

**A report for
Universitätsklinikum Schleswig-Holstein/Campus Kiel
on shared decision making
for childbirth in women with breech presentation at
term
(caesarean section vs. vaginal birth)**



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LIST OF ABBREVIATIONS

CI	Confidence interval
CDSR	Cochrane Database of Systematic Reviews
CRD	Centre for Reviews and Dissemination
CS	Caesarean section
DARE	Database of Abstracts of Reviews of Effects
ECV	External cephalic version
FAQ	Frequently asked question
GIN	Guidelines International Network
GRADE	Grading of Recommendations, Assessment, Development and Evaluations
HIE	Hypoxic ischemic encephalopathy
HTA	Health Technology Assessment
ICU	Intensive care unit
KSR	Kleijnen Systematic Reviews
N/A	Not applicable
N	Sample size
NHS	National Health Service (UK)
NICE	National Institute for Health and Care Excellence (UK)
NICU	Neonatal intensive care unit
NM	Not mentioned
NR	Not reported
OR	Odds ratio
PICOS	Participants, intervention, comparators, outcomes and study design
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QoL	Quality of life
RCOG	Royal College of Obstetricians and Gynaecologists
RCT	Randomised controlled trial
RR	Risk ratio
SDM	Shared decision making
SR	Systematic review
UK	United Kingdom
VD	Vaginal delivery

1. PROJECT OBJECTIVE

A key aim of the research project “Making SDM a reality” is to inform patients as part of shared decision making (SDM).

Kleijnen Systematic Reviews (KSR) Ltd has prepared an evidence report with a synthesis of the evidence of the relevant treatment options.

The topic of this evidence report is childbirth in women with breech presentation at term (caesarean section vs. vaginal birth).

2. METHODS

2.1 INCLUSION CRITERIA

The research question underpinning the literature searches for this topic was developed in conjunction with clinical departments at Universitätsklinikum Schleswig-Holstein/Campus Kiel. The question was framed in terms of participants, intervention, comparators, outcomes and study design (PICOS), see Table 1.

Table 1: Inclusion and exclusion criteria

	Included	Excluded
Population	Pregnant women with a breech presentation at term (≥ 37 weeks of pregnancy)	Pregnant women with clear indication for caesarean section (e.g. after second caesarean section, small for gestational age, uterine malformation)
Intervention	Planned caesarean section	Non-elective caesarean section
Comparator	Planned vaginal birth with or without the possibility of External Cephalic Version (ECV)	Induction of labour
Outcomes	Mother and child (separately) • All-cause mortality • Cause-specific mortality • Survival time • Surgical risks • Post-operative risks • Post-operative complications Mother only • Quality of life (QoL) • Satisfaction with care/treatment • Resolution of adverse symptoms • Pain • Functionality • Time to return to usual activity • Time to return to sports • Time to return to sex • Time to return to urinary functionality • Time to return to bowel functionality • Implications for family planning or fertility issues • Surgery complications or ICU admission (infection, pain, bleeding, organ injuries, need for blood transfusion, thromboembolic complications)	

	Included	Excluded
	• Postoperative pain (perineal and abdominal pain) • Urinary or bowel dysfunction, • Pelvic floor dysfunction • Complications affecting later pregnancies (uterine ruptures, infertility, placental anomalies (placenta previa, increta or accrete)) Child Only • Risks to the child: e.g. birth asphyxia, Apgar score below normal range, cord pH below normal range, injuries to child, NICU admission, breathing problems, neurological morbidity, hypoxic ischemic encephalopathy (HIE), intracranial bleeding • Long-term implications for child: adjustment disorder, asthma, diabetes, various food allergies, allergic rhinitis Other outcomes • Length of hospital stay • Operative time/anaesthesia time • Problems of mother-child relationship (bonding) after birth • Complicated breastfeeding • Bonding/relationship with baby	
Study design	Systematic reviews, health technology assessments and guidelines	Literature reviews; expert opinions; primary research*; letters
Effect modification / Subgroups	Women with a previous caesarean section	
* One primary study was included in the discussion section ECV = External Cephalic Version; HIE = hypoxic ischemic encephalopathy; ICU = Intensive Care Unit; NICU = Neonatal Intensive Care Unit; QoL = quality of life		

