

# The Evidence for Physiologic Management of the Active Phase of the First Stage of Labor

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The active phase of first stage labor is generally defined as the period between 3 cm to 4 cm to complete cervical dilatation, in the presence of regular uterine contractions. Most women will experience this portion of labor within hospital obstetric units, where care commonly features restriction to bed, electronic fetal monitoring, early treatment of “slow” labors, and few pain management options beyond epidurals and narcotics. However, the available evidence on appropriate care for healthy childbearing women favors activity in labor, intermittent auscultation, patience from caregivers, and nonpharmacologic methods of pain relief. This article reviews the evidence for care practices that support physiologic labor. Modifying intrapartum care to reflect current evidence will improve women’s health, and will require a multilevel approach and consistent midwifery demonstration of the model. *J Midwifery Womens Health* 2007;52:207–215 © 2007 by the American College of Nurse-Midwives.

**keywords:** active phase labor, continuous support, first stage labor, labor management, midwifery care

## INTRODUCTION

Obstetric textbooks typically define the active phase of the first stage of labor according to cervical dilatation endpoints in the presence of regular uterine contractions, starting at 3 cm to 4 cm and ending at complete dilatation. These endpoints are derived from Emanuel Friedman’s studies of labor progress, which were conducted in the 1950s and 1960s,<sup>1</sup> and onset of the active phase indicates that the latent phase of the first stage has been completed. When the active phase commences, uterine contractions progressively increase in frequency, intensity, and duration, and the rate of cervical dilatation increases. The active phase of the first stage is sometimes called the “dilatation phase” of labor. Because hospitalization for childbirth is essentially universal in the United States, nearly all women will experience the active phase of first stage labor within a hospital obstetric unit. Thus, the style of care during this time may influence the course of labor and its eventual outcomes. This article will review current evidence on care strategies that foster normalcy in the active phase of first stage labor. These include continuous labor support, patience with the progress of labor, and several low-technology care measures that encourage a physiologic labor. Such strategies are interdependent and together may better assist a woman to trust her body, labor with confidence, cope with pain, and actively give birth.

## Background

Most women have the potential to have a physiologic labor and birth: one that starts and proceeds on its own, without routine use of interventions or drugs. The World

Health Organization (WHO) has estimated that 70% to 80% of all gravidas may be viewed as low-risk at the start of labor.<sup>2</sup> Such women meet all of the following criteria: 1) labor begins spontaneously at term (37–42 completed weeks); with 2) a singleton fetus in a cephalic presentation; and 3) no serious medical problems that predated the pregnancy or have arisen during the course of pregnancy.<sup>2</sup> Because of the high proportion of healthy gravidas in the total childbearing population, and the ethical responsibility of clinicians to “first, do no harm,” intrapartum care strategies that help labor remain normal warrant priority status in maternity care.

Labor and birth are prime examples of mind–body integration, where mental states (fear, anxiety, need for information, and reassurance) may profoundly affect bodily processes. A British statistician has discussed maternal confidence as a key psychological ingredient for optimal physiologic functioning leading to a normal birth.<sup>3</sup> Confidence implies trust in one’s own abilities to meet a challenge, self-efficacy, self-reliance, boldness, and fearlessness.<sup>4</sup> The style of care as rendered during labor may effectively augment or diminish a woman’s confidence in her own ability to labor and give birth.

The past half-century has seen dramatic changes in maternity care and in the profile of childbearing women. Hospitalization for birth is the established norm, and women in labor typically enter an unfamiliar, busy institutional setting to receive care from an array of strangers. Numerous technical care measures are utilized as a matter of routine. In the United States, most reproductive-age women are now in the workplace, and they are having smaller families at later ages. The proportion of all gravidas who are having a first child has risen, and presently stands at 40% of all births.<sup>5</sup> Previous experience with pregnancy and childbirth and access to helpful information about giving birth may be very limited for many childbearing women. These factors may

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combine to create anxiety and fear and undermine maternal confidence.

The first *Listening to Mothers* survey<sup>6</sup> has painted a picture of modern maternity care in the United States. In 2002, a national sample of 1583 recently-delivered women reported their experiences with the health care system during pregnancy, labor, and birth: only 36% of respondents attended prepared childbirth classes; 93% had electronic fetal monitoring and 6% intermittent auscultation; 63% used epidurals, 30% narcotics, and 20% used no drug methods for pain relief; 53% received oxytocin augmentation of labor. Most (71%) women labored in bed. Nearly all women had a support person with them, usually a husband or nurse, but labor support was more likely to be rated “excellent” by the few women who had a doula or midwife assisting them. Nonpharmacologic methods of pain relief were used by 88% of women at some time in their labors, and two-thirds of respondents rated these as helpful. Only 64% of all women had spontaneous vaginal births, and most of these women pushed and delivered while lying flat on their backs.

Much of the data from this landmark survey are not collected by any state or federal agency. The report, from the unique perspective of women’s recent birth experiences, describes the dominant style of care for childbearing women in the United States. The common use of interventions and treatments during labor and the resulting low proportion of spontaneous vaginal births argue for modifications in the current priorities in hospital-based care.

