

Understanding and Identifying Opportunities for Improvement

in the Latent Labor OB Triage Process

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Author Note

This report was created using the guidance presented in the Standards for Quality Improvement Reporting Excellence - SQUIRE 2.0 (Ogrinc et al., 2016).

### Abstract

Current variation in the care during triage of obstetric patients regarding coping in latent labor can impact the timing of admission for these patients. It has been shown that admission in active labor rather than latent labor is associated with improved obstetric outcomes. An understanding of current triage care practices at a rural community hospital's family birth center was obtained through the use of the Ishikawa cause-and-effect tool. Opportunities for improvement in the processes of care in labor triage were identified, and a latent labor triage intervention was developed to address the lack of educational tools and improve patient coping skills. A series of rapid process improvement cycles over a period of three months was conducted. Outcomes measured focused on the use of the intervention consistently with all eligible patients. By the end of the quality improvement cycles, the intervention was being implemented with a majority (68%) of the patients who met criteria for the triage intervention and nursing staff reported that the interventions facilitated their ability to provide quality care during the latent labor triage project. This project could be replicated easily on other units and the triage tools generated in the project are still in use even after completion of the project.

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One of the many duties of charge nurses at Legacy Silverton Family Birth Center (FBC) is to triage all patients who present for care in labor at the FBC. Currently, there is a wide variation in the kind of care and education related to coping in labor that a patient may receive when presenting for evaluation in latent labor. This often depends on the nurse, the time of day, other duties the nurse is managing at the time, and the kind of provider (nurse-midwife, obstetrician, or family medicine physician) attending the patient. This can result in significant variation in the timing of admission in labor with some women being admitted in active labor and others being admitted much earlier in latent labor, potentially exposing them to increased risk of obstetric intervention.

### **Background**

#### **Available Knowledge**

One consequence of varied practice in labor triage is inconsistency in the timing of admission in labor. This is not isolated to the FBC at Legacy Silverton. The literature shows that in the current obstetric environment, there exists much variation in practice and that when women are admitted in latent labor before the onset of the active phase, they experience higher rates of epidural use, oxytocin administration to augment labor progress, and cesarean section (Bailit, Dierker, Blanchard, & Mercer, 2005; Davey, McLachlan, Forster, & Flood, 2013; Holmes, Oppenheimer, & Wen, 2001; Mikolajczyk, Zhang, Chan, & Grewal, 2008).

Another difficulty affecting the labor triage process is the fact that accurately diagnosing active labor is challenging. In fact, definitions of the onset of labor and labor dystocia are not clear. Labor is defined vaguely in one text as “regular, effective contractions that lead to dilation and effacement of the cervix,” (Gabbe, Niebyl, & Galan, 2012). One systematic review of 62

studies researching definitions of the onset of labor concluded that the only consistency in the definition of labor onset is the presence of regular painful contractions (Hanley et al., 2016). The most recent ACOG Practice Bulletin for labor dystocia and augmentation ambiguously defines labor dystocia as “slow, abnormal progression of labor,” (ACOG, 2004). This lack of specificity has allowed for great variation in practice (Kozhimannil, Law, & Virnig, 2013).

The qualitative literature also reveals that women themselves often bring very different levels of self-efficacy and ability to cope with labor when they present to labor and delivery units. The strongest theme women voice about their experiences in latent labor in relation to the timing of admission is the concept of power and autonomy. On being asked to return home to labor before returning for admission, some women feel empowered and confident while others are uncertain and feel unable to cope (Cheyne et al., 2007). In one study of women who were sent home in latent labor, of the women who were not happy with the decision to go home, 90% stated their reason was simply because they did not want to be at home any longer, 59% stated they were unhappy because they in too much pain, and 51% felt that they lived too far away to be sent home (Hosek, Faucher, Lankford, & Alexander, 2014).

In addition to outcomes and women’s experiences, researchers are also exploring factors associated with admission in either latent or active labor. The three main categories in this research examine maternal characteristics, antenatal interventions, and intrapartum interventions. Nulliparity and obesity were the primary maternal characteristics that were associated with a higher rate of admission in latent labor (Carlson & Lowe, 2014; Norman et al., 2012). Carlson & Lowe found that obesity in nulliparous women is associated with an increased rate of latent labor hospital admission, artificial rupture of membranes before 6 cm dilation, augmentation of labor, and epidural use (2014). In addition to the review, Norman et al. (2012), conducted a

retrospective cohort study and found women with a BMI >30 have a longer and slower progression of latent phase labor. Norman et al., (2012) recommend that definitions of labor arrest and dystocia should be different for obese women to prevent overuse of the cesarean section in this population. When clinicians do not recognize that a slower latent phase is without pathology for obese women, more of these women will be admitted earlier in labor and subject to higher rates of intervention.

The literature on prenatal interventions to increase the rate of women admitted in active labor was also explored. Three studies found prenatal interventions to be useful for increasing active labor admission. Two studies found that specific prenatal education increased the ability for women to correctly self-identify true active labor and present at the hospital in active labor (Lumluk & Kovavisarach, 2011; Maimburg, Vaeth, Durr, Hvidman, & Olsen, 2010). Both interventions included lecture and discussion about the onset of labor. The final study to examine the impact of prenatal interventions on the timing of admission focuses on the mode of care. A retrospective case control study found that women participating in midwifery-led group prenatal care compared with those who received individual midwifery care were more likely to arrive at the hospital in active labor [OR 1.73; 95% CI of 1.03- 2.99; p=0.49] (Tilden et al., 2016).

### **Rationale**

The purpose of this project is to improve the quality of care during the triage process through standardization. Activities to facilitate this discovery included creating Ishikawa cause-and-effect diagrams with both nursing and provider groups to describe the current processes and activities related to care when triaging uncomplicated, term, singleton, patients presenting for care in latent labor. By capturing the full context of how the materials, policies, providers, patients, and environment all interact with one another to influence the care given, the Ishikawa

exercise serves to conceptualize the process of care into components, highlighting the effect that each component has on the triage process. This examination of each component influencing the way care in triage is delivered allowed themes and opportunities to emerge. From these opportunities, one was selected to form the foundation for an intervention to improve the labor triage process. This intervention was implemented in a series of Plan-Do-Study-Act (PDSA) quality improvement cycles which allowed for assessment of its effectiveness. Tools developed by the Institute for Healthcare Improvement for implementing PDSA cycles are used to facilitate quality improvement efforts in healthcare across the nation and were utilized throughout the project for guidance and documentation of the efforts (IHI, 2016).

### **Specific Aims**

The specific aim of this project was to discover the full context of the latent labor triage process and to improve the quality of care during the triage process through standardization. By assessing the multiple factors and perspectives that influence decision-making in latent labor, the goal was to obtain a fuller understanding of the behaviors and choices patients and providers make in latent labor. From this understanding, one aspect of this care was identified and chosen to become the foundation for rapid PDSA cycles to improve and standardize the latent labor triage process.

### **Methods**

#### **Context**

While Legacy Silverton Medical Center is one of Oregon's smaller rural community hospitals, the Family Birth Center (FBC) at Silverton ranks tenth in volume among Oregon hospitals for number of deliveries per year, welcoming 1,474 infants in 2015 (OHA, 2016). Of the 48 beds at Silverton, 18 are on the labor and delivery unit with only two rooms designated for triage of all obstetrical patients. The nurses who care for triage patients on the unit are charge

nurses, meaning that they often juggle other duties and responsibilities while caring for triage patients. The project was led by the DNP student and with collaborative input from key leadership in nursing staff, obstetric providers, and OHSU faculty. The hospital-based nurse-midwifery practice and the supporting nursing staff have a long history of driving collaborative quality improvement in this facility, which made it an ideal environment in which to conduct a DNP project. Within the individual hospital and the larger health system, there are already existing quality improvement processes in place on the practice, department, hospital, and system level.

### **Interventions**

Leadership for the project was provided by the DNP student. Other major stakeholders providing input throughout the project were the midwifery practice manager, another nurse-midwife with DNP experience in QI projects, and the nurse-managers of the FBC. Two separate facilitated conversations with stakeholders were conducted before the initiation of the PDSA cycles. The first was held on January 17, 2017 with the obstetrician and CNM provider group. A summary of the current literature surrounding the timing of admission was introduced to the group (see Figure 1), and an Ishikawa diagram was used as the tool to elicit their perceptions of factors that impact care for the labor triage patient at the FBC (see Figure 2). The same approach was used in a separate discussion with the charge nurses and a separate Ishikawa diagram was completed (see Figure 3). Ideally, these groups would have met together and had one shared facilitated discussion, but scheduling constraints eliminated this option. After both groups had provided input, their responses were combined into one Ishikawa diagram (see Figure 4 and Table 1). The joint document was color-coded to delineate which statements came from the separate nurse and provider groups and which were voiced by members of both roles. From this,

a list of opportunity statements was created by the team based on needs and priorities in triage identified during the discussions (see Figure 5). The top two opportunities, a need for patient education materials and tools in triage, and a need for increasing patient coping skills in latent labor were identified as the top priorities for this project – creating the aim of improving patient education and labor support through standardization in the latent labor triage process.

With the decision to focus on improving patient education and labor support in triage, a patient education handout was developed outlining activities that are helpful for women in latent labor (see Figure 6), posters suggesting positions for coping with labor were installed in each triage room, and two 65cm exercise balls were purchased to be permanently available for use in triage (see Figure 7). Prior to this project, there were no latent labor educational handouts, there were limited numbers of exercise balls on the unit which were only very rarely used for triage patients, and there were no informational posters about labor for patients to reference during their time in triage. In addition, women presenting for care in latent labor were presented with whatever verbal guidance and education each triage nurse had time or desire to provide in the moment of that particular triage. With the implementation of this project, providers and nursing staff were given instructions to begin using the new triage materials to guide their education for coping in latent labor when assessing and caring for women in triage with uncomplicated, term, singleton, vertex pregnancies.

