

BOXES, FIGURES AND TABLES

Box 1. List of pharmacological pain management options.

Pharmacological pain management options:

- Epidural analgesia
- Parenteral opioids, such as fentanyl, diamorphine and pethidine
- Patient-controlled analgesia, such as remifentanyl
- Inhaled analgesia, such as nitrous oxide
- Non-opioid drugs, such as diazepam
- Local anesthetic nerve block, such as paracervical block

Box 2. List of outcome categories (maternal, fetal, neonatal, child health, health service, provider's perspective and economic outcomes) and sub-categories based on consultations with clinical experts.

<p>Maternal outcomes</p> <p><i>Pain-related outcomes</i> Pain intensity, variably measured using:</p> <ul style="list-style-type: none"> • visual analogue score or visual analogue pain score • verbal analogue/rating score • numerical rating scale • other methods <p>Back soreness/Back ache Motor blockade Sensory blockade</p> <p><i>Women's perspective outcomes</i> Woman's satisfaction with pain relief</p> <ul style="list-style-type: none"> • visual analogue score or visual analogue pain score • numerical rating scale • descriptive scale (verbal) • percentage score <p>Satisfaction with analgesia in labour measured during the postnatal period Memory of labour Sense of control in labour Satisfaction with childbirth experience Desire to use the same analgesia in future</p> <p><i>Physiological outcomes</i> Maternal blood pressure Maternal hypotension Maternal heart rate Respiratory rate</p>	<p>Respiratory depression Apnoea End tidal CO₂ (EtCO₂) Oxygen saturation (SaO₂) Oxygen desaturation (as defined by trialist) Maternal acid-base balance/blood gases Maternal serum levels (lactate, aspartate transaminase, creatinine, prolactin) Maternal temperature</p> <p><i>Labour and childbirth outcomes</i> Duration of stages of labour Slow labour progress Progress of cervical dilatation Uterine contractions Uterine relaxation Spontaneous membrane rupture Amniotomy Maternal expulsion period Meconium-stained liquor Malposition Use of catheterisation during labour Mode of birth Spontaneous vaginal birth Assisted vaginal birth (including forceps, vacuum) Caesarean section (emergency, elective) Indication for caesarean section Uterine rupture Continuous support (e.g. midwifery support, contact with relatives) Birth trauma</p>	<p>Perineal trauma Oxytocin augmentation Episiotomy</p> <p><i>Infection-related outcomes</i> Fever Urinary infection</p> <p><i>Mental health-related outcomes</i> Mental state Postnatal depression Anxiety/distress</p> <p><i>Immediate postpartum outcomes</i> Blood loss Postpartum haemorrhage</p> <p><i>Other maternal outcomes</i> Vaginal haematoma Negative effects on mother/baby interaction Addition of other pain relief interventions (other than study drug) Need for rescue analgesia/medication (mother or baby) Duration of analgesia Amount of analgesia given Onset of analgesia Time from request of analgesia to time she felt the level of pain relief was satisfactory Time from study drug administration until request for additional analgesia</p>	<p>Time from the administration of analgesia to the beginning of the second stage Number of women after 10 mins experiencing satisfactory pain relief Number of top-up doses requested to treat breakthrough pain</p> <p>Maternal side effects Bradycardia Headache Nausea Vomiting Itching (pruritus) Feeling cold Shivers Drowsiness Sedation Euphoria Dizziness Numbness Dreams, hallucinations Smell of gas Dry mouth Orientation Motor coordination Mobility, ability to ambulate Hyperthermia Patient cooperation Patient responsiveness Pain experienced from injection Urinary retention Renal and hepatic toxicity Cardiac compromise</p>
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Box 3. List of outcome categories (maternal, fetal, neonatal, child health, health service, provider's perspective and economic outcomes) and sub-categories based on consultation with clinical experts continued.

