

The Coping With Labor Algorithm: An Alternate Pain Assessment Tool for the Laboring Woman

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The documentation of pain in the labor and delivery setting is one of the essential tasks of all health care providers who care for women in labor. The Joint Commission standards mandate regular pain assessments, but compliance with this mandate in the highly unique patient population of laboring woman is problematic when using the standard 0 to 10 Numeric Rating Scale. Labor pain is always unique given the various contributing physiologic, emotional, social, and cultural components. This article describes the work of a process improvement group to create an alternative pain assessment tool named the Coping With Labor Algorithm. The group, consisting of nurses and nurse-midwives, used the FOCUS format and Deming's "Plan, Do, Check, and Act" cycle to create a formalized assessment tool for use with laboring women. The Coping With Labor Algorithm is currently in use in the labor unit of a large tertiary care facility, which successfully passed a Joint Commission inspection while using the coping algorithm. The value of the coping algorithm is two-fold: it provides a mechanism for pain documentation, and it provides nursing care suggestions for the laboring woman. This article reports nurses' perceptions of the tool. *J Midwifery Womens Health* 2010;55:107–116 © 2010 by the American College of Nurse-Midwives.

keywords: algorithm, coping, labor, pain, process improvement

"Unlike other acute and chronic pain experiences, labor pain is not associated with pathology but with the most basic and fundamental of life's experiences—the bringing forth of new life."¹

INTRODUCTION

It is universally acknowledged that pain is associated with labor and birth. Pain is defined by the International Association of the Study of Pain (IASP) and the American Pain Society (APS) as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage."² The pain of labor, however, is not adequately captured by this phrase. Lowe¹ described Chapman's conceptual model of pain as applied to a woman's labor experience, noting that pain is highly individual and has both emotional and sensory components. McCaffery and Pasero³ define pain as "whatever the experiencing person says it is, existing whenever he says it does." Perceptions of pain are influenced by social and environmental factors, and by a person's experiences and cultural factors.^{1,4–6} Therefore, an individual's perception of pain is distinct and unique. Pain in labor and childbirth is not easily defined, nor is it simple to assess. Childbirth pain tends to be either celebrated or vilified depending upon a woman's personal and cultural models and expectations. Because multiple factors influence pain and a woman's perception of pain during labor, assessing pain accurately is a clinical practice challenge.^{1,3–6}

In 2001, The Joint Commission noted that the lack of a standardized pain assessment and reassessment tool

was a barrier to adequate pain care for patients. The Joint Commission's goal was that institutions provide relevant pain management to various patient populations.⁷ Therefore, The Joint Commission developed standards for the assessment and management of pain in accredited hospitals. In response, many hospitals embraced the use of the Numeric Rating Scale (NRS), which asks a patient to rate pain on a scale of 0 to 10. The NRS has increasingly been used for most patient populations. The University of Utah Hospital in Salt Lake City, Utah adopted and implemented a standard 0 to 10 NRS for use in pain assessment, with 0 being no pain and 10 being the worst possible pain, for all patient populations. The purpose of this article is to describe how a team worked together on a quality improvement project to find and ultimately create an appropriate tool to assist in caring for the laboring women while at the same time meeting The Joint Commission standard for documentation of pain care.

BACKGROUND: MODELS OF PAIN CARE IN LABOR

In the United States, there are currently two divergent models for dealing with the sensations associated with labor and birth: a pharmacologic model and a nonpharmacologic model. The pharmacologic model desires to eliminate or minimize the pain a woman feels in labor, and the nonpharmacologic model offers resources for effective coping during the labor and birth experience without the use of pain-relieving medications. Simkin and Bolding⁸ refer to these as the "medical model" and the "midwifery model," respectively. Birth setting, staffing constraints, economic incentives, provider philosophies, and maternal choice all affect the model of care that is offered at specific birthing institutions.⁹

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The pharmacologic model of care views pain as pathologic, and the elimination of painful sensation is its emphasis. A joint opinion issued by the American College of Obstetricians and Gynecologists and the American Society of Anesthesiologists states that “there is no other circumstance where it is considered acceptable for an individual to experience untreated severe pain amenable to safe intervention, while under a physician’s care....Pain management should be offered.”¹⁰ Acceptance of this model mandates a pharmacologic response to labor pain, directing women and providers toward the use of analgesics or regional anesthetics in an effort to either minimize or eliminate labor pain.

The perspective of the nonpharmacologic model views childbirth as a private holistic experience—a physiologic process that can be influenced by many factors. The focus of this model is on the elimination of suffering.^{8,11} The American College of Nurse-Midwives (ACNM) issued a philosophy statement that asserts a woman’s “right to self-determination, to complete information and to active participation in all aspects of her care within the bounds of safety.”¹² This approach and an appreciation for pain’s integral role in the labor process can assist a woman in experiencing labor pain without suffering.

