

US Midwives' Knowledge and Use of Sterile Water Injections for Labor Pain

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The purpose of this research study was to identify and describe US midwives' knowledge and use of sterile water injections to relieve pain during labor. Research studies have shown that injections of sterile water to relieve low back pain during labor are effective with good maternal satisfaction. However, no knowledge is available about their use by midwives in the United States. Questionnaires were mailed to a random sample (N = 450) of midwives who were members of the American College of Nurse-Midwives (ACNM). One hundred thirty-two respondents (29%) returned the questionnaire. One-fourth (26%) of the midwives use sterile water injections, although infrequently. More than half of the midwives use the intracutaneous injection technique, and most use a total of four injections. Most midwives give the injections between contractions, with the assistance of another person, and report very good pain relief. Of those not using sterile water injections, most had no experience or training in use of the method and were interested in learning more about their use. While sterile water injections are a good treatment for back pain during labor, there is a lack of knowledge among midwives about this method of pain relief during labor and an interest in knowing more. *J Midwifery Womens Health* 2008; 53:115–122 © 2008 by the American College of Nurse-Midwives.

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INTRODUCTION

For most of the approximately 4 million women who give birth annually in the United States, labor pain is an issue of concern. The intermittent uterine contractions needed to expel the fetus from the uterine cavity dilate the cervix, causing pain that can radiate to the lower abdomen and/or the lower back (sacral area). Approximately 25% of laboring women experience back pain. For women who want to labor without an epidural, the back pain can be severe enough to undermine their intentions. Sterile water injection can offer significant relief from back pain in labor without concerns that the method might harm the mother and/or the fetus or slow the labor pattern.¹ The Gate Control Theory is proposed as the most plausible mechanism of action.² Despite these benefits, there is no information available regarding US midwives' use of sterile water injections during labor. The aim of this study was to identify and describe US midwives' knowledge and use of sterile water injections for pain relief during labor.

BACKGROUND

Methods to lessen labor pain are a major concern for the mother and her caregivers. Different sensory stimulation methods can be good alternatives for pain relief in labor. Examples of these techniques include massage, counter-

pressure, heat, acupuncture, and sterile water injections. Sterile water injections are subcutaneous or intracutaneous injections of a small amount of sterile water administered in the lumbar-sacral region of the back³ (Table 1, Figure 1, and Appendix A). By introducing small amounts of sterile water into the intradermal layer of skin, a hyperstimulation of the large inhibitory nerve fibers occurs.¹ There is a sharp, transitory stinging sensation within the first seconds of application, which is more pronounced when the injections are given intracutaneously.⁴ The onset of pain relief is fast—usually within a few minutes—and can last 1 to 2 hours. The treatment can be repeated several times.¹

The technique for sterile water injections is very old. It was first mentioned in the literature by Halsted⁵ in 1885 when he wrote, "The skin can be completely anesthetized to any extent by cutaneous injections of water." In 1904, Anon⁶ stated that sterile water could be used as a local anesthetic during minor surgery. The method was considered difficult because of the discomfort from administration, but could nevertheless constitute a good alternative for those patients with hypersensitivity to the drugs used with general anesthesia. Sterile water injections have been used for treatment for pain other than labor pain with positive outcomes, including acute attack of urolithiasis⁷ and neck and shoulder pain after whiplash injury.^{8,9} However, the majority of the recent literature about sterile water injections addresses lower back pain during labor.

