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WOMEN'S HEALTH CARE PHYSICIANS

# COMMITTEE OPINION

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## Committee on Obstetric Practice

*The American College of Nurse–Midwives and the Association of Women's Health, Obstetric and Neonatal Nurses endorse this document. This Committee Opinion was developed by the American College of Obstetricians and Gynecologists' Committee on Obstetric Practice, in collaboration with American College of Nurse–Midwives' liaison member Tekoa L. King, CNM, MPH, and College committee members Kurt R. Wharton, MD, Jeffrey L. Ecker, MD, and Joseph R. Wax, MD.*

*This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.*

## Approaches to Limit Intervention During Labor and Birth

**ABSTRACT:** Obstetrician–gynecologists, in collaboration with midwives, nurses, patients, and those who support them in labor, can help women meet their goals for labor and birth by using techniques that are associated with minimal interventions and high rates of patient satisfaction. Many common obstetric practices are of limited or uncertain benefit for low-risk women in spontaneous labor. For women who are in latent labor and are not admitted, a process of shared decision making is recommended. Admission during the latent phase of labor may be necessary for a variety of reasons. A pregnant woman with term premature rupture of membranes (also known as prelabor rupture of membranes) should be assessed, and the woman and her obstetrician–gynecologist or other obstetric care provider should make a plan for expectant management versus admission and induction. Data suggest that in women with normally progressing labor and no evidence of fetal compromise, routine amniotomy is not necessary. The widespread use of continuous electronic fetal heart-rate monitoring has not improved outcomes when used for women with low-risk pregnancies. Multiple nonpharmacologic and pharmacologic techniques can be used to help women cope with labor pain. Women in spontaneously progressing labor may not require routine continuous infusion of intravenous fluids. For most women, no one position needs to be mandated nor proscribed. Nulliparous women who have an epidural and no indication for expeditious delivery may be offered a period of rest for 1–2 hours before initiating pushing efforts. Obstetrician–gynecologists and other obstetric care providers should be familiar with and consider using low-interventional approaches for the intrapartum management of low-risk women in spontaneous labor.

### Recommendations and Conclusions

The American College of Obstetricians and Gynecologists (the College) makes the following recommendations and conclusions:

- For a woman who is at term in spontaneous labor with a fetus in vertex presentation, labor management may be individualized (depending on maternal and fetal condition and risks) to include techniques such as intermittent auscultation and nonpharmacologic methods of pain relief.
- Admission to labor and delivery may be delayed for women in the latent phase of labor when their status and their fetuses' status are reassuring. The women can be offered frequent contact and support, as well as nonpharmacologic pain management measures.
- When women are observed or admitted for pain or fatigue in latent labor, techniques such as education and support, oral hydration, positions of comfort, and nonpharmacologic pain management techniques such as massage or water immersion may be beneficial.
- Obstetrician–gynecologists and other obstetric care providers should inform pregnant women with term premature rupture of membrane (PROM [also known as prelabor rupture of membranes]) who are considering a period of expectant care of the potential risks associated with expectant management and the limitations of available data. For informed women, if concordant with their individual preferences and if there are no other maternal or fetal reasons to expedite delivery, the choice of expectant management for

a period of time may be appropriately offered and supported. For women who are group B streptococci (GBS) positive, however, administration of antibiotics for GBS prophylaxis should not be delayed while awaiting labor. In such cases, many patients and obstetrician–gynecologists or other obstetric care providers may prefer immediate induction.

- Evidence suggests that, in addition to regular nursing care, continuous one-to-one emotional support is associated with improved outcomes for women in labor.
- For women with normally progressing labor and no evidence of fetal compromise, routine amniotomy need not be undertaken unless required to facilitate monitoring.
- To facilitate the option of intermittent auscultation, obstetrician–gynecologists and other obstetric care providers and facilities should consider adopting protocols and training staff to use a hand-held Doppler device for low-risk women who desire such monitoring during labor.
- Use of the coping scale in conjunction with different nonpharmacologic and pharmacologic pain management techniques can help obstetrician–gynecologists and other obstetric care providers tailor interventions to best meet the needs of each woman.
- Frequent position changes during labor to enhance maternal comfort and promote optimal fetal positioning can be supported as long as adopted positions allow appropriate maternal and fetal monitoring and treatments and are not contraindicated by maternal medical or obstetric complications.
- When not coached to breathe in a specific way, women push with an open glottis. In consideration of the limited data regarding outcomes of spontaneous versus Valsalva pushing, each woman should be encouraged to use the technique that she prefers and is most effective for her.
- In the absence of an indication for expeditious delivery, women (particularly those who are nulliparous with epidural analgesia) may be offered a period of rest of 1–2 hours (unless the woman has an urge to bear down sooner) at the onset of the second stage of labor.

## Introduction

This Committee Opinion reviews the evidence for labor care practices that facilitate a physiologic labor process and minimize intervention for appropriate women who are in spontaneous labor at term. The desire to avoid unnecessary interventions during labor and birth is shared by health care providers and pregnant women. Obstetrician–gynecologists, in collaboration with midwives, nurses, patients, and those who support them in

labor, can help women meet their goals for labor and birth by using techniques that are associated with minimal interventions and high rates of patient satisfaction (1).