Eligibility for the intervention included all English-speaking, term, vertex, singleton, patients of any parity presenting for a labor evaluation in latent labor. With the second PDSA cycle, eligibility expanded to include Spanish-speaking patients also meeting the other inclusion criteria. Exclusions for measurement included preterm, multiple gestation, malpresentation, scheduled induction or scheduled cesarean delivery and speaking a language other than English



or Spanish. Direct admission in apparent active labor or complications such as frank bleeding, prelabor rupture of membranes, or fetal distress also excluded patients from the use of the intervention.

The impact of this intervention was assessed over a series of three rapid PDSA cycles each lasting approximately 3 weeks between Jan 25, 2017 and April 29, 2017. The first PDSA cycle focused on the impact of introducing the use of the triage materials into the latent labor assessment workflow with English-speaking patients. The second PDSA made the change of adding patient educational materials in Spanish to be able to ensure that nearly 100% of the eligible population would have these materials available to them in their native language. The third PDSA focused on altering the content of the educational materials in response to nursing and provider feedback to facilitate the use of the materials by more nurses with more patients. A brief summary of the three PDSA cycles is depicted in Figure 8 below.

### **Study of the Intervention**

The outcomes of the intervention were assessed after the completion of each PDSA cycle. The first two PDSA cycles were assessed with the aid of surveys sent to the triage nurses to report on their use of the intervention. Changes were made to the assessment process for the third PDSA cycle and instead of completing surveys, data sheets were completed at the time of each triage that met criteria for the use of the intervention.

### **Measures**

The measures that were chosen to assess the impact of the interventions of the first PDSA cycles were determined by the aim of improving patient education and labor support in the latent labor triage process. Since latent labor educational materials were not available for use previous to the project, the frequency of use of the materials by nurses with patients and the independent

patient participation in the suggested activities were chosen as outcome measures. A survey was administered to participating nurses at the end of PDSA cycle 1 and PDSA cycle 2. The questions that were included in the survey to assess PDSA cycle 1 can be viewed in Figure 9, and the survey questions used to assess PDSA cycle 2 can be viewed in Figure 10. Face validity of the surveys was established by submitting the questions to the academic chairs of this project for review. Feedback was obtained and revisions were made to the questions. Full survey validation including tasks such as principal components analysis and checking for internal consistency was not performed due to the time constraints of the project. The Likert scale was chosen for many of the responses as it is a standardized format for quantifying qualitative responses for analysis.

For measuring the outcomes of PDSA 3, the survey was replaced with a data collection form. Nurses were asked to briefly collect data after completion of each triage in which the patient met criteria for use of the latent labor triage materials (see figure 11). Data included notation of which materials were presented to a patient, which activities were used independently by the patient, and whether the patient was admitted or discharged after that triage visit.

### **Analysis**

Quantitative data from each PDSA were collected and analyzed using descriptive statistics. When survey responses consisted of numeric ranges across a Likert scale, weighted averages were computed to be able to assess the impact across the population. Qualitative data were organized and analyzed for themes.

### **Ethical Considerations**

As this is a quality improvement project, the focus of the assessment was on the processes involved in providing education and support to patients in latent labor. Protected health information (PHI) was not collected for the execution or analysis of this project. The privacy of

patients presenting for care in labor is already protected by the Health Insurance Portability and Accountability Act (HIPAA) – this quality improvement project did not affect protections already in place for patients at the Silverton FBC. The project design was submitted to IRB through both Oregon Health & Science University and Legacy Health, the educational and clinical settings for this project. The project was initiated after both institutions agreed that the initiative was not research and exempt from IRB approval. Processes of care were evaluated and the outcomes of the project are being used to guide and inform the care providers serving laboring women at this facility.

### **Outcomes**

The specific aim of this project was to discover the full context of the triage process for patients presenting for care in latent labor. A robust understanding of the factors influencing care of the latent labor patient in triage was obtained through the facilitated discussions held to develop the Ishikawa diagrams. As the project developed, the focus for the PDSA cycles became the improvement of patient education and labor support in the latent labor triage process through standardization.

### **PDSA 1- Results**

The outcome measures included in PDSA cycle 1 were the frequency of use of the labor triage materials with uncomplicated term English-speaking patients being triaged for labor at the FBC, discussion of these materials with patients, and the frequency of use of the exercises presented in the materials by patients. The materials for the intervention included the patient education handout, the labor positions poster, and a 65cm exercise ball. The survey was sent out to all 12 charge nurses who share the role of triaging patients presenting for care at the FBC; six of these 12 nurses responded to the first survey, a 50% response rate. Respondents ranged

between 1.5 to 22 years of clinical nursing experience, averaging 9.75 years. Analysis of the survey results from PDSA cycle 1 found that 50% (n=3) of charge nurses reported giving the handouts at least 50% of the time to patients meeting criteria, and 33.3% (n=2) of respondents gave the materials at least 25% of the time (see Figure 12). These responses were an estimate made by each nurse upon reflection of their use of the intervention during the first PDSA cycle. The weighted average of the 5 triage nurse respondents' perception of how frequently they used the intervention revealed their estimate that they were using the intervention with approximately 40% of eligible English-speaking patients; one respondent did not answer this question. Fifty percent (n=3) of nurses reported using the handout less than 75% of the time with patients who met criteria. All of the nurses who responded (n=6) reported having a brief or detailed discussion with patients when using them (see Figure 13). Regarding patient participation, the activities that nurses reported observing patients select most frequently were eating and drinking (weighted average 3.8) and walking (weighted average 3.7). The next most frequently used group of activities included using the 65cm exercise ball (weighted average 2.8), positions from the chart (weighted average 2.7) and resting (weighted average 2.7). The weighted average of the reported frequency of patient participation for all activities can be seen in Figure 14.

Process measures were also assessed by the qualitative free text responses that were given in the initial survey. These included how useful the nurses felt the new tools were to their ability to provide care for the latent labor triage patient, and how much time nurses spent discussing the materials. Nurses responded that the time they spent presenting the triage materials to the latent labor patient varied, dependent on time of day, space in the unit, and whether or not there were other pressing duties at the moment of that patient's triage. Some respondents offered that the option to have patients use the stairs outside the unit represented a

liability if a patient were to fall and that this recommendation should be deleted from the materials. Another recommendation was to provide materials in Spanish to be able to serve nearly 100% of the latent labor triage patients.

Balancing measures anticipated were the possibility that the addition of this workflow would detract from time available for other duties. This did not come up as a pressing issue for nurses responding to the survey. Overall, nurses reported that the materials were most helpful for their practice (weighted average 3.57) and for the laboring women (weighted average 3.43); they reported that the intervention materials were less helpful to the support people accompanying the laboring women (see Figure 15).

### **PDSA 2 - Results**

Based on the feedback from the nurses and discussion with the team, it was decided to make the change for PDSA cycle 2 to include the addition of the latent labor education handout in Spanish so that it would be available to nearly all of the patients who met criteria. The handouts were created by the team, and Spanish-language proof-reading and editing was provided by the hospital's interpretation services. Spanish-language handouts were now available to Spanish-speaking patients which made the intervention accessible to more patients who met the clinical criteria for inclusion in the project (see Figure 16).

The outcome measures included in PDSA cycle 2 remained the same as the measures used in PDSA cycle 1, except with the inclusion of Spanish-language patients –the frequency of use of the materials, and frequency of independent participation in suggested activities. A modified survey was sent again to the same 12 charge nurses (Figure 10). This time, 5 nurses responded, all of whom had also responded to the survey after PDSA cycle 1. Three nurses (75%) reported using the educational handout and one reported that she was not using the

materials in her practice at all with either English or Spanish-speaking patients (see Figure 17). While most nurses reported using the materials at some point, the weighted average of use with English-speaking patients remained at 40.6%, consistent with the result reported on the same question asked in the assessment of the first PDSA cycle. With Spanish-speaking patients, the nurses reported higher rates of use with a weighted average of 50.1%. For PDSA cycle 2, a new question was added to the survey to better address nursing perception of the process measure of how the intervention impacts their time for other duties. One (20%) nurse stated that the new intervention has facilitated the process, three (60%) stated that it has not impacted their time, and one did not respond to the question. There were no responses stating that the intervention was taking up a burdensome amount of their time (see Figure 17a).

### **PDSA 3- Results**

During PDSA cycle 2, the project lead, the DNP student, presented on the status of the ongoing project at a meeting of the charge nurses and facilitated a discussion to collaboratively decide which process change to implement for the third PDSA cycle. At this time, it was decided to modify the handouts in both languages to eliminate the recommendation for the use of stairs due to prominent feedback gained from PDSA cycle 1. At this meeting, there was considerable discussion that the inclusion of the recommendation for patients to use stairs might deter some nurses from using the intervention at all with any patients due to concern for liability. The stairs option was eliminated and the modifications are illustrated in Figure 18.

Since the survey response rate was not robust - at best, a 50% response rate of 6 of the 12 potential respondents, and the data from these surveys were perceptions of what was done rather than documentation of actual care, it was decided to change the way that the outcomes were being measured for PDSA cycle 3. This decision was made collectively with the project lead and

the charge nurses present at the meeting. Initially, the survey was employed with the hopes of not over-burdening the charge nurses with tasks during the project. At this meeting, the group decided that asking for less than one minute of data collection with each triage visit was not too burdensome a task to require for the three week of the final PDSA cycle. Therefore, to improve on the assessment of the impact of the intervention, a data collection sheet was created to document the use of the intervention triage materials and the suggested activities that each patient chose during their visit (see Figure 11). The data points collected were the date, gestational age, parity, which materials were presented to the patient, which activities were utilized by the patient, and whether or not the patient was admitted or discharged to home care. The data was collected over a three-week period, tabulated in an excel spreadsheet, and analyzed.

