

**Standardizing Documentation to Improve Prolonged Second Stage Evaluation & Provider
Communication: A Quality Improvement Project**

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March 1, 2022

Abstract

Background: Current obstetric practice lacks clear guidelines regarding the management of a prolonged second stage (PSS). Research suggests increased risks for poor perinatal outcomes with PSS. Finding the balance point between promoting a healthy vaginal delivery and minimizing adverse perinatal outcomes could be instrumental in guiding the management of the second stage. **Aims:** The aims of this project were to 1) examine PSS outcomes for patients cared for by midwives at an academic health center between 2012 and 2019 and 2) determine and act upon opportunities for improvement in clinical and systems approaches to best practice.

Methods: Frequency of PSS was quantified from among 1456 nulliparous patients attended by the midwifery service between 2012 and 2019. Adjusted regression models were used to estimate the odds of poor perinatal outcomes for patients with and without a PSS. Results were compiled and presented to the CNM practice with suggestions on how to improve PSS evaluation and management. **Intervention:** A standardized documentation tool was created to be used on all midwifery patients approaching and experiencing a PSS. Implementation of this tool was intended to increase critical thinking about factors that can lead to a PSS, prompt consideration of management techniques, and improve communication between care providers. **Results:** During the span of this project, six patients qualified for use of the PSS tool. The tool was used 100% correctly on four charts and 75% correctly on two charts. The overall correct utilization rate was 91.67%. Fourteen out of 27 providers responded to the wrap-up survey. Survey results indicated that the majority of midwives thought the tool promoted critical thinking and improved communication with labor-team care providers. **Conclusion:** This project sheds light on how a thorough standardized documentation tool can effectively influence provider critical thinking, management, and communication during PSS.

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Problem Description

With increasing cesarean rates, there has been a global focus on preventing primary cesareans in efforts to reduce subsequent ones (The American College of Obstetricians & Gynecologists [ACOG], 2014). These efforts have led many providers to tolerate longer second stages in efforts to promote vaginal births. Some experts argue that while longer second stages may increase vaginal delivery rates, they may also contribute to poor maternal and neonatal outcomes such as operative deliveries, maternal postpartum hemorrhages, and neonatal intensive care unit admissions (Laughon et al., 2014; Matta et al., 2018; Pergialiotis et al., 2020).

Researchers have been investigating the impact of a prolonged second stage (PSS) on maternal and neonatal outcomes for decades. Unfortunately, this research has failed to provide clear clinical guidance due to the lack of consensus regarding what is considered prolonged and what perinatal outcomes are associated with a lengthy second stage. Balancing the safety of the fetus and the mother while promoting a vaginal delivery can lead to contradictory recommendations; thus, making management of the second stage highly challenging (Gimovsky et al., 2021; King et al., 2019).

Most research studies use historical ACOG practice bulletins to define PSS as full cervical dilation for: >3 hours for nulliparous with an epidural and >2 hours without an epidural. For multiparous patients the cutoffs are >2 hours with an epidural and >1 hour without (ACOG, 2003; ACOG, 2012; Laughon et al., 2014). Based on these definitions, the incidence of PSS in nulliparous parturients was reported to be 13.9% and 9.9% with and without epidural, respectively. For multiparous patients, PSS rates were reported to be 3.1% and 3.5% with and without epidural, respectively (Cheng & Caughey, 2015). A recent retrospective cohort study (n=661) reported nulliparous PSS incidence rates as high as 16.7% (Gimovsky et al., 2021). The

aims of this project were to 1) examine PSS outcomes for patients cared for by an academic health center's midwifery practice between 2012 and 2019 and 2) determine and act upon opportunities for improvement in clinical and systems approaches to best practice.

Available Knowledge

The definition of the second stage of labor is the period from complete cervical dilation until the fetus is born. While this definition is most widely used, it is important to note that from a physiologic perspective, the second stage of labor is more accurately defined as the onset of the urge to bear down, which usually occurs at +1 station, until the infant is born (King et al., 2019). Research on the length of second stage initially began in the 1950s with Dr. Emanuel Friedman who concluded the average length of the second stage in minutes was 14 and 46 for multiparous and primiparous patients respectively. His research was later contested as 55% of the labors Friedman studied were terminated using mid to low forceps (King et al., 2019), thus the duration of 'average' was a feature of past obstetric practice rather than healthy physiology. At present, widespread use of epidural analgesia is associated with a longer second stage. In 1989, the first analysis was published examining labor lengths that resulted in spontaneous vaginal deliveries with and without epidurals (Kilpatrick & Laros, 1989). The mean duration (standard deviation) for primiparous second stage without an epidural was 54 (± 39) minutes and with an epidural was 79 (± 53) minutes. For multiparous patients the means were 19 (± 21) minutes without an epidural and 45 (± 43) minutes with an epidural (Kilpatrick & Laros, 1989).

The most recent language ACOG (2014) uses to discuss PSS does not definitively define a PSS, but rather provides management guidelines which recommend at least 2 hours of active pushing in multiparous patients and at least 3 hours in nulliparous patients before diagnosing an

arrest of labor in the second stage. Longer durations of second stage may be appropriate based on individual considerations (epidural analgesia & fetal position), as long as progress is documented. Labor characteristics commonly seen in correlation with PSS include primiparity, increased maternal age, tobacco use, use of oxytocin, use of epidural, intra-amniotic infection, neonatal birth weight \geq 90th percentile, occipital posterior fetal position, shoulder dystocia, and male infant sex (Finnegan et al, 2019; Laughon et al., 2014; Matta et al., 2019; Pergialiotis et al., 2020). Laboring people who experience a protracted first stage are more likely to have a prolonged second stage (Cheng & Caughey, 2015).

Several poor perinatal outcomes have been associated with PSS (ranging from >3 to ≥ 5 hours). Outcomes include higher rates of chorioamnionitis, endometritis, postpartum fever (Cheng & Caughey, 2015; Hehir et al., 2018; Laughon et al., 2014; Pergialiotis et al., 2020), shoulder dystocia, obstetric anal sphincter injuries (OASI) and episiotomy (Cheng & Caughey, 2015; Finnegan et al., 2019; Gimovsky et al., 2021; Laughon et al., 2014; Matta et al., 2018; Pergialiotis et al., 2020), and postpartum hemorrhage (PPH; Cheng & Caughey, 2015; Finnegan et al., 2019; Gimovsky et al., 2021; Hehir et al., 2018; Laughon et al., 2014; Matta et al., 2018; Pergialiotis et al., 2020).