As used in this document, “low risk” indicates a clinical scenario for which there is no demonstrable benefit for a medical intervention. What constitutes low risk will, therefore, vary depending on individual circumstances and the proposed intervention. For example, a woman who requires oxytocin augmentation will need continuous electronic fetal heart rate monitoring, and she would, therefore, not be low risk with regard to eligibility for intermittent auscultation. Rather than label a woman as low risk or high risk, the goal of this document is to ensure that the obstetrician–gynecologist or other obstetric care provider carefully selects and tailors labor interventions to the requirements and preferences of the woman in labor.

## Latent Labor: Labor Management and Timing of Admission

Observational studies have found that admission in the latent phase of labor is associated with more arrests and cesarean deliveries in the active phase and with an increase in the use of oxytocin, intrauterine pressure catheters, and antibiotics for intrapartum fever (2–4). However, these studies were unable to determine whether these outcomes reflected interventions associated with earlier and longer exposure to the hospital environment or a propensity for dysfunctional labor among women who present for care during the latent phase. A randomized controlled trial (RCT) that compared admission at initial presentation to the labor unit (immediate admission) versus admission when in active labor (delayed admission) found that those allocated to the delayed admission group had lower rates of epidural use and augmentation of labor, had greater satisfaction, and spent less time in the labor and delivery unit. Although there were no significant differences between study groups in operative vaginal or cesarean deliveries or newborn outcomes, the study was underpowered to assess these outcomes (5). Importantly, recent data from the Consortium for Safe Labor support updated definitions for latent and active labor. In contrast to the prior suggested threshold of 4 cm, the onset of active labor for many women may not occur until 5–6 cm (6–8). These data suggest that expectant management is reasonable for women at 4–6 cm dilatation who are in latent labor if maternal and fetal status are reassuring. For women who are in latent labor and are not admitted, a process of shared decision making is recommended to create a plan for self-care activities and coping techniques. An agreed-upon time for reassessment should be determined at the time of each contact. Care for women in latent labor may be facilitated by having an alternate unit where women can rest and be offered support techniques before admission to labor and delivery.

Admission during the latent phase of labor may be necessary for a variety of reasons, including pain

management or maternal fatigue (9, 10). When women are observed or admitted for pain or fatigue in latent labor, techniques such as education and support, oral hydration, positions of comfort, and nonpharmacologic pain management techniques such as massage or water immersion may be beneficial (11, 12).

## **Term Premature Rupture of Membranes**

When membranes rupture at term before the onset of labor, approximately 77–79% of women will go into labor spontaneously within 12 hours, and 95% will start labor spontaneously within 24–28 hours (13, 14). A woman with term PROM should be assessed, and the woman and her obstetrician–gynecologist or other obstetric care provider should make a plan for expectant management versus admission and induction. A Cochrane review that compared immediate induction with expectant management did not find a difference in cesarean delivery or neonatal infection, but did find a decreased risk of chorioamnionitis (relative risk [RR], 0.74; 95% confidence interval [CI], 0.56–0.97), endometritis (RR, 0.30; 95% CI, 0.12–0.74), and admission to a neonatal intensive care unit (NICU) (RR, 0.72; 95% CI, 0.57–0.92) in the induction group (15). The Cochrane authors commented that because there were no differences in neonatal infection, the higher incidence of NICU admission in the expectant group, “could relate to hospital policy but could [also] reflect less illness in the babies under planned [immediate induction] management.” The Cochrane review concluded, “Since planned [immediate induction] and expectant management may not be very different, women need to have appropriate information to make informed choices.” In balancing the alternatives, the authors of another study, who conducted the largest RCT on PROM at term, suggested that “induction of labor ... and expectant management are all reasonable options for women and their babies if membranes rupture before the start of labor at term, since they result in similar rates of neonatal infection and cesarean section” (16).

The randomized controlled trials addressing pregnancies experiencing term PROM included expectant care intervals ranging from 10 hours up to 4 days. The risk of infection increases with prolonged duration of ruptured membranes. However, the optimal duration of expectant management that maximizes the chance of spontaneous labor while minimizing the risk of infection has not been determined. In line with knowledge that a large proportion of women will go into spontaneous labor in the hours immediately following term PROM and recognizing questions that remain unanswered, obstetrician–gynecologists and other obstetric care providers should inform pregnant women with term PROM who are considering a period of expectant care of the potential risks associated with expectant management and the limitations of available data. For informed women, if concordant with their individual

preferences and if there are no other maternal or fetal reasons to expedite delivery, the choice of expectant management for a period of time may be appropriately offered and supported (15, 16). For women who are GBS positive, however, administration of antibiotics for GBS prophylaxis should not be delayed while awaiting labor. In such cases, many patients and obstetrician–gynecologists or other obstetric care providers may prefer immediate induction.

