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Mode of Delivery Preferences in a Diverse Population of Pregnant Women

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Abstract

OBJECTIVE—To assess women's preferences for vaginal versus cesarean delivery in four contexts: prior cesarean, twins, breech presentation, and absent indication for cesarean.

STUDY DESIGN—Cross-sectional study of pregnant women at 24-40 weeks gestation. After assessing stated preferences for vaginal or cesarean delivery, we used the standard gamble metric to measure the strength of these preferences and the time tradeoff metric to determine how women value the potential processes and outcomes associated with these two delivery approaches.

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RESULTS—Among the 240 participants, 90.8% had a stated preference for vaginal delivery. Across the four contexts, these women indicated that, on average, they would accept a 59-75% chance of an attempted vaginal birth ending in a cesarean before choosing a planned cesarean, indicating strong preferences for spontaneous, uncomplicated vaginal delivery. Variations in preferences for labor processes emerged. While uncomplicated labor ending in vaginal birth was assigned mean utilities of 0.993 or higher (on a 0-to-1 scale with higher scores indicating more preferred outcomes), the need for oxytocin, antibiotics, or operative vaginal delivery resulted in lower mean scores, comparable to those assigned to uncomplicated cesarean delivery. Substantially lower scores (ranging from 0.432 to 0.598) were obtained for scenarios ending in severe maternal or neonatal morbidity.

CONCLUSIONS—While most women expressed strong preferences for vaginal delivery, their preferences regarding interventions frequently employed to achieve that goal varied. These data underscore the importance of educating patients about the process of labor and delivery to facilitate incorporation of informed patient preferences in shared decision making regarding delivery approach.

Keywords

mode of delivery; standard gamble; time trade off; patient preferences; shared decision making

INTRODUCTION

Determining the optimal delivery approach for each pregnant woman is critical to providing high-quality, patient-centered care in obstetrics. Although vaginal delivery remains the most common delivery mode, the overall cesarean rate reached 32.8% in 2010, including 26.4% of low-risk nulliparous women and 89.9% of low-risk women with a prior cesarean delivery.[1,2] The morbidity associated with this cesarean epidemic is profound, and as a result, reducing cesarean deliveries is a goal of numerous professional organizations and the U.S. Department of Health and Human Services.[1,3,4] Yet, while studies among pregnant or postpartum women demonstrate a majority prefer vaginal delivery,[5-10] and the strength of this preference has been associated with increased likelihood of achieving this goal,[11] recent clinical guidelines aimed at reducing the cesarean rate fail to mention inclusion of patient preferences in delivery mode counseling or planning.[4]

The model of shared decision making, in which decisions are informed by the best evidence available, weighted according to the specific characteristics and values of the patients, and made in collaboration between patients and health care providers,[12,13] has been advocated for some clinical scenarios in obstetrics; however, defining the optimal way to incorporate patient preferences in delivery decisions remains challenging.[14,15] While women often state a desire to be included in the process of mode-of-delivery decision making,[16] the extent to which patient preferences should be incorporated remains a matter of debate. As shared decision making and reduction of the cesarean delivery rate are both important goals, and the strength of a woman's preference for vaginal delivery has an impact on likelihood of vaginal birth,[11] perhaps more explicit incorporation of patient preferences would be beneficial. However, to do so requires a better understanding of how women view planned vaginal versus planned cesarean delivery, including how strongly they prefer one delivery

mode over the other, how they perceive potential labor interventions facilitating vaginal birth, and how they value potential outcomes of the two delivery approaches.

To date, most mode-of-delivery preference studies have simply asked women whether they would prefer vaginal or cesarean delivery, without exploring the strength of these preferences and how women feel about potential outcomes of decisions to undergo planned vaginal versus planned cesarean delivery. Our objective was to conduct a comprehensive study of mode-of-delivery preferences among a diverse population of women. To do so, we assessed stated preferences for vaginal versus cesarean delivery, the strength of these delivery mode preferences, and preferences (known as utilities) for potential interventions associated with and outcomes of planned vaginal versus planned cesarean deliveries in four clinical contexts: prior cesarean delivery; twins; breech presentation; and absent medical indication for cesarean.[15]

MATERIALS AND METHODS

The “Mode of Delivery Preferences among Diverse Populations of Women” study was conducted at the University of California, San Francisco (UCSF), between 2008 and 2014. This report describes the primary outcomes of this study. Methods have been described elsewhere.[11,17] In brief, women receiving prenatal care at UCSF were sent letters describing the study. Women who opted in or who did not return the postage-paid response card were contacted to assess eligibility and interest. Inclusion criteria included being 24-40 weeks pregnant with a singleton or twin gestation and having the ability to complete an English-language interview. Exclusion criteria included inability to complete a face-to-face interview, having triplets or higher-order multiple gestation, or inability to speak English. Women were not excluded on the basis of medical comorbidities or number of prior cesarean deliveries. Participation consisted of one face-to-face interview that included a sociodemographic and attitudinal questionnaire and a series of preference elicitation exercises specific to the participant’s clinical context. All participants received a $40 gift card. This study was approved by the UCSF Committee on Human Research. All participants provided written consent.

We assessed three types of mode-of-delivery preferences using “ELICIT,” a computerized preference elicitation tool previously developed by our group.[18] The first type was a stated preference, for which we simply asked the participant “if you could choose, which type of delivery would you want to have?” with response options of “definitely a vaginal birth,” “probably a vaginal birth,” “probably a cesarean delivery” and “definitely a cesarean delivery.” The second type focused on the strength of the stated preference (focusing on those preferring vaginal delivery), which we assessed using the standard gamble metric (see explanation below).[19] Finally, because planned vaginal and planned cesarean delivery can involve various interventions and outcomes, such as induction of labor, use of antibiotics for chorioamnionitis, operative vaginal delivery, and surgical complications, the third type of preference we measured focused on the value women attach to experiencing these interventions and outcomes. These utilities were measured using the time tradeoff metric (see explanation below).[19,20] To measure the strength of preference for vaginal delivery among women who preferred this delivery mode, we opted to use a standard gamble

exercise that reflected a simplified choice a woman might realistically face in thinking through whether to opt for a planned vaginal versus a planned cesarean delivery. To gain an understanding of how all the participants, regardless of their preferred delivery mode, felt about many of other the potential outcomes of these two delivery approaches, we used the time tradeoff. This is a metric was developed specifically for use in health care evaluations,[21] and we and others have found to be more easily comprehended by study participants, particularly when a large number of scenarios, without a clear "worst case," must be assessed.

Participants were assigned to one of four preference elicitation protocols depending on their clinical context. After identifying their preferred delivery mode, women preferring vaginal delivery were presented with a choice between certainty of an uncomplicated planned cesarean delivery (the intermediately ranked outcome) or a gamble between a specified probability of an uneventful, spontaneous vaginal birth with no adverse outcomes (the ideal outcome) and the complementary probability of having the attempted vaginal birth end in a cesarean delivery (the undesired outcome for women preferring vaginal delivery).[19] For this assessment, the ideal, intermediate, and undesired outcomes were assigned and standardized for all women identifying vaginal delivery as their preferred delivery mode. The probability of the gamble was varied until the woman was indifferent between the two choices, i.e., until the participant found the gamble between the ideal and undesired outcomes to be equivalent to certainty of the intermediate outcome. The "strength-of-preference" score was calculated at this indifference point. In theory, a woman strongly preferring vaginal delivery would choose the gamble even with a high chance of ending in a cesarean delivery, whereas a woman with a weaker preference would only choose the gamble if the likelihood of a cesarean delivery was relatively low. For example, if a woman had a stated preference for vaginal delivery, but indicated she would opt for a planned cesarean if the chance labor would end in a cesarean was only 10%, her strength-of-preference score would be 0.10, indicating a weak preference for vaginal delivery. But if she would only opt for a planned cesarean if her chance of cesarean was as high as 90%, her strength-of-preference score for vaginal delivery would be 0.90, indicating a strong preference for vaginal birth.

