

REPORT

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RAPID REVIEW FOR PATIENT DECISION AID:

Pain relief for women in labour

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Key messages

The pain that women experience during labour is affected by multiple physiological and psychosocial factors and its intensity can vary greatly. Most women in labour require some pain relief and a wide range of pain management methods are offered and used by women during childbirth.

Eight Cochrane reviews were included as our evidence base for pain management interventions for women in labour, seven quantitative and one qualitative. The interventions were grouped into non-invasive, non-pharmacological and pharmacological. Nine comparisons were included. The certainty of the evidence ranged from very low to moderate. Moderate certainty evidence showed that:

- Immersion in water compared to no immersion probably improves satisfaction with pain relief and makes little or no difference to perineal trauma.
- Companionship helped women to have a positive birth experience.
- Acupuncture compared to usual care probably makes little difference to augmentation with oxytocin.
- TENS compared to placebo or usual care probably makes no difference to satisfaction with pain relief.
- Epidural compared to placebo or no intervention probably slightly improves satisfaction with pain relief and reduces caesarean sections.
- Epidural compared to continuous support probably makes little or no difference to satisfaction with pain relief, assisted vaginal birth, caesarean section, long-term headache or long-term backache.

Some of the outcomes of interest were rarely measured, such as satisfaction with childbirth experience, breastfeeding or adverse effects. The interventions were most often compared to usual care or placebo, however, a detailed description was often lacking.

Title

Pain relief for women in labour

Publication type

Rapid review

We cannot answer everything:

No recommendations

No economic evaluation

Publisher

The Norwegian Institute of Public Health was commissioned by the University Hospital of North Norway

Updated

Search for literature was conducted in April 2021

Hovedbudskap

Smerten kvinner opplever under fødselen påvirkes av flere fysiologiske og psykososiale faktorer og intensiteten varierer. De fleste kvinner i fødsel trenger noe smertelindring, og et bredt spekter av smertestillende metoder tilbys og brukes av kvinner under fødsel.

Åtte Cochrane-oversikter som så på smertelindring for kvinner i fødsel ble inkludert, syv kvantitative og en kvalitativ. Tiltakene ble gruppert i ikke-invasive, ikke-farmakologiske og farmakologiske. Ni sammenligninger ble inkludert. Tilliten til dokumentasjonen varierte fra svært lav til moderat. Resultater med moderat tillit viste at:

- Fødsel i vann sammenlignet med vanlig behandling forbedrer sannsynligvis tilfredshet med smertelindring og utgjør liten eller ingen forskjell for fødselsrifter.
- Følge av ledsager hjalp kvinner å få en positiv fødselsopplevelse
- Akupunktur sammenlignet med vanlig behandling gjør sannsynligvis liten forskjell for stimulering av oksytocin.
- TENS sammenlignet med placebo eller vanlig behandling gjør sannsynligvis ingen forskjell for tilfredshet med smertelindring.
- Epidural sammenlignet med placebo eller ingen intervensjon forbedrer sannsynligvis tilfredsheten med smertelindring noe og reduserer risiko for keisersnitt.
- Epidural sammenlignet med kontinuerlig støtte gjør sannsynligvis liten eller ingen forskjell for tilfredshet med smertelindring, assistert vaginal fødsel, keisersnitt, langvarig hodepine eller langvarig ryggsmarter.

Noen av utfallene av interesse ble sjelden målt, for eksempel tilfredshet med fødselsopplevelsen, rier eller uønskede hendelser som påvirkning av amming. De ulike tiltakene ble som regel sammenliknet med vanlig behandling eller placebo, men en detaljert beskrivelse av dette manglet som regel.

Tittel

Smertelindring ved fødsel

Publikasjonstype

Hurtigoversikt

Svarer ikke på alt

Gir ingen anbefaling

Gir ingen økonomisk vurdering

Hvem står bak denne publikasjonen?

Folkehelseinstituttet har gjennomført oppdraget etter forespørsel fra Universitetssykehuset Nord-Norge

Når ble litteratursøket utført?

Søk etter studier ble utført i april 2021

Preface

The Centre for Shared Decision Making at the University Hospital of North Norway and the Division for Health Services, Norwegian Institute of Public Health, signed a collaboration agreement in 2017 to develop evidence-based shared decision-making tools.

Patient decision aids are continuously published at www.helsenorge.no/samvalg/.

Our aim is to:

- be resource effective
- be trustworthy
- work in line with national quality criteria for patient decision making tools
- present updated and evidence-based information in a format that is easily understood by laypeople, including patients and their caretakers

For this rapid review, commissioned by Haukeland University Hospital, we aimed to summarise research syntheses on the effectiveness of pain management options for vaginal childbirth, both concerning the mother and the baby/newborn/infant.

The authors report no conflict of interest.

We wish to thank Bente K. Langeland, Lene Haugen, Eline Bjørnstad and Jörg Kessler, all at Haukeland University Hospital, for peer review.

Hege Kornør
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project leader*

Background

The pain that women experience during labour is affected by multiple physiological and psychosocial factors and its intensity can vary greatly. Most women in labour require some pain relief and a wide range of pain management methods are offered and used by women during childbirth.

Commonly, pain management in labour include non-pharmacological interventions (hypnosis, biofeedback, intracutaneous or subcutaneous sterile water injection, immersion in water, aromatherapy, relaxation techniques (yoga, music, audio), acupuncture or acupressure, manual methods (massage, reflexology), transcutaneous electrical nerve stimulation (TENS)) and pharmacological interventions (inhaled analgesia, opioids, non-opioid drugs, local anaesthetic nerve blocks, epidural and intrathecal injections of local anaesthetics or opioids, or both).

The non-pharmacological interventions primarily aim to help women cope with pain in labour, whereas the pharmacological interventions primarily aim to relieve the pain of labour.

During the different stages in the birth process the women might want to use various interventions that aid coping with pain or giving pain relief. Usually, the women giving birth will be supported by a midwife and together they can choose which interventions and which combinations to use.

The aim of this review was to examine the relative effects of pain management options for vaginal childbirth, both on the mother and on the baby/newborn/infant.

Method

Inclusion criteria

Population	Women in labour
Interventions	Non-invasive interventions: partner support in labour, labour companionship, relaxation techniques; breathing, massage, maternal position and mobility, immersion in water, (hot water bottle or shower) Non-pharmacological interventions: acupuncture, intradermal/intracutaneous sterile water injection, transcutaneous electrical nerve stimulation (TENS) Pharmacological interventions: nitrous oxide (with 50 % oxygen), epidural/spinal analgesia, pudendal block
Comparators	Non-pharmacological and pharmacological interventions Usual care Placebo/sham interventions
Outcomes	Satisfaction with pain relief Satisfaction with childbirth experience Assisted vaginal birth (ventous or forceps) Caesarean Section Labour contractions (uterine inertia) Breastfeeding Maternal adverse/side effects: itching/pruritus, fever, hypotension, postpartum haemorrhage/blood loss, perineal trauma/perineal lacerations/perineal tear, malposition of fetus, urinary retention, long term headache, long term backache, other significant adverse/side effects Fetal/neonatal adverse/side effects: Fetal heart rate changes/abnormalities, other significant adverse/side effects
Study designs	Systematic reviews

Literature search

We browsed Cochrane reviews listed under the topic Pregnancy & Childbirth in Cochrane Library, and also all reviews published by the Pregnancy & Childbirth Group, in April 2021.

Selection of studies and data

Potentially eligible systematic reviews were presented and discussed for inclusion within the review group and together with the experts in the field. We only included reviews that had identified and included studies and data that met our inclusion criteria. That is, we excluded reviews where studies meeting our inclusion criteria were *eligible*, but no relevant studies or data were included.

Presenting the results and assessing in the certainty of the evidence

We used the GRADE (Grading of Recommendations Assessment, Development and Evaluation, Table 1) tool to assess in the certainty of the effect estimates for each outcome. When authors of included reviews already had assessed the certainty of the evidence, we reproduced their assessments. We present the results in text and in summary of findings tables (Supplement 2).

Table 1. GRADE Working Group grades of evidence

High certainty ⊕⊕⊕⊕	<i>We are very confident that the true effect lies close to that of the estimate of the effect.</i>
Moderate certainty ⊕⊕⊕⊖	<i>We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.</i>
Low certainty ⊕⊕⊖⊖	<i>Our confidence in the effect estimate is limited. The true effect may be substantially different from the estimate of the effect.</i>
Very low certainty ⊕⊖⊖⊖	<i>We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of the effect.</i>

We also present the results by using standardized statements about effects developed by Cochrane (Figure 1).