The data regarding neonatal complications are less consistent. Some studies report an increased risk of birth asphyxia (Laughon et al., 2014; Sandström et al., 2017), umbilical artery acidosis (Sandström et al., 2017), admission to the neonatal intensive care unit (NICU; Cheng & Caughey, 2015; Gimovsky et al., 2021; Laughon et al., 2014; Matta et al., 2018; Pergialiotis et al., 2020; Sandström et al., 2017), neonatal sepsis (Laughon et al., 2014; Pergialiotis et al., 2020), low Apgar scores (Cheng & Caughey, 2015; Laughon et al., 2014; Matta et al., 2018), and neonatal birth injuries (Finnegan et al., 2019). In contrast, other data suggest no increased risk of

NICU admissions (Cheng & Caughey, 2015; Hehir et al., 2018), neonatal acidosis, or birth trauma (Cheng & Caughey, 2015; Hehir et al., 2018; Matta et al., 2018). Furthermore, in their large population-based cohort study, including 42,539 nulliparous patients, Sandström et al. (2017) noted that while the relative risk of neonatal complications increased, these outcomes remained rare, and the absolute risk difference was small. For example, birth asphyxia increased from 0.42% at < 1 hour to 1.29% at ≥ 4 hours (Sandström et al., 2017). There has been no increased risk of perinatal death or hypoxic-ischemic encephalopathy identified with pushing for >2 to > 5 hours (Laughon et al., 2014; Pergialiotis et al., 2020).

Laboring people with a PSS were more likely to undergo assisted vaginal deliveries or cesarean deliveries (Hehir et al., 2018; Laughon et al., 2014; Matta et al., 2018; Pergialiotis et al., 2020). Despite an increased risk for operative deliveries, most studies note that even with a PSS, there is a high likelihood of a successful vaginal delivery with rates ranging from 80% to 93% (Cheng & Caughey, 2015; Gimovsky et al., 2021; Finnegan et al., 2019; Laughon et al., 2014). For cesarean delivery after PSS, research indicates increased rates of maternal and neonatal complications, including hysterotomy extensions, postpartum hemorrhage, blood transfusions, maternal gut injury, postpartum infection, difficult fetal extraction, fetal trauma, and NICU admissions (Bruey et al., 2017; Cebekulu & Buchmann, 2006; Cheng & Caughey, 2015; Malik et al., 2021; Qadir & Amir, 2017; Wood et al., 2017).

Review of the available knowledge highlights problematic limitations of the research. Some studies did not define PPH (Cheng & Caughey, 2015; Finnegan et al., 2019; Hehir et al., 2018), while others used the outdated definition of 500 ml for vaginal births (Gimovsky et al., 2021; Laughon et al., 2014; Pergialiotis et al., 2020). Most studies did not distinguish the duration of delayed pushing/passive descent, if any, versus the duration of active pushing.

Delayed pushing encourages patients to delay active pushing until they feel an involuntary urge to do so. Waiting until this urge is felt is thought to stimulate endogenous maternal oxytocin release and promote increased pushing efficacy and decrease maternal exhaustion (Lemos et al., 2017). A sentinel multi-site randomized clinical trial that examined delayed pushing versus active pushing found no differences in rates of vaginal deliveries but did note an increase in PPH (500ml) and chorioamnionitis in the delayed pushing arm for nulliparous individuals with a working epidural (Cahill et al., 2018). With these results in mind, it is also essential to distinguish between active and passive pushing when finding causation between lengths of the second stage and perinatal outcomes. Furthermore, although there appears to be consistent themes in the literature, it remains unclear if there is a causal relationship between PSS and poor perinatal outcomes or if a PSS serves as a marker for other complication etiologies, such as infection and operative vaginal deliveries (Cheng & Caughey, 2015; Laughon et al., 2014).

Rationale

Current obstetric practice is lacking a clearly defined upper limit to the second stage of labor. Regardless of the limitations, current research suggests that increasing risks to both the parturient and the neonate exist as the length of the second stage increases. Finding the balance point between the likelihood of a vaginal delivery and the lowest risk for adverse perinatal outcomes could be instrumental in guiding the management of the second stage. This clinical quandary informed the analysis of the incidence rates of PSS and associated perinatal outcomes in the Oregon Health and Science University faculty midwifery practice. The hope was that the findings would present opportunities for improved PSS management that could be translated into actionable steps to influence change in the practice setting. The Knowledge to Action framework (Appendix A, Graham et al., 2006) was used to guide the research findings into several possible

knowledge tools and products that could be used in future clinical practice. The CNM practice deliberated possible solutions based upon the data from the practice outcomes, and a survey was used to gather responses. The majority of midwives voted for one of the actionable improvement plans, which was to implement a standardized progress note for labors affected by PSS. The improvement product was then implemented using The Institute for Healthcare Improvement's (IHI) Model for Improvement and Plan-Do-Study-Act cycles (PDSA; Appendix B, IHI, 2021).

Specific Aims

The global aim of this project was to increase proactive midwifery critical thinking of factors that can lead to a PSS, prompt consideration of management techniques, and improve communication between labor-team care providers. The specific aims of this project were A) by October 2021, implement the developed standardized documentation tool with $\geq 80\%$ usage by the end of the first PDSA cycle for all patients with and approaching a PSS. B) By November 2021, edit and update the documentation tool based on provider feedback with 100% utilization rates by the faculty midwives and midwifery students for patients with and approaching a PSS.

Context

The institution where this project took place is a public academic health center located in the Pacific Northwest. Thirty-two percent of the patient population are covered by a public payer or do not have insurance. The practice attends approximately 500 births per year. The patient population is predominately white, non-Hispanic (79%) and 23% are over the age of 35. The sample included in this project consisted of patients from the midwifery clinic as well as referrals for intrapartum care only from suburban and urban communities. The midwifery practice consists of 11 faculty CNMs and nine per diem CNMs. Midwives take call on a rotating basis and often supervise student midwives. The midwifery faculty practice independently cares for

low and moderate-risk pregnancies. The obstetrician (OB) and maternal-fetal medicine (MFM) physicians act as consultants to the midwifery practice on an as needed basis. See Appendix C for the institution's 2021 labor and birth statistics.

The institution's Perinatal Best Practice (PBP) Committee is a multidisciplinary committee comprised of nurses, obstetricians, MFM practitioners, midwives, neonatologists, anesthesiologists, and family medicine providers. The PBP Committee aims to collaborate on policy and guideline development to implement evidence-based practice and improve systems among the perinatal units. Their plan for the year of this project was to analyze best practice for prolonged second stages of labor, which helped to inspire this project.

The midwifery practice guidelines lack protocols for managing labors affected by a PSS, allowing for wide inter-provider variability regarding total length of second stage tolerated, management techniques, timing of OB consultation, and associated documentation. The guidelines suggest hourly labor-team huddles during the second stage but lack specific execution details regarding who to involve and required documentation. Thus, providers report that these huddles happen informally with the labor nurse, if at all.

Methods

The faculty midwifery practice maintains a repository with over 200 variables for the purposes of quality assessment and research. This database was used by Elise Erickson, PhD, CNM, to conduct the data analysis that informed this project. For this analysis, all nulliparous patients cared for during their intrapartum period by the faculty CNM practice, from January 2012 through December 2019, who had a term (≥ 37 weeks), singleton, vertex pregnancy, and reached complete dilation and attempted a vaginal delivery were included. Patients were stratified into subgroups of individuals who had a PSS and those who did not. After cleaning the

repository data, all data was de-identified and reported in aggregate to protect personal health information in accordance with the institution's Internal Review Board protocol.