For PDSA cycle 3, the goal was to use and document the intervention with at least 70% of patients who met criteria for the intervention. During this third PDSA, 54 women presented for triage in labor and 38 of these were found to be in latent labor and met criteria for use of the intervention. The remaining 16 presented in active labor, were directly admitted, and did not meet criteria for the intervention. Of these 38 who did meet criteria, the handouts were given and discussed with 11 patients (28.9%), 9 were presented with the materials on the poster (23.7%), 8 were presented with the exercise ball (21.0%), and 12 (31.6%) were presented with none of the triage intervention materials (see Figure 19); in total, 68.4% of patients meeting the intervention criteria were presented with at least one of the materials - the handout, the poster, or the ball, nearly meeting the goal of 70% (see Figure 20).

Of the activities suggested by the materials, patients participated most often in drinking (60.5%), walking (36.8%), and using the exercise ball (23.7%). The least utilized activity was the

knee press (0.0%), with 0 patients reported trying this activity, and there were 3 write-ins of patients using a hands and knees position (7.8%) that was not listed as an option on the data-collection sheet. To see the full description of patient activity, see Figure 21. Seventeen (44.7%) of the latent labor triages were discharged home in latent labor after the triage visit, 17 others (44.7%) were admitted to the unit from triage while in latent labor, and 4 (10.5%) were admitted in active labor after presenting to triage in latent labor and transitioning to active labor during the triage assessment (Figure 22).

## **Discussion**

### **Summary**

Much improvement to patient education in triage was made through the implementation of this project. The purpose of this project was to improve the quality of care during the triage process through standardization. Facilitated conversations with stakeholders revealed opportunities for improvement in patient education for coping in latent labor. Through the introduction of the latent labor education materials, it became clear that for the intervention to reach the patients, the nursing staff must accept and incorporate the materials in their practice. Frequency of use of the intervention with English-speaking patients in PDSA cycle 1 was approximately 40% and by the third PDSA cycle, 68% of eligible patients were receiving the intervention. The most utilized activities employed by patients were drinking (60.5%), walking (36.8%), and using the exercise ball (23.7%). Only the ball was newly available to patients in triage as a result of this intervention; drinking and ambulating have been standard suggestions in latent labor triage for years. In retrospect, gathering data of activities used by patients in triage for latent labor prior to the implementation of the project would have provided a clear baseline from which to measure the outcomes of this intervention.



While one of the measures was use of the intervention materials with patients in triage for latent labor, the goal was not to merely distribute materials to patients, but to improve patient education for the triage of the latent labor patient. All of the materials that were being assessed throughout the project were not previously available when triaging women in latent labor. Prior to the PDSA cycles, there were no latent labor educational handouts, there were limited numbers of exercise balls which were only very rarely used for triage patients, and there were no informational posters about labor for patients to reference during their time in triage. In addition, women presenting for care in latent labor were presented with whatever verbal guidance and education each triage nurse had time to provide in the moment of that particular triage. Since the initiation of this project, there are now increased resources available to nurses to educate and encourage women as they are nearing the end of their pregnancy journey. These resources are also available for women and their support people to investigate independently, allowing for self-education and skill building as well. By simply increasing the kind and quantity of resources available to nurses to use with patients, education for the latent labor triage patient has improved significantly. Anecdotally, multiple members of the nursing staff expressed on separate occasions that they like having the labor posters and exercise balls readily available for patients - that simple proximity of having these tools present consistently in triage makes it much more likely that they will discuss coping techniques in latent labor with patients.

One major strength of this project is that it was an inter-professional and multi-disciplinary collaboration. It was led by a CNM DNP student, backed by CNM and other maternity care providers and had continuous support and feedback from the nurse managers and the charge nurses of the FBC. Without the team approach, there would have been much less success with the project. The project was also inexpensive. The total cost of the exercise balls

and the posters was approximately \$80 and is easily absorbed into most facility budgets - making it easier to replicate in other units. Another strength is that the project is rooted in the needs and opportunities that came out of the work done with the Ishikawa diagrams. This initial step helped to frame the work of the intervention in a way that met a need identified by stakeholders in the triage process at the FBC. Because of this, there was significant ownership of the project across roles which increases the sustainability beyond the completion of the official DNP project. Other areas in the triage process that were identified for improvement, yet were not addressed by this project, include management of term pre-labor rupture of membranes, how perceptions of liability impact care, and the lack of guidelines for nurses who take phone calls from patients. All of these remain areas in which the team can address after the official DNP project ends.

### **Interpretation**

Overall, as noted above, adding educational tools to the workflow for triage of the latent labor patient was a positive first step towards improving early labor triage care at the FBC. The rationale for the latent labor triage intervention was rooted in the evidence that quality, skilled support, quality prenatal education, and group prenatal care are all associated with higher rates of women presenting for care in more advanced labor (Lumruk & Kovavisarach, 2011; Maimburg et al., 2010; Tilden et al., 2016). Presenting for care in active labor rather than in latent labor is associated with better outcomes and lower rates of obstetric intervention (Bailit et al., 2005; Davey et al., 2013; Holmes et al., 2001; Neal et al., 2014). The common thread that all interventions associated with active labor admission share is the quality education component. Women who have home visits from nurses while in latent labor receive intensive individualized education about their labor process (Janssen, Iker, & Carty, 2003; Janssen et al., 2006); women attending childbirth education classes or participating in group prenatal care also receive in-depth

education about how to cope with the labor process (Lumluk & Kovavisarach, 2011; Tilden et al., 2016). This project capitalized on the time a woman spends in triage as another opportunity in which to provide quality education to patients about how to cope with labor and facilitate admission in active labor. This is a sentinel point from this project - that the triage process presents an opportunity in maternity care for so much more than another physical assessment and a determination of stage of labor.

Triage is often a lengthy visit in the hospital spanning several hours, offering a significant moment in which women are often very receptive to education about labor and coping in labor, given that they perceive that these skills will be necessary imminently. For women who have participated in childbirth education or group prenatal care, the triage visit is an opportunity to review many of the skills and techniques they were already exposed to in these classes. For women who have not been able to participate in any of these activities, the triage visit presents a unique opportunity to provide a limited amount of individualized education about the labor process in which, after a few minutes of instruction, women can begin practicing skills that will help them to cope with their current sensations and their future active labor. Triage presents an opportunity to help reinforce existing education or to fill in gaps that exist in knowledge and coping skills before the woman moves into active labor. The latent labor triage intervention was designed to harness this opportunity that caregivers have in the triage unit to build and add to existing patient knowledge and skills about how to cope in labor. While the intervention is robust, it remains brief. Implementation is largely directing patients to the resources which are designed for self-guidance through the activities. The intervention is less telling patients what to do and more of patients learning through practice. There is not yet any research that specifically examines the effect of an educational triage intervention, although one researcher has proposed

that providing an “early labor lounge,” where patients being triaged in latent labor can participate in stations that provide mindful meditation, therapeutic shower, acupressure, ambulation, positions, and massage, will reduce stress and promote relaxation (Paul et al., 2017).

### **Limitations**

While, overall, the latent labor triage project had many strengths, it is not without limitations. First, the low response rate to the surveys sent out to charge nurses to assess the impact of PDSA cycles 1 and 2 limits the ability to generalize to all of the nurses who participated. At most, half of the nurses (6 of 12) participating in the intervention gave feedback through the surveys. This lends itself to another limitation as the method of measuring the outcomes was changed between PDSA cycles 2 and 3. While this was needed to better be able to assess the impact of the intervention, since the data sets differed between PDSA cycles 1 and 2 and the final PDSA cycle, it made comparison between the three cycles more challenging and less reliable. This is a reality of this type of rapid cycle quality improvement structure. Improvement for interpreting the data gathered in the PDSA cycles would have been gained by collecting a baseline set of data analyzing what nurses and patients were already doing prior to implementing the project. Another limitation is that the literacy of both the English and Spanish-speaking populations was not known or assessed and lower literacy levels could easily impact the efficacy of the written patient education materials. However, all of the printed materials, the posters in each triage room as well as the education handouts did provide illustrations to guide patients in choosing activities for laboring.

During PDSA cycle 3, it was recognized that several patients whose data were included had been admitted for prelabor rupture of membranes because the cases were familiar to the author. For the other patients in the data set, it is not known whether they were admitted because

of pre-labor rupture of membranes or other factors usually associated with admission in latent labor such as pain, exhaustion, lack of transportation or provider or patient preference. While clear instructions on inclusion and exclusion were provided prior to the PDSA cycles, these criteria were not specifically printed on the data collection sheets provided during PDSA cycle 3. Clear and frequent reminders of inclusion and exclusion criteria throughout the project could have helped to increase the reliability of the data set. In future efforts, it is also recommended to include the reason for admission in latent labor in the data collection tool in order to fully understand all of the factors that impact latent labor admission in this facility. Having these reasons for admission would also serve to guide future PDSA cycles or clinical research.

Another limitation to this project that likely contributed to the low response rates and challenge of getting all charge nurses to participate fully in the project is the fact that this project was conducted on a unit that is simultaneously undergoing other significant transitions and changes. The hospital that runs the FBC was recently purchased by a larger hospital system, and throughout the time of the implementation of the PDSA cycles, multiple policy changes came through impacting nursing workflow in other aspects of maternity care on the unit. Also, during the time of the conduction of this project, ongoing hospital-wide preparations for transitioning to an entirely new EHR system were underway and implementation of this system began only days after the completion of the final PDSA cycle. It is possible that some nurses experienced change fatigue and prioritized implementation of other workflow changes over the latent labor triage intervention.

A final limitation to this particular project is that, due to concerns for patient privacy, the project did not include a way to elicit feedback on the intervention from the patient perspective. This is a vital piece to fully understand the impact of the care provided in triage, especially in

light of the research that highlights the importance of facilitating women's power and autonomy in latent labor (Carlsson, Ziegert, Sahlberg-Blom, & Nissen, 2012; Janssen et al., 2006).

