Quality Improvement Project: Introducing a Patient Decision Aid for Elective Induction of Labor at a Suburban Collaborative Practice

Margaret McGann

School of Nursing, Oregon Health and Science University

DNP 703B

March 6, 2023

Abstract

BACKGROUND: Recent research in the area of safety of elective inductions is changing the practice towards routinely offering elective induction of labor to patients. This has increased the need for shared decision-making discussions with patients, and evidence-based materials on the topic. There is currently only one published decision aid on this topic, and it has a focus on late term inductions. This quality improvement project was conducted at a collaborative practice at a suburban hospital in the Pacific Northwest with both midwives and physicians providing prenatal care to patients. This practice did not currently have a standardized strategy about offering elective induction to patients.

METHODS AND INTERVENTIONS: A literature review was conducted to create an evidence-based Patient Decision Aid. The format of the PDA was modified from a previous quality improvement project and adhered to international standards. It was distributed either in paper form or electronically to qualifying patients at 30 weeks of gestation or beyond by the provider. Providers then led a follow-up discussion based on the PDA at 32 weeks of gestation or beyond. The Plan Do Study Act method of quality improvement was used for implementation of the PDA. Patient chart reviews were conducted to determine the gestational age of receipt of the PDA and documented eIOL discussion, and the level of provider engagement per appointment.

RESULTS: The specific aim of creating an evidence-based PDA that satisfied provider desire for quality patient information was met. The project goal of 65% of qualified patients receiving the PDA by 37 weeks of gestation was not met; the rate was 56%. 89% of patients had a

documented eIOL discussion with their provider at some point in their pregnancy. The process goal of 75% of eligible patients receiving the PDA by the designated appointment was not met; the rate was 51%. Provider survey results and post-study data indicate PDA implementation was sustainable and that providers plan to continue PDA-based discussion at this practice, but that workflow modifications may be needed surrounding the distribution of PDA handouts.

CONCLUSIONS: Creation and implementation of a patient decision aid improved provider experience in shared decision-making about elective induction with patents. The project established baseline measures for frequency of eIOL discussions at this practice. Additional work is needed in establishing sustainable workflow practices, including timing of patients' discussions and distribution of PDA to patients.

Keywords: Elective induction of labor, patient decision aid, quality improvement

Problem Description

Induction of labor (IOL) has become a common obstetrical practice, with more than 31% of labors induced in 2020 in the United States (Osterman et al., 2021). A recent estimate is that one in ten inductions is performed without medical indication, also known as elective induction of labor (eIOL, Dögl et al., 2018). Despite the prevalence of these elective inductions, there is no standardized process regarding patient education and shared decision-making about eIOL among providers. A recent American College of Nurse-Midwives (ACNM) bulletin on IOL outlined the minimum requirements for a shared decision-making process to be achieved, including an assessment of the patient's desire and ability to make decisions, bidirectional communication between the client and health care provider, provision of current evidence-based information about the labor induction process, its risks and benefits, and practice-specific outcome statistics (*American College of Nurse-Midwives Clinical Bulletin Number 18*, 2022). This amount of information can be difficult to convey during a single visit and the discussion may depend on the provider's attitudes towards induction, the evolving evidence base, and the particulars of the IOL process at a specific practice (Declercq et al., 2020). Given these significant challenges, a well-designed and informative patient decision aid (PDA) would be of benefit to both provider and patient to help in shared decision-making regarding elective induction of labor (Say et al., 2011). Patient decision aids help patients make informed choices about their healthcare, taking into account their values and preferences as well as the evidence available and the individualized recommendations of their medical team (Stacey et al., 2017).

Previously, midwives in a practice at a teaching hospital in the Pacific Northwest developed and deployed a PDA on IOL in 2021 as part of a quality improvement project. Follow-

up surveys of the midwives found that use of the PDA was valuable, and the respondents noted that it helped patients clarify their values regarding delivery interventions. The current quality improvement project assessed the impact of an application of a revised version of the PDA in a suburban community hospital, where both midwives and obstetricians provide perinatal care via a collaborative practice model.

Available Knowledge

Induction of labor (IOL) is recommended for specific indications and risk factors, including for patients with post-term pregnancy and hypertension/preeclampsia, with significant evidence to support these recommendations (D. Coates et al., 2020). Recently, in a study known as the ARRIVE trial, Grobman et al. (2018) analyzed outcomes regarding the safety and benefits of elective IOL versus expectant management in low-risk nulliparous pregnant people in their 39th week of pregnancy across 41 hospitals. The primary outcome was a composite of severe neonatal complications including death; the secondary outcomes included cesarean delivery rate, gestational hypertension and preeclampsia, and other neonatal complications, including shoulder dystocia and admission to the neonatal intensive care unit. While there was no statistical difference between elective IOL and the expectant management group in the primary outcome, the researchers found that elective induction reduced overall cesarean delivery rates, from 22.2% to 18.6% (0RR = 0.84, 95% CI, 0.76-0.93), as well as gestational hypertension and preeclampsia (9.1% versus 14.1%, RR=0.64, 95%CI 0.56-0.74). While significant, the generalizability of these results to all pregnant people and providers remains to be seen, as the study population was young relative to national averages and nulliparous. Further, the expectant management group's

cesarean delivery rate was lower than the national average, yet higher than many midwifery practices. Additionally, the long-term consequences of eIOL, such as on breast-feeding or childhood development, remain to be determined. Despite these limitations, the ARRIVE study has become a sentinel study for elective IOL and from these data, clinical organizations made recommendations to offer elective IOL to low-risk nulliparous women at 39 weeks of gestation (American College of Obstetricians and Gynecologists, 2018; Society of Maternal-Fetal Medicine, 2019). When implemented in practice, these recommendations have the potential to substantially increase the number of inductions without medical indications. To that point, a recent analysis of the potential impact of this trial on practice suggests, through correlation analyses, that induction rates rose faster than previous trends and cesarean delivery rates declined, while there were no improvements and potentially a slight worsening of other maternal and neonatal outcomes (Gilroy et al., 2022). The ACNM has not changed their guidelines in favor of elective induction, but does support shared decision-making for IOL (*American College of Nurse-Midwives Clinical Bulletin Number 18*, 2022). In its guidance, ACOG also underscores the importance and necessity of an informed and value-based decision-making process for the induction of labor (*Clinical Guidance for Integration of the Findings of The ARRIVE Trial*, 2018 ; Christopher, 2018).

A lack of independent decision-making is a common theme among pregnant people, from the UK to Brazil to the US, who are often dissatisfied after their induction of labor experiences (Coates et al., 2019). For example, Dupont, et al., (2020) found that lack of involvement in the decision-making process for induction of labor significantly increased the likelihood of dissatisfaction in nulliparous French women (OR: 1.92, 95% CI [1.23; 3.02]). Furthermore, a meta-

analysis of post-term induction of labor experiences in the UK and Canada concluded that more information and discussion with providers was necessary for women to engage in shared decision-making and ultimately feel comfortable with their choices (Akuamoah-Boateng & Spencer, 2018). This conclusion is echoed by a psychological study from Australia that measured the effect of different levels of information and provider trust on informed decision-making outcomes during induction of labor (Stevens & Miller, 2012).

One tool that may enhance the ability of providers to implement a shared decision-making framework is the patient decision aid (PDA) (Légaré et al., 2018). Patient decision aids clarify the values of the patient in addition to providing information about the options and outcomes specific to the treatment or procedure. A systematic review has shown that use of PDAs is associated with greater knowledge of options, better accuracy of risk perception, and an increase in selecting the option that best aligned with a patient's values (Stacey et al., 2017). Yet a search of the published literature including the term "decision aid" and the MeSH term "labor, induced" resulted in only three studies, none of which contained a PDA as described by the International Patient Decision Aids Standards (*International Patient Decision Aids Standards (IPDAS) Collaboration*, 2022). There is a recently released PDA in the Patient Decision Aid inventory maintained by Ottawa Hospital that directly addresses elective induction of labor; this PDA provides quality information about what to expect with elective induction, but is focused on elective induction at 41 weeks of gestation or beyond and provides limited information on risks associated with continuing pregnancy (Peralta, 2022).

Patient decision aids can allow a wide range of practitioners to present a consistent and unified framework guiding the discussion of specific procedures, risks, and alternatives (Bentley

et al., 2014). A recent meta-analysis from six western countries suggests that, in general, obstetricians and midwives historically have different views on labor management, with midwives emphasizing physiologic birth and obstetricians emphasizing medical interventions aimed at risk reduction (Healy et al., 2016). For induction of labor, this has led to divergent opinions about when and for which indications an induction should be recommended, particularly at 39 weeks of gestation for pregnant people with no complications (American College of Nurse-Midwives et al., 2022). However, a collaborative practice with both midwives and obstetricians has the potential to combine the best aspects of each discipline to the advantage of the patient (Caughey, 2015). True collaboration results in an environment in which the disciplines share responsibilities and value each other's contributions to patient care. Critical to the establishment and success of collaborative practices is the use of clear procedures and guidelines (Smith, 2015). For induction of labor, establishing the workflow for distribution and discussion with a PDA , including the associated training for its use, could provide one such shared procedure.