Figure 1. Standardised statements about effect

Table of standardised statements about effect

	Important benefit/harm	Less important benefit/harm	No important benefit/harm
High quality / certainty¹ evidence	<i>[Intervention]</i> improves/reduces <i>[outcome]</i> (high quality / certainty evidence)	<i>[Intervention]</i> slightly improves/reduces <i>[outcome]</i> (high quality / certainty evidence)	<i>[Intervention]</i> makes little or no difference to <i>[outcome]</i> (high quality / certainty evidence)
Moderate quality / certainty¹ evidence	<i>[Intervention]</i> probably improves/reduces <i>[outcome]</i> (moderate quality / certainty evidence)	<i>[Intervention]</i> probably slightly improves/reduces / probably leads to slightly better/worse <i>[outcome]</i> (moderate quality / certainty evidence)	<i>[Intervention]</i> probably makes little or no difference to <i>[outcome]</i> (moderate quality / certainty evidence)
Low quality / certainty¹ evidence	<i>[Intervention]</i> may improve/reduce <i>[outcome]</i> (low quality / certainty evidence)	<i>[Intervention]</i> may slightly improve/reduce <i>[outcome]</i> (low quality / certainty evidence)	<i>[Intervention]</i> may make little or no difference to <i>[outcome]</i> (low quality / certainty evidence)
Very low quality / certainty¹ evidence	We / The review authors are uncertain whether <i>[intervention]</i> improves/reduces <i>[outcome]</i> as the quality / certainty of the evidence has been assessed as very low		
No studies	No studies were found that looked at <i>[outcome]</i>		

¹Within GRADE, the phrase "quality of the evidence" is increasingly referred to as "certainty of" the evidence. Use the same term that has been used elsewhere in the review.

Source: https://www.cochrane.no/sites/cochrane.no/files/public/uploads/how_to_write_a_cochrane_pls_15th_june_2018.pdf

Results

We identified 647 Cochrane reviews (Figure 2). Twenty-one reviews were read in full text. Of these, 12 were excluded (Appendix 1) and nine were included.

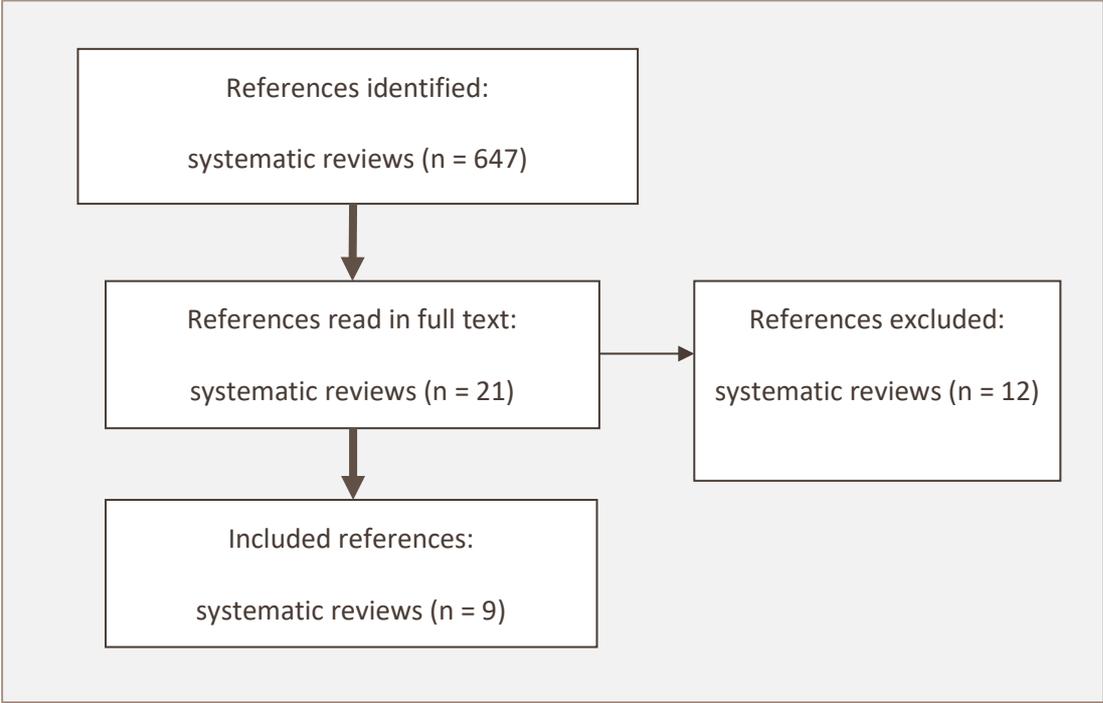


Figure 2. Flow chart

Included evidence

Four of the included Cochrane reviews addressed non-invasive pain relief interventions (1-4), three addressed non-pharmacological interventions (5-7) and two addressed pharmacological interventions (8;9) (Tab 2). The least recent review was published in 2009, and the most recent was published in 2020.

Table 2. Included evidence

Study ID (reference)	No. of included studies (women)	Eligible interventions	Control
Smith 2018a (4)	14 (1055)	Massage	Usual care
Smith 2018b (3)	19 (2519)	Relaxation techniques	Usual care

Cluett 2018 (2)	15 (3663)	Immersion in water	No immersion in water
Bohren 2019 (1)	51	Labour companionship	No control (review of qualitative studies)
Smith 2020 (7)	28 (3960)	Acupuncture	Usual care, sham control, no intervention, sterile water injection
Dowswell 2009 (6)	17 (1466)	TENS	Placebo or usual care
Derry 2012 (5)	7 (766)	Sterile water injection	Placebo (saline)
Anim-Somuah 2018 (8)	52 (> 11,000)	Epidural	No analgesia, continuous care, TENS
Klomp 2012 (9)	26 (2959)	Inhaled analgesia	Placebo, no intervention, TENS

Note: TENS= Transcutaneous electrical nerve stimulation

To identify any eligible research syntheses or randomised trials published more recently than the Cochrane reviews, we checked all references in UpToDate's chapters on pain relief during labour (10-12). The UpToDate literature searches in were updated in July 2021. Finally, we screened recent randomised studies listed in Swedish Agency for Health Technology Assessment and Assessment of Social Services' (SBU) 2017 rapid review on inhaled analgesia during labour (13). We identified two systematic reviews and two randomised trials (Appendix 2). These are not included in our rapid review due to limited resources.

Summary of Findings

Non-invasive interventions

Massage compared to usual care

What are the effects of massage compared to usual care during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 1), we found that massage compared to usual care:

- May slightly reduce perineal trauma (low certainty evidence)
- May make little or no difference to: the need for augmentation with oxytocin, postpartum haemorrhage, the incidence of Apgar score < 7 at 5 minutes, and to admissions to neonatal intensive care unit (low certainty evidence)

We are uncertain whether massage increases satisfaction with childbirth experience and the incidence of assisted vaginal birth and caesarean section (very low certainty evidence). No studies were found that measured satisfaction with pain relief, breastfeeding, or other adverse or side effects.

Relaxation techniques compared to usual care

What are the effects of relaxation techniques compared to usual care during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 2), it is uncertain whether relaxation techniques increase satisfaction with pain relief, satisfaction with childbirth experience, the incidence of assisted vaginal births, the incidence of caesarean section, the need for augmentation with oxytocin, postpartum haemorrhage, the incidence of Apgar score < 7 at 5 minutes, and admissions to neonatal intensive care unit (very low certainty evidence). No studies were found that measured satisfaction with pain relief, breastfeeding or other adverse or side effects.

Immersion in water compared to no immersion in water

What are the effects of immersion in water compared to no immersion in water during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 3), we found that immersion in water compared to no immersion in water:

- Probably improves satisfaction with pain relief and makes little or no difference to perineal trauma (moderate certainty evidence)
- May improve satisfaction with childbirth experience (low certainty evidence)
- May make little or no difference to: the incidence of assisted vaginal birth, the incidence of caesarean section, perineal trauma, maternal infections, the incidence of Apgar score < 7 at 5 minutes, admissions to neonatal intensive care unit, and to breastfeeding (low certainty evidence)

It is uncertain whether immersion in water increases the need for augmentation with oxytocin, postpartum haemorrhage, neonatal infection, and abnormal fetal heart rate (very low certainty evidence). No studies were found that measured other adverse or side effects in the mothers.