Several studies have consistently shown that sterile water injections provide good pain relief during labor, particularly for low back pain^{3,10–18} (Table 1). The trials

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are quite similar to each other regarding aims, designs, instruments, and results. The only negative side effect is the burning or stinging pain the woman experiences in connection with administration. Some studies indicate that the burning sensation can be reduced if the injections are given subcutaneously⁴ without losing the pain-reducing effect.^{11,15} In three systematic reviews, the authors concluded that sterile water injections were more effective for labor pain than acupuncture and other complementary methods, such as acupressure, hypnosis, and massage.^{19–21}

The nature of labor pain is a complex process. The pain experience of childbirth is extremely individual, and it also changes throughout the labor process.²² Pain is considered to have at least three dimensions: sensory, affective, and cognitive components.^{23,24} The sensory component passes signals from different stimuli all over the body to the brain in an attempt to give information about the intensity, quality, and location of pain.²⁵ The affective component is associated with pleasant or unpleasant emotions.^{26,27} For labor, fear and anxiety are important emotions that can enhance pain.^{28–31} The cognitive component is associated with knowledge about mood, behavior, and thought patterns.³² Knowledge about all these components helps in understanding an individual's response to pain.³³

The mechanisms of action for sterile water injections are not fully clear, but the Gate Control Theory is one logical explanation. This theory was formulated by Melzack and Wall in 1965.² It describes pain as a function of the balance between the information traveling into the spinal cord through large nerve fibers and information traveling into the spinal cord through small nerve fibers. If the relative amount of activity is greater in small nerve fibers, then there will be pain. However, if there is more activity in the large nerve fibers, there should be little or no pain as these fibers cause the pain "gate" to close to other stimuli. For example, when the skin in the lumbar area is stimulated with sterile water injections, a cutting type of pain will be generated, thus creating a block to the slower signals from the uterine contractions. This knowledge is useful to practitioners assisting women in labor, because many techniques for labor support depend on the distraction from pain caused by the stimulation of competing nerve fibers. Methods such as massage, counter-pressure, acupuncture, and heat may have a mechanism of action similar to sterile water injections.

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METHODS

This descriptive study used a mail survey to collect self-reported information. The survey was adapted from a similar instrument prepared by the first author (L.M.) and used in Sweden.³⁴ The original survey included questions concerning acupuncture that were deleted from the questionnaire for this study. The questionnaire contained a total of 20 questions. Demographic information was collected for descriptive purposes. Four yes/no questions asked about the provider's knowledge, usage, and overall interest in sterile water injections. Eleven multiple-choice questions focused on clinical practice experiences with sterile water injections. Five questions were short answers regarding comfort level and experiences with the administration of sterile water injections and other pain relief choices used during labor. The short answer questions had space for participants to write in comments. Respondents who did not use sterile water injections were instructed to stop answering questions at a designated point. A group of 10 midwife colleagues reviewed the questionnaire for face validity, clarity, and ease of completion. After receiving the feedback, simple modifications were made and all questions were retained.

Approval for the study was obtained from the Institutional Review Board at the University of Rhode Island and from the American College of Nurse-Midwives (ACNM) Division of Research. A simple computer-randomized sample of 450 members was selected from the 4600 active members of the ACNM in January 2005. No student or associate members were included in the sample. Questionnaires were mailed to potential participants with a cover letter that informed the participants about the background of the study, that approval had been obtained from the institutional review board and the ACNM Division of Research, that their participation was voluntary, and that returning the questionnaire was evidence of their consent. To ensure confidentiality, the respondents were not asked to provide their names or practice sites. An identifying number was added to each returned survey for tracking and data entry purposes. ACNM members who returned the questionnaire before the deadline constituted the sample for this study.

Data were analyzed using univariate statistics computed in SPSS 10.0 (SPSS Inc., Chicago, IL). Descriptive statistics were calculated for all variables, including mean, median, standard deviation, range, and percentages as appropriate. Individual questions had varied response rates, so percentages were calculated using only the actual number of respondents for a particular question.