The labor variables that were examined included epidural use, fetal occiput anterior (OA) position, oxytocin use, maternal hypertensive disorders, meconium-stained amniotic fluid, and laboring down ≥ 1 hour. For the outcome analysis, the independent variable was length of the second stage of labor, defined as from complete dilation until delivery. Dependent maternal variables included: mode of delivery, PPH (≥ 1000 ml), blood transfusions, OASI, infection, postpartum fever, and prolonged hospital stay. The neonatal outcomes examined included: shoulder dystocia, NICU admissions, Apgar scores < 7 at five minutes, infant not discharged with mother, and a composite of neonatal complications that included one or more of the following: newborn bacterial infection, cardiac failure, shock, intraventricular hemorrhage, necrotizing enterocolitis, pneumonia, persistent pulmonary hypertension, renal failure, respiratory distress syndrome, seizures, sepsis, post-birth antibiotics, meconium aspiration, and neonatal death. These variables were chosen to be in concordance with prior studies (Bruey et al., 2017; Cebekulu & Buchmann, 2006; Cheng & Caughey, 2015; Finnegan et al., 2019; Gimovsky et al., 2021; Hehir et al., 2018; Laughon et al., 2014; Malik et al., 2021; Pergialiotis et al., 2020; Qadir & Amir, 2017; Wood et al., 2017).

Adjusted regression models were used to examine differences in maternal and neonatal outcomes for patients with and without a PSS. The results indicated an incidence of PSS in primiparous patients of 27.5% (n=1456). Nulliparas who had a PSS were more likely to have an epidural, a malpositioned fetus, oxytocin augmentation, hypertensive disorders, meconium-stained fluid, and labored down \geq one hour. The maternal outcomes of most statistical significance were increased rates of instrument assisted vaginal births (5.7%), cesarean deliveries

(19.5%), OASI (5.7%), and chorioamnionitis (6.8%). There were no significant increases in the risk of a PPH (1000ml), blood transfusions, postpartum fevers, or prolonged hospital stays. The neonatal outcomes of most significance were NICU admissions (5.7%) and Apgar score less than 7 at five minutes (2.6%). Although NICU admissions were increased, the analysis showed that the rates of couplet discharges did not differ between a normal and PSS. Additionally, the analysis illustrated that chorioamnionitis is an independent risk factor for NICU admissions regardless of the length of the second stage. There were no increases in the rate of the composite neonatal complications or shoulder dystocia with a PSS.

These results were compiled and presented to the midwifery practice with four suggestions on how to improve PSS evaluation and management. The extensive chart reviews performed to clean the analytical data, illuminated the wide inter-provider variability of PSS management and the lack of consistent and thorough progress notes. The paucity of consistent documentation posed obstacles when reviewing charts for this research and could be problematic in future research and litigation. This highlighted the need for a standardized documentation protocol to facilitate consultations, change of shift reports, transfers of care, and accurate records. This suggestion was included in the four options for a quality improvement project which were an improved second stage documentation tool, guidelines for Pitocin augmentation in the second stage, improved identification, and management of malpositioned babies, and a patient counseling tool about risk of OASI with a PSS. By majority vote (63%) the documentation tool was selected.

The documentation tool was then developed and published in the electronic health record (EHR) and shared with all midwives and student midwives taking call in the institution's labor and delivery unit. Using IHI's Model for Improvement PDSA cycles as a guide, the

documentation tool was implemented and evaluated in a series of two PDSA cycles. In between the cycles, the midwives provided feedback with suggestions to edit and improve the documentation tool. These edits were implemented prior to initiating the second PDSA cycle. The goal was to have all midwives using the standardized documentation tool on all patients who were approaching or experiencing a PSS.

Interventions

The first intervention of this project was analyzing and presenting the data related to the incidence of PSS and various perinatal outcomes among the midwifery patient population. These results were combined with a thorough description of the problem and available knowledge in a 20-minute voice-over slide set that was distributed to the 11 full-time faculty midwives. The midwives were then asked to vote on which quality improvement project they wanted to implement. Of note, the other top contender that received the remaining four votes was implementing better practices surrounding early identification and management of malpositioned fetuses. Due to this topic's popularity, assessment of fetal position is included in the "dot phrase" with prompts regarding confirmation and management techniques. This remains an important and sought-after topic of clinical inquiry that should be considered for future quality improvement projects.

After the standardized documentation tool was written and published into the EHR, it was shared in the form of a "dot phrase" among all midwives and student midwives taking call at the institution's labor and delivery unit. An email was sent out with an example of the "dot phrase," instructions on its use, and request for cooperation with its implementation. Additionally, an informational flyer was posted in the midwifery call-room, student midwife call-room, and at the labor unit charting station. The flyers were intended to act as reminders in the clinical setting to

positively influence “dot-phrase” utilization. Of note, the progress note was also shared with the institution’s quality-lead OB physician and the director of labor and delivery, who is a MFM physician. The physician suggested adding a line about pulse oximetry usage to differentiate between maternal and fetal heart rates in the second stage. This suggestion was added to the second rendition of note for PDSA cycle two.

The first PDSA cycle was initiated on October 11, 2021, with the official rollout of the documentation tool in the intrapartum setting. All faculty midwives (16) and students (6) who were actively taking call were given access to the “dot phrase” with specific instructions for its use. The note was intended to be used on every patient one hour before their second stage was considered prolonged and every hour thereafter until delivery or transfer of care. For multiparous patients, they were instructed to begin using the note after one hour of active pushing. For nulliparous patients, usage of the note began after two hours of active pushing. Nulliparous patients included any patient without a prior vaginal delivery, including those who had delivered previously by cesarean section alone. Please see Appendix E for a copy of the progress note used for PDSA cycle one.

After three weeks of use, the note was updated to reflect suggestions made by the midwives. Edits primarily included wording adjustments to better reflect a standard progress note and the addition of several clinical variables to promote a more complete clinical picture. The updated note was published on November 8, 2021, initiating the second and final PDSA cycle. See Appendix F for the edited version of the progress note use in PDSA cycle two.

Study of the Interventions

To track the utilization of the “dot phrase,” a report was created in the midwifery repository that exported all deliveries with a second stage greater than one hour that occurred

during the PDSA cycles. This report was reviewed weekly to determine which patients were eligible for the “dot phrase” based on the length of their second stage in correlation with their parity. Once the appropriate patients were identified, their EHR record was audited to assess for the usage of the note. Weekly reports were emailed to the midwives and student midwives that outlined how many patients qualified for the use of the note, how well the note was used by providers, gave praise to those who used it, and offered suggestions for improvement as needed.

At the end of the second PDSA cycle a final wrap-up survey was distributed to the entire CNM faculty practice including 21 midwives and the six students that were taking call during the project implementation. The goal of this survey was to evaluate provider perceptions pertaining to usefulness of the note, plans for continued use, and a final opportunity to provide feedback. The survey was distributed via email and responses were collected anonymously. Responses were compiled with the results of the project and shared with the midwives during a practice meeting to discuss provider experiences with the note, future sustainability of the “dot phrase,” and considerations for future projects. Please see Appendix G for a copy of the survey.