Rationale

This project was guided by the Model for Improvement (MFI) developed at the Institute for Healthcare Improvement. The MFI is a process to set aims, establish measures, and select changes to implement, which can then be tested using a series of Plan-Do-Study-Act (PDSA) cycles (Langley et al., 2009). When used in the healthcare setting, this methodology leads to quality improvements and enhanced patient outcomes (Knudsen et al., 2019). Iterative PDSA cycles were useful for this project to enable nimble implementation and changes to procedures,

especially in a new organization undergoing change. Discussions with the practice manager revealed a lack of formalized processes regarding IOL discussions between providers and patients at the study site. In general, there were a limited number of patient education materials present on site, and those that exist were being used at the discretion of individual providers.

This project sought to improve patient-centered care for IOL. This is one of the six domains of health care quality identified by the Institute of Medicine. Patient-centered care requires that the needs, values, and preferences of the patient are respected and guide all clinical decisions (Institute of Medicine (US) Committee on Quality of Health Care in America, 2001). One essential dimension of patient-centered care is shared decision-making, a collaborative process where the provider solicits the patient to explore their values, knowledge, and experiences in order to make an informed choice (Barry & Edgman-Levitan, 2012). This process is also at the core of midwifery in the United States and is explicitly recommended for IOL decisions (American College of Nurse-Midwives et al., 2022).

Patient decision aids are specifically designed to facilitate and formalize a discussion of values, as well as provide evidence-based information about risks and alternatives (Stacey et al., 2017). Shared decision-making with use of a PDA has been shown to expand patient knowledge of procedural risks and benefits and increase patient satisfaction, reduce patient anxiety and decisional conflict, and decrease medical costs (Say et al., 2011 ; Pope, 2017). Therefore, implementation of a PDA was chosen to improve the quality and consistency of shared decision-making at the practice. Consistent use of the PDA aimed to provide a systematic framework for patients to share their values and inform a shared decision-making discussion at a standardized gestational age.

Specific Aims

The aims for the QI project were to modify and implement a PDA on elective IOL to improve patient-centered care and to standardize the framework and timing of IOL discussions at a suburban community hospital practice.

The aim for the PDA materials was the creation of an evidence-based PDA that meets international standards and is satisfactory and useful for both midwives and physicians at the practice.

Aims for implementation of the newly developed PDA were that by the end of December 2022, 75% of clinic patients would receive the PDA at their 34 weeks of gestation appointment, and 65% would have a documented follow-up discussion by their 36 weeks of gestation appointment.

Context

This improvement project took place in a collaborative practice in a mid-sized community hospital in the Pacific Northwest that had been established in the last two years. The practice had 5.0 Full Time Employees (FTE) of clinical midwives. There were four midwives at this practice full time, four part-time, and several others that took call on the labor and delivery unit as well. In addition, there was a midwifery practice manager with 0.3 FTE. The clinic also had 5 OB/GYN physicians that saw pregnant patients in the clinic and a physician practice manager.

As a newly formed practice, the practice managers were working on a number of simultaneous revisions to practice workflow and the creation of practice guidelines. Several of

these practice workflow adjustments that were concurrent to this project included the patient visit cadence, the templates for OB visit notes, and the introduction of a pregnancy checklist.

The specific rates for number of births, IOL rates, and cesarean delivery rates for this practice were unavailable. The practice did not collect benchmarking data at this time, and several practices' numbers were included in the accessible hospital-wide data. There was also no baseline information regarding how often and when providers have discussions about elective IOL with patients nor whether these discussions met the standards for shared decision-making.

Based on hospital nursing resources, the practice was only able to schedule approximately one induction per day on the birthing unit. Information about how or whether this constraint was limiting elective inductions was not available at the time of the study.

The racial demographics of the patient population served by the clinic (N=2,521) in 2021 were as follows: 77.5% white, 1.4% American Indian/Alaska Native, 5.8% Asian, 2.6% Black, 0.08% Native Hawaiian, 0.5% Other Pacific Islander, (9.7% declined to disclose race). 26.3% patients identified as Hispanic; primary or preferred language data was not available. The practice accepted a variety of insurances, and there was a fairly even split between patients who had private insurance and Medicaid (47.16% and 44.36%, respectively).

At this practice, patients may alternate between midwives and physicians during antepartum care, which is the nature of this collaborative practice model. In practice, the timing, duration, depth, and approach of a discussion regarding induction of labor was up to each provider to determine, and the clinic did not have any written patient material on IOL. There was variation among providers about their own biases related to offering a healthy pregnancy patient eIOL. The providers expressed an interest in creating a more standardized approach.

Interventions

A PDA for eIOL developed for another local practice's quality improvement project (Appendix A) was modified for this current project with feedback from midwife and obstetric providers via an electronic survey (Appendix B). The survey asked about recommended gestational age for PDA distribution and IOL discussion. A literature review was conducted to create an evidence-based explanation of benefits or issues with either choice. Modifications to the PDA adhered to International PDA Society (IPDAS) standards, retained direct quotes from parents who were induced, and included a series of clarifying questions about patient values about birth using a Likert-like scale to record preference.

After the content of the PDA was finalized, the practice clinicians received a short educational training about how to use the PDA and office workflow prior to the first Plan-Do-Study-Act (PDSA) cycle in which they were to take part. Practice midwives participated in all three cycles, physicians in cycles 2 and 3.

The implementation occurred over two separate visits, creating a two-step process with the intention of allowing patients time to reflect on their values as they relate to inductions and discuss with partners and other support people if desired. Eligible patients were those who were appropriate for a vaginal delivery, without medical indications for induction prior to 39 weeks of gestation. The gestational age for PDA distribution was selected to be 30-34 weeks based on the results of the provider survey. Then, discussion of induction using the PDA, with guidance from the patient's responses, was to be carried out at a subsequent visit. If the patient was beyond 34 weeks of gestation, handout and discussion could be combined into one visit.

In the first two cycles, providers were sent email reminders by the doctoral student prior to each clinic day, listing patients who were 30 weeks of gestation or beyond, and suggesting if the were eligible for a handout of discussion about eIOL. In the third cycle, the providers were responsible for identifying eligible patients themselves. Documentation was completed using both the patient "pink sticky" (a commenting tool within EPIC) and the patient notes in the electronic health record. Providers used the "IOL PDA Given" dot phrase (a documentation template for electronic health records) in the patient note to document receipt of the PDA. On a subsequent visit, providers were to discuss the PDA with patients who had received the PDA and were still candidates for elective inductions, documenting the discussion with the "IOL PDA Discussed" dot phrase.

Patient chart review was conducted to determine the number of patients receiving the PDA and engaging in a discussion about induction. Patient discussion counts were based on use of the pink sticky, documentation of eIOL discussion in the patient note, or documentation in the pregnancy checklist. Implementation of other workflow modifications during the study period required an expansion of data collection types. Collection included anonymized data of (Appendix D).

The project was conducted from October - December 2022 in three PDSA cycles. The first cycle was ten clinic days; the second and third cycle were thirteen clinic days. A provider survey was sent between the first and second cycle soliciting information on the PDA and workflow. In January of 2023, a final survey was distributed to the participating providers for individual, anonymous feedback on the workflow, content and satisfaction with the PDA.

Study of the Intervention

As part of each PDSA cycle, the fidelity of implementation was evaluated by tabulating the number of appointments at which an eligible patient received the PDA and/or had a discussion of IOL with their provider. Since PDA-guided discussions of eIOL are completely new to this practice, the outcomes measured were taken to be due to the intervention alone. Barriers to implementation were assessed from responses to follow-up emails and addressed in subsequent cycles. Provider satisfaction was assessed at the end of the project to identify obstacles and advantages of the workflow.

Measures

The primary outcome measurement was percentage of distinct eligible and distinct patients that had an OL discussion guided by the PDA by their 36th week of gestation appointment (measured at <37 weeks of gestation). The total number of eligible patients who received the PDA at any point in their pregnancy was also measured, categorized by gestational age and whether the IOL discussion occurred at the same visit or subsequent visits.