RESULTS

Questionnaires were returned by 132 (29%) of the 450 surveyed members. Demographic data are shown in Table 2. The majority of respondents worked full time,

Table 1. Summary of Studies of Sterile Water Injections as Relief for Labor Pain

Study (Year)	Objective	Inclusion Criteria	Design	Instrument	Results
Bahasadri et al. (2006) ¹⁰	To evaluate the efficacy of SC sterile water injection in reduction of labor pain compared with placebo	First stage of labor; planned normal vaginal delivery	RCT, <i>Intervention group</i> (n = 50) 1 × 0.5 mL sterile water injection SC; <i>Control group</i> (n = 50) 1 × 0.5 mL saline SC	Face rating scale	The median pain score in the sterile water group was significantly lower than the placebo group at 10 min, as well as 45 min, after the injection
Wiruchpongsanon (2006) ¹⁷	To study the effectiveness of IC injection of sterile water in relieving low back pain during labor in Thai women	Pregnant women (wks 37–42); active first stage of labor; low back pain	RCT, <i>Treatment group</i> (n = 25) 4 × 0.1 mL sterile water IC; <i>Placebo group</i> (n = 25) 0.1 mL saline IC	VAS	Mean pain reduction was significantly greater in the treatment group compared to the placebo group at 30 min, 1 and 2 hours after injection ($P < .001$)
Mårtensson et al. (2000) ³	To investigate whether, during injections of sterile water, there is any difference in perceived pain between IC and SC injections	Women aged 18–45 years; not pregnant; no pain conditions experienced during the trial	RCT, Cross-over design: <i>group 1</i> (n = 50); <i>group 2</i> (n = 50); all women were given both IC and SC injections in randomized order	VAS	IC injections of sterile water showed to be significantly more painful than SC injections even when trial, day and injection location were taken into consideration ($P < .001$)
Mårtensson and Wallin (1999) ¹⁴	To evaluate relief of pain in labor with SC and intracutaneous injections of sterile water vs placebo	Pregnant women (wks 37–42); first stage of labor; severe lower back pain	RCT, <i>Treatment group 1</i> (n = 33) 4 × 0.1 mL sterile water IC; <i>Treatment group 2</i> (n = 33) 4 × 0.5 mL sterile water SC; <i>Placebo group</i> (n = 33) 4 × 0.1 mL saline SC	VAS	The pain reduction was significantly greater in both treatment groups compared to placebo at 10 and 45 min after treatment
Labrecque et al. (1999) ¹²	To compare sterile water injections and TENS for low back pain during labor	Pregnancy (wk > 36); low-risk; active first stage of labor; low back pain	RCT, <i>Group 1</i> (n = 11) 4 × 0.1 mL sterile water IC; <i>Group 2</i> (n = 12) TENS; <i>Group 3</i> (n = 12) standard care (bath, massage, mobilization)	VAS	Sterile water injections are more effective than standard care and TENS for low back pain
Dahl and Aarnes (1991) ¹¹	To reevaluate the method and factors possibly influencing its efficacy	Healthy women; pregnant (wks 38–42); single gestation	<i>Group 1</i> (n = 101) 2–4 injections of sterile water IC; <i>group 2</i> (n = 50) dry needle injections; <i>group 3</i> control group (n = 117) conventional treatment; lumbosacral and/or suprapubic injections used	VAS ungraded 0 = no pain, 10 = unbearable pain	Sterile water papules provided better relief for labor pain in the IC group compared with the dry needle group; early treatment yielded best effect
Trolle et al. (1991) ¹⁵	Evaluate the analgesic effect of intradermal sterile water block for back pain during labor	Active labor; back pain	RCT, <i>Study group</i> (n = 141) 4 × 0.1 mL sterile water IC; <i>Control group</i> (n = 131) 4 × 0.1 mL NaCl IC; lumbosacral injections were given	VAS ungraded 0 = no pain, 10 = unbearable pain	Significantly greater reduction of VAS score in the sterile water group compared with the NaCl group, up to 90 min after treatment

(Continued)

Table 1 (Cont'd). Summary of Studies of Sterile Water Injections as Relief for Labor Pain