### **Conclusions**

The opportunity for significant patient education during the triage visit in latent labor is a recognized opportunity for educating the pregnant patient about the process of labor and how to cope with the sensations of labor (Paul et al., 2017). The early work of this project, with the creation of the Ishikawa diagrams, is important in providing understanding of the factors that influence care of women in latent labor: providers, nurses, patient characteristics, environment, policies and procedures, and materials. The intervention itself is a step forward in understanding the impact that brief, quality education about the labor process can have on the outcomes of a patient's experience and her labor. Since the initiation of the project, it is now much more common to see women using exercise balls for comfort in latent labor or trying out the positions suggested to relieve back pain. Other patients who have been given a handout in triage and then sent home have commented on using it as a guide while at home before returning to the hospital in more active labor.

While three official PDSA cycles have been completed, there is still much work that can be done with this project. Outside the context of the DNP student-led project and under the current institutional quality improvement systems, it will be possible to conduct patient surveys and gain patient feedback about the intervention. From this feedback, PDSA cycles can be implemented to incorporate patient responses into future iterations of the intervention. A closer examination of data collected for this project can provide a clearer clinical picture of the women being admitted for care in latent labor. Knowing the clinical reason that women are admitted in latent labor will facilitate improvement for care and guide potential process changes. Ultimately,

linking active labor admission to delivery and health outcomes such as labor augmentation and cesarean section is the broader goal.

Once the current latent labor triage intervention is improved sufficiently to fit the context of the FBC, the list of opportunities that was generated from the Ishikawa exercises can be revisited (Figure 5). Those items that are still relevant can be re-prioritized and addressed through a similar PDSA process, as outlined above with a new intervention. Regarding sustainability of the current intervention, the exercise balls and posters remain in the triage rooms, and the unit clerks have added the education materials to all of the packets provided to patients in triage. It is largely up to the individual nurses providing this care to continue to present and discuss these resources when providing care to the latent labor patient.

Currently, there are plans to present the results of the project to the provider and nursing groups who were supportive of the project as well as adding latent labor education to the skills labs for the broader nursing staff. During the first few weeks in which the new EHR system is implemented in the hospital, it is likely that fewer patients will receive in-depth instruction with these resources as staff will be juggling providing quality care with learning a new complex EHR system. After the unit has adjusted to some of these more sweeping changes, reminders about the triage intervention will be communicated to nurses and providers, and gathering more data about the use and effectiveness of the intervention from the patients' perspective will be possible. A presentation that was planned to be completed during PDSA cycle 3 to all of the obstetric providers who practice at the hospital about the project was postponed due to cancellation of the meeting to better prepare for the EHR implementation. Rescheduling this presentation to communicate with more providers about the results of this project and future quality improvement in the triage unit will serve to facilitate continued improvement in our triage

process. Providing a continuing education training to nurses to underscore the importance of maintaining the use of this specific education during triage may also increase rates of use of the intervention with patients. One nurse did emerge as a champion for this project and she will be assisting with the continuing education presentation as well as making sure that this piece is incorporated into the training for all nurses learning the charge role on our unit. Learning from this project can also be disseminated through presenting a poster at a regional nursing conference such as the one held annually by the Western Institute of Nursing.

Participating in quality improvement work such as this project is an effective tool for identifying gaps and providing ideas for clinical research. The speed of the PDSA cycles allows for interventions to be implemented, studied, and adjusted rapidly. The cycles allow for potential ideas for clinical research to be implemented and assessed quickly in a quality improvement setting, testing the intervention, adjusting it, getting feedback from stakeholders throughout the process, and trialing varied methods of measurement so that when partnering with PhD researchers, the time and investment of clinical research is spent on an optimized intervention rather than an untested one. Using the tools of quality improvement can serve to augment the tools that PhD researchers bring to clinical research to help understand the systems in which the research is being carried out, and to identify potential barriers and gaps which could negatively impact the quality of the research.

Regarding the impact of this project for others outside of this facility, this intervention could easily be replicated in other units. As stated above, it is an inexpensive intervention. Providing high quality education and skills to women to help them better understand and prepare for their labor at any time in the pregnancy is optimal - whether through formal prenatal education, group prenatal care, or during a triage visit. It is not possible to control when and how



a woman accesses quality prenatal education, but it is possible to provide as many opportunities for women to gain information and skills that will be useful to her in her labor. Triage is likely an overlooked opportunity in many health systems. Currently, clinical research does not exist that examines the impact of a triage education intervention for women in latent labor. For clinical research, it would be very useful to design and study the effectiveness of a specific triage education intervention on a scale large enough to assess the impact on the timing of admission in labor and other health outcomes such as rates of epidural use, Pitocin augmentation, and cesarean delivery.

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Tables

Table 1

Factors Impacting the Decision to Admit in Latent Labor: The Ishikawa Results in Table Form

| <b>Categories that contribute to the decision to admit in latent labor</b> | <b>Comments from providers only</b>   | <b>Comments from nurses only</b>  | <b>Comments from both groups</b>   |
|--|---|---|--|
| <b>Materials</b>   | no patient handouts; CNMs give “Coping with Labor” handout in prenatal visits; birth balls occasionally available                                   | cost: >9hrs = observation, \$\$; <9hrs = triage, \$; lack of tools to help patients cope, heat pads; lack of good discharge education materials | none   |
| <b>Nursing</b>   | exam consistency; change of shift varying ability to provide hands-on support; strip interpretation   | liability – no backup for nurse phone triage; -limited time for patient education   | level of experience  |
| <b>Providers</b>   | availability- in office/at home during call; not all providers do phone triage; having to rely on someone else’s assessment                         | provider distance from FBC, clinic or home; feels convenient to admit someone; willingness to admit in latent labor                             | variation in practice when minimal cervical change or term PROM; willingness to use therapeutic rest |
| <b>Patients</b>  | Parity: G1P0 want to come in earlier; family pressure; prodroming   | low education about labor; OP babies; weather; cultural norms; patient access to transportation   | coping skills; patient preference; prenatal risk factors or comorbidities; where patient lives       |
| <b>Environment</b>   | none  | lack of doulas  | liability concerns; 2 triage rooms; limited space; no tub in triage rooms                            |
| <b>Policies &amp; Procedures</b>   | triage limited to 1-2 hours; different response if patients call FBC vs. calling provider; triage nurses have other responsibilities: charge or L&D | freedom to decide how long to triage; non-reassuring FHTs; no good way to document nurse triage phone calls                                     | difference in practice managing term PROM  |

*Note:* The content for this table is identical to the content presented in the Ishikawa diagram in Figure 4.

Figures

### LATENT LABOR TRIAGE

January 17, 2017

#### TIMING OF ADMISSION IN LABOR

1. What the literature says:

**■ The decision to admit a woman for care in labor is complex:**

- Active labor is a retrospective diagnosis; lack of specificity has led to wide variation in practice [1].
- Admission in latent labor is associated with increased rates of: epidural use, oxytocin augmentation, cesarean section [2-6]
- Women present with social factors that influence the decision to admit [7, 8]
- Women present with varied abilities to cope with the sensations of labor [7, 9]

**Factors demonstrated to impact timing of admission in labor:**

- Obesity is associated with a higher rate of admission in latent labor [10, 11]
- Prenatal labor education is associated with increased rates of admission in active labor [12, 13]
- Having group prenatal care is associated with increased rates of admission in active labor [14]
- Home visits by RN's in latent labor are associated with increased rates of admission in active labor [15, 16]

2. Our discussion today:

**■ What impacts the decision to admit a woman for care in latent labor?**

- Environment
- Policies & Procedures
- Patients
- Providers
- Nursing
- Materials

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Figure 1. Handout given to providers and nurses to introduce the topic for the Ishikawa activity.

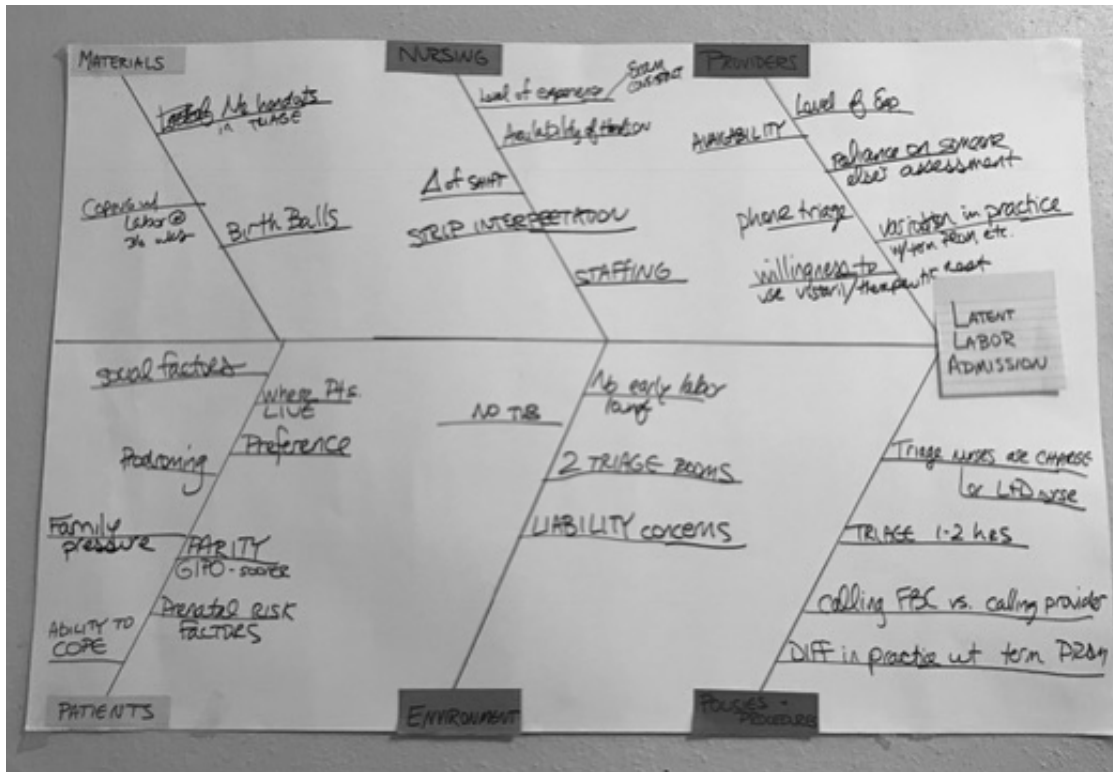


Figure 2. Ishikawa diagram created at OB/CNM discussion.