2.2 FREQUENTLY ASKED QUESTIONS

The following research questions were identified as frequently asked questions (FAQs):

1. What does treatment for breech presentation at term involve? (What is the procedure? Length of procedure (operative time/anaesthesia time); length of hospital stay; anaesthesia choices)
2. How will it affect survival of the mother?
 - a. All-cause mortality

- b. Cause-specific mortality
 - c. Survival time
- 3. How will it affect survival of the child?
 - a. All-cause mortality
 - b. Cause-specific mortality
 - c. Survival time
- 4. Will quality of life of the mother improve?
 - a. Quality of life
 - b. Satisfaction levels
 - c. Resolution of adverse symptoms
 - d. Pain
 - e. Functionality
- 5. When will the mother recover?
 - a. Time to return to usual activity
 - b. Time to return to sports
 - c. Time to return to sex
 - d. Time to return to urinary functionality
 - e. Time to return to bowel functionality
- 6. What are the risks and long-term implications for the mother?
 - a. Surgical risks
 - b. Post-operative risks/complications
 - c. Implications for family planning or fertility issues
 - d. Surgery complications (infection, pain, bleeding, organ injuries, need for blood transfusion, thromboembolic complications)
 - e. Postoperative pain (perineal and abdominal pain)
 - f. Urinary or bowel dysfunction
 - g. Pelvic floor dysfunction
 - h. Complications affecting later pregnancies (uterine ruptures, infertility, placental anomalies (placenta Previa, increta or accrete))
- 7. What are the risks and long-term implications for the child?
 - a. Birth asphyxia
 - b. Apgar score below normal range
 - c. Cord pH below normal range
 - d. Injuries to child
 - e. NICU admission
 - f. Breathing problems
 - g. Neurological morbidity
 - h. Hypoxic ischemic encephalopathy (HIE)
 - i. Intracranial bleeding

- j. Long-term implications for child: adjustment disorder, asthma, diabetes, various food allergies, allergic rhinitis
8. Will the mode of birth affect the relationship between mother and child?
- a. Problems with mother-child relationships after birth, i.e. bonding
 - b. Complicated breastfeeding

2.3 LITERATURE SEARCHES

Literature searches were conducted to identify systematic reviews, health technology assessments (HTAs) and guidelines about childbirth in women with breech presentation at term (caesarean section vs. vaginal birth).

The search strategies were developed specifically for each database and the keywords adapted according to the configuration of each database. Searches were limited by date range for systematic reviews and guidelines to 2012-2019. Searches were not limited by language or publication status.

2.3.1 Search sources

The following systematic review specific databases were searched from 2012:

- Cochrane Database of Systematic Reviews (CDSR) (Wiley): issue 9 of 12, September 2019
- Database of Abstracts of Reviews of Effects (DARE) (CRD): 2012 to 31 Mar 2015
- Health Technology Assessment (HTA) database (CRD): 2012 to 31 Mar 2018
- KSR Evidence (Internet) (<https://ksrevidence.com/>): 2012-2019
- Epistemonikos (Internet) (<https://www.epistemonikos.org/>): 2012-2019

The following guidelines resources were searched from 2012:

- Guidelines International Network (GIN) (Internet) (<https://www.g-i-n.net/home>): up to 2019/09/11
- NICE Evidence (Internet) (www.evidence.nhs.uk/): 2012-2019
- NICE Guidance (Internet) (<https://www.nice.org.uk/guidance>): 2012-2019
- ECRI Guidelines Trust (Internet) (<https://guidelines.ecri.org/>): 2012-2019

Full details of all search strategies are presented in Appendix 1.

2.3.2 Handling of citations

Identified references from the bibliographic database searches were downloaded into EndNote bibliographic management software for further assessment and handling.

2.4 METHODS OF STUDY SELECTION, QUALITY ASSESSMENT AND DATA EXTRACTION

2.4.1 Study selection

Two reviewers independently screened the title and abstract of each record identified by the search and determined the potential relevance of each record. For potentially relevant records, the full paper was obtained, independently checked, and inclusion criteria applied. Any disagreements were resolved through discussion.