## CONTINUOUS LABOR SUPPORT

One of the earliest writings on the importance of a labor companion came from Dick-Read in the 1940s.<sup>7</sup> He described the cycle of fear-tension-pain, and proposed that it could be muted by effective support from a labor companion. The first “doula” study appeared in 1980.<sup>8</sup> In this study, women giving birth for the first time in a busy public hospital in Guatemala City were randomly assigned to one of two groups. One group received continuous bedside support from an unknown lay woman (doula), and the other group received “usual care,” which meant laboring alone in that setting. The primary purpose of the study was to ascertain if supported women would behave differently toward their newly-born infants. Results showed that supported mothers had more positive behaviors toward their infants, but also had shorter labors and fewer operative births. A supportive companion may have reduced the stress of laboring in this particular

environment. No harmful effects were associated with continuous labor support.

Since that time, numerous studies about labor support have been published, including randomized and observational studies. A systematic review of 15 randomized trials is found in the Cochrane Database.<sup>9</sup> These studies involve nearly 13,000 women from 11 countries, and all studies were conducted within hospitals. Support was described in each case as one-to-one bedside care beginning early in the labor. Components of support included constant presence and emotional support, information and advice about coping with labor, physical comfort measures, advocacy, and support of the woman’s significant other. Support persons varied and could be a hospital staff member (midwife, nurse, or student) or a trained or untrained woman or female relative.

Key findings of the Cochrane review indicated that women who received continuous support had specific benefits.<sup>9</sup> They were significantly less likely to use pain medication or epidurals (RR = 0.87; 95% CI, 0.79–0.96), more likely to have spontaneous vaginal births rather than operative vaginal births or cesareans (RR = 1.08; 95% CI, 1.04–1.13), and less likely to report dissatisfaction with their birth experiences (RR = 0.73; 95% CI, 0.65–0.83). Further, some of the included studies indicated that labor support may reduce the likelihood of postpartum depression, improve maternal self-esteem, increase confidence in mothering, and increase breastfeeding success, but further research is needed on these topics. No harmful effects from continuous labor support have been identified. An important caveat was that support from hospital staff members was determined to be less effective in achievement of all observed benefits than was support from those not on staff.

The most recent trial included in the Cochrane review was a study of 6915 women who gave birth in 13 North American hospitals.<sup>10</sup> This study assessed the effect of labor support by staff nurses in busy, technically-oriented labor units, and the primary outcome was cesarean delivery. Because this study contributed half of the women to the Cochrane review, it would influence overall conclusions about the efficacy of labor support in the pooled data. In this study, 62% of women received oxytocin, 77% had continuous electronic fetal monitoring, and 75% had epidurals. Women in the experimental group had a nurse providing “continuous bedside support for 80% of the time in labor,” and the control group received “usual care.” No objective measures assessed what nurses did and for how long. The study also did not control for support provided by a partner or friend. The trial found no differences in the cesarean rates or in any other maternal or neonatal outcomes between women in the supported and usual care groups. However, most women in both groups received multiple technical interventions, and it is unlikely that a nurse providing bedside

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support would be able to ignore the equipment. Thus, labor support in this study may not have been the same type of support (undivided attention to the woman and her response to labor) as found in the earlier studies contributing the other half of the data in the Cochrane review. Further, some of the intermediate benefits of labor support (shorter labors, less need for pain medication) would be nullified by routine use of epidurals and oxytocin.

Nonetheless, even with variability in the intensity of labor support, clear benefits are demonstrated for continuous bedside care in the Cochrane meta-analysis. With such support, the likelihood of a spontaneous vaginal birth is increased and women report a greater sense of personal control and satisfaction with their birth experience. Physical presence and undivided attention to a laboring woman's needs conveys that she is valued and respected.

### PATIENCE WITH LABOR PROGRESS

In the United States, the Friedman criteria for labor progress have been widely utilized for decades. This model was developed by Friedman et al. in the 1950s and 1960s from clinical observational data. These data were compared against a subset of labors in the Collaborative Perinatal Project to derive statistical norms.<sup>1</sup> Labor progress was described by separate sigmoid curves for nulliparas and multiparas in the active phase of first stage. Labors progressing slower than 1.2 cm per hour (nulliparas) or 1.5 cm per hour (multiparas) were defined as the outer fifth percentile for time in labor. These statistical norms were adopted as a clinical practice standard and have been used in the United States to diagnose and treat slow labors (Figure 1).

British physicians Philpott and Castle developed the partogram in the early 1970s while working in Africa.<sup>11</sup> The partogram illustrated labor progress as a straight line, changing at 1 cm per hour in the active phase of first

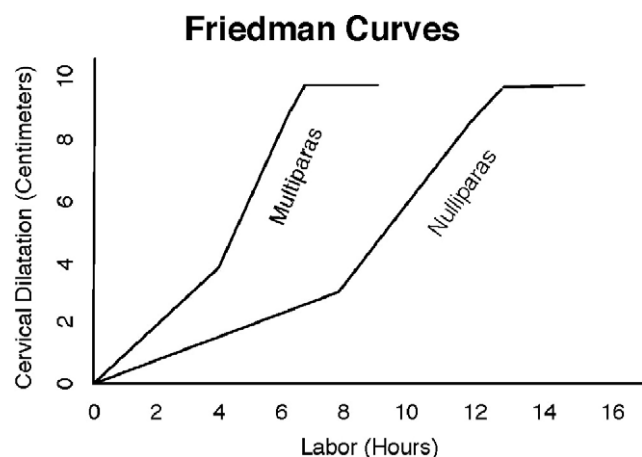


Figure 1. Friedman curves (adapted from Friedman<sup>1</sup>).