Ethical Considerations

A request for determination was confirmed by the institution’s Internal Review Board (IRB) that this project was not human subject research. This author has no conflicts of interest or financial relationships to disclose.

Results

Throughout the first and second PDSA cycles spanning October 11, 2021, to November 29, 2021, there were six patients who had a PSS and qualified for use of the progress note. Five of these patients were primiparous. One was multiparous but had no prior vaginal births. Birth modes were as follows: three normal spontaneous vaginal births, one forceps-assisted vaginal

birth, and two cesarean deliveries, one repeat and one primary. There were three reported postpartum hemorrhages (>1000ml), none of which resulted in a blood transfusion, and one retained placenta. No other maternal or neonatal complications were reported.

The PSS progress note was used by a total of six CNMs and four student midwives. Of the six eligible patients, four of them had 100% perfect progress note utilization. This means that notes were written one hour prior to the diagnosis of a PSS and every hour thereafter until delivery or transfer of care. The other two EHRs had 75% correct utilization. These EHRs were both missing the last note prior to the transfer of care to obstetricians. Based on the previous EHR review conducted during the data analysis, this is a commonly missed piece of documentation. A possible explanation for this could be that it is assumed that the accepting provider will write a timely progress note and that the off-going provider does not need to write a final note outlining the transfer of care. The overall “dot phrase” utilization rate was 91.67%.

A total of 10 CNMs out of 21 and four students out of six responded to the wrap-up survey. Of the 14 respondents, eight (64%) reported using the PSS progress note during its implementation. Unfortunately, an additional respondent (for a total of 9) continued to answer questions meant only for those who had worked directly with the progress note. This likely skewed some of the data as it was not possible to determine which answers belonged to that respondent. Of these nine respondents, eight (89%) reported that using the progress note helped promoted critical thinking regarding factors that contributed to the prolonged second stage as well management techniques either a little, a moderate amount, or a lot. One respondent (11%) said that the note did not influence their critical thinking of either contributing factors or management techniques at all. Since using the note is required to infer how it affects one’s critical thinking, it is very likely that the extra respondent who did not actually use the note is the

one who answered saying that it did not influence their critical thinking. While seven providers (78%) reported that the note improved communication with OB colleagues during consultations and care transfers, only five (56%), reported that the note was useful in facilitating labor-team huddles with the labor nurse. Four (50%) of the respondents who used the note, reported that the note changed their PSS management by assisting with group communication, considering Pitocin augmentation earlier, increased assertiveness with pushing, and greater awareness of time. Ten providers (71.4%) said they planned to continue to use the progress note for future patients with a PSS, while two (14.3%) said they may or may not, and the remaining two providers (14.3%) said they would probably not continue to use the note.

Two major themes emerged from survey question nine, which asked providers to share their general thoughts regarding the progress note. First, the note was too long; participants reported that they would be more likely to continue to use the note if it was modified into a more concise note. Second, providers raised concerns about the logistics of stepping away from bedside care once an hour to write the note during active pushing. Please see Appendix H for the full graphical report of survey responses.

Discussion

The global aim of this project was to increase proactive midwifery critical thinking of factors that can lead to a PSS, prompt consideration of management techniques, and improve communication between labor-team care providers. The global aim was not assessed directly; instead, it was assessed by subjective report through a survey. Breaking this aim into two main themes – promotion of critical thinking and improved communication – it is apparent that they were achieved with various levels of success. Overall, the majority of midwives (89%) reported that the note stimulated their critical thinking, which is a meaningful and important finding. The

sheer number of clinical details the note asked the author to consider, likely stimulated the provider's thought process. Unfortunately, it is this same aspect of the note that caused it to be lengthy and thus, discouraged future use. Great consideration and clinician collaboration may be required to edit the note in a way that promotes usage while still stimulating broad enough clinical query to positively influence PSS management.

The progress note's effect on communication was less profound. Midwives reported moderate improvement (78%) of communication with OBs during consultations and transfers of care. This modest result is likely due to an established formal collaboration culture that exists at the institution. Fifty-six percent of midwives reported that the note had a positive effect on labor-team huddles between the CNM and primary labor nurse. While this result is still positive, it is less successful which could be related to the fact that many midwives do not engage in formal labor-team huddles and thus, there was no opportunity to implement the note in such a practice, resulting in an absence of improvement.

While a change in provider management of PSS was not specifically assessed in this project, it appears to have been a downstream effect of increased critical thinking. Although a reduction in poor perinatal outcomes related to PSS is an ultimate global goal, it was out of the scope of this project. It is insightful to see that 50% of providers changed their management technique with an intervention as simple as a thorough progress note. Evaluating how these practice changes affect associated perinatal outcomes should be addressed in future research.

A strength of this project was that the midwifery practice voted on the intervention themselves increasing their buy-in and willingness to participate. Additionally, weekly communication and usage reports gave participants an opportunity to be praised for their participation, reminded about appropriate use, and given a chance to provide real-time feedback.

One of the major limitations of the project was its short timeline and small sample size. With only six weeks of active runtime, this limited the number of eligible patients with a PSS, as well as providers who had an opportunity to use the note. Furthermore, due to the anonymous nature of the wrap-up survey, it was unclear if everyone who used the note provided feedback. With more transparent feedback, it may have been easier to determine the progress note's true impact.

Future sustainability of this project relies on whether the midwifery practice decides to make the note the standard protocol in labors affected by PSS, as well as if they can make the note more concise to increase provider participation. This project could also be implemented at the midwifery practice's sister institution. Additionally, this project can be used as a resource for future projects including increasing midwifery providers' assessment and management of malpositioned fetuses as well evaluating the impact of the note on PSS outcomes in the midwifery practice's patient population. A summary of the midwifery project will be shared with the institution's Perinatal Best Practice Committee to inform their PSS best practice analysis.

Conclusion

This quality improvement project documents the incidence of PSS in a generally healthy midwifery-care population, which is lacking in the literature. The project highlights the importance of standardized documentation during clinical situations, like prolonged second stages, that require heightened awareness and proactive management. This project also demonstrates how a documentation tool can effectively influence provider critical thinking. The results of this project illuminate provider resistance to using documentation tools that are long and cumbersome, no matter how useful they may be. Future projects should be aimed at developing a documentation tool that satisfies providers' requests for a more concise note while maintaining the depth and thoroughness that is required of complex clinical situations.

Additional research examining the implementation of this progress note on PSS perinatal outcomes for the CNM practice should also be considered. Results from the analysis conducted on PSS for use in this quality improvement project will be submitted for publication as a contribution to the evidence base on midwifery-led care outcomes.