There were three process measures. The first process measure was the percent of eligible patients that received the PDA by their 34-week appointment (measured at <35 weeks of gestation). The second measured provider engagement with the PDA handouts by appointment, by tabulating whether or not a provider gave a patient a PDA handout at an appointment in which they were eligible to receive it. The third process measured provider engagement with an eIOL discussion with patients guided by the handout, similarly tabulated per eligible appointment. These second and third measures used the number of eligible appointments as the

denominator, rather than the number of patients. The use of appointment-based data allows for analysis within and across PDSA cycles. All quantitative data was obtained by chart review in EPIC.

Feedback was solicited through email, informal interviews, and performed post-cycle and final surveys with staff. This qualitative data were also used to assess barriers to implementation including the two-step workflow (PDA handout and follow-up discussion), or time issues that arose. These data were also used to evaluate issues surrounding the documentation procedures and the content of the written PDA.

Analysis

For the data regarding PDA content and timing, both qualitative and quantitative analyses were performed. Qualitative analyses were used to revise the PDA content and determine patient eligibility. Formal qualitative analyses of personal correspondence and survey data was limited by the small number of responses, but still allowed for identification of some barriers to implementation.

Quantitative analysis of the outcome and process measures was performed in Rstudio using tidyverse package and Microsoft Excel. Distinct patient data were evaluated longitudinally over the course of the project; appointment data were tabulated by date and analyzed by PDSA cycle. Data collected in the chart review process allowed further analyses of ineligible patients, primary language, provider type, and advanced maternal age.

Ethical Considerations

One ethical consideration was the opportunity cost during the appointment, for both provider and patient, to discuss other issues than possible IOL, or whether appointments were longer to accommodate the discussions. This consideration is intertwined with respect for clinician independence and judgement. It is critical for providers, within the guidelines of their profession, to have the freedom to determine their own method of patient care, and the tools available to the provider must be designed to work for a broad range of users. The PDA is meant primarily for the patient to have more information about IOL and to help incorporate their own values into the shared decision-making process, not as a prescriptive document that the provider must follow. Providers were given opportunities to provide input into the content, timing, and workflow of the interventions, both formally and informally.

From a patient perspective, there can be such a thing as too much information, and it was important that the PDA and IOL discussion not come at the expense of patient satisfaction. Stacey, et al., (2017) have shown that PDA use has no negative effects on patient satisfaction or health outcomes.

The limitation for scheduled inductions in the hospital to one per day may have meant that not all patients would be able to get an elective induction at the time they desired. This could have created potential disappointment with or loss of trust in the medical team or process. Any scarcity issues for desired inductions also had the potential to create inequities. This concern was expressed by many providers at the outset of the project, but no feedback was received that this was an issue throughout the duration of the project.

An additional ethical consideration is that the PDA was only provided in English and no other languages. This excluded speakers of other languages from being able to use the document.

The frequency with which this was an issue was recorded in the distinct patient data and can be used to inform further improvement of the PDA. Patient data was collected solely for the purpose of quality improvement and this study was determined to not involve human subjects by the institution's Research Integrity Office and Institutional Review Board (IRB).

Results

Quantitative results for this project show that over the course of the project, 83 distinct patients of greater than 30 weeks of gestation were documented over 238 appointments. Of these, 55 were eligible for elective induction at some point during the project duration, and 33 patients were ineligible at some point (5 changed eligibility status over the course of the project). The primary quantitative outcome measure is illustrated in Figures 1 and 2. These show that 29 of 52 (56%) patients who were eligible by their 36-week appointment had the EIOL discussion, which was 9% below the aim of 65%. Yet Figure 1 also shows those numbers increased with gestational age, and that 88% of patients eligible for eIOL discussion had one at some point in their pregnancy. The gestational age distribution data in Figure 2 is bimodal, with the first mode centered at the 34th week of gestation appointment

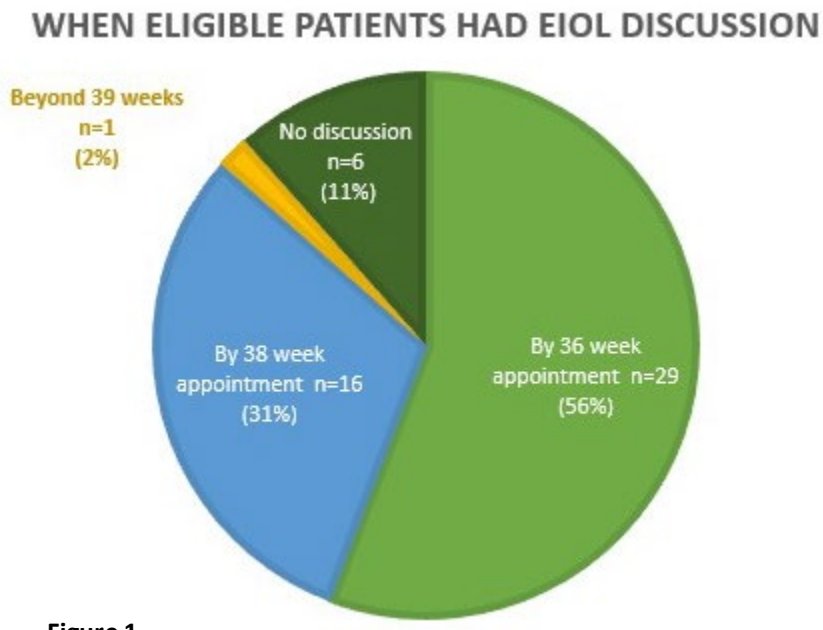


Figure 1.

that matches the target gestational age for the project, and a second mode at the 38th week of gestation.

Process measures are captured in Figures 3-5. Figure 3 shows the patient-based process measure of number of eligible patients to whom a PDA handout was given. It presents a similar picture to the discussion analysis (Figure 1), but with a smaller percentage of patients meeting the gestational age goals. The aims of the project assumed that PDA handout levels would be higher than discussion levels, yet the opposite was observed, and there was a larger gap between aims and results for PDA handouts, with a 24% difference.

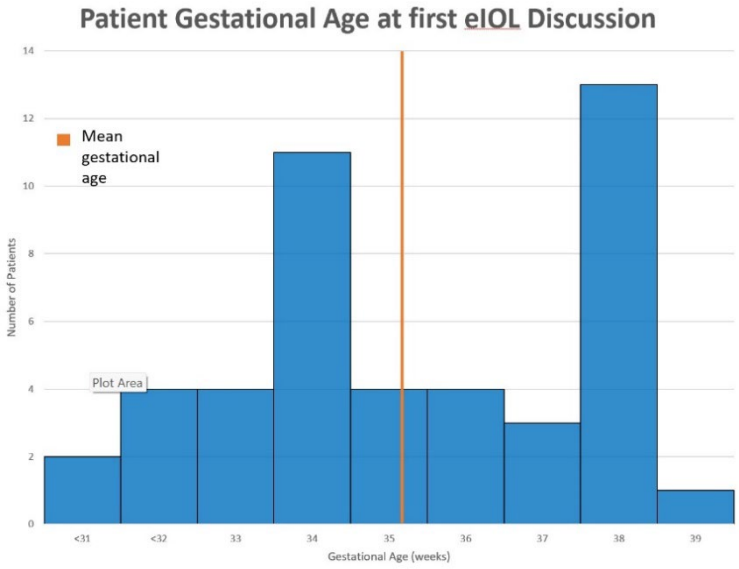


Figure 2.