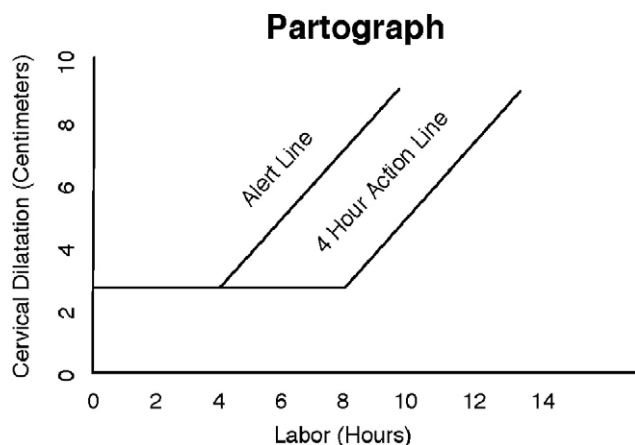


Figure 2. Partograph (adapted from Philpott and Castle<sup>11</sup>).

stage. A parallel “action” line was drawn 4 hours to the right of the “alert” line to indicate possible abnormality in slower labors. The partogram is a single model of labor progress for all women, regardless of parity. It is slightly more relaxed than the Friedman criteria, and is utilized in Europe, Australia, and in a number of developing countries, under the auspices of the WHO (Figure 2).

These authors advanced the understanding of labor. Friedman was the first researcher to distinguish between a latent and active phase of first stage. But rigid interpretation of labor progress according to either schematic, without consideration of the full context of the labor, can result in unnecessary treatment and related morbidity.

More recent observational data from research on more than 12,000 healthy women in the past 15 years indicate that normal labor in contemporary populations takes longer than has been generally appreciated. Kilpatrick and Laros<sup>12</sup> retrospectively evaluated the duration of labor in 6991 women, where 13% had conduction anesthesia. The means and statistical limits (95th percentile) for first stage were twice as long as those in the original Friedman data, for both multigravida and primigravida women. Perl and Hunter<sup>13</sup> analyzed labor progress in 505 healthy primigravidas and found that 21% progressed slower than 1 cm per hour in first stage. Only those progressing at rates below 0.5 cm per hour had higher rates of complications.

Two studies involving 3984 healthy unmedicated midwifery clients<sup>14,15</sup> observed that the active phase of first stage took over twice as long as the Friedman criteria, without elevated rates of maternal or neonatal morbidity. Means and statistical limits for first and other births were more than doubled. Finally, Zhang et al.<sup>16</sup> analyzed data from 1162 healthy nulliparas, where 48% used epidurals and 50% received oxytocin. With a high proportion of medical interventions in labor, first stage took over twice as long as in the Friedman data, and 2-hour arrests of dilatation were a common occurrence in the first stage. A comparison of data from only healthy, unmedicated

**Table 1.** Length of First Stage Labor in Healthy Childbearing Women

Source	Mean (hours)	95th Percentile (hours)
Nulliparas		
Friedman <sup>1</sup>	4.1	8.5
Kilpatrick and Laros <sup>12</sup>	8.1	16.6
Albers, Schiff, and Gorwoda <sup>14</sup>	7.7	19.4
Albers <sup>15</sup>	7.7	17.5
Multiparas		
Friedman <sup>1</sup>	2.4	7.0
Kilpatrick and Laros <sup>12</sup>	5.7	12.5
Albers, Schiff, and Gorwoda <sup>14</sup>	5.7	13.7
Albers <sup>15</sup>	5.6	13.8

women in the above studies versus similar women in the original Friedman data shows impressive differences (Table 1).

These contemporary data indicate that a reasonable expectation for first stage labor progress is a far slower rate of cervical dilatation than 1 cm per hour in women with healthy pregnancies. The rate is more appropriately 0.5 cm per hour, and for some women may be as low as 0.3 cm per hour, assuming a well mother and fetus and a leisurely uterine contraction pattern.<sup>17</sup> Utilizing the more current data would reduce the frequency with which a “problem” is diagnosed and medically treated. It would allow a trial of nonpharmacologic measures, which are often more pleasant for laboring women. Greater patience from clinicians would convey a positive attitude about the process of labor, and this may potentially enhance maternal confidence and reduce overall stress.

### LOW-TECHNOLOGY CARE MEASURES

Intermittent auscultation of the fetal heart rate, activity and position change, and nonpharmacologic methods of pain relief are examples of strategies that may enhance maternal confidence and allow labor to proceed in its own manner. These strategies are often interrelated and interdependent when used in the first stage of labor. For example, a woman whose fetus is monitored intermittently with a hand-held Doppler may be able to spend more time out of bed and utilize baths or showers for pain relief. Such care measures are often utilized in the context of intensive labor support and individualized care.

