National Institute for Health and Care Excellence

Draft for consultation

Termination of Pregnancy

[N] Anaesthesia or sedation for surgical termination of pregnancy

NICE guideline <TBC>

Evidence reviews

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Draft for Consultation

These evidence reviews were developed by the National Guideline Alliance hosted by the Royal College of Obstetricians and Gynaecologists

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ISBN:

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Anaesthesia or sedation for surgical termination of pregnancy?

Review question

What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

Introduction

The aim of this review is to determine the optimal method of anaesthesia or sedation for surgical termination of pregnancy.

Summary of the protocol

See Table 1 for a summary of the population, intervention, comparison and outcome (PICO) characteristics of this review.

Table 1: Summary of the protocol (PICO table)

Population	Women who are having a uterine evacuation for surgical termination of pregnancy using electric or manual vacuum aspiration, or dilatation and evacuation.
Intervention	Local anaesthesia: • Paracervical block • Intracervical block • Intrauterine installation • Anaesthetic gel (e.g., lidocaine) Conscious sedation: • Oral or IV Benzodiazepines • Zopiclone • Nitrous oxide and oxygen mixture (Entonox or titrated nitrate) Deep sedation: • IV Benzodiazepines • Propofol • Ketamine General anaesthesia: • IV Benzodiazepines • Propofol • Sevoflurane • Isoflurane • Desflurane • Ketamine • Thiopentone • Etomodate
Comparison	• Local anaesthesia only versus conscious sedation (± local anaesthesia and/or IV or oral opioids)

	• Local anaesthesia only versus deep sedation • Local anaesthesia only versus general anaesthesia • Conscious sedation (± local anaesthesia and/or IV or oral opioids) versus deep sedation • Conscious sedation (± local anaesthesia and/or IV or oral opioids) versus general anaesthesia • Deep sedation versus general anaesthesia • Propofol (general anaesthesia) versus sevoflurane/ isoflurane/ desflurane (general anaesthesia) • Oral conscious sedation (± local anaesthesia and/or IV or oral opioids) versus IV conscious sedation (± local anaesthesia and/or IV or oral opioids) • Local anaesthesia method A versus local anaesthesia method B
Outcome	**Critical outcomes** • Patient satisfaction • Termination of pregnancy completed with intended method of sedation/anaesthesia • Pain **Important outcomes** • Haemorrhage requiring transfusion or > 500ml of blood loss • Nausea • Vomiting • Length of admission

IV: intravenous

For further details see the full review protocol in appendix A.

Clinical evidence

Included studies

Only studies conducted from 1990 were considered for this review question, as propofol was licensed in the mid-1980's, using a cut off of 1990 gives time for anaesthetists to become experienced with the agent and not capture studies with a high complication rate due to inexperience.

Eleven randomised controlled trials (RCTs; number of participants, N=1,260) were included in the review (Allen 2009; Bayer 2015; Conti 2016; Edelman 2004; Edelman 2006; Mankowski 2009; Micks 2015; Nathan 1998; Raeder 1992; Wong 2002; Xu 2012).

Two RCTs compared local anaesthesia against conscious sedation (and local anaesthesia) (Bayer 2015; Wong 2002). One RCT compared deep sedation (and local anaesthesia) against general anaesthesia (Raeder 1992). Three RCTs compared propofol (general anaesthesia) against sevoflurane (general anaesthesia) (Micks 2015; Nathan 1998; Xu 2012). One RCT compared oral conscious sedation against intravenous (IV) conscious sedation (Allen 2009). Four RCTs compared different methods of administration for local anaesthesia (paracervical block versus intracervical block [n=1; Mankowski 2009], paracervical block versus self-administered anaesthetic gel [n=1; Conti 2016], paracervical block and intrauterine infusion versus paracervical block alone [n=2; Edelman 2004; Edelman 2006]). No studies compared local anaesthesia against deep sedation or general anaesthesia, or conscious sedation against deep sedation or general anaesthesia.

None of the included studies reported subgroup data based on medical conditions or gestational age. However, 7 of the 11 RCTs only included women with gestational ages less than 14^{+0} weeks. An additional 2 studies only included women during the first-trimester but did not define the threshold for this in terms of gestational age; 1 of these trials (Conti 2016) used the preoperative use of misoprostol (normally given from 12 weeks in the included clinics) as the threshold. Only 1 RCT (Micks 2015) included women after 14^{+0} weeks' gestation. The remaining RCT (Nathan 1998) did not report the gestational ages included.

The included studies are summarised in Table 2.

See the literature search strategy in appendix B and study selection flow chart in appendix C.

Excluded studies

Studies not included in this review with reasons for their exclusions are provided in appendix K.

Summary of clinical studies included in the evidence review

A summary of the studies that were included in this review are presented in Table 2.

Table 2: Summary of included studies

Study and setting	Population	Intervention/ comparison	Outcomes
Allen 2009 RCT USA	n=130 English- or Spanish-speaking women ≥18 years old 5^{+0} to 12^{+6} weeks' gestation	**Oral conscious sedation:** Two oral 5mg oxycodone tablets and 1 sublingual 1mg lorazepam tablet; 60 minutes later, 2 2ml syringes of saline **IV conscious sedation:** Two oral placebo tablets and 1 sublingual placebo tablet (Vitamin C and Vitamin B12); 60 minutes later, 2ml IV fentanyl and 2ml IV midazolam	• Patient satisfaction • Termination of pregnancy completed with intended method of sedation/ anaesthesia • Pain • Nausea • Vomiting
Bayer 2015 RCT USA	n=123 English- or Spanish-speaking women ≥18 years old; good general health; ≥100lbs 6^{+0} to 10^{+6} weeks' gestation	**Conscious sedation (+ local anaesthesia):** 5mL oral cherry-flavoured 2 mg/mL midazolam syrup and PCB of 20ml buffered 1% lidocaine **Local anaesthesia:** 5ml oral cherry-flavoured placebo syrup and PCB of 20ml buffered 1% lidocaine	• Patient satisfaction • Pain • Vomiting
Conti 2016	n=147	**PCB:** 12ml of 1% lidocaine (total 120mg);	• Patient satisfaction

Study and setting	Population	Intervention/ comparison	Outcomes
RCT USA	English- or Spanish-speaking women ≥18 years old; chosen IV sedation First trimester (cut-off was administration of preoperative misoprostol which was normally given from 12 weeks at the included clinics)	100mg IV fentanyl and 1mg IV midazolam **Lidocaine gel:** 20ml of 2% lidocaine gel (total 400mg) self-administered vaginally; 100mg IV fentanyl and 1mg IV midazolam	• Pain
Edelman 2004 RCT USA	n=80 English-speaking women ≥18 years old; good general health; >100lbs <11 weeks' gestation	**PCB + intrauterine infusion:** PCB of 1ml of 1% nonbuffered lidocaine on the anterior and posterior lip of the cervix and 4.5ml of 1% lidocaine at 4 and 8 o'clock position; 10ml 1% lidocaine intrauterine infusion **PCB:** PCB of 1ml of 1% nonbuffered lidocaine on the anterior and posterior lip of the cervix and 4.5ml of 1% lidocaine at 4 and 8 o'clock position; 10ml sterile saline intrauterine infusion	• Patient satisfaction • Pain
Edelman 2006 RCT USA	n=77 English-speaking women ≥18 years old; good general health; >100lbs <11 weeks' gestation	**PCB + intrauterine infusion:** PCB of 1ml of 1% nonbuffered lidocaine on the anterior and posterior lip of the cervix and 4.5ml of 1% lidocaine at 4 and 8 o'clock position; 5ml 4% lidocaine intrauterine infusion **PCB:** PCB of 1ml of 1% nonbuffered lidocaine on the anterior and posterior lip of the cervix and 4.5ml of 1% lidocaine at 4 and 8 o'clock position; 5ml sterile saline intrauterine infusion	• Patient satisfaction • Pain
Mankowski 2009	n=132	**PCB:** 20ml local anaesthetic (5ml 1%	• Pain

Study and setting	Population	Intervention/ comparison	Outcomes
RCT USA	≥98lbs (further inclusion criteria not reported) <12 weeks' gestation	lidocaine, 5 units vasopressin, 5ml 8% sodium bicarbonate) injected at the cervicovaginal junction **Intracervical block:** 20ml local anaesthetic (5ml 1% lidocaine, 5 units vasopressin, 5ml 8% sodium bicarbonate) injected into the cervical stroma	• Nausea • Vomiting
Micks 2015 RCT USA	n=160 Women ≥16 years old 18-24 weeks' gestation	**Sevoflurane:** Sevoflurane and oxygen mixture (concentration not reported) delivered through face mask; IV propofol, IV midazolam, IV fentanyl, IV oxytocin and inhaled nitrous oxide (doses not reported) **Control:** IV propofol, IV midazolam, IV fentanyl, IV oxytocin and inhaled nitrous oxide (doses not reported)	• Patient satisfaction • Termination of pregnancy completed with intended method of sedation/anaesthesia • Pain • Haemorrhage requiring transfusion or > 500ml of blood loss • Nausea • Vomiting
Nathan 1998 RCT France	n=52 Women >18 years old; ASA grade I Gestational age not reported	**Sevoflurane:** Induced using the single breath vital capacity technique with 8% sevoflurane in 6 $1min^{-1}$ oxygen; maintained with 2-3% sevoflurane in 2 $1min^{-1}$ fresh gas flow including nitrous oxide **Propofol:** Induced with propofol (dose not reported) and maintained with 60% nitrous oxide	• Pain • Nausea • Vomiting
Raeder 1992 RCT Norway	n=59 50-80kg; ASA grade I or II First trimester (not defined)	**Deep sedation (+ local anaesthesia):** 0.1mg/kg IV midazolam and 0.01mg/kg IV alfentanil before PCB with 2 10ml of 20mg/ml mepivacaine and 0.005mg/ml adrenaline	• Patient satisfaction • Pain

Study and setting	Population	Intervention/ comparison	Outcomes
		General anaesthesia: 0.01mg/kg IV alfentanil 1 minute before 2mg/kg bolus injection propofol; women breathed 75% nitrous oxide in oxygen by mask	
Wong 2002 RCT China	n=100 Women aged >16 years; normal general and gynaecological exam <12 weeks' gestation	**Conscious sedation (+ local anaesthesia):** 2mg IV midazolam and 25micrograms IV fentanyl were given 2 minutes prior to PCB with 10ml 1% lignocaine **Local anaesthesia:** PCB with 10ml 1% lignocaine	• Patient satisfaction
Xu 2012 RCT China	N=200 Electrical suction aspiration <10 weeks' gestation	**Sevoflurane:** 8% sevoflurane with oxygen through spontaneous breathing with a face mask **Propofol:** 1.5 to 2.5mg/kg IV propofol	• Patient satisfaction

ASA grade: American Society of Anesthesiologists physical status classification; IV: intravenous; min: minute; PCB: paracervical block; RCT: randomised controlled trial

See the full evidence tables in appendix D and the forest plots in appendix E.

Quality assessment of clinical studies included in the evidence review

See the clinical evidence profiles in appendix F.

Economic evidence

Included studies

A systematic review of the economic literature was conducted but no economic studies were identified which were applicable to this review question.

A single economic search was undertaken for all topics included in the scope of this guideline. Please see supplementary material 2 for details.

Excluded studies

No full-text copies of articles were requested for this review and so there is no excluded studies list.

Economic model

No economic modelling was undertaken for this review because the committee agreed that other topics were higher priorities for economic evaluation.

Evidence statements

Comparison 1. Local anaesthesia versus conscious sedation (and local anaesthesia)

Critical outcomes

Patient satisfaction – would recommend to friend

RCT evidence showed a lower clinically important difference in the rate of women that would recommend their anaesthesia method to a friend in the 'local anaesthesia' group compared with the 'conscious sedation (and local anaesthesia); group (1 RCT, n=122; RR=0.76 [95% CI 0.60, 0.96]; moderate quality).

Patient satisfaction – overall satisfaction

RCT evidence showed a lower clinically important difference in the rate of women rating overall satisfaction as 'excellent' (1 RCT, n=100; RR=0.10 [95% CI 0.01, 0.75]; high quality); and there was a higher clinically important difference in rates of women rating overall satisfaction as 'fair' (1 RCT, n=100; RR=1.67 [95% CI 1.08, 2.57]; moderate quality) in the 'local anaesthesia' group compared with the 'conscious sedation (and local anaesthesia)' group. RCT evidence did not detect a clinically important difference in the rate of women rating overall satisfaction as 'satisfactory' (1 RCT, n=100; RR=0.60 [95% CI 0.29, 1.24]; low quality) or 'unsatisfactory' (1 RCT, n=100; RR=1.43 [95% CI 0.59, 3.45]; low quality) between the 'local anaesthesia' group and the 'conscious sedation (and local anaesthesia)' group; however there was uncertainty around the estimate. However, RCT evidence did not detect a clinically important difference in patient satisfaction between the 'local anaesthesia' group and the 'conscious sedation (and local anaesthesia)' group when measured on a 100mm visual analogue scale 30 minutes post-operation (1 RCT, n=122; MD=-0.60 [95% -7.42, 6.22]; high quality) or 3 days post-operation (1 RCT, n=85; (MD=-9.20 [95% CI -20.25, 1.85]; moderate quality); however there was uncertainty around the estimates. .

Patient satisfaction – anxiety control (100mm visual analogue scale)

RCT evidence showed a lower clinically important difference in patient satisfaction measured as anxiety control in the 'local anaesthesia' group compared with the 'conscious sedation (and local anaesthesia)' group 30 minutes post-operation (1 RCT, n=122; MD=-12.80 [95% CI -22.47, -3.23]; moderate quality) and 3 days post-operation (1 RCT, n=85; MD=-14.50 [95% CI -27.29, -1.71]; moderate quality).

Patient satisfaction – pain control (100mm visual analogue scale)

RCT evidence did not detect a clinically important difference in patient satisfaction measured as pain control between the 'local anaesthesia' group and the 'conscious sedation (and local anaesthesia) group 30 minutes post operation (1 RCT, n=122; MD=-6.8 [95% CI -17.11, 3.51]; moderate quality) or 3 days post-operation (1 RCT, n=85; MD=-11.6 [95% CI -24.56, 1.36]; moderate quality); however there was uncertainty around the estimates.

Termination of pregnancy completed with intended method of sedation/ anaesthesia

No evidence was identified to inform this outcome.

Pain – during aspiration (100mm visual analogue scale)

RCT evidence did not detect a clinically important difference in pain during aspiration between the 'local anaesthesia' group and the 'conscious sedation (and local anaesthesia)' group (1 RCT, n=123; MD=4.2 [95% CI -3.35, 11.75]; moderate quality); however there was uncertainty around the estimate.

Important outcomes

Haemorrhage requiring transfusion or > 500ml of blood loss

No evidence was identified to inform this outcome.

Nausea

No evidence was identified to inform this outcome.

Vomiting – 30 minutes post-operation

RCT evidence did not detect a clinically important difference in the rate of vomiting between the 'local anaesthesia' group and the 'conscious sedation (and local anaesthesia)' group (1 RCT, n=122; RR=1.00 [95% CI 0.06, 15.62]; low quality); however there was uncertainty around the estimate.

Length of admission

No evidence was identified to inform this outcome.

Comparison 2. Deep sedation (and local anaesthesia) versus general anaesthesia

Critical outcomes

Patient satisfaction – would have same anaesthesia again

RCT evidence did not detect a clinically important difference in the rate of women who would have the same anaesthesia again between the 'deep sedation (and local anaesthesia)' group and the 'general anaesthesia' group (1 RCT, n=59; RR=1.07 [95% CI 0.83, 1.37]; low quality); however there was uncertainty around the estimate.

Termination of pregnancy completed with intended method of sedation/ anaesthesia

No evidence was identified to inform this outcome.

Pain

RCT evidence showed a lower clinically important difference in the rate of pain during the hospital stay (1 RCT, n=59; RR=0.33 [95% CI 0.17, 0.67]; moderate quality) and pain measured continuously on an 11=point sale (1 RCT, n=59; MD=-1.00 [95% CI -1.77, -0.23]; low quality) in the 'deep sedation (and local anaesthesia)' group compared with the 'general anaesthesia' group. However, RCT evidence did not detect a clinically important difference in the rate of pain during travel home (1 RCT, n=59; RR=0.18 [95% CI 0.02, 1.45]; very low quality) or during the following night and day (1 RCT, n=59; RR=0.90 [95% CI 0.39, 2.08];

very low quality) between the 'deep sedation (and local anaesthesia)' group and the 'general anaesthesia' group; however there was uncertainty around the estimates.

Important outcomes

Haemorrhage requiring transfusion or > 500ml of blood loss

No evidence was identified to inform this outcome.

Nausea

No evidence was identified to inform this outcome.

Vomiting

No evidence was identified to inform this outcome.

Length of admission

No evidence was identified to inform this outcome.

Comparison 3. Propofol (general anaesthesia) versus sevoflurane (general anaesthesia)

Critical outcomes

Patient satisfaction – overall satisfaction

RCT evidence showed no clinically important difference in the rate of overall satisfaction (1 RCT, n=200; RR=0.99 [95% CI 0.91, 1.08]; moderate quality) or satisfaction measured continuously on a 10cm visual analogue scale (1 RCT, n=160; MD=-0.10 [95% CI -0.49, 0.29]; high quality) between the 'propofol' group and the 'sevoflurane' group.

Patient satisfaction – would recommend to friend (10cm visual analogue scale)

RCT evidence showed no clinically important difference in the rate of women who would recommend their anaesthesia method to a between the 'propofol' group and the 'sevoflurane' group (1 RCT, n=160; MD=-0.10 [95% CI -0.48, 0.28]; high quality).

Termination of pregnancy completed with intended method of sedation/ anaesthesia

RCT evidence showed no clinically important difference in the rate of termination being completed with intended method of sedation/anaesthesia between the 'propofol' group and the 'sevoflurane' group (1 RCT, n=160; RR=1.03 [95% CI 0.98, 1.07]; high quality).

Pain

RCT evidence did not detect a clinically important difference in the rate of pain during recovery (1 RCT, n=52; RR=5.00 [95% CI 0.25, 99.34]; very low quality), 24 hours post-operation (1 RCT, n=45; RR=1.28 [95% CI 0.53, 3.08]; very low quality); however there was uncertainty around the estimate. The evidence showed there was no clinically important difference when measured continuously on a 10cm visual analogue scale upon waking from anaesthesia (1 RCT, n=160; MD=0.20 [95% CI -0.50, 0.90]; high quality) or upon discharge (1 RCT, n=160; MD=-0.20 [95% CI -0.89, 0.49]; high quality) between the 'propofol' group and the 'sevoflurane' group.