<p>Venous thromboembolic events Require general anaesthetic for caesarean section Other serious maternal morbidity (e.g. meningitis, eclampsia, ICU admission)</p> <p>Fetal outcomes</p> <p>Fetal distress/non-reassuring fetal status Fetal bradycardia Abnormal fetal heart rate Fetal temperature Fetal heart rate monitoring/CTG Fetal scalp blood sampling Doppler pulsatility index</p> <p>Neonatal outcomes</p> <p>Physiological outcomes</p> <p>Umbilical cord blood gases (arterial or venous) Neonatal acid-base balance Acidosis, as defined by cord blood arterial pH <7.2, 7.15 Blood chemistry (base excess or deficits of haemoglobin concentrations) Neonatal oxygen saturation Neonatal temperature Neonatal blood pressure Apgar score (as defined by trialist)</p> <p>Cardio-respiratory outcomes</p>	<p>Silverman-Anderson Score Time of delivery to first breath Neonatal respiratory rate Neonatal asphyxia Neonatal resuscitation Oxygen and ventilation support Respiratory depression</p> <p>Nutrition outcomes</p> <p>Breastfeeding (at specified time points) Birth weight Weight change Neonatal feeding behaviour Neonatal hypoglycaemia</p> <p>Neurological outcomes</p> <p>Neurobehavioral assessment Muscle tone The Amiel-Tison Test at 2 and 24 hours Neurological and Adaptive Capacity Score (NACS) at 2 and 24 hours Neonatal seizure within 24 hours after birth Neurodevelopment outcomes during infancy</p> <p>Infection-related outcomes</p> <p>Neonatal fever Neonatal sepsis</p> <p>Metabolic outcomes</p> <p>Neonatal serum bilirubin levels/hyperbilirubinemia</p>	<p>Neonatal jaundice Neonatal lethargy/irritability</p> <p>Other neonatal outcomes</p> <p>Long-term neonatal complication Neonatal morbidity (e.g. intraventricular haemorrhage, necrotising enterocolitis) Neonatal mortality</p> <p>Child health outcomes</p> <p>Poor infant outcomes at long-term follow-up (as defined by trialist, e.g. seizures, disability in childhood)</p> <p>Health service outcomes</p> <p>Maternal</p> <p>Duration of maternal admission Postpartum follow-up Postpartum hospital admission within 6 weeks of discharge Number of women re-admitted into hospital within one month Number of women requiring ongoing anaesthetic follow-up following discharge from hospital</p> <p>Neonatal</p> <p>Paediatrician assessment at 24 hours Admission to SCN/NICU Naloxone administration</p>	<p>Infant discharged from hospital 6 days postpartum</p> <p>Provider outcomes</p> <p>Provider's perspective of labour pain, pain relief, or progress of labour</p> <p>Adverse effects on healthcare provider</p> <p>Occupational exposure (for the professional) Toxic effects on reproduction (for the professional)</p> <p>Economic outcome</p> <p>Cost (as defined by trialist)</p>
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Figure 1. PRISMA Flow Chart