#### Intermittent Auscultation

Although continuous electronic fetal monitoring (EFM) is essentially universal in the management of labors in the United States, all available evidence favors intermittent auscultation (IA) to assess fetal well-being in labor, particularly with low-risk women. IA may be done with a fetoscope, a hand-held Doppler, or the EFM machine. A recent American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin<sup>18</sup> retains the organization’s decade-long view that either method of fetal monitoring (EFM or IA) is “acceptable” for women without complications. The bulletin acknowledges two facts: EFM increases the risk of operative delivery (cesareans and vaginal operative procedures) without clear benefit for the baby, and the false-positive rate for EFM data (that is, the frequency with which EFM indicates a problem when no problem truly exists) is extremely high, at more than 99% for predicting cerebral palsy.<sup>18</sup> Overall, 50% to 75% of ominous fetal heart rate patterns will not signify any fetal compromise.<sup>19</sup> Other organizations, such as the Royal College of Obstetricians and Gynaecologists in the United Kingdom,<sup>20</sup> the Society of Obstetricians and Gynecologists of Canada,<sup>21</sup> and the WHO<sup>2,22</sup> go further than ACOG and articulate the position that IA is the method of choice for low-risk pregnancies; the challenge now being how to bring practice in line with the evidence.

Many research articles comparing EFM with IA are available in the literature, in both randomized and observational studies. A Cochrane review<sup>23</sup> includes 9 clinical trials where women were randomly assigned to either EFM or IA for fetal assessment in labor. Data are included for more than 18,000 women, although 13,000 came from a single trial in Dublin, Ireland, where the cesarean rate was extremely low (2%–3%) at the time. Thus, the Dublin data would influence conclusions drawn from the combined 9 clinical trials. The Cochrane meta-analysis found that continuous EFM use was associated with an increased risk of a cesarean delivery (RR = 1.41; 95% CI, 1.23–1.61), as well as vaginal operative delivery (RR = 1.20; 95% CI, 1.11–1.30). However, given the number of subjects contributed by the Dublin data, the overall rise in operative births associated with EFM may be underestimated. No differences were observed for any neonatal morbidity or mortality indicators (Apgar scores, admissions to neonatal intensive care units, perinatal deaths, or cerebral palsy) except for neonatal seizures within 48 hours of birth. Of all the included studies, only the Dublin trial was large enough to assess seizures, which occurred in 39 newborns of 12,964 mothers, or 3 per 1000 babies (27 in IA; 12 in EFM). In a subgroup analysis, seizures were found to be associated with longer labors stimulated by high doses of oxytocin. Few of these seizures persisted, and long-term follow-up of these infants<sup>24</sup> indicated no differences in neonatal outcomes according to the original randomization. Only 3 babies in each group had seizures beyond the immediate newborn period. Thus, the risk of transient early seizures in women receiving IA, but without high-dose oxytocin, is not known.

Women’s views about the method of fetal monitoring were recorded in three of the trials included in the Cochrane review.<sup>25</sup> Low-risk women viewed intermittent auscultation in labor more favorably, because of the

greater support they received from their caregivers. The method of monitoring was less important than the amount of support from staff, reflecting the value women place on intensive labor support.

When intermittent auscultation is used, the fetal heart rate is best assessed for a full minute, beginning toward the end of a contraction, and the optimum frequency of listening is every 15 minutes in the first stage of labor, and every 5 minutes, or with each push, in second stage. This was the listening method used with most of the women in the Cochrane review, and the latest ACOG Practice Bulletin<sup>18</sup> suggests this listening frequency. With IA, a laboring woman is free to move about. Other care measures, such as ambulation, or the use of baths or showers, may be utilized in the context of physical presence and emotional support from a caregiver.<sup>26</sup> Thus, IA will usually require a clinician to focus on one woman, whereas restriction to bed with continuous EFM allows a clinician to care for more than one laboring woman.

Recent studies have highlighted the difficulties incorporating the evidence on fetal assessment into practice. While most nurses agree that IA should be the standard of care for low-risk women, nurse–patient ratios may not permit one-to-one care.<sup>27</sup> Staff education on performance of IA and clinical leadership to promote change in the practice setting are also essential to update usual care.<sup>28</sup> Further, teachers have a responsibility for instruction and role-modeling of IA with clinicians-in-training. Along with individualized care and intensive support, IA may permit use of other nontechnical care measures and thus help achieve a spontaneous birth.

### Activity and Position Change

Recumbency and bed confinement are the norm for labor management in the United States,<sup>6</sup> and these may best fit the needs of clinicians and institutions. Upright positions and mobility may be more pleasant for laboring women, and may have distinct advantages in promoting progress leading to a spontaneous vaginal birth. Past reviews of research have identified flaws in early studies of mobility and position change, such as small samples, selection bias, and confounding in nonrandomized studies, and failures of randomization in attempted trials.<sup>29,30</sup> Nonetheless, certain advantages have been associated with activity during labor, including improved uterine contraction intensity and shorter labors, less need for pain medications, fewer variant fetal heart rate patterns, and increased maternal autonomy and control.<sup>29,30</sup> No harmful effects have ever been observed, and the inclination some women have to move about appears related to options available in the birth environment and encouragement from caregivers.