Important outcomes

Haemorrhage requiring transfusion or > 500ml of blood loss

RCT evidence did not detect a clinically important difference in the rate of haemorrhage requiring transfusion or >500ml blood loss between the 'propofol' and 'sevoflurane' group (1 RCT, n=160; RR=0.20 [95% CI 0.01, 4.10]; moderate quality); however there was uncertainty around the estimate.

Nausea

RCT evidence did not detect a clinically important difference in the rate of nausea between the 'propofol' group and the 'sevoflurane' group (2 RCTs, n=205; RR=0.52 [95% CI 0.19, 1.46]; very low quality); however there was uncertainty around the estimate.

Vomiting

RCT evidence did not detect a clinically important difference in the rate of vomiting between the 'propofol' group and the 'sevoflurane' group (2 RCTs, n=205; RR=0.54 [95% CI 0.19, 1.54]; very low quality); however there was uncertainty around the estimate.

Length of admission

No evidence was identified to inform this outcome.

Comparison 4. Oral conscious sedation versus intravenous conscious sedation

Critical outcomes

Patient satisfaction – pain control

RCT evidence showed a lower clinically important difference in the rate of pain control being rated as 'completely/mostly acceptable' (1 RCT, n=130; RR=0.65 [95% CI 0.50, 0.83]; moderate quality) a higher clinically important difference in the rate of pain control being rated as 'somewhat acceptable' (1 RCT, n=130; RR=3.38 [95% CI 1.66, 6.87]; high quality) , and the rate of pain control being rated as 'mostly/completely unacceptable' (1 RCT, n=130; RR=1.00 [95% CI 0.21, 4.77]; low quality) did not detect a clinically important difference between the 'oral conscious sedation' group and the 'intravenous conscious sedation' grou; however there was uncertainty around the estimate..

Patient satisfaction – would recommend to friend

RCT evidence did not detect a clinically important difference in the rates of women who would 'definitely/probably' recommend their anaesthesia method to a friend (1 RCT, n=130; RR=0.87 [95% CI 0.75, 1.00]; moderate quality), 'don't know' if they would recommend their anaesthesia method to a friend (1 RCT, n=130; RR=5.00 [95% CI 0.60, 41.63]; low quality), or would 'probably/definitely not' recommend their anaesthesia method to a friend between the 'oral conscious sedation' group and the 'intravenous conscious sedation' group. (1 RCT, n=130; RR=2.00 [95% CI 0.63, 6.32]; low quality); however there was uncertainty around the estimates.

Patient satisfaction – would choose same method again

RCT evidence showed a lower clinically important difference in the rate of women who would 'definitely/probably' choose the same method again (1 RCT, n=130; RR=0.77 [95% CI 0.65, 0.91]; moderate quality), a higher clinically important difference in the rate of women who

would 'probably/definitely not' choose the same method again (1 RCT, n=130; RR=3.50 [95% CI 1.22, 10.07]; moderate quality), and did not detect a clinically important difference in the rate of women who 'don't know' if they would choose the same method again (1 RCT, n=130; RR=9.00 [95% CI 0.49, 163.85]; low quality) between the 'oral conscious sedation' group and the 'intravenous conscious sedation' group; however there was uncertainty around the estimates.

Termination completed with intended method of sedation/anaesthesia

RCT evidence showed there was no clinically important difference in the rate of termination being completed with the intended method of sedation/anaesthesia between the 'oral conscious sedation' group and the 'intravenous conscious sedation' group (1 RCT, n=130; RR=1.00 [95% CI 0.97, 1.03]; high quality).

Pain – intraoperative

RCT evidence showed a higher clinically important difference in intraoperative pain measured continuously on a 100-point scale (1 RCT, n=130; MD=24.90 [95% CI 16.01, 33.79]; high quality) and the rate of pain being rated as 'severe' (1 RCT, n=130; RR=3.00 [95% CI 1.60, 5.62]; high quality), a lower clinically important difference in the rate of pain being rated as 'mild' (1 RCT, n=130; RR=0.32 [95% CI 0.18, 0.55]; high quality), and did not detect a clinically important difference in the rate of pain being rated as 'moderate' (1 RCT, n=130; RR=1.35 [95% 0.80, 2.29]; moderate quality) between the 'oral conscious sedation' group and the 'intravenous conscious sedation' group; however there was uncertainty around the estimates.

Pain – postoperative (100-point scale)

RCT evidence did not detect a clinically important difference in postoperative pain between the 'oral conscious sedation; group and the 'intravenous conscious sedation' group (1 RCT, n=130; MD=7.30 [95% CI 1.01, 13.59]; moderate quality); however there was uncertainty around the estimates. .

Important outcomes

Haemorrhage requiring transfusion or > 500ml of blood loss

No evidence was identified to inform this outcome.

Nausea – postoperative

RCT evidence showed a higher clinically important difference in the rate of postoperative nausea in the 'oral conscious sedation' group compared with the 'intravenous conscious sedation' group (1 RCT, n=130; RR=1.91 [95% CI 1.00, 3.63]; moderate quality).

Vomiting – postoperative

RCT evidence did not detect a clinically important difference in the rate of postoperative vomiting between the 'oral conscious sedation' group and the 'intravenous conscious sedation' group (1 RCT, n=130; RR=2.50 [95% CI 0.83, 7.57]; moderate quality); however there was uncertainty around the estimates.

Length of admission

No evidence was identified to inform this outcome.

Comparison 5. Local anaesthesia method A versus local anaesthesia method B

Critical outcomes

Patient satisfaction – overall satisfaction (100mm VAS)

Paracervical block versus lidocaine gel

RCT evidence did not detect a clinically important difference in overall satisfaction between the 'paracervical block' group and the 'lidocaine gel' group (1 RCT, n=137; MD=-6.48 [95% CI -14.49, 1.53]; very low quality); however there was uncertainty around the estimates. .

Paracervical block and intrauterine infusion versus paracervical block

RCT evidence showed there was no clinically important difference in overall satisfaction between the 'paracervical block and intrauterine infusion' group and the 'paracervical block' group (2 RCTs, n=157; MD=2.01 [95% CI -4.66, 8.68]; moderate quality)

Patient satisfaction – would recommend to friend (100mm VAS)

Paracervical block versus lidocaine gel

RCT evidence did not detect a clinically important difference in the rate of women who would recommend their anaesthesia method to a friend between the 'paracervical block' group and the 'lidocaine gel' group (1 RCT, n=137; MD=-3.00 [95% CI -9.30, 3.30]; very low quality); however there was uncertainty around the estimates.

Termination of pregnancy completed with intended method of sedation/ anaesthesia

No evidence was identified to inform this outcome.

Pain – cervical dilation

Paracervical block versus lidocaine gel

RCT evidence did not detect a clinically important difference in the rate of pain with cervical dilation measured on a 100mm visual analogue scale between the 'paracervical block' group and the 'lidocaine gel' group (1 RCT, n=137; MD=-4.00 [95% CI -11.58, 3.58]; very low quality); however there was uncertainty around the estimates.

Paracervical block versus intracervical block

RCT evidence showed there was no clinically important difference in the rate of pain with cervical dilation measured on a 10cm visual analogue scale between the 'paracervical block' group and the 'intracervical block' group (1 RCT, n=132; MD=-0.20 [95% CI -0.97, 0.57]; moderate quality).

Paracervical block and intrauterine infusion versus paracervical block

RCT evidence did not detect a clinically important difference in the rate of pain measured on a 100mm visual analogue scale between the 'paracervical block and intrauterine infusion' group and the 'paracervical block' group when a 10ml 1% lidocaine intrauterine infusion was used (1 RCT, n=79; MD=-3.00 [95% CI -14.72, 8.72]; low quality) but a lower clinically important difference when a 5ml 4% lidocaine intrauterine infusion was used (1 RCT, n=74;

MD=-20.00 [95% CI -32.86, -7.14]; low quality); however there was uncertainty around the estimates.

Pain – aspiration/curettage

Paracervical block versus intracervical block

RCT evidence did not detect a clinically important difference in the rate of pain with curettage measured on a 10cm visual analogue scale between the 'paracervical block' group and the 'intracervical block' group (1 RCT, n=132; MD=0.60 [95% CI -0.32, 1.52]; low quality); however there was uncertainty around the estimates.

Paracervical block and intrauterine infusion versus paracervical block

RCT evidence did not detect a clinically important difference in pain with aspiration measured on a 100mm visual analogue scale between the 'paracervical block and intrauterine infusion' group and the 'paracervical block' group when a 10ml 1% lidocaine intrauterine infusion was used (1 RCT, n=80; MD=-4.00 [95% CI -18.27, 10.27]; low quality); however there was uncertainty around the estimate but there was a lower clinically important difference when a 5ml 4% lidocaine intrauterine infusion was used (1 RCT, n=76; MD=-28.00 [95% CI -39.53, -16.47]; moderate quality).

Pain – 30-45 minutes post operation (100mm VAS)

Paracervical block versus lidocaine gel

RCT evidence showed there was no clinically important difference in the rate of pain 30-45 minutes post operation between the 'paracervical block' group and the 'lidocaine gel' group (1 RCT, n=137; MD=1.10 [95% CI -5.41, 7.61]; very low quality).

Paracervical block and intrauterine infusion versus paracervical block

RCT evidence did not detect a clinically important difference in the rate of pain 30 minutes post operation between the 'paracervical block and intrauterine infusion' group and the 'paracervical block' group when a 10ml 1% lidocaine intrauterine infusion was used (1 RCT, n=79; MD=7.00 [95% CI -2.26, 16.26]; low quality) or when a 5ml 4% lidocaine intrauterine infusion was used (1 RCT, n=75; MD=-5.00 [95% CI -14.51, 4.51]; low quality); however there was uncertainty around the estimates.

Important outcomes

Haemorrhage requiring transfusion or > 500ml of blood loss

No evidence was identified to inform this outcome.

Nausea

Paracervical block versus intracervical block

RCT evidence did not detect a clinically important difference in the rate of nausea between the 'paracervical block' group and the 'intracervical block' group (1 RCT, n=132; RR=0.33 [95% CI 0.01, 8.04]; very low quality); however there was uncertainty around the estimates.

Vomiting

Paracervical block versus intracervical block

RCT evidence did not detect a clinically important difference in the rate of vomiting between the 'paracervical block' group and the 'intracervical block' group (1 RCT, n=132; RR=0.33 [95% CI 0.01, 8.04]; very low quality); however there was uncertainty around the estimates.

Length of admission

No evidence was identified to inform this outcome.

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The aim of sedation and anaesthesia during termination of pregnancy is to reduce pain, distress and, if desired, awareness during the procedure; therefore, patient satisfaction and pain were selected as critical outcomes. Whether or not it was possible to complete the termination of pregnancy with the intended method of sedation or anaesthesia was also selected as a critical outcome as it may be necessary to administer additional sedation or anaesthesia if the procedure is not tolerated using selected methods.

Haemorrhage requiring transfusion or greater than 500ml of blood loss was selected as an important outcome as some agents, particularly inhalational anaesthesia (sevoflurane, isoflurane and desflurane), cause uterine relaxation, which may in turn cause excessive bleeding during the termination of pregnancy procedure. Similarly, nausea and vomiting were selected as important outcomes as these may be more common with the use of some agents, particularly inhalational anaesthesia and oral or intravenous opioids used in sedation or general anaesthetic regimes. Finally, length of admission was selected as an important outcome as this will be affected by: time needed for sedation or anaesthesia to take effect, including titrating dose to required level of sedation and administration of additional sedation or anaesthesia as needed; management of any immediate complications that arise, which may differ based on sedation or anaesthesia used; and time to recover from sedation or anaesthesia.

The quality of the evidence

The evidence in the pairwise comparisons was assessed using the GRADE methodology. Evidence for patient satisfaction ranged from very low to high quality but the majority of evidence was of moderate to high quality; the main reasons evidence for this outcome was downgraded was imprecision due to wide confidence intervals and risk of bias due to a lack of blinding and the subjective nature of this outcome. There was limited evidence available for whether termination of pregnancy was completed with intended method of sedation or anaesthesia; however, where this evidence was available, it was high quality. Evidence for pain ranged from very low to high quality; the main reasons evidence for this outcome was downgraded was imprecision due to wide confidence intervals and risk of bias due to a lack of blinding and the subjective nature of this outcome, but there was also some inconsistency in this outcome across included studies. Haemorrhage requiring transfusion or greater than 500ml of blood loss was only reported for one comparison (propofol general anaesthesia versus sevoflurane general anaesthesia); evidence was moderate quality and downgraded because of imprecision due to wide confidence intervals. Evidence for nausea and vomiting

ranged from very low to moderate quality and the main reason evidence was downgraded was imprecision due to wide confidence intervals. Finally, there was no evidence for length of admission.

There was no evidence comparing local anaesthesia with deep sedation or general anaesthesia, or conscious sedation with deep sedation or general anaesthesia.

Benefits and harms

There was evidence of greater overall patient satisfaction and satisfaction with anxiety control, and increased rate of women who would recommend the anaesthesia or sedation method they received to a friend, for women who received conscious sedation in addition to local anaesthesia compared with women who received local anaesthesia without sedation. However, the committee agreed that there were benefits of having local anaesthesia without sedation, such as a shorter admission time due to reduced time for anaesthesia to take effect and reduced recovery time, that may contribute to overall patient satisfaction that were not observable in the evidence due to differences between administering local anaesthesia only as part of a placebo-controlled randomised trial compared with normal clinical practice. Therefore, the committee did not think it was appropriate to conclude that conscious sedation and local anaesthesia would be superior to local anaesthesia without sedation for all women and recommended the use of both methods, depending on the preference of the woman.

There was evidence of reduced pain during the hospital stay in women who had deep sedation compared with general anaesthesia. However, this trial was confounded as women in the deep sedation arm also received local anaesthesia, which was not given in the general anaesthesia arm. As general anaesthesia is very short acting, pain would be expected after the termination of pregnancy procedure if women have not received local anaesthesia. Therefore, the committee agreed there was insufficient evidence to conclude that either deep sedation or general anaesthesia is more effective than the other and recommended that both methods would be appropriate for women who desire a lack of full consciousness during the procedure.

There was good evidence of improved satisfaction with pain control, an increase in the rate of women who would choose the same method of sedation or anaesthesia again and reduced pain and nausea in women who had intravenous conscious sedation compared with those who had oral conscious sedation; therefore, the committee made a strong recommendation that, if using conscious sedation, intravenous conscious sedation is used rather than oral conscious sedation.

The available evidence showed no clinically meaningful differences between propofol general anaesthesia and sevoflurane general anaesthesia. However, haemorrhage requiring transfusion or greater than 500ml of blood loss is a rare event and evidence for this outcome was only available from 1, relatively small study which may have been underpowered to detect differences in this outcome. Further, 1 of the included trials (Nathan 1998) was stopped early due to twice as much bleeding occurring in the sevoflurane arm compared with the propofol arm. Therefore, the committee recommended that clinicians consider using propofol for general anaesthesia compared with inhalational anaesthesia. Propofol does not have any analgesic properties and all included studies also used a short-acting opioid, such as fentanyl. Therefore, the committee recommended a short-acting opioid was used in combination with propofol.

The recommendation was made for all inhalational anaesthesia (sevoflurane, isoflurane and desflurane), rather than just sevoflurane, as they are all known to cause uterine relaxation (Yoo 2006), which is the likely cause of increased blood loss in the sevoflurane arm. The committee agreed that further research comparing inhalational and intravenous anaesthesia

would be beneficial to inform future practice, so they decided to make a research recommendation (see Appendix L).

There was evidence of no clinically meaningful differences between different methods of administration of local anaesthesia, with the exception of reduced pain with cervical dilation and aspiration when a 5ml 4% lidocaine intrauterine infusion was added to a paracervical block; however, this difference was not observed when a 10ml 1% lidocaine intrauterine infusion was used. Therefore, the committee agreed that it was not possible to recommend a specific method of local anaesthesia. However, there was limited evidence comparing paracervical or intracervical methods of local anaesthesia with intrauterine methods, the evidence that was available was mainly low quality, and there were major confounders such as the use of fentanyl. Therefore, the committee agreed that further research on the efficacy of local anaesthesia methods, including the addition of intrauterine anaesthesia, would be beneficial to inform future research so made a research recommendation (see Appendix L).

The committee noted that the use of local anaesthesia and conscious sedation was not widespread among all sectors of the NHS, although interest was growing, and the use of conscious sedation is widespread in other areas like endoscopy and assisted conception. There was concern that a recommendation to offer these could mean that units introduced them without using best practice and as a result women could have a poor experience. Therefore, it is likely that training will be needed for staff administering it. Whilst different methods of local anaesthesia and conscious sedation were compared as part of this review, comparisons of optimal techniques within these methods were not considered as part of this review question. Therefore, the committee could not recommend specific protocols for local anaesthesia.

Cost effectiveness and resource use

A systematic review of the economic literature was conducted but no relevant studies were identified which were applicable to this review question.

The committee discussed the potential costs and savings of recommendations and agreed that there would not be a substantial increase in costs or resources. There is the potential for reduced resource use associated with using intravenous conscious sedation rather than oral conscious sedation as the former takes less time to take effect and has a shorter recovery time. Further, due to the greater effectiveness of intravenous compared with oral conscious sedation, increased use of intravenous sedation is likely to reduce the need for additional sedation or anaesthesia, or rebooking procedures due to inadequate sedation. However, absolute reductions in resource use are unclear as it is not currently known what proportion of procedures are undertaken using oral conscious sedation.

Other consideration

The committee acknowledged that some women, for example those who have previously given birth without any pain relief, may not want any sedation or anaesthesia for the termination of pregnancy procedure and should have the option of declining this. However, no anaesthesia was not included as a comparison in this review question so the committee could not make recommendation in this area..

The committee were aware of guidelines on perioperative fasting from the European Society of Anaesthesiology (2011); however, fasting was not considered as part of this review question so the committee could not make recommendations in this area.

Whilst this question did not investigate the use of oral analgesics, the committee noted that most of the trials in the evidence base had used oral analgesia pre-treatment and so their

findings may not apply if this did not happen. Therefore, although they were not able to make any recommendations specifically about oral analgesics, the committee noted that they may be of benefit.