An evidence hierarchy was used to select the most appropriate study(ies) to populate the evidence tables. Where more than one study could provide evidence, the most relevant studies were selected using the following criteria: recency (most recent preferred), quality (highest quality preferred), representativeness (populations representative of the general target population preferred). Where there were gaps in the evidence (no systematic review or guideline available), as described before, relevant randomised controlled trials (RCTs) would have been searched for and extracted, and where no RCTs would have been identified, observational studies would have been employed.

2.4.2 Data extraction

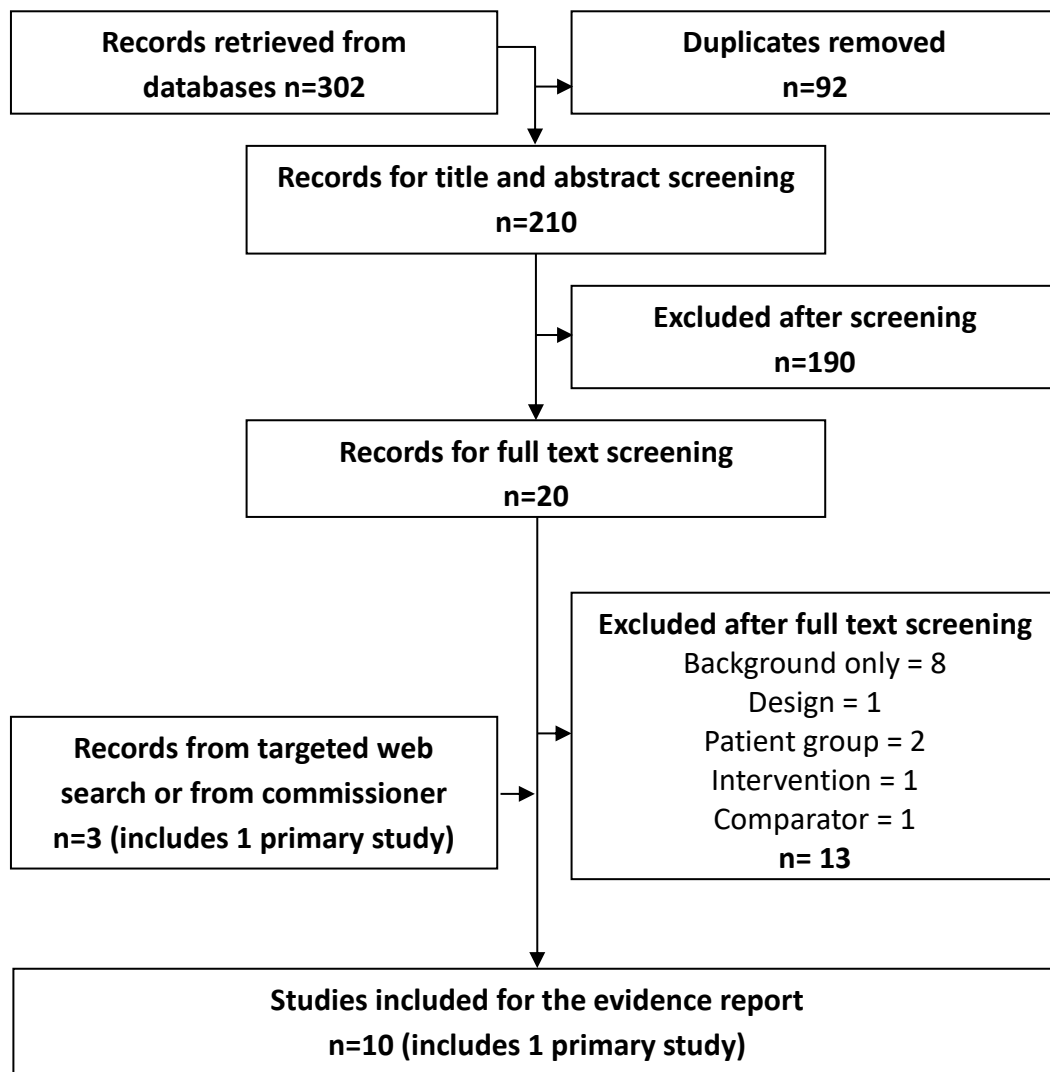
For each study, data were extracted by one reviewer and checked by another. Any disagreements were resolved by consensus.