Labour companionship – perceptions and experiences

What are the women's perceptions and experiences of labour companionship?

Based on our summary of findings (Appendix 3, Table 4), we found that:

- Labour companions provide women with information, practical, and emotional support, and can speak up in support of women. Companionship also helped women having a positive birth experience. There were no or minor concerns regarding methodological limitations / relevance / coherence / adequacy (moderate to high certainty evidence)
- Women could develop close bonds with their doulas. Foreign-born women in high-income settings may appreciate support from community-based doulas to receive culturally competent care. There were moderate concerns regarding methodological limitations / relevance / coherence / adequacy (low certainty evidence).

Non-pharmacological interventions

Acupuncture compared to usual care

What are the effects of acupuncture compared to usual care during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 5), we found that acupuncture compared to usual care:

- probably makes little difference to augmentation with oxytocin (moderate certainty evidence)
- may make little or no difference to satisfaction with pain relief, assisted vaginal birth, caesarean section, perineal trauma and Apgar score < 7 at 5 minutes after birth (low certainty evidence)

It is uncertain whether acupuncture reduces postpartum haemorrhage (very low certainty evidence). No studies were found that measured satisfaction with childbirth experience, other adverse or side effects, or at breastfeeding.

Acupuncture compared to no intervention

What are the effects of acupuncture compared to no intervention during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 6), it is uncertain whether acupuncture increases the incidence of assisted vaginal births or the incidence of caesarean section. No studies were found that measured satisfaction with pain relief, satisfaction with childbirth experience, labour contractions, adverse and side effects in the mother and in the baby/fetus, or breastfeeding.

Transcutaneous electrical nerve stimulation (TENS) compared to placebo TENS or usual care

What are the effects of TENS compared to placebo TENS or routine care during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth,

caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 7), we found that TENS to the mothers' backs compared to placebo TENS or routine care:

- probably makes little or no difference to satisfaction with pain relief (moderate certainty evidence)
- may make little or no difference to assisted vaginal birth and caesarean section (low certainty evidence)

It is uncertain whether TENS to mothers' backs reduces fetal distress (very low certainty evidence). No studies were found that measured satisfaction with childbirth experience, labour contractions, other adverse or side effects, or breastfeeding.

Sterile water injections compared to placebo (normal saline)

What are the effects of sterile water injections compared to placebo (normal saline) during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, table 8), we found that sterile water may make little or no difference in the use of assisted vaginal birth or caesarean section. No studies were found that measured satisfaction with pain relief, satisfaction with childbirth experience, effect on labour contractions, adverse effects mother or adverse effects baby.

Pharmacological interventions

Epidural compared to transcutaneous electrical nerve stimulation (TENS)

What are the effects of epidural compared to TENS during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 9), we found that it is uncertain whether epidural increases the incidence of assisted vaginal births, the incidence of caesarean section, hypotension or urinary retention (very low certainty evidence). No studies were found that measured satisfaction with pain relief, satisfaction with childbirth experience, labour contractions, other adverse or side effects, or breastfeeding.

Epidural compared to continuous support

What are the effects of epidural compared to continuous support during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 10), we found that epidural compared to continuous support:

- probably makes little or no difference to satisfaction with pain relief, assisted vaginal birth, caesarean section, long-term headache, or long-term backache (moderate certainty evidence)
- may make little or no difference to the occurrence of Apgar score < 7 at 5 minutes after birth (low certainty evidence)

No studies were found that measured satisfaction with childbirth experience, labour contractions, other adverse or side effects, or breastfeeding.

Epidural compared to placebo or no intervention

What are the effects of epidural compared to placebo or no intervention during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 11), we found that epidural compared to placebo or no intervention:

- probably slightly improves satisfaction with pain relief and reduces caesarean sections (moderate certainty evidence)
- may make little or no difference to assisted vaginal births (low certainty evidence)

It is uncertain whether epidural increases itching, fever, perineal trauma and urinary retention in the mothers, or the occurrence of Apgar score < 7 at 5 minutes after birth (very low certainty evidence). No studies were found that measured satisfaction with childbirth experience, labour contractions, other adverse or side effects, or breastfeeding.

Inhaled analgesia compared to transcutaneous electrical nerve stimulation (TENS)

What are the effects of inhaled analgesia compared to TENS during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 12), we found that it is uncertain whether inhaled analgesia increases satisfaction with pain relief (very low certainty evidence). No studies were found that measured satisfaction with childbirth experience, the incidence of assisted vaginal births, the incidence of caesarean section, labour contractions, adverse or side effects, or breastfeeding.

Inhaled analgesia compared to placebo or no intervention

What are the effects of inhaled analgesia compared to placebo or no intervention during labour on satisfaction with pain relief, satisfaction with childbirth experience, assisted vaginal birth, caesarean section, labour contractions, adverse and side effects in the mother and in the baby/fetus, and breastfeeding?

Based on our summary of findings (Appendix 3, Table 13), we found that it is uncertain whether inhaled analgesia increases the incidence of assisted vaginal births, the incidence of caesarean section, neonatal asphyxia or the occurrence of Apgar score < 7 at 5 minutes after birth (very low certainty evidence, Table 13). No studies were found that measured satisfaction with pain relief, satisfaction with childbirth experience, labour contractions, other adverse or side effects, or breastfeeding.

Discussion

Main findings

We included eight systematic reviews in our evidence base for pain relief interventions for women in labour. Seven of these reviews were quantitative and one was qualitative. Three of the reviews compared non-invasive pain relief interventions as massage and relaxation techniques with usual care. Two of the reviews compared non-pharmacological interventions as acupuncture and TENS with usual care or placebo. Two reviews compared pharmacological interventions as epidural and inhaled analgesia with placebo, no intervention or TENS. The qualitative review looked at the perceptions and experiences of labour companionship. For all comparisons the quality of evidence was evaluated as very low to moderate. Below, only the evidence considered to moderate certainty is presented as main results.

Non-invasive interventions:

- Immersion in water compared to no immersion probably improves satisfaction with pain relief and makes little or no difference to perineal trauma.

Non-pharmacological interventions:

- Acupuncture compared to usual care probably makes little difference to augmentation with oxytocin.
- TENS compared to placebo or usual care probably makes no difference to satisfaction with pain relief.

Pharmacological interventions:

- Epidural compared to placebo or no intervention probably slightly improves satisfaction with pain relief and reduces caesarean sections.
- Epidural compared to continuous support probably makes little or no difference to satisfaction with pain relief, assisted vaginal birth, caesarean section, long-term headache or long-term backache.

Due to the limited amount of quantitative data on childbirth experience we included a systematic review based on qualitative studies. This review had high to moderate confidence in most of the findings and concluded that companionship helped women to have a positive birth experience.

Thirteen systematic reviews were excluded, most of them due to type of intervention. On agreement with the clinical experts, we excluded reviews looking at pain relief interventions as opioids, hypnosis or aromatherapy, as these were not relevant to the Norwegian setting. In addition, we did not include studies comparing different doses of drugs or studies comparing one drug against another.

Limitations

We included literature from Pregnancy & Childbirth in the Cochrane Library and UpToDate as we believe that these sources probably included the most recently updated information on the topic. However, there might be other sources with relevant information that we have not obtained.

Classifying the control interventions was challenging, as the definition or description of usual care or no intervention seldom was provided in the reviews or the original studies. The studies were carried out in many different countries and the content of usual care might have varied. Therefore, there is a risk that some of the results are not directly transferable to the Norwegian setting.

Many of the original studies included in the reviews did not measure the outcomes of interest to this report. Rarely, they measured the satisfaction with childbirth experience, labour contractions or adverse effects as breastfeeding.

The quality of evidence in the systematic reviews was often very low or low. Common biases were small sample sizes and few events, unexplained heterogeneity and wide confidence intervals. Lack of blinding and selective reporting were also often reported as biases.

Update and research gaps

More research on pain relief in labour should be carried out including the outcomes satisfaction with childbirth experience, labour contractions and adverse effects as breastfeeding. The studies should be more transparent in the description of the interventions and comparisons in order to increase the understanding of the results' applicability to the setting of interest.

Conclusion

There seems to be moderate certainty evidence that some non-invasive, non-pharmacological and pharmacological interventions can be beneficial to reduce pain for women in labour. However, most of the evidence is of low certainty and several important outcomes are rarely addressed. Thus, more research of good quality is needed within this field.