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Appendices

Appendix A – Review protocols

Review protocol for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

Field (based on PRISMA-P	Content
Review question in SCOPE	What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?
Review question in guideline	What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?
Type of review question	Intervention
Objective of the review	To determine the optimal method of anaesthesia or sedation for surgical termination of pregnancy
Eligibility criteria – population	Women who are having a uterine evacuation for surgical termination of pregnancy using electric or manual vacuum aspiration, or dilatation and evacuation. Exclusions: - Studies with indirect populations will not be considered
Eligibility criteria – intervention(s)	Local anaesthesia: • Paracervical block • Intracervical block • Intrauterine installation • Anaesthetic gel (e.g., lidocaine) Conscious sedation: • Oral or IV Benzodiazepines • Zopiclone • Nitrous oxide and oxygen mixture (Entonox or titrated nitrate) Deep sedation: • IV Benzodiazepines • Propofol • Ketamine General anaesthesia: • IV Benzodiazepines • Propofol • Sevoflurane • Isoflurane • Desflurane • Ketamine • Thiopentone • Etomodate

Field (based on PRISMA-P	Content
Eligibility criteria – comparator(s)/control	Comparisons: 1. Local anaesthesia only versus conscious sedation (± local anaesthesia and/or IV or oral opioids) 2. Local anaesthesia only versus deep sedation 3. Local anaesthesia only versus general anaesthesia 4. Conscious sedation (± local anaesthesia and/or IV or oral opioids) versus deep sedation 5. Conscious sedation (± local anaesthesia and/or IV or oral opioids) versus general anaesthesia 6. Deep sedation versus general anaesthesia 7. Propofol (general anaesthesia) versus sevoflurane/ isoflurane/ desflurane (general anaesthesia) 8. Oral conscious sedation (± local anaesthesia and/or IV or oral opioids) versus IV conscious sedation (± local anaesthesia and/or IV or oral opioids) 9. Local anaesthesia method A versus local anaesthesia method B
Outcomes and prioritisation	**Critical outcomes:** • Patient satisfaction • Termination of pregnancy completed with intended method of sedation/ anaesthesia • Pain **Important outcomes:** • Haemorrhage requiring transfusion or > 500ml of blood loss • Nausea • Vomiting • Length of admission
Eligibility criteria – study design	- Systematic reviews of RCTs - RCTs
Other inclusion exclusion criteria	Inclusion: - English-language - Studies conducted from 1990 (see below)
Proposed sensitivity/sub-group analysis, or meta-regression	Stratified analyses based on the following sub-groups of women, where possible: Medical conditions: - Complex pre-existing medical conditions - No complex pre-existing medical conditions Gestation:

Field (based on PRISMA-P	Content
	- <9 weeks - ≥9^{+0} to 13^{+6} - ≥14 weeks Or if not possible, - <14 weeks - ≥14 weeks
Selection process – duplicate screening/selection/analysis	Dual weeding will not be performed for this question Sifting, data extraction, appraisal of methodological quality and GRADE assessment will be performed by the systematic reviewer. Quality control will be performed by the senior systematic reviewer. Dual data extraction will not be performed for this question.
Data management (software)	Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5). 'GRADEpro' will be used to assess the quality of evidence for each outcome. NGA STAR software will be used for study sifting, data extraction, recording quality assessment using checklists and generating bibliographies/citations,
Information sources – databases and dates	Sources to be searched: Medline, Medline In-Process, CCTR, CDSR, DARE, HTA, Embase Limits (e.g. date, study design): Apply standard animal/non-English language exclusion Limit to RCTs and systematic reviews Dates: from 1990 Only studies conducted from 1990 will be considered for this review question, as propofol was licensed in the mid-1980's, using a cut off of 1990 gives time for anaesthetists to become experienced with the agent and not capture studies with a high complication rate due to inexperience
Identify if an update	Not an update
Author contacts	For details please see the guideline in development web site.
Highlight if amendment to previous protocol	For details please see Section 4.5 of Developing NICE guidelines: the manual
Search strategy – for one database	For details please see appendix B
Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as appendix D (clinical evidence tables) or appendix H (economic evidence tables).
Data items – define all variables to be collected	For details please see evidence tables in appendix D (clinical evidence tables) or appendix H (economic evidence tables).

Field (based on PRISMA-P	Content
Methods for assessing bias at outcome/study level	Appraisal of methodological quality: The methodological quality of each study will be assessed using an appropriate checklist: • RoBIS for systematic reviews • Cochrane risk of bias tool for RCTs The risk of bias across all available evidence will be evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/
Criteria for quantitative synthesis (where suitable)	For details please see Section 6.4 of Developing NICE guidelines: the manual
Methods for analysis – combining studies and exploring (in)consistency	Synthesis of data: Pairwise meta-analysis will be conducted where appropriate for all other outcomes. When meta-analysing continuous data, change scores will be pooled in preference to final scores. For details regarding inconsistency, please see the methods chapter Minimally important differences: Statistical significance will be used for 'haemorrhage requiring transfusion or > 500ml of blood loss'. For the remaining outcomes, default values will be used: 0.8 and 1.25 for dichotomous outcomes (relative risks); 0.5 times SD (for the control group) for continuous outcomes.
Meta-bias assessment – publication bias, selective reporting bias	For details please see Section 6.2 of Developing NICE guidelines: the manual. If sufficient relevant RCT evidence is available, publication bias will be explored using RevMan software to examine funnel plots.
Assessment of confidence in cumulative evidence	For details please see Sections 6.4 and 9.1 of Developing NICE guidelines: the manual
Rationale/context – Current management	For details please see the introduction to the evidence review.
Describe contributions of authors and guarantor	A multidisciplinary committee developed the guideline. The committee was convened by The National Guideline Alliance and chaired by Profession Iain Cameron in line with section 3 of Developing NICE guidelines: the manual. Staff from The National Guideline Alliance will undertake systematic literature searches, appraise the evidence, conduct meta-analysis and cost-effectiveness analysis where appropriate, and draft the guideline in collaboration with the

Field (based on PRISMA-P	Content
	committee. For details please see the methods chapter.
Sources of funding/support	The National Guideline Alliance is funded by NICE and hosted by the Royal College of Obstetricians and Gynaecologists
Name of sponsor	The National Guideline Alliance is funded by NICE and hosted by the Royal College of Obstetricians and Gynaecologists
Roles of sponsor	NICE funds The National Guideline Alliance to develop guidelines for those working in the NHS, public health, and social care in England
PROSPERO registration number	Not registered

GRADE: Grading of Recommendations Assessment, Development and Evaluation; IV: intravenous; N/A: not applicable; NHS: National Health Service; NICE: National Institute for Health and Care Excellence; NGA: National Guideline Alliance; RCT: randomised controlled trial; RoBIS: risk of bias in systematic reviews; SD: standard deviation

Appendix B – Literature search strategies

Literature search strategy for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

The search for this topic was last run on 11th June 2018. It was decided not to undertake a re-run for this topic in November 2018 as this is not a fast moving evidence base and there were unlikely to be any new studies published which would affect the recommendations.

Database: Medline & Embase (Multifile)
Last searched on **Embase Classic+Embase** 1947 to 2018 June 08, **Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R)** 1946 to Present
Date of last search: 11th June 2018

#	Searches
1	exp abortion/ use emczd
2	exp pregnancy termination/ use emczd
3	exp Abortion, Induced/ use ppez
4	Abortion Applicants/ use ppez
5	exp Abortion, Spontaneous/ use ppez
6	exp Abortion, Criminal/ use ppez
7	Aborted fetus/ use ppez
8	fetus death/ use emczd
9	abortion.mp.
10	(abort$ or postabort$ or preabort$).tw.
11	((f?etal$ or f?etus$ or gestat$ or midtrimester$ or pregnan$ or prenatal$ or pre natal$ or trimester$) and terminat$).tw.
12	((f?etal$ or f?etus$) adj loss$).tw.
13	((gestat$ or midtrimester$ or pregnan$ or prenatal$ or pre natal$ or trimester$) adj3 loss$).tw.
14	(((elective$ or threaten$ or voluntar$) adj3 interrupt$) and pregnan$).tw.
15	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
16	Pain/dt, pc use ppez
17	pain/dt, pc use emczd
18	Pain, Postoperative/dt, pc use ppez
19	postoperative pain/dt, pc use emczd
20	(pain adj (control or management or treatment)).tw.
21	(Anesthesia, Local/ or Anesthetics, Local/) use ppez
22	(Anesthesia, Obstetrical/ or Analgesia, Obstetrical/) use ppez
23	Lidocaine/ use ppez
24	(local anesthesia/ or local anesthetic agent/) use emczd
25	(obstetric anesthesia/ or obstetric analgesia/) use emczd
26	paracervical block/ use emczd
27	lidocaine/ use emczd
28	(local adj3 (an?esthe$ or analges$)).tw.

#	Searches
29	((paracervical or intracervical or intrauterine or para-cervical or intra-cervical or intra-uterine) adj3 (an?esthe$ or analges$ or block$)).tw.
30	((an?esthe$ or analges$) adj3 (gel$ or topical or cream$ or ointment$ or spray$)).tw.
31	(lidocain$ or lignocain$ or xylocain$).tw.
32	Conscious Sedation/ use ppez
33	Deep Sedation/ use ppez
34	"Hypnotics and Sedatives"/ use ppez
35	exp sedation/ use emczd
36	sedative agent/ use emczd
37	(sedat$ or hypnot$ or tranquiliz$).tw.
38	exp Benzodiazepines/ use ppez
39	exp benzodiazepine derivative/ use emczd
40	ben?odia?epin$.tw.
41	zopiclone/ use emczd
42	(zopiclon$ or zimovan$ or imovan$).tw.
43	Nitrous Oxide/ use ppez
44	nitrous oxide/ use emczd
45	nitrous oxide plus oxygen/ use emczd
46	(nitrous adj oxide$).tw.
47	entonox$.tw.
48	(N2O adj inhal$).tw.
49	(propofol$ or diprivan$ or fresofol$ or pofol$ or recofol$).tw.
50	Ketamine/ use ppez
51	ketamine/ use emczd
52	(ketamin$ or ketalar$).tw.
53	(exp Anesthesia, General/ or exp Anesthetics, General/) use ppez
54	(exp general anesthesia/ or exp anesthetic agent/) use emczd
55	(general adj3 an?esthe$).tw.
56	exp Methyl Ethers/ use ppez
57	exp Thiobarbiturates/ use ppez
58	exp ether derivative/ use emczd
59	exp barbituric acid derivative/ use emczd
60	(sevoflurane$ or sevorane$ or ultane$ or isoflurane$ or forane$ or terrell$ or desflurane$ or suprane$ or thiopentone$ or thiopental$ or trapanal$ or etomidat$ or hypnomidate$ or amidate$).tw.
61	or/16-60
62	15 and 61
63	((surgical or suction or vacuum) adj6 (abortion or termination)).tw.
64	61 and 63
65	62 or 64
66	(controlled clinical trial or pragmatic clinical trial or randomized controlled trial).pt. or drug therapy.fs. or (groups or placebo or randomi#ed or randomly or trial).ab.

#	Searches
67	crossover procedure/ or double blind procedure/ or randomized controlled trial/ or single blind procedure/ or (assign* or allocat* or crossover* or cross over* or ((doubl* or singl*) adj blind*) or factorial* or placebo* or random* or volunteer*).ti,ab.
68	meta-analysis/
69	meta-analysis as topic/
70	systematic review/
71	meta-analysis/
72	(meta analy* or metanaly* or metaanaly*).ti,ab.
73	((systematic or evidence) adj2 (review* or overview*)).ti,ab.
74	((systematic* or evidence*) adj2 (review* or overview*)).ti,ab.
75	(reference list* or bibliograph* or hand search* or manual search* or relevant journals).ab.
76	(search strategy or search criteria or systematic search or study selection or data extraction).ab.
77	(search* adj4 literature).ab.
78	(medline or pubmed or cochrane or embase or psychlit or psyclit or psychinfo or psycinfo or cinahl or science citation index or bids or cancerlit).ab.
79	cochrane.jw.
80	((pool* or combined) adj2 (data or trials or studies or results)).ab.
81	letter/
82	editorial/
83	news/
84	exp historical article/
85	Anecdotes as Topic/
86	comment/
87	case report/
88	(letter or comment*).ti.
89	81 or 82 or 83 or 84 or 85 or 86 or 87 or 88
90	randomized controlled trial/ or random*.ti,ab.
91	89 not 90
92	animals/ not humans/
93	exp Animals, Laboratory/
94	exp Animal Experimentation/
95	exp Models, Animal/
96	exp Rodentia/
97	(rat or rats or mouse or mice).ti.
98	91 or 92 or 93 or 94 or 95 or 96 or 97
99	letter.pt. or letter/
100	note.pt.
101	editorial.pt.
102	case report/ or case study/
103	(letter or comment*).ti.
104	99 or 100 or 101 or 102 or 103
105	randomized controlled trial/ or random*.ti,ab.
106	104 not 105

#	Searches
107	animal/ not human/
108	nonhuman/
109	exp Animal Experiment/
110	exp Experimental Animal/
111	animal model/
112	exp Rodent/
113	(rat or rats or mouse or mice).ti.
114	106 or 107 or 108 or 109 or 110 or 111 or 112 or 113
115	98 use ppez
116	114 use emczd
117	115 or 116
118	66 use ppez
119	67 use emczd
120	118 or 119
121	(or/68-69,72,74-79) use ppez
122	(or/70-73,75-80) use emczd
123	121 or 122
124	65 and 117
125	65 not 124
126	120 or 123
127	125 and 126
128	remove duplicates from 127
129	limit 128 to english language
130	limit 129 to yr="1990 -Current"

Database: Cochrane Library via Wiley Online
Date of last search: 11th June 2018

#	Searches
#1	MeSH descriptor: [Abortion, Induced] explode all trees
#2	MeSH descriptor: [Abortion Applicants] explode all trees
#3	MeSH descriptor: [Abortion, Spontaneous] explode all trees
#4	MeSH descriptor: [Abortion, Criminal] explode all trees
#5	MeSH descriptor: [Aborted Fetus] explode all trees
#6	"abortion":ti,ab,kw (Word variations have been searched)
#7	(abort* or postabort* or preabort*):ti,ab,kw (Word variations have been searched)
#8	((fetal* or fetus* or foetal* or foetus* or gestat* or midtrimester* or pregnan* or prenatal* or pre natal* or trimester*) and terminat*):ti,ab,kw (Word variations have been searched)
#9	((fetal* or fetus* or foetal* or foetus*) next loss*):ti,ab,kw (Word variations have been searched)
#10	((gestat* or midtrimester* or pregnan* or prenatal* or pre natal* or trimester*) near/3 loss*):ti,ab,kw (Word variations have been searched)
#11	(((elective* or threaten* or voluntar*) near/3 interrupt*) and pregnan*):ti,ab,kw (Word variations have been searched)
#12	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11

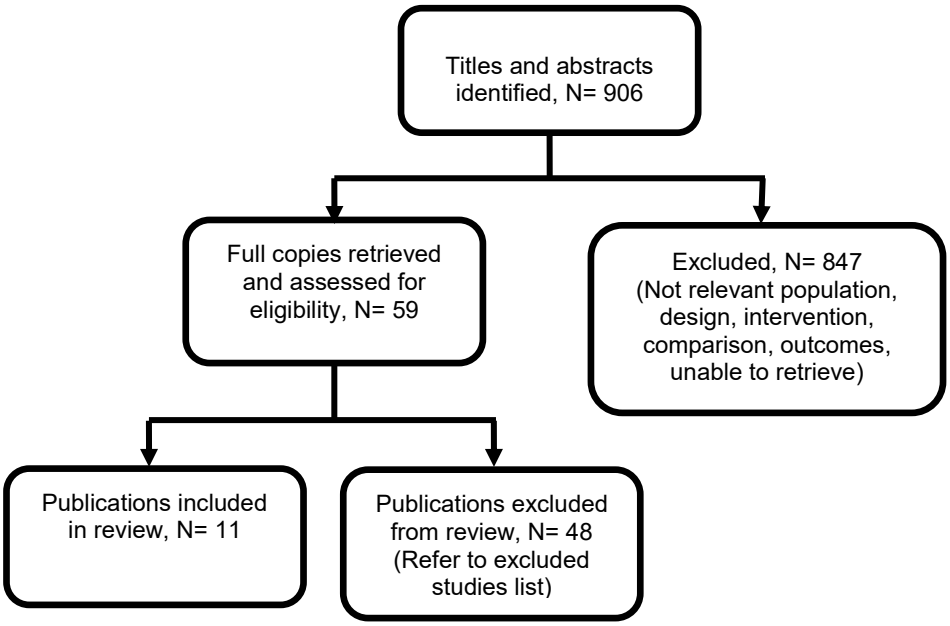
#	Searches
#13	MeSH descriptor: [Pain] this term only and with qualifier(s): [Drug therapy - DT, Prevention & control - PC]
#14	MeSH descriptor: [Pain, Postoperative] this term only and with qualifier(s): [Drug therapy - DT, Prevention & control - PC]
#15	(pain next (control or management or treatment)):ti,ab,kw (Word variations have been searched)
#16	MeSH descriptor: [Anesthesia, Local] this term only
#17	MeSH descriptor: [Anesthetics, Local] this term only
#18	MeSH descriptor: [Anesthesia, Obstetrical] this term only
#19	MeSH descriptor: [Analgesia, Obstetrical] this term only
#20	MeSH descriptor: [Lidocaine] this term only
#21	(local near/3 (anesthe* or anaesthe* or analges*)):ti,ab,kw (Word variations have been searched)
#22	((paracervical or intracervical or intrauterine or para-cervical or intra-cervical or intra-uterine) near/3 (anesthe* or anaesthe* or analges* or block*)):ti,ab,kw (Word variations have been searched)
#23	((anesthe* or anaesthe* or analges*) near/3 (gel* or topical or cream* or ointment* or spray*)):ti,ab,kw (Word variations have been searched)
#24	(lidocain* or lignocain* or xylocain*):ti,ab,kw (Word variations have been searched)
#25	MeSH descriptor: [Conscious Sedation] this term only
#26	MeSH descriptor: [Deep Sedation] this term only
#27	MeSH descriptor: [Hypnotics and Sedatives] this term only
#28	(sedat* or hypnot* or tranquiliz*):ti,ab,kw (Word variations have been searched)
#29	MeSH descriptor: [Benzodiazepines] explode all trees
#30	ben?odia?epin*:ti,ab,kw (Word variations have been searched)
#31	(zopiclon* or zimovan* or imovan*):ti,ab,kw (Word variations have been searched)
#32	MeSH descriptor: [Nitrous Oxide] this term only
#33	(nitrous next oxide*):ti,ab,kw (Word variations have been searched)
#34	entonox*:ti,ab,kw (Word variations have been searched)
#35	(N2O next inhal*):ti,ab,kw (Word variations have been searched)
#36	(propofol* or diprivan* or fresofol* or pofol* or recofol*):ti,ab,kw (Word variations have been searched)
#37	MeSH descriptor: [Ketamine] this term only
#38	(ketamin* or ketalar*):ti,ab,kw (Word variations have been searched)
#39	MeSH descriptor: [Anesthesia, General] explode all trees
#40	MeSH descriptor: [Anesthetics, General] explode all trees
#41	(general near/3 (anesthe* or anaesthe*)):ti,ab,kw (Word variations have been searched)
#42	MeSH descriptor: [Methyl Ethers] explode all trees
#43	MeSH descriptor: [Thiobarbiturates] explode all trees
#44	(sevoflurane* or sevorane* or ultane* or isoflurane* or forane* or terrell* or desflurane* or suprane* or thiopentone* or thiopental* or trapanal* or etomidat* or hypnomidate* or amidate*):ti,ab,kw (Word variations have been searched)
#45	#13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44
#46	#12 and #45