All participants then completed a series of time tradeoff exercises to generate utilities for potential labor interventions and potential outcomes of planned delivery approaches specific to their clinical context. A similar scale was used regardless of preferred delivery mode.[19,20] The narratives for each clinical context were developed after a qualitative analysis of six focus groups; these narratives then underwent an iterative process of feedback and revision based on participant responses and expert opinion to develop the complete set of scenarios. For each clinical scenario, the participant was presented with a choice between living her full life expectancy experiencing each outcome versus living a shorter life expectancy with her preferred delivery mode without interventions or complications. The life expectancy was then varied until the participant reached her indifference point. In this case a score of 0 resulted if the respondent indicated she would give up her entire lifetime to avoid the scenario being assessed, whereas a score of 1 resulted if she indicated she would not give up any time (meaning it is nearly equivalent to her ideal outcome; see Appendix for outcome descriptions by protocol). Participants in the prior cesarean and breech presentation contexts additionally evaluated a range of maternal and neonatal morbidity outcomes related to

uterine rupture and head entrapment, respectively, as these are central components of counseling for women considering these options.

The primary analyses consisted of determining the percent of women with stated preferences for one delivery mode over the other in each clinical context, calculating the mean strength-of-preference score for spontaneous, uncomplicated vaginal delivery among those who had a stated preference for vaginal delivery in each clinical context, and calculating the mean time tradeoff utilities for the potential interventions and outcomes of planned vaginal versus planned cesarean for the entire sample of women in each of the four protocol groups, using SAS version 9.3 (SAS Institute, Cary, NC).

RESULTS

In this population of 240 women, the mean age was 33.0 (SD ±6.0) and approximately half (45%) were nulliparous (Table 1). Approximately 23% had a prior cesarean delivery (38 with one prior, 10 with two prior, and 2 with three prior) and 36% had a prior vaginal delivery. The population was racially/ethnically diverse (56% white, 21% African American, 14% Asian/Asian American and 9% Latina) and well-educated (65% college graduates). Overall, 90.8% of the participants had a stated preference for vaginal delivery, which varied from 83% of women with a prior cesarean delivery to 93% of the women without a medical indication for a cesarean delivery (Table 2). On average, these women strongly preferred vaginal delivery, as indicated by strength-of-preference scores ranging from a mean of 0.59 for women with a prior cesarean (suggesting they would accept a 59% chance of their planned vaginal birth after cesarean ending in cesarean before opting for a planned repeat cesarean) to 0.75 for women without an indication for cesarean delivery (suggesting they would accept a 75% chance of their attempted vaginal delivery ending in a cesarean before choosing a planned cesarean).

We also found that, regardless of clinical context, participants assigned high preference scores (utilities) to having a planned vaginal delivery without interventions that concluded with a vaginal birth without complications, ranging from a mean of 0.993 for women carrying twins to 0.998 for women with breech presentations or a prior cesarean (Table 3). We observed more variation in the scores assigned to a planned cesarean delivery ending with a cesarean birth and no complications, ranging from 0.933 among participants carrying twins to 0.974 among participants in the prior cesarean group. Planned vaginal delivery ending in cesarean had higher mean utilities than operative vaginal delivery in all contexts except for breech presentation, ranging from 0.934 to 0.973 for planned vaginal delivery ending in cesarean delivery, and from 0.906 to 0.959 for operative vaginal delivery. Among women carrying twins, experiencing a combined delivery (vaginal delivery for the presenting twin followed by a cesarean delivery for the second twin) received a lower mean utility (0.918) than scenarios with uncomplicated cesarean delivery for both twins, whereas experiencing a vertex vaginal delivery of the presenting twin followed by breech extraction of the second twin received a utility (0.936) similar to planned or unplanned uncomplicated cesarean delivery of both twins. Lower scores indicate a greater number of years women would be willing to give up from her projected lifespan in order to achieve their desired

outcome; for example, for woman with a lifespan of 80 years, a score of 0.925 (=(80-6)/80) indicates she would give up 6 years of life in order to avoid the undesirable outcome.

Our participants reported decrements in utility associated with labor interventions and short-term complications. For example, women with a prior cesarean or no indication for cesarean assigned scores of 0.986 and 0.975, respectively, to induction at 39 weeks ending in vaginal delivery, and slightly lower scores of 0.979 and 0.958 to augmentation of spontaneous labor with oxytocin resulting in a vaginal birth. Planned vaginal delivery requiring antibiotic administration for chorioamnionitis and ending with vaginal delivery was valued similarly to planned vaginal delivery with induction at 41 weeks that ended in a cesarean delivery. And vaginal deliveries that resulted in major perineal lacerations received lower utilities for both groups (0.944 for prior cesarean; 0.952 absent medical indication) than either planned or unplanned uncomplicated cesarean delivery.

As expected, scenarios including serious maternal and/or neonatal complications were assigned substantially lower scores (Table 4). In the prior cesarean group, uterine rupture resulting in severe infant complications or infant death received the lowest utility scores (from 0.506 to 0.598), whereas deliveries ending in maternal complications but no infant complications received higher utilities. Among women with breech presentations, a vaginal breech delivery with head entrapment without long-term sequelae received a mean utility of 0.952, whereas head entrapment scenarios requiring further interventions and/or resulting in long-term sequelae had substantially lower scores. Planned vaginal breech delivery with head entrapment resulting in neonatal death received the lowest mean score (0.432), indicating participants would give up over half of their life expectancy to avoid this devastating outcome.

COMMENT

We measured preferences for planned vaginal versus planned cesarean delivery in the context of prior cesarean, twins, breech presentation, and absent medical indication for cesarean, finding that in all of them, the majority of women highly value vaginal delivery. We also identified substantial variation in preferences for interventions that are often employed during labor to help achieve a vaginal delivery. Women in our study assigned relatively low utilities to common labor interventions as well as less frequent minor and major morbidities of planned vaginal delivery. Further, the variation in and decrements for utilities for common interventions and morbidities were similar across clinical contexts, demonstrating similar preferences regardless of clinical history. These findings highlight the importance of improved communication between patients and providers regarding processes that may occur during labor and delivery, to help create realistic expectations and allow the opportunity for elicitation of informed patient preferences. The results of our three-level approach to preference assessment emphasize the need to ensure women have meaningful opportunities not only to attempt vaginal delivery in various contexts, but to receive patient-centered information and participate in shared decision making about labor and delivery.

Our finding that women would accept a 59 – 75% chance of their attempted vaginal birth ending in a cesarean delivery before opting for a planned cesarean delivery underscores the

intensity of the preference for vaginal delivery in this population. However, the utilities for labor processes and outcomes reveal this preference to be nuanced. While in the context of natural labor the mean strength-of-preference scores for spontaneous, uncomplicated vaginal delivery suggest a high risk tolerance for unplanned cesarean, the full range of utilities assessed suggests women are less accepting of labor requiring interventions, even when those interventions are consistent with the goal of vaginal birth. Moreover, these utilities suggested participants viewed some routine labor interventions as equivalent to uncomplicated cesarean deliveries, an unexpected finding given the strength of preference for vaginal delivery. For example, the finding that an uncomplicated operative vaginal delivery received similar utilities to vaginal delivery with major perineal laceration and lower utilities than cesarean delivery suggests participants may have a different understanding than clinicians would anticipate of the risks and benefits of an uncomplicated operative vaginal delivery as compared to other outcomes. Alternatively, it may mean that while they would like to have a vaginal delivery, the prospect of a major laceration is more worrisome to them than the prospect of a cesarean delivery. These data emphasize the importance of patient education and counseling to improve concordance between patient and provider expectations regarding indications for and potential benefits of labor interventions, as well as the potential morbidity of cesarean delivery.