Simkin and Bolding⁸ define the psychologic elements of suffering for a laboring woman as “a perceived threat to the body and/or psyche; helplessness and loss of control; distress; insufficient resources for coping with the distressing situation.” Merriam-Webster defines suffering as “to submit to or be forced to endure, undergo, experience, to put up with especially as inevitable or unavoidable.”¹³ Labor is nearly always unavoidable and inevitable when welcoming a newborn into the world. Despite the negative connotations of the words “unavoidable” and “inevitable,” they are also synonymous with necessary and foreseeable. A woman’s ability to foresee and know that she will actively participate in her labor can change the experience from one of suffering to a well managed state of acceptance and anticipation. It is a woman’s right to receive support for a model of labor care that encourages her active participation in labor whether she chooses a nonpharmacologic or pharmacologic method of labor management. A woman’s level of confidence in her ability to cope with labor is one of the best predictors for her labor experience.¹

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ASSESSMENT OF PAIN USING A NUMERIC SCALE

Soon after implementation of the NRS, laboring women, nurses, and midwives at the University of Utah Hospital voiced dissatisfaction with the utility of the scale. Upon being asked to “rate” their pain, laboring women would voice confusion and sometimes annoyance with the request. Women’s confusion stemmed from the question of when they should rate their pain—in between contractions or with a contraction. Women planning an unmediated birth were at times annoyed by the request for a pain rating. They viewed this as an intrusion in their birthing plan, particularly if they were following a birthing technique that preferred no mention of pain and/or no mention of contractions. An example of this is self-hypnosis for labor, which uses a technique of imaginative transformation that reinterprets the pain as benign, such as contractions becoming surges or energy.¹⁴ The NRS was viewed more as a barrier than an aid to the appropriate care of the laboring woman.

Berry et al.⁷ indicate that the intention of the Joint Commission standard is that a hospital’s “assessment approaches, including tools, must be appropriate for the patient population.” We consulted with Dr. Berry, who helped us to understand that The Joint Commission does not dictate the use of the 0 to 10 NRS for all patient populations and the intent of the standard was to ensure an appropriate approach to pain management in special populations. Armed with a newfound understanding of the Joint Commission standards for pain management, and our belief that laboring women meet the special population criteria, our team set out to develop a new assessment tool for laboring women.

DEVELOPMENT OF A NEW ASSESSMENT TOOL

The creation of the coping algorithm was accomplished as a process improvement project. Institutional review board approval was sought and an exemption granted on this basis. As per standard practice at the University of Utah Hospital, process improvement projects use the FOCUS format. The acronym FOCUS stands for *find* a process to improve, *organize* a team that knows the process, *clarify* current knowledge of the process, *understand* sources of process variation, and *select* the process improvement¹⁵ (Figure 1). Although it is unclear where it began, the FOCUS format was adopted by the Hospital Corporation of America in 1988 as a process improvement strategy.

In addition, Deming’s “Plan, Do, Check, and Act” (PDCA) cycle provided the theoretical framework for the evaluation of this project. In the early 1950s, Edward Deming developed the concept of total quality management (TQM) as an alternative approach to top-down management philosophies. TQM is based on the analysis of objective data gathered from observation of the process being examined. Deming’s PDCA model began in business and

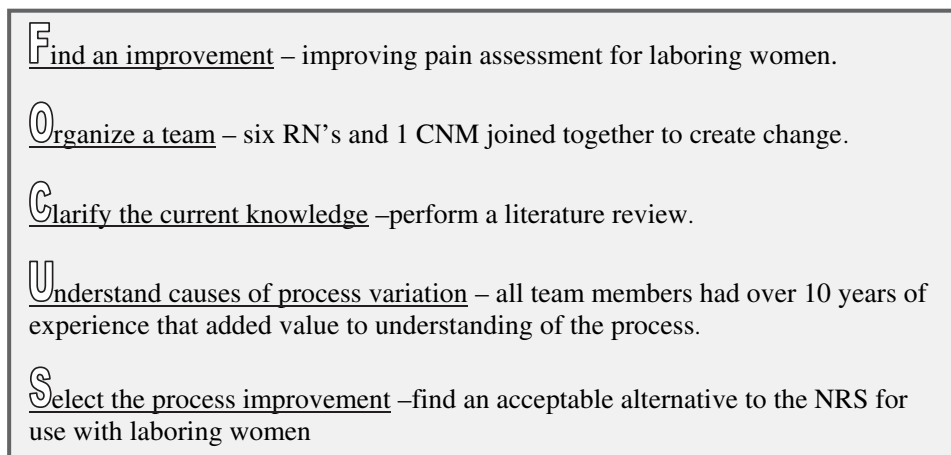


Figure 1. FOCUS format.

spread to health care in the early 1990s.¹⁶ First, an improvement is planned and data collection begins or continues if in subsequent cycles. Second, the improvement is implemented and data are collected. Third, the results are checked: Did the process improve as expected? What worked well, and what still needs to be improved? The fourth step allows for standardization of the parts of the process improvement that went well and for a new PDCA cycle to begin.¹⁶ Figure 2 outlines the use of Deming's model as applied to the development of the coping algorithm.

An interdisciplinary task force consisting of experienced labor and delivery nurses and a nurse-midwife was formed to develop and evaluate a new tool for documentation of labor pain. The first task was a review of the Joint Commission standard to develop a clear understanding regarding the standards objective. The task force set out to find an alternative method for assessment and documentation of a woman's labor pain. A search of CINAHL, PubMed, and the Cochrane Library using the keywords "labor pain documentation" and "labor pain assessment" offered few resources on the topic of