A large, recent trial about the effects of walking in labor illustrates some of the challenges in studying this

topic.<sup>31</sup> In this study, 1067 healthy women were randomly assigned to walk or remain in bed during labor, in order to measure any positive or negative effects on labor and birth. Walking was measured by nursing observations and by the use of pedometers. No differences in any labor or birth variables, nor harmful effects were found to be associated with walking. Of the 536 women assigned to the walking group, 22% (n = 116) did not walk at all. Of the women who did walk, the average time spent out of bed was 56 minutes. Very little walking actually occurred in this study, and therefore, the two comparison groups would be expected to be similar on all outcomes of interest. The nursing care in the research setting was not described, and the degree to which women were encouraged and assisted to ambulate was not reported.

No Cochrane meta-analysis is available on activity and position change in the first stage of labor. However, a systematic review of nonpharmacologic methods of pain relief by Simkin and Bolding<sup>32</sup> was published in a recent issue of this *Journal*. One of the reviewed topics is ambulation and position change in labor. In this review, data from 14 studies are summarized, 8 of which used women as their own controls (n = 311). That is, women in first stage labored upright for periods of 15 to 30 minutes, and then labored recumbent in bed, and so on. Pain and progress were serially assessed in each position. Less pain was consistently reported when upright positions (standing or sitting) were used, and very late in the first stage, less pain was reported by women who assumed a side-lying position. Upright and lateral positions were associated with more efficient labor progress as well.

Six studies in the Simkin and Bolding review<sup>32</sup> included 2629 women. These studies each compared an upright group (sitting, standing, or walking) with a recumbent group (supine or side-lying) in labor. Although there were variations in study procedures, adherence to group assignment, measurement of key variables, and reported outcomes, the data generally indicated that women had less pain and shorter labors when upright, without any evidence of harm.

A recent radiologic study using magnetic resonance imaging of women's pelvic dimensions helps explain the benefits of upright positioning.<sup>33</sup> In this investigation, 35 nonpregnant women had pelvic dimensions measured in three positions: lying flat on the back, squatting, and leaning forward while kneeling. Pelvic dimensions were altered by upright positions, and anterior–posterior and transverse diameters of the pelvic cavity and outlet increased in the squatting and kneeling positions, compared with lying supine.<sup>33</sup> The changes were greatest for women who were younger, taller, or who had previously given birth. The researchers argue that the joint laxity of pregnancy could account for even greater increase in pelvic diameters with movement and positioning.

Activity and position change assist the physiologic

**Table 2.** Nonpharmacologic Methods of Pain Management in Labor

Nonpharmacologic Methods for Managing Labor Pain	Source for Available Evidence
Continuous labor support	Hodnett et al, <sup>9</sup> Simkin & Bolding, <sup>32</sup> and Simkin & O'Hara <sup>36</sup>
Movement and position changes	Roberts, <sup>30</sup> Simkin & Bolding, <sup>32</sup> and Simkin & O'Hara <sup>36</sup>
Immersion water baths	Simkin & Bolding, <sup>32</sup> Simkin & O'Hara, <sup>36</sup> and Cluett et al. <sup>37</sup>
Touch and massage	Simkin & Bolding <sup>32</sup> and Simkin & O'Hara <sup>36</sup>
Intradermal water blocks	Simkin & Bolding <sup>32</sup> and Simkin & O'Hara <sup>36</sup>
Acupuncture	Simkin & Bolding <sup>32</sup> and Smith et al. <sup>38</sup>
Hypnosis	Simkin & Bolding <sup>32</sup> and Smith et al. <sup>38</sup>
Aromatherapy	Simkin & Bolding <sup>32</sup> and Smith et al. <sup>38</sup>
Transcutaneous electrical nerve stimulation	Simkin & Bolding <sup>32</sup>
Heat or cold applications	Simkin & Bolding <sup>32</sup>
Childbirth education	Simkin & Bolding <sup>32</sup>
Music/audioanalgesia	Simkin & Bolding <sup>32</sup>
Patterned breathing/relaxation	Simkin & Bolding <sup>32</sup>

mechanisms of labor, and promote fetal adaptation to the maternal pelvis.<sup>30</sup> Upright positions improve uteroplacental circulation, and women feel less pain and may progress more efficiently through labor.<sup>36</sup> Moving about in labor often involves close interaction with another person, thus greater support, and laboring upright conveys a sense of normalcy, autonomy, and personal control.

### Nonpharmacologic Methods of Pain Relief

Today, women in the United States have fewer options for pain control in labor, compared with their European counterparts.<sup>34</sup> Although opiate analgesics are available

in essentially all hospital obstetric units, and epidural analgesia is now available in most of the larger ones, nonpharmacologic methods of pain relief have become limited or absent from many birth settings. This poses a dilemma because ideal pain relief should lower pain levels without adverse effects for mother, baby, or the course of labor, a definition first put forth by Dick-Read in the 1940s.<sup>7</sup> All pharmacologic methods are known to have potential untoward effects.