Appropriate patient education that enables women to place labor interventions and potential maternal and neonatal outcomes in context is critical to ensuring informed patient choices. In counseling women about labor, providers must explain that many interventions facilitate the shared goal of achieving vaginal delivery. Our work suggests education about goals for birth should extend beyond simply asking what type of birth a woman hopes to achieve, but also should include a discussion of how common labor interventions may be utilized to achieve that goal. Such framing also allows providers the opportunity to discuss the rarity of major maternal or neonatal complications, which women in our study strongly desired to avoid. While the women in our study reported that they would give up nearly half of their remaining lifespan to avoid outcomes such as neonatal death, such events are exceedingly rare. The absolute risk of term neonatal hypoxic ischemic encephalopathy is 0.46 per 1000 women undergoing trial of labor after cesarean;[22] for women with breech presentations, long-term data show planned cesarean is not associated with a reduction in risk of death or neurodevelopmental delay compared to planned vaginal delivery.[23,24] Similarly, a recent landmark trial of women with a cephalic presenting twin demonstrated no differences in composite perinatal morbidity and mortality between women randomized to planned vaginal versus planned cesarean delivery.[25] Women in these clinical scenarios are commonly counseled about rare adverse outcomes and, while women and providers are strongly motivated to avoid these unlikely but devastating events, the appropriate presentation of the likelihood of these outcomes is crucial to allow women to place them in context with other tradeoffs inherent to delivery decisions. Our findings underscore the need for research investigating optimal counseling techniques that promote fully informed decisions while avoiding overweighting low probability events.

In addition to improving the quality of obstetric care, enhanced patient education and greater focus on patient preferences could potentially contribute to reducing the cesarean rate. Despite expressed preferences for vaginal birth, the vast majority of U.S. women with prior

cesarean(s), twins, and breech do not undergo planned vaginal delivery.[3,4,26] Provider and system factors contribute to delivery decisions and are potential points of intervention to reduce the cesarean rate.[3] Metz et al, for example, have suggested provider factors are a potentially significant reason for disparities in rates of trial of labor after cesarean among women who are good candidates.[27] Similarly, Bernstein et al found when women with a prior cesarean perceived their provider to have a preference, they were more likely to choose their perceived provider-preferred delivery mode.[28] Patient preferences should be considered along with safety and medical capacity, and providers have a role in offering balanced counseling incorporating realistic framing of risks and benefits. This process may first and foremost help patients make medically appropriate decisions in alignment with their goals, which may ultimately reduce the cesarean delivery rate.

This study is not without limitations. First, this population was limited to English-speaking women within the San Francisco Bay Area receiving care at an academic medical center with multiple resources available. Trial of labor after cesarean, singleton vaginal breech deliveries, and vaginal delivery of a non-vertex second twin were offered with careful attention to patient selection. Women may have chosen this site for delivery based on these resources and, as a result, their preferences may not be generalizable. In addition, while the population was ethnically and racially diverse, they reported high educational attainment and income. However, a significant strength of this study is that it is one of the first to study the complexity of mode-of-delivery preferences in several clinical contexts. The use of both standard gamble and time tradeoff methods of preference elicitation allowed nuanced exploration of women's values for birth processes and outcomes, and the measurement of these preferences in four differing clinical contexts enabled us to assess how women's preferences differ (or remain the same) in these contexts.

In this racially/ethnically diverse population of high income, highly educated women, our work suggests that most women highly value uncomplicated vaginal birth but that preferences for obstetric interventions facilitating vaginal delivery vary substantially. These data highlight the importance of preparing patients for birth by providing clear information, appropriately contextualized risk education, and ongoing opportunities for communication. Providers must offer balanced patient counseling that frames rare adverse events as rare and manages patient expectations about labor processes. Shared decision making encouraging fully informed patient preferences is critical to achieving patient-centered care in obstetrics.

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APPENDIX

Summary of all clinical scenarios

Scenario	Clinical context			
	Prior Cesarean	**Twins**	**Breech**	**Absent Medical Indication**
Planned VD ending in VD, no interventions or complications	X	X	X	X
Planned VD with induction, ending in VD	X			X
Planned VD with augmentation using oxytocin, ending in VD	X			X
Planned VD with induction, ending in CD	X			X
Planned CD ending in CD, no surgical complications	X	X	X	X
Planned VD ending in CD, no surgical complications	X	X	X	X
Planned VD with antibiotic administration during labor, ending in VD	X			X
Planned VD ending in VD with minor neonatal complications	X			X
Planned VD ending in vacuum-or forceps-assisted VD	X	X	X	X
Planned VD ending in VD with 3rd or 4th degree perineal laceration	X			X
Planned VD with cascade of interventions ending in VD	X			X
Planned CD ending in CD with surgical complications	X	X	X	X
Planned VD ending in vertex VD of twin A and breech extraction of twin B		X		
Planned VD ending in combined delivery (VD twin A and CD twin B)		X		
Planned VD ending in uterine rupture, no infant complications	X			
Planned VD ending in uterine rupture with surgical complications, no infant complications	X			
Planned VD ending in uterine rupture with hysterectomy, no infant complications	X			
Planned VD ending in uterine rupture with hysterectomy and severe infant complication	X			
Planned VD ending in uterine rupture with severe infant complication	X			
Planned VD ending in uterine rupture with hysterectomy and infant death	X			
Planned VD ending in uterine rupture with infant death	X			
Planned breech VD ending in breech VD with head entrapment, no infant complications			X	
Planned breech VD ending in breech VD with forceps and brachial plexus injury			X	

Scenario	Clinical context			
	Prior Cesarean	Twins	Breech	Absent Medical Indication
Planned breech VD ending in breech VD with head entrapment, Duhrssen incisions, no infant complications			X	
Planned breech CD ending in CD with hysterectomy, no infant complications			X	
Planned breech VD ending in breech VD with head entrapment, cerebral palsy			X	
Planned breech VD ending in breech VD with head entrapment, infant death			X	

VD, vaginal delivery; CD, cesarean delivery

Prior Cesarean Clinical Scenarios	
Planned VD ending in VD, no interventions or complications	• You go into labor within a week of your due date. • At the hospital, your labor progresses as expected. • You do not have any other medical interventions. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery. • You resume your normal activities in 1-2 weeks.
Planned VD with induction, ending in VD	• You schedule an induction of labor at 39 weeks. • You are able to tell your friends and family the exact date of delivery. • You get a medicine to help your cervix start opening and start contractions. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • You are in labor for 24 hours. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery.
Planned VD with augmentation using oxytocin, ending in VD	• You go into labor within a week of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • Your baby does not have any complications.