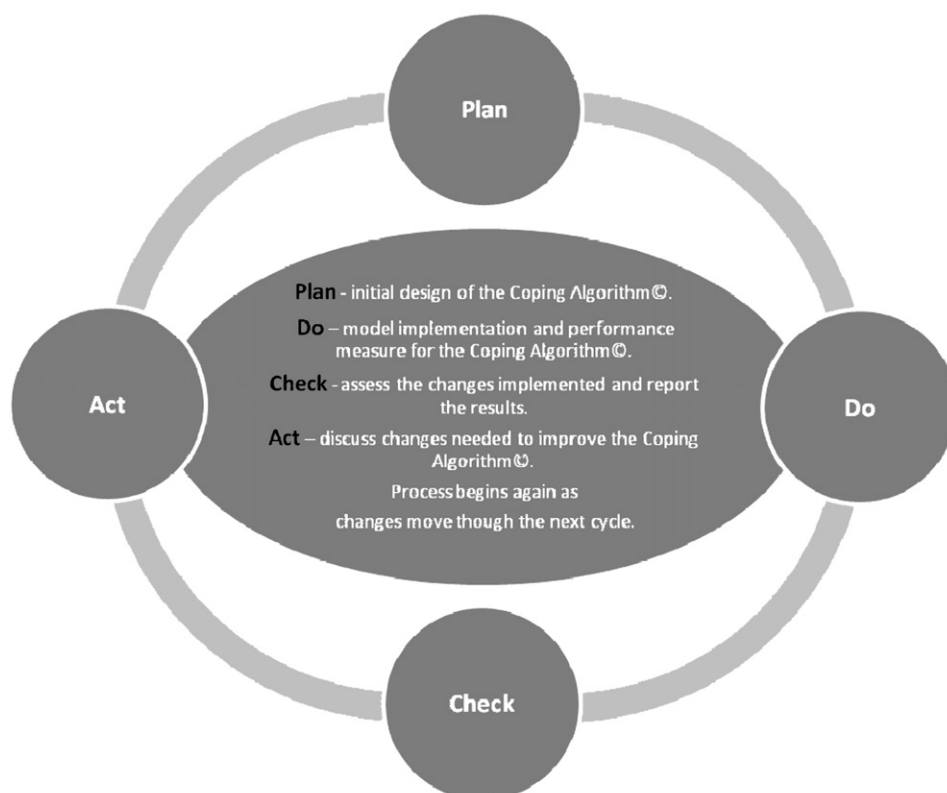


Figure 2. Edward Deming's "Plan, Do, Check, and Act" (PDCA) cycle. This PDCA cycle was designed to reflect Deming's quality improvement cycle.¹⁶

Coping with Labor Algorithm ©

Coping Side

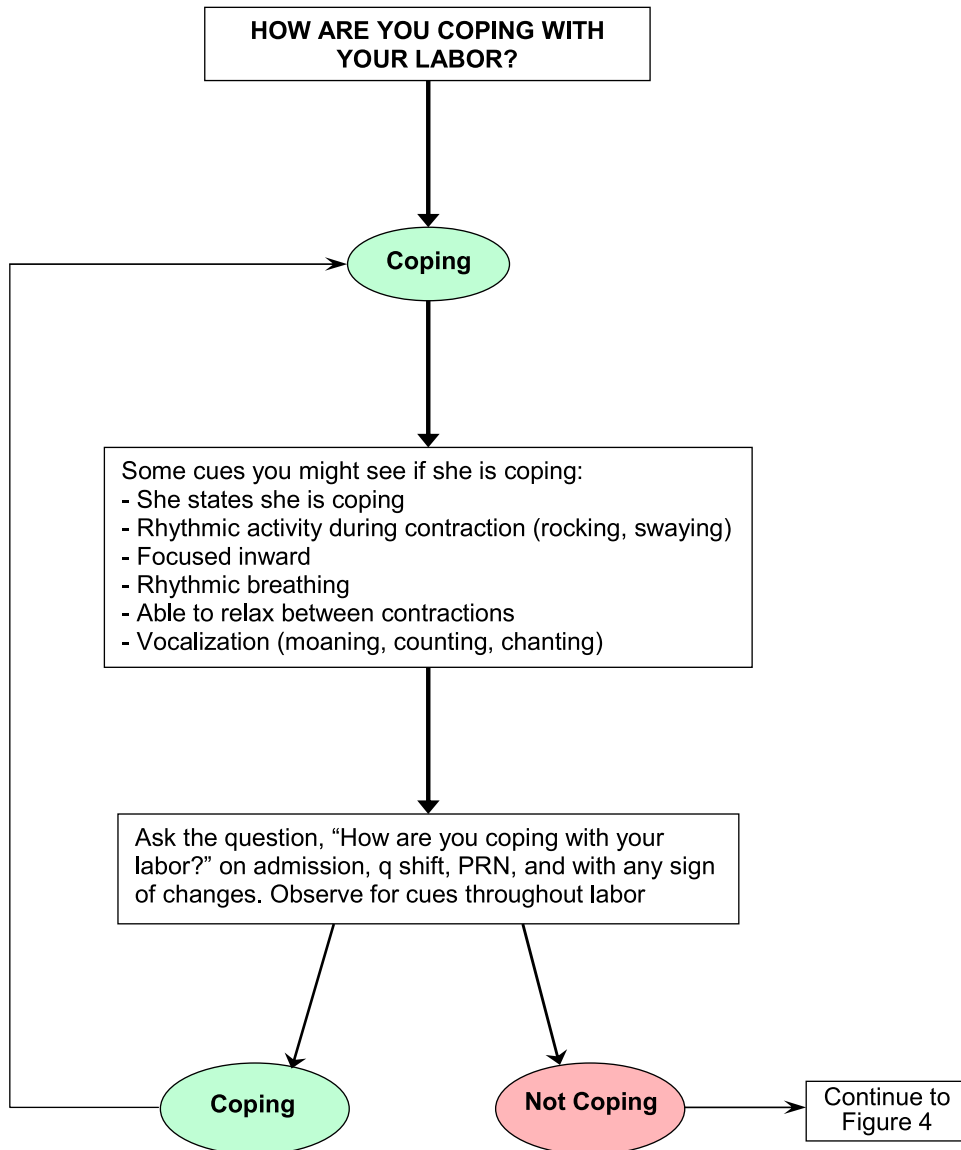


Figure 3. Coping side.

assessment and documentation of labor pain. An open-ended search yielded only three publications that discussed labor pain assessment: Lowe^{1,11} and Schuiling and Sampsel¹⁷. This literature review and anecdotal comments from laboring women and nurses informed the development of the Coping With Labor Algorithm (Figures 3 and 4). Lowe¹¹ describes the difficulty of assessing labor pain with the Joint Commission's standards, which were written "from the viewpoint of the sick, injured or postsurgical patient," and proposed that laboring women constitute a specific population that requires different assessment policies. She suggests that a "more appropriate assessment" would be to ask the open-ended

question, "How are you coping with the pain of your labor?"¹¹ Similarly, Schuiling and Sampsel¹⁷ advocate for the use of open-ended questions such as asking the laboring woman about her level of comfort.

