the literature, but they didn't report details of how they did their literature review to find these estimates. They concluded that giving birth at 38 weeks would prevent 48 stillbirths but lead to 12 more infant deaths and 21 more cases of cerebral palsy compared to giving birth at 39 weeks. Also, according to their model, giving birth at 38 weeks would slightly reduce the rate of maternal deaths from 16.2 per 100,000 to 15.4 per 100,000.

A retrospective study from Israel compared 240 people with GDM who were induced between 37 and 40 weeks to 454 people who were induced for term PROM (when the mother's water breaks before the start of regular labor contractions) (Bas-lando et al., 2014). This is not an appropriate choice for a comparison group, but the authors wanted to see if elective induction for GDM is linked to a higher Cesarean rate compared to other reasons for elective induction. They found that elective induction with GDM is indeed linked to a higher Cesarean rate compared to elective induction with term PROM (17% versus 11%). Although this may be true, we would caution that these two groups do not make for a reliable comparison because people with term PROM tend to be easier to induce—the rupture of membranes can induce labor in itself and also can mean that the body was ready to go into labor.

Are there effective treatments for gestational diabetes that reduce the risk of poor outcomes?

If you have GDM, treatment with diet changes, exercise, and sometimes medicine, is necessary to maintain healthy blood sugar levels. With effective treatment, it is possible for someone with GDM to



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reduce the risk of having complications from the condition, such as a big baby. Importantly, when the risk of complications from GDM is reduced with treatment, then there is less potential benefit from labor induction.

Overview of Cochrane systematic reviews on treatments for gestational diabetes

Several Cochrane reviews have looked at different treatments to improve pregnancy outcomes for people with GDM. Recently, Cochrane researchers published an overview of 14 of these systematic reviews, and pooled data from 10 of the reviews in a giant meta-analysis (128 trials, nearly 18,000 mothers) (Martis et al., 2018). They looked at dietary interventions, exercise programs, insulin and oral-glucose-lowering drugs, supplements, combination lifestyle interventions, and obstetric management strategies (induction or planned Cesarean).

The only intervention found to provide effective treatment for GDM leading to health benefits for mothers and babies was lifestyle changes that combined two or more interventions. This data came from the Cochrane review and meta-analysis by Brown et al. (2017a). At a minimum, the lifestyle intervention included healthy eating, exercise, and self-monitoring of blood sugar levels. Of the people assigned to lifestyle intervention, 10% also received pharmacological (drug) interventions, such as insulin or oral anti-diabetic therapies if they needed additional help managing their blood sugar levels.

People randomly assigned to lifestyle intervention versus usual care were 40% less likely to have babies large for gestational age, defined as weighing more than 90% of other babies (6 trials, 2,994 participants). They were also 62% less likely to experience shoulder dystocia (5 trials, 2,894 babies). It's also important to note that the majority of participants (90%) achieved these benefits from lifestyle changes alone (without any medication).

There was no clear evidence of a difference between groups for the risk of pre-eclampsia, Cesarean, the mother developing Type 2 diabetes, perineal trauma, or induction of labor. While the difference in the rate of induction between groups was not statistically significant, the authors mention several times that there was a trend toward lifestyle intervention increasing the risk of induction of labor. They found this trend worrisome enough to conclude "lifestyle intervention may increase the number of inductions, causing possible harm." However, this trend was not statistically significant, and all it means is that we need more research on whether prescribing lifestyle intervention can lead to an increase in the risk of induction.

Seven of the 14 meta-analyses reported on stillbirth and infant death. There was no evidence of a difference between groups for any of the treatment interventions. So we do not have evidence from meta-analyses of randomized controlled trials (the highest level of scientific evidence) that treating someone with GDM lowers their risk of experiencing stillbirth or infant death.

Systematic review and meta-analysis by Farrar et al. (2017)

This other recent study also looked at whether treatment for GDM improves the health of the mother and baby. It included 12 trials that compared 'bundles of care' (starting with lifestyle changes then using medication as necessary to lower blood sugar levels) versus routine care. They found that bundles of care cut the risk of large birth weight by 50% and shoulder dystocia by 60%. They did not find a significant difference in the risk of pre-eclampsia, Cesarean, newborn intensive care, newborn low blood sugar, preterm birth, low Apgar scores, use of forceps/vacuum, or labor induction. In two of the trials, mothers reported higher quality of life after treatment for GDM.