## **Continuous Support During Labor**

Evidence suggests that, in addition to regular nursing care, continuous one-to-one emotional support provided by support personnel, such as a doula, is associated with improved outcomes for women in labor. Benefits found in randomized trials include shortened labor, decreased need for analgesia, fewer operative deliveries, and fewer reports of dissatisfaction with the experience of labor (1, 17). As summarized in a Cochrane evidence review, a woman who received continuous support was less likely to have a cesarean delivery (RR, 0.78; 95% CI, 0.67–0.91) or a newborn with a low 5-minute Apgar score (fixed-effect, RR, 0.69; 95% CI, 0.50–0.95) (1). Continuous support for a laboring woman that is provided by a non-medical person also has a modest positive effect on shortening the duration of labor (mean difference –0.58 hours; 95% CI, –0.85 to –0.31) and improving the rate of spontaneous vaginal birth (RR, 1.08; 95% CI, 1.04–1.12) (1).

It also may be effective to teach labor-support techniques to a friend or family member. This approach was tested in a randomized trial of 600 nulliparous, low-income, low-risk women, and the treatment resulted in significantly shorter length of labor, greater cervical dilation at the time of epidural anesthesia, and higher Apgar scores at 1 minute and 5 minutes (18). Continuous labor support also may be cost effective given the associated lower cesarean rate. One analysis suggested that paying for such personnel might result in substantial cost savings annually (19). Given these benefits and the absence of demonstrable risk, patients, obstetrician–gynecologists and other obstetric care providers, and health care organizations may want to develop programs and policies to integrate trained support personnel into the intrapartum care environment to provide continuous one-to-one emotional support to women undergoing labor.

## **Routine Amniotomy**

Amniotomy is a common intervention in labor and may be used to facilitate fetal or intrauterine pressure monitoring. Amniotomy also may be used alone or in combination with oxytocin to treat slow labor progress. However, whether elective amniotomy is beneficial for women without a specific indication has been questioned. A Cochrane review of 15 studies found that among women in spontaneous labor, amniotomy alone did not shorten the duration of spontaneous labor (mean difference, –20.43 minutes; 95% CI, –95.93 to 55.06) or

lower the incidence of cesarean births. Likewise, when compared with women who did not undergo amniotomy, those who did were similar in terms of patient satisfaction, frequencies of 5-minute Apgar scores less than 7, umbilical cord prolapse, and abnormal fetal heart rate patterns (20). Another study evaluated the combination of early amniotomy with oxytocin augmentation as a joint intervention for women in spontaneous labor or for women with mild delays in labor progress (21). This meta-analysis of 14 trials found that amniotomy together with oxytocin augmentation is associated with modest reduction in the duration of the first stage of labor (mean difference,  $-1.11$  hours; 95% CI,  $-1.82$  to  $-0.41$ ) and a modest reduction in cesarean birth rates when compared with expectant management (RR, 0.87; 95% CI, 0.77–0.99). Overall, these data suggest that for women with normally progressing labor and no evidence of fetal compromise, routine amniotomy need not be undertaken unless required to facilitate monitoring.

### Intermittent Auscultation

Continuous electronic fetal heart rate monitoring (EFM) was introduced to reduce the incidence of perinatal death and cerebral palsy and as an alternative to the practice of intermittent auscultation. However, the widespread use of continuous EFM has not improved these outcomes when used for women with low-risk pregnancies. *Low risk* in this context has been variously defined, but generally includes women who have no meconium staining, intrapartum bleeding, or abnormal or undetermined fetal test results before birth or at initial admission; no increased risk of developing fetal acidemia during labor (eg, congenital anomalies, intrauterine growth restriction); no maternal condition that may affect fetal well-being (eg, prior cesarean scar, diabetes, hypertensive disease); and no requirement for oxytocin induction or augmentation of labor. A Cochrane review of 13 RCTs included women with varying degrees of a priori risk of fetal acidemia at the onset of labor (22). This meta-analysis found that continuous EFM was associated with an increase in cesarean deliveries (RR, 1.63; 95% CI, 1.29–2.07;  $n=18,861$ , 11 RCTs) and an increase in instrumental vaginal birth rate (RR, 1.15; 95% CI, 1.01–1.33;  $n=18,615$ , 10 RCTs) when compared with intermittent auscultation. However, continuous EFM was associated with a halving of the rate of early neonatal seizures (RR, 0.50; 95% CI, 0.31–0.80,  $n=32,386$ , nine trials, 0.15% for EFM versus 0.29% for intermittent auscultation group), but the authors found no significant difference in the rates of perinatal death or cerebral palsy when compared with intermittent auscultation (22). In the largest RCT conducted, in the group who had early seizures, the rate of neonatal death was similar among those allocated to EFM versus intermittent auscultation; moreover, at 4 years of age, there was no difference in the rate of cerebral palsy (1.8 per 1,000 in the EFM group versus 1.5 per 1,000 in the intermittent auscultation group) (23).

To facilitate the option of intermittent auscultation, obstetrician–gynecologists and other obstetric care providers and facilities should consider adopting protocols and training staff to use a hand-held Doppler device for low-risk women who desire such monitoring during labor (24–30). In considering the relative merits of intermittent auscultation and continuous EFM, patients and obstetrician–gynecologists and other obstetric care providers also should evaluate how the technical requirements of each approach may affect a woman’s experience in labor; intermittent auscultation can facilitate freedom of movement, which some women find more comfortable. The effect on staffing is an additional important consideration. Guidelines, indications, and protocols for intermittent auscultation are available from the American College of Nurse–Midwives (30), the National Institute for Health and Care Excellence (31), and the Association of Women’s Health, Obstetric and Neonatal Nurses (29).