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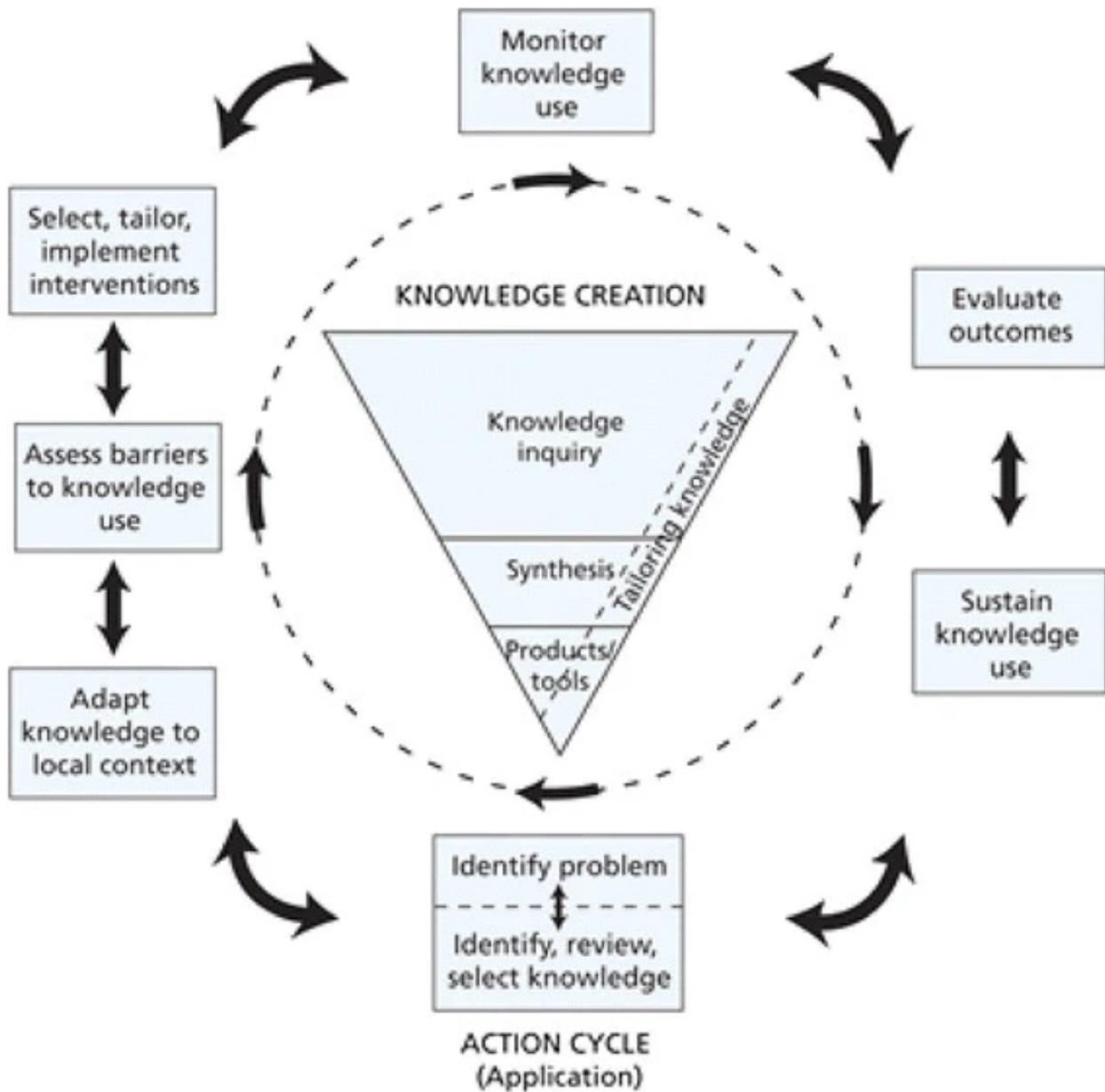
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Appendix A

Knowledge to Action Framework

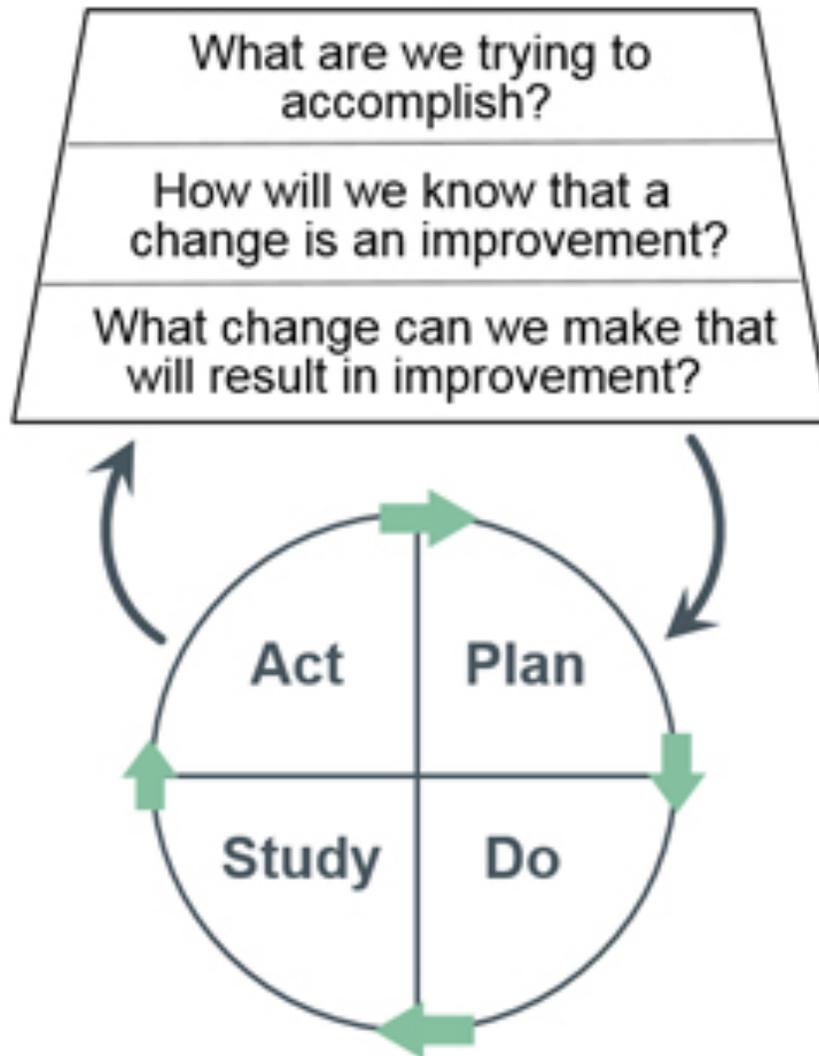


(Graham et al., 2006)

Appendix B

IHI Model for Improvement

Model for Improvement



(IHI, 2021)

Appendix C

Institution Statistics January 1st – December 31st, 2021

	Institution Total	CNM Faculty Practice
Annual # of Births	2526	547
Inductions	Unable to retrieve data	209
Epidurals	949 (37.6%)	251 (46%)
Cesarean Deliveries	773 (30.6%)	102 (18.6%)
Operative Vaginal Deliveries	Unable to retrieve data	19 (3.5%)
Normal Spontaneous Vaginal Deliveries	1,684 (66.6%)	426 (77.9%)

Appendix D

Progress Note During PDSA Cycle One

This dot phrase is intended to be used during hourly second stage huddles. The goal is to use it on every patient one hour before their second stage is considered prolonged and every hour thereafter. The first time it would be used would be after completion of 1 hour of pushing for multiples, after 2 hours of pushing for nullips, and then every hour thereafter until delivery or transfer of care.