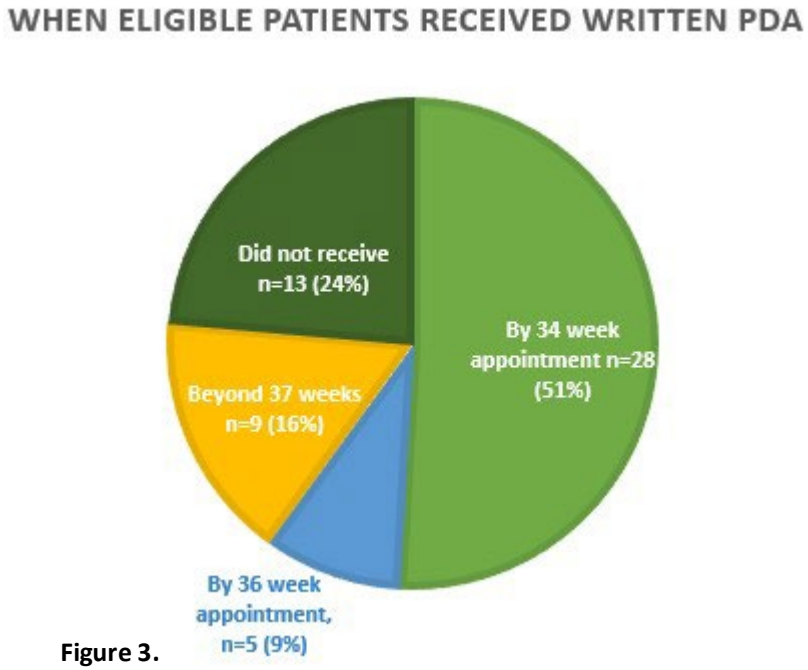
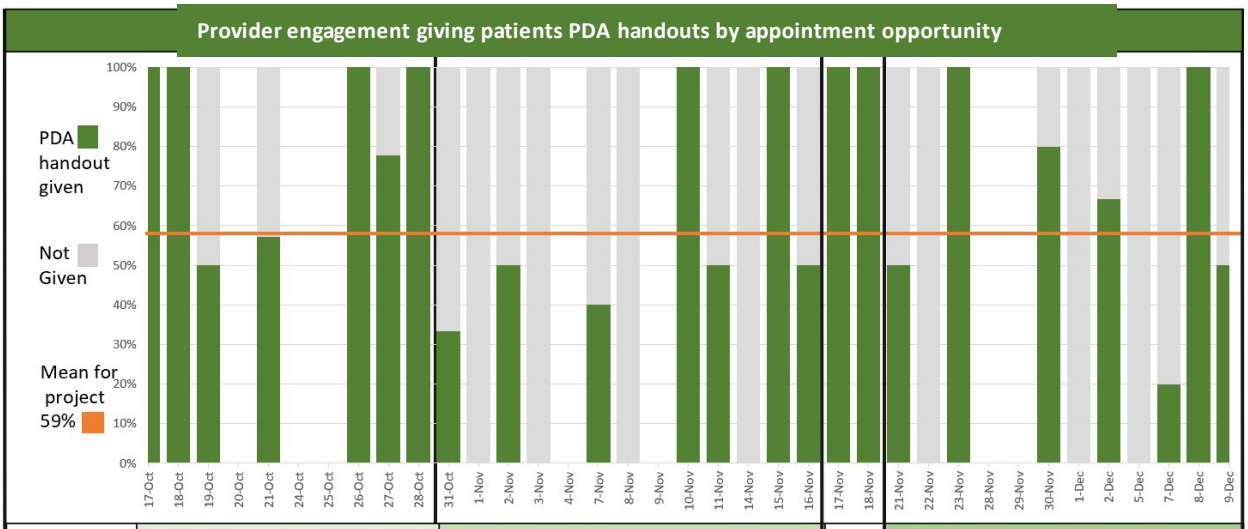


Figure 3.

The results for provider engagement by appointment opportunity are shown in Figures 4 and 5. There were 227 total appointments for patients in the appropriate gestational age range during this project. Provider type data was collected, as adding more providers and provider types were part of the changes made between cycles. The count by provider showed that physicians had a slightly higher rate of engagement in eIOL discussion and a lower rate of documented PDA handouts given, but their overall counts were less than one quarter of the data in all categories. This demonstrates that the quality improvement project was largely measuring midwife engagement.

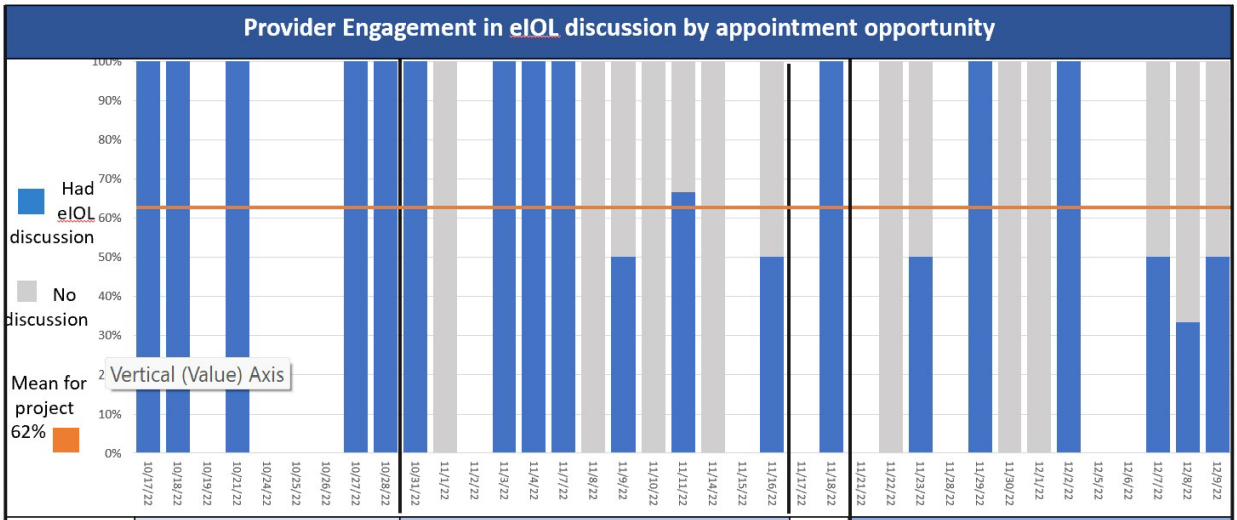
No project-specific target rates were specified for these process measures. Informally, there was an aim to maintain or increase engagement between first and second cycles and maintain that level without reminders in the third cycle for the PDA handouts. Data for the handouts given by appointment opportunity (Figure 4) show that the engagement did hold



PDSA Cycle	1) Begin with Midwives only and daily reminders	2) Physicians begin engagement. All providers participating with reminders	3) All Providers, no daily reminders sent.
Midwives	21/29	8/18	8/20
Physicians	NA	3/5	0/2
Total	21/29	11/23	12/23
Percent	72.4%	47.8%	52.2%

Figure 4.

steady without reminders in the third cycle, at about half of appointments, but well below the first cycle. For the eIOL discussion by appointment, the first cycle helped establish the workflow, and while there was 100% engagement, the counts are low because of the nature of the two-step process of this workflow. Engagement did drop without reminders between the



PDSA Cycle	1) Begin with Midwives only and daily reminders	2) Physicians begin engagement. All providers participating with reminders		3) All Providers, no daily reminders sent.
Midwives	8/8	9/14		8/20
Physicians	NA	4/6		2/2
Total	8/8	13/20		10/22
Percent	100%	65%		45%

Figure 5.

second and third cycle. The 45% engagement of the third cycle suggests that it would take just over two appointments on average before a provider engages with an eligible patient.

There is not a benchmark to determine if this engagement level is sufficient. But the relatively small subset of data collected for patients who had entered eligibility before the end of the project showed that 11 out of 12 (92%) went on to have an eIOL discussion at some point in their pregnancy (Supplemental Figure 1). This suggests that a 45% engagement rate may be sufficient to achieve the primary outcome aim of patient discussions for all eligible patients.

The results of Supplemental Figure 2 demonstrate that 24% of patients (11/46) who had a discussion about eIOL needed at least two appointments with a provider to come to a decision about their labor preferences. This reinforces the importance of creating a practice workflow that starts early enough to allow for providers to engage in the discussion in a timely manner. This figure also provides some baseline data for patient preferences at this practice.

Qualitative results collected through personal communications and provider surveys yielded almost exclusively positive comments about the content of the handout, describing it as useful. The most positive comments were about the section of the PDA dedicated to explaining induction, rather than the decision-making sections. Providers noted, "It describes things in a simple way," and said the patient "felt informed… and supported with information." Furthermore, they felt patients were more prepared for induction when they arrived to give birth. Through personal communications, providers also said they gave out the PDA to patients who were not elective induction patients, because the explanation of induction section was valuable to all patients eligible for vaginal birth. In this project, 18 patients (21% of total patients, 55% of ineligible patients, Supplemental Figure 3) were categorized as ineligible because they were to be medically induced, suggesting a significant population could utilize a PDA resource on medically indicated IOL.

In both the post-PDSA Cycle 1 survey and final survey, no modifications were suggested to the content. One personal communication did suggest that eligibility requirements might be added to the handout, and another stated some patients felt the discussion, but not necessarily the handout, was encouraging the choice to have elective induction.

The qualitative results regarding workflow from both the initial survey and personal communication showed that providers were unsure about the two-step process of giving a handout at one visit and discussing it at a following visit, even from the outset of the project. This continued to be an issue to the end of the project. After the Cycle 1 survey, providers asked for more workflow reminders. At the end, some providers who had initially been unsure reported that the two-step process was working. Two of four respondents of the final survey said they thought the workflow was sustainable, while another found it difficult, the fourth did not answer this question.

Providers generally reported that they plan to continue using the PDA in the future. On a 1-5 scale of how likely they were to use the PDA again, the mean and median were 4 ("Very likely"). One provider reported they would prefer not to continue to offer elective induction to all patients. One provider communicated that this project made them "come around" to offering elective induction and they plan to continue it with all eligible patients. Providers did not have a strong interest in more training on PDAs or shared decision-making, with all respondents noting "maybe" for future training in these areas.