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12. Grant GG. Pharmacologic management of pain during labor and delivery. I: Hepner DL, Berghella V, red. UpToDate. Waltham, MA: UpToDate; 2020. Tilgjengelig fra: <https://www.uptodate.com/contents/pharmacologic-management-of-pain-during-labor-and-delivery>
13. Swedish Agency for Health Technology Assessment and Assessment of Social Services. Inhaled analgesia during labour. 2017. Tilgjengelig fra: <https://www.sbu.se/sv/publikationer/sbus-upplysningstjanst/lustgas-som-smartlindring-vid-forlossning/>

Supplement 1. Excluded reviews

Citation	Intervention	Control	Comments
Novikova N, Cluver C. Local anaesthetic nerve block for pain management in labour. Cochrane Database of Systematic Reviews 2012, Issue 4. Art. No.: CD009200. DOI: 10.1002/14651858.CD009200.pub2. Accessed 17 August 2021.	Local anaesthetic nerve blocks	“any other type of local anaesthetic nerve block, placebo/no treatment; hypnosis; bio-feedback; intracutaneous or subcutaneous sterile water injection; immersion in water; aromatherapy; relaxation techniques (yoga, music, audio); acupuncture or acupressure; manual methods (massage, reflexology); TENS; inhaled analgesia; opioids; non-opioid drugs.”	Only one comparison involving pudendal block in this review: pudendal block with 1% carbocaine 20 mL with adrenaline 5 mcg/mL or without adrenaline. Comparison did not meet our inclusion criteria.
East CE, Dorward EDF, Whale RE, Liu J. Local cooling for relieving pain from perineal trauma sustained during childbirth. Cochrane Database of Systematic Reviews 2020, Issue 10. Art.	Localised cooling treatment ap-	No treatment, placebo, another cooling treatment	Pain relief after birth

No.: CD006304. DOI: 10.1002/14651858.CD006304.pub4. Accessed 17 August 2021.	plied to the perineum – post partum		
Smith LA, Burns E, Cuthbert A. Parenteral opioids for maternal pain management in labour. Cochrane Database of Systematic Reviews 2018, Issue 6. Art. No.: CD007396. DOI: 10.1002/14651858.CD007396.pub3. Accessed 17 August 2021.	Intramuscular or intravenous opioids	Another opioid, placebo, no treatment, other non-pharmacological interventions (transcutaneous electrical nerve stimulation (TENS)) or inhaled analgesia	Intervention did not meet our inclusion criteria.
Weibel S, Jelting Y, Afshari A, Pace NL, Eberhart LHJ, Jokinen J, Artmann T, Kranke P. Patient-controlled analgesia with remifentanyl versus alternative parenteral methods for pain management in labour. Cochrane Database of Systematic Reviews 2017, Issue 4. Art. No.: CD011989. DOI: 10.1002/14651858.CD011989.pub2. Accessed 17 August 2021.	Remifentanyl (PCA)	Another opioid (intravenous (IV)/intramuscular (IM)), or with another opioid (PCA), or with epidural analgesia, or with remifentanyl (continuous IV), or with remifentanyl (PCA, different regimen), or with inhalational analgesia, or with placebo/no treatment	Intervention did not meet our inclusion criteria.
Madden K, Middleton P, Cyna AM, Matthewson M, Jones L. Hypnosis for pain management during labour and childbirth. Cochrane Database of Systematic Reviews 2016, Issue 5. Art. No.: CD009356. DOI: 10.1002/14651858.CD009356.pub3. Accessed 17 August 2021.	Use of hypnosis during labour, with or without concurrent use of pharmacological or non-pharmacological pain relief methods	Placebo, no treatment or any analgesic drug or technique	Intervention did not meet our inclusion criteria.

<p>Sng BL, Leong WL, Zeng Y, Siddiqui FJ, Assam PN, Lim Y, Chan ESY, Sia AT. Early versus late initiation of epidural analgesia for labour. Cochrane Database of Systematic Reviews 2014, Issue 10. Art. No.: CD007238. DOI: 10.1002/14651858.CD007238.pub2. Accessed 17 August 2021.</p>	<p>Early initiation of epidural</p>	<p>Late initiation</p>	<p>Comparison did not meet our inclusion criteria.</p>
<p>Simmons SW, Taghizadeh N, Dennis AT, Hughes D, Cyna AM. Combined spinal-epidural versus epidural analgesia in labour. Cochrane Database of Systematic Reviews 2012, Issue 10. Art. No.: CD003401. DOI: 10.1002/14651858.CD003401.pub3. Accessed 17 August 2021.</p>	<p>Combined spinal-epidural (CSE) technique</p>	<p>Epidural analgesia</p>	<p>Comparison did not meet our inclusion criteria.</p>
<p>Othman M, Jones L, Neilson JP. Non-opioid drugs for pain management in labour. Cochrane Database of Systematic Reviews 2012, Issue 7. Art. No.: CD009223. DOI: 10.1002/14651858.CD009223.pub2. Accessed 17 August 2021.</p>	<p>Non-opioid drugs (NSAIDs; paracetamol; antispasmodics; sedatives and antihistamines)</p>	<p>Placebo or standard care; different forms of non-opioid drugs (e.g. sedatives versus antihistamines); or different interventions (e.g. Non-opioids versus opioids)</p>	<p>Intervention did not meet our inclusion criteria.</p>
<p>Jones L, Othman M, Dowswell T, Alfirevic Z, Gates S, Newburn M, Jordan S, Lavender T, Neilson JP. Pain management for women in labour: an overview of systematic reviews. Cochrane Database of Systematic Reviews 2012, Issue 3. Art. No.: CD009234. DOI: 10.1002/14651858.CD009234.pub2. Accessed 17 August 2021.</p>	<p>1. Intervention versus placebo or standard care; 2. Different forms of the same intervention (e.g. One opioid versus another opioid); 3. One type of intervention versus a different type of intervention (e.g. TENS versus opioid)</p>		<p>Umbrella review. All relevant comparisons covered by single systematic reviews.</p>

Smith CA, Collins CT, Crowther CA. Aromatherapy for pain management in labour. Cochrane Database of Systematic Reviews 2011, Issue 7. Art. No.: CD009215. DOI: 10.1002/14651858.CD009215. Accessed 17 August 2021.	Aromatherapy	Placebo, no treatment or other non-pharmacological forms of pain management	Intervention did not meet our inclusion criteria.
Barragán Loayza IM, Solà I, Juandó Prats C. Biofeedback for pain management during labour. Cochrane Database of Systematic Reviews 2011, Issue 6. Art. No.: CD006168. DOI: 10.1002/14651858.CD006168.pub2. Accessed 17 August 2021.	Biofeedback in prenatal lessons	?	Intervention did not meet our inclusion criteria.
Smith CA, Collins CT, Cyna AM, Crowther CA. Complementary and alternative therapies for pain management in labour. Cochrane Database of Systematic Reviews 2006, Issue 4. Art. No.: CD003521. DOI: 10.1002/14651858.CD003521.pub2. Accessed 17 August 2021.	Complementary and alternative therapies (but not biofeedback)	Placebo, no treatment or pharmacological forms of pain management	Intervention did not meet our inclusion criteria.