S: Maternal preferences regarding second stage management include:

O: @VS@

Second Stage Timing:

Complete Dilation @ *** (time)
Urge to push? {YES/NO:63}, if yes @ *** (time)

Duration laboring down: ***h***m Duration actively pushing: ***h***m Total time of second stage: ***h***m

Second Stage Efforts/Coping:

Maternal efforts: ***
Pushing position(s): ***
Pain Management: Epidural, *** Effective / Inner resources, Patient *** coping

Contraction Assessment

UC pattern: ***
Strength ***. Assessed via IUPC/MVUs Pitocin: *** milliunits/min

Bladder management ***

Fetal Observations

FHTs: ***BL, *** variability, *** accels, *** decels. FSE in use {YES/NO:63}
FHT evolution over second stage: *** Intrauterine resuscitative measures: ***

Fetal Position: ***
Assessed & confirmed by ***SVE / ***BSUS

Change in Fetal Station: ***

A:
Second Stage *** hours
***Adequate Progress
Category *** fetal tracing, *** signs of developing fetal acidemia ***Febrile/Suspected Chorioamnionitis
***Fetal malposition

P:
Continue Pushing / *** Labor down
Consult OB colleagues ***
Continue to monitor for developing signs of infection Consider Pitocin augmentation
Continue frequent maternal position changes q***m Consider manual rotation of fetal head

***, SNM, actively participated in the care of this patient.
The total time I spent face to face with the patient was *** minutes.

@me@

Appendix E

Progress Note During PDSA Cycle Two (*edits highlighted*)

CNM Second Stage Progress Note

SUBJECTIVE: @FNAME@ is doing well***/feeling tired***/motivated to keep pushing***. Her preferences regarding second stage management include: laboring down***, continued pushing***, consideration of assisted delivery***.

OBSERVATION:

@VS@

@IOBRIEF@

Bladder management: Foley *** Last void at ***

Second Stage Timing:

Complete Dilation @ *** (time), station ***

Urge to push? {YES/NO:63}, if yes @ *** (time)

Duration laboring down: ***h***m

Duration actively pushing: ***h***m

Total time of second stage at time of this note: ***h***m

Second Stage Efforts/Coping:

Maternal efforts: ***

Pushing position(s): ***

Pain Management: Patient *** coping with ***epidural that is working effectively / using her own inner resources***

Pulse oximeter in use to distinguish maternal and fetal heart rate: {YES/NO:63}, ***not indicated

Contraction Assessment

UC pattern: q *** mins x *** secs

Strength *** to palpation *** adequate via IUPC/MVUs

Pitocin: *** milliunits/min. Initiated @ *** (time). Augmentation x *** hrs at time of this note.

Fetal Observations

FHTs: ***BL, *** variability, *** accels, *** decels.

FSE in use {YES/NO:63}, placed in {FIRST/SECOND:310191} stage

FHT evolution over second stage: ***

Intrauterine resuscitative measures used: ***

Fetal Position: *** , by ***SVE/Leopold's, *** confirmed by BSUS

Change in Fetal Station: ***

ASSESSMENT:

@AGE@@@GTPAL@ @ @GA@

Second stage x *** hrs *** mins

***Adequately progressing

Category *** fetal tracing, *** signs of developing fetal acidemia

ROM x ***hrs, GBS *** , ***afebrile, *** s/s of IAI

Suspected fetal malposition {YES/NO:63}

PLAN:

Continue Pushing / *** Labor down

Consult OB: {YES/NO:63}

Continue to monitor for developing signs of infection

Consider/***continue Pitocin augmentation: {YES/NO:63}

Continue frequent maternal position changes q***m

Consider manual rotation of fetal head: {YES/NO:63}

Reassess in ***1hr/PRN

***, SNM, assisted with the patient examination and documentation of this service. I performed the appropriate physical examination. I saw the patient and reviewed and verified all information documented by the student and made modifications to such information, when appropriate.

@me@

The majority of time for this visit, greater than 50%, was spent in counseling and/or coordination of care regarding *** plan of care, etc. The total floor time I spent face to face with the patient coordinating care was *** minutes

Appendix F

Wrap-Up Survey

Q1. Did you use the prolonged second stage progress note? (if yes, answer all questions. If no, skip to question 7)

- Yes
- No

Q2. Did using this progress note promote your critical thinking regarding **factors that contribute** to a prolonged second stage?

- Yes, a lot
- Yes, a moderate amount
- Yes, a little
- No, not at all

Q3. Did using this progress note promote your critical thinking regarding **management techniques** for a prolonged second stage?

- Yes, a lot
- Yes, a moderate amount
- Yes, a little
- No, not at all

Q4. Did use of this note improve labor team huddles?

- Yes, a lot
- Yes, a moderate amount
- Yes, a little
- No, not at all

Q5. Did use of this note facilitate obstetric consultations and or transfers of care?

- Yes, a lot
- Yes, a moderate amount
- Yes, a little
- No, not at all

Q6. Did use of this note change your practice with prolonged second stages? If yes, how?

Yes

No

Q7. Did you participate in the care of a patient, either intrapartum or postpartum, in which you were not the author of the prolonged second stage progress note, but found referencing the note helpful in providing care to the patient?

Yes, it was very helpful

No, it was not helpful or didn't alter my care at all

N/A, I did not participate in any care where the note was used

Q8. Do you plan to use this note in the future if you have a prolonged second stage?

Definitely yes

Probably yes

Might or might not

Probably not

Definitely not

Q9. Please share any thoughts on the usage guidelines or content of the note. These can include what worked well, what needs improvement, and just overall feedback.

Q10. Are you a student midwife or certified nurse midwife?