The publications by Lowe^{1,11} and Schuiling and Sampsel¹⁷ influenced the task force discussions and in turn the components of the coping algorithm. The goal in developing a new labor pain assessment standard was to find an assessment process that would allow care providers to recognize the uniqueness of the laboring woman's experience and acknowledge the intensely personal nature of labor pain.¹⁸

In reviewing the literature on pain, it was decided that "coping" was a more apt descriptor than pain level.

Coping with Labor Algorithm ©

Not Coping Side

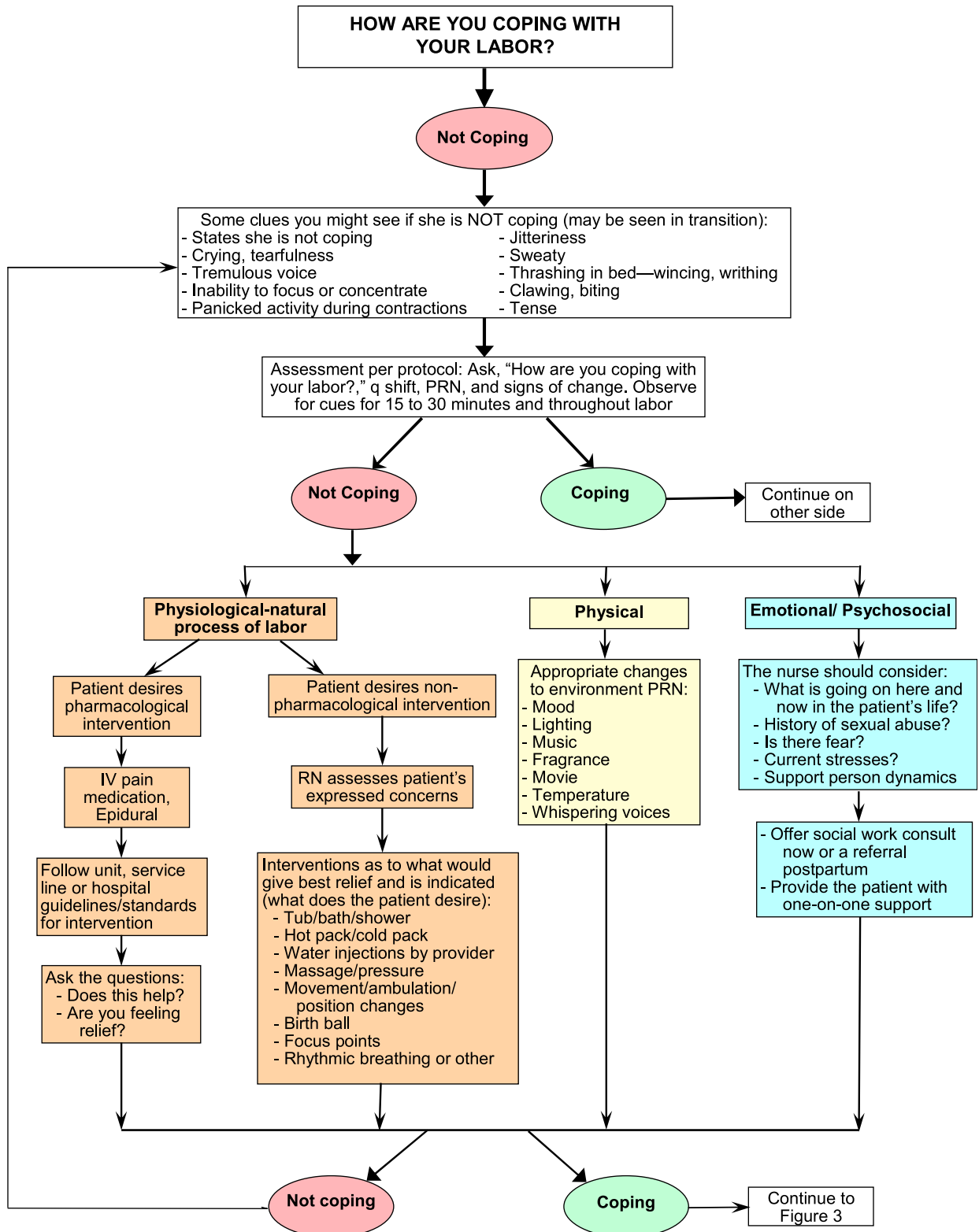


Figure 4. Not Coping side.