Supplement 2. More recent reviews and studies

Citation	Type of study	Comparison	Comments
Pasha H, Basirat Z, Hajahmadi M, Bakhtiari A, Faramarzi M, Salmalian H. Maternal expectations and experiences of labor analgesia with nitrous oxide. <i>Iran Red Crescent Med J.</i> 2012;14(12):792-797. doi:10.5812/ircmj.3470	Randomised trial	Nitrous oxide vs no nitrous oxide	Published same year as Cochrane review (Klomp 2012)
Heesen P, Halpern SH, Beilin Y, Mauri PA, Eidelman LA, Heesen M, Orbach-Zinger S. Labor neuraxial analgesia and breastfeeding: An updated systematic review. <i>J Clin Anesth.</i> 2021 Feb;68:110105. doi: 10.1016/j.jclinane.2020.110105.	Systematic review	Epidural vs other or no analgesia	Breastfeeding only outcome. Very short follow up. Vote counting
Makvandi S, Latifnejad Roudsari R, Sadeghi R, Karimi L. Effect of birth ball on labor pain relief: A systematic review and meta-analysis. <i>J Obstet Gynaecol Res.</i> 2015 Nov;41(11):1679-86. doi: 10.1111/jog.12802.	Systematic review	Birth ball vs any or no intervention	Labour pain score only outcome
Santana LS, Gallo RB, Ferreira CH, Duarte G, Quintana SM, Marcolin AC. Transcutaneous electrical nerve stimulation (TENS) reduces pain and postpones the need for pharmacological analgesia during labour: a randomised trial. <i>J Physiother.</i> 2016 Jan;62(1):29-34. doi: 10.1016/j.jphys.2015.11.002.	Randomised trial	TENS vs no TENS	Primary outcome: pain severity

Supplement 3. Summary of Findings (GRADE)

GRADE Working Group grades of evidence

High certainty: We are very confident that the true effect lies close to that of the estimate of the effect

Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different

Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect

Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

Non-invasive interventions

Table 1. Massage compared to usual care

Setting: Hospital settings in Australia, Brazil, Canada, Iran, Taiwan and UK

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with usual care	Risk with massage				
Satisfaction with pain relief	-	-	-	-	-	No studies were found that measured satisfaction with pain relief
Satisfaction with childbirth experience (5-point scale, 5=more satisfaction)	The mean satisfaction with childbirth experience was 3.7	MD 0.47 higher (0.13 lower to 1.07 higher)	-	60 (1 RCT)	⊕⊕⊕⊕ VERY LOW ^{b,d}	It is uncertain whether massage increase satisfaction with childbirth experience compared to usual care

Assisted vaginal birth	191 per 1000	136 per 1000 (84 to 216)	RR 0.71 (0.44 to 1.13)	368 (4 RCTs)	⊕⊕⊕⊕ VERY LOW ^{a,b,e}	It is uncertain whether massage increase incidence of assisted vaginal birth compared to usual care
Caesarean section	191 per 1000	144 per 1000 (98 to 209)	RR 0.75 (0.51 to 1.09)	514 (6 RCTs)	⊕⊕⊕⊕ VERY LOW ^{a,b,e}	It is uncertain whether massage increase incidence of Caesarean section compared to usual care
Effect on labour contractions: Need for augmentation with oxytocin	421 per 1000	324 per 1000 (193 to 543)	RR 0.77 (0.46 to 1.29)	468 (5 RCTs)	⊕⊕○○ LOW ^{b,f}	Massage may make little or no difference on the need for augmentation with oxytocin compared to usual care
Adverse effect mother: perineal trauma	964 per 1000	849 per 1000 (762 to 945)	RR 0.88 (0.79 to 0.98)	128 (1 RCT)	⊕⊕○○ LOW ^{a,c}	Massage may slightly reduce the incidence of perineal trauma compared to usual care
Adverse effects mother: post partum haemorrhage	181 per 1000	148 per 1000 (76 to 291)	RR 0.82 (0.41 to 1.61)	171 (1 RCT)	⊕⊕○○ LOW ^d	Massage probably makes little or no difference on post partum haemorrhage compared to usual care
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effect baby: Apgar score < 7 at 5 minutes	38 per 1000	27 per 1000 (6 to 118)	RR 0.72 (0.17 to 3.14)	215 (2 RCTs)	⊕⊕○○ LOW ^{b,e}	Massage may make little or no difference on the incidence of Apgare score < 7 at 5 minutes compared to usual care
Adverse effects baby: admission to NICU	106 per 1000	75 per 1000 (33 to 172)	RR 0.71 (0.31 to 1.62)	231 (2 RCTs)	⊕⊕○○ LOW ^{b,e}	Massage may make little or no difference on the incidence of admission to neonatal intensive care unit compared to usual care
Other adverse effects baby	-	-	-	-	-	No studies were found that measured other adverse effects in the babies
Breastfeeding	-	-	-	-	-	No studies were found that measured breastfeeding

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio ; **NICU:** neonatal intensive care unit

- a. Downgraded one level due to massage being given for the first time during the trial by untrained personnel (indirectness).
- b. Downgraded one level due to design limitations being present in most trials, lack of blinding outcome assessor, unclear risk of bias some other domains
- c. Downgraded one level due to small sample size.
- d. Downgraded two levels due to small sample size and wide confidence intervals that cross the line of no effect.
- e. Downgraded one level due to wide confidence intervals that cross the line of no effect.
- f. Downgraded one level due to high statistical heterogeneity.

Table 2. Relaxation techniques compared to usual care

Setting: Hospital settings in Brazil, Italy, Sweden, Turkey and UK

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with usual care	Risk with relaxation				
Satisfaction with pain relief	50 per 1000	400 per 1000 (55 to 1000)	RR 8.00 (1.10 to 58.19)	40 (1 RCT)	⊕⊕⊕⊕ VERY LOW ^{c,d}	It is uncertain whether relaxation techniques increase satisfaction with pain relief compared to usual care
Satisfaction with childbirth experience (higher scores indicate more satisfaction)	The mean satisfaction with childbirth experience was 27.1	SMD 0.03 lower (0.37 lower to 0.31 higher)	-	1176 (3 RCTs)	⊕⊕⊕⊕ VERY LOW ^{a,b,e}	It is uncertain whether relaxation techniques increase satisfaction with childbirth experience compared to usual care
Assisted vaginal birth	149 per 1000	91 per 1000 (30 to 275)	RR 0.61 (0.20 to 1.84)	1122 (4 RCTs)	⊕⊕⊕⊕ VERY LOW ^{a,f,g}	It is uncertain whether relaxation techniques increase the incidence of assisted vaginal births compared to usual care
Caesarean section	214 per 1000	157 per 1000 (56 to 431)	RR 0.73 (0.26 to 2.01)	1122 (4 RCTs)	⊕⊕⊕⊕ VERY LOW ^{a,f,g}	It is uncertain whether relaxation techniques increase the incidence of caesarean section births compared to usual care
Labour contractions: need for augmentation with oxytocin	714 per 1000	814 per 1000 (586 to 1000)	RR 1.14 (0.82 to 1.59)	35 (1 RCT)	⊕○○○ VERY LOW ^{h,i}	It is uncertain whether relaxation techniques increase the need for augmentation with oxytocin compared to usual care
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effect baby: Apgar score < 7 at 5 minutes	50 per 1000	24 per 1000 (1 to 535)	RR 0.47 (0.02 to 10.69)	34 (1 RCT)	⊕○○○ VERY LOW ^{h,i}	It is uncertain whether relaxation techniques increase Apgar score < 7 at 5 minutes compared to usual care
Adverse effect baby: admission to neonatal intensive care unit	33 per 1 000	34 per 1 000 (2 to 526)	RR 1.03 (0.07 to 15.77)	59 (1 RCT)	⊕○○○ VERY LOW ^{c,g,i}	It is uncertain whether relaxation techniques increase admission to neonatal intensive care unit compared to usual care
Other adverse effects baby	-	-	-	-	-	No studies were found that measured other adverse effects in the babies
Breastfeeding	-	-	-	-	-	No studies were found that measured breastfeeding

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

^a Downgraded one level: severe unexplained heterogeneity.

^b Downgraded one level: wide confidence intervals crossing the line of no effect.

- ^c Downgraded one level: one included study has high risk of bias in blinding.
- ^d Downgraded two levels: small sample size and rare events.
- ^e Downgraded one level: all included studies at high risk of bias for blinding.
- ^f Downgraded one level: all included studies are at a high risk of bias in at least one domain.
- ^g Downgraded two levels: small sample size, few events and wide confidence interval crossing the line of no effect.
- ^h Downgraded two levels, high or unclear risk of bias on all domains
- ⁱ Downgraded one level, small sample size

Table 3. Immersion in water compared to no immersion in water

Setting: hospital-based maternity units in the following countries: UK, Canada, Iran, Finland, Australia, USA, Belgium, Brazil, Sweden, South Africa and China.