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Treatment for gestational diabetes improves outcomes

The good news is that treatment for gestational diabetes improves outcomes. If you are diagnosed with GDM and you choose treatment (starting with advice about diet/exercise and self-monitoring of blood sugar levels, followed by medication as needed), you are less likely to have a baby that weighs more than 8 pounds, 13 ounces or is large for gestational age. You are also less likely to experience shoulder dystocia.

There are still a great many things we don't know about treatments for GDM. There is very little research on potential long-term health benefits from treatment for mothers or babies. As far as safety, insulin does not cross the placenta, and thus is highly unlikely to cause any harm to the baby ([Martis et al., 2018](#)). On the other hand, oral antidiabetic medications (i.e. metformin and glyburide) do cross the placenta and there is limited information about the long-term effects of these medications on the baby. We don't know which combination lifestyle intervention is most effective, or which medications (insulin or oral anti-diabetic medications) work best for individuals. For example, insulin is considered the preferred medication for women in pregnancy, but new evidence suggests that insulin may increase the risk of hypertensive disorders of pregnancy compared to oral medications for some individuals (ACOG, 2018; [Martis et al., 2018](#)).

We also don't know much about the psychological impact of treatment on pregnant people. Being diagnosed and treated for GDM may cause stress for some women. However, in two of the trials in the [Farrar et al. \(2017\)](#) meta-analysis, mothers reported higher quality of life after treatment for GDM, including lower levels of postpartum depression. Mothers diagnosed with GDM face more medical appointments (to meet with a registered dietitian, a diabetes educator, or both) and they are told to carefully watch what they eat and monitor blood sugar levels several times a day (NIH, 2013). Testing supplies, blood sugar medication (if needed), and extra monitoring all come with significant costs, which are not always fully covered by insurance.

Mothers who require medication to manage their blood sugar levels also face additional fetal testing (monitoring the baby and levels of amniotic fluid). There is no consensus on whether people with diet-controlled GDM should receive routine fetal testing. The specific type of testing and how often to test varies from provider to provider (ACOG, 2018).

Recently updated practice guidelines on labor induction with gestational diabetes

The American College of Obstetricians and Gynecologists (ACOG) advises against inducing labor before 39 weeks in people with GDM who have well-controlled blood sugar levels with diet and exercise alone. For these women, they recommend that expectant management is appropriate up to 40 weeks, 6 days. For people with GDM who have well-controlled blood sugar levels *with medication*, ACOG recommends birth between 39 weeks, 0 days to 39 weeks, 6 days. ACOG guidance suggests even earlier inductions for people with poorly controlled blood sugar levels, but it's important to consider the tradeoffs, since prematurity also carries risks (ACOG, 2018).

In the United Kingdom, guidelines also advise people with GDM to give birth no later than 40 weeks, 6 days ([NICE, 2015](#)).

The Polish Gynecological Society recommends that people with GDM consider induction after 39 weeks ([Bomba-Opoń et al., 2017](#)).





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In Canada, the current recommendation is that pregnant people with GDM should be offered an induction between 38 to 40 weeks, depending on their blood sugar control and other risk factors (Berger et al., 2016).