Study (Year)	Objective	Inclusion Criteria	Design	Instrument	Results
Ader et al. (1990) ⁹	Investigate the efficacy of sterile water papules for back pain during labor	Pregnant (wk \geq 37); first stage of labor; back pain; pain relief required	RCT, <i>Study group</i> (n = 24) 4 \times 0.1 mL sterile water IC; <i>control group</i> (n = 21) 4 \times 0.1 mL NaCl SC; lumbosacral injections were given	VAS ungraded 0 = no pain, 10 = unbearable pain	Significantly increased reduction of VAS score in the sterile water group compared with the NaCl group; analgesic effect up to 90 min
Lytzen et al. (1989) ¹³	Evaluate if sterile water papules can be an alternative for alleviating back pain	Established labor	<i>Study group</i> (n = 83) 4 \times 0.1 mL sterile water IC; lumbosacral injection were given	VAS; ungraded 0 = no pain, 10 = unbearable pain	VAS score reduced significantly 3 hours after injection compared with just before administration
Trolle et al. (1986) ¹⁶	Evaluate if back pain during labor can be treated with IC sterile water papules	Primipara; pregnancy (wk \geq 37); cervix dilatation \leq 4 cm	RCT, <i>Study group</i> (n = 38) 4 \times 0.1 mL sterile water IC; <i>Control group</i> (n = 38) no treatment; lumbosacral injections were given	VAS ungraded 0 = no pain, 10 = unbearable pain	The treatment group experienced significantly better pain relief compared with the control group, up to 60 min after treatment

IC = intracutaneous; ID = intradermal; NaCl = sodium chloride; RCT = randomized controlled trial; SC = subcutaneous; TENS = transcutaneous electrical nerve stimulation; VAS = visual analog scale.

and 95% were actively attending births. Participants had worked as midwives for an average of 14 years.

The midwives were presented with a list of common pain relief measures used during labor and were asked to estimate the percentage of clients with which they used each method. Table 3 shows the participants' estimated

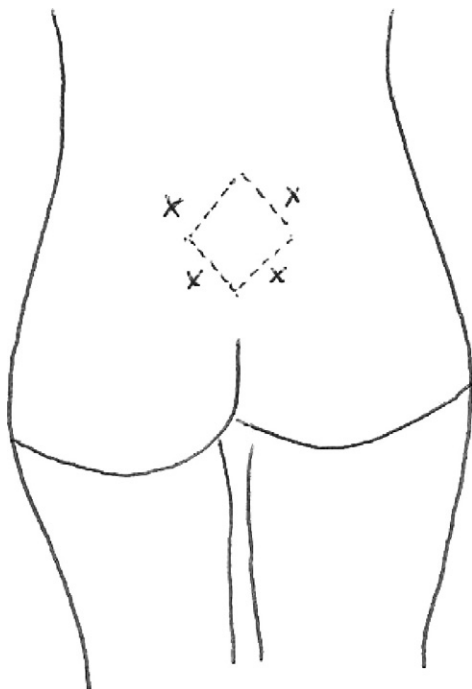


Figure 1. Diagram of suggested sites for sterile water injections if one is not using maternal pain points. (Reprinted with permission from Mårtensson, 2006.³)

use of specific pain relief techniques and frequency of use. For instance, almost all of the midwives (98%) reported that they cared for women who needed no pain relief approximately 24% of the time. The most commonly used pharmacologic pain relief methods reported by the midwives were intramuscular or intravenous analgesia and traditional epidural analgesia. Thirty-four (32%) midwives reported that they used sterile water injections, and they estimated use of sterile water injections by 1.5% of women. Of the 15 midwives attending births at a birth center, eight (53%) reported using sterile water injections. Two out of the three midwives attending home births stated they incorporated sterile water injections into their practice. Of the midwives who were

Table 2. Demographic Data for the Study Participants (N = 132)

Demographic Characteristic	n (%) [*]
Years of age, mean (\pm SD)	49 (8)
Years of experience mean (\pm SD)	14 (9)
Number of births attended per year mean (\pm SD)	88 (8)
Practice setting for births [†]	
Hospital	107 (95)
Birth center	13 (10)
Home birth	3 (3)
Work Status	
Working full-time	93 (70)
Working part-time	20 (15)
Retired	7 (5)
Not attending births	12 (9)

SD = standard deviation.