Nonpharmacologic methods of pain relief are generally less effective than pharmacologic methods, particularly epidural analgesia. However, they may assist a woman in coping with labor, are inexpensive (especially when compared with epidural analgesia), and do not cause harm.<sup>32</sup> They may be ideal for use in early labor. Because the nonpharmacologic methods often require a supportive human presence, their efficacy may be partially explained by the greater support that women receive when using these methods. Nonpharmacologic methods also necessitate the woman's choice, participation, and control. They may reinforce a sense of self-efficacy, as opposed to dependence and vulnerability.<sup>32</sup>

Until recently, the nonpharmacologic methods were studied primarily in self-selected populations, where women already had a favorable attitude toward these methods.<sup>35</sup> Several systematic reviews are now available that combine randomized trials and meta-analyses comparing pain management methods.<sup>32,36-38</sup> The array of nonpharmacologic methods used to mitigate and cope with labor pain are listed in Table 2, along with references for locating current evidence. Although many of these methods need further study, most have been found to be effective to some degree in reducing labor pain. Mothers rate them highly (Table 3), even when pain relief is judged as minimal, indicating that psychological benefits may be

**Table 3.** Women's Ratings of the Effectiveness of Nonpharmacologic Pain Relief Methods

Pain Relief Method	All Mothers Used Specified Method of Pain Relief (N = 1573)				
	Overall % Used*	Very Helpful % <sup>†</sup>	Somewhat Helpful % <sup>†</sup>	Not Very Helpful % <sup>†</sup>	Not Helpful at All % <sup>†</sup>
Immersion in tub or pool	6	48	43	5	3
Hands-on techniques (e.g., massage)	20	40	51	7	2
Narcotics	22	40	35	15	11
Birthing ball	7	34	33	21	12
Shower	4	33	45	7	12
Application of hot or cold	6	31	50	13	4
Mental strategies	25	28	49	15	8
Position changes	42	23	54	17	7
Changes to environment (e.g., music)	4	21	57	20	2
Breathing techniques	49	21	56	17	5

Adapted with permission from Declercq et al.<sup>39</sup>

\*Percent of all mothers in study.

<sup>†</sup>Percent of all mothers who used this specific method of pain relief.

derived from the ability to exercise personal choice of methods and to receive assistance in using them.<sup>32,39</sup>

For women to use nonpharmacologic methods of pain relief, options must be available in the birth setting, and women need encouragement to try them. Bed confinement cannot be expected of all women. Caregivers need skill and comfort with intermittent auscultation and with assisting women to be active during their labors, as many of these methods will be used by women who are mobile and out of bed. If nonpharmacologic methods of pain relief help a woman cope with labor, and have no untoward effects, then using them may promote maternal and fetal well-being without interference in the normal course of labor.

## EVIDENCE FOR CLINICAL PRACTICE

The goal of evidence-based care is to incorporate information from research into practice. This would make the best-evaluated treatments and interventions available to women, and therefore improve their health and reduce the potential of harm.<sup>40</sup> All available evidence on the care of healthy women in the first stage of labor suggests that the following care practices be standard management for women in labor: 1) continuous support, 2) flexible parameters for defining labor progress, 3) intermittent auscultation of the fetal heart, 4) promotion of upright positions and activity, and 5) nonpharmacologic methods of pain relief. This combination is most likely to support physiologic labor and a spontaneous vaginal birth. While a uniform and predetermined formula for intrapartum care in the United States, with care elements opposite to this list, may serve the needs of clinicians and institutions, no data demonstrate that this emphasis on medical interventions has made birth safer, as all interventions have unwanted effects.<sup>3</sup>

The WHO's Principles of Perinatal Care argue for evidence-based practice in childbirth.<sup>22</sup> These specifically include one-to-one care in labor, support of the woman's companion, intermittent auscultation, ambulation in labor, minimizing all interventions, appropriate partogram use, and vaginal exams limited to every 4 hours in normal labor. These principles are based on research and have been globally disseminated. Appendix A lists other organizations that have taken up the challenge to educate professionals and consumers about the advantages of normal birth and how to achieve it, which starts with implementing evidence-based practice. Lamaze International created the Institute for Normal Birth in 2004 (whose vision is "confident women choosing normal birth"). Childbirth Connection (formerly Maternity Center Association in New York City) has a 90-year history of educational and advocacy activities to improve the quality of maternity services. Childbirth Connection and Lamaze International recently joined together to conduct the second national *Listening to*

*Mothers Survey* in early 2006.<sup>39</sup> The Royal College of Midwives in the United Kingdom has recently begun a Campaign for Normal Birth.

Midwives in the United States can argue forcefully for evidence-based care, which fully supports the midwifery model of care.<sup>41</sup> But modifying current practice norms will require additional efforts to inform women's expectations of intrapartum care, alter institutional routines, and influence the attitudes of other professionals. British researchers have recently argued that achieving a higher rate of normal vaginal birth is associated with clinicians' belief in birth as a physiologic process, evidence-based practice and one-to-one care, and team work involving a shared philosophy with colleagues.<sup>42</sup>

Two points are often put forth as rationale for maintaining the status quo: maternal preference for technologic care (e.g., epidurals), and lack of staff. Consumer choices in maternity care are partially determined by clinician preference, by what is available in the birth setting, and by lack of full informed consent for common forms of care. It is difficult for women to request care measures that are not being practiced and are unfamiliar to caregivers.<sup>43</sup> Informed consent conducted in a superficial or abbreviated manner may inadvertently manipulate women to "choose" what caregivers prefer.<sup>44</sup> The staffing argument fails to consider that under a system of evidence-based care, staff might be working differently. With potentially less electronic monitoring, fewer epidurals, and fewer operative births, clinicians would be able to spend more time with laboring women and individualize their care. Thus, the work would be more likely to meet women's needs, and at the same time be more gratifying for staff, compared with today's mass production-style of hospital care.