### Techniques for Coping With Labor Pain

Multiple nonpharmacologic and pharmacologic techniques can be used to help women cope with labor pain. These techniques can be used sequentially or in combination. Some nonpharmacologic methods seem to help women cope with labor pain rather than directly mitigating the pain. Conversely, pharmacologic methods mitigate pain, but they may not relieve anxiety or suffering. Data about the relative effectiveness of nonpharmacologic techniques are limited because, until recently, evaluation of labor pain has relied on the use of the numeric pain scale of 1–10, which some have argued is insufficient to assess the complex and multifactorial experience of labor (32). As an alternative, a coping scale has been developed and approved by the Joint Commission. The coping scale asks, “On a scale of 1 to 10, how well are you coping with labor right now” (33)? Use of the coping scale in conjunction with different nonpharmacologic and pharmacologic pain management techniques can help obstetrician–gynecologists and other obstetric care providers tailor interventions to best meet the needs of each woman.

Most women can be offered a variety of nonpharmacologic techniques. None of the nonpharmacologic techniques have been found to adversely affect the woman, the fetus, or the progress of labor, but few have been studied extensively enough to determine clear or relative effectiveness. During the first stage of labor, water immersion consistently has been found to lower pain scores (8, 34). Intradermal sterile water injections, relaxation techniques, acupuncture, and massage have all demonstrated statistically significant reductions in pain in many studies, but methodologies for rating pain and applying these techniques have been varied; therefore, exact techniques that are most effective have not been determined (35, 36). Other techniques, such as childbirth education, transcutaneous electrical nerve stimulation, aromatherapy, or

audioanalgesia, may help women cope with labor more than directly affect pain scores (11, 36). The importance of avoiding pharmacologic analgesia or epidural anesthesia will vary with individual patient values and medical circumstances. In the hospital setting, pharmacologic analgesia should be available for all women in labor who desire medication (37).

### **Hydration and Oral Intake in Labor**

Women in spontaneously progressing labor may not require routine continuous infusion of intravenous fluids. Although safe, intravenous hydration limits freedom of movement and may not be necessary. Oral hydration can be encouraged to meet hydration and caloric needs. Arguments for limiting oral intake during labor center on concerns for aspiration and its sequelae. Current guidance supports oral intake of moderate amounts of clear liquids by women in labor who do not have complications. However, particulate-containing fluids and solid food should be avoided (38, 39). These restrictions have recently been questioned, citing the low incidence of aspiration with current obstetric anesthesia techniques (40). This information may inform ongoing review of recommendations regarding oral intake during labor. Assessment of urinary output and the presence or absence of ketosis can be used to monitor hydration. If such monitoring indicates concern, intravenous fluids can be administered as needed. If intravenous fluids are required, the solution and the infusion rate should be determined by individual clinical need and anticipated duration of labor. Despite historic concerns regarding the use of dextrose-containing solutions and the possibility that these solutions may induce neonatal hypoglycemia, recent RCTs did not find lower umbilical cord pH values or increased rates of neonatal hypoglycemia after continuous administration of 5% dextrose in normal saline (41, 42).

### **Maternal Position During Labor**

Observational studies of maternal position during labor have found that women spontaneously assume many different positions over the course of labor (43). There is little evidence that any one position is best. Moreover, although many have encouraged a supine position during labor, this position has known adverse effects, including supine hypotension and more frequent fetal heart rate decelerations (44, 45). Therefore, for most women, no one position needs to be mandated nor proscribed.

In research studies, it was difficult to isolate the independent effect of position on labor. Women are unlikely to stay in one position during the course of a study and cannot be expected to maintain one position. Nonetheless, a recent meta-analysis that compared upright positioning, ambulation, or both, with recumbent, lateral, or supine positions during the first stage of labor found that upright positions shorten the duration of the first stage of labor by approximately 1 hour

and 22 minutes (mean difference,  $-1.36$ ; 95% CI,  $-2.22$  to  $-0.51$ ), a mean difference that exceeded the effect of amniotomy with oxytocin (mean difference,  $-1.11$  hours). Women in upright positions also were less likely to have a cesarean delivery (RR, 0.71; 95% CI, 0.54–0.94) (43). A second Cochrane meta-analysis of RCTs that examined the effect of position during the second stage of labor found that upright or lateral positions compared with supine positions are associated with fewer “abnormal” fetal heart rate patterns (RR, 0.46; 95% CI, 0.22–0.93), a reduction in episiotomies (RR, 0.79; 95% CI, 0.70–0.90), and a decrease in the incidence of operative vaginal births (RR, 0.78; 95% CI, 0.68–0.90) (46). In this analysis, however, women in upright positions experienced a statistically significant increase in second-degree perineal tears (RR, 1.35; 95% CI, 1.20–1.51) and estimated blood loss greater than 500 mL (RR, 1.65; 95% CI, 1.32–2.60) (46). Frequent position changes during labor to enhance maternal comfort and promote optimal fetal positioning can be supported as long as adopted positions allow appropriate maternal and fetal monitoring and treatments and are not contraindicated by maternal medical or obstetric complications.