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with no immersion in water	Risk with immersion in water				
Satisfaction with pain relief: does not wish to use bath next birth	203 per 1 000	94 per 1 000 (49 to 183)	RR 0.46 (0.24 to 0.90)	236 (2 RCTs)	⊕⊕⊕○ MODERATE ^g	Immersion in water probably improves satisfaction with pain relief compared to no immersion in water
Satisfaction with childbirth experience: little or not satisfied with coping experience	211 per 1 000	51 per 1 000 (15 to 168)	RR 0.24 (0.07 to 0.80)	117 (1 RCT)	⊕⊕○○ LOW ^{c,h}	Immersion in water may improve satisfaction with childbirth experience compared to no immersion in water
Assisted vaginal birth	133 per 1 000	115 per 1 000 (93 to 139)	RR 0.86 (0.70 to 1.04)	2739 (8 RCTs)	⊕⊕○○ LOW ^{a,b}	Immersion in water may make little or no difference in the use of assisted vaginal birth compared to no immersion in water
Caesarean section	42 per 1 000	50 per 1 000 (36 to 69)	RR 1.19 (0.86 to 1.65)	2832 (9 RCTs)	⊕⊕○○ LOW ^{a,b}	Immersion in water may make little or no difference in the use of caesarean section compared to no immersion in water
Labour contractions: use of oxytocin for augmentation of labour	286 per 1 000	183 per 1 000 (92 to 367)	RR 0.64 (0.32 to 1.28)	1125 (5 RCTs)	⊕○○○ VERY LOW ^{a,b,f}	It is uncertain whether immersion in water increases the use of oxytocin for augmentation of labour compared to no immersion in water
Adverse effect mother: perineal trauma (third- or fourth-degree tears)	24 per 1 000	33 per 1 000 (21 to 52)	RR 1.37 (0.86 to 2.17)	2401 (5 RCTs)	⊕⊕⊕○ MODERATE ^a	Immersion in water probably makes little or no difference to perineal trauma compared to no immersion in water

Adverse effect mother: postpartum haemorrhage	76 per 1 000	56 per 1 000 (6 to 525)	RR 0.73 (0.08 to 6.90)	394 (2 RCTs)	⊕○○○ VERY LOW ^{a,d,e}	It is uncertain whether immersion in water increases postpartum haemorrhage compared to no immersion in water
Adverse effect mother: infection during labour/ postnatal period	23 per 1 000	23 per 1 000 (12 to 45)	RR 0.99 (0.50 to 1.96)	1295 (5 RCTs)	⊕⊕○○ LOW ^{a,b}	Immersion in water may make little or no difference to maternal infections compared to no immersion in water
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effects baby: abnormal fetal heart rate patterns	280 per 1 000	219 per 1 000 (95 to 468)	RR 0.75 (0.34 to 1.67)	487 (2 RCTs)	⊕⊖⊖⊖ VERY LOW ^{a,d}	It is uncertain whether immersion in water increases abnormal fetal heart rate patterns compared to no immersion in water
Adverse effect baby: admission to neonatal intensive care unit	66 per 1 000	65 per 1 000 (46 to 91)	RR 0.99 (0.70 to 1.39)	1862 (5 RCTs)	⊕⊕○○ LOW ^{a,b}	Immersion in water may make little or no difference to admissions to neonatal intensive care units compared to no immersion in water
Adverse effect baby: neonatal infection	5 per 1000	9 per 1000 (2 to 37)	RR 2.00 (0.50 to 7.94)	1295 (5 RCTs)	⊕○○○ VERY LOW ^{a,d}	It is uncertain whether immersion in water increases neonatal infection compared to no immersion in water
Adverse effect baby: Apgar score < 7 at 5 minutes	6 per 1 000	11 per 1 000 (5 to 26)	RR 1.79 (0.76 to 4.25)	1953 (6 RCTs)	⊕⊕○○ LOW ^{a,b}	Immersion in water may make little or no difference to the occurrence of Apgar score less than seven at 5 minutes after birth compared to no immersion in water
Breastfeeding: not breastfeeding 6 weeks after birth	95 per 1 000	111 per 1 000 (61 to 204)	RR 1.17 (0.64 to 2.15)	363 (2 RCTs)	⊕⊕○○ LOW ^{a,b}	Immersion in water may make little or no difference to breastfeeding compared to no immersion in water

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

- a. Included trials had design limitation with respect to selection, performance, detection and reporting bias (-1)
- b. Wide confidence intervals that cross the line of no effect (-1)
- c. Data from one study with design limitations: trial was not blinded, and did not randomise adequately (-1)
- d. Few events and wide confidence intervals crossing the line of no effect (-2)
- e. $I^2 = 61\%$ (-1)
- f. $I^2 = 79\%$ (-1)
- g. Data from two studies with design limitations: neither trial was blinded, nor randomised adequately (-1)

h. Wide confidence interval (-1)

Table 4. Women's experience of companionship

Findings	Studies	Confidence	Comment
Women stated different preferences for their desired companion, including their husband or male partner, sister, mother, mother-in-law, doula, or a combination of different people. Regardless of which person they preferred, women who wanted a labour companion present during labour and childbirth expressed the need for this person to be a caring, compassionate, and trustworthy advocate.	20	High	Due to very minor concerns regarding coherence, relevance and adequacy, and minor concerns regarding methodological limitations
Women described the desire for a happy and healthy birth for both themselves and their babies. Support provided by doulas and companions paved the way for them to have a positive birth experience, as the support facilitated them to feel safe, strong, confident and secure.	21	High	Due to minor concerns regarding coherence, relevance, and adequacy, and moderate concerns regarding methodological limitations
Immigrant, refugee, and foreign-born women resettled in high-income countries highlighted how community-based doulas (e.g. someone from their ethnic/religious/ cultural community trained as a doula) were an important way for them to receive culturally competent care.	4	Low	Due to minor concerns regarding coherence, moderate concerns regarding methodological limitations and relevance, and serious concerns due to adequacy
Some women were concerned that their male partners would have diminished sexual attraction to them if they witnessed the birth. Likewise, some men believed that it is taboo to see a female partner give birth because of the risk of a loss of sexual interest.	5	Moderate	Due to minor concerns regarding methodological limitations and coherence, moderate concerns regarding relevance, and serious concerns regarding adequacy
Some women felt embarrassed or shy to have a male partner as a companion present throughout labour and childbirth.	4	Low	Due to minor concerns regarding methodological limitations and coherence, moderate concerns regarding relevance, and serious concerns regarding adequacy
Women who did not have a companion may view the lack of support as a form of suffering, stress and fear that made their birth experience more challenging. These women detailed experiences of poor quality of care that included mistreatment, poor communication, and neglect that made them feel vulnerable and alone.	7	Moderate	Due to minor concerns regarding methodological limitations and coherence, and moderate concerns regarding relevance and adequacy
Some women described having their male partners present as an essential part of the birth process, which facilitated bonding between the father and the baby, the couple, and as a family.	3	Low	Due to minor concerns regarding methodological limitations and coherence, moderate concerns regarding relevance, and serious concerns regarding adequacy

Most women who had a doula present described doulas as motherly, sisterly, or like family, suggesting a high level of relational intimacy.	5	Low	Due to minor concerns regarding coherence, moderate concerns regarding methodological limitations and adequacy, and serious concerns regarding relevance
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Non-pharmacological interventions

Table 5. Acupuncture compared to usual care

Setting: Hospital, (Denmark, Norway, Sweden, England, South-America, Asia)

Outcomes	Anticipated absolute effects*(95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with usual care	Risk with acupuncture				
Satisfaction with pain relief	787 per 1000	843 per 1000 (756 to 945)	RR 1.07 (0.96 to 1.20)	343 (2 RCTs)	⊕⊕⊖⊖ LOW ^a	Acupuncture may make little or no difference to mothers' satisfaction with pain relief compared to usual care
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	127 per 1000	118 per 1000 (89 to 158)	RR 0.93 (0.70 to 1.24)	1217 (6 RCTs)	⊕⊕⊖⊖ LOW ^{b,d}	Acupuncture may make little or no difference on the incidence of assisted vaginal birth compared to usual care
Caesarean section	116 per 1000	83 per 1000 (54 to 126)	RR 0.72 (0.47 to 1.09)	861 (5 RCTs)	⊕⊕⊖⊖ LOW ^{c,d}	Acupuncture may make little or no difference on the incidence of Caesarean section compared to usual care
Labour contractions: augmentation with oxytocin	493 per 1 000	453 per 1 000 (384 to 537)	RR 0.92 (0.78 to 1.09)	635 (3 RCTs)	⊕⊕⊕⊖ MODERATE ^e	Acupuncture probably makes little difference in augmentation with oxytocin compared to usual care
Adverse effect mother: perineal trauma	95 per 1000	49 per 1000 (12 to 183)	RR 0.51 (0.13 to 1.92)	125 (1 RCT)	⊕⊕⊖⊖ LOW ^{ef}	Acupuncture may make little or no difference on the incidence of perineal trauma compared to usual care