Summary

The project achieved the specific aim of developing a patient decision aid that was satisfactory to both midwives and physicians. The PDA was a great strength of the project. It was well received, with the main feedback being a desire to expand its use to patients with medical indications for induction.

The specific aim of 65% of patients having a documented PDA-guided discussion by their 36-week appointment was not achieved, though the 59% achieved was close. Furthermore, the fact that 88% had a discussion by their 38-week appointment shows providers did engage with the project and materials with most patients at some point in their pregnancy. The stated intent to continue discussions with the PDA, and the early evidence that providers were doing so after the 3rd PDSA cycle, suggests the general outline of PDA-based discussions is welcome and potentially sustainable at this practice.

The success of the two-step workflow and documentation was ambiguous both in qualitative and quantitative data. Concurrent practice improvements or the novelty of the approach may have impacted results. Implementation of the project at a practice with stronger existing workflow practices, or reimplementation at this practice when it is more established may have stronger results.

Interpretation

The results of the primary quantitative outcome showed that a large majority of patients were engaged in discussions of eIOL during their pregnancy, throughout this project and beyond. The goal of reaching 65% of patients by their 36-week appointment may not have been an appropriate target, since there were no baseline data. The data distribution largely shows success in reaching the gestational goal, showing a concentration around 35-36 weeks of gestation, and taken with the overall discussion rate, largely shows success in the outcome aims.

Discussions of eIOL after 37 weeks of gestation were primarily due to missed opportunities. But analysis also showed that some of these patients had discussion after 37

weeks of gestation because it was the first opportunity to engage them that occurred during the project. The skew towards later discussions may reflect increased frequency of appointments later in pregnancy, which meant that patients had more opportunities for both the handout and the discussion in later weeks. Another possibility could be preexisting provider preference or habit for the timing of eIOL discussions, or possibly an indication of workflow challenges.

The workflow process measures and impact of different PDSA cycles were tracked using appointment data (not individual patients), using the process measures of number of handouts given and completed discussions when a patient was eligible. As expected, the engagement rate per appointment is lower than the final per-patient rate because the project was designed so that patients had multiple opportunities for discussion.

The results for these process measures are difficult to evaluate as a baseline goal was not set. This project was set up with the intention of having several appointment opportunities per patient, but the frequency of patient visits was in flux as the project was being developed and there were no data on the no-show rate, which made it hard to establish the rate of engagement per appointment to achieve the eIOL discussion goals. These data can serve to help establish a baseline for that relationship.

Evaluation of the appointments-needed-to-engage ratio, combined with the information that a portion of patients will need more than one visit to decide on their labor plan, provide useful information for this practice (and potentially others) to modify their workflow to begin the shared decision-making process at an earlier gestational age. The early success in the first PDSA cycle indicates the practice may be able to achieve more engagement per appointment if the workflow is optimized.

For the PDA handouts, a higher percentage of patients had an eIOL discussion documented than documented receipt of the PDA at any time in their pregnancy (88% vs. 76%). This was opposite of the expected outcome, which supposed that there would be a reduction in discussions relative to handouts due to lack of follow-up. Results also showed that ~50% of patients who had the discussion received the PDA on the same visit. Some of this may be due to later-term patients in Cycle 1 needing both before their 38th week appointment, or to catch-up after missed opportunities. But taken together, these results may be the clearest quantitative indications that the two-step process was not well-established during the time of this project. Concurrent clinic workflow changes may have also impacted documentation of patient handouts. The provider responses in the final survey also contribute doubt towards this workflow.

The ambiguity of the workflow results may also be related to the overall run time of this QI project. The high rate of PDA handouts given the same visit as the discussion, the later gestational age that the handouts and discussions occurred, and the fact that the withdrawal of daily reminders correlated with less provider engagement, suggests that longer cycles may be needed to see clear results and establish workflow habits. Longer run time would allow for the ability to see changes in the patient eIOL discussion rates over time.

Despite the issues with workflow, the impact on people and systems was positive. From the providers' perspectives, the PDA was a beneficial resource and the implementation of the PDA handout and discussion led to patients being ready for an induction when it was decided on. There were no reports from providers that the discussions took away from other patient needs, or extended appointment times. In fact, the feedback that patients were increasingly prepared

for induction when they arrived for labor could reduce the time needed for education in the intrapartum setting.

Limitations

This project was only conducted at a single site and its generalizability may be limited for other patient populations. The setting of a collaborative practice with several provider types could potentially impact generalizability. The physicians only had a small number of observations involving eligible patients throughout, so physician rates might not have significance.

Two limitations of the PDA materials themselves were language, and the lack of patient input on the content. Due to the iterative nature of the project, the initial goal of getting the PDA translated into Spanish was not achieved in time. However, this only seems to have a minor impact as 3 eligible patients were affected (Supplemental Figure 4).

Workflow-centered limitations were that the practice was engaging in other improvements at the same time. These included a change in the low-risk patient visit schedule, and the adoption of a pregnancy checklist. The pregnancy checklist offered a competing workflow for documentation, and in Cycle 3 there may have been some ambiguity in how best to document eIOL discussions.

A limitation in the original design was the primary outcome measure was longitudinal based on the patient engagement with the PDA. This meant the primary outcome measures could not necessarily be assessed during each PDSA cycle, as their engagement usually spanned cycles. This was to some degree offset by the process measures, which were able to capture handouts given and discussions per day for each PDSA cycle.

Conclusions

This project sought to improve the quality of understanding, and increase the number of shared decision-making discussions, regarding elective induction of labor at a collaborative practice. From the provider perspective, these goals were achieved by implementing the PDA as described, leading to increased patient knowledge and value-based discussions when considering eIOL. To further increase the reach and utility of this resource, several directions suggest themselves. First could be dividing the PDA into two versions, one that is an explanation of induction of labor that can be used by all induction-eligible patients (medical or elective) and a second value-based version that assists in the choice of elective induction. Second, the use of the PDA can be exported to additional locations or practice types (such as Family Medicine), especially within the same parent health system. Third, various translations could be made that would expand the reach of this resource to non-English speaking patients. Combined, these directions could fill gaps in patient knowledge that are persistently observed in the literature (D. Coates et al., 2021).

Modifications might be made to the workflow to make it more useful or sustainable, depending on the particular practice and its patient population. This workflow required actions at two separate appointments and thus may be overly complicated for some situations. In fact, two of the final survey respondents and some personal communications indicated that this was a challenge during this project. Potential solutions to this issue are to increase the training and education about the PDA workflow, allow more time to get used to the procedure, or compress the process into a single visit. Creating an environment that is conducive to shared decision-

making will require additional optimization and training, though what those training programs should include is still very much a matter for debate (Légaré et al., 2013).

This practice is planning to continue to use the PDA by putting it into their electronic patient education materials that all patients receive. They also plan to document labor method preferences using the pregnancy checklist. Yet these methods will not necessarily trigger reminders to discuss the PDA, nor specify when discussions should occur. Thus, this practice will need to create a workflow that ensures all patients have been notified of the information and given the opportunity to discuss eIOL. This study suggests that multiple opportunities may be required for patient and provider to do so, and therefore, next steps could also include coming to a consensus on the gestational age by which they expect to begin the PDA process. These steps will hopefully create equity across the patient population and a cleaner workflow that will allow these discussions to happen seamlessly, regardless of the type of provider seen or other factors.

This PDA has the potential to be submitted to the Ottawa Hospital directory for circulation as patient education material worldwide (Ottawa Hospital Research Institute, 2019). This could allow for a widespread increase of evidence-based shared decision-making for eIOL. Because eIOL is a very active area of research, the PDA should also be released in a modifiable version, so that new research can be incorporated and practice-specific information data may be included.

While results from the provider surveys focused on the usefulness of the information contained in the PDA, the utility of the decision-making portion may be better assessed from the patient perspective. To fully assess the PDA as a tool, it would be valuable to perform further studies on patient-centered outcomes of PDA-guided discussions (i.e., feeling informed or satisfied). Similar studies (Simpson et al., 2010) have shown significant improvements in these

measures when patients attended childbirth classes that covered similar information as the PDA developed here. Patient-centered studies could also indicate how well providers are adhering to the guidelines for shared decision-making discussions, such as those suggested by the ACNM (*American College of Nurse-Midwives Clinical Bulletin Number 18*, 2022).