^{*}Data reported as n (%) unless otherwise noted.

[†]Some midwives reported that they practice in more than one setting.

Table 3. Number of Participants Reporting Different Kinds of Pain Relief Methods for Labor Pain and the Estimated Frequency of Use in Clinical Practice (N = 107)

Methods	Number of Midwives Reporting Use n (%)	Mean (Range)	± SD
IM or IV analgesia	102 (95)	27 (0–98)	20
Traditional epidural analgesia	82 (77)	38 (0–95)	27
Sterile water injections	34 (32)	1.5 (0–30)	4
“Walking” epidural analgesia	28 (26)	10 (0–80)	22
Other	26 (24)	8 (10–90)	22
Hydrotherapy	20 (19)	38 (10–90)	22
Acupressure	19 (18)	2.6 (0–15)	8
Acupuncture	4 (0.04)	0.3 (0–15)	1.8
Paracervical nerve block	1 (0.01)	0.2 (0–10)	1.2

IM = intramuscular; IV = intravenous; SD = standard deviation.

not using sterile water injections, 58 (80%) were interested in learning more about their use.

Among the 107 midwives actively attending births, 24 (22%) reported informing women about sterile water injections during prenatal care. The majority of the midwives (58%) estimated that none of the women they care for know about sterile water injections. However, 38% of the midwives estimated that up to one-fourth of women they care for know about sterile water injections, and five (4%) midwives estimated that more than one-fourth of their clients know about sterile water injections.

Table 4 shows the reasons why some respondents do not use sterile water injections. The midwives’ most frequent response (81%) was that they had no experience or training using sterile water injections. A few midwives reported resistance in the practice setting to the idea of sterile water injections. One commented that the anesthesia department prohibited the use of sterile water injections on the intrapartum floor because their opinions were that there is no evidence about their effectiveness or safety. Some midwives stated that other non-pharmacologic techniques were working and that they did not need to try sterile water injections. Other explanations were as follows:

I have used them in the past . . . in [the] present setting there is no demand or expectation for “alternative” treatments.

The pain of administration is too great if it doesn’t work.

Most of our current population wants epidurals.

Not comfortable . . . have never seen it . . . am afraid it would be seen as using a placebo.

Never even heard of this!

The second part of the questionnaire was completed only by those midwives using sterile water injections (n = 34) in clinical practice and included questions about frequency of use, indications, techniques for administration, and choices for methods to offer pain relief. Sixteen midwives answered that they perform sterile water injections intracutaneously, 12 reported using the subcutaneous technique, and six did not respond. The majority of the midwives use between 0.1 and 1.0 mL of sterile water for each injection. Twenty-seven of the midwives used four injections total, four used two injections, and three did not respond. The injections were given between the contractions by 25 midwives and during a contraction by nine midwives. Eleven midwives stated they administered the injections alone some of the time, while 23 administer the injections simultaneously with another person. A registered nurse was the most common assistant when administering bilateral sterile water injections simultaneously.

The midwives were asked what type of labor pain they treat with sterile water injections. Four choices were offered: back pain, abdominal pain, groin pain, and other pain. They could select more than one alternative. All but two midwives stated that they use sterile water injections for back pain; the two remaining midwives used sterile water injections for abdominal pain and other pain. When asked what other methods they used for back pain, 13 of the 34 midwives chose other treatments such as hydrotherapy, massage, and epidural. The midwives reported the quality of relief obtained when using sterile water injections for treating back pain ranged from very good pain relief (70%) to moderate pain relief (18%) to no pain relief (12%).

DISCUSSION

The most interesting result from this survey was that 32% of the respondents use sterile water injections for labor pain. More midwives chose sterile water injections than any other method for managing back pain in labor. More than 75% of the midwives reported very good to moderate pain relief when they used sterile water injections. These data reinforce the literature review which

Table 4. Reasons Stated for Not Using Sterile Water Injections Technique for Pain Relief (N = 143)*

Reasons	n (%)
No experience using sterile water injections	60 (46)
No training using sterile water injections	46 (35)
Resistance to use or not allowed in setting	17 (13)
Do not feel comfortable using them	10 (8)
Other	7 (5)
Do not like them	2 (2)
Nurses not allowed to help	1 (1)

Some participants gave more than one answer.