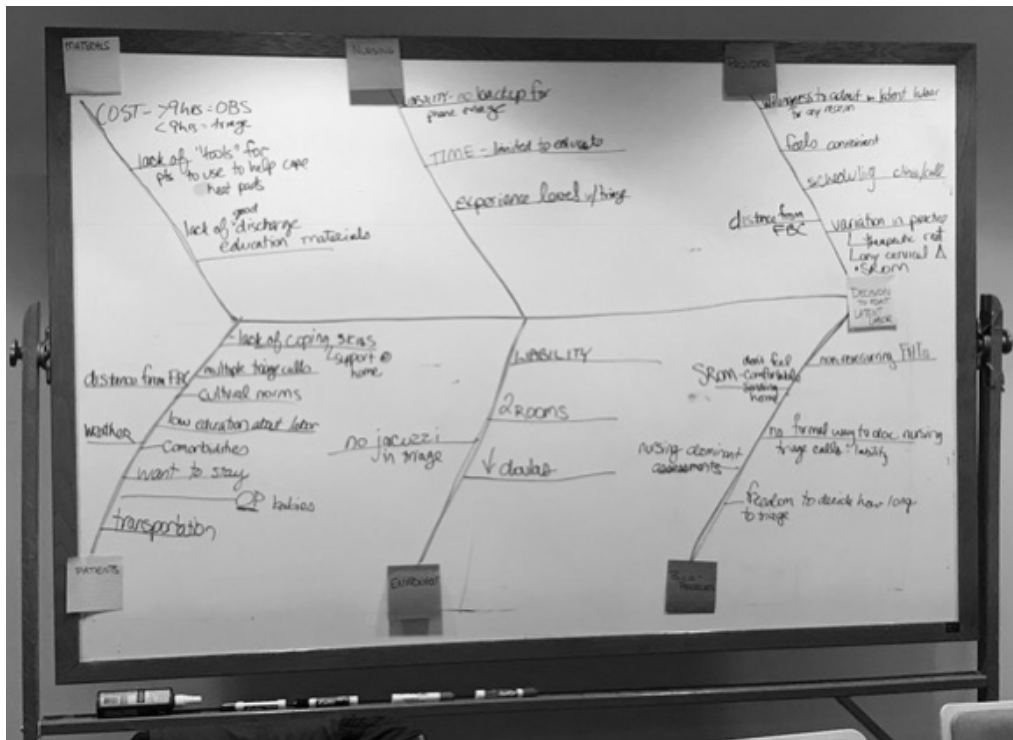


Figure 3. Ishikawa diagram completed during triage discussion with FBC charge nurses.



### Factors Impacting the Decision to Admit in Latent Labor

Discussions with Legacy Silverton Nurse-Midwives, Ob/Gyn's and RNs - Jan 2017

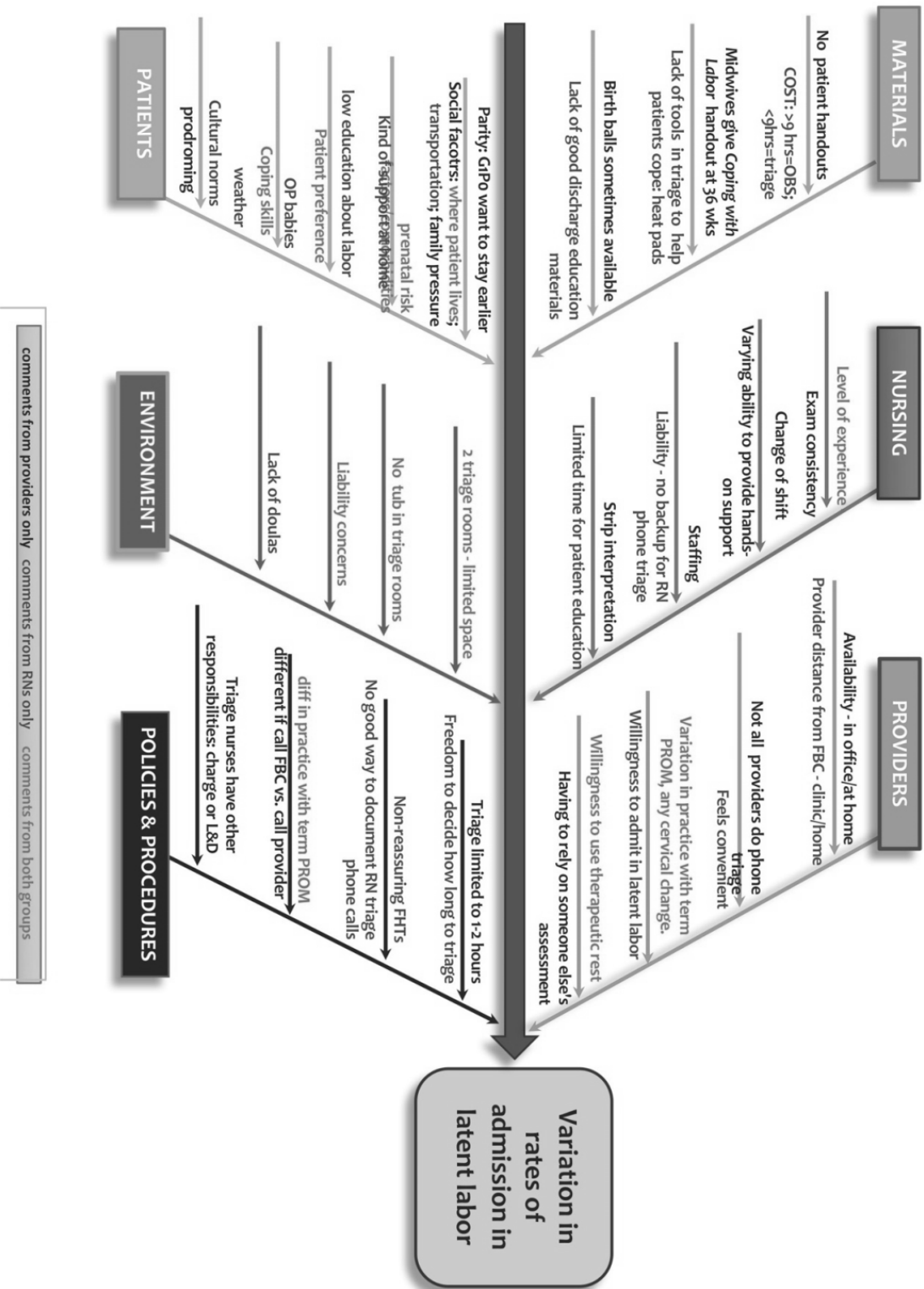


Figure 4. Combined Ishikawa from nurse and provider discussions regarding latent labor triage.

## **LATENT LABOR TRIAGE**

February 16, 2017

### **OPPORTUNITIES FOR QUALITY IMPROVEMENT**

Derived from provider and RN Ishikawa discussions held in January 2017

1. Need for patient education materials and tools in labor triage
2. Care focus on increasing patient coping skills
3. Examining how management of term PROM affects our outcomes
4. Improve consistency in management across providers for term PROM
5. Create guidelines for RN phone triage to reduce liability
6. Review actual existing liability and compare with perceived liability
7. Review guidelines for therapeutic rest for prodromal labor
8. Alter triage staffing to free time for hands on RN support
9. Review clinical definitions of active labor and discuss at OB/Peds
10. Review existing clinical practice guidelines that influence care in latent labor  
and see if they are current with EBP.


Figure 5. Opportunity statements created after examining results from Ishikawa discussions.

### EARLY LABOR ToDo List:


- ❑ **EAT** - light meals/snacks help to keep your energy up. Labor is a lot of work!
- ❑ **DRINK** - staying hydrated with non-caffeinated beverages helps your contractions to work better and *can make labor shorter!*
- ❑ **WALK** - the gentle movements of walking help your baby to come down.
- ❑ **POSITIONS** - Use the chart on the bathroom door to choose a new position every 15 minutes. Choose one position from each row on the poster, and mark it off as you complete it.
- ❑ **STAIRS** - Slowly climb the stairs just outside the birth center. Use the rails at the top and bottom to work in a few squats. Repeat for 15-20 minutes.
- ❑ **SHOWER/TUB** - warm water is a very effective pain reliever in early labor
- ❑ **REST/SLEEP**- even a few minutes of sleep between contractions can help you to have more energy for labor later.
- ❑ If you are having *back pain*, see the other side for recommendations.

### FOR BACK PAIN:


- ❑ **LUNGES** - see poster
- ❑ **STAIRS**
- ❑ **INVERSION** -see poster: "kneeling" row
- ❑ **HIP SQUEEZE** - constant pressure
- ❑ **BACK PRESSURE** - constant pressure





- ❑ **KNEE PRESS:** constant pressure



- ❑ **HIP SQUEEZE:** constant pressure








Figure 6. Latent labor education materials (English, version1), developed for PDSA 1. All images used in the education materials were created by the author for use in this project.



Figure 7. Posters added to triage rooms to facilitate patient education in latent labor.