References

Akuamoah-Boateng, J., & Spencer, R. (2018). Woman-centered care: Women's experiences and perceptions of induction of labor for uncomplicated post-term pregnancy: A systematic review of qualitative evidence. *Midwifery*, *67*, 46–56. https://doi.org/10.1016/j.midw.2018.08.018

American College of Nurse-Midwives, Carlson, N. S., Dunn Amore, A., Ellis, J. A., Page, K., & Schafer, R. (2022). American College of Nurse-Midwives Clinical Bulletin Number 18: Induction of Labor. *Journal of Midwifery & Women's Health*, *67*(1), 140–149. https://doi.org/10.1111/jmwh.13337

American College of Nurse-Midwives Clinical Bulletin Number 18: Induction of Labor. (2022). https://doi.org/10.1111/jmwh.13337

American College of Obstetricians and Gynecologists. (2018). *Clinical Guidance for Integration of the Findings of The ARRIVE Trial: Labor Induction Versus Expectant Management in Low-Risk Nulliparous Women*. American College of Obstetricians and Gynecologists. https://www.acog.org/en/clinical/clinical-guidance/practice-advisory/articles/2018/08/clinical-guidance-for-integration-of-the-findings-of-the-arrive-trial

Barry, M. J., & Edgman-Levitan, S. (2012). Shared decision making—Pinnacle of patient-centered care. *The New England Journal of Medicine*, *366*(9), 780–781. https://doi.org/10.1056/NEJMp1109283

Bentley, K. J., Price, S. K., & Cummings, C. R. (2014). A psychiatric medication decision support guide for social work practice with pregnant and postpartum women. *Social Work*, *59*(4), 303–313. https://doi.org/10.1093/sw/swu039

Caughey, A. B. (2015). Midwife and obstetrician collaborative care: The whole is better than the parts. *Journal of Midwifery & Women's Health*, *60*(2), 120–121. https://doi.org/10.1111/jmwh.12302

Christopher, M. (2018, August 9). *ACNM Responds to Release of ARRIVE Trial Study Results*. https://www.midwife.org/ACNM-Responds-to-Release-of-ARRIVE-Trial-Study-Results

Clinical Guidance for Integration of the Findings of The ARRIVE Trial: Labor Induction Versus Expectant Management in Low-Risk Nulliparous Women. (2018, August). https://www.acog.org/en/clinical/clinical-guidance/practice-advisory/articles/2018/08/clinical-guidance-for-integration-of-the-findings-of-the-arrive-trial

Coates, D., Donnolley, N., Foureur, M., Thirukumar, P., & Henry, A. (2021). Factors associated with women's birth beliefs and experiences of decision-making in the context of planned birth: A survey study. *Midwifery*, *96*, 102944. https://doi.org/10.1016/j.midw.2021.102944

Coates, D., Makris, A., Catling, C., Henry, A., Scarf, V., Watts, N., Fox, D., Thirukumar, P., Wong, V., Russell, H., & Homer, C. (2020). A systematic scoping review of clinical indications for

induction of labour. *PloS One*, *15*(1), e0228196. https://doi.org/10.1371/journal.pone.0228196

Coates, R., Cupples, G., Scamell, A., & McCourt, C. (2019). Women's experiences of induction of labour: Qualitative systematic review and thematic synthesis. *Midwifery*, *69*, 17–28. https://doi.org/10.1016/j.midw.2018.10.013

Declercq, E., Belanoff, C., & Iverson, R. (2020). Maternal perceptions of the experience of attempted labor induction and medically elective inductions: Analysis of survey results from listening to mothers in California. *BMC Pregnancy and Childbirth*, *20*(1), 458. https://doi.org/10.1186/s12884-020-03137-x

Dögl, M., Romundstad, P., Berntzen, L. D., Fremgaarden, O. C., Kirial, K., Kjøllesdal, A. M., Nygaard, B. S., Robberstad, L., Steen, T., Tappert, C., Torkildsen, C. F., Vaernesbranden, M. R., Vietheer, A., & Heimstad, R. (2018). Elective induction of labor: A prospective observational study. *PloS One*, *13*(11), e0208098. https://doi.org/10.1371/journal.pone.0208098

Dupont, C., Blanc-Petitjean, P., Cortet, M., Gaucher, L., Salomé, M., Carbonne, B., & Ray, C. L. (2020). Dissatisfaction of women with induction of labour according to parity: Results of a population-based cohort study. *Midwifery*, *84*, 102663. https://doi.org/10.1016/j.midw.2020.102663

Gilroy, L., McLaren, R., Minkoff, H., & Al-Kouatly, H. B. (2022). Changes in obstetric practice in low-risk nulliparous women following publication of the ARRIVE trial. *American Journal of Obstetrics & Gynecology*, *226*(1), S84. https://doi.org/10.1016/j.ajog.2021.11.156

Healy, S., Humphreys, E., & Kennedy, C. (2016). Midwives' and obstetricians' perceptions of risk and its impact on clinical practice and decision-making in labour: An integrative review. *Women and Birth*, *29*(2), 107–116. https://doi.org/10.1016/j.wombi.2015.08.010

Institute of Medicine (US) Committee on Quality of Health Care in America. (2001). *Crossing the Quality Chasm: A New Health System for the 21st Century*. National Academies Press (US). http://www.ncbi.nlm.nih.gov/books/NBK222274/

International Patient Decision Aids Standards (IPDAS) Collaboration. (2022, January 18). http://www.ipdas.ohri.ca/using.html

Knudsen, S. V., Laursen, H. V. B., Johnsen, S. P., Bartels, P. D., Ehlers, L. H., & Mainz, J. (2019). Can quality improvement improve the quality of care? A systematic review of reported effects and methodological rigor in plan-do-study-act projects. *BMC Health Services Research*, *19*(1), 683. https://doi.org/10.1186/s12913-019-4482-6

Langley, G. J., Moen, R. D., Nolan, K. M., Nolan, T. W., Norman, C. L., & Provost, L. P. (2009). *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance* (2nd edition). Jossey-Bass.

Légaré, F., Adekpedjou, R., Stacey, D., Turcotte, S., Kryworuchko, J., Graham, I. D., Lyddiatt, A., Politi, M. C., Thomson, R., Elwyn, G., & Donner-Banzhoff, N. (2018). Interventions for increasing the use of shared decision making by healthcare professionals. *Cochrane Database of Systematic Reviews*, *7*. https://doi.org/10.1002/14651858.CD006732.pub4

Légaré, F., Moumjid-Ferdjaoui, N., Drolet, R., Stacey, D., Härter, M., Bastian, H., Beaulieu, M.-D., Borduas, F., Charles, C., Coulter, A., Desroches, S., Friedrich, G., Gafni, A., Graham, I. D., Labrecque, M., LeBlanc, A., Légaré, J., Politi, M., Sargeant, J., & Thomson, R. (2013). Core

Competencies for Shared Decision Making Training Programs: Insights From an International, Interdisciplinary Working Group. *Journal of Continuing Education in the Health Professions*, *33*(4), 267–273. https://doi.org/10.1002/chp.21197

Osterman, M., Hamilton, B., Martin, J. A., Driscoll, A. K., & Valenzuela, C. P. (2021). Births: Final Data for 2020. *National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System*, *70*(17), 1–50.

Ottawa Hospital Research Institute. (2019, June 26). *A to Z Inventory—Patient Decision Aids*. https://decisionaid.ohri.ca/azinvent.php

Peralta, A. (2022). *Your Choice: Spontaneous Labor or Labor Induction?* https://decisionaid.ohri.ca/AZsumm.php?ID=2003

Pope, T. M. (2017). Certified Patient Decision Aids: Solving Persistent Problems with Informed Consent Law. *The Journal of Law, Medicine & Ethics: A Journal of the American Society of Law, Medicine & Ethics*, *45*(1), 12–40. https://doi.org/10.1177/1073110517703097

Say, R., Robson, S., & Thomson, R. (2011). Helping pregnant women make better decisions: A systematic review of the benefits of patient decision aids in obstetrics. *BMJ Open*, *1*(2), Article 2. https://doi.org/10.1136/bmjopen-2011-000261

Simpson, K. R., Newman, G., & Chirino, O. R. (2010). Patients' Perspectives on the Role of Prepared Childbirth Education in Decision Making Regarding Elective Labor Induction. *The Journal of Perinatal Education*, *19*(3), 21–32. https://doi.org/10.1624/105812410X514396

Smith, D. C. (2015). Midwife-physician collaboration: A conceptual framework for interprofessional collaborative practice. *Journal of Midwifery & Women's Health*, *60*(2), 128–139. https://doi.org/10.1111/jmwh.12204

Society of Maternal-Fetal Medicine. (2019). SMFM Statement on Elective Induction of Labor in Low-Risk Nulliparous Women at Term: The ARRIVE Trial. *American Journal of Obstetrics and Gynecology*, *221*(1), B2–B4. https://doi.org/10.1016/j.ajog.2018.08.009

Stacey, D., Légaré, F., & Lewis, K. B. (2017). Patient Decision Aids to Engage Adults in Treatment or Screening Decisions. *JAMA*, *318*(7), Article 7. https://doi.org/10.1001/jama.2017.10289

Stevens, G., & Miller, Y. D. (2012). Overdue choices: How information and role in decision-making influence women's preferences for induction for prolonged pregnancy. *Birth (Berkeley, Calif.)*, *39*(3), 248–257. https://doi.org/10.1111/j.1523-536X.2012.00554.x

Appendix A: Patient Decision Aid

IS AN ELECTIVE INDUCTION RIGHT FOR ME?