Conclusion

- At this time, there is no evidence from randomized controlled trials to support routinely inducing labor at 38 or 39 weeks for everyone with GDM. The one randomized trial on induction for GDM failed to find any benefits for the mother or baby from elective induction between 38 weeks, 0 days and 39 weeks, 0 days of pregnancy versus waiting for labor to start on its own until 41 weeks, 0 days, as long as no medical problems developed. Importantly, this trial was not large enough to detect a difference in stillbirth.
- There is some evidence from observational studies that people with GDM who give birth at 39 or 40 weeks have a lower relative risk of perinatal death compared to those who continue the pregnancy beyond 40 weeks. However, the absolute risk of perinatal death is low whether a mother chooses planned early birth or waits for labor to start on its own. Since the evidence on perinatal death comes from a large study that used administrative data, the researchers could not comment on the glucose control of the women, so it's not clear if the results apply to mothers with well-managed blood sugar levels.
 - At 39 weeks, the absolute risk of stillbirth or newborn death was 9 deaths per 10,000 for people who gave birth versus 15 deaths per 10,000 with expectant management for one more week.
 - At 40 weeks, the absolute risk of stillbirth or newborn death was 10 deaths per 10,000 for people who gave birth versus 17 deaths per 10,000 with expectant management for one more week.
- The largest observational study to look at maternal and newborn outcomes found that inducing labor at 39 weeks is linked to a lower rate of Cesarean and fewer cases of pre-eclampsia/hypertension compared to waiting until at least 40 weeks to give birth. Newborns of mothers who are induced during their 39th week of pregnancy are less likely to weigh more than 4,000 grams and less likely to have breathing problems compared to those born at 40+ weeks. It is possible that these potential benefits of early induction do not apply to mothers with GDM who have well-managed blood sugars.

Resources

- If you want to read more about induction or Cesarean for suspected big babies (with or without gestational diabetes), you can read [this article](http://evidencebasedbirth.com/bigbaby) (<http://evidencebasedbirth.com/bigbaby>).

Reviewers

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Evidence On: Induction for Gestational Diabetes

Table 1: Observational studies of early induction vs. expectant management for people with GDM

Author (Year)	Sample	Comparison	Results	Notes
Rosenstein (2012)	Nearly 200,000 births to people with GDM between 36 to 42 weeks; data came from a large linked dataset of California births	For each gestational age (between 36 to 42 weeks), they estimated what the risk of stillbirth and infant death was for people who gave birth that week versus those who gave birth one week later	<p>Newborn outcomes: perinatal death</p> <ul style="list-style-type: none"> The risk of stillbirth increased continuously with gestational age The risk of infant death was U-shaped, highest at 36 weeks, lowest at 39-40 weeks, and high again at 41 and 42 weeks The risk of perinatal death (combined stillbirth and newborn death) was lower with expectant management at 36 weeks; however, at 38 weeks and beyond, there was a higher risk of perinatal death with expectant management vs. giving birth at that time (significant at 39 and 40 weeks) 	<p>80% increase in the <i>relative risk</i> of perinatal death with expectant management at 39 and 40 weeks vs. giving birth at that time; the <i>absolute risk</i> remained low: 9 vs. 15 deaths per 10,000 live births at 39 weeks, and 10 vs. 17 deaths per 10,000 at 40 weeks</p> <p>Did not compare people with well-managed blood sugar levels vs. those with poorly controlled blood sugar levels—</p> <p>So the results may not apply to mothers with good <i>glycemic control</i></p>



Evidence On: Induction for Gestational Diabetes

Author (Year)	Sample	Comparison	Results	Notes
Sutton (2014)	Included 679 people with mild GDM who gave birth between 37 and 41+ weeks; data came from a multicenter, randomized trial by Landon et al. (2009) that assigned people with mild GDM to treatment or routine care	Compared people who had inductions at a specific gestational age vs. those who followed expectant management	<p>Maternal outcomes:</p> <p>They found a similar Cesarean rate with elective induction at 39 weeks compared to expectant management at that time. Cesareans increased with gestational age among people who had their labors induced—from 6.3% at 38 weeks to 43.3% at 41+ weeks. People who went into labor on their own did not experience an obvious rise in the Cesarean rate with each week of pregnancy. Starting at 40 weeks, induction was linked to a 3x higher rate of Cesarean compared to expectant management at that time. The most common reason for Cesarean in this study was failed induction.</p> <p>Newborn outcomes:</p> <p>There were zero stillbirths or newborn deaths. There were no differences in low blood sugar, jaundice, breathing problems, birth weight greater than 4,000 grams, or birth trauma in the induction vs. expectant management groups at any gestational age. There were more intensive care unit admissions at 41+ weeks among those who were induced at that time.</p>	<p>About half the participants received treatment and half did not receive any treatment; very few participants required medication since everyone had mild GDM</p> <p>More than half the women in this study were Hispanic</p>