Certified Nurse Midwife (CNM)

Student Midwife (SNM)

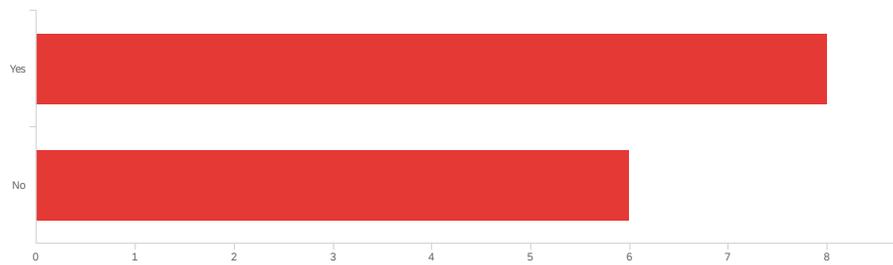
Appendix G

Survey Responses

Default Report

2nd Stage Documentation
 January 26, 2022 4:15 PM MST

Q1 - Did you use the prolonged second stage progress note? (if yes, answer all questions. If no, skip to question 7)



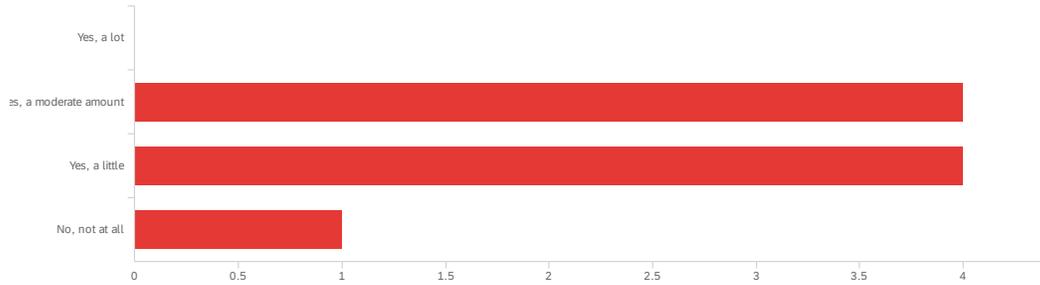
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you use the prolonged second stage progress note? (if yes, answer all questions. If no, skip to question 7)	1.00	2.00	1.43	0.49	0.24	14

#	Field	Choice Count
1	Yes	57.14% 8
2	No	42.86% 6

14

Showing rows 1 - 3 of 3

Q2 - Did using this progress note promote your critical thinking regarding factors that contribute to a prolonged second stage?



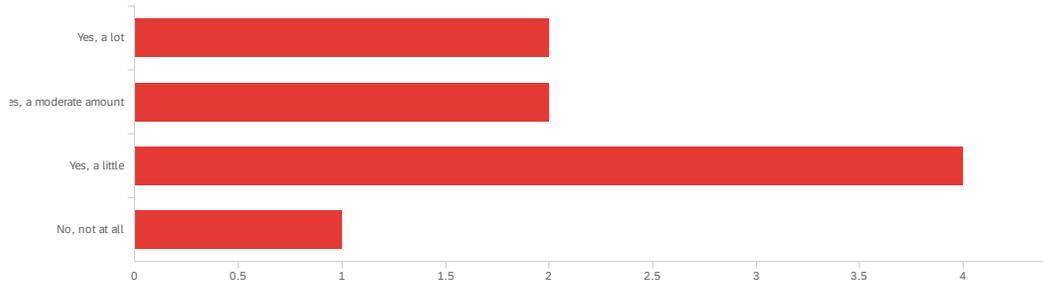
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did using this progress note promote your critical thinking regarding factors that contribute to a prolonged second stage?	2.00	4.00	2.67	0.67	0.44	9

#	Field	Choice Count
1	Yes, a lot	0.00% 0
2	Yes, a moderate amount	44.44% 4
3	Yes, a little	44.44% 4
4	No, not at all	11.11% 1

9

Showing rows 1 - 5 of 5

Q3 - Did using this progress note promote your critical thinking regarding management techniques for a prolonged second stage?



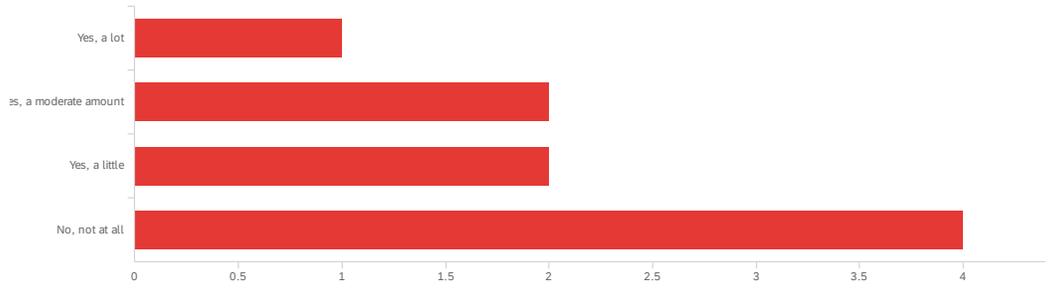
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did using this progress note promote your critical thinking regarding management techniques for a prolonged second stage?	1.00	4.00	2.44	0.96	0.91	9

#	Field	Choice Count
1	Yes, a lot	22.22% 2
2	Yes, a moderate amount	22.22% 2
3	Yes, a little	44.44% 4
4	No, not at all	11.11% 1

9

Showing rows 1 - 5 of 5

Q4 - Did use of this note improve labor team huddles?



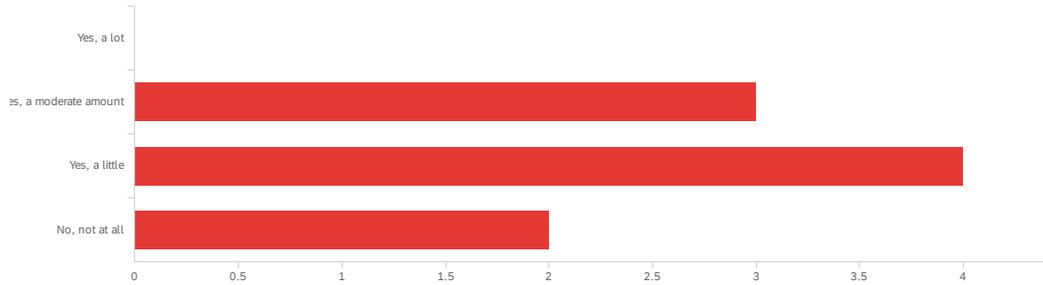
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did use of this note improve labor team huddles?	1.00	4.00	3.00	1.05	1.11	9

#	Field	Choice Count
1	Yes, a lot	11.11% 1
2	Yes, a moderate amount	22.22% 2
3	Yes, a little	22.22% 2
4	No, not at all	44.44% 4

9

Showing rows 1 - 5 of 5

Q5 - Did use of this note facilitate obstetric consultations and or transfers of care?