## PDSA Cycles

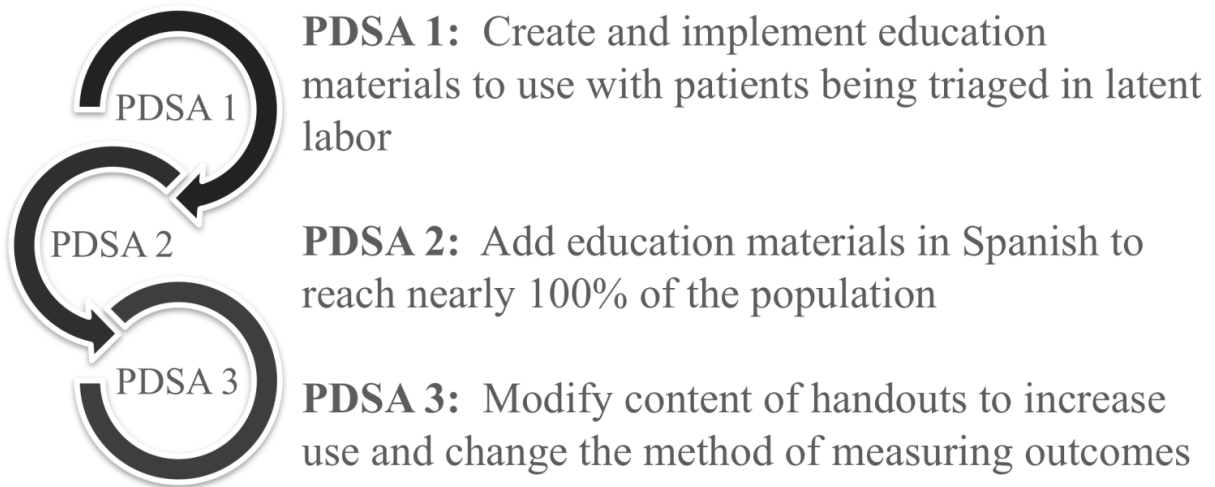


Figure 8. Brief summary of the three PDSA cycles.

1. How often do you give the new triage educational materials to uncomplicated term English-speaking patients in latent labor being triaged at the FBC?

- I **don't give** the materials to the patients.
- I give them **0-25%** of the time
- I give them **26-50%** of the time.
- I give them **51-75%** of the time.
- I give them **76-100%** of the time.

2. How do you discuss the new materials with term patients being triaged in latent labor at the FBC?

- I do not discuss the materials with patients.
- I briefly discuss the materials with the patients but mostly allow the patients to read the materials and direct themselves through the coping exercises and activities if they want to.
- I give a detailed explanation of the materials and strongly encourage the patients to make a specific plan using the handout and poster.

3. Rate the new materials:

How helpful do you think laboring women find the materials?

How helpful do you think support people find the materials?

How helpful do you find the materials in assisting you with latent labor education?

4. Of the new materials in triage, please rank them in terms of how helpful they are to your practice, with 1 being the most helpful:

- The handouts
- Having a ball ready in each room
- The posters on the doors

5. How many term patients being triaged in latent labor complete these specific activities during their triage experience?

Eat/Drink

Walk

Positions from the chart

Stairs

Ball

Rest

Shower

Any exercises for back pain (knee press, hip squeeze, inversion, counterpressure or lunges)

6. What changes would you make to the new education materials being used in triage to improve overall patient care and experience?

free text response

7. What changes would you make to the triage process to improve overall patient care and experience?

free text response

8. What concerns do you have about the new education materials being used in triage?

free text response

9. How often do you participate in the triage of uncomplicated term English-speaking patients in latent labor?

Every shift.

>75% of my shifts.

51-75% of my shifts.

25-50% of my shifts.

<25% of my shifts.

10. How long have you been working as an RN in labor and delivery?

free text response

Figure 9. Survey questions answered by charge nurses to assess the outcomes of PDSA 1.

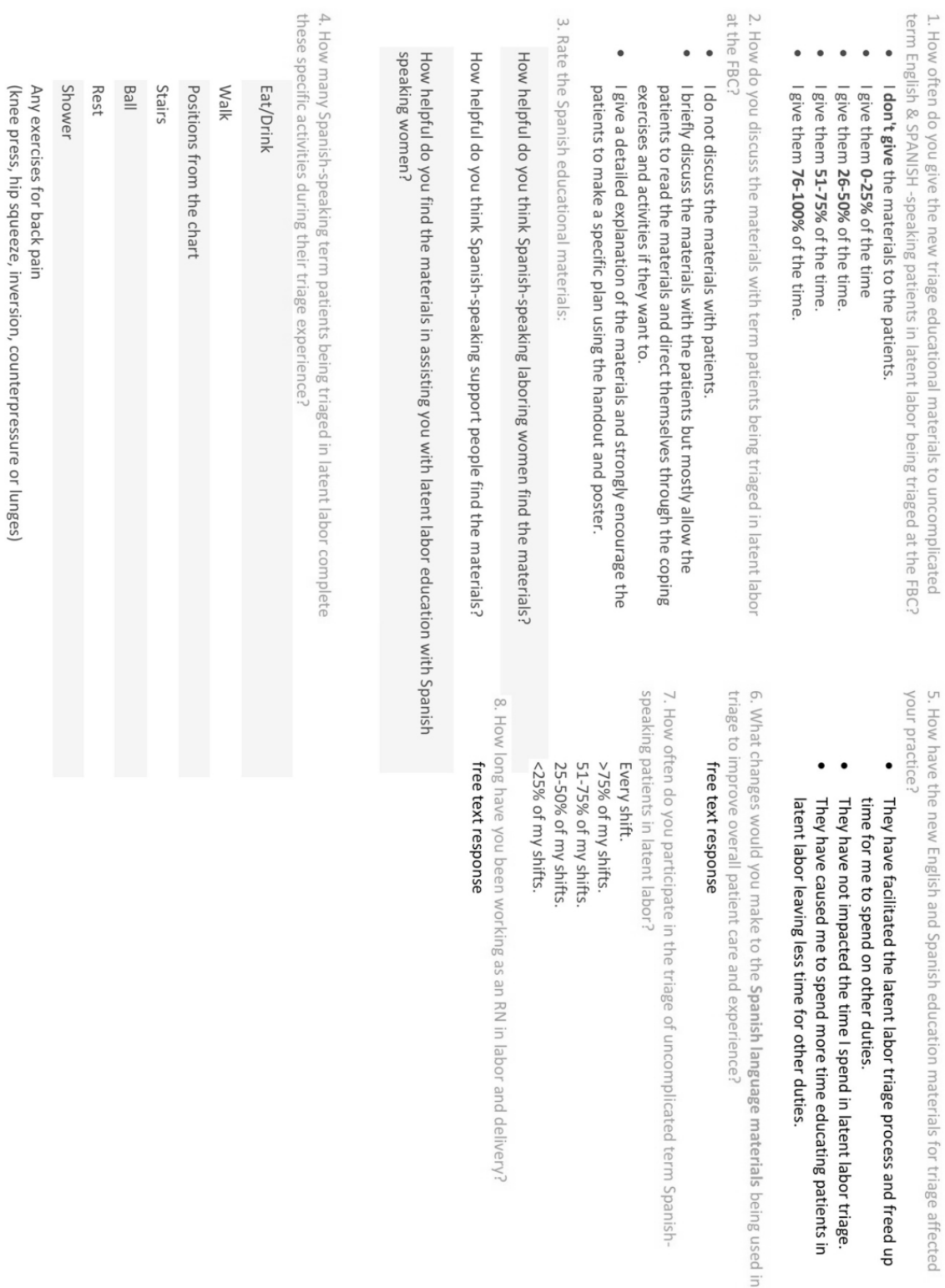


Figure 10. Survey questions answered by charge nurses to assess the outcomes of PDSA 2.

### LATENT LABOR TRIAGE DATA COLLECTION

SILVERTON FBC – LATENT LABOR TRIAGE PROJECT – APRIL 7-29, 2017

For all uncomplicated, term, low-risk patients being triaged for labor, please record the following about how the triage materials are being used.

| DATE | GA | PARITY | MATERIALS PRESENTED TO PATIENTS  | CIRCLE ACTIVITIES TRIED BY PATIENT  |
|------|----|--------|--|---|
|      |    | G P    | <input type="checkbox"/> Handouts <input type="checkbox"/> Ball <input type="checkbox"/> Poster<br><input type="checkbox"/> No materials presented<br><hr/> <input type="checkbox"/> Admitted <input type="checkbox"/> Sent Home | Ball Walk Eat Drink<br>Shower Lunges<br>Hip Squeeze Knee Press<br>Counterpressure Inversion |
| DATE | GA | PARITY | MATERIALS PRESENTED TO PATIENTS  | CIRCLE ACTIVITIES TRIED BY PATIENT  |
|      |    | G P    | <input type="checkbox"/> Handouts <input type="checkbox"/> Ball <input type="checkbox"/> Poster<br><input type="checkbox"/> No materials presented<br><hr/> <input type="checkbox"/> Admitted <input type="checkbox"/> Sent Home | Ball Walk Eat Drink<br>Shower Lunges<br>Hip Squeeze Knee Press<br>Counterpressure Inversion |
| DATE | GA | PARITY | MATERIALS PRESENTED TO PATIENTS  | CIRCLE ACTIVITIES TRIED BY PATIENT  |
|      |    | G P    | <input type="checkbox"/> Handouts <input type="checkbox"/> Ball <input type="checkbox"/> Poster<br><input type="checkbox"/> No materials presented<br><hr/> <input type="checkbox"/> Admitted <input type="checkbox"/> Sent Home | Ball Walk Eat Drink<br>Shower Lunges<br>Hip Squeeze Knee Press<br>Counterpressure Inversion |

Figure 11. Example of the data collection sheet used to assess impact of PDSA 3.

**Q1. How often do you give the new triage educational materials to uncomplicated term English-speaking patients in latent labor being triaged at the FBC?**

Answered: 5 Skipped: 1

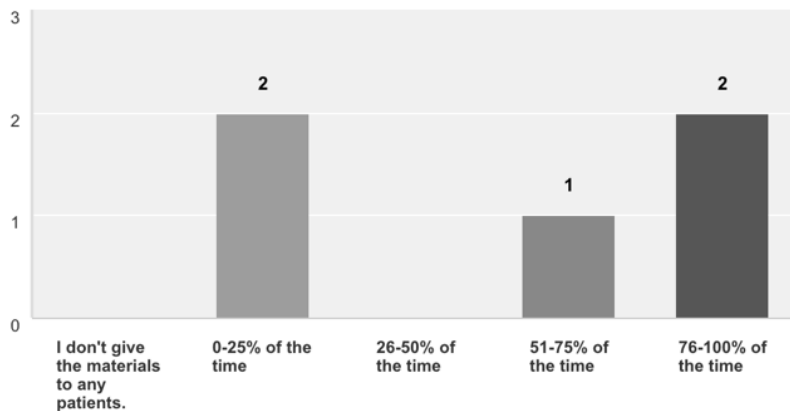


Figure 12. Sum of nurses reporting on their use of the educational triage materials, PDSA 1.