Prior Cesarean Clinical Scenarios	
	• You and your baby go home 48 hours after delivery.
Planned VD with induction, ending in CD	• You do not go into labor. • One week after your due date you have come to the hospital for an induction of labor. • You get a medicine to help your cervix start opening and start contractions. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • You are in labor for 72 hours. Your cervix is not opening up. • You are transferred to the operating room to have a cesarean delivery. • You are given an epidural or spinal anesthesia for the delivery. • You do not have any complications. • Your baby does not have any complications. • You get to hold your baby in the recovery room after surgery. • You and your baby go home 72 hours after delivery.
Planned CD ending in CD, no surgical complications	• You schedule a cesarean delivery. • You are able to tell your friends and family the exact date of delivery. • You have a planned cesarean delivery. • You are given spinal anesthesia for the delivery. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 72 hours after delivery. • At home, you are recovering from surgery while you are taking care of your infant. • Full recovery from surgery takes between 2-6 weeks. • You will likely need to take pain medicine for 1-2 weeks. • You will not be able to lift heavy things or engage in vigorous physical activity for 4-6 weeks.
Planned VD ending in CD, no surgical complications	• You go into labor within a week of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • You have been in labor for over 24 hours. Your cervix is not opening up. • You are transferred to the operating room to have a cesarean delivery. • You are given an epidural or spinal anesthesia for the delivery. • You do not have any complications. • Your baby does not have any complications. • You get to hold your baby in the recovery room after surgery. • You and your baby go home 72 hours after delivery. • At home, you are recovering from surgery while you are taking care of your infant. • Full recovery takes between 2-6 weeks. • You will likely need to take pain medicine for 1-2 weeks.

Prior Cesarean Clinical Scenarios	
	• You will not be able to lift heavy things or engage in vigorous physical activity for 4-6 weeks.
Planned VD with antibiotic administration during labor, ending in VD	• Your water bag breaks and you go into labor the week of your due date. • Your labor progresses slowly. • After 24 hours you develop a fever and get IV antibiotics. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • After delivery your baby gets some antibiotics for infection. • You and your baby go home 72 hours after delivery.
Planned VD ending in VD with minor neonatal complications	• You go into labor within a week of your due date. • Your labor progresses as expected. • You give birth vaginally after 36 hours. • Your baby has a complication and has to stay in the hospital for an additional 4 days. There are not long term effects from the complication. • You go home 48 hours after delivery.
Planned VD ending in vacuum or forceps-assisted VD	• You go into labor within a week of your due date. • Your labor progresses as expected. • You push for 2 hours. • The baby is showing mild signs of not tolerating labor. • To deliver sooner, you deliver by a vacuum assisted vaginal delivery or a forceps assisted vaginal delivery. • Immediately after delivery, the pediatricians examine your baby in the labor room. After the exam, you get to hold your baby. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery.
Planned VD ending in VD with 3rd or 4th degree perineal laceration	• You go into labor within a week of your due date. • Your labor progresses as expected. • You push for 3 hours. • You have a vaginal delivery. • You get a tear in the vagina and muscles around the anus from the delivery. It is repaired with stitches. • You get to hold your baby immediately after delivery. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery. • The stitches in the vagina and anus take 6 weeks to heal completely. You have a lot of discomfort from the tear for the first 1-2 weeks but are able to resume your normal activities after 2 weeks. • You have a small increased chance of having fecal incontinence in the future.
Planned VD with cascade of interventions ending in VD	• You go into labor within a week of your due date. • You come to the hospital and are admitted into a labor room.

Prior Cesarean Clinical Scenarios	
	• You can have as many family and friends as you want in the delivery room. • You get an IV and have a fetal heart rate monitor on your abdomen. • After several hours in the hospital, your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • After 24 hours of labor, you develop a fever. You are given IV antibiotics during the rest of delivery and receive one dose after delivery. • After 30 hours you are ready to push. You push for 2 hours. • The baby is showing mild signs of not tolerating labor. • To deliver sooner, you deliver by a vacuum assisted vaginal delivery or a forceps assisted vaginal delivery. • Immediately after delivery, the pediatricians examine your baby in the labor room. After the exam, you get to hold your baby. • You get a tear in the vagina and muscles around the anus from the delivery. It is repaired with stitches, this takes about 30 minutes. • Your baby does not have any complications. • Both you and your baby go home 48 hours after delivery. • The stitches in the vagina and anus take 6 weeks to heal completely. You have a lot of discomfort from the tear for the first 1-2 weeks but are able to resume your normal activities after 2 weeks. • As a result of the tear, you have a small increased chance of having fecal incontinence in the future.
Planned CD ending in CD with surgical complications	• You schedule a cesarean delivery. • You are able to tell your friends and family the exact date of delivery. • You have a planned cesarean delivery. • You are given spinal anesthesia for the delivery. • You have surgical complications. • During surgery, you have a large amount of blood loss and require a blood transfusion. • You have an injury to your bladder during surgery. You have to have a bladder catheter for one week after surgery. • Since your surgery is complicated and much longer than expected, the spinal anesthesia will not last long enough so you are given general anesthesia. Your surgery is 3 hours. • One day after surgery you get a fever and require IV antibiotics for 48 hours. • Three days after surgery, your surgical incision becomes infected and the skin opens up. You have to get daily wound care at home for six weeks. • You and your baby go home 6 days after delivery. • Your baby does not have any complications. • At home, you are recovering from surgery while you are taking care of your infant. • Full recovery from surgery takes between 2-6 weeks. • You will likely need to take pain medicine for 1-2 weeks. • You will not be able to lift heavy things or engage in vigorous physical activity for 4-6 weeks.
Planned VD ending in uterine rupture, no infant complications	• You go into labor within 1-2 weeks of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent.

Prior Cesarean Clinical Scenarios	
	• Your water bag is broken to help labor progress. • After 18 hours of labor, your cervix is completely dilated (open) and you start pushing. • The baby's heart beat shows patterns requiring immediate delivery. • You are quickly transferred to the operating room for an emergency cesarean section. You are put to sleep for the delivery. • You have an emergency cesarean section, where it is found that your uterine scar from your previous cesarean has opened. • The opening of your uterine scar is repaired, so you will be able to get pregnant and give birth again in the future. • You have no other complications. • Your baby does not have any complications. • You and your baby go home 4 days after delivery. • At home, you are recovering from surgery while you are taking care of your infant. • Full physical recovery takes between 2-6 weeks. • You need to take pain medicine for 1-2 weeks. • You are not able to lift heavy things, engage in vigorous physical activity for 4-6 weeks. • It takes 2-6 weeks to fully recover from surgery and resume all of your normal daily activities.

Prior Cesarean Clinical Scenarios	
Planned VD ending in uterine rupture with surgical complications, no infant complications	• You go into labor within 1-2 weeks of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • After 18 hours of labor, your cervix is completely dilated (open) and you start pushing. • The baby's heart beat shows patterns requiring immediate delivery. • You are quickly transferred to the operating room for an emergency cesarean section. You are put to sleep for the delivery. • You have an emergency cesarean section, where it is found that your uterine scar from your previous cesarean has opened. • The opening of your uterine scar is repaired, so you will be able to get pregnant and give birth again in the future. • During the surgery, your bladder is injured and you have a large amount of blood loss that requires a blood transfusion. • Although your bladder injury was repaired, you will have to go home with a catheter in your bladder, which will stay there for 6 weeks. • Because of your complicated surgery 3 days are added to your hospital stay. • Your baby does not have any complications. • You and your baby go home 1 week after delivery. • At home, you are recovering from surgery while you are taking care of your infant. • Full physical recovery takes between 2-6 weeks. • You need to take pain medicine for 1-2 weeks. • You are not able to lift heavy things, engage in vigorous physical activity for 4-6 weeks. • It takes 2-6 weeks to fully recover from surgery and resume all of your normal daily activities.
Planned VD ending in uterine rupture with hysterectomy, no infant complications	• You go into labor within 1-2 weeks of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • After 18 hours of labor, your cervix is completely dilated (open) and you start pushing. • The baby's heart beat shows patterns requiring immediate delivery. • You are quickly transferred to the operating room for an emergency cesarean section. You are put to sleep for the delivery. • You have an emergency cesarean section, where it is found that your uterine scar from your previous cesarean has opened. • The opening of your uterine scar cannot be repaired, so you undergo a hysterectomy. This means that you will not be able to become pregnant or give birth in the future. • During the surgery, your bladder is injured and you have a large amount of blood loss that requires a blood transfusion. • Although your bladder injury was repaired, you will have to go home with a catheter in your bladder, which will stay there for 6 weeks. • Because of your complicated surgery 3 days are added to your hospital stay. • Your baby does not have any complications.