#	Searches
#47	((surgical or suction or vacuum) near/6 (abortion or termination)):ti,ab,kw (Word variations have been searched)
#48	#45 and #47
#49	#46 or #48

Appendix C – Clinical evidence study selection

Clinical evidence study selection for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

Figure 1: Study selection flow chart



Appendix D – Clinical evidence tables

Clinical evidence tables for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

Study details	Participants	Interventions	Outcomes and Results	Comments
Full citation Allen, R. H., Fitzmaurice, G., Lifford, K. L., Lasic, M., Goldberg, A. B., Oral compared with intravenous sedation for first-trimester Surgical Abortion: A randomized controlled trial, Obstetrics and Gynecology, 113, 276-283, 2009 **Ref Id** 883805 **Country/ies where the study was carried out** USA **Study type** Randomised controlled trial **Aim of the study**	**Sample size** n=2,193 screened for eligibility (n=444 ineligible for sedation; n=387 underweight; n=156 gestational age; n=59 language; n=37 maternal age; n=21 allergy; n=8 narcotic or intravenous drug use; n=2 inability to give consent) n=132 randomised (n=67 oral conscious sedation; n=65 IV conscious sedation) n=130 analysed (n=67 oral conscious sedation [n=2 excluded due to protocol violation]; n=65 conscious sedation) **Characteristics** Age in years (mean; standard deviation in parentheses): Oral conscious sedation: 23.9 (5.4)	All women received 800mg oral ibuprofen and additional oral medication according to treatment allocation. After 60 minutes, women received IV medication according to treatment allocation. All women received a paracervical block with 20ml of 1% buffered lidocaine; 2ml was administered into the anterior lip of the cervix before tenaculum placement and 8ml to the 4 and 8 o'clock positions of the cervix. The termination was completed using Pratt dilators and electric or manual suction; oxygen was given throughout the procedure and 25 to 50µ fentanyl was given if requested. Pain was measured on a 100-point scale within 3 minutes of speculum removal;	**Outcome: Patient satisfaction** <u>Pain control: completely/mostly acceptable</u> Oral conscious sedation: 35/65 IV conscious sedation: 54/65 <u>Pain control: somewhat acceptable</u> Oral conscious sedation: 27/65 IV conscious sedation: 8/65 <u>Pain control: mostly or completely unacceptable</u> Oral conscious sedation: 3/65 IV conscious sedation: 3/65	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: low risk, computer-generated blocks of four or six Allocation concealment: low risk, sequentially numbered sealed opaque envelopes Blinding of participants and personnel: low risk, double-blind Blinding of outcome assessment: low risk, double-blind Attrition: low risk for all outcomes; no missing data Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information**

Study details	Participants	Interventions	Outcomes and Results	Comments
To test whether oral and intravenous conscious sedation are equivalent for management of pain during first trimester surgical termination of pregnancy **Study dates** July 2006 to July 2007 **Source of funding** Anonymous foundation	IV conscious sedation: 26.1 (6.3) Gestational age in days (mean; standard deviation in parentheses): Oral conscious sedation: 61.3 (13) IV conscious sedation: 58.8 (11.2) Ethnicity - Latina (number; percentage in parentheses): Oral conscious sedation: 13 (20) IV conscious sedation: 10 (15.4) Ethnicity - African American (number; percentage in parentheses): Oral conscious sedation: 26 (40) IV conscious sedation: 22 (33.8) Ethnicity - White (number; percentage in parentheses): Oral conscious sedation: 22 (33.8) IV conscious sedation: 24 (36.9) Ethnicity - Asian (number; percentage in parentheses): Oral conscious sedation: 0 (0) IV conscious sedation: 3 (4.6)	postoperative pain and side effects were measured approximately 30 minutes after arriving in recovery. **Oral conscious sedation:** Women received 2 oral 5mg oxycodone tablets and 1 sublingual 1mg lorazepam tablet; 60 minutes later, 2 2ml syringes of saline were administered. **IV conscious sedation:** Women received 2 oral placebo tablets and 1 sublingual placebo tablet (Vitamin C and Vitamin B12); 60 minutes later, 2ml IV fentanyl and 2ml IV midazolam were administered.	Recommend to a friend: definitely/probably Oral conscious sedation: 52/65 IV conscious sedation: 60/65 Recommend to a friend: don't know Oral conscious sedation: 5/65 IV conscious sedation: 1/65 Recommend to a friend: probably or definitely no Oral conscious sedation: 8/65 IV conscious sedation: 4/65 Things about the pain control that could be better: strongly agree/agree Oral conscious sedation: 30/65 IV conscious sedation: 18/65 Things about the pain control that could be better: not sure	Underpowered to detect a difference of 2.5 on the pain scale; recruitment stopped at 50% of the way through planned sample size due to futility - assumed that further data collection would not yield evidence of equivalence

Study details	Participants	Interventions	Outcomes and Results	Comments
	Nulliparous (number; percentage in parentheses): Oral conscious sedation: 31 (48) IV conscious sedation: 28 (43) Prior termination (number; percentage in parentheses): Oral conscious sedation: 41 (63) IV conscious sedation: 39 (60) Prior termination (number; percentage in parentheses): Oral conscious sedation: 41 (63) IV conscious sedation: 39 (60) **Inclusion criteria** English- or Spanish-speaking women (or had translator available) at least 18 years old requesting surgical termination of pregnancy between 5^{+0} and 12^{+6} weeks' gestation **Exclusion criteria** Contraindication to any of the study medication; chronic narcotic, benzodiazepine, or barbiturate use within the past		Oral conscious sedation: 7/65 IV conscious sedation: 5/65 Things about the pain control that could be better: strongly disagree/disagree Oral conscious sedation: 28/65 IV conscious sedation: 42/65 Would choose same method again: definitely/probably Oral conscious sedation: 47/65 IV conscious sedation: 61/65 Would choose same method again: don't know Oral conscious sedation: 4/65 IV conscious sedation: 0/65 Would choose same method again: probably/ definitely not	

Study details	Participants	Interventions	Outcomes and Results	Comments
	year, IV drug use within the past year; weight <120lb		Oral conscious sedation: 14/65 IV conscious sedation: 4/65 **Outcome: Termination of pregnancy completed with intended method of sedation/ anaesthesia** Oral conscious sedation: 65/65 IV conscious sedation: 65/65 **Outcome: Pain (measured on 100-point scale)** <u>Intraoperative (continuous)</u> Oral conscious sedation: N=65, M=61.2; SD=25.2 IV conscious sedation: N=65, M=36.3, SD=26.5 <u>Intraoperative - mild (<40)</u> Oral conscious sedation: 12/65	

Study details	Participants	Interventions	Outcomes and Results	Comments
			IV conscious sedation: 38/65 Intraoperative - moderate (≥40-<70) Oral conscious sedation: 23/65 IV conscious sedation: 17/65 Intraoperative - severe (≥70-100) Oral conscious sedation: 30/65 IV conscious sedation: 10/65 Postoperative Oral conscious sedation: N=65, M=18.5, SD=18.8 IV conscious sedation: N=65, M=11.2, SD=17.8 **Outcome: Nausea (postoperative)** Oral conscious sedation: 21/65 IV conscious sedation: 11/65	

Study details	Participants	Interventions	Outcomes and Results	Comments
			Outcome: Vomiting (postoperative) Oral conscious sedation: 10/65 IV conscious sedation: 4/65	
Full citation Bayer, L. L., Edelman, A. B., Fu, R., Lambert, W. E., Nichols, M. D., Bednarek, P. H., Miller, K., Jensen, J. T., An Evaluation of Oral Midazolam for Anxiety and Pain in First-Trimester Surgical Abortion: A Randomized Controlled Trial, Obstetrics and Gynecology, 126, 37-46, 2015 **Ref Id** 883693 **Country/ies where the study was carried out** USA **Study type** Randomised controlled trial	**Sample size** n=870 screened for eligibility (n=416 did not meet inclusion criteria [n=273 gestational age; n=40 required IV sedation; n=19 younger than 18 years old; n=84 other reasons]; n=157 declined to participate; n=84 declined anxiolytic; n=70 daily enrolment limit had been reached; n=18 research assistant unavailable; n=1 study drug unavailable) n=124 randomised (n=62 midazolam [conscious sedation + local anaesthesia]; n=62 placebo [local anaesthesia]) n=123 analysed for primary outcome (n=62 midazolam [conscious sedation + local anaesthesia]; n=61 placebo [local anaesthesia; n=1 changed decision to have termination])	All women received 800mg oral ibuprofen at least 60 minutes before the procedure and study medication was given 30 to 60 minutes before the start of the procedure. All women were given a paracervical block of 20ml buffered 1% lidocaine and terminations were performed using vacuum aspiration; pain and anxiety were assessed at several time points throughout the procedure. Following the procedure, physicians reported difficulty of the procedure, adverse events, and maximum sedation of the women; women's satisfaction, pain and memory was assessed following the procedure and they were asked to complete	**Outcome: Patient satisfaction** Recommend to a friend (30 minutes postoperatively) Midazolam (conscious sedation + local anaesthesia): 49/61 Placebo (local anaesthesia): 37/61 Satisfaction with anxiety control - 100mm VAS (30 minutes postoperatively) Midazolam (conscious sedation + local anaesthesia): N=61, M=68.9, SD=24.7 Placebo (local anaesthesia): N=61, M=56.1, SD=29.6 Satisfaction with pain control - 100mm VAS	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: low risk, computer generated blocks of four; prepared by research pharmacy Allocation concealment: low risk, sequentially numbered sealed opaque envelopes; prepared by research pharmacy Blinding of participants and personnel: low risk, double blind Blinding of outcome assessment: low risk, double blind Attrition: low risk for all outcomes; missing data on primary outcomes for 1 woman in midazolam arm because left the clinic before completing the post-operative questionnaire;

Study details	Participants	Interventions	Outcomes and Results	Comments
Aim of the study To investigate the effect of midazolam on pain and anxiety for first-trimester surgical termination of pregnancy **Study dates** May 2013 to December 2013 **Source of funding** Society of Family Planning	**Characteristics** Age in years (mean; standard deviation in parentheses): Midazolam (conscious sedation + local anaesthesia): 25.5 (5.8) Placebo (local anaesthesia): 25.8 (5.3) Gestational age <8 weeks (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 39 (62.9) Placebo (local anaesthesia): 29 (46.8) Gestational age ≥8 weeks (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 23 (37.1) Placebo (local anaesthesia): 33 (53.2) Race - White (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 42 (67.7) Placebo (local anaesthesia): 44 (71.0) Race - African-American (number; percentage in parentheses):	a questionnaire between 1 and 3 days postoperatively. **Midazolam (conscious sedation + local anaesthesia):** 5 mL oral cherry-flavoured 2 mg/mL midazolam syrup (total 10mg midazolam) **Placebo (local anaesthesia):** 5ml oral cherry-flavoured placebo syrup	(30 minutes postoperatively) Midazolam (conscious sedation + local anaesthesia): N=61, M=50.0, SD=27.3 Placebo (local anaesthesia): N=61, M=43.2, SD=30.7 Overall satisfaction - 100mm VAS (30 minutes postoperatively) Midazolam (conscious sedation + local anaesthesia): N=61, M=78.4, SD=20.1 Placebo (local anaesthesia): N=61, M=77.8, SD=18.3 Satisfaction with anxiety control - 100mm VAS (1-3 days postoperatively) Midazolam (conscious sedation + local anaesthesia): N=44, M=64.7, SD=28.2 Placebo (local anaesthesia): N=41, M=50.2, SD=31.7	rates of completion for 1-3 days postoperative questionnaire were similar between groups Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
	Midazolam (conscious sedation + local anaesthesia): 6 (9.7) Placebo (local anaesthesia): 3 (4.8) Race - Asian (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 1 (1.6) Placebo (local anaesthesia): 4 (6.5) Ethnicity - Hispanic (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 8 (12.9) Placebo (local anaesthesia): 9 (14.5) Parity - nulliparous (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 32 (51.6) Placebo (local anaesthesia): 38 (61.3) Parity - parous (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 30 (48.4) Placebo (local anaesthesia): 24 (38.7)		<u>Satisfaction with pain control - 100mm VAS (1-3 days postoperatively)</u> Midazolam (conscious sedation + local anaesthesia): N=44, M=48.2, SD=30.1 Placebo (local anaesthesia): N=41, M=36.6, SD=30.8 <u>Overall satisfaction - 100mm VAS (1-3 days postoperatively)</u> Midazolam (conscious sedation + local anaesthesia): N=44, M=74.9, SD=25.5 Placebo (local anaesthesia): N=41, M=65.7, SD=26.4 **Outcome: Pain - measured on 100mm visual analogue scale (VAS)** <u>During aspiration:</u> Midazolam (conscious sedation + local anaesthesia): N=62, M=70.1, SD=22.1	

Study details	Participants	Interventions	Outcomes and Results	Comments
	Previous vaginal delivery (number; percentage in parentheses): Midazolam (conscious sedation + local anaesthesia): 22 (35.5) Placebo (local anaesthesia): 20 (32.2) Previous surgical termination (number; percentage in parentheses): Placebo (local anaesthesia): 21 (33.9) **Inclusion criteria** English- or Spanish-speaking women aged at least 18 years old; good general health; requesting surgical termination between 6^{+0} and 10^{+6} weeks' gestation **Exclusion criteria** Early pregnancy failure; required cervical priming; <100lb in weight; contraindications to study medications; used heroin or methadone in previous 3 months; requested narcotic or IV sedation; used alcohol,		Placebo (local anaesthesia): N=61, M=74.3, SD=20.6 **Outcome: vomiting - 30 minutes postoperatively** Midazolam (conscious sedation + local anaesthesia): 1/61 Placebo (local anaesthesia): 1/61	

Study details	Participants	Interventions	Outcomes and Results	Comments
	narcotics or benzodiazepines in previous 24 hours			
Full citation Conti, J. A., Lerma, K., Shaw, K. A., Blumenthal, P. D., Self-Administered Lidocaine Gel for Pain Control With First-Trimester Surgical Abortion: A Randomized Controlled Trial.[Erratum appears in Obstet Gynecol. 2016 Dec;128(6):1450; PMID: 28092300], Obstetrics & GynecologyObstet Gynecol, 128, 297-303, 2016 **Ref Id** 771419 **Country/ies where the study was carried out** USA **Study type** Randomised controlled trial **Aim of the study** To compare the efficacy of paracervical block and self-administered lidocaine gel for	**Sample size** n=274 screened for eligibility (n=64 ineligible; n=57 declined participation; n=11 other reasons) n=142 randomised (n=70 paracervical block; n=72 lidocaine gel) n=147 received allocated intervention and included in analysis (n=68 paracervical block [n=1 declined termination; n=1 declined IV sedation]; n=69 lidocaine gel [n=2 <18 years old; n=1 ineligible for IV sedation]) **Characteristics** Age in years (mean; standard deviation in parentheses): Paracervical block: 26.5 (5.9) Lidocaine gel: 27 (6.6) Gestational age ≤7^{+6} weeks (number; percentage in parentheses): Paracervical block: 25 (37) Lidocaine gel: 40 (58)	All women received 100mg IV fentanyl and 1mg IV midazolam immediately prior to speculum insertion; additional doses of IV medication were permitted as needed. Pain was measured at several time points on a 100mm visual analogue scale (VAS) and satisfaction was measured on a 100mm VAS immediately prior to discharge. Procedure for termination was not reported. **Paracervical block:** 12ml of 1% lidocaine (total 120mg) was administered using a 22-guage spinal needle; 2ml was injected superficially into the cervix at the tenaculum and the remaining 10ml was injected into the cervicovaginal junction at the 4 and 8 o'clock positions continuously from superficial to deep (1 to 2cm); unclear if	**Outcome: patient satisfaction (measured on 100mm VAS)** <u>Overall experience</u> Paracervical block: N=68, M=48.02, SD=26.23 Lidocaine gel: N=69, M=54.5, SD=21.3 <u>Recommend to friend</u> Paracervical block: N=68, M=80.5, SD=20.3 Lidocaine gel: N=69, M=83.5, SD=17.2 **Outcome: Pain (measured on 100mm VAS)** <u>Cervical dilation</u> Paracervical block: N=68, M=60.1, SD=24.2 Lidocaine gel: N=69, M=64.1, SD=20.9 <u>30-45 minutes post-procedure</u>	Limitations **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: unclear risk, block randomisation, not-reported whether this was computer generated Allocation concealment: low risk, sequentially numbered sealed opaque envelopes Blinding of participants and personnel: no blinding; low risk for objective outcomes; high risk for subjective outcomes Blinding of outcome assessment: no blinding; low risk for objective outcomes; high risk for subjective outcomes Attrition: low risk for all outcomes; no missing data Selective reporting: moderate risk, insufficient data reported for analysis for pain outcomes at some time points