### **Second Stage of Labor: Pushing Technique**

Obstetrician–gynecologists and other obstetric care providers in the United States often encourage women in labor to push with a prolonged, closed glottis effort (ie, Valsalva maneuver) during each contraction. However, when not coached to breathe in a specific way, women push with an open glottis (47). A Cochrane review of seven RCTs that compared spontaneous to Valsalva pushing in the second stage of labor found no differences in the duration of the second stage or the rates of operative vaginal delivery, cesarean delivery, episiotomy, perineal lacerations, 5-minute Apgar score less than 7, or neonatal intensive care admissions. The Valsalva technique was associated with a slightly shorter duration of pushing (mean difference,  $-5.2$  min; 95% CI,  $-7.78$  to  $-2.62$ ) (48).

A meta-analysis that included three RCTs of low-risk nulliparous women at 36 weeks or greater of gestation without epidural analgesia found no differences in the rates of operative vaginal delivery, cesarean delivery, episiotomy, or perineal lacerations. However, the study found a somewhat shorter second stage of labor with Valsalva, although confidence intervals were wide (mean difference  $-18.59$  minutes; 95% CI,  $-46$  to  $-36.75$ ) (49). One of these RCTs found an increased frequency of abnormal urodynamics 3 months postpartum in association with Valsalva pushing (50). The long-term clinical significance of this finding is uncertain. However, in consideration of the limited data regarding outcomes of spontaneous versus Valsalva pushing, each woman should be encouraged to use the technique that she prefers and is most effective for her (48, 49).

## Immediate Versus Delayed Pushing for Nulliparous Women With Epidural Analgesia

Offering nulliparous women with epidural analgesia a rest period at 10 centimeters dilatation before pushing is based on the theory that a rest period allows the fetus to passively rotate and descend while conserving the woman's energy for pushing efforts (51). This practice is called delayed pushing, laboring down, or passive descent. The second stage of labor has two phases: 1) the passive descent of the fetus through the maternal pelvis and 2) the active phase of maternal pushing. Studies that suggest an increased risk of adverse maternal and neonatal outcomes with increasing second-stage duration generally do not account for the duration of these passive and active phases (52, 53).

Two recent meta-analyses of RCTs compared maternal and neonatal outcomes in women assigned to immediate versus delayed pushing. Both studies found that delaying pushing for 1–2 hours extended the duration of the second stage by a mean of approximately 1 hour despite, on average, approximately 20 minutes less active maternal pushing efforts (48, 54). Although both reports noted significantly increased spontaneous vaginal delivery rates with delayed pushing, this difference was no longer significant when the analysis was restricted to high-quality RCTs (RR, 1.07; 95% CI, 0.98–1.16) (54). The Cochrane review of 13 RCTs observed no differences in episiotomy, perineal lacerations, 5-minute Apgar scores less than 7, or NICU admissions (48). However, in one study that used an umbilical artery pH of 7.10 as the definition for a low value, a higher frequency of low umbilical arterial cord pH was observed with delayed pushing (55). The clinical significance of the biochemical finding is uncertain, given the heterogeneity of pH thresholds across studies and the lack of other significant differences in adverse neonatal outcomes. A recent large retrospective analysis found that delaying pushing by 60 minutes or more was associated with modest increases in cesarean (adjusted odds ratio [AOR], 1.86; 95% CI, 1.63–2.12) and operative vaginal (AOR, 1.26; 95% CI, 1.14–1.40) delivery, postpartum hemorrhage (AOR, 1.43; 95% CI, 1.05–1.95), and transfusion (AOR, 1.51; 95% CI, 1.04–2.17), but no increase in adverse neonatal outcomes. The study design does not determine causation and did not account for important confounders such as the indications for delayed pushing or fetal station at the onset of the second stage of labor (56). Collectively, these data suggest that in the absence of an indication for expeditious delivery, women (particularly those who are nulliparous with epidural analgesia) may be offered a period of rest of 1–2 hours (unless the woman has an urge to bear down sooner) at the onset of the second stage of labor.

## Conclusion

Many common obstetric practices are of limited or uncertain benefit for low-risk women in spontaneous labor. In addition, some women may seek to reduce medical interventions during labor and delivery. Satisfaction with one's birth experience also is related to personal expectations, support from caregivers, quality of the patient–caregiver relationship, and the patient's involvement in decision making (57). Therefore, obstetrician–gynecologists and other obstetric care providers should be familiar with and consider using low-interventional approaches, when appropriate, for the intrapartum management of low-risk women in spontaneous labor.

## For More Information

The American College of Obstetricians and Gynecologists has identified additional resources on topics related to this document that may be helpful for ob-gyns, other health care providers, and patients. You may view these resources at [www.acog.org/More-Info/LimitInterventionDuringLabor](http://www.acog.org/More-Info/LimitInterventionDuringLabor).

These resources are for information only and are not meant to be comprehensive. Referral to these resources does not imply the American College of Obstetricians and Gynecologists' endorsement of the organization, the organization's website, or the content of the resource. The resources may change without notice.