A comprehensive strategy for change would include community education about normal birth; prenatal care that creates expectations for labor support and options in care; education of hospital staff and colleagues about the content features of evidence-based care; participation in hospital policy-setting committees; demonstration and role-modeling of evidence-based care, starting on low census days; chart reviews to document outcomes of physiologic management; and assessment of women's views of their care. Current evidence indicates that women's satisfaction with their childbirth experience is known to be largely dependent on personal expectations and whether they were met, the quality of support from and interaction with their caregivers, and the degree of involvement in decisions about their own care.<sup>45</sup> Women need encouragement to expect more of their obstetric care. Over time, data on outcomes and women's perspectives may combine with consistent midwifery advocacy of the model to bring evidence-based care into the mainstream where all childbearing women will benefit.

## REFERENCES

1. Friedman EA. Labor: Clinical evaluation & management, 2nd ed. New York: Appleton-Century-Crofts, 1978.
2. Maternal and Newborn Health/Safe Motherhood Unit. Care in normal birth: A practical guide. Geneva: World Health Organization, 1996.
3. Tew M. Safer childbirth?, 2nd ed. London: Chapman & Hall, 1995.
4. Turner G, editor. The Australian concise Oxford dictionary of current english, 7th ed. Melbourne: Oxford University Press, 1987.
5. Martin JA, Hamilton BE, Sutton PD, Ventura SJ, Menacker F, Munson ML. Final data for 2003. National vital statistics reports; vol 54, no 2. Hyattsville, MD: National Center for Health Statistics, 2005.
6. Declercq ER, Sakala C, Corry MP, Applebaum S, Risher P. Listening to mothers: Report of the first national U.S. survey of women's childbearing experiences. New York: Maternity Center Association, 2002.
7. Dick-Read G. Childbirth without fear. New York: Harper & Brothers, 1944.
8. Sosa R, Kennell J, Klaus M, Robertson S, Urrutia J. The effect of a supportive companion on perinatal problems, length of labor, and mother-infant interaction. *N Engl J Med* 1980;303:597-600.
9. Hodnett ED, Gates S, Hofmeyr GJ, Sakala C. Continuous support for women during childbirth. *The Cochrane Database of Systematic Reviews* 2003, Issue 3. Art No: CD003766. DOI: 10.1002/14651858.CD003766.
10. Hodnett ED, Lowe NK, Hannah ME, Willan AR, Stevens B, Weston JA, et al. Effectiveness of nurses as providers of birth labor support in North American hospitals: A randomized controlled trial. *JAMA* 2002;288:1373-81.
11. Philpott RH, Castle WM. Cervicographs in the management of labour in primigravidae, I and II. *J Obstet Gynaecol Br Commonw* 1972;79:592-602.
12. Kilpatrick SJ, Laros RK. Characteristics of normal labor. *Obstet Gynecol* 1989;74:85-7.
13. Perl FM, Hunter DJS. What cervical dilatation rate during active labour should be considered normal? *Eur J Obstet Gynecol Reprod Biol* 1992;45:89-92.
14. Albers LL, Schiff M, Gorwoda JG. The length of active labor in normal pregnancies. *Obstet Gynecol* 1996;87:355-9.
15. Albers LL, for the CNM Data Group 1996. The duration of labor in healthy women. *J Perinatol* 1999;19:114-9.
16. Zhang J, Troendle JF, Yancey MK. Reassessing the labor curve in nulliparous women. *Am J Obstet Gynecol* 2002;187:824-8.
17. Keirse MJ, Enkin M, Crowther C, Nelison J, Hodnett E, Hofmeyr J, Duley L. A guide to effective care in pregnancy and childbirth, 3rd ed. Oxford: Oxford University Press, 2000.
18. American College of Obstetricians and Gynecologists. ACOG practice bulletin: Intrapartum fetal heart rate monitoring. *Obstet Gynecol* 2005;106:1453-61.
19. Royal Australian and New Zealand College of Obstetricians and Gynaecologists Web site. The RANZCOG Clinical Guidelines, Intrapartum Fetal Surveillance, 2002. Available from: [www.ranzcog.edu.au/publications/pdfs/ClinicalGuidelines-IFSSecEd.pdf](http://www.ranzcog.edu.au/publications/pdfs/ClinicalGuidelines-IFSSecEd.pdf) [Accessed December 22, 2006].
20. Royal College of Obstetricians and Gynaecologists. The use of electronic fetal monitoring: The use and interpretation of cardiotocography in intrapartum fetal surveillance. London: RCOG, 2001.
21. Society of Obstetricians and Gynecologists of Canada. Clinical practice guideline, fetal health surveillance in labour. Ottawa: SOGC, 2001.
22. Chalmers B, Mangiaterra V, Porter R. WHO principles of perinatal care: The essential antenatal, perinatal, and postpartum care course. *Birth* 2001;28:202-7.
23. Thacker SB, Stroup D, Chang M. Continuous electronic heart rate monitoring for fetal assessment during labor. *The Cochrane Database of Systematic Reviews* 2001, Issue 2. Art No: CD000063. DOI: 10.1002/14651858.CD000063.
24. Grant A, O'Brien N, Joy MT, Hennessey E, MacDonald D. Cerebral palsy among children born during the Dublin randomized trial of intrapartum monitoring. *Lancet* 1989;8674:1233-6.
25. Spencer JAD, Ward RHT. Intrapartum fetal surveillance. London: RCOG Press, 1993, pp. 233-391.
26. Albers LL. Monitoring the fetus in labor: Evidence to support the methods. *J Midwifery Womens Health* 2001;46:366-73.
27. Walker DS, Shunkwiler S, Supanich J, Williamsen J, Yensch A. Labor and delivery nurses' attitudes toward intermittent fetal monitoring. *J Midwifery Womens Health* 2001;46:374-80.
28. Graham ID, Logan J, Davies B, Nimrod C. Changing the use of electronic fetal monitoring and labor support: A case study of barriers and facilitators. *Birth* 2004;31:293-301.
29. Albers LL, Anderson D, Cragin L, Daniels SM, Hunter C, Sedler KD, et al. The relationship of ambulation in labor to operative delivery. *J Nurse-Midwifery* 1997;42:4-8.
30. Roberts J. Maternal position in the first stage of labour. In: Chalmers I, Enkin M, Keirse MJNC, editors. *Effective care in pregnancy and childbirth*, vol 2. Oxford: Oxford University Press, 1989, pp. 883-92.
31. Bloom SL, McIntire DD, Kelly MA, Beimer HL, Burpo RH, Garcia MA, et al. Lack of effect of walking on labor and delivery. *N Engl J Med* 1998;339:76-9.
32. Simkin P, Bolding A. Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. *J Midwifery Womens Health* 2004;49:489-504.
33. Michel S, Rake A, Treiber K, Seifert B, Chaoui R, Huch R, et al. MR obstetric pelvimetry: Effect of birthing position on pelvic bony dimensions. *Am J Roentgenol* 2002;179:1063-7.
34. Marmor TR, Krol DM. Labor pain management in the United States: Understanding patterns and the issue of choice. *Am J Obstet Gynecol* 2002;186:S173-80.
35. Simkin P. Non-pharmacological methods of pain relief during labour. In: Chalmers I, Enkin M, Keirse MJNC, editors. *Effective care in pregnancy and childbirth*, vol 2. Oxford: Oxford University Press, 1989, pp. 893-912.