PAGE 1 - ABOUT INDUCTIONS

WHAT IS AN INDUCTION OF LABOR?

Induction of labor is a series of processes that encourages labor to start with medical assistance. This helps to deliver your baby before your body goes into labor on its own (also called **spontaneous labor**).

WHAT IS AN ELECTIVE INDUCTION?

Elective inductions are inductions you choose without a medical reason. This is a personal decision that involves a balance of medical benefits and risks, goals for you as the patient, and your personal preferences. This handout will help you talk with your provider and decide what is right for you.

WHEN DO ELECTIVE INDUCTIONS HAPPEN?

A typical pregnancy lasts around 40 weeks. Elective inductions are considered a safe option for parent and baby after completing 38 weeks of pregnancy. Recent studies suggest elective induction during the 39th week of pregnancy may reduce the risk of some pregnancy complications.[1] Most providers recommend induction of labor before 42 weeks of pregnancy. Personal preference and scheduling also play a role in when inductions happen.

It is your choice to have an induction or not; you can change your mind or tell your provider what timing is right for you.

WHAT ARE MY CHOICES?

Schedule an induction at or after 39 weeks

OR

Wait for my body to go into labor on its own

Go into labor on my own

OR

Possibly have an induction later in pregnancy because I am at 41-42 weeks, or for medical reasons

INDUCTION FOR OTHER REASONS

Induction may also be done for medical reasons earlier in pregnancy, or recommended when you are past your due date between 41 and 42 weeks. The health status of a pregnant person or baby may change during pregnancy and your provider may suggest an induction for those medical reasons if that happens. Some common medical reasons include: diabetes, hypertension, problems with the baby such as poor growth, problems with the placenta, infections, or low amniotic fluid.[2]

IS AN ELECTIVE INDUCTION RIGHT FOR ME?

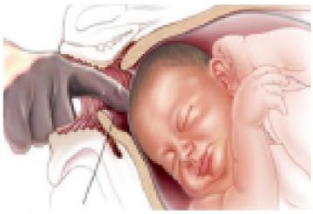
PAGE 2 - WHAT IS IT LIKE TO GET AN INDUCTION?

HOW LONG DOES AN INDUCTION TAKE?

Induction lengths can have wide variation. The process can take from 1-3 days. It may be helpful to expect it to take several days if you have not had a baby before. The early part of the induction, called **cervical ripening,** is the longest part of the induction. It can be uncomfortable, but people are usually able to rest and distract themselves during this part of the induction

CAN I DO ANYTHING TO HELP LABOR START BEFORE A HOSPITAL INDUCTION?

- Your care provider can perform a membrane sweep. After 39 weeks, this increases the chance your labor will begin. A membrane sweep involves a care provider doing a vaginal examination and making circular movements in the area of your cervix with their finger.[3]
- At home, you can try nipple stimulation[4] or having sexual intercourse,[5] both of which may help. It is best to discuss nipple stimulation with your provider to learn whether you are a good candidate and receive instructions.
- Supplements or acupuncture may be an option you can talk to your provider about.



WHAT TAKES PLACE DURING AN INDUCTION?

Early in an induction, your provider may give you **prostaglandins and/or a cervical balloon to** help the cervix get ready for labor.[2]

- **Prostaglandins** are a medication that can be swallowed as a pill or inserted inside the vagina. Sometimes they can cause contractions.
- **A cervical balloon** is a tube with a balloon that is placed inside the cervix to help slowly open the cervix (dilate). It is inside you for up to 12 hours to help get the cervix ready for labor.

When the cervix is ready for labor, additional steps may be taken.[2]

- **Pitocin** is a medicine that can be given in an IV. It brings on mild and then stronger contractions and starts your labor.
- Your provider may also be able to open or "break" the bag of water surrounding the baby to speed up your labor.

Your baby's heart rate and contractions will be continuously monitored during the induction process. You will be able to eat during the induction You may drink and shower or use the tub if you do not have any pain medications, with your provider's approval.

IS AN ELECTIVE INDUCTION RIGHT FOR ME?

PAGE 3 - POINTS TO CONSIDER

WHY DO SOME PEOPLE CHOOSE AN INDUCTION?

- End an uncomfortable pregnancy.
- More control around the timing of delivery.
- There may be some pregnancy risks that are reduced by having an induction of labor:
  - Avoid possible complications of continuing pregnancy, such as developing high blood pressure disorder or having a large baby.[6]
  - Lower risk of stillbirth. Stillbirth risk increases as pregnancy continues; the risk is dependent on whether you have had a baby before, your age, and other factors.[7]
  - Possibly lower risk of cesarean birth with your first baby, according to recent studies.[1] Research shows the rate varies among hospitals, providers, and communities. Ask your provider about the cesarean birth and induction rates at your hospital.

WHY DO SOME PEOPLE CHOOSE TO WAIT FOR SPONTANEOUS LABOR?

- To spend their early labor at home.
- To spend less time in the hospital before the baby is born.
- To possibly lower the likelihood of getting pain medication.[8]
- To lower the chances of having medical interventions, such as continuous fetal monitoring.
- For personal or cultural reasons.

WHAT ARE SOME ISSUES WITH AN INDUCTION?

- Longer time spent in the hospital before the birth of the baby.
- A longer process than spontaneous labor for most patients.
- Rarely, stimulation of too many contractions.[2]

WHAT IS SIMILAR BETWEEN INDUCTION AND SPONTANEOUS LABOR?

- Same chance of needing help to get the baby out with tools like forceps or a vacuum.[6]
- Same chance of severe bleeding or tearing in the vagina after birth.[6]
- Mostly the same chance of complications for baby. An induction may lower the chance of baby needing short term respiratory support.[1]
- Every laboring person has a chance that their baby will be born by cesarean, forceps or vacuum.

IS AN ELECTIVE INDUCTION RIGHT FOR ME?

PAGE 4 - WHAT CAN HELP ME CHOOSE?

HOW DO PEOPLE TEND TO FEEL ABOUT GETTING AN INDUCTION?

Satisfaction varies from person to person. Evidence shows people who had an induction were more satisfied when more information and choice was provided.[9] These are how some parents felt about their induction.

"The whole process went exactly how I had hoped even after all the worries of the induction ruining all my plans"

"For me I didn't find induction a very positive experience as I felt out of control the entire time."

"It can be quite wonderful. Yes, it can be positive. Yes, it can be empowering. Yes it can be done without pain relief."

"It's a really intense experience and doesn't have the slow build-up of pain like a [spontaneous] labor."

I remember...feeling...relieved to be admitted to the hospital for induction."

"My [provider] had warned me that induction could be a long process, but I didn't really grasp how long."

WHAT MATTERS MOST TO YOU?

	Most important		Equally important		Most important	
It is important for me to know the general time my baby will be born						I am not too worried about the timing of my delivery
I don't mind being in the hospital for several days before my delivery						I do not want to be in the hospital any longer than I absolutely have to
The end of this pregnancy has made it impossible for me to rest and feel like myself						I can feel the stress on my body at the end of pregnancy but I'm still able to do a lot of things and feel mostly like myself
I think my baby will be ready for delivery any time after 39 weeks gestation						I do not want anything to interfere with my body and my baby's own readiness for labor
I am concerned about the growing size of my baby as I approach and pass my due date						I am not worried that my body will make a baby that is too big for my pelvis.
I am okay with interventions that go along with IOL including continuous monitoring and an IV						I want a labor with little to no intervention
I am comfortable with medications to induce labor						Medications to induce labor give me a lot of concern

IS AN ELECTIVE INDUCTION RIGHT FOR ME?

PAGE 5 - HOW AM I FEELING ABOUT THIS CHOICE?

Now that you have thought about the facts and your feelings, you may have a general idea where you stand on this decision.

Leaning towards being induced						Leaning towards waiting for labor

Do you understand the options available to you?

Do you have enough support and advice from others to make a choice?

Are you clear about which benefits and side effects matter most to you?