Beutler and Moos¹⁹ describe coping as a complex and multidimensional phenomenon, having cognitive, behavioral, and emotional qualities. According to Abushaikh,²⁰ “Coping is defined as a stress-specific pattern by which an individual’s perceptions, emotions, and behaviors prepare for adapting and changing.” Because pain is an inherent part of labor, helping a woman cope with the sensations she is experiencing may also help alleviate feelings of helplessness and suffering. Personal perceptions of labor and the degree of pain relief achieved can alter a woman’s sense of effective coping. Coping effectively in labor has been linked to lower levels of pain, positive birth outcomes, greater satisfaction with the birth experience, and more self-confidence.^{1,21–23}

THE COPING WITH LABOR ALGORITHM

The coping algorithm has two pathways. One is the coping path, giving the care provider cues that may indicate a woman is coping well with her labor, such as rhythmic activity, breathing, inward focus, the ability to relax between contractions, and/or verbalizing that she is coping. The other path provides cues indicating that a woman may not be coping well with her labor, such as clawing, biting, crying, inability to concentrate, and/or verbalizing that she is no longer coping. The “not coping” path of the algorithm is broken into three distinct color-coded branches: (1) the physiologic process of labor, (2) the physical environment, and the (3) emotional or psychosocial. Each branch presents the care provider with a list of management options to consider in assisting a woman’s return to the coping path of the algorithm.

Assessment and documentation of pain in labor was the primary focus of the original literature review. After the development of the coping algorithm, there were frequent requests from other institutions that wanted to use the algorithm. We performed a retrospective literature review in the interest of linking the care measures or interventions in the algorithm to current evidence. Even though not all care measures recommended in the coping algorithm were found to be effective in randomized controlled trials, if they are not harmful and are self-selected by women who find them helpful in labor, it was felt that supportive evidence from published literature was not needed to justify keeping them in the coping algorithm. [Table 1](#) summarizes the evidence found for most of the care measures in the coping algorithm.

IMPLEMENTING THE COPING WITH LABOR ALGORITHM

The members of the task force implemented the coping algorithm with laboring women over a 2-week period. During this time, task force members used both the algorithm and the NRS to assess labor pain while caring for laboring women. Team members conducted ongoing communication about how the coping algorithm was received by laboring women. Users discussed their perspectives about

the effectiveness, utility, and ease of use. After using this tool for the initial 2-week time frame, the team met and discussed suggested changes to the coping algorithm. Upon completion of the revisions, the algorithm was presented to the hospital committee on pain assessment and permission was granted to use the coping algorithm as the sole method of pain assessment for laboring women.

The revised coping algorithm was then introduced to the staff. Nurses received education on how to use the algorithm and how to appropriately document their assessment of a woman’s coping. After 6 weeks, a questionnaire was given to all nursing staff in the labor and delivery unit. Based on this feedback, the coping algorithm was revised again. Gaps in staff education regarding the proper use of the algorithm and appropriate documentation of algorithm measures were identified. Educational reinforcement was provided in targeted areas.

The coping algorithm was then used for 6 months, after which nurses were again queried and minor changes were made on the basis of their feedback. When the final revision of the coping algorithm was ready, a workplace psychology expert assisted in color-coding the algorithm. The color coding provides visual cues for the user. Green represents “coping” because it symbolizes nature and is a calming color. Red represents “not coping” because it is an emotionally intense color and will also attract attention. Under the three arms of “not coping,” the physiologic process of labor is represented by orange because it demands attention but is not as emotionally intense as red. The physical arm, representative of the physical environment, is colored yellow because it is an optimistic color and is thought to enhance concentration. The last arm of the “not coping” side is the emotional/psychosocial and is represented by blue. Even though blue can be peaceful or tranquil, it also represents depression and cold, which captures the essence of psychosocial or emotional difficulties that may limit a woman’s ability to cope in labor. After these final color revisions were made, the authors applied for and received a copyright for the coping algorithm.

NURSES’ RESPONSE TO THE COPING WITH LABOR ALGORITHM

Evaluation questionnaires were placed in the mail files of approximately 65 full-time, part-time, and per diem nurses, at both 2 weeks and 6 months after the algorithm was implemented. The questionnaire consisted of five “yes” or “no” questions and provided an opportunity for open-ended answers. The evaluations of the coping algorithm were conducted in July and December of 2005. In July, there were 21 respondents, and in December there were 14 respondents. There may be overlap in the respondents; those who responded in July may have also responded in December. The questions and results are presented in [Table 2](#).

From a total of 35 responses and anecdotal discussions on the unit, the coping algorithm received an overwhelmingly positive reaction. Nurses felt that the coping