Prior Cesarean Clinical Scenarios	
	• You and your baby go home 1 week after delivery. • At home, you are recovering from surgery while you are taking care of your infant. • Full physical recovery takes between 2-6 weeks. • You need to take pain medicine for 1-2 weeks. • You are not able to lift heavy things, engage in vigorous physical activity for 4-6 weeks. • It takes 2-6 weeks to fully recover from surgery and resume all of your normal daily activities.
Planned VD ending in uterine rupture with hysterectomy and severe infant complication	• You go into labor within 1-2 weeks of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • After 18 hours of labor, your cervix is completely dilated (open) and you start pushing. • The baby's heart beat shows patterns requiring immediate delivery. • You are quickly transferred to the operating room for an emergency cesarean section. You are put to sleep for the delivery. • You have an emergency cesarean section, where it is found that your uterine scar from your previous cesarean has opened. • The opening of your uterine scar cannot be repaired, so you undergo a hysterectomy. This means that you will not be able to become pregnant or give birth in the future. • During the surgery, your bladder is injured and you have a large amount of blood loss that requires a blood transfusion. • Although your bladder injury was repaired, you will have to go home with a catheter in your bladder, which will stay there for 6 weeks. • Because of your complicated surgery 3 days are added to your hospital stay. • The baby has been deprived of oxygen for a short period of time, causing damage to the brain and other organs. • As a result, your child will have developmental delay or mental retardation, difficulty walking, and occasional seizures. • You are able to go home 1 week after delivery, and your physical recovery is similar to the other scenarios. • Your baby has to stay in the hospital for a month or longer due to his/her medical complications. You will need to go to the hospital to be with your baby until he/she comes home. • You will face the uncertainties and challenges of knowing that your baby will need additional care and have other special needs as he/she develops into a child and adult. • You need to take pain medicine for 1-2 weeks. • You are not able to lift heavy things, engage in vigorous physical activity for 4-6 weeks. • It takes 2-6 weeks to fully recover from surgery and resume all of your normal daily activities.
Planned VD ending in uterine rupture with severe infant complication	• You go into labor within 1-2 weeks of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress.

Prior Cesarean Clinical Scenarios	
	• After 18 hours of labor, your cervix is completely dilated (open) and you start pushing. • The baby's heart beat shows patterns requiring immediate delivery. • You are quickly transferred to the operating room for an emergency cesarean section. You are put to sleep for the delivery. • You have an emergency cesarean section, where it is found that your uterine scar from your previous cesarean has opened. • The opening of your uterine scar is repaired, so you will be able to get pregnant and give birth again in the future. • You have no other complications. • The baby has been deprived of oxygen for a short period of time, causing damage to the brain and other organs. • As a result, your child will have developmental delay or mental retardation, difficulty walking, and occasional seizures. • You go home 4 days after delivery with the same physical recovery as in the other scenarios. • Your baby has to stay in the hospital for a month or longer due to his/her medical complications. You will need to go to the hospital to be with your baby until he/she comes home. • You will face the uncertainties and challenges of knowing that your baby will need additional care and have other special needs as he/she develops into a child and adult. • You need to take pain medicine for 1-2 weeks. • You are not able to lift heavy things, engage in vigorous physical activity for 4-6 weeks. • It takes 2-6 weeks to fully recover from surgery and resume all of your normal daily activities.
Planned VD ending in uterine rupture with hysterectomy and infant death	• You go into labor within 1-2 weeks of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • After 18 hours of labor, your cervix is completely dilated (open) and you start pushing. • The baby's heart beat shows patterns requiring immediate delivery. • You are quickly transferred to the operating room for an emergency cesarean section. You are put to sleep for the delivery. • You have an emergency cesarean section, where it is found that your uterine scar from your previous cesarean has opened. • The opening of your uterine scar cannot be repaired, so you undergo a hysterectomy. This means that you will not be able to become pregnant or give birth in the future. • The baby has been deprived of oxygen for a significant period of time, causing damage to the brain and other organs. • The baby dies several days after the birth. • You need to take pain medicine for 1-2 weeks. • You are not able to lift heavy things, engage in vigorous physical activity for 4-6 weeks. • It takes 2-6 weeks to fully recover from surgery and resume all of your normal daily activities.
Planned VD ending in uterine	• You go into labor within 1-2 weeks of your due date.

Prior Cesarean Clinical Scenarios	
rupture with infant death	• Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • After 18 hours of labor, your cervix is completely dilated (open) and you start pushing. • The baby's heart beat shows patterns requiring immediate delivery. • You are quickly transferred to the operating room for an emergency cesarean section. You are put to sleep for the delivery. • You have an emergency cesarean section, where it is found that your uterine scar from your previous cesarean has opened. • The opening of your uterine scar is repaired, so you will be able to get pregnant and give birth again in the future. • You have no other surgical complications. • The baby has been deprived of oxygen for a significant period of time, causing damage to the brain and other organs. • The baby dies several days after the birth. • You need to take pain medicine for 1-2 weeks. • You are not able to lift heavy things, engage in vigorous physical activity for 4-6 weeks. • It takes 2-6 weeks to fully recover from surgery and resume all of your normal daily activities.

VD, vaginal delivery; CD, cesarean delivery

Twins Clinical Scenarios	
Planned VD ending in VD, no interventions or complications	• Both of your babies are head down, also called "vertex" or "cephalic." • You go into labor spontaneously. • You are admitted to the hospital and can have friends and family present. • Your cervix is dilated 5 centimeters when you arrive. • Labor progresses normally. • You have an epidural placed. • When it is time to deliver, you are moved to the operating room because you have twins. • You deliver your first baby vaginally after 2 hours of pushing. • You then push for 30 more minutes and deliver your second baby vaginally. • You and your babies do not have any complications. • You and your babies go home 48 hours after delivery. • You will resume your normal activities in 1 to 2 weeks.
Planned CD ending in CD, no surgical complications	• You schedule a cesarean delivery. • You are given spinal anesthesia. • You and your babies do not have any complications. • You and your babies go home 72 hours after delivery. • You are recovering from surgery while taking care of your infants. • You will need pain medicine for 1 to 2 weeks.