Adverse effect mother: postpartum haemorrhage (> 500 ml)	119 per 1 000	48 per 1 000 (13 to 170)	RR 0.40 (0.11 to 1.43)	125 (1 RCT)	⊕○○○ VERY LOW ^{ed}	It is uncertain whether acupuncture reduces postpartum haemorrhage > 500 ml compared to usual care
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effect baby: Apgar score < 7 at 5 minutes	6 per 1000	5 per 1000 (1 to 19)	RR 0.75 (0.12 to 3.10)	883 (5 RCTs)	⊕⊕○○ LOW ^{ef}	Acupuncture may make little or no difference on the incidence of Apgar score < 7 at 5 minutes compared to usual care
Other adverse effects baby	-	-	-	-	-	No studies were found that measured the effect on other adverse effects on baby
Breastfeeding	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers

***The risk in the intervention group** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

- a. Downgraded two levels for very serious risk of bias: both studies had unclear or high risk of bias related to blinding and this was likely to influence a self-reported outcome
- b. Downgraded one level for serious risk of bias: five of six studies at unclear or high risk of bias in both performance and detection bias. This may have influenced the outcome.
- c. Downgraded one level for serious risk of bias: three of four studies at high or unclear risk of bias in both performance and detection bias. This may have influenced the outcome.
- d. Downgraded one level for imprecision due to wide confidence intervals.
- e. Downgraded one level because of lack of blinding of outcome assessor
- f. Downgraded two levels because of wide confidence intervals

Table 6. Acupuncture compared to no intervention

Setting: Hospital, Beijing China						
Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with no treatment	Risk with acupuncture				
Satisfaction with pain relief	-	-	-	-	-	No studies were found that measured satisfaction with pain relief
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	123 per 1000	60 per 1000 (22 to 170)	RR 0.49 (0.18 to 1.38)	163 (1 RCT)	⊕⊖⊖⊖ VERY LOW ^{ab}	It is uncertain whether acupuncture increases the use of assisted vaginal birth compared to no treatment
Caesarean section	160 per 1000	122 per 1000 (56 to 262)	RR 0.76 (0.35 to 1.63)	163 (1 RCT)	⊕⊖⊖⊖ VERY LOW ^{ab}	It is uncertain whether acupuncture increases the use of Caesarean section compared to no treatment
Labour contractions	-	-	-	-	-	No studies were found that measured effect on labour contractions
Adverse events mother	-	-	-	-	-	No studies were found that measured adverse effects on mother
Adverse effects baby	-	-	-	-	-	No studies were found that measured adverse effects on baby
Breastfeeding	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

a. Downgraded by two levels for very serious risk of bias: high risk of bias in one domain (blinding for a subjective outcome) and unclear risk of bias in four domains.

b. Downgraded two levels for very serious imprecision due to a single study, with few events, small sample size and wide confidence intervals providing data.

Table 7. TENS (to back) compared to placebo TENS or routine care

Setting: USA, Sweden, Brazil, Ireland, Canada, Australia, Denmark, India, Germany, Norway, the Netherlands

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with placebo TENS or routine care	Risk with TENS				
Satisfaction with pain relief	264 per 1 000	330 per 1 000 (259 to 422)	RR 1.25 (0.98 to 1.60)	452 (5 RCTs)	⊕⊕⊕○ MODERATE ^a	TENS probably makes little or no difference to the satisfaction with pain relief compared to placebo TENS or routine care
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	120 per 1 000	98 per 1 000 (67 to 143)	RR 0.82 (0.56 to 1.19)	840 (7 RCTs)	⊕⊕○○ LOW ^{a,b}	TENS may make little or no difference to the use of assisted vaginal birth compared to placebo TENS or routine care
Caesarean section	59 per 1 000	80 per 1 000 (50 to 129)	RR 1.35 (0.84 to 2.17)	868 (8 RCTs)	⊕⊕○○ LOW ^{a,b}	TENS may make little or no difference to the use of caesarean section compared to placebo TENS or routine care
Labour contractions	-	-	-	-	-	No studies were found that measured labour contractions
Adverse effects mother	-	-	-	-	-	No studies were found that measured adverse effects in the mothers
Adverse effect baby: fetal distress	10 per 1 000	3 per 1 000 (0 to 81)	RR 0.33 (0.01 to 8.09)	200 (1 RCT)	⊕○○○ VERY LOW ^{a,c}	It is uncertain whether TENS reduces fetal distress compared to placebo TENS or routine care
Other adverse effects baby	-	-	-	-	-	No studies were found that measured other adverse effects in the babies

Breastfeeding	-	-	-	-	-	No studies were found that measured breast-feeding
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*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; RR: Risk ratio

a. High or unclear risk of selection, performance and detection bias (-1)

b. Wide confidence interval including different directions of effect (-1)

c. Wide confidence interval and few events (-2)

Table 8. Sterile water compared to placebo (normal saline)

Setting: Thailand, Sweden, Iran and India

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with normal saline	Risk with Sterile water				
Satisfaction with pain relief	0 per 1 000	0 per 1 000 (0 to 0)	not estimable	(0 studies)	-	No studies were found that measured satisfaction with pain relief
Satisfaction with childbirth experience	0 per 1 000	0 per 1 000 (0 to 0)	not estimable	(0 studies)	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	71 per 1 000	93 per 1 000 (56 to 155)	RR 1.31 (0.79 to 2.18)	666 (6 RCTs)	⊕⊕○○ LOW ^{a,b}	Sterile water may make little or no difference in the use of assisted vaginal birth compared to placebo (normal saline)
Caesarean section	81 per 1 000	47 per 1 000 (27 to 82)	RR 0.58 (0.33 to 1.02)	766 (7 RCTs)	⊕⊕○○ LOW ^{a,b}	Sterile water may make little or no difference in the use of caesarean section compared to placebo (normal saline)
Effect on labour contractions	0 per 1 000	0 per 1 000 (0 to 0)	not estimable	(0 studies)	-	No studies were found that measured effect on labour contractions
Adverse effects mother	0 per 1 000	0 per 1 000 (0 to 0)	not estimable	(0 studies)	-	No studies were found that measured adverse effects mother

Adverse effects baby	0 per 1 000	0 per 1 000 (0 to 0)	not estimable	(0 studies)	-	No studies were found that measured adverse effects baby
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*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; RR: Risk ratio

a. incomplete outcome data, small sample size, performance bias

b. wide confidence intervals

Pharmacological interventions

Table 9. Epidural compared to TENS

Setting: hospital in Beijing, China (1 RCT)

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with TENS	Risk with Epidural				
Satisfaction with pain relief	-	-	-	-	-	No studies were found that measured satisfaction with pain relief
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	67 per 1 000	67 per 1 000 (10 to 443)	RR 1.00 (0.15 to 6.64)	60 (1 RCT)	⊕○○○ VERY LOW ^{a,b}	It is uncertain whether epidural compared to TENS increases the use of assisted vaginal birth
Caesarean section	33 per 1 000	67 per 1 000 (6 to 697)	RR 2.00 (0.19 to 20.90)	60 (1 RCT)	⊕○○○ VERY LOW ^{a,b}	It is uncertain whether epidural compared to TENS increases the use of caesarean section

Labour contractions	-	-	-	-	-	No studies were found that measured labour contractions
Adverse effects mother: hypotension	0 per 1 000	0 per 1 000 (0 to 0)	RR 3.00 (0.13 to 70.83)	60 (1 RCT)	⊕○○○ VERY LOW ^{a,b}	It is uncertain whether epidural compared to TENS increases hypotension
Adverse effects mother: urinary retention	0 per 1 000	0 per 1 000 (0 to 0)	RR 3.00 (0.13 to 70.83)	60 (1 RCT)	⊕○○○ VERY LOW ^{a,b}	It is uncertain whether epidural compared to TENS increases urinary retention.
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effects baby	-	-	-	-	-	No studies were found that measured adverse effects in the babies
Breastfeeding	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers

***The risk in the intervention group** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

a. High risk of performance and detection bias due to lack of blinding. Unclear risk of selection, attrition and reporting bias (-1)

b. Very few events and wide confidence interval (-2)

Table 10. Epidural compared to continuous support

Setting: Australia (1 RCT)