Study details	Participants	Interventions	Outcomes and Results	Comments
pain management during first trimester surgical termination of pregnancy **Study dates** April 2015 to October 2015 **Source of funding** Society of Family Planning Research Fund	Gestational age ≥8^{+0} weeks [within first trimester; boundary not reported] (number; percentage in parentheses): Paracervical block: 40 (59) Lidocaine gel: 27 (39) Note. percentages for gestational age do not add up as there was a small number of women included for reaspiration or failed medical termination of pregnancy Nulliparous (number; percentage in parentheses): Paracervical block: 40 (59) Lidocaine gel: 44 (64) Previous vaginal delivery (number; percentage in parentheses); Paracervical block: 23 (34) Lidocaine gel: 22 (32) Previous termination (number; percentage in parentheses): Paracervical block: 28 (41) Lidocaine gel: 26 (38) Race - White (number; percentage in parentheses): Paracervical block: 40 (59) Lidocaine gel: 41 (59)	this was before or after IV medication. **Lidocaine gel:** 20ml of 2% lidocaine gel (total 400mg) was self-administered vaginally, using a 20ml sterile, Luer-lock syringe, 20 to 30 minutes before the termination procedure.	Paracervical block: N=68, M=18.2, SD=19.3 Lidocaine gel: N=69, M=17.1, SD=19.6	**Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
	Race - Black/African American (number; percentage in parentheses): Paracervical block: 7 (10) Lidocaine gel: 6 (9) Race - Asian (number; percentage in parentheses): Paracervical block: 6 (9) Lidocaine gel: 4 (6) Race - Native Hawaiian or Pacific Islander (number; percentage in parentheses): Paracervical block: 3 (4) Lidocaine gel: 1 (1) Ethnicity - Hispanic/Latina (number; percentage in parentheses): Paracervical block: 37 (54) Lidocaine gel: 35 (51) **Inclusion criteria** English- or Spanish-speaking women aged at least 18 years old; undergoing first trimester surgical termination of pregnancy; had chosen IV sedation **Exclusion criteria**			

Study details	Participants	Interventions	Outcomes and Results	Comments
	Preoperative use of misoprostol (normally given from 12 weeks at the included clinics); allergy to study medications; uterine anomaly; prior cervical surgery			
Full citation Edelman, A., Nichols, M. D., Leclair, C., Astley, S., Shy, K., Jensen, J. T., Intrauterine lidocaine infusion for pain management in first-trimester abortions, Obstetrics & GynecologyObstet Gynecol, 103, 1267-72, 2004 **Ref Id** 771422 **Country/ies where the study was carried out** USA **Study type** Randomised controlled trial **Aim of the study** To investigate the efficacy of intrauterine lidocaine infusion, in addition to paracervical block, for pain management	**Sample size** n=571 screened for eligibility (n=10 <18 years old; n=94 ≥11 weeks' gestation; n=73 requested narcotics; n=20 non-English speaking n=80 randomised (n=40 paracervical block + intrauterine infusion; n=40 paracervical block; exact number of eligible women who declined participation is not known) **Characteristics** Age in years (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 26 (6.0) Paracervical block: 24 (4.8) Gestational age in weeks (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 7.0 (1.9) Paracervical block: 7.5 (1.9)	All women were given 800mg of ibuprofen and if requested 5mg of Valium 20 to 30 minutes before the procedure. At the start of the procedure, a speculum was placed and all women received a paracervical block of 1ml of 1% nonbuffered lidocaine on the anterior and posterior lip of the cervix and then 4.5ml of 1% lidocaine at 4 and 8 o'clock positions. Following this, a 3mm Novack curette was passed into the uterine cavity and intrauterine infusion was administered according to treatment allocation; the curette was held in place for 3 minutes. The cervix was dilated to 1mm less than the gestational age in weeks and terminations were performed with an electric vacuum pump device using rigid curved cannulas. Women	**Outcome: Patient satisfaction (measured on 100mm VAS)** Paracervical block + intrauterine infusion: N=40, M=82, SD=23 Paracervical block: N=40, M=83, SD=20 **Outcome: Pain (measured on 100mm VAS)** <u>Cervical dilation</u> Paracervical block + intrauterine infusion: N=39, M=33, SD=28 Paracervical block: N=40, M=36, SD=25 <u>Aspiration</u> Paracervical block + intrauterine infusion: N=40, M=47, SD=38 Paracervical block: N=40, M=51, SD=26	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: low risk, computer generated blocks of 20 Allocation concealment: unclear risk, sequentially numbered data sheets and syringes but not clear if these were in sealed opaque envelopes Blinding of participants and personnel: low risk, double blind Blinding of outcome assessment: low risk, double blind Attrition: low risk for all outcomes; some missing data from 1 woman in intervention arm Selective reporting: low risk, all outcomes reported in sufficient detail for analysis

Study details	Participants	Interventions	Outcomes and Results	Comments
during first trimester surgical termination **Study dates** July 2002 to February 2003 **Source of funding** The Oregon Health & Science Family Planning Fellowship Fund	Ethnicity - White (number; percentage in parentheses): Paracervical block + intrauterine infusion: 32 (80) Paracervical block: 35 (88) Nulligravid (number; percentage in parentheses): Paracervical block + intrauterine infusion: 11 (28) Paracervical block: 15 (38) Multigravid (number; percentage in parentheses): Paracervical block + intrauterine infusion: 29 (73) Paracervical block: 25 (63) Previous vaginal deliveries (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 0.85 (0.95) Paracervical block: 0.53 (0.83) Previous terminations (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 0.60 (0.90) Paracervical block: 0.65 (0.89) **Inclusion criteria**	were asked to rate their pain on a 100mm visual analogue scale (VAS) at several time points throughout the procedure and prior to discharge. **Paracervical block + intrauterine infusion:** 10ml 1% lidocaine intrauterine infusion **Paracervical block:** 10ml sterile saline intrauterine infusion	<u>30 minutes after procedure</u> Paracervical block + intrauterine infusion: N=39, M=28, SD=21 Paracervical block: N=40, M=21, SD=21	**Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
	English-speaking women in good general health, aged more than 18 years old requesting termination of pregnancy at <11 weeks' gestation; weight >100lbs **Exclusion criteria** Refusal or inability to receive ibuprofen and/or paracervical blocks; requesting intravenous narcotics			
Full citation Edelman,A., Nichols,M.D., Leclair,C., Jensen,J.T., Four percent intrauterine lidocaine infusion for pain management in first-trimester abortions, Obstetrics and Gynecology, 107, 269-275, 2006 **Ref Id** 131670 **Country/ies where the study was carried out** USA **Study type** Randomised controlled trial	**Sample size** n=2200 screened for eligibility (n=40 <18 years old; n=335 gestational age ≥11 weeks; n=88 requested narcotics; n=62 non-English speaking) n=80 randomised (n=40 paracervical block + intrauterine infusion; n=40 paracervical block; exact number of eligible women who were offered the study and declined is not known) n=77 received allocated treatment (n=38 paracervical block + intrauterine infusion [n=2 withdrew before receiving study medication]; n=39 paracervical block [n=1	All women were given 800mg of ibuprofen and if requested 5mg of diazepam 20 to 30 minutes before the procedure. At the start of the procedure, a speculum was placed and all women received a paracervical block of 1ml of 1% nonbuffered lidocaine on the anterior and posterior lip of the cervix and then 4.5ml of 1% lidocaine at 4 and 8 o'clock positions to a depth of approximately 1.5 inches. Following this, a 3mm Novak curette was passed into the uterine cavity and intrauterine infusion was rapidly	**Outcome: Patient satisfaction (measured on 100mm VAS)** Paracervical block + intrauterine infusion: N=38, M=85, SD=19 Paracervical block: N=39, M=80, SD=23 **Outcome: Pain (measured on 100mm VAS)** <u>Cervical dilation</u> Paracervical block + intrauterine infusion: N=35, M=35, SD=30	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: low risk, computer generated blocks of 20 Allocation concealment: unclear risk, sequentially numbered data sheets and syringes but not clear if these were in sealed opaque envelopes Blinding of participants and personnel: low risk, double blind Blinding of outcome assessment: low risk, double blind

Study details	Participants	Interventions	Outcomes and Results	Comments
Aim of the study To investigate the efficacy of intrauterine lidocaine infusion, in addition to paracervical block, for management of pain in first trimester surgical terminations **Study dates** November 2003 to December 2004 (recruitment suspended March 2004 to June 2004) **Source of funding** The Oregon Health & Science Family Planning Fellowship Fund	withdrew before receiving study medication]) **Characteristics** Age in years (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 26 (5.7) Paracervical block: 26 (6.7) Gestational age in weeks (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 8 (1.6) Paracervical block: 8 (1.6) Ethnicity - White (number; percentage in parentheses): Paracervical block + intrauterine infusion: 37 (95) Paracervical block: 33 (83) Nulligravid (number; percentage in parentheses): Paracervical block + intrauterine infusion: 16 (41) Paracervical block: 18 (46) Multigravid (number; percentage in parentheses): Paracervical block + intrauterine infusion: 23 (59)	administered according to treatment allocation; the curette was held in place for 3 minutes (changed to slow infusion over the 3 minutes after half of the procedures due to concern regarding lidocaine toxicity). The cervix was dilated to 1mm less than the gestational age in weeks and terminations were performed with an electric vacuum pump device using rigid curved cannulas. Women were asked to rate their pain on a 100mm visual analogue scale (VAS) at several time points throughout the procedure and prior to discharge. **Paracervical block + intrauterine infusion:** 5ml 4% lidocaine intrauterine infusion **Paracervical block:** 5ml sterile saline intrauterine infusion	Paracervical block: N=39, M=55, SD=26 <u>Aspiration</u> Paracervical block + intrauterine infusion: N=37, M=43, SD=30 Paracervical block: N=39, M=71, SD=20 <u>30 minutes after procedure</u> Paracervical block + intrauterine infusion: N=37, M=20, SD=20 Paracervical block: N=38, M=25, SD=22	Attrition: low risk for all outcomes; 2 women in the intervention arm and 1 woman in the control arm withdrew before taking study medication; some missing data for pain scores but rate of missing data is small and similar between arms Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
	Paracervical block: 26 21 (54) Previous vaginal delivery (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 0.67 (1.15) Paracervical block: 0.64 (0.90) Previous termination (mean; standard deviation in parentheses): Paracervical block + intrauterine infusion: 0.51 (0.68) Paracervical block: 0.52 (0.82) **Inclusion criteria** English-speaking women aged >18 years old in good general health; <11 weeks' gestation requesting termination of pregnancy; >100lbs **Exclusion criteria** Refusal or inability to receive ibuprofen and/or paracervical blocks; request for intravenous narcotics			
Full citation Mankowski, J. L., Kingston, J., Moran, T., Nager, C. W., Lukacz, E. S., Paracervical	**Sample size** n=153 screened for eligibility (n=2 declined participation; n=12 ineligible; n=3 withdrew	All women received 800mg oral ibuprofen, 1mg IV midazolam and 100micrograms (mcg) IV	**Outcome: Pain (10cm VAS)** <u>Cervical dilation</u>	**Limitations** **Quality of study:**

Study details	Participants	Interventions	Outcomes and Results	Comments
compared with intracervical lidocaine for suction curettage: a randomized controlled trial, Obstetrics & GynecologyObstet Gynecol, 113, 1052-7, 2009 **Ref Id** 771433 **Country/ies where the study was carried out** USA **Study type** Randomised controlled trial **Aim of the study** To compare the efficacy of paracervical and intracervical local anaesthesia for first trimester termination of pregnancy **Study dates** December 2007 to February 2008 **Source of funding**	consent; n=3 missed by provider; n=1 no pregnancy found) n=132 randomised (n=66 paracervical block; n=66 intracervical block) **Characteristics** Age in years (mean; standard deviation in parentheses): Paracervical: 26 (6) Intracervical: 26 (6) Gestational age in days (mean; standard deviation in parentheses): Paracervical: 60 (13) Intracervical: 61 (12) Race - White (number; percentage in parentheses): Paracervical: 19 (29) Intracervical: 23 (35) Ethnicity - Hispanic (number; percentage in parentheses): Paracervical: 33 (50) Intracervical: 26 (39) Race - African American (number; percentage in parentheses): Paracervical: 10 (15)	fentanyl before the procedure and local anaesthesia was administered according to treatment allocation. Cervical dilation was performed by the surgeon using Denniston dilators and the termination was conducted using electric vacuum aspiration. Pain was measured at baseline, at completion of dilation and at completion of curettage on a 10cm visual analogue scale (VAS). **Paracervical:** 20ml local anaesthetic (5ml 1% lidocaine, 5 units vasopressin, 5ml 8% sodium bicarbonate) administered using a 5/8-inch, 25-guage needle; a small amount was injected at the tenaculum and the remainder was injected at the cervicovaginal junction at the 3, 5, 7 and 9 o'clock positions. **Intracervical:**	Paracervical: N=66, M=2.6, SD=2.3 Intracervical: N=66, M=2.8, SD=2.2 <u>Curettage</u> Paracervical: N=66, M=3.9, SD=2.9 Intracervical: N=66, M=3.3, SD=2.5 **Outcome: Nausea** Paracervical: 0/66 Intracervical: 1/66 **Outcome: Vomiting** Paracervical: 0/66 Intracervical: 1/66	Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: unclear risk, randomised in blocks of 10 using a random-numbers table (unclear if computer generated) Allocation concealment: low risk, sequentially numbered sealed opaque envelopes Blinding of participants and personnel: low risk, double blind Blinding of outcome assessment: low risk, double blind Attrition: low risk for all outcomes; small amount of missing data for primary outcome (pain) - intention to treat analysis Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
No sources reported	Intracervical: 6 (9) Race - Asian or Pacific Islander (number; percentage in parentheses): Paracervical: 4 (6) Intracervical: 9 (14) Gravidity (median; range in parentheses): Paracervical: 2 (7) Intracervical: 3 (7) Parity - vaginal (median; range in parentheses): Paracervical: 0 (5) Intracervical: 21 (5) Parity - caesarean (median; range in parentheses): Paracervical: 0 (2) Intracervical: 0 (2) Terminations - spontaneous (median; range in parentheses): Paracervical: 0 (1) Intracervical: 0 (3) Terminations - medical (median; range in parentheses): Paracervical: 0 (1) Intracervical: 0 (1) Terminations - surgical (median; range in parentheses): Paracervical: 0 (3)	20ml local anaesthetic (5ml 1% lidocaine, 5 units vasopressin, 5ml 8% sodium bicarbonate) administered using a 1-inch, 20-guage needle; a small amount was injected at the tenaculum and the remainder was injected into the cervical stroma at the 12, 3, 6 and 9 o'clock positions.		

Study details	Participants	Interventions	Outcomes and Results	Comments
	Intracervical: 1 (6) Prior D&C (median; range in parentheses): Paracervical: 0 (4) Intracervical: 0 (6) **Inclusion criteria** Not reported **Exclusion criteria** Gestation >12 weeks; weight <98lb; known allergy to lidocaine; non-viable pregnancy			
Full citation Micks, E., Edelman, A., Botha, R., Bednarek, P., Nichols, M., Jensen, J. T., The effect of sevoflurane on interventions for blood loss during dilation and evacuation procedures at 18-24 weeks of gestation: A randomized controlled trial, Contraception, 91, 488-494, 2015 **Ref Id** 802192	**Sample size** n=160 randomised (n=80 sevoflurane; n=80 control) **Characteristics** Age in years (mean; standard deviation in parentheses): Sevoflurane: 25.9 (6.2) Control: 25.9 (5.9) Gestational age in weeks (mean; standard deviation in parentheses): Sevoflurane: 20.8 (1.9) Control: 20.8 (1.8)	All women received cervical priming with overnight laminaria and 400mcg misoprostol given bucally roughly 90 minutes before the procedure and preoperative doxycycline; women over 22 weeks at 1 of the 2 sites (accounting for 97% of procedures) received intraamniotic or intrafetal digoxin injection. Inhaled agents were administered according to treatment allocation on arrival to the operating room. All women received IV propofol, IV	**Patient satisfaction measured on 10cm VAS** <u>Satisfaction with anaesthesia</u> Sevoflurane: N=80, M=9.4, SD=1.1 Control: N=80, M=9.3, SD=1.4 <u>Recommend to others</u> Sevoflurane: N=80, M=9.3, SD=1.4 Control: N=80, M=9.2, SD=1.0	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: low risk, computer generated; prepared by study staff not involved in enrolment Allocation concealment: low risk, sequentially numbered sealed opaque envelopes; prepared by study staff not involved in enrolment Blinding of participants and personnel: women and surgeons

Study details	Participants	Interventions	Outcomes and Results	Comments
Country/ies where the study was carried out USA **Study type** Randomised controlled trial **Aim of the study** To investigate if the use of sevoflurane for anaesthesia during dilatation and evacuation increases the need for interventions for bleeding **Study dates** Not reported **Source of funding** Anonymous donor to the Oregon Health & Science University Family Planning	Ethnicity - White (number; percentage in parentheses): Sevoflurane: 55 (68.8) Control: 45 (56.3) Ethnicity - Black (number; percentage in parentheses): Sevoflurane: 6 (7.5) Control: 10 (12.5) Ethnicity - Latina (number; percentage in parentheses): Sevoflurane: 3 (3.8) Control: 6 (7.5) Nulliparous (number; percentage in parentheses): Sevoflurane: 50 (62.5) Control: 44 (55) Prior caesarean section (number; percentage in parentheses): Sevoflurane: 12 (15) Control: 8 (10) **Inclusion criteria** Women aged at least 16 years old undergoing voluntary surgical termination of pregnancy between 18 and 24 weeks' gestation.	midazolam, IV fentanyl, IV oxytocin and inhaled nitrous oxide (doses not reported). Pain was recorded using visual analogue scales (VAS) after waking from anaesthesia and before discharge and women were asked about side effects. **Sevoflurane:** Sevoflurane and oxygen mixture (concentration not reported) delivered through face mask **Control:** Oxygen only delivered through face mask	**Outcome: Termination of pregnancy completed with intended method of sedation/anaesthesia** Sevoflurane: 78/80 (surgeon asked inhaled agents to be stropped due to severe haemorrhage) Control: 80/80 **Outcome: Pain measured on 10cm VAS** <u>Upon waking from anaesthesia</u> Sevoflurane: N=80, M=2.6, SD=2.3 Control: N=80, M=2.8, SD=2.2 <u>Upon discharge</u> Sevoflurane: N=80, M=2.2, SD=2.5 Control: N=80, M=2.0, SD=1.9 **Outcome: Haemorrhage requiring transfusion**	blinded, anaesthetists unblinded; low risk for objective outcomes; high risk for subjective outcomes reported by women Blinding of outcome assessment: women and surgeons blinded, anaesthetists unblinded; low risk for objective outcomes; high risk for subjective outcomes reported by women Attrition: low risk for all outcomes; no missing data Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
	Exclusion criteria Severe maternal respiratory disease, upper respiratory tract infection or sinus blockage; currently anticoagulated; known multiple pregnancy fetal demise; known allergy/sensitivity to sevoflurane or other inhaled anaesthetic agents		**or > 500ml of blood loss** Sevoflurane: 2/80 Control: 0/80 **Outcome: Nausea** Sevoflurane: 13/80 Control: 11/80 **Outcome: Vomiting** Sevoflurane: 4/80 Control: 3/80	
Full citation Nathan, N., Peyclit, A., Lahrimi, A., Feiss, P., Comparison of sevoflurane and propofol for ambulatory anaesthesia in gynaecological surgery, Canadian Journal of Anaesthesia, 45, 1148-50, 1998 **Ref Id** 883587 **Country/ies where the study was carried out** France	**Sample size** n=52 randomised (n=26 sevoflurane; n= 26 propofol) **Characteristics** Not reported; demographic details, gestational age and duration of surgery were not different between groups **Inclusion criteria** Women aged >18 years old undergoing termination of pregnancy by aspiration and were grade I on the American Society of	All women received 1mg oral lorazepam and 800mg oral cimetidine 2 hours before surgery; 0.5 to 0.75mg alfentanil was given immediately prior to induction anaesthesia. A questionnaire was completed at discharge and 24 hours after surgery. **Sevoflurane:** Anaesthesia was induced using the single breath vital capacity technique with 8% sevoflurane in 6 1min-1 oxygen and maintained with 2-3% sevoflurane in 2 1min-	**Outcome: Pain** <u>During recovery:</u> Sevoflurane: 0/26 Propofol: 2/26 24 hours after surgery: Sevoflurane: 6/22 Propofol: 8/23 **Outcome: Nausea (24 hours after surgery)** Sevoflurane: 13/22 Propofol: 4/23 **Outcome: Vomiting (24 hours after surgery)**	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: unclear risk, insufficient information reported Allocation concealment: low risk, sealed envelopes Blinding of participants and personnel: no blinding; low risk for objective outcomes; high risk for subjective outcomes Blinding of outcome assessment: no blinding; low