Twins Clinical Scenarios	
	• Breastfeeding is more difficult. • You will not be able to lift heavy things or engage in vigorous physical activity for 4 to 6 weeks. • Full recovery from surgery by 6 weeks.
Planned VD ending in CD, no surgical complications	• You go into labor spontaneously. • Both of your babies are head down. • Your cervix is dilated only 2 centimeters when you arrive. • You have an epidural placed for pain control and in case you need medical interventions for delivery. • After several hours, your labor stops progressing. • You receive an IV medicine (Pitocin) to make your contractions stronger. • Your bag of water of the first baby is broken to help labor progress. • Eventually, you have been in labor for over 36 hours. Your cervix never fully dilates (opens). • Your babies are showing some signs of not tolerating labor. • You are recommended a cesarean section for delivery of both babies. • You have an uncomplicated cesarean section in the operating room. • Your babies do not have any complications. • Afterwards, you are more tired because you were laboring and had surgery. • You and your babies go home 72 hours after delivery. • You are recovering while taking care of your infants. • You will need pain medicine for 1 to 2 weeks. • Breastfeeding is more difficult. • You will not be able to lift heavy things or engage in vigorous physical activity for 4 to 6 weeks. • Full recovery from surgery by 6 weeks.
Planned VD ending in vacuum or forceps-assisted VD	• You go into labor spontaneously. • Both of your babies are head down. • You receive an epidural. • When your cervix is dilated, you start pushing. • You push for 3 hours with the first baby and are exhausted. • Your first baby is showing mild signs of not tolerating labor. • To deliver sooner, you deliver by a vacuum-assisted vaginal delivery or a forceps-assisted vaginal delivery. • You push for a short time with the second baby, and then, because you are tired, the doctors again use a vacuum or forceps to help the second baby be born. • You and your babies do not have any complications. • You and your babies go home 48 hours after delivery. • You will resume your normal activities in 1 to 2 weeks.
Planned CD ending in CD with surgical complications	• You schedule a cesarean delivery. • You are given spinal anesthesia. • You have a large amount of blood loss & require a blood transfusion. • You also have an injury to your bladder.

Twins Clinical Scenarios	
	• You have a bladder catheter for one week after surgery. • Since your surgery is complicated, the spinal anesthesia will not last long enough. • You are given general anesthesia. Your surgery is 3 hours. • You can hold both babies in the recovery room 2 to 3 hours after surgery. • Your babies do well and do not have complications. • Three days after surgery, your surgical incision becomes infected and the skin opens up. • You and your babies go home 6 days after delivery. • You are recovering from surgery while you are taking care of your infants. • You need daily wound care at home for six weeks. • You need to take pain medicine for 1 to 2 weeks, and longer for dressing changes. • Breastfeeding both babies is particularly challenging because of your wound. • Full recovery from surgery by 6 weeks.
Planned VD ending in vertex VD of twin A and breech extraction of twin B	• You go into labor spontaneously. • Your first baby is head down and your second baby is in breech position. • You decide to attempt a vaginal delivery with a breech extraction of the second baby. • You receive an epidural. • You go to the operating room for delivery. • You deliver your first baby vaginally after 2 hours of pushing. • The doctor reaches inside your uterus to pull the feet of the second baby into the vagina, and breaks the bag of water for the second baby. • The second baby is delivered feet-first. • You and your babies do not have any complications. • You and your babies go home 48 hours after delivery. • You will resume your normal activities in 1 to 2 weeks.
Planned VD ending in combined delivery (VD twin A and CD twin B)	• Both of your babies are head down. • As in the prior scenario, you go into labor spontaneously and receive an epidural. • You deliver your first baby vaginally without problems after 2 hours of pushing. • The bag of water for your second baby breaks spontaneously. • The umbilical cord of your second baby drops in front of the head (“cord prolapse”), which is a dangerous emergency. • You have an emergency cesarean section for the second baby. • Your support person has to leave the delivery room because of the emergency. • Although it was an emergency, you and your babies do not have complications. • You and your babies go home 72 hours after delivery. • You are recovering while taking care of your infants. • You will need pain medicine for 1 to 2 weeks. • Breastfeeding is more difficult. • You will not be able to lift heavy things or engage in vigorous physical activity for 4 to 6 weeks. • Full recovery from surgery by 6 weeks.

VD, vaginal delivery; CD, cesarean delivery

Breech Clinical Scenarios	
Introduction to all scenarios	• 3 to 4 weeks before your due date, your baby is breech (head up) • Your options for delivery are: **1.** Planned C-section **2.** Go into labor spontaneously and plan to have a C-section at that time **3.** Try a vaginal delivery • The delivery will be done by an obstetrician. • To attempt a vaginal delivery, you will need: – Ultrasound to see if your baby weighs less than 8 pounds – CT scan to see whether your pelvis can accommodate a breech delivery, which is a minimal amount of radiation • For vaginal breech delivery: – Epidural – Delivery in operating room – You can have two people with you in the operating room • For C-section, you'll be limited to one person
Planned VD ending in VD, no interventions or complications	• Decide to attempt vaginal birth • Eligible for vaginal delivery • Go into labor • Admitted to labor room • Baby still breech • As many family and friends as you want • Cervix dilated and labor progresses normally • IV, epidural and fetal heart rate monitor • Start pushing • Operating room with pediatricians • Deliver vaginally without problems after 2 hours • Hold baby skin-to-skin and breastfeed • Go home 2 days later • Normal activities within 1 to 2 weeks
Planned CD ending in CD, no surgical complications	• Decide to have C-section • Tell friends and family exact date • Spinal anesthesia so you can be awake • One person in operating room • Delivery less than an hour; no complications • Hold baby skin-to-skin and breastfeed • Go home 3-4 days later • Recover while taking care of baby • Pain medicine for 1 to 2 weeks • Breastfeeding difficult • Not able to lift heavy things or engage in rigorous activity for 4-6 weeks

Breech Clinical Scenarios	
	• Resume normal activities
Planned VD ending in CD, no surgical complications	• Decide to attempt vaginal delivery • 2 cm dilated • Epidural • Labor slows down - stops progressing • No medications • Bag of water broken • Cervix never fully opens • Heart rate shows decelerations • Doctor recommends C-section • Skin-to-skin and breastfeed 1-2 hours after surgery • Go home 3-4 days later • Recover while taking care of baby • Pain medicine 1 to 2 weeks • Breastfeeding difficult • Not able to lift heavy things/engage in rigorous activity for 4-6 weeks • Resume normal activities
Planned VD ending in vacuum or forceps-assisted VD	• Attempt vaginal delivery • Go into labor • Push for 3 hours • Baby's body out • Head unable to be delivered • Doctors recommend forceps • Risk of injury • No injuries occur • Recovery same as in uncomplicated planned vaginal delivery
Planned CD ending in CD with surgical complications	• Require blood transfusion • Injury to bladder/need bladder catheter for 1 week • General anesthesia to go to sleep • Hold baby skin-to-skin and breastfeed 2 to 3 hours after surgery • Baby has no complications • Incision opens up • Go home 6 days after delivery. • Recover while taking care of baby • Daily bandage changes 6 weeks • Pain medicine more than 2 weeks • Challenging to breastfeed • Not able to lift heavy things/engage in rigorous activity for 4-6 weeks • Resume normal activities

Breech Clinical Scenarios	
Planned breech VD ending in breech VD with head entrapment, no infant complications	• While pushing, part of baby's body comes out • Cervix closes around head • Obstetric emergency • Fast-acting medication to relax uterus. • No further complications • Recovery same as in uncomplicated planned vaginal delivery
Planned breech VD ending in breech VD with forceps and brachial plexus injury	• Injury to nerves supplying one arm • Weakness in one arm and hold arm in unusual position • Resolves by 3 months • No further complications • Recovery same as in uncomplicated planned vaginal delivery
Planned breech VD ending in breech VD with head entrapment, Duhrssen incisions, no infant complications	• While pushing, part of baby's body comes out • Cervix closes around head • Medication doesn't relax uterus • 2-3 cuts on cervix (Duhrssen incisions) • Baby delivered • Cervix repaired • No further complications • Recovery same as in ideal outcome • Future pregnancy: increased risk of cervical insufficiency; can result in late second trimester miscarriage; suture may be placed in cervix.
Planned breech CD ending in CD with hysterectomy, no infant complications	• Require many blood transfusions • Emergency hysterectomy/uterus removed • General anesthesia to go to sleep • Hold baby skin-to-skin and breastfeed 2 to 3 hours after surgery • Pain medicine for 1 to 2 weeks • Breastfeeding difficult • Not able to lift heavy things/engage in rigorous activity for 6-8 weeks • No menstrual periods • Not able to get pregnant • No immediate menopause as result of surgery
Planned breech VD ending in breech VD with head entrapment, cerebral palsy	• Baby's head gets stuck • Umbilical cord compressed • Doesn't allow enough oxygen to reach baby • Baby needs oxygen • Admitted to NICU • Unable to hold baby skin-to-skin or breastfeed after delivery • Baby develops seizures - controlled with medication • Baby discharged one week later • Cerebral palsy