Table 1. Summary of Care Measures

Care Measure	Algorithm Arm	Evidence for Use	Study or Review	Comments
One-on-one support	Emotional/psychosocial	Sufficient	Simkin and Bolding, ⁸ Hodnett et al., ²⁴ Albers, ²⁵ and NICE ²⁶	Most effective with lay person or trained doula; greater benefit if begun in early vs active labor
Tub/bath/shower (hydrotherapy)	Physiologic/natural process of labor nonpharmacologic	Sufficient	Lowe, ¹ Simkin and Bolding, ⁸ Hodnett et al., ²⁴ NICE, ²⁶ and Cluett et al. ²⁷	In the first stage of labor, reduces a woman's perception of pain and use of anesthesia; timing of entry, duration, and water temperature are important
Intradermal water injections	Physiologic/natural process of labor nonpharmacologic	Sufficient	Simkin and Bolding, ⁸ Albers, ²⁵ Huntley, ²⁸ and Mårtensson et al. ²⁹	Reduces low back pain severity; provides relief for up to 2 hours; stinging at the injection sites
Movement/ambulation/position change	Physiologic/natural process of labor nonpharmacologic	Sufficient	Simkin and Bolding, ⁸ Albers, ²⁵ Simkin, ³⁰ and Gupta et al. ³¹	May shorten labors and lessen pain with lateral or upright position; possible increase in blood loss with upright posture; encourage position of comfort
Massage/pressure (acupressure)	Physiologic/natural process of labor nonpharmacologic	Insufficient evidence	Simkin and Bolding, ⁸ NICE, ²⁶ Huntley, ²⁸ Field, ³² Smith et al., ³³ Trout, ³⁴ and Tournaire and Theau-Yonneau ³⁵	Massage can reduce leg and back pain during pregnancy; no evidence of harm, and potential subjective benefit; based on the neuromatrix theory of pain; should be considered as viable alternative therapies (note: although acupuncture is not in the algorithm, lower levels of pain have been reported with its use)
Rhythmic breathing	Physiologic/natural process of labor nonpharmacologic	Insufficient evidence	Simkin and Bolding, ⁸ NICE, ²⁶ Huntley, ²⁸ and Smith et al. ³³	No indication of harm and may assist a woman with her ability to cope in labor
Hot pack/cold pack	Physiologic/natural process of labor nonpharmacologic	Insufficient evidence	Simkin and Bolding ⁸	Contraindicated with regional anesthesia, otherwise no evidence of harm
Music	Physical environment	Insufficient evidence	Simkin and Bolding, ⁸ NICE, ²⁶ Smith et al., ³³ and Tournaire and Theau-Yonneau ³⁵	No indication of harm, and soft music without lyrics may reduce distress in labor; potential subjective benefit
Fragrance (aromatherapy)	Physical environment	Insufficient evidence	Simkin and Bolding, ⁸ NICE, ²⁶ Smith et al., ³³ and Tournaire and Theau-Yonneau ³⁵	No indication of harm, and may decrease anxiety; potential subjective benefit
Intravenous pain medication (parenteral opioids)	Physiologic/natural process of labor pharmacologic	Limited evidence to support	Bricker and Lavendar ³⁶ and McCool et al. ³⁷	Doubts about efficacy for pain control; maternal side effects of nausea, vomiting, and sedation; opioids cross the placental barrier, showing adverse effects on the newborn
Epidural anesthesia (regional anesthesia)	Physiologic/natural process of labor pharmacologic	Sufficient for effective pain relief	McCool et al., ³⁷ Leighton and Halpern, ³⁸ and Lieberman and O'Donoghue ³⁹	Provides effective pain relief in labor; is the most commonly used pain relief in the United States; associated with increased length of the second stage of labor, increased instrumental delivery, heightened maternal fever, increased maternal hypotension, and a decrease in spontaneous vaginal birth

NICE = National Institute for Health and Clinical Excellence.

Table 2. Results of Questionnaire Regarding Use of the Coping With Labor Algorithm (N = 35)

Question	July (n = 21) n (%)		December (n = 14) n (%)	
	Yes	No	Yes	No
1. Do you feel that coping/not coping is beneficial for the patient?	21 (100)	0 (0)	14 (100)	0 (0)
2. Do you feel that coping/not coping has helped you better assess the laboring patient when compared to using the 1–10 scale?	20 (95)	1 (5)	14 (100)	0 (0)
3. Do you feel that the new coping/not coping is an improvement in pain assessment?	21 (100)	0 (0)	13 (93)	1 (7) ^a
4. Do you have any suggestions or improvements that could be made to the coping/not coping assessment?	4 (19)	17 (81)	2 (14)	12 (86)
5. Do you have any additional educational needs regarding coping/not coping?	4 (19)	17 (81)	1 (7)	13 (93)

^aRespondent clarified that s/he was confused about how to rate a patient with an epidural so chose a “no” response, yet did feel it was an improvement with patients who did not have an epidural for labor analgesia.

algorithm was beneficial to laboring women and allowed them to provide a better assessment. Overall, they believed it was an improvement over the NRS. The only inconsistency was a single respondent on question three in December. In the comment section, the respondent clarified that s/he was confused about how to rate the response of a woman who had an epidural when she used the coping algorithm so she marked a “no” response to the question that asked if the coping algorithm was better than the numeric pain scale, yet she did feel that the coping algorithm was an improvement over the NRS for the assessment of women who did not have epidurals.

Thematic Analysis of Nurses’ Perceptions

In addition to numeric answers, the open-ended questions generated 100 comments from nurses who responded to the questionnaire. Eighty-eight comments were made in response to the first three questions and 12 comments were in response to the last two questions. These comments were reviewed using a process of inductive qualitative analysis in three phases of coding—primary, secondary, and tertiary—to generate themes that captured the essence of the data.⁴⁰ This approach allowed us to explore the story of the data and obtain more insight into nurses’ perceptions of using the Coping With Labor Algorithm.

The responses were aggregated into a master list. In a series of facilitated meetings, the group reviewed the list as a whole, paying attention to common conceptual and emotional elements within the sample. A qualitative researcher

helped generate a list of relevant concepts derived from the questionnaire responses, based on the group’s multiple readings of the comments.

In the first coding phase, relevant concepts were identified and categorized, and these categories were related to each other. Next, through a method of constant comparative analysis, 39 primary codes were reduced into a shorter set of 10 secondary codes that unified and described the various thoughts from the primary coding phase.

In the final coding phase, we analyzed the 10 secondary codes to identify the overarching themes that connected the codes together and told the story in these data. Through this approach, the three essential themes that emerged were coping, process, and communication. The richness of the qualitative data as expressed in these three essential themes can be experienced through some of the nursing comments made during evaluation of the coping algorithm.

“Coping” was the overarching theme that appeared to be a catalyst and a decision point, in that coping influenced the process of labor and was also the decision point for branching into each of the coping algorithm pathways.

“We focus more on how the patient feels rather than a number.”