*Seventy-three participants did not use sterile water injections.

indicates that sterile water injections are an effective pain relief option in labor.^{3,10-18}

The demographic profile of the respondents was similar to ACNM membership in age and years of experience. The distribution of birth settings in the sample was the same as ACNM members for hospital births, but there were slightly more respondents (9%) practicing in birth centers than among the general membership (6%).³⁵ A higher percentage of midwives working in birth centers used sterile water injections than midwives practicing in hospitals, although their numbers were too small in this sample for meaningful comparisons. ACNM is not able to retrieve the names of midwives by practice activity or sites, so participants could not be selected for site of practice.

Of the midwives who use sterile water injections, 57% of them stated that they use the intracutaneous technique; 43% use the subcutaneous technique. In a similar survey conducted in Sweden, it was found that 88.1% of the midwives use the intracutaneous technique, 9.8% use the subcutaneous technique, and 2.1% use both injection techniques.³⁴ Earlier studies have shown that the subcutaneous injections also provide effective pain relief for low back pain during labor^{11,15} with less pain during administration.⁴ The fact that so many midwives prefer the more painful injection technique may indicate that they are unfamiliar with the literature showing that the less painful subcutaneous injections also are effective. There is no evidence in the literature that more injection pain gives more pain relief.

The amount of sterile water used for injections by the midwives varied. Most guidelines recommend making a wheal on the patient's skin that resembles a purified protein derivative injection for tuberculosis skin test. One midwife stated that she gets longer relief from a larger wheal, although this variation has never been studied.

The majority of the midwives used the recommended four injections, and 75% of the midwives used assistance to administer the injections simultaneously. Midwives who administer the injections alone may do so because of a personal preference or possibly a staffing issue. There was no agreement on whether to administer the injections between contractions or during a contraction. A few of the participants found this issue unimportant. Mårtensson¹ recommends simultaneous injections in an attempt to give all injections during one contraction. The idea is that a woman would have less pain from the administration of the injections during a contraction because of the relative high level of pain from the uterine contraction. However, there is no available research on this issue to date.

The results of the survey suggest that there is a lack of knowledge among American midwives about sterile water injections as a pain relief option during labor. One-half of the midwives attending births were not aware of sterile water injections as an option. The most frequent reason for nonuse of sterile water injections was

that the midwives had no training or no experience using sterile water injections. The majority of the midwives who stated that they were unaware of sterile water injections as a pain relief method during labor requested to receive information about sterile water injections. These results validate the need for more education regarding sterile water injections as a pain relief option during labor.

Several misconceptions about sterile water injections were evident in the midwives' comments, especially in relation to their conception of efficiency of pain relief. More than one respondent stated that they would not want to inflict the discomfort of the "bee sting" administration if the technique did not work. This negative side effect could be decreased if the injections are administered subcutaneously.⁴ Another stated that she would feel as if she was offering her patient a placebo if she used sterile water injections. These misconceptions may be a result of unfamiliarity with the mechanisms of action and the literature (Table 1) on the efficacy of sterile water injections compared to placebo.^{10-12,15,16,18} Mårtensson and Wallin¹⁵ found that women injected with sterile water versus normal saline were more likely to repeat both intracutaneous and subcutaneous injections, most likely because they got better relief because of the effectiveness of the sterile water injections in comparison to a placebo.