NOTES OR QUESTIONS

References

1. Grobman WA, Rice MM, Reddy UM, et al. Labor Induction versus Expectant Management in Low-Risk Nulliparous Women. N Engl J Med. 2018;379(6):513-523. doi:10.1056/NEJMoa1800566
2. King TL, Brucker MC, Osborne K, Jevitt CM. Varney's Midwifery. 6th edition. Jones & Bartlett Learning; 2018.
3. Finucane EM, Murphy DJ, Biesty LM, et al. Membrane sweeping for induction of labour. Cochrane Database Syst Rev. 2020;2:CD000451. doi:10.1002/14651858.CD000451.pub3
4. Kavanagh J, Kelly AJ, Thomas J. Breast stimulation for cervical ripening and induction of labour. Cochrane Database Syst Rev. 2005;(3):CD003392. doi:10.1002/14651858.CD003392.pub2
5. Omar NS, Tan PC, Sabir N, Yusop ES, Omar SZ. Coitus to expedite the onset of labour: a randomised trial. BJOG. 2013;120(3):338-345. doi:10.1111/1471-0528.12054
6. Sotiriadis A, Petousis S, Thilaganathan B, et al. Maternal and perinatal outcomes after elective induction of labor at 39 weeks in uncomplicated singleton pregnancy: a meta-analysis. Ultrasound Obstet Gynecol. 2019;53(1):26-35. doi:10.1002/uog.20140
7. Reddy UM, Ko CW, Willinger M. Maternal age and the risk of stillbirth throughout pregnancy in the United States. Am J Obstet Gynecol. 2006;195(3):764-770. doi:10.1016/j.ajog.2006.06.019
8. P M, E S, J M, Ca C, Jc G. Induction of labour at or beyond 37 weeks' gestation. The Cochrane database of systematic reviews. 2020;7(7). doi:10.1002/14651858.CD004945.pub5
9. Coates D, Goodfellow A, Sinclair L. Induction of labour: Experiences of care and decision-making of women and clinicians. Women Birth. 2020;33(1):e1-e14. doi:10.1016/j.wombi.2019.06.002

Appendix B provider Survey Questions

Provider surveys original conducted through Google Forms.

Pre-Survey

1. Where do you see patients at HMC?
2. My opinion on induction of labor for elective indications is:

3. For which conditions do you support elective induction of labor?

4. Do you regularly engage in a risk/benefit discussion about elective 39w inductions with patients?
5. If you do, at what gestational age do you introduce the topic?

6. Implementing the patient decision aid (PDA) will be a two-part process:
   - Patient will be given the PDA to take home and fill out.
   - The provider will discuss the PDA with the patient at a subsequent appointment.
   - Given this strategy, in your opinion what would be the optimal time to send the PDA home with patients?

7. Which patients should be included in this QI project?
8. When you discuss induction of labor with patients, what aspects do you cover?
9. We are modifying an existing PDA used in the midwifery practice at OHSU. Please elaborate on any specific points you would like to see included in a PDA for elective induction of labor.

Cycle 1-2 Survey

1. How are you giving out the patient the PDA?
2. In the first PDSA cycle, I sent reminders about upcoming patients who are eligible for the PDA. Do you feel you could continue to implement the project with the discussion and the handout without reminders next cycle?
3. Do you have any other workflow suggestions?
4. Do you have any additions or modifications of the content that you would like to see in the PDA?
5. Do you have any suggestions to improve the clarity or layout of the PDA?

No Survey conducted cycles 2-3, only personal communication.

Post Study Survey

1. Handout: Please rate your level of agreement or disagreement with the following statement: **"I plan to use the PDA in the future."**
2. Handout: Please rate your level of agreement or disagreement with the following statement: **"I found the PDA handout helpful."**
3. Handout: Please rate your level of agreement or disagreement with the following statement: **"I feel more confident in using patient decision aids to guide shared decision-making conversations."**
4. Handout: Do you have any additions or modifications of the content or layout that you would like to see in the PDA?
5. Workflow: What barriers, if any, did you face implementing the PDA handout and discussion process?
6. Workflow: Do you have any workflow or documentation suggestions that will help providers clearly communicate to each other whether patients have had discussions about induction and what their preferences are?
7. Workflow: The intention of giving the PDA at an appointment separate from having the discussion was to allow patients time to reflect on their values. Does this sequential approach feel useful and/or sustainable?
8. Workflow: Do you have any recommendations for changes to the workflow that would help to improve the patient experience surrounding discussions about elective induction?

9. Did you receive any additional feedback from patients that you would be willing to share?
10. Would you be interested in any further information or training about shared decision-making?
11. Are there any other practice areas at HMC for which you would like to see a Patient decision aid implemented or developed?

Appendix C: Supplementary Data

Supplemental Figure 1: Post-Study Data

Study outcomes for patients who were eligible and received handouts during PDSA Cycle 3, but remained discussion-eligible after the project closed.

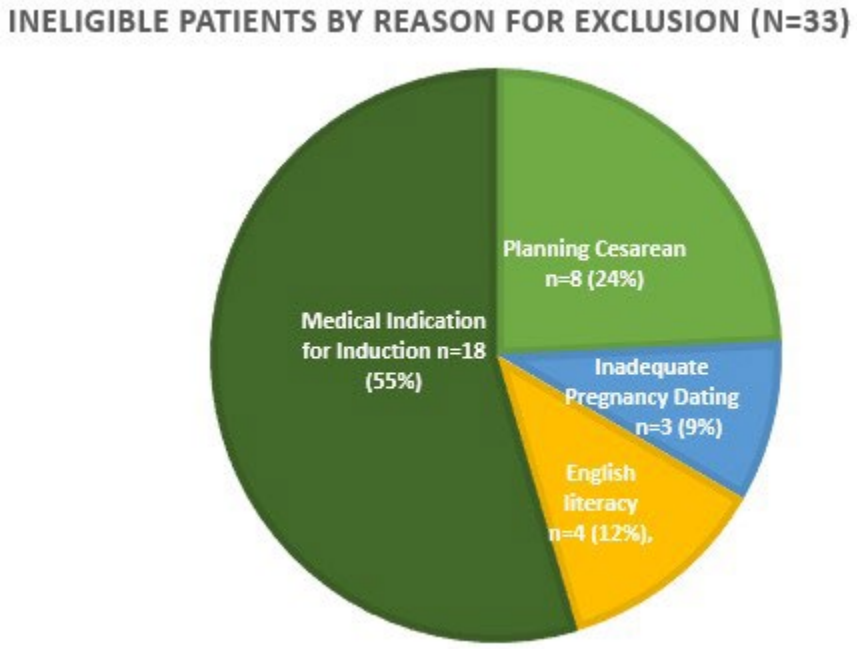
	Appointment Date	Patient ID	Choice	Gestational age at discussion
1	10/27/2022	24	IOL	38 4/7
2	11/21/2022	32	expectant management	36 2/7
3	11/30/2022	42	expectant management	36 4/7
4	11/7/2022	48	NA	NA
5	12/9/2022	61	NA	38
6	12/2/2022	70	NA	35
7	12/2/2022	71	NA	38 4/7
8	12/2/2022	72	NA	33
9	12/5/2022	73	NA	35 4/7
10	12/7/2022	75	NA	35 1/7
11	12/7/2022	77	expectant management	34 2/7
12	12/9/2022	78	expectant management	32 4/7

Supplemental Figure 2: Patient Preference after eIOL discussion

Labor preference	# Patients	Final choice
expectant management	23	
undecided --> expectant management	1	24
eIOL	9	
undecided --> eIOL	5	
expectant management --> eIOL	3	17
undecided	2	2
patient preference not recorded	3	3
Total	46	46

Arrow (→) indicates patient changed preference between visits.

Supplemental Figure 3: Breakdown of ineligible patients



Supplemental Figure 4: Non-English-speaking patients of >30 weeks of gestation documented during PDSA cycles (of 83 total)

Language	Otherwise eIOL eligible	Not eligible patients	Total
Spanish	**2**	**2**	**4**
Farsi	**1**	**1**	**2**
Thai	**1**	**0**	**1**

Supplemental Figure 5: List of Variables collected through patient chart review after each PDSA cycle.

Appointment Data

1. Patient ID (anonymized)
2. Parity
3. Gestational Age
4. AMA status
5. Provider Name
6. Provider Type
7. Eligibility status for elective induction
8. Reasons for ineligibility, if in eligible
9. Primary Language
10. Eligibility per appointment for patient to receive PDA
11. Method of documentation of PDA receipt
12. Eligibility per appointment for eIOL discussion
13. Method of documentation of discussion
14. Record of discussion not using PDA
15. Labor Preference
16. Whether provider received reminders about upcoming eligible patients.