“It is so much easier and [more] logical than the scale because of the complexities of pain and labor.”

The theme “process” represents comments about labor as a process: the nursing process and the quality assurance process. The algorithm not only directs the nursing process for pain assessment and care in labor; it also functioned as a teaching tool for novice nurses.

“Allows use of nursing process and your own intuition as to what is happening with the patient rather than limiting it to a scale.”

“Does not focus on labor as ‘pain’ but rather a process, in which pain is not good or bad.”

The “communication” theme gathered all the different processes and created cohesion. It comprised all the communications that occur during labor between the midwife, the nurse, the woman, and the family. The term communication represented the nurses’ ability to be respectful of a woman’s birthing preference while obtaining necessary information. It also represented the woman’s ability to communicate her coping with the process of labor either verbally or with nonverbal cues.

“Patients understand what I am asking them and respond well to both the initial inquiry and the follow up to interventions.”

“Patients feel like they need to give you a high number in order for their pain to be real.”

The thematic analysis verified that nurses feel the coping algorithm is assessing how a woman is coping with her labor and is an improvement over the 0 to 10 NRS.

DISCUSSION

The initial goal of this project was to find an alternative tool that we could use to evaluate and document a woman's pain and coping during her birth experience. The desire was to increase satisfaction for both staff and laboring women with the pain documentation process as well as to comply with the Joint Commission standards. The coping algorithm has been used exclusively at the University of Utah Hospital since January 2006. The process works well, and a new pain/coping documentation policy was written to accompany the algorithm. The 0 to 10 NRS continues to be used for all women who have surgery or who suffer from chronic pain.

The quantification of a woman's pain relief is only one component of her overall labor and birth experience, yet an important one as dictated by the Joint Commission standards. Not only has the algorithm proven to be a useful tool in the assessment and management of laboring woman, it has also passed the Joint Commission inspection in our institution. It has proven to be an excellent staff education tool when orienting new care providers to the diverse coping strategies used by women in labor. It assists in teaching new nurses the process of labor and the potential verbal and nonverbal communication cues when evaluating a woman in labor. Nurses and students new to the labor and delivery area may consult the coping algorithm to see what actions they might take to assist a woman in coping with her labor.

The development of the coping algorithm was a process improvement project, and it could be further refined through both qualitative and quantitative research to determine both the validity and reliability of the tool. We did not compare use of the coping algorithm to the NRS when we used both together on labor and delivery. We discussed the different systems and even asked a few laboring women which system they preferred. One woman who was laboring and had chronic pain indicated that she could easily differentiate between her "chronic pain" and her ability to "cope" in labor. She also voiced that she loved the idea of not having to label her labor pain with a number.

The analysis of the nurses' responses to this tool may not be generalizable to a larger population of nurses who care for women in labor. This was a small sample with a low response rate of 32% and 22% in July and December, respectively. In addition, we do not yet have input from laboring women to validate the cues that are used in the coping algorithm. Because we only had institutional review board approval for a quality improvement project, we relied on the formal education and collective experience of the nurses and midwife who had a combined experience of more than 150 years with laboring women. This

puts the average experience of each team member at 22-plus years. Every team member also had personal knowledge of the labor process from having experienced it at some point in her life. This cumulative experience provides a general sense for coping cues in a predominantly white population.

The next steps for the Coping With Labor Algorithm may include research on coping clues and validation from other ethnicities and cultures, assessing interrater reliability, and validation from a patient perspective. The coping algorithm has been distributed to more than 140 other institutions, which provides an opportunity to survey nurses, midwives, and the women they care for on a much larger scale. Evaluating the ease with which institutions adopt the coping algorithm and how care providers respond to the algorithm would provide another avenue for further research. In addition, there is international interest in translating the coping algorithm into Spanish, French, and German, and validating the algorithm in those languages. There is also an interest in translating the coping algorithm into an outpatient tool that addresses pain and discomforts of pregnancy.

CONCLUSION

There are multiple factors that affect a woman's ability to cope with her labor, including her personal social and cultural values, place of birth setting, and the effect of provider characteristics. For all its joy, labor is associated with pain. This algorithm enables a woman to avoid quantifying her pain during labor, which is only one component of her overall labor and birth experience. The Coping With Labor Algorithm has proven to be a useful tool in the assessment and management of laboring woman and has passed the Joint Commission inspection in one institution. It is our hope that the other institutions will find success in implementing the coping algorithm on their labor and delivery units.

REFERENCES

1. Lowe NK. The nature of labor pain. *Am J Obstet Gynecol* 2002;186:S16-24.
2. Merskey H. Pain terms: A list with definitions and a note on usage. Recommended by the International Association for the Study of Pain (IASP) Subcommittee on Taxonomy. *Pain* 1979;6:249-52.
3. McCaffery M, Pasero C. *Pain clinical manual*, 2nd ed. Philadelphia: Mosby, 1999.
4. Caton D, Corry MP, Frigoletto FD, Hopkins DP, Lieberman E, Mayberry L, et al. The nature and management of labor pain: Executive summary. *Am J Obstet Gynecol* 2002;186(5 suppl nature):S1-15.
5. McCool WF, Smith T, Aberg C. Pain in women's health: A multi-faceted approach toward understanding. *J Midwifery Womens Health* 2004;49:473-81.