## References

1. Hodnett ED, Gates S, Hofmeyr GJ, Sakala C. Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews* 2013, Issue 7. Art. No.: CD003766. DOI: 10.1002/14651858.CD003766.pub5. [[PubMed](#)] [[Full Text](#)] ↵
2. Bailit JL, Dierker L, Blanchard MH, Mercer BM. Outcomes of women presenting in active versus latent phase of spontaneous labor. *Obstet Gynecol* 2005;105:77–9. [[PubMed](#)] [[Obstetrics & Gynecology](#)] ↵
3. Neal JL, Lamp JM, Buck JS, Lowe NK, Gillespie SL, Ryan SL. Outcomes of nulliparous women with spontaneous labor onset admitted to hospitals in preactive versus active labor. *J Midwifery Womens Health* 2014;59:28–34. [[PubMed](#)] [[Full Text](#)] ↵
4. Wood AM, Frey HA, Tuuli MG, Caughey AB, Odibo AO, Macones GA, et al. Optimal admission cervical dilation in spontaneously laboring women. *Am J Perinatol* 2016;33:188–94. [[PubMed](#)] [[Full Text](#)] ↵
5. McNiven PS, Williams JL, Hodnett E, Kaufman K, Hannah ME. An early labor assessment program: a randomized, controlled trial. *Birth* 1998;25:5–10. [[PubMed](#)] [[Full Text](#)] ↵
6. Zhang J, Troendle JF, Yancey MK. Reassessing the labor curve in nulliparous women. *Am J Obstet Gynecol* 2002;187:824–8. [[PubMed](#)] ↵
7. Zhang J, Troendle J, Reddy UM, Laughon SK, Branch DW, Burkman R, et al. Contemporary cesarean delivery practice in the United States. *Consortium on Safe Labor*. *Am J Obstet Gynecol* 2010;203:326.e1–10. [[PubMed](#)] [[Full Text](#)] ↵