36. Simkin PP, O'Hara MA. Nonpharmacologic relief of pain during labor: Systematic reviews of five methods. *Am J Obstet Gynecol* 2002;186:S131–59.

37. Cluett ER, Nikodem VC, McCandlish RE, Burns EE. Immersion in water in pregnancy, labour and birth. *The Cochrane Database of Systematic Reviews* 2002, Issue 2. Art No: CD000111. DOI: 10.1002/14651858.CD000111.pub2.

38. Smith CA, Collins CT, Cyna AM, Crowther CA. Complementary and alternative therapies for pain management in labour. *The Cochrane Database of Systematic Reviews* 2003, Issue 2. Art No: CD003521. DOI: 10.1002/14651858.CD003521.

39. Declercq ER, Sakala C, Corry MP, Applebaum S. Listening to mothers II: Report of the second national U.S. survey of women's childbearing experiences. New York: Childbirth Connection, 2006.

40. Albers LL. "Evidence" and midwifery practice. *J Midwifery Womens Health* 2001;46:130–6.

41. Division of Education of the American College of Nurse-Midwives. The core competencies for basic midwifery practice. *J Midwifery Womens Health* 2002;47:403–6.

42. Johanson R, Newburn M, MacFarlane A. Has the medicalization of childbirth gone too far? *Br Med J* 2002;324:892–5.

43. van Teijlingen ER, Hundley V, Rennie AM, Graham W, Fitzmaurice A. Maternity satisfaction studies and their limitations: "What is, must still be best." *Birth* 2003;30:75–82.

44. Cahill HA. Male appropriation and medicalization of childbirth: An historical analysis. *J Adv Nurs* 2001;33:334–42.

45. Hodnett ED. Pain and women's satisfaction with the experience of childbirth: A systematic review. *Am J Obstet Gynecol* 2002;186:S160–72.

**Appendix A. Organizations With Educational Materials for Evidence-Based Practices to Promote Normal Birth**

Organization	URL
Lamaze International Institute for Normal Birth Childbirth Connection (formerly Maternity Center Association) The Royal College of Midwives Campaign for Normal Birth	<a href="http://www.lamaze.org">www.lamaze.org</a> <a href="http://www.childbirthconnection.org">www.childbirthconnection.org</a> <a href="http://www.rcm.org.uk">www.rcm.org.uk</a>