**Q2. How do you discuss the new materials with term patients being triaged in latent labor at the FBC?**

Answered: 6 Skipped: 0

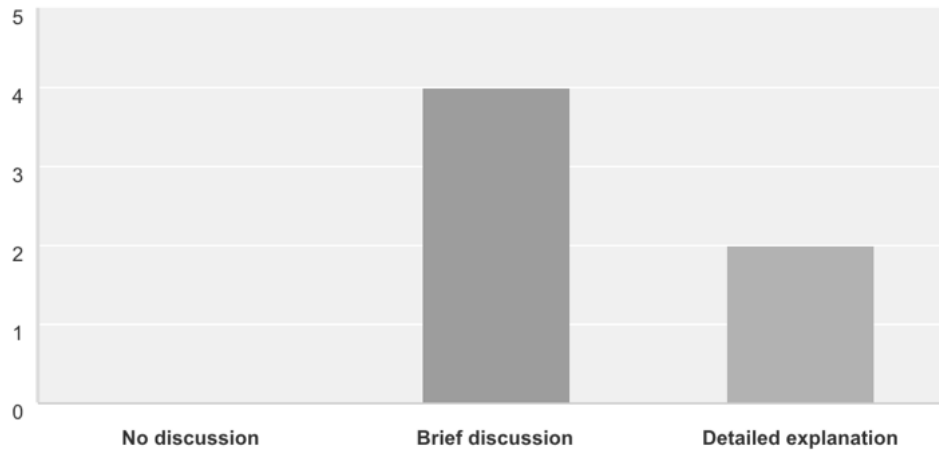


Figure 13. Types of discussion of the educational triage materials with patients, PDSA 1.

**Q5. Weighted average of activities that patients use when being triaged in latent labor:**

Answered: 6 Skipped: 0

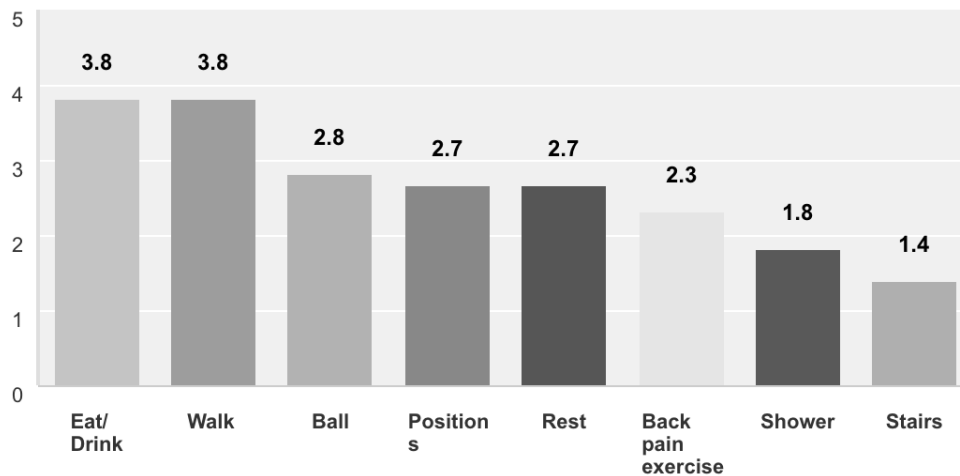


Figure 14. Weighted average of activities used by patients who meet criteria for the triage intervention, PDSA 1.



**Weighted average of helpfulness of educational triage materials for women, support people, & RNs; 0 - not helpful, to 5 - very helpful**

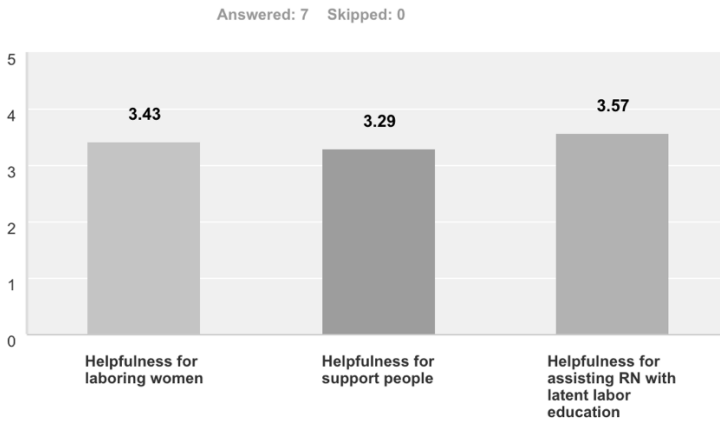


Figure 15. Weighted average of helpfulness of educational triage materials for women, support people, and nurses, PDSA 1.


### QueHacer durante el Parto:

- ❑ **COMA**- comidas ligeras mantienen la energía. ¡El trabajo de parto requiere esfuerzo!
- ❑ **BEBA**- el mantener la hidratación con bebidas sin cafeína facilita las contracciones y *¡puede reducir la duración del parto!*
- ❑ **CAMINE** - el movimiento facilita que baje el bebé.
- ❑ **POSICIONES** - Use el cartel en la puerta del baño y escoja una posición nueva cada 15 minutos. Elija una posición de cada fila del cartel y márcala al completarla.
- ❑ **ESCALERAS** - Hay escaleras justo afuera del centro de partos. Use la baranda al subir y bajar para apoyarse al agachar varias veces.
- ❑ **EI BAÑO/LA DUCHA** - agua tibia es muy eficaz en la reducción de dolor.
- ❑ **DESCANSE/DUERMA**- hasta unos pocos minutos de sueño le puede dar más energía para el parto.


Si tiene dolor de espalda, consulta el revés para recomendaciones.

### PARA DOLOR DE ESPALDA:


- ❑ **ZANCADAS** - vea el cartel
- ❑ **ESCALERAS**
- ❑ **INVERSIÓN** -vea el cartel
- ❑ **PRESIÓN EN LA ESPALDA** - presión constante



- ❑ **PRESIÓN DE RODILLAS:** presión constante



- ❑ **APRETÓN DE CADERAS**- presión constante












Figure 16. Latent labor education materials (Spanish, version 1), developed for PDSA cycle 2. All images used in the education materials were created by the author for use in this project.

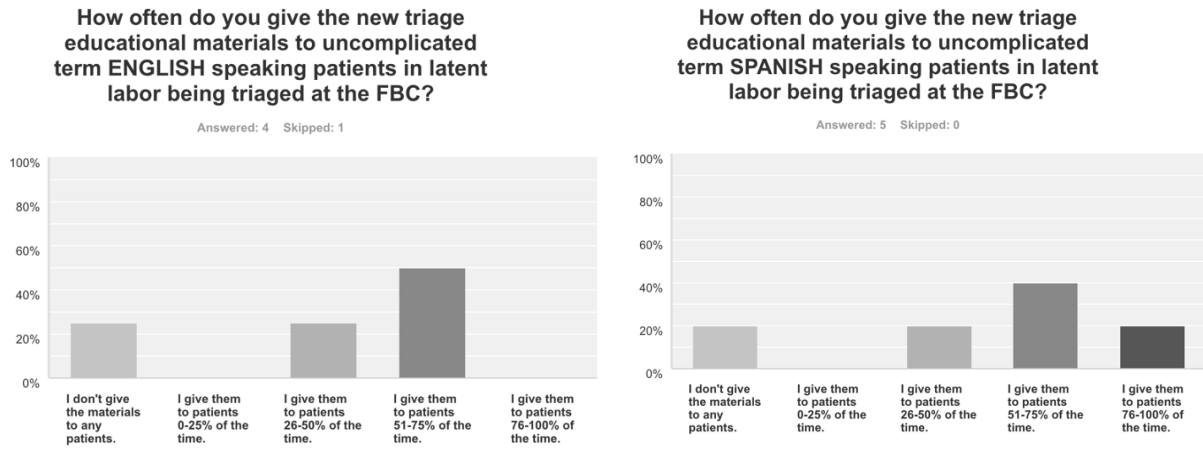


Figure 17. Nurse responses reporting frequency of use of educational triage materials for English and Spanish-speaking patients, PDSA cycle 2.

### How have the new English and Spanish education materials for triage affected your practice?



Figure 17a. Process Measure: Nurses' perception of the impact of the intervention on their time, PDSA cycle 2.

### EARLY LABOR ToDo List:

- ❑ **EAT** - light meals/snacks help to keep your energy up. Labor is a lot of work!
- ❑ **DRINK** - staying hydrated with non-caffeinated beverages helps your contractions to work better and *can make labor shorter!*
- ❑ **WALK** - the gentle movements of walking help your baby to come down.
- ❑ **POSITIONS** - Use the chart on the bathroom door or the back of this sheet to choose a new position every 15 minutes. Upright positions help labor to move along! Choose one position from each row on the poster, and mark it off as you complete it.
- ❑ **SHOWER/TUB** - warm water is a very effective pain reliever in early labor
- ❑ **REST/SLEEP**- even a few minutes of sleep between contractions can help you to have more energy for labor later.
- ❑ If you are having *back pain*, see the other side for recommendations.