Breech Clinical Scenarios	
	– Lack of oxygen of birth – Leg braces and life-long medication – Might have developmental delay
Planned breech VD ending in breech VD with head entrapment, infant death	• Lack of oxygen during delivery • Doesn't move arms or legs, blue, needs breathing tube • Serious damage to brain and other organs • Baby dies several days after birth • Very rare event

VD, vaginal delivery; CD, cesarean delivery

Absent Medical Indication Clinical Scenarios	
Planned VD ending in VD, no interventions or complications	• You go into labor within a week of your due date. • At the hospital, your labor progresses as expected. • You do not have any other medical interventions. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery. • You resume your normal activities in 1-2 weeks.
Planned VD with induction, ending in VD	• You schedule an induction of labor at 39 weeks. • You are able to tell your friends and family the exact date of delivery. • You get a medicine to help your cervix start opening and start contractions. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • You are in labor for 24 hours. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery.
Planned VD with augmentation using oxytocin, ending in VD	• You go into labor within a week of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • Your baby does not have any complications.

Absent Medical Indication Clinical Scenarios	
	• You and your baby go home 48 hours after delivery.
Planned VD with induction, ending in CD	• You do not go into labor. • One week after your due date you have come to the hospital for an induction of labor. • You get a medicine help your cervix start opening and start contractions. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • You are in labor for 72 hours. Your cervix is not opening up. • You are transferred to the operating room to have a cesarean delivery. • You are given an epidural or spinal anesthesia for the delivery. • You do not have any complications. • Your baby does not have any complications. • You get to hold your baby in the recovery room after surgery. • You and your baby go home 72 hours after delivery.
Planned CD ending in CD, no surgical complications	• You schedule a cesarean delivery. • You are able to tell your friends and family the exact date of delivery. • You have a planned cesarean delivery. • You are given spinal anesthesia for the delivery. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 72 hours after delivery. • At home, you are recovering from surgery while you are taking care of your infant. • Full recovery from surgery takes between 2-6 weeks. • You will likely need to take pain medicine for 1-2 weeks. • You will not be able to lift heavy things or engage in vigorous physical activity for 4-6 weeks.
Planned VD ending in CD, no surgical complications	• You go into labor within a week of your due date. • Your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • Your water bag is broken to help labor progress. • You have been in labor for over 24 hours. Your cervix is not opening up. • You are transferred to the operating room to have a cesarean delivery. • You are given an epidural or spinal anesthesia for the delivery. • You do not have any complications. • Your baby does not have any complications. • You get to hold your baby in the recovery room after surgery. • You and your baby go home 72 hours after delivery. • At home, you are recovering from surgery while you are taking care of your infant. • Full recovery takes between 2-6 weeks. • You will likely need to take pain medicine for 1-2 weeks.

Absent Medical Indication Clinical Scenarios	
	• You will not be able to lift heavy things or engage in vigorous physical activity for 4-6 weeks.
Planned VD with antibiotic administration during labor, ending in VD	• Your water bag breaks and you go into labor the week of your due date. • Your labor progresses slowly. • After 24 hours you develop a fever and get IV antibiotics. • You have a vaginal delivery. • You get to hold your baby immediately after delivery. • You do not have any complications. • After delivery your baby gets some antibiotics for infection. • You and your baby go home 72 hours after delivery.
Planned VD ending in VD with minor neonatal complications	• You go into labor within a week of your due date. • Your labor progresses as expected. • You give birth vaginally after 36 hours. • Your baby has a complication and has to stay in the hospital for an additional 4 days. There are not long term effects from the complication. • You go home 48 hours after delivery.
Planned VD ending in vacuum or forceps-assisted VD	• You go into labor within a week of your due date. • Your labor progresses as expected. • You push for 2 hours. • The baby is showing mild signs of not tolerating labor. • To deliver sooner, you deliver by a vacuum assisted vaginal delivery or a forceps assisted vaginal delivery. • Immediately after delivery, the pediatricians examine your baby in the labor room. After the exam, you get to hold your baby. • You do not have any complications. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery.
Planned VD ending in VD with 3rd or 4th degree perineal laceration	• You go into labor within a week of your due date. • Your labor progresses as expected. • You push for 3 hours. • You have a vaginal delivery. • You get a tear in the vagina and muscles around the anus from the delivery. It is repaired with stitches. • You get to hold your baby immediately after delivery. • Your baby does not have any complications. • You and your baby go home 48 hours after delivery. • The stitches in the vagina and anus take 6 weeks to heal completely. You have a lot of discomfort from the tear for the first 1-2 weeks but are able to resume your normal activities after 2 weeks. • You have a small increased chance of having fecal incontinence in the future.
Planned VD with cascade of interventions ending in VD	• You go into labor within a week of your due date. • You come to the hospital and are admitted into a labor room.

Absent Medical Indication Clinical Scenarios	
	• You can have as many family and friends as you want in the delivery room. • You get an IV and have a fetal heart rate monitor on your abdomen. • After several hours in the hospital, your labor stops progressing. • You get an IV medicine (Pitocin) to make your contractions stronger and more frequent. • After 24 hours of labor, you develop a fever. You are given IV antibiotics during the rest of delivery and receive one dose after delivery. • After 30 hours you are ready to push. You push for 2 hours. • The baby is showing mild signs of not tolerating labor. • To deliver sooner, you deliver by a vacuum assisted vaginal delivery or a forceps assisted vaginal delivery. • Immediately after delivery, the pediatricians examine your baby in the labor room. After the exam, you get to hold your baby. • You get a tear in the vagina and muscles around the anus from the delivery. It is repaired with stitches, this takes about 30 minutes. • Your baby does not have any complications. • Both you and your baby go home 48 hours after delivery. • The stitches in the vagina and anus take 6 weeks to heal completely. You have a lot of discomfort from the tear for the first 1-2 weeks but are able to resume your normal activities after 2 weeks. • As a result of the tear, you have a small increased chance of having fecal incontinence in the future.
Planned CD ending in CD with surgical complications	• You schedule a cesarean delivery. • You are able to tell your friends and family the exact date of delivery. • You have a planned cesarean delivery. • You are given spinal anesthesia for the delivery. • You have surgical complications. • During surgery, you have a large amount of blood loss and require a blood transfusion. • You have an injury to your bladder during surgery. You have to have a bladder catheter for one week after surgery. • Since your surgery is complicated and much longer than expected, the spinal anesthesia will not last long enough so you are given general anesthesia. Your surgery is 3 hours. • One day after surgery you get a fever and require IV antibiotics for 48 hours. • Three days after surgery, your surgical incision becomes infected and the skin opens up. You have to get daily wound care at home for six weeks. • You and your baby go home 6 days after delivery. • Your baby does not have any complications. • At home, you are recovering from surgery while you are taking care of your infant. • Full recovery from surgery takes between 2-6 weeks. • You will likely need to take pain medicine for 1-2 weeks. • You will not be able to lift heavy things or engage in vigorous physical activity for 4-6 weeks.