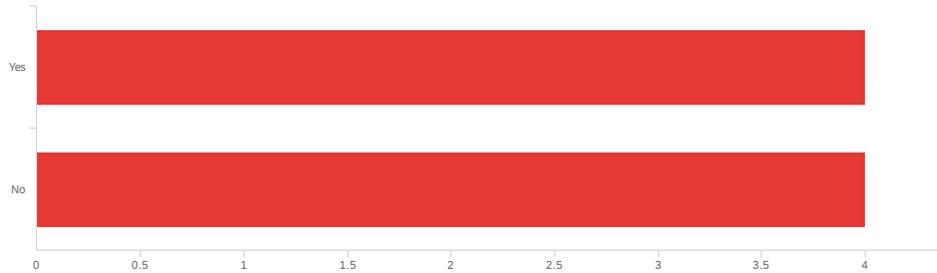
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did use of this note facilitate obstetric consultations and or transfers of care?	2.00	4.00	2.89	0.74	0.54	9

#	Field	Choice Count
1	Yes, a lot	0.00% 0
2	Yes, a moderate amount	33.33% 3
3	Yes, a little	44.44% 4
4	No, not at all	22.22% 2

9

Showing rows 1 - 5 of 5

Q6 - Did use of this note change your practice with prolonged second stages? If yes, how?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did use of this note change your practice with prolonged second stages? If yes, how? - Selected Choice	1.00	2.00	1.50	0.50	0.25	8

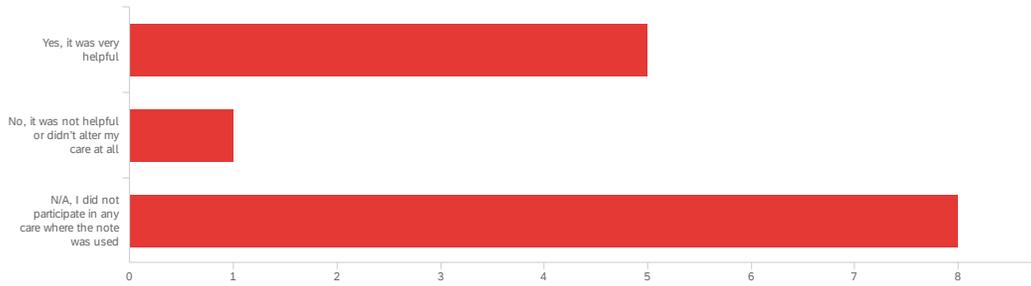
#	Field	Choice Count
1	Yes	50.00% 4
2	No	50.00% 4
		8

Showing rows 1 - 3 of 3

Q6_1_TEXT - Yes

- Yes
- made me get more assertive with pushing
- did not have a chance to use personally, but i think it would help the group keep communication clear and organized between providers and for chart review
- I was more proactive earlier into the second stage to consider Pitocin augmentation and manual rotation, rather than waiting until the 3 hour mark I often would consider more interventions at the 2 hour mark.
- More consistent awareness of time

Q7 - Did you participate in the care of a patient, either intrapartum or postpartum, in which you were not the author of the prolonged second stage progress note, but found referencing the note helpful in providing care to the patient?

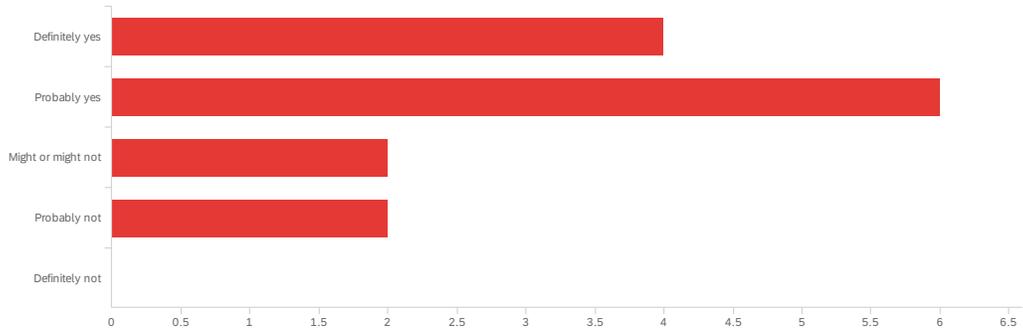


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you participate in the care of a patient, either intrapartum or postpartum, in which you were not the author of the prolonged second stage progress note, but found referencing the note helpful in providing care to the patient?	1.00	3.00	2.21	0.94	0.88	14

#	Field	Choice Count
1	Yes, it was very helpful	35.71% 5
2	No, it was not helpful or didn't alter my care at all	7.14% 1
3	N/A, I did not participate in any care where the note was used	57.14% 8
		14

Showing rows 1 - 4 of 4

Q8 - Do you plan to use this note in the future if you have a prolonged second stage?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Do you plan to use this note in the future if you have a prolonged second stage?	1.00	4.00	2.14	0.99	0.98	14

#	Field	Choice Count
1	Definitely yes	28.57% 4
2	Probably yes	42.86% 6
3	Might or might not	14.29% 2
4	Probably not	14.29% 2
5	Definitely not	0.00% 0
		14

Showing rows 1 - 6 of 6

Q9 - Please share any thoughts on the usage guidelines or content of the note. These can include what worked well, what needs improvement, and just overall feedback.

Please share any thoughts on the usage guidelines or content of the note. T...

A little long for regular use, but maybe if modified

hard to leave the room hourly, would make it more concise

Never had the opportunity to use the note, but your instructions and regular communication were very helpful!

I think the intent of the note is excellent and serves well to promote critical thinking and handoffs. I think the actual note itself is relatively cumbersome to use. With some modification I would happily keep using it though because it is an excellent resource for both providers and students.

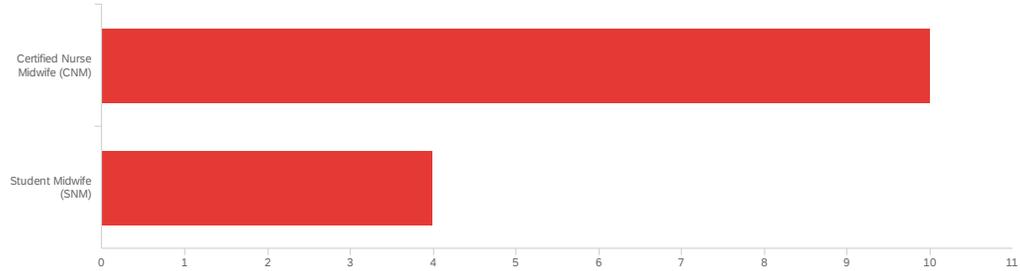
I had someone with a prolonged second stage, who in retrospect I think it was potentially related to a full bladder. While the note prompted my evaluation, and I suggested the patient void, I missed that the patient did not actually void as intended on the toilet. I would perhaps consider attempting a bladder scan in the future. I don't think the note could necessarily have prevented this, just an observation.

The Improved note in the middle of the tem was great and really made it possible to use as a single progress note without other supplementation.

I didn't personally use the note, and it was helpful when reviewing a chart. My only hesitation is logistical -- how do I break away from hands-on work to write a complicated note? I think it can be done, it's just a change in process, which is always hard....

It was a very, very long note. I liked all of the information, but I think that I would probably delete some of it in the future if I were to use it again. I did like the note overall and thought it had good information.

Q10 - Are you a student midwife or certified nurse midwife?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Are you a student midwife or certified nurse midwife?	1.00	2.00	1.29	0.45	0.20	14

#	Field	Choice Count
1	Certified Nurse Midwife (CNM)	71.43% 10
2	Student Midwife (SNM)	28.57% 4

Showing rows 1 - 3 of 3

End of Report