Study details	Participants	Interventions	Outcomes and Results	Comments
Study type Randomised controlled trial **Aim of the study** To investigate the cost-effectiveness of propofol or sevoflurane anaesthesia for termination of pregnancy **Study dates** Not reported Source of funding No sources reported	Anesthesiologists physical status classification **Exclusion criteria** Obesity; symptomatic regurgitation; unable to understand the vital capacity procedure	1 fresh gas flow including nitrous oxide. **Propofol:** Anaesthesia was induced with propofol (dose not reported) and maintained with 60% nitrous oxide; additional boluses of 20mg propofol were given if the anaesthesia was too light	Sevoflurane: 5/22 Propofol: 2/23	risk for objective outcomes; high risk for subjective outcomes Attrition: low risk for all outcomes; missing data from questionnaire 24 hours after surgery was small and similar between arms Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information** The study was stopped early due to increased bleeding in the sevoflurane group (twice as much as propofol group)
Full citation Raeder, J. C., Propofol anaesthesia versus paracervical blockade with alfentanil and midazolam sedation for outpatient abortion, Acta Anaesthesiologica Scandinavica, 36, 31-37, 1992 **Ref Id** 883860	**Sample size** n=88 screened for eligibility (n=21 declined to participate; n=8 did not meet inclusion criteria) n=59 randomised (n=28 general anaesthesia; n=31 regional anaesthesia [deep sedation]) **Characteristics** Age in years (mean; standard deviation in parentheses): Regional anaesthesia (deep sedation): 24 (6.3)	All women were seen by the anaesthesiologist a week before the procedure and were asked about previous health issues, anaesthetic experience, smoking, coffee and alcohol habits, anxiety before the procedure. Women fasted (for at least 9 hours) before the operation. Anaesthesia was performed according to treatment assignment; discomfort and side effects were noted. Women were discharged	**Outcome: Patient satisfaction - would have same anaesthesia again** Regional anaesthesia (deep sedation): 26/31 General anaesthesia: 22/28 **Outcome: Pain** <u>During hospital stay</u> Regional anaesthesia (deep sedation): 7/31	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: unclear risk, insufficient information reported Allocation concealment: unclear risk, insufficient information reported Blinding of participants and personnel: no blinding; low risk

Study details	Participants	Interventions	Outcomes and Results	Comments
Country/ies where the study was carried out Norway **Study type** Randomised controlled trial **Aim of the study** To compare the effectiveness of, and recovery from, rapid elimination sedatives (e.g., alfentanil and midazolam) compared with propofol for surgical termination of pregnancy **Study dates** Not reported **Source of funding** Astra-Pharma; ICI-Pharma; Janssen-Pharma; Roche Norway	General anaesthesia: 23 (4.8) ASA grade I (number; percentage in parentheses): Regional anaesthesia (deep sedation): 29 (94) General anaesthesia: 25 (89) ASA grade II (number; percentage in parentheses): Regional anaesthesia (deep sedation): 2 (6) General anaesthesia: 3 (11) **Inclusion criteria** Women having a first trimester surgical termination of pregnancy; 50 to 80kg; American Society of Anesthesiologists physical status classification grade I or II **Exclusion criteria** No additional criteria reported	after 3 hours of postoperative observations; 5 days after the operation they were sent a questionnaire about discomfort and side effects during the hospital stay, while travelling home and over the following night and day. **Regional anaesthesia (deep sedation):** Women were given 0.1mg/kg IV midazolam and 0.01mg/kg IV alfentanil before a paracervical block with 2 10ml of 20mg/ml mepivacaine and 0.005mg/ml adrenaline; air was breathed as normal but women were assisted with an oxygen mask if oxygen saturation dropped below 85% **General anaesthesia:** Women were given 0.01mg/kg IV alfentanil 1 minute before 2mg/kg bolus injection propofol; women	General anaesthesia: 19/28 <u>During travel home</u> Regional anaesthesia (deep sedation): 1/31 General anaesthesia: 5/28 <u>At home (over following night and day)</u> Regional anaesthesia (deep sedation): 8/31 General anaesthesia: 8/28 On a scale of 1-11 Regional anaesthesia (deep sedation): N=31, M=1.4, SD=1.1 General anaesthesia: N=28, M=2.4, SD=1.8	for objective outcomes; high risk for subjective outcomes Blinding of outcome assessment: investigators of postoperative function were blinded to treatment allocation, women weren't; low risk for objective outcomes and investigator reported subjective outcomes; high risk for patient-reported subjective outcomes Attrition: low risk for all outcomes; no missing data Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
		breathed 75% nitrous oxide in oxygen by mask and were assisted if arterial oxygen saturation dropped below 85%		
Full citation Wong, C. Y. G., Ng, E. H. Y., Ngai, S. W., Ho, P. C., A randomized, double blind, placebo-controlled study to investigate the use of conscious sedation in conjunction with paracervical block for reducing pain in termination of first trimester pregnancy by suction evacuation, Human Reproduction, 17, 1222-1225, 2002 **Ref Id** 772996 **Country/ies where the study was carried out** China **Study type** Randomised controlled trial	**Sample size** n=100 randomised (n=50 conscious sedation [+ local anaesthesia]; n=50 placebo [local anaesthesia]) **Characteristics** Age in years (median; range in parentheses): Conscious sedation (+ local anaesthesia): 26 (16-42) Placebo (local anaesthesia): 29 (16-43) Gestational age in years (median; range in parentheses): Conscious sedation (+ local anaesthesia): 10 (8-12) Placebo (local anaesthesia): 10 (8-12) Previous deliveries (number; percentage in parentheses): Conscious sedation (+ local anaesthesia): 21 (42) Placebo (local anaesthesia): 35 (70)	Women received IV medication according to treatment assignment followed by a paracervical block of 10ml 1% lignocaine at the 4 and 8 o'clock positions of the cervix. The cervix was dilated if needed (using Hegar dilator 8 to 10) and the termination was performed using suction with Karmen catheters 8 to 10. The surgeon graded the maximum level of sedation achieved and the need for additional analgesia (pethidine) was recorded. Women were asked to rate their pain (on a scale of 1 to 10) during insertion of IV catheter, during suction evacuation, 5 minutes after evacuation and 1 hour after evacuation. Post-operative side effects and satisfaction were recorded prior to	**Outcome: Patient satisfaction** <u>Excellent</u> Conscious sedation (+local anaesthesia): 10/50 Placebo (local anaesthesia: 1/50 <u>Satisfactory</u> Conscious sedation (+local anaesthesia): 15/50 Placebo (local anaesthesia: 9/50 <u>Fair</u> Conscious sedation (+local anaesthesia): 18/50 Placebo (local anaesthesia: 30/50 <u>Unsatisfactory</u> Conscious sedation (+local anaesthesia): 7/50	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: low risk, computer-generated blocks of 10 Allocation concealment: low risk, sealed opaque envelopes Blinding of participants and personnel: low risk, double blind Blinding of outcome assessment: low risk, double blind Attrition: low risk for all outcomes; no missing data Selective reporting: moderate risk; pain outcomes not reported in sufficient detail for analysis **Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
Aim of the study To investigate the effect of conscious sedation for pain relief during first trimester surgical termination of pregnancy under local anaesthesia **Study dates** September 1999 to December 1999 **Source of funding** No sources reported	Previous termination of pregnancy (number; percentage in parentheses): Conscious sedation (+ local anaesthesia): 18 (36) Placebo (local anaesthesia): 25 (50) **Inclusion criteria** Women aged >16 years with normal general and gynaecological examination; <12 weeks' gestation on the day of recruitment **Exclusion criteria** History of severe and recurrent liver disease; myasthenia gravis; psychiatric condition requiring medication; contraindications to prostaglandins	discharge (normally after 4 hours). **Conscious sedation (+local anaesthesia):** 2mg IV midazolam and 25mcg IV fentanyl were given 2 minutes prior to the paracervical block **Placebo (local anaesthesia):** 2ml IV saline given 2 minutes prior to the paracervical block	Placebo (local anaesthesia: 10/50	
Full citation Xu, G. H., Liu, X. S., Yu, F. Q., Gu, E. W., Zhang, J., Wang, K., Dreaming during sevoflurane or propofol short-term sedation: A randomised controlled trial, Anaesthesia	**Sample size** n=220 screened for eligibility (n=4 declined participation; n=8 insufficient oral bowel preparation; n=6 had altered anaesthetic plan; n=2 serious cardiac morbidity (American	Intravenous access was initiated and oxygen administration started at arrival to the operating room. All women received 4 1/minute oxygen through a face mask for denitrogenation and were	**Outcome: Patient satisfaction - satisfied with care** Sevoflurane: 92/100 Propofol: 91/100	**Limitations** **Quality of study:** Risk of bias assessed using Cochrane risk of bias tool Random sequence generation: low risk, computer generated

Study details	Participants	Interventions	Outcomes and Results	Comments
and Intensive Care, 40, 505-510, 2012 **Ref Id** 883630 **Country/ies where the study was carried out** China **Study type** Randomised controlled trial **Aim of the study** To investigate dreaming occurring under short-term sedation with sevoflurane or propofol and whether dreaming is affected by recover time (main aim, and therefore primary outcomes, are outside the scope of the protocol for this review question but patient satisfaction, which is an outcome of interest, is reported and therefore the study had has been included to extract this information)	Society of Anesthesiologists grade III) n=200 randomised (n=100 sevoflurane; n=100 propofol) **Characteristics** Age in years (mean; standard deviation in parentheses): 30 (6.46) Not reported separately based on treatment allocation but authors report that characteristics were similar between groups **Inclusion criteria** Women undergoing termination of pregnancy by electric suction aspiration at <10 weeks' gestation **Exclusion criteria** Inadequate understanding of Chinese language; psychotic disorder	given 1 bolus 1mcg/kg IV fentanyl. Anaesthesia was induced according to study medication and the procedure began when the eyelash reflex was lost. Anaesthetists were instructed to target the level of sedation to an Observer's Assessment of Alertness/Sedation (OAA/S) score of 1; sevoflurane and propofol were stopped at this point. All women were interviewed immediately after waking up from sedation. **Sevoflurane:** 8% sevoflurane with oxygen through spontaneous breathing with a face mask **Propofol:** 1.5 to 2.5mg/kg IV propofol		Allocation concealment: low risk, sealed opaque envelopes Blinding of participants and personnel: no blinding; low risk for objective outcomes; high risk for subjective outcomes Blinding of outcome assessment: no blinding; low risk for objective outcomes; high risk for subjective outcomes Attrition: low risk, no missing data Selective reporting: low risk, all outcomes reported in sufficient detail for analysis **Other information** None

Study details	Participants	Interventions	Outcomes and Results	Comments
Study dates No reported **Source of funding** Youth Culture Program of First Affiliated Hospital, Anhui Medical University, China; National Nature Science Foundation of China				

IV: intravenous; mcg: micrograms; VAS: visual analogue scale

Appendix E – Forest plots

Forest plots for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

Comparison 3. Propofol (general anaesthesia) versus sevoflurane (general anaesthesia)

Figure 2: Nausea

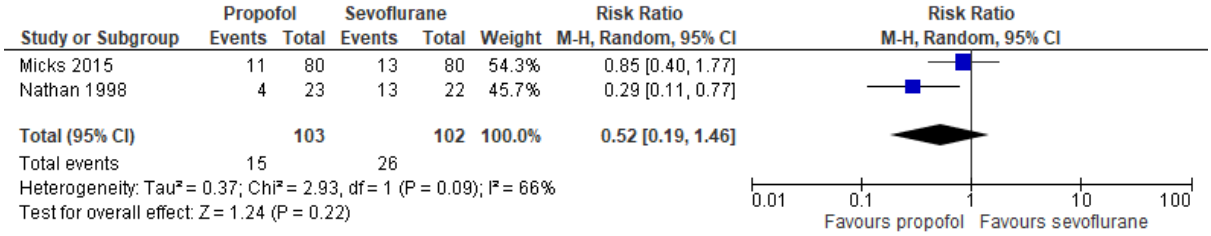
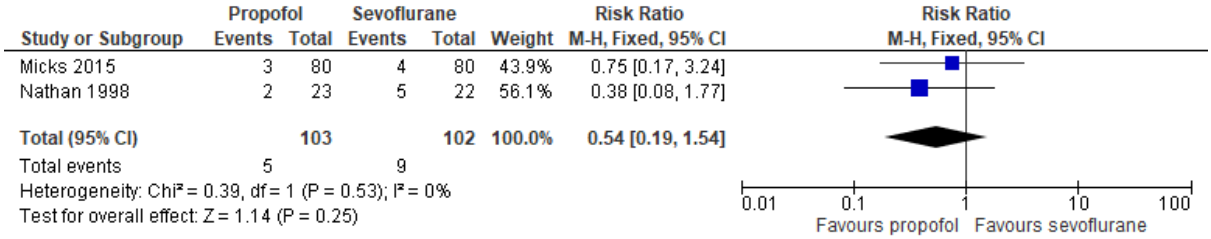
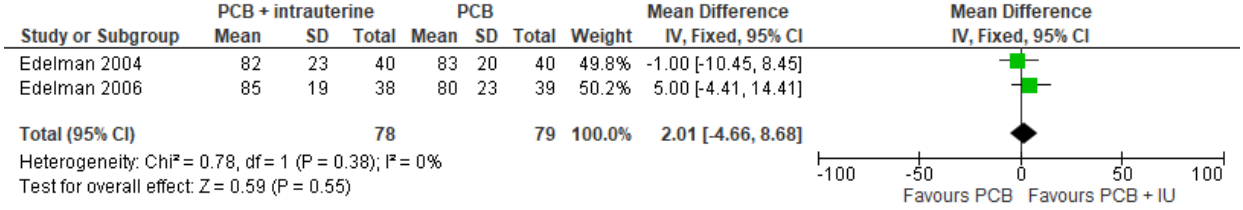


Figure 3: Vomiting



Comparison 5. Local anaesthesia method A versus local anaesthesia method B

Figure 4: Patient satisfaction measured on 100mm visual analogue scale (VAS)



Appendix F – GRADE tables

GRADE tables for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

Table 3: Clinical evidence profile: Comparison 1. Local anaesthesia versus conscious sedation (and local anaesthesia)

Quality assessment							No of patients		Effect			
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Local anaesthesia**	**Conscious sedation (+ local anaesthesia)**	**Relative (95% CI)**	**Absolute**	**Quality**	**Importance**
Patient satisfaction: would recommend to friend												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	37/61 (60.7%)	49/61 (80.3%)	RR 0.76 (0.6 to 0.96)	193 fewer per 1000 (from 32 fewer to 321 fewer)	MODERATE	CRITICAL
Patient satisfaction: overall satisfaction - Excellent												
1 (Wong 2002)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	1/50 (2%)	10/50 (20%)	RR 0.1 (0.01 to 0.75)	180 fewer per 1000 (from 50 fewer to 198 fewer)	HIGH	CRITICAL
Patient satisfaction: overall satisfaction - Satisfactory												
1 (Wong 2002)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Very serious[2]	None	9/50 (18%)	15/50 (30%)	RR 0.6 (0.29 to 1.24)	120 fewer per 1000 (from 213 fewer to 72 more)	LOW	CRITICAL
Patient satisfaction: overall satisfaction - Fair												
1 (Wong 2002)	Randomised trials	No serious	No serious inconsistency	No serious indirectness	Serious[1]	None	30/50 (60%)	18/50 (36%)	RR 1.67 (1.08 to 2.57)	241 more per 1000 (from 29	MODERATE	CRITICAL

		risk of bias								more to 565 more)		
Patient satisfaction: overall satisfaction - Unsatisfactory												
1 (Wong 2002)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Very serious[2]	None	10/50 (20%)	7/50 (14%)	RR 1.43 (0.59 to 3.45)	60 more per 1000 (from 57 fewer to 343 more)	LOW	CRITICAL
Patient satisfaction: anxiety control (100mm VAS) - 30 minutes post-op												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	61	61	Not relevant	MD 12.8 lower (22.47 to 3.13 lower)	MODERATE	CRITICAL
Patient satisfaction: anxiety control (100mm VAS) - 3 days post-op												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	41	44	Not relevant	MD 14.5 lower (27.29 to 1.71 lower)	MODERATE	CRITICAL
Patient satisfaction: pain control (100mm VAS) - 30 minutes post-op												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	61	61	Not relevant	MD 6.8 lower (17.11 lower to 3.51 higher)	MODERATE	CRITICAL
Patient satisfaction: pain control (100mm VAS) - 3 days post-op												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	41	44	Not relevant	MD 11.6 lower (24.56 lower to 1.36 higher)	MODERATE	CRITICAL
Patient satisfaction: overall satisfaction (100mm VAS) - 30 minutes post-op												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	61	61	Not relevant	MD 0.6 lower (7.42 lower to 6.22 higher)	HIGH	CRITICAL