VD, vaginal delivery; CD, cesarean delivery

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Table 1

Sociodemographic and clinical characteristics of study population

Sociodemographic characteristics	**N (%)**
Age (mean, ±SD)	33.0 (±6.0)
Race/ethnicity	
African American	49 (20.5%)
Asian/Asian American	34 (14.2%)
Caucasian	133 (55.6%)
Latina	21 (8.8%)
Native American/Other	3 (1.3%)
College graduate	155 (64.9%)
Employed	140 (58.6%)
Household income >$100,000	107 (45.9%)
Married or living with partner	205 (85.4%)
Born in the United States	193 (80.4%)
Clinical characteristics	
Nulliparous	109 (45.4%)
Prior cesarean delivery	54 (22.5%)
Pre-pregnancy BMI (mean, ±SD)	26.3 (±5.9)
Clinical context*	
Prior cesarean delivery	41 (17.1%)
Twins	50 (20.8%)
Breech presentation	33 (13.8%)
Absent medical indication for cesarean	116 (48.3%)

SD, standard deviation; BMI, body mass index

*Participants were recruited to participate in one of four protocols that presented hypothetical outcomes of planned vaginal versus planned cesarean delivery specific to their clinical context: prior cesarean delivery, current twin gestation, breech presentation, or absent medical indication for cesarean delivery. Note that women were recruited for participation in a specific clinical context but may have had clinical histories making them eligible for participation in more than one context. For example, of the 54 women with prior cesarean deliveries, 41 participated in the prior cesarean delivery protocol, 4 in the twins protocol, 4 in the breech presentation protocol, and 5 in the absent medical indication protocol. All participants in the same protocol were provided the same set of clinical scenarios to evaluate, regardless of actual number of prior cesarean deliveries they had undergone.

Table 2

Stated preference for vaginal delivery and strength of this preference

	Prior Cesarean (n=41)	Twins (n=50)	Breech (n=33)	Absent Medical Indication (n=116)
Stated preference for vaginal delivery (n, %)	34 (82.9%)	44 (88.0%)	29 (87.9%)	111 (93.4%)
Strength of preference for spontaneous, uncomplicated vaginal delivery (mean, ± SD)*	0.592 ±0.369	0.634 ±0.266	0.596 ±0.342	0.749 ±0.279

SD, standard deviation

*Strength-of-preference score was generated using the standard gamble method, for participants with a stated preference for vaginal delivery. Participants were presented with the option of an uncomplicated scheduled cesarean delivery versus a gamble between a specified probability of an uneventful vaginal birth with no adverse outcomes to the mother or neonate (the ideal outcome) and the complementary probability of having the attempted vaginal birth end in a cesarean delivery (the undesirable outcome). Scores range from 0 (weakest preference for vaginal delivery) to 1 (strongest preference for vaginal delivery).

Table 3

Mean time tradeoff utilities for potential outcomes of planned vaginal and planned cesarean delivery*

Scenario†	Prior Cesarean n=41 mean (SD)	Twins n=50 mean (SD)	Breech n=33 mean (SD)	Absent Medical Indication n=116 mean (SD)
Planned VD ending in VD, no interventions or complications‡	0.998 (±0.007)	0.993 (±0.024)	0.998 (±0.007)	0.997 (±0.025)
Planned VD with induction at 39 weeks, ending in VD	0.986 (±0.041)			0.975 (±0.060)
Planned VD with augmentation using oxytocin, ending in VD	0.979 (±0.061)			0.958 (±0.113)
Planned VD with induction at 41 weeks, ending in CD	0.976 (±0.045)			0.952 (±0.088)
Planned CD ending in CD, no surgical complications	0.974 (±0.070)	0.933 (±0.134)	0.966 (±0.047)	0.957 (±0.090)
Planned VD ending in CD, no surgical complications	0.973 (±0.050)	0.934 (±0.112)	0.950 (±0.067)	0.961 (±0.069)
Planned VD with antibiotic administration during labor, ending in VD	0.972 (±0.064)			0.959 (±0.110)
Planned VD ending in VD with minor neonatal complications§	0.952 (±0.076)			0.929 (±0.135)
Planned VD ending in vacuum or forceps-assisted VD	0.946 (±0.092)	0.906 (±0.134)	0.953 (±0.055)	0.959 (±0.097)
Planned VD ending in VD with 3rd or 4th degree perineal laceration	0.944 (±0.084)			0.952 (±0.092)
Planned VD with cascade of interventions ending in VD**	0.939 (±0.096)			0.931 (±0.126)
Planned CD ending in CD with surgical complications	0.931 (±0.086)	0.874 (±0.208)	0.931 (±0.099)	0.923 (±0.108)
Planned VD ending in vertex VD of twin A and breech extraction of twin B		0.936 (±0.091)		
Planned VD ending in combined delivery (VD twin A and CD twin B)		0.918 (±0.144)		

SD, standard deviation; VD, vaginal delivery; CD, cesarean delivery

*Utilities are presented in order from highest to lowest scores for the prior cesarean context. Mean utilities are presented for both women who preferred CD and who preferred VD, with a similar scale regardless of preference. Women who preferred VD assigned a score of 1 to the “Planned VD ending in VD, no interventions or complications” scenario. Women who preferred CD assigned a score of 1 to the “Planned CD ending in CD, no surgical complications” scenario. Higher scores indicate the scenario is similar to the preferred delivery mode. Lower scores indicate a stronger desire to avoid the scenario.

†See Appendix for details of the clinical scenarios.

‡For twins, vertex deliveries of both twin A and B. For breech context, vaginal breech delivery.

§Delayed neonatal hospital discharge without long-term complications.

**Arrested labor, oxytocin augmentation, chorioamnionitis, antibiotic administration, prolonged second stage, operative vaginal delivery, third or fourth degree perineal laceration

Table 4

Mean time tradeoff utilities for rare but serious maternal and neonatal outcomes of planned vaginal delivery

Scenario	Prior Cesarean n=41 mean (SD)	Breech n=33 mean (SD)
Planned VD ending in uterine rupture, no infant complications	0.954 (±0.076)	
Planned VD ending in uterine rupture with surgical complications, no infant complications	0.906 (±0.111)	
Planned VD ending in uterine rupture with hysterectomy, no infant complications	0.878 (±0.125)	
Planned VD ending in uterine rupture with hysterectomy and severe infant complication	0.598 (±0.271)	
Planned VD ending in uterine rupture with severe infant complication	0.595 (±0.226)	
Planned VD ending in uterine rupture with hysterectomy and infant death	0.523 (±0.307)	
Planned VD ending in uterine rupture with infant death	0.506 (±0.298)	
Planned breech VD ending in breech VD with head entrapment, no infant complications		0.952 (±0.069)
Planned breech VD ending in breech VD with forceps and brachial plexus injury		0.924 (±0.108)
Planned breech VD ending in breech VD with head entrapment, Duhrssen incisions, no infant complications		0.914 (±0.109)
Planned breech CD ending in CD with hysterectomy, no infant complications		0.865 (±0.143)
Planned breech VD ending in breech VD with head entrapment, cerebral palsy		0.510 (±0.284)
Planned breech VD ending in breech VD with head entrapment, infant death		0.432 (±0.343)

SD, standard deviation; VD, vaginal delivery; CD, cesarean delivery