### QueHacer durante el Parto:

- ❑ **COMA**- comidas ligeras mantienen la energía. ¡El trabajo de parto requiere esfuerzo!
- ❑ **BEBA**- el mantener la hidratación con bebidas sin cafeína facilita las contracciones y *¡puede reducir la duración del parto!*
- ❑ **CAMINE** - el movimiento facilita que baje el bebé.
- ❑ **POSICIONES** - Use el cartel en la puerta del baño y escoja una posición nueva cada 15 minutos. Elija una posición de cada fila del cartel. Posiciones verticales facilitan el progreso del parto.
- ❑ **EI BAÑO/LA DUCHA** - agua tibia es muy eficaz en la reducción de dolor.
- ❑ **DESCANSE/DUERMA**- hasta unos pocos minutos de sueño le puede dar más energía para el parto.

Si tiene dolor de espalda, consulta el revés para recomendaciones.










Figure 18. English and Spanish versions of the education materials created for PDSA 3 that eliminated the recommendation to use stairs.

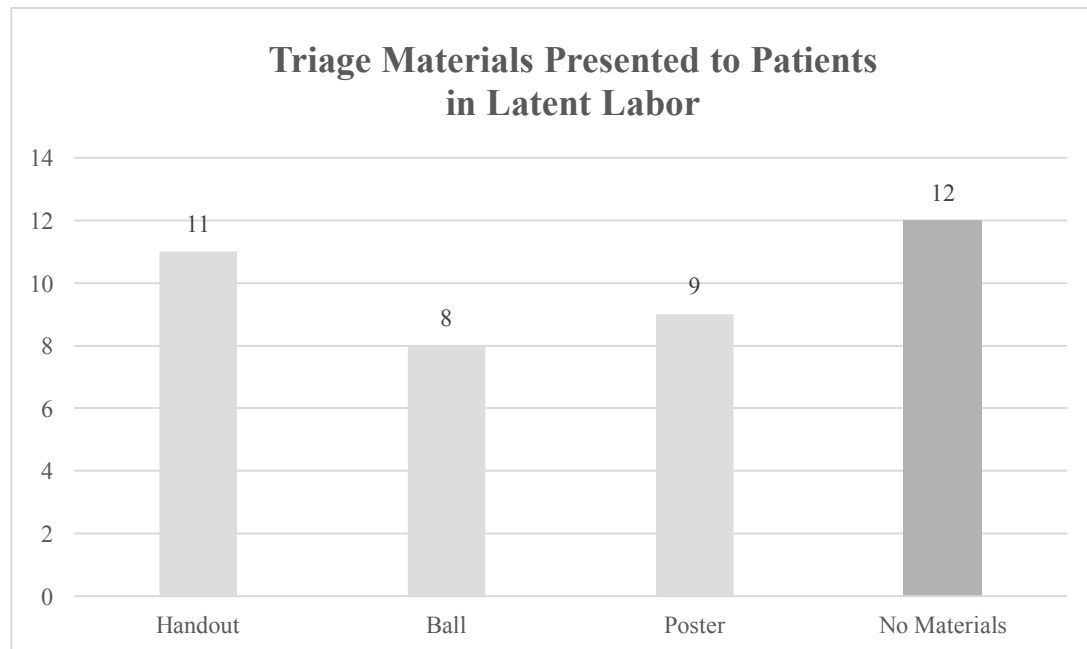


Figure 19. Triage intervention materials presented to patients in latent labor, PDSA 3.

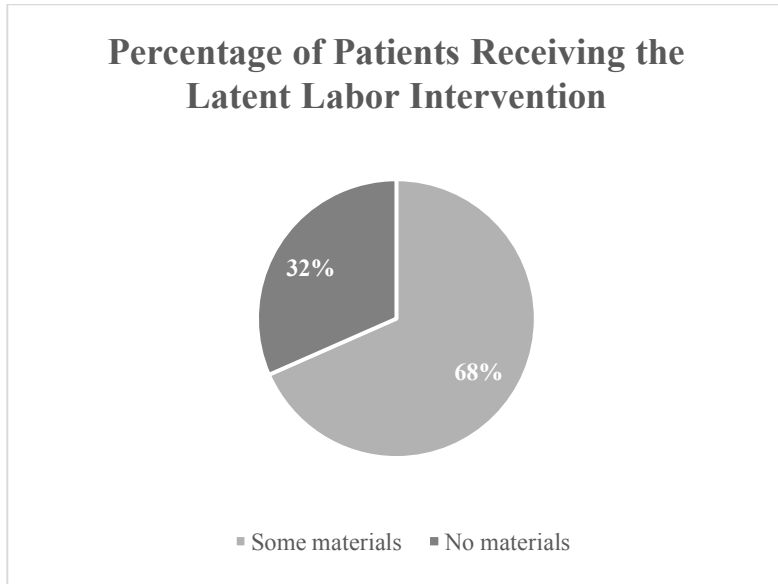


Figure 20. Percentage of patients who met criteria who received the triage intervention, PDSA 3.

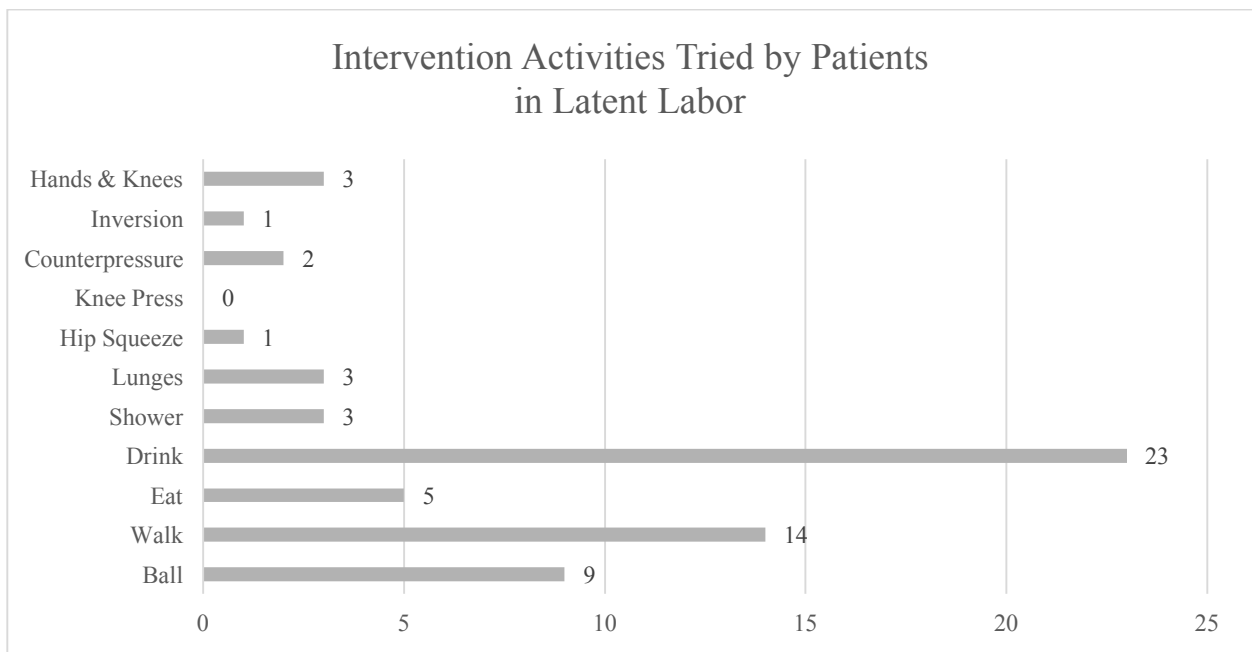


Figure 21. Intervention activities tried by patients in latent labor, PDSA 3.

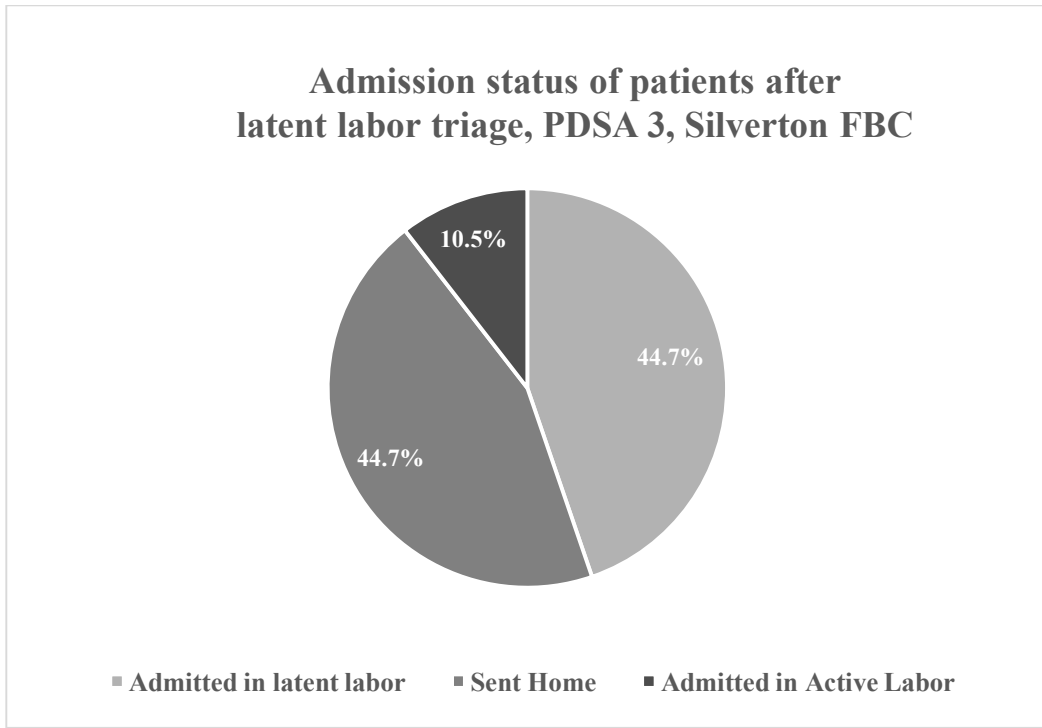


Figure 22. Admission status of patients after triage on latent labor, PDSA3, Silverton FBC.