Patient satisfaction: overall satisfaction (100mm VAS) - 3 days post-op												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	41	44	Not relevant	MD 9.2 lower (20.25 lower to 1.85 higher)	MODERATE	CRITICAL
Pain: during aspiration (100mm VAS)												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	61	62	Not relevant	MD 4.2 higher (3.35 lower to 11.75 higher)	MODERATE	CRITICAL
Vomiting: 30 minutes post-op												
1 (Bayer 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Very serious[2]	None	1/61 (1.6%)	1/61 (1.6%)	RR 1 (0.06 to 15.63)	0 fewer per 1000 (from 15 fewer to 240 more)	LOW	IMPORTANT

CI: confidence interval; MD: mean difference; MID: minimally important difference; RR: relative risk; VAS: visual analogue scale
[1] The quality of evidence was downgraded by 1 as the 95% confidence interval crossed 1 MID
[2] The quality of evidence was downgraded by 2 as the 95% confidence interval crossed 2 MIDs

Table 4: Clinical evidence profile: Comparison 2. Deep sedation (and local anaesthesia) versus general anaesthesia

Quality assessment							**No of patients**		**Effect**			
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Deep sedation (+ local anaesthesia)**	**General anaesthesia**	**Relative (95% CI)**	**Absolute**	**Quality**	**Importance**
Patient satisfaction: would have same anaesthesia again												
1 (Raeder 1992)	Randomised trials	Serious[1]	No serious inconsistency	No serious indirectness	Serious[2]	None	26/31 (83.9%)	22/28 (78.6%)	RR 1.07 (0.83 to 1.37)	55 more per 1000 (from 134 fewer to 291 more)	LOW	CRITICAL
Pain - During hospital stay												

1 (Raeder 1992)	Randomised trials	Serious[1]	No serious inconsistency	No serious indirectness	No serious imprecision	None	7/31 (22.6%)	19/28 (67.9%)	RR 0.33 (0.17 to 0.67)	455 fewer per 1000 (from 224 fewer to 563 fewer)	MODERATE	CRITICAL
Pain - During travel home												
1 (Raeder 1992)	Randomised trials	Serious[1]	No serious inconsistency	No serious indirectness	Very serious[3]	None	1/31 (3.2%)	5/28 (17.9%)	RR 0.18 (0.02 to 1.45)	146 fewer per 1000 (from 175 fewer to 80 more)	VERY LOW	CRITICAL
Pain - At home (following night and day)												
1 (Raeder 1992)	Randomised trials	Serious[1]	No serious inconsistency	No serious indirectness	Very serious[3]	None	8/31 (25.8%)	8/28 (28.6%)	RR 0.9 (0.39 to 2.08)	29 fewer per 1000 (from 174 fewer to 309 more)	VERY LOW	CRITICAL
Pain (11-point scale)												
1 (Raeder 1992)	Randomised trials	Serious[1]	No serious inconsistency	No serious indirectness	Serious[2]	None	31	28	Not relevant	MD 1 lower (1.77 to 0.23 lower)	LOW	CRITICAL

CI: confidence interval; MD: mean difference; MID: minimally important difference; RR: relative risk
[1] The quality of evidence was downgraded 1 level as this is a subjective patient reported outcome and women were not blind to treatment allocation
[2] The quality of evidence was downgraded by 1 as the 95% confidence interval crossed 1 MID
[3] The quality of evidence was downgraded by 2 as the 95% confidence interval crossed 2 MIDs

Table 5: Clinical evidence profile: Comparison 3. Propofol (general anaesthesia) versus sevoflurane (general anaesthesia)

Quality assessment							**No of patients**		**Effect**			
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Propofol (general anaesthesia)**	**Sevoflurane (general anaesthesia)**	**Relative (95% CI)**	**Absolute**	**Quality**	**Importance**
Patient satisfaction: overall satisfaction												

1 (Xu 2012)	Randomised trials	Serious[1]	No serious inconsistency	No serious indirectness	No serious imprecision	None	91/100 (91%)	92/100 (92%)	RR 0.99 (0.91 to 1.08)	9 fewer per 1000 (from 83 fewer to 74 more)	MODERATE	CRITICAL
Patient satisfaction: satisfaction with anaesthesia (10cm VAS)												
1 (Micks 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	80	80	Not relevant	MD 0.1 lower (0.49 lower to 0.29 higher)	HIGH	CRITICAL
Patient satisfaction: would recommend to friend (10cm VAS)												
1 (Micks 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	80	80	Not relevant	MD 0.1 lower (0.48 lower to 0.28 higher)	HIGH	CRITICAL
Termination completed with intended method of sedation/anaesthesia												
1 Micks 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	80/80 (100%)	78/80 (97.5%)	RR 1.03 (0.98 to 1.07)	29 more per 1000 (from 19 fewer to 68 more)	HIGH	CRITICAL
Pain - During recovery												
1 (Nathan 1998)	Randomised trials	Very serious[2]	No serious inconsistency	No serious indirectness	Very serious[3]	None	2/26 (7.7%)	0/26 (0%)	RR 5 (0.25 to 99.34)	Not estimable	VERY LOW	CRITICAL
Pain - 24 hours post-op												
1 (Nathan 1998)	Randomised trials	Very serious[2]	No serious inconsistency	No serious indirectness	Very serious[3]	None	8/23 (34.8%)	6/22 (27.3%)	RR 1.28 (0.53 to 3.08)	76 more per 1000 (from 128 fewer to 567 more)	VERY LOW	CRITICAL
Pain (10cm VAS) - Upon waking from anaesthesia												
1 Micks 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	80	80	Not relevant	MD 0.2 higher (0.5 lower to 0.9 higher)	HIGH	CRITICAL

Pain (10cm VAS) - Upon discharge												
1 (Micks 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	80	80	Not relevant	MD 0.2 lower (0.89 lower to 0.49 higher)	HIGH	CRITICAL
Haemorrhage requiring transfusion or >500ml blood loss												
1 Micks 2015)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[4]	None	0/80 (0%)	2/80 (2.5%)	RR 0.2 (0.01 to 4.1)	20 fewer per 1000 (from 25 fewer to 78 more)	MODERATE	IMPORTANT
Nausea												
2 (Micks 2015; Nathan 1998)	Randomised trials	Serious[5]	Serious[6]	No serious indirectness	Very serious[3]	None	15/103 (14.6%)	26/102 (25.5%)	RR 0.52 (0.19 to 1.46)	122 fewer per 1000 (from 206 fewer to 117 more)	VERY LOW	IMPORTANT
Vomiting												
2 (Micks 2015; Nathan 1998)	Randomised trials	Serious[7]	No serious inconsistency	No serious indirectness	Very serious[3]	None	5/103 (4.9%)	9/102 (8.8%)	RR 0.54 (0.19 to 1.54)	41 fewer per 1000 (from 71 fewer to 48 more)	VERY LOW	IMPORTANT

CI: confidence interval; MD: mean difference; MID: minimally important difference; RR: relative risk; VAS: visual analogue scale

[1] The quality of evidence was downgraded 1 level as this is a subjective, patient reported outcome and there was no blinding

[2] The quality of evidence was downgraded 2 levels as insufficient information was provided regarding random sequence generation and this is a subjective patient reported outcome and women were not blind to treatment allocation

[3] The quality of evidence was downgraded by 2 as the 95% confidence interval crossed 2 MIDs

[4] The quality of evidence was downgraded 1 level based on optimal information size as there was <300 events

[5] The quality of evidence was downgraded 1 level as there was insufficient information provided regarding randomisation method in 1 of the included trials; further this a subjective, patient reported outcome and there was no blinding in 1 of the included trials

[6] The quality of evidence was downgraded 1 level as there were high rates of unexplained heterogeneity (66%)

[7] The quality of evidence was downgraded 1 level as there was insufficient information provided regarding randomisation method in 1 of the included trials

Table 6: Clinical evidence profile: Comparison 4. Oral conscious sedation versus intravenous conscious sedation

Quality assessment							No of patients		Effect			
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Oral conscious sedation**	**IV conscious sedation**	**Relative (95% CI)**	**Absolute**	Quality	Importance
Patient satisfaction: pain control - Completely/mostly acceptable												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	35/65 (53.8%)	54/65 (83.1%)	RR 0.65 (0.5 to 0.83)	291 fewer per 1000 (from 141 fewer to 415 fewer)	MODERATE	CRITICAL
Patient satisfaction: pain control - Somewhat acceptable												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	27/65 (41.5%)	8/65 (12.3%)	RR 3.38 (1.66 to 6.87)	293 more per 1000 (from 81 more to 722 more)	HIGH	CRITICAL
Patient satisfaction: pain control - Mostly/completely unacceptable												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Very serious[2]	None	3/65 (4.6%)	3/65 (4.6%)	RR 1 (0.21 to 4.77)	0 fewer per 1000 (from 36 fewer to 174 more)	LOW	CRITICAL
Patient satisfaction: recommend to friend - Definitely/probably												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	52/65 (80%)	60/65 (92.3%)	RR 0.87 (0.75 to 1)	120 fewer per 1000 (from 231 fewer to 0 more)	MODERATE	CRITICAL
Patient satisfaction: recommend to friend - Don't know												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Very serious[2]	None	5/65 (7.7%)	1/65 (1.5%)	RR 5 (0.6 to 41.63)	62 more per 1000 (from 6 fewer to 625 more)	LOW	CRITICAL
Patient satisfaction: recommend to friend - Probably/definitely not												

1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Very serious[2]	None	8/65 (12.3%)	4/65 (6.2%)	RR 2 (0.63 to 6.32)	62 more per 1000 (from 23 fewer to 327 more)	LOW	CRITICAL
Patient satisfaction: would choose same method again - Definitely/probably												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	47/65 (72.3%)	61/65 (93.8%)	RR 0.77 (0.65 to 0.91)	216 fewer per 1000 (from 84 fewer to 328 fewer)	MODERATE	CRITICAL
Patient satisfaction: would choose same method again - Don't know												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Very serious[2]	None	4/65 (6.2%)	0/65 (0%)	RR 9 (0.49 to 163.85)	Not estimable	LOW	CRITICAL
Patient satisfaction: would choose same method again - Probably/definitely not												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	14/65 (21.5%)	4/65 (6.2%)	RR 3.5 (1.22 to 10.07)	154 more per 1000 (from 14 more to 558 more)	MODERATE	CRITICAL
Termination completed with intended method of sedation/anaesthesia												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	65/65 (100%)	65/65 (100%)	RR 1 (0.97 to 1.03)	0 fewer per 1000 (from 30 fewer to 30 more)	HIGH	CRITICAL
Pain (100-point scale) - Intraoperative												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	65	65	Not relevant	MD 24.9 higher (16.01 to 33.79 higher)	HIGH	CRITICAL
Pain (100-point scale) - Postoperative												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	65	65	Not relevant	MD 7.3 higher (1.01 to	MODERATE	CRITICAL

										13.59 higher)		
Intraoperative pain - Mild (<40)												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	12/65 (18.5%)	38/65 (58.5%)	RR 0.32 (0.18 to 0.55)	398 fewer per 1000 (from 263 fewer to 479 fewer)	HIGH	CRITICAL
Intraoperative pain - Moderate (40-69)												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	23/65 (35.4%)	17/65 (26.2%)	RR 1.35 (0.8 to 2.29)	92 more per 1000 (from 52 fewer to 337 more)	MODERATE	CRITICAL
Intraoperative pain - Severe (70-100)												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	30/65 (46.2%)	10/65 (15.4%)	RR 3 (1.6 to 5.62)	308 more per 1000 (from 92 more to 711 more)	HIGH	CRITICAL
Nausea (postoperative)												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	21/65 (32.3%)	11/65 (16.9%)	RR 1.91 (1 to 3.63)	154 more per 1000 (from 0 more to 445 more)	MODERATE	IMPORTANT
Vomiting (postoperative)												
1 (Allen 2009)	Randomised trials	No serious risk of bias	No serious inconsistency	No serious indirectness	Serious[1]	None	10/65 (15.4%)	4/65 (6.2%)	RR 2.5 (0.83 to 7.57)	92 more per 1000 (from 10 fewer to 404 more)	MODERATE	IMPORTANT

CI: confidence interval; IV: intravenous; MD: mean difference; MID: minimally important difference; RR: relative risk
[1] The quality of evidence was downgraded by 1 as the 95% confidence interval crossed 1 MID
[2] The quality of evidence was downgraded by 2 as the 95% confidence interval crossed 2 MIDs

Table 7: Clinical evidence profile: Comparison 5. Local anaesthesia method A versus local anaesthesia method B

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	**Design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Local anaesthesia method A**	**Local anaesthesia method B**	**Relative (95% CI)**	**Absolute**		
Patient satisfaction (100mm VAS) - paracervical block (PCB) versus lidocaine gel - Overall experience												
1 (Conti 2016)	Randomised trials	Very serious[1]	No serious inconsistency	No serious indirectness	Serious[2]	None	68	69	Not relevant	MD 6.48 lower (14.49 lower to 1.53 higher)	VERY LOW	CRITICAL
Patient satisfaction (100mm VAS) - paracervical block versus lidocaine gel - Would recommend to friend												
1 (Conti 2016)	Randomised trials	Very serious[1]	No serious inconsistency	No serious indirectness	Serious[2]	None	68	69	Not relevant	MD 3 lower (9.3 lower to 3.3 higher)	VERY LOW	CRITICAL
Patient satisfaction (100mm VAS) - PCB + intrauterine infusion versus PCB												
2 (Edelman 2004; Edelman 2006)	Randomised trials	Serious[3]	No serious inconsistency	No serious indirectness	No serious imprecision	None	78	79	Not relevant	MD 2.01 higher (4.66 lower to 8.68 higher)	MODERATE	CRITICAL
Pain (100mm VAS) - paracervical block versus lidocaine gel - Cervical dilation												
1 (Conti 2016)	Randomised trials	Very serious[1]	No serious inconsistency	No serious indirectness	Serious[2]	None	68	69	Not relevant	MD 4 lower (11.58 lower to 3.58 higher)	VERY LOW	CRITICAL
Pain (100mm VAS) - paracervical block versus lidocaine gel - 30-45 minutes postop												
1 (Conti 2016)	Randomised trials	Very serious[1]	No serious inconsistency	No serious indirectness	No serious imprecision	None	68	69	Not relevant	MD 1.1 higher (5.41 lower to 7.61 higher)	LOW	CRITICAL
Pain (10cm VAS) - paracervical block versus intracervical block - Cervical dilation												

1 (Mankowski 2009)	Randomised trials	Serious[4]	No serious inconsistency	No serious indirectness	No serious imprecision	None	66	66	Not relevant	MD 0.2 lower (0.97 lower to 0.57 higher)	MODERATE	CRITICAL
Pain (10cm VAS) - paracervical block versus intracervical block - Curettage												
1 (Mankowski 2009)	Randomised trials	Serious[4]	No serious inconsistency	No serious indirectness	Serious[2]	None	66	66	Not relevant	MD 0.6 higher (0.32 lower to 1.52 higher)	LOW	CRITICAL
Pain (100mm VAS) - PCB + intrauterine infusion versus PCB - Cervical dilation - 10ml 1% lidocaine IUI												
1 (Edleman 2004)	Randomised trials	Serious[5]	No serious inconsistency[6]	No serious indirectness	Serious[2]	None	39	40	Not relevant	MD 3 lower (14.72 lower to 8.72 higher)	LOW	CRITICAL
Pain (100mm VAS) - PCB + intrauterine infusion versus PCB - Cervical dilation - 5ml 4% lidocaine IUI												
1 (Edelman 2006)	Randomised trials	Serious[5]	No serious inconsistency[6]	No serious indirectness	Serious[2]	None	35	39	Not relevant	MD 20 lower (32.86 to 7.14 lower)	LOW	CRITICAL
Pain (100mm VAS) - PCB + intrauterine infusion versus PCB - Aspiration - 10ml 1% lidocaine IUI												
1 (Edelman 2004)	Randomised trials	Serious[5]	No serious inconsistency[7]	No serious indirectness	Serious[2]	None	40	40	Not relevant	MD 4 lower (18.27 lower to 10.27 higher)	LOW	CRITICAL
Pain (100mm VAS) - PCB + intrauterine infusion versus PCB - Aspiration - 5ml 4% lidocaine IUI												
1 (Edelman 2006)	Randomised trials	Serious[4]	No serious inconsistency[7]	No serious indirectness	No serious imprecision	None	37	39	Not relevant	MD 28 lower (39.53 to 16.47 lower)	MODERATE	CRITICAL
Pain (100mm VAS) - PCB + intrauterine infusion versus PCB - 30 minutes postop - 10ml 1% lidocaine IUI												
1 (Edelman 2004)	Randomised trials	Serious[5]	Serious[8]	No serious indirectness	Serious[2]	None	39	40	Not relevant	MD 7 higher (2.26 lower	LOW	CRITICAL

										to 16.26 higher)		
Pain (100mm VAS) - PCB + intrauterine infusion versus PCB - 30 minutes postop - 5ml 4% lidocaine IUI												
1 (Edelman 2006)	Randomised trials	Serious[5]	No serious inconsistency[8]	No serious indirectness	Serious[2]	None	37	38	Not relevant	MD 5 lower (14.51 lower to 4.51 higher)	LOW	CRITICAL
Nausea - paracervical block versus intracervical block												
1 (Mankowski 2009)	Randomised trials	Serious[3]	No serious inconsistency	No serious indirectness	Very serious[8]	None	0/66 (0%)	1/66 (1.5%)	RR 0.33 (0.01 to 8.04)	10 fewer per 1000 (from 15 fewer to 107 more)	VERY LOW	IMPORTANT
Vomiting - paracervical block versus intracervical block												
1 (Mankowski 2009)	Randomised trials	Serious[3]	No serious inconsistency	No serious indirectness	Very serious[8]	None	0/66 (0%)	1/66 (1.5%)	RR 0.33 (0.01 to 8.04)	10 fewer per 1000 (from 15 fewer to 107 more)	VERY LOW	IMPORTANT

CI: confidence interval; MD: mean difference; MID: minimally important difference; PCB: paracervical block; RR: relative risk; VAS: visual analogue scale

[1] The quality of evidence was downgraded 2 levels as insufficient information was reported regarding random sequence generation and this is a subjective patient reported outcome and women were not blind to treatment allocation

[2] The quality of the evidence was downgraded by 1 as the 95% confidence interval crossed 1 MID

[3] The quality of evidence was downgraded 1 level as there was insufficient information reported about allocation concealment in both trials

[4] The quality of evidence was downgraded 1 level as there was insufficient information reported regarding random sequence generation

[5] The quality of evidence was downgraded 1 level as there was insufficient information reported about allocation concealment

[6] Results are presented separately based on intrauterine infusion volume and concentration to explore significant heterogeneity that was present when analysed together (73%)

[7] Results are presented separately based on intrauterine infusion volume and concentration to explore significant heterogeneity that was present when analysed together (85%)

[8] Results are presented separately based on intrauterine infusion volume and concentration to explore significant heterogeneity that was present when analysed together (68%)

[9] The quality of evidence was downgraded by 2 as the 95% confidence interval crossed 2 MIDs

Appendix G – Economic evidence study selection

Economic evidence for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

No economic evidence was identified which was applicable to this review question.