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with continuous support	Risk with Epidural				
Satisfaction with pain relief	990 per 1 000	1000 per 1 000 (990 to 1 000)	RR 1.01 (1.00 to 1.02)	992 (1 RCT)	⊕⊕⊕○ MODERATE ^a	Epidural probably makes little or no difference to satisfaction with pain relief compared to continuous support.
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	297 per 1 000	344 per 1 000 (285 to 412)	RR 1.16 (0.96 to 1.39)	992 (1 RCT)	⊕⊕⊕○ MODERATE ^a	Epidural probably makes little or no difference to the use of assisted vaginal birth compared to continuous support.
Caesarean section	142 per 1 000	172 per 1 000 (129 to 231)	RR 1.21 (0.91 to 1.62)	992 (1 RCT)	⊕⊕⊕○ MODERATE ^a	Epidural probably makes little or no difference to the use of caesarean section compared to continuous support.
Labour contractions	-	-	-	-	-	No studies were found that measured labour contractions
Adverse effect mother: long-term headache at 6 months	291 per 1 000	279 per 1 000 (230 to 340)	RR 0.96 (0.79 to 1.17)	992 (1 RCT)	⊕⊕⊕○ MODERATE ^a	Epidural probably makes little or no difference to long-term headache compared to continuous support.
Adverse effect mother: long-term backache at 6 months	238 per 1 000	210 per 1 000 (165 to 265)	RR 0.88 (0.69 to 1.11)	992 (1 RCT)	⊕⊕⊕○ MODERATE ^a	Epidural probably makes little or no difference to long-term backache compared to continuous support.

Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effect baby: Apgar score < 7 at 5 minutes	8 per 1 000	16 per 1 000 (5 to 54)	RR 2.02 (0.61 to 6.68)	992 (1 RCT)	⊕⊕○○ LOW ^{a,b}	Epidural may make little or no difference to the occurrence of Apgar score < 7 at 5 minutes after birth compared to continuous support.
Other adverse effects baby	-	-	-	-	-	No studies were found that measured other adverse effects in the babies
Breastfeeding	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).

CI: Confidence interval; RR: Risk ratio

a. High risk attrition bias and blinding, unclear other bias (-1)

b. Wide confidence interval (-1)

Table 11. Epidural compared to placebo or no intervention

Setting: Brazil (1 RCT), Turkey (1 RCT), China (3 RCTs)

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with placebo/no treatment	Risk with Epidural				
Satisfaction with pain relief	714 per 1 000	943 per 1 000 (750 to 1 000)	RR 1.32 (1.05 to 1.65)	70 (1 RCT)	⊕⊕⊕○ MODERATE ^a	Epidural probably slightly improves satisfaction with pain relief compared to placebo/no treatment.
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	8 per 1 000	27 per 1 000 (5 to 146)	RR 3.41 (0.62 to 18.80)	515 (4 RCTs)	⊕⊕○○ LOW ^{b,c}	Epidural may make little or no difference to the use of assisted vaginal birth compared to placebo/no treatment.
Caesarean section	83 per 1 000	38 per 1 000 (19 to 75)	RR 0.46 (0.23 to 0.90)	578 (5 RCTs)	⊕⊕⊕○ MODERATE ^b	Epidural probably reduces the use of ceasarean section compared to placebo/no treatment.
Effect on labour contractions	-	-	-	-	-	No studies were found that measured labour contractions

Adverse effects mother: itching	0 per 1 000	0 per 1 000 (0 to 0)	RR 3.00 (0.13 to 70.83)	60 (1 RCT)	⊕○○○ VERY LOW ^{a,c}	It is uncertain whether epidural increases itching compared to placebo/no treatment.
Adverse effects mother: fever > 38° C	0 per 1 000	0 per 1 000 (0 to 0)	RR 11.00 (0.63 to 191.69)	70 (1 RCT)	⊕○○○ VERY LOW ^{a,c}	It is uncertain whether epidural increases maternal fever compared to placebo/no treatment.
Adverse effects mother: perineal trauma requiring suturing	162 per 1 000	139 per 1 000 (81 to 243)	RR 0.86 (0.50 to 1.50)	285 (1 RCT)	⊕○○○ VERY LOW ^{c,e}	It is uncertain whether epidural increases perineal trauma requiring suturing compared to placebo/no treatment.
Adverse effects mother: urinary retention	0 per 1 000	0 per 1 000 (0 to 0)	RR 3.00 (0.32 to 28.21)	160 (2 RCTs)	⊕○○○ VERY LOW ^{b,d}	It is uncertain whether epidural increases urinary retention compared to placebo/no treatment
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effects baby: Apgar score < 7 at 5 minutes	0 per 1 000	0 per 1 000 (0 to 0)	not estimable	60 (1 RCT)	⊕○○○ VERY LOW ^{a,d}	It is uncertain whether epidural increases the occurrence of Apgar < 7 at 5 minutes after birth compared to placebo/no treatment

Other adverse effects baby	-	-	-	-	-	No studies were found that measured other adverse effects in the babies
Breastfeeding	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

- a. High risk of performance and detection bias (-1)
- b. The included trials had design limitations with respect to blinding and selective reporting. Also, there was unclear risk of bias in many domains. (-1)
- c. Wide confidence interval (-1)
- d. Few events and very wide confidence interval (-2)
- e. High risk of performance, detection, reporting and other bias, unclear risk of selection and attrition bias (-2)

Table 12. Inhaled analgesia compared to TENS

Setting: USA, UK, Sweden, Norway, Canada, China, Singapore, Iran

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with TENS	Risk with Inhaled analgesia				
Satisfaction with pain relief	900 per 1 000	504 per 1 000 (261 to 963)	RR 0.56 (0.29 to 1.07)	20 (1 RCT)	⊕○○○ VERY LOW ^{a,b,c}	It is uncertain whether inhaled analgesia increases satisfaction with pain relief compared to TENS
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience

Assisted vaginal birth	-	-	-	-	-	No studies were found that measured the use of assisted vaginal birth
Caesarean section	-	-	-	-	-	No studies were found that measured the use of Caesarean section
Labour contractions	-	-	-	-	-	No studies were found that measured labour contractions
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effects baby	-	-	-	-	-	No studies were found that measured adverse effects in the babies
Breastfeeding	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

- a. Unclear risk of selection, performance and detection bias due to lacking methodological details (-1)
- b. Wide confidence interval and few events (-2)
- c. Not downgraded for indirectness.

Table 13. Inhaled analgesia compared to placebo control or no intervention

Setting: USA, UK, Sweden, Norway, Canada China, Iran, Singapore

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with placebo /no treatment	Risk with inhaled analgesia				
Satisfaction with pain relief	-	-	-	-	-	No studies were found that measured satisfaction with pain relief
Satisfaction with childbirth experience	-	-	-	-	-	No studies were found that measured satisfaction with childbirth experience
Assisted vaginal birth	40 per 1 000	60 per 1 000 (18 to 206)	RR 1.50 (0.44 to 5.15)	200 (1 RCT)	⊕○○○ VERY LOW ^{a,b,c}	It is uncertain whether inhaled analgesia increases the use of assisted vaginal birth compared to placebo or no treatment
Caesarean section	115 per 1 000	137 per 1 000 (86 to 219)	RR 1.20 (0.75 to 1.91)	465 (3 RCTs)	⊕○○○ VERY LOW ^{a,c,d}	It is uncertain whether inhaled analgesia increases the use of caesarean section compared to placebo or no treatment
Labour contractions	-	-	-	-	-	No studies were found that measured labour contractions
Other adverse effects mother	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers
Adverse effect baby: Neonatal asphyxia	60 per 1 000	67 per 1 000 (16 to 284)	RR 1.11 (0.26 to 4.73)	110 (1 RCT)	⊕○○○ VERY LOW ^{a,b,c}	It is uncertain whether inhaled analgesia increases neonatal asphyxia compared to placebo or no treatment

Adverse effect baby: Apgar score < 7 at 5 minutes	0 per 1 000	0 per 1 000 (0 to 0)	RR 9.00 (0.49 to 165.00)	200 (1 RCT)	⊕○○○ VERY LOW ^{a,b,c}	It is uncertain whether inhaled analgesia increases the occurrence of Apgar score < 7 at 5 minutes after birth compared to placebo or no treatment
Other adverse effects baby	-	-	-	-	-	No studies were found that measured other adverse effects in the babies
Breastfeeding	-	-	-	-	-	No studies were found that measured other adverse effects in the mothers

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio

- a. Unclear risk of selection, performance and detection bias due to lacking methodological details (-1)
- b. Wide confidence interval and few events (-2)
- c. Not downgraded for indirectness.
- d. Wide confidence interval including different directions of effect (-1)

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