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Evidence On: Induction for Gestational Diabetes

Author (Year)	Sample	Comparison	Results	Notes
Melamed (2016)	Included over 8,000 people with GDM who gave birth between 38 and 42 weeks in Ontario, Canada	<p>Two comparisons:</p> <ul style="list-style-type: none"> • People who were induced between 38 weeks - 38 weeks, 6 days vs. those who waited until at least 39 weeks to give birth • People who were induced between 39 weeks - 39 weeks, 6 days vs. those who waited until at least 40 weeks to give birth 	<p>Maternal outcomes:</p> <p>Mothers induced during their 38th week had a lower Cesarean rate (16.7% versus 21.3%), less pre-eclampsia or hypertension during pregnancy (0 versus 5.6%), and more epidural use (78.1% versus 73%) compared to mothers who followed expectant management to 39+ weeks; no difference in shoulder dystocia, birth with forceps or vacuum, or postpartum hemorrhage.</p> <p>Mothers induced during their 39th week had a lower Cesarean rate (19.6% versus 22.9%), less pre-eclampsia or hypertension during pregnancy (0 versus 4.8%), and more epidural use (82% versus 73.6%) compared to mothers who followed expectant management to 40+ weeks. No difference in shoulder dystocia, birth with forceps or vacuum, postpartum hemorrhage, or anal sphincter injury.</p> <p>Newborn outcomes:</p> <p>The newborns of the mothers induced during their 38th week had less birth weight above 4,000 grams (9.1% versus 12.7%), more intensive care unit admission (13.9% versus 10.8%), more jaundice (5% versus 3.4%), and more hypoglycemia (6.2% versus 4%). There were no differences in perinatal death, length of stay in intensive care, breathing problems, or <i>composite morbidity</i>, which is a combined measure of different poor health outcomes.</p> <p>The newborns of the mothers who were induced during their 39th week had less birth weight above 4,000 grams (12.4% versus 15.5%) and less breathing problems (2.6% versus 4.1%). There was no difference in composite morbidity, perinatal death, intensive care unit admission, jaundice, or hypoglycemia.</p>	<p>Everyone included in the early induction groups had their induction for reasons related to GDM or suspected big baby</p> <p>Women in the early induction groups tended to be older, less likely to be giving birth for the first time, more likely to require insulin treatment to manage their blood sugar levels, and had a higher pre-pregnancy body mass index (BMI); no data on glycemic control</p> <p>When they only looked at first-time mothers, there was a lower Cesarean rate with induction at 39 weeks but not 38 weeks vs. expectant management.</p>

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Evidence On: Induction for Gestational Diabetes

Author (Year)	Sample	Comparison	Results	Notes
Feghali (2016)	Included 863 people with GDM who gave birth at 37+ weeks at a U.S. hospital in Pennsylvania	Compared people who had inductions at a specific gestational age vs. those who followed expectant management	<p>Maternal outcomes: Several factors were linked to a higher rate of Cesarean: being a first-time mother, having an unripe cervix, labor induction, and completing 40+ weeks of pregnancy. Overall, induction and expectant management were linked to a similar rate of Cesarean between 37 and 40 weeks. However, the rate of Cesarean was much higher for experienced mothers with induction at 38 weeks compared to expectant management at that time. After 40 weeks' gestation, everyone experienced an increase in Cesareans regardless of whether their labors were induced or spontaneous.</p> <p>Newborn outcomes: There were no differences in birth weight above 4,000 grams or the morbidity composite (intensive care unit admission, breathing problems, low blood sugar, jaundice) at any gestational age after considering the mother's BMI and how well her blood sugar levels were controlled</p>	<p>They used data from prenatal visits to calculate a <i>Bishop score</i> from the last cervical exam, which measures cervical ripeness</p> <p>The most common reason for Cesarean at every gestational age was <i>cephalopelvic disproportion</i>, which means that the care provider thought the baby was too large to fit through the birth canal</p>