8. Safe prevention of the primary cesarean delivery. Obstetric Care Consensus No. 1. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2014;123:693–711. [PubMed] [*Obstetrics & Gynecology*] ↵
9. Ruhl C, Scheich B, Onokpise B, Bingham D. Content validity testing of the Maternal Fetal Triage Index. *J Obstet Gynecol Neonatal Nurs* 2015;44:701–9. [PubMed] ↵
10. Hospital-based triage of obstetric patients. Committee Opinion No. 667. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2016;128:e16–9. [PubMed] [*Obstetrics & Gynecology*] ↵
11. Simkin P, Bolding A. Update on nonpharmacologic approaches to relieve labor pain and prevent suffering. *J Midwifery Womens Health* 2004;49:489–504. [PubMed] [Full Text] ↵
12. Immersion in water during labor and delivery. Committee Opinion No. 679. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2016;128:e231–6. ↵
13. Grant JM, Serle E, Mahmood T, Sarmandal P, Conway DI. Management of prelabour rupture of the membranes in term primigravidae: report of a randomized prospective trial. *Br J Obstet Gynaecol* 1992;99:557–62. [PubMed] ↵
14. Conway DI, Prendiville WJ, Morris A, Speller DC, Stirrat GM. Management of spontaneous rupture of the membranes in the absence of labor in primigravid women at term. *Am J Obstet Gynecol* 1984;150:947–51. [PubMed] ↵
15. Dare MR, Middleton P, Crowther CA, Flenady V, Varatharaju B. Planned early birth versus expectant management (waiting) for prelabour rupture of membranes at term (37 weeks or more). *Cochrane Database of Systematic Reviews* 2006, Issue 1. Art. No.: CD005302. DOI: 10.1002/14651858.CD005302.pub2. [PubMed] [Full Text] ↵
16. Hannah ME, Ohlsson A, Farine D, Hewson SA, Hodnett ED, Myhr TL, et al. Induction of labor compared with expectant management for prelabour rupture of the membranes at term. TERMPROM Study Group. *N Engl J Med* 1996;334:1005–10. [PubMed] [Full Text] ↵
17. Kennell J, Klaus M, McGrath S, Robertson S, Hinkley C. Continuous emotional support during labor in a US hospital. A randomized controlled trial. *JAMA* 1991;265:2197–201. [PubMed] ↵
18. Campbell DA, Lake MF, Falk M, Backstrand JR. A randomized control trial of continuous support in labor by a lay doula. *J Obstet Gynecol Neonatal Nurs* 2006;35:456–64. [PubMed] ↵
19. Kozhimannil KB, Hardeman RR, Attanasio LB, Blauer-Peterson C, O'Brien M. Doula care, birth outcomes, and costs among Medicaid beneficiaries. *Am J Public Health* 2013;103:e113–21. [PubMed] [Full Text] ↵
20. Smyth RM, Markham C, Dowswell T. Amniotomy for shortening spontaneous labour. *Cochrane Database of Systematic Reviews* 2013, Issue 6. Art. No.: CD006167. DOI: 10.1002/14651858.CD006167.pub4. [PubMed] [Full Text] ↵
21. Wei S, Wo BL, Qi HP, Xu H, Luo ZC, Roy C, et al. Early amniotomy and early oxytocin for prevention of, or therapy for, delay in first stage spontaneous labour compared with routine care. *Cochrane Database of Systematic Reviews* 2013, Issue 8. Art. No.: CD006794. DOI: 10.1002/14651858.CD006794.pub4. [PubMed] [Full Text] ↵
22. Alfirevic Z, Devane D, Gyte GM. Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour. *Cochrane Database of Systematic Reviews* 2013, Issue 5. Art. No.: CD006066. DOI: 10.1002/14651858.CD006066.pub2. [PubMed] [Full Text] ↵
23. Grant A, O'Brien N, Joy MT, Hennessy E, MacDonald D. Cerebral palsy among children born during the Dublin randomised trial of intrapartum monitoring. *Lancet* 1989; 2:1233–6. [PubMed] ↵
24. Ayres-de-Campos D, Arulkumaran S. FIGO consensus guidelines on intrapartum fetal monitoring: introduction. FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. *Int J Gynaecol Obstet* 2015;131:3–4. [PubMed] [Full Text] ↵
25. Ayres-de-Campos D, Arulkumaran S. FIGO consensus guidelines on intrapartum fetal monitoring: physiology of fetal oxygenation and the main goals of intrapartum fetal monitoring. FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. *Int J Gynaecol Obstet* 2015;131:5–8. [PubMed] [Full Text] ↵
26. Ayres-de-Campos D, Spong CY, Chandrachan E. FIGO consensus guidelines on intrapartum fetal monitoring: cardiotocography. FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. *Int J Gynaecol Obstet* 2015;131:13–24. [PubMed] [Full Text] ↵
27. Lewis D, Downe S. FIGO consensus guidelines on intrapartum fetal monitoring: intermittent auscultation. FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. *Int J Gynaecol Obstet* 2015;131:9–12. [PubMed] [Full Text] ↵
28. Visser GH, Ayres-de-Campos D. FIGO consensus guidelines on intrapartum fetal monitoring: adjunctive technologies. FIGO Intrapartum Fetal Monitoring Expert Consensus Panel. *Int J Gynaecol Obstet* 2015;131:25–9. [PubMed] [Full Text] ↵
29. Association of Women's Health, Obstetric and Neonatal Nurses. *Fetal heart monitoring: principles and practices*. 5th ed. Washington, DC: AWHONN; 2015. ↵
30. Intermittent auscultation for intrapartum fetal heart rate surveillance. American College of Nurse-Midwives [published erratum appears in *J Midwifery Womens Health* 2016;61:134]. *J Midwifery Womens Health* 2015;60: 626–32. [PubMed] [Full Text] ↵
31. National Institute for Health and Care Excellence. *Intrapartum care for healthy women and babies*. Clinical Guideline 190. London: NICE; 2014. Available at: <https://www.nice.org.uk/guidance/cg190>. Retrieved October 24, 2016. ↵
32. Lowe NK. Context and process of informed consent for pharmacologic strategies in labor pain care. *J Midwifery Womens Health* 2004;49:250–9. [PubMed] [Full Text] ↵
33. Roberts L, Gulliver B, Fisher J, Cloyes KG. The coping with labor algorithm: an alternate pain assessment tool for the laboring woman. *J Midwifery Womens Health* 2010;55:107–16. [PubMed] [Full Text] ↵
34. Cluett ER, Burns E. Immersion in water in labour and birth. *Cochrane Database of Systematic Reviews* 2009, Issue 2.