Appendix H – Economic evidence tables

Economic evidence tables for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

No economic evidence was identified which was applicable to this review question.

Appendix I – Economic evidence profiles

Economic evidence profiles for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

No economic evidence was identified which was applicable to this review question.

Appendix J – Economic analysis

Economic analysis for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

No economic analysis was conducted for this review question.

Appendix K – Excluded studies

Excluded studies for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

Clinical studies

Study	Reason for Exclusion
Acmaz, G., Aksoy, H., Ozoglu, N., Aksoy, U., Albayrak, E., Effect of paracetamol, dexketoprofen trometamol, lidocaine spray, and paracervical block application for pain relief during suction termination of first-trimester pregnancy, BioMed Research International, 2013 (no pagination), 2013	Comparison not included in protocol: lidocaine spray
Agostini, A., Provansal, M., Collette, E., Capelle, M., Estrade, J. P., Cravello, L., Gamerre, M., Comparison of ropivacaine and lidocaine for paracervical block during surgical abortion, Contraception, 77, 382-385, 2008	Comparison not included in protocol: ropivacaine versus lidocaine local anaesthesia - both administered by paracervical block
Aho, M., Erkola, O., Kallio, A., Scheinin, H., Korttila, K., Comparison of dexmedetomidine and midazolam sedation and antagonism of dexmedetomidine with atipamezole, Journal of Clinical Anesthesia, 5, 194-203, 1993	Comparison not included in protocol: Dexmedetomidine versus midazolam - (dexmedetomidine not of interest to committee)
Aksoy, H., Aksoy, U., Ozyurt, S., Ozoglu, N., Acmaz, G., Aydin, T., Idem Karadag, O., Tayyar, A. T., Comparison of lidocaine spray and paracervical block application for pain relief during first-trimester surgical abortion: A randomised, double-blind, placebo-controlled trial, Journal of Obstetrics and Gynaecology, 36, 649-653, 2016	Comparison not included in protocol (lidocaine spray)
Allen, R. H., Kumar, D., Fitzmaurice, G., Lifford, K. L., Goldberg, A. B., Pain management of first-trimester surgical abortion: effects of selection of local anesthesia with and without lorazepam or intravenous sedation, Contraception, 74, 407-13, 2006	Non-randomised study design
Arellano, R. J., Pole, M. L., Rafuse, S. E., Fletcher, M., Saad, Y. G., Friedlander, M., Norris, A., Chung, F. F. T., Omission of nitrous oxide from a propofol-based anesthetic does not affect the recovery of women undergoing outpatient gynecologic surgery, Anesthesiology, 93, 332-339, 2000	Comparison not included in protocol: propofol only versus propofol and nitrous oxide
Hall, G., Ekblom, A., Persson, E., Irestedt, L., Effects of prostaglandin treatment and paracervical blockade on postoperative pain in patients undergoing first trimester abortion in general anesthesia, Acta obstetricia ET gynecologica scandinavica, 76, 868-72, 1997	Comparison not included in protocol: general anaesthesia and paracervical block versus general anaesthesia only
Hall,J.E., Ng,W.S., Smith,S., Blood loss during first trimester termination of pregnancy: comparison of two anaesthetic techniques, British Journal of Anaesthesia, 78, 172-174, 1997	Outcomes reported are not included in protocol
Hamar, O., Garamvolgyi, G., Fentanyl-midazolam-flumazenil anaesthesia during induced abortion, Acta Chirurgica HungaricaActa Chir Hung, 31, 63-8, 1990	Comparison not included in protocol: comparison of different non-inhaled agents for general anaesthesia

Study	Reason for Exclusion
Ireland, L. D., Allen, R. H., Pain Management for Gynecologic Procedures in the Office, Obstetrical & Gynecological SurveyObstet Gynecol Surv, 71, 89-98, 2016	Includes populations outside scope of guideline
Jakobbson, J., Andreen, M., Westgren, M., Thomasson, K., Discomfort after outpatient abortion using paracervical block: A comparison between two opioids and one non-opioid drug for premedication, Gynecologic and Obstetric Investigation, 30, 71-74, 1990	Comparison not included in protocol: morphine and scopolamine versus pethadine versus midazolam administered under paracervical block
Kan, A. S. Y., Ng, E. H. Y., Ho, P. C., The role and comparison of two techniques of paracervical block for pain relief during suction evacuation for first-trimester pregnancy termination, Contraception, 70, 159-163, 2004	Comparison not in protocol: different techniques for paracervical block
Kapp, N., Whyte, P., Tang, J., Jackson, E., Brahmi, D., A review of evidence for safe abortion care, Contraception, 88, 350-63, 2013	Contains comparisons no included in protocol: facets of termination care beyond anaesthesia and analgesia
Karasahin,K.E., Alanbay,I., Ercan,C.M., Mesten,Z., Simsek,C., Baser,I., Lidocaine spray in addition to paracervical block reduces pain during first-trimester surgical abortion: a placebo-controlled clinical trial, Contraception, 83, 362-366, 2011	Comparison not included in protocol: lidocaine spray
Kumarasinghe,N., Harpin,R., Stewart,A.W., Blood loss during suction termination of pregnancy with two different anaesthetic techniques, Anaesthesia and intensive care, 25, 48-50, 1997	Outcomes reported are not included in protocol
Lazenby, G. B., Fogelson, N. S., Aeby, T., Impact of paracervical block on postabortion pain in patients undergoing abortion under general anesthesia, Contraception, 80, 578-82, 2009	Comparison not included in protocol: deep sedation/general anaesthesia ad paracervical block versus deep sedation/general anaesthesia only
Li, Mf, Effect of drugs on artificial abortion of parous and primiparous women in randomized triple blind method, Zhonghua hu li za zhi [Chinese journal of nursing], 25, 73-74, 1990	Non-English language
Li, Mf, The dilatation effect of local anesthetics on the cervix during surgical termination of early pregnancy, Zhonghua fu chan ke za zhi, 26, 37-9, 62, 1991	Non-English language
Mercier, R. J., Zerden, M. L., Intrauterine anesthesia for gynecologic procedures: a systematic review, Obstetrics & GynecologyObstet Gynecol, 120, 669-77, 2012	Contains comparisons outside scope: women undergoing gynaecological procedures other than termination of pregnancy
Moayedi, G., Tschann, M., Pain Management for First-Trimester Uterine Aspiration, Obstetrical and Gynecological Survey, 73, 174-181, 2018	Includes non-pharmacological methods of pain management
Nct,, Trial Comparing Intravenous and Oral Moderate Sedation for First Trimester Surgical Abortions, Https://clinicaltrials.gov/show/nct01011634, 2009	Protocol only
Nct,, Refining Paracervical Block Techniques for Pain Control in First Trimester Surgical Abortion, Https://clinicaltrials.gov/show/nct01466491, 2011	Protocol only

Study	Reason for Exclusion
Nct,, Sevoflurane as an Anesthetic During Dilation and Evacuation Procedures, Https://clinicaltrials.gov/show/nct01048658, 2010	Protocol only
Nct,, Lidocaine-Prilocaine Cream in Conjunction With Paracervical Block for Pain With Abortion, Https://clinicaltrials.gov/show/nct03508804, 2016	Protocol only
Nct,, 4% Intrauterine Lidocaine Infusion for Pain Management in First Trimester Abortions, Https://clinicaltrials.gov/show/nct00121329, 2005	Protocol only
Nct,, Evaluation of a Prefixed 50% N2O- 50%O2 Mixture in Legal Abortion Under Local Analgesia, Https://clinicaltrials.gov/show/nct00769912, 2008	Protocol only
Nct,, Lidocaine and Pain Management in First Trimester Abortions, Https://clinicaltrials.gov/show/nct00613821, 2008	Protocol only
Nct,, Comparison of Lidocaine Spray and Paracervical Block Application for Pain Relief During First-trimester Surgical Abortion: a Randomized, Double-blind, Placebo-controlled Trial, Https://clinicaltrials.gov/show/nct02007408, 2013	Protocol only
Nct,, Nitrous Oxide Versus Intravenous Sedation for Anesthesia, Https://clinicaltrials.gov/show/nct02755090, 2016	Protocol only
Nct,, The Feasibility of Different Doses of Etomidate Admixed With Propofol in Induced Abortion: a Randomized, Double Blind Controlled Trial, Https://clinicaltrials.gov/show/nct02208596, 2014	Protocol only
Nct,, Intravenous Sedation Versus General Anesthesia in Patients Undergoing Minor Gynecologic Surgery, Https://clinicaltrials.gov/show/nct01890707, 2012	Protocol only
Owolabi, O. T., Moodley, J., A randomized trial of pain relief in termination of pregnancy in South Africa, Tropical Doctor, 35, 136-139, 2005	Comparison not include in protocol: different techniques for paracervical block
Peng, Zy, Chen, Xm, Zeng, Bx, Liu, Jj, Propofol and midazolam used in artificial abortion section, Chinese journal of anesthesiology, 14, 369-371, 1994	Non-English language
Renner, R. M., Edelman, A. B., Nichols, M. D., Jensen, J. T., Lim, J. Y., Bednarek, P. H., Refining paracervical block techniques for pain control in first trimester surgical abortion: a randomized controlled noninferiority trial, Contraception, 94, 461-466, 2016	Comparison not included in protocol: difference paracervical block techniques
Renner, R. M., Jensen, J. T., Nichols, M. D., Edelman, A. B., Pain control in first-trimester surgical abortion: a systematic review of randomized controlled trials, Contraception, 81, 372-388, 2010	Includes non-pharmacological methods of pain management
Renner, R. M., Nichols, M. D., Jensen, J. T., Li, H., Edelman, A. B., Paracervical block for pain control in first-trimester surgical abortion: A randomized controlled trial, Obstetrics and gynecology, 119, 1030-1037, 2012	Comparison not included in protocol: conscious sedation and paracervical block versus conscious sedation only
Renner, Regina-Maria, Jensen, Jeffrey T J, Nichols, Mark D N, Edelman, Alison, Pain control in first trimester surgical abortion, Cochrane Database of Systematic Reviews, 2009	Includes non-pharmacological methods of pain management
Rossi, Ae, Lo, Sapio D, Oliva, O, Vitale, O, Ebano, A, Hospital day-surgery: comparative evaluation of 3 general anesthesia techniques, Minerva Anestesiologica, 61, 265-269, 1995	Non-English language

Study	Reason for Exclusion
Singh, R. H., Montoya, M., Espey, E., Leeman, L., Nitrous oxide versus oral sedation for pain management of first-trimester surgical abortion - a randomized study, Contraception, 96, 118-123, 2017	Comparison not included in protocol: oral conscious sedation versus inhaled conscious sedation
Singh, R. H., Montoya, M., Espey, E., Leeman, L., Nitrous Oxide Versus Oral Sedation for Pain Management of First-Trimester Surgical Abortion-A Randomized Study, Obstetrical and Gynecological Survey, 72, 646-648, 2017	Abstract and editorial review for Singh 2017
Suliman, S., Ericksen, T., Labuschgne, P., de Wit, R., Stein, D. J., Seedat, S., Comparison of pain, cortisol levels, and psychological distress in women undergoing surgical termination of pregnancy under local anaesthesia versus intravenous sedation, BMC Psychiatry, 7, 24, 2007	Non-randomised study
Tablov, V, Tsafarov, M, Tablov, B, Popov, I, Partenov, P, Diprivan versus midazolam in combined anaesthesia with ketamin for minor gynecological surgery, Akusherstvo i ginekologiia, 46, 41-43, 2007	Non-English language
Tangsiriwatthana, Thumwadee, Sangkomkamhang, Ussanee S, Lumbiganon, Pisake, Laopaiboon, Malinee, Paracervical local anaesthesia for cervical dilatation and uterine intervention, Cochrane Database of Systematic Reviews, 2013	Contains comparisons and populations not included in protocol
Wiebe, E. R., Comparison of the efficacy of different local anesthetics and techniques of local anesthesia in therapeutic abortions, American Journal of Obstetrics and Gynecology, 167, 131-134, 1992	Comparison not included in protocol: different techniques for paracervical block
Wiebe, E. R., Pain control in abortion, International Journal of Gynecology and Obstetrics, 50, 41-46, 1995	Comparison not included in protocol: different techniques for paracervical block
Wiebe, E. R., Trouton, K. J., Savoy, E., Intra-cervical versus i.v. fentanyl for abortion, Human Reproduction, 20, 2025-2028, 2005	Comparison not included in protocol: IV fentanyl not of interest to committee
Wu, J., Yao, S., Wu, Z., Chu, S., Xia, G., Deng, F., A comparison of anesthetic regimens using etomidate and propofol in patients undergoing first-trimester abortions: Double-blind, randomized clinical trial of safety and efficacy, Contraception, 87, 55-62, 2013	Comparison not included in protocol: different methods of general anaesthesia excluding anaesthetic gases
Zhou, J, The effect of nitrous oxide analgesia on artificial abortion, Chinese journal of anesthesiology, 14, 152, 1994	Non-English language

Economic studies

No economic evidence was identified for this review. See supplementary material 2 for further information.

Appendix L – Research recommendations

Research recommendations for review question: What is the optimal method of anaesthesia or sedation for surgical termination of pregnancy?

What local anaesthetic techniques are most effective for women having surgical termination of pregnancy?

Why this is important?

Surgical termination under local anaesthesia is an established technique that is acceptable to women and has advantages in enabling quick, same day procedures, short admission times, no need for fasting and no need for care by a competent adult in the recovery phase and immediate provision of effective long acting reversible contraception. However the only RCTs conducted are on small numbers. Modest improvements in techniques could make a considerable difference to the experience of a large number of women.

Table 8: Research recommendation rationale

Research question	What local anaesthetic techniques are most effective for women having surgical termination of pregnancy?
Importance to 'patients' or the population	Termination of pregnancy is a common procedure. For those women opting for a surgical procedure, the use of local anaesthesia can offer advantages. Any technique that reduces pain or distress could potentially benefit a large number of women and result in more having the confidence to choose local anaesthesia. Women can also have effective long acting reversible contraception fitted at the same.
Relevance to NICE guidance	Very little evidence was found in the comparison of "local anaesthesia method A versus local anaesthesia method B" and so no recommendation could be made.
Relevance to the NHS	Surgical Termination of pregnancy is a common procedure conducted in NHS. The ability to conduct more procedures using local anaesthesia would enable services to offer surgical treatments out of theatre environments which are far more cost effective and less intrusive for the woman. The procedure can be delivered in community settings, freeing resource in acute hospitals.
National priorities	Access to safe termination is a public health priority. Identifying treatments that are cost effective and which enable a transfer of care from theatre to clinic, and from acute hospitals to community settings, are NHS priorities.
Current evidence base	Limited to trials involving very low numbers of women
Equality	N / A

N/A: not applicable; NHS: National Health Service; NICE: National Institute for Health and Care Excellence

Table 9: Research recommendation modified PICO table

Criterion	Explanation
Population	Women who are having a surgical termination of pregnancy under local anaesthesia (also known as "manual vacuum aspiration")
Intervention	Standard technique using paracervical block (8 to 12mls local anaesthesia, wait of <3 minutes, use of unbuffered acidic local anaesthetic, no adjuvant intrauterine anaesthetic)
Comparator	Four arms to compare 1 of:

Criterion	Explanation
	1. high volume technique (up to 40mls) 2. delay of 5 & 10 minutes between anaesthetic and start of procedure 3. use of bicarbonate to create a neutral pH of local 4. addition of intrauterine anaesthetic (e.g. 4% lignocaine gel left in-situ for 1 or 5 minutes)
Outcome	• Patient satisfaction (including whether would choose same technique in future) • Pain score (maximal and at 5 and 15 minutes) • Proportion reporting severe or minimal pain • Proportion reporting pain less than or equivalent to that of normal menstruation • Admission time • Need for additional analgesia
Study design	RCT
Timeframe	12 months
Additional information	Trial could also recruit from other populations such as miscarriage

RCT: randomised controlled trial

Research recommendations for review question: What is the optimal regimen for general anaesthesia for women having surgical termination of pregnancy?

Why this is important?

There is little research on the optimal method of general anaesthesia for a surgical termination of pregnancy. However there is some weak evidence that the inhalational agents may result in more bleeding than intravenous drugs, as a result of their relaxant effect on the uterus.

Table 10: Research recommendation rationale

Research question	What is the optimal regimen for general anaesthesia for women having surgical termination of pregnancy?
Importance to 'patients' or the population	Although an increasing proportion of surgical terminations of pregnancy are expected to be conducted under local anaesthesia in the future, use of general anaesthesia remains commonplace and there are women who have a strong preference for general anaesthesia.
Relevance to NICE guidance	Uncertainty remains as to whether inhalational agents or intravenous anaesthetic drugs are better for inducing general anaesthesia in women undergoing a surgical termination of pregnancy
Relevance to the NHS	Surgical termination of pregnancy under general anaesthesia is a common procedure conducted in NHS
National priorities	Optimising the regimen of general anaesthesia for surgical termination of pregnancy may improve the experience for women and enable termination services to function more efficiently.
Current evidence base	Limited
Equality	N/A

N/A: not applicable; NHS: National Health Service; NICE: National Institute for Health and Care Excellence

Table 11: Research recommendation modified PICO table

Criterion	Explanation
Population	Women who are having a surgical termination of pregnancy under general anaesthesia
Intervention	intravenous anaesthetic drug
Comparator	inhalational anaesthetic agent
Outcome	Blood loss, surgeon assessed uterine contractility, nausea, vomiting, patient acceptability
Study design	RCT
Timeframe	12 months
Additional information	None

RCT: randomised controlled trial