A woman's knowledge about pain relieving options or techniques influences the choices she makes with her midwife and affects how her midwife practices. Sterile water injections may not be something that women discuss frequently when talking about their labor experiences or even in childbirth classes. The general public does not have access to this knowledge as readily as providers do. Because of the safety of administration and cost effectiveness, sterile water injections will not be seen as a controversial topic on the evening news. Interestingly, 42% of the midwives estimated that the women they care for were aware of sterile water injection as an option for pain control during labor. This does not mean that these women had accurate knowledge of the physiologic processes that make sterile water injections an efficient provider of pain control. For women who desire to use nonpharmacologic pain relief methods during childbirth, information packets with a concise explanation of these methods and their mechanisms of actions could be a helpful option. The more aware the woman is of the birthing process, including the science behind the pain relieving techniques, the more confident she can be about making informed choices.

An unanticipated finding in this survey was the wide use of hydrotherapy and the rate of epidural use. Interestingly, when the midwives were asked about what techniques they use to manage pain during labor, the estimated percentages of women using traditional epidurals and hydrotherapy were similar.

The survey had several limitations. The sample was limited to active members of the ACNM in 2005 and did not include certified midwives and certified nurse-midwives who were non-ACNM members. The 29% response rate was significantly less than anticipated. Two factors that may have contributed to the low response rate were that reminder cards were not sent out to nonresponders because of time and cost factors, and the time to return the questionnaire was brief. Allowing more time for responses to be returned and sending reminder cards may have increased the questionnaire's rate of return. Another limitation is the potential for bias because of the possibility that midwives who use sterile water injections are more likely to return a questionnaire about this pain relief method than are midwives who do not use it. However, this survey is the first to describe US midwives' knowledge and use of sterile water injections at present and to assess the need for more knowledge about sterile water injections to be disseminated.

CONCLUSION

Earlier research has shown that sterile water injections are a safe and effective treatment for low back pain during labor. The results of this study show that sterile water injections are used occasionally as an alternative pain relief method by US midwives and that those who do not use them would like more information. The results also show that there is a lack of knowledge among midwives about how to use the method and the mechanisms of action. There is a need to disseminate more information and increase knowledge about this method not only among midwives in clinical practice, but also among pregnant women and their partners.

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Appendix A. Sample Procedural Guidelines for Sterile Water Injections

Purpose: To relieve lower back pain during labor

Contraindication: Patient declines procedure

Procedure:

1. Obtain order from midwife or physician.
2. Explain procedure to the woman using the diagram to describe area of injection. Be sure that the woman understands that an intense burning sensation will accompany the injection, but that back pain relief will occur within 1 to 3 minutes and will last from 1

to 2 hours. Obtain verbal consent and document in progress note.

3. Assemble equipment: two 2-mL syringes with 25 gauge needles, preservative-free sterile water (do not use 0.9% saline), and alcohol swabs.
4. Position woman either sitting, upright, or laterally. Have labor partner or another staff member hold woman's hand and offer support and encouragement during the procedure.
5. Identify four areas for injection sites (Figure 1).* Some people like to mark the areas to be injected with a pen. The sacral dimples can be palpated for guidelines. In Sweden, midwives often give the injections where the mother feels the pain in her back. Ask the woman to point out the area for pain location in the lumbosacral region.
6. Draw up 1.0 mL of sterile water in each of two syringes. It is possible to use one syringe twice.
7. Cleanse the skin with an alcohol swab.
8. Plan to do the injections during a contraction (preferred) or between contractions (if woman's preference). Plan for two people (preferred) so that injections can be done simultaneously on each side to minimize the time and pain of injections. They can all be done by one person if necessary. Rapidly inject 0.5 mL of sterile water subcutaneously[†] in the chosen areas. Avoid touching or rubbing this area after injections.
9. The procedure can be repeated once the pain relief wears off.
10. One can document the pain scores before and after the injections. Also, results should be recorded in the progress notes.

* Of 10 studies, six were done giving the injections in Michaelis' rhomboid, and four at painful points in the lumbosacral area. Both sites gave good pain relief.

[†] Because of the results from some studies showing reduced injection pain and good pain relief from subcutaneous injections, the authors recommend the subcutaneous injection technique. However, intracutaneous injections can be used if one prefers.