- Art. No.: CD000111. DOI: 10.1002/14651858.CD000111.pub3. [↔](#)
35. Derry S, Straube S, Moore RA, Hancock H, Collins SL. Intracutaneous or subcutaneous sterile water injection compared with blinded controls for pain management in labour. *Cochrane Database of Systematic Reviews* 2012, Issue 1. Art. No.: CD009107. DOI: 10.1002/14651858.CD009107.pub2. [[PubMed](#)] [[Full Text](#)] [↔](#)
  36. Jones L, Otham M, Dowswell T, Alfrevic Z, Gates S, Newburn M, et al. Pain management for women in labour: an overview of systematic reviews. *Cochrane Database of Systematic Reviews* 2012, Issue 3. Art. No.: CD009234. [[PubMed](#)] [[Full Text](#)] [↔](#)
  37. Levels of maternal care. *Obstetric Care Consensus No. 2*. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2015;125:502–15. [[PubMed](#)] [[Obstetrics & Gynecology](#)] [↔](#)
  38. Oral intake during labor. ACOG Committee Opinion No. 441. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2009;114:714. [[PubMed](#)] [↔](#)
  39. Practice guidelines for obstetric anesthesia: an updated report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and the Society for Obstetric Anesthesia and Perinatology. *Anesthesiology* 2016;124:270–300. [[PubMed](#)] [↔](#)
  40. Sperling JD, Dahlke JD, Sibai BM. Restriction of oral intake during labor: whither are we bound? *Am J Obstet Gynecol* 2016;214:592–6. [[PubMed](#)] [↔](#)
  41. Sharma C, Kalra J, Bagga R, Kumar P. A randomized controlled trial comparing parenteral normal saline with and without 5% dextrose on the course of labor in nulliparous women. *Arch Gynecol Obstet* 2012;286:1425–30. [[PubMed](#)] [↔](#)
  42. Shrivastava VK, Garite TJ, Jenkins SM, Saul L, Rumney P, Preslicka C, et al. A randomized, double-blinded, controlled trial comparing parenteral normal saline with and without dextrose on the course of labor in nulliparas. *Am J Obstet Gynecol* 2009;200:379.e1–6. [[PubMed](#)] [↔](#)
  43. Lawrence A, Lewis L, Hofmeyr GJ, Styles C. Maternal positions and mobility during first stage labour. *Cochrane Database of Systematic Reviews* 2013, Issue 10. Art. No.: CD003934. DOI: 10.1002/14651858.CD003934.pub4. [[PubMed](#)] [[Full Text](#)] [↔](#)
  44. Carbonne B, Benachi A, Leveque ML, Cabrol D, Papiernik E. Maternal position during labor: effects on fetal oxygen saturation measured by pulse oximetry. *Obstet Gynecol* 1996;88:797–800. [[PubMed](#)] [↔](#)
  45. Abitbol MM. Supine position in labor and associated fetal heart rate changes. *Obstet Gynecol* 1985;65:481–6. [[PubMed](#)] [↔](#)
  46. Gupta JK, Hofmeyr GJ, Shehmar M. Position in the second stage of labour for women without epidural anaesthesia. *Cochrane Database of Systematic Reviews* 2012, Issue 5. Art. No.: CD002006. DOI: 10.1002/14651858.CD002006.pub3. [↔](#)
  47. Rossi MA, Lindell SG. Maternal positions and pushing techniques in a nonprescriptive environment. *J Obstet Gynecol Neonatal Nurs* 1986;15:203–8. [[PubMed](#)] [↔](#)
  48. Lemos A, Amorim MM, Dornelas de Andrade A, de Souza AI, Cabral Filho JE, Correia JB. Pushing/bearing down methods for the second stage of labour. *Cochrane Database of Systematic Reviews* 2015, Issue 10. Art. No.: CD009124. DOI: 10.1002/14651858.CD009124.pub2. [[PubMed](#)] [[Full Text](#)] [↔](#)
  49. Prins M, Boxem J, Lucas C, Hutton E. Effect of spontaneous pushing versus Valsalva pushing in the second stage of labour on mother and fetus: a systematic review of randomised trials. *BJOG* 2011;118:662–70. [[PubMed](#)] [[Full Text](#)] [↔](#)
  50. Schaffer JI, Bloom SL, Casey BM, McIntire DD, Nihira MA, Leveno KJ. A randomized trial of the effects of coached vs uncoached maternal pushing during the second stage of labor on postpartum pelvic floor structure and function. *Am J Obstet Gynecol* 2005;192:1692–6. [[PubMed](#)] [↔](#)
  51. Brancato RM, Church S, Stone PW. A meta-analysis of passive descent versus immediate pushing in nulliparous women with epidural analgesia in the second stage of labor. *J Obstet Gynecol Neonatal Nurs* 2008;37:4–12. [[PubMed](#)] [↔](#)
  52. Rouse DJ, Weiner SJ, Bloom SL, Varner MW, Spong CY, Ramin SM, et al. Second-stage labor duration in nulliparous women: relationship to maternal and perinatal outcomes. Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. *Am J Obstet Gynecol* 2009;201:357.e1–7. [[PubMed](#)] [[Full Text](#)] [↔](#)
  53. Allen VM, Baskett TF, O’Connell CM, McKeen D, Allen AC. Maternal and perinatal outcomes with increasing duration of the second stage of labor. *Obstet Gynecol* 2009;113:1248–58. [[PubMed](#)] [[Obstetrics & Gynecology](#)] [↔](#)
  54. Tuuli MG, Frey HA, Odibo AO, Macones GA, Cahill AG. Immediate compared with delayed pushing in the second stage of labor: a systematic review and meta-analysis. *Obstet Gynecol* 2012;120:660–8. [[PubMed](#)] [[Obstetrics & Gynecology](#)] [↔](#)
  55. Fraser WD, Marcoux S, Krauss I, Douglas J, Goulet C, Boulvain M. Multicenter, randomized, controlled trial of delayed pushing for nulliparous women in the second stage of labor with continuous epidural analgesia. The PEOPLE (Pushing Early or Pushing Late with Epidural) Study Group. *Am J Obstet Gynecol* 2000;182:1165–72. [[PubMed](#)] [↔](#)
  56. Yee LM, Sandoval G, Bailit J, Reddy UM, Wapner RJ, Varner MW, et al. Maternal and neonatal outcomes with early compared with delayed pushing among nulliparous women. Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network. *Obstet Gynecol* 2016;128:1039–47. [[PubMed](#)] [[Obstetrics & Gynecology](#)] [↔](#)
  57. Hodnett ED. Pain and women’s satisfaction with the experience of childbirth: a systematic review. *Am J Obstet Gynecol* 2002;186:S160–72. [[PubMed](#)] [↔](#)



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