6. King TL, McCool WF. The definition and assessment of pain. *J Midwifery Womens Health* 2004;49:471–2.
7. Berry PH, Chapman CR, Covington EC, Dahl JL, Katz JA, Miaskowski C, et al. National Pharmaceutical Council. Pain: Current understanding of assessment, management, and treatments. Available from: www.ampainsoc.org/ce/downloads/npc/npc.pdf [Accessed March 2, 2005].
8. Simkin P, Bolding A. Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. *J Midwifery Womens Health* 2004;49:489–504.
9. Marmor TR, Krol DM. Labor pain management in the United States: Understanding patterns and the issue of choice. *Am J Obstet Gynecol* 2002;186(5 suppl nature):S173–80.
10. Goetzl LM. Obstetric Analgesia and Anesthesia. American College of Obstetricians and Gynecologists 2006 Compendium. Practice Bulletin Number 36, July 2002.
11. Lowe NK. Context and process of informed consent for pharmacologic strategies in labor pain care. *J Midwifery Womens Health* 2004;49:250–9.
12. American College of Nurse-Midwives Web site. ACNM philosophy. Available from: www.midwife.org/display.cfm?id=480 [Accessed October 4, 2007].
13. Merriam-Webster Online Dictionary. Suffering. Available from: www.merriam-webster.com/dictionary/suffering [Accessed October 16, 2007].
14. Ketterhagen D, VandeVuss L, Berner MA. Self hypnosis: Alternative anesthesia for childbirth. *MCN Am J Matern Child Nurs* 2002;27:335–40.
15. Melum MM, Sinioris MK. Total quality management: The health care pioneers. Washington, DC: American Hospital Publishing, Inc., 1992.
16. Shaw P, Elliott C, Isaacson P, Murphy E. Quality & performance improvement in healthcare: A tool for programmed learning, 3rd ed. Chicago, IL: American Health Information Management Association, 2007.
17. Schuiling KD, Sampselle CM. Comfort in labor and midwifery art. *Image J Nurs Sch* 1999;31:77–81.
18. Gulliver BG, Fisher J, Roberts L. A new way to assess pain in laboring women: Replacing the rating scale with a “coping” algorithm. *Nurs Womens Health* 2008;12:405–8.
19. Beutler LE, Moos RH. Coping and coping styles in personality and treatment planning: Introduction to the special series. *J Clin Psychol* 2003;59:1045–7.
20. Abushaikh LA. Methods of coping with labor pain used by Jordanian women. *J Transcult Nurs* 2007;18:35–40.
21. Callister L, Khalaf I, Semenic S, Kartchner R, Vehvilainen-Julkunen K. The pain of childbirth: Perceptions of culturally diverse women. *Pain Manag Nurs* 2003;4:145–54.
22. Spiby H, Slade P, Escott D, Henderson B, Fraser RB. Selected coping strategies in labor: An investigation of women’s experience. *Birth* 2003;30:189–94.
23. Da Costa D, Dritsa M, Larouche J, Brender W. Psychosocial predictors of labor/delivery complications and infant birth weight: A prospective multivariate study. *J Psychosom Obstet Gynaecol* 2000;21:137–48.
24. Hodnett ED, Gates S, Hofmeyr GJ, Sakala C. Continuous support for women during childbirth. *Cochrane Database Syst Rev* 2007;3:CD003766.
25. Albers LL. The evidence for the physiologic management of the active phase of the first stage of labor. *J Midwifery Womens Health* 2007;52:207–15.
26. National Institute for Health and Clinical Excellence Web site. Intrapartum care: Care of healthy women and their babies during childbirth. Available from: <http://guidance.nice.org.uk/CG055> [Accessed November 24, 2009].
27. Cluett ER, Nikodem VC, McCandlish RE, Burns EE. Immersion in water in pregnancy, labour and birth. *Cochrane Database Syst Rev* 2002;2:CD000111.
28. Huntley AL. Complementary and alternative medicine for labor pain: A systematic review. *Am J Obstet Gynecol* 2004;191:36–44.
29. Mårtensson L, McSwiggin M, Mercer JS. US midwives’ knowledge and use of sterile water injections for labor pain. *J Midwifery Womens Health* 2008;53:115–22.
30. Simkin P. Maternal positions and pelvis revisited. *Birth* 2003;30:130–2.
31. Gupta JK, Hofmeyr GJ, Smyth RMD. Position in the second stage of labour for women without epidural anaesthesia. *Cochrane Database Syst Rev* 2004;1:CD002006.
32. Field T. Pregnancy and labor alternative therapy research. *Altern Ther Health Med* 2008;14:28–34.
33. Smith CA, Collins CT, Cyna AM, Crowther CA. Complementary and alternative therapies for pain management in labour. *Cochrane Database Syst Rev* 2006;4:CD003521.
34. Trout K. The neuromatrix theory of pain: Implications for selected nonpharmacologic methods of pain relief for labor. *J Midwifery Womens Health* 2004;49:482–8.
35. Tournaire M, Theau-Yonneau A. Complementary and alternative approaches to pain relief during labor. *Evid Based Complement Alternat Med* 2007;4:409–17.
36. Bricker L, Lavender T. Parenteral opioids for labor pain relief: A systematic review. *Am J Obstet Gynecol* 2002;86:S94–109.
37. McCool WF, Packman J, Zwerling A. Obstetric anesthesia: Changes and choices. *J Midwifery Womens Health* 2004;49:505–13.
38. Leighton BL, Halpern SH. The effects of epidural anesthesia on labor, maternal and neonatal outcomes: A systematic review. *Am J Obstet Gynecol* 2002;186:S69–77.
39. Lieberman E, O’Donoghue C. Unintended effects of epidural analgesia during labor: A systematic review. *Am J Obstet Gynecol* 2002;186:S31–68.
40. Strauss AL, Corbin JM. Basics of qualitative research, 2nd ed. Thousand Oaks, CA: Sage, 1998.