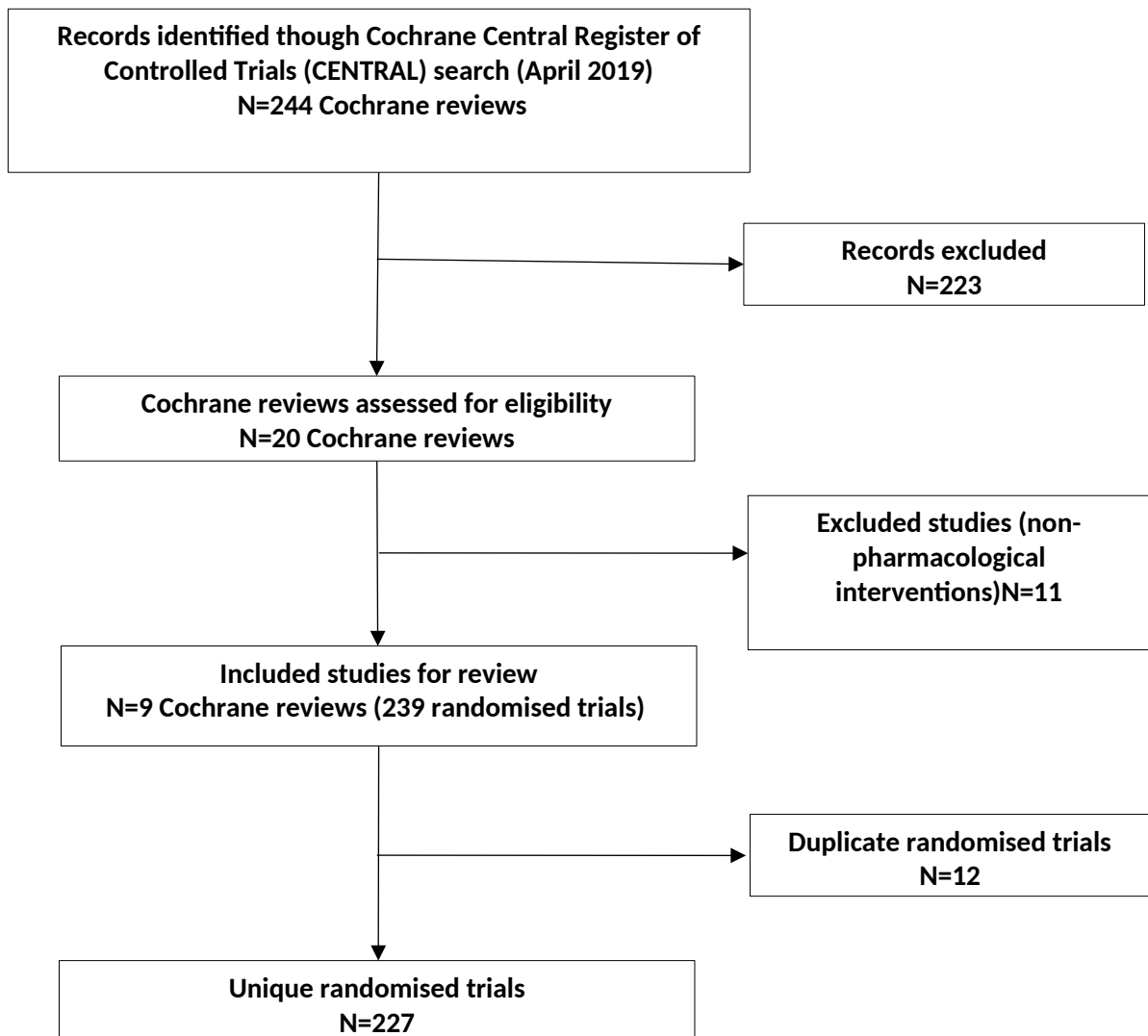


Table 1. Frequency of outcomes reported in N=236 studies (Cochrane reviews and RCTs).

Domain	Number of Outcomes N=146	Number of Studies (reviews and trials) N=236
Maternal outcomes	92/146 (63.0)	236/236 (100)
Pain-related	4/92 (4.3)	172/236 (72.9)
Women's perspectives ¹	6/92 (6.5)	143/236 (60.6)
Labour and childbirth	22/92 (23.9)	208/236 (88.1)
Physiological	12/92 (13.0)	172/236 (72.9)
Infection-related	2/92 (2.2)	20/236 (8.5)
Mental health	3/92 (3.3)	17/236 (7.2)
Immediate postpartum	3/92 (3.3)	39/236 (16.5)
Side effects	28/92 (30.4)	194/236 (82.2)
Other ²	12/92 (13.0)	186/236 (78.8)
Fetal outcomes	7/146 (4.8)	147/236 (62.3)
Neonatal outcomes	34/146 (23.3)	218/236 (92.4)
Physiological	8/34 (23.5)	207/236 (87.7)
Cardio-respiratory	7/34 (20.6)	80/236 (33.9)
Nutrition	5/34 (14.7)	90/236 (38.1)
Neurological	6/34 (17.6)	40/236 (16.9)
Infection	2/34 (5.9)	14/236 (5.9)
Metabolic	3/34 (8.8)	14/236 (5.9)
Other ³	3/34 (8.8)	30/236 (12.7)
Child health outcomes	1/146 (0.7)	4/236 (1.7)
Health service outcomes	9/146 (6.2)	105/236 (44.5)
Maternal	5/9 (55.6)	49/236 (20.8)
Neonatal	4/9 (44.4)	83/236 (35.2)
Provider outcomes	3/146 (2.1)	57/236 (24.2)
Provider's perspective	1/3 (33.3)	56/236 (23.7)
Adverse effects on provider	2/3 (66.7)	1/236 (0.4)
Economic outcomes	1/146 (0.7)	15/236 (6.4)

¹ Examples of women's perspectives include a woman's satisfaction of pain relief and childbirth experience, sense of control in labour and memory of labour, as defined by trialist

² This includes but is not limited to the onset, time and duration of analgesia used during labour and childbirth

³ Includes long-term neonatal complications, morbidity and mortality