3. RESULTS

3.1 LITERATURE SEARCH RESULTS AND INCLUSION ASSESSMENT

Searches were conducted in September 2019 to identify systematic reviews, health technology assessments or evidence-based guidelines. A total of 302 records were retrieved from the literature searches. After removal of duplicate records 210 titles and abstracts were screened by two reviewers. After screening, 20 records were selected for further assessment from which seven were selected as meeting the inclusion criteria. Three additional publications from the targeted web search were used in the report: One primary study (retrospective cohort) that did not meet the eligibility criteria was used to inform FAQ1 one HTA and one guideline that were not found in searches. A summary of the study selection process according to modified PRISMA reporting guidelines¹ is reported in Figure 1.

Figure 1: Study selection process



3.2 OVERVIEW OF THE EVIDENCE

Table 2 summarises the sources of evidence used to answer the eight FAQs.

Table 2: Evidence sources

Study/year	Evidence type	Intervention	FAQ1: What does the procedure involve?	FAQ2: Will the mother live longer?	FAQ3: Will the child live longer?	FAQ4: Will mothers' quality of life get better?	FAQ5: When will the mother recover?	FAQ6: What are the risks and long-term implications for the mother?	FAQ7: What are the risks and long-term implications for the child?	FAQ8: Will the mode of birth affect the relationship between mother and child?
Berhan 2016 ²	SR	VD			✓				✓	
		CS			✓				✓	
Dixon 2018 ³	SR	VD						✓		✓
		CS						✓		✓
Hofmeyr 2015 ⁴	SR	ECV	✓							
Hofmeyr 2015 ⁵	SR	VD				✓	✓	✓	✓	✓
		CS				✓	✓	✓	✓	✓
Hutton 2015 ⁶	SR	ECV	✓							
RCOG 2017 ⁷	Guideline	VD	✓		✓			✓	✓	
		CS	✓		✓			✓	✓	
RCOG 2017 ⁸	Guideline	ECV	✓							
NICE 2011 ⁹	Guideline	CS						✓		
Wängberg Nordborg 2017 ¹⁰	HTA	VD	✓	✓		✓	✓	✓	✓	
		CS	✓	✓		✓	✓	✓	✓	

Study/year	Evidence type	Intervention	FAQ1: What does the procedure involve?	FAQ2: Will the mother live longer?	FAQ3: Will the child live longer?	FAQ4: Will mothers ' quality of life get better?	FAQ5: When will the mother recover?	FAQ6: What are the risks and long-term implications for the mother?	FAQ7: What are the risks and long-term implications for the child?	FAQ8: Will the mode of birth affect the relationship between mother and child?
Additional Paper (Primary Research)										
Louwen 2017 ¹¹	Retro-spective Cohort Study	VD	✓							
CS = caesarean section; ECV = external cephalic version; FAQ = Frequently Asked Question; HTA = Health Technology Assessment; RCOG = Royal College of Obstetricians and Gynaecologists; SR = Systematic Review; VD = vaginal delivery										

3.3 FAQ1: WHAT DOES IT INVOLVE?

Breech presentation also known as non-cephalic presentation is when a baby is positioned bottom first or feet first in the uterus. Table 3 summarises options in women with breech presentation at term. Treatment options are mutually exclusive although intended vaginal delivery results in an emergency caesarean section in 44% (95% confidence interval (CI) 42% to 46%) of the cases.¹⁰

Table 3: Description of options in women with breech presentation

Breech presentation
Breech presentation complicates 3–4% of term deliveries and is more common in women who have never given birth before (nulliparous) and in preterm pregnancies.⁸ There are three main types of breech. Firstly, frank breech, where baby's buttocks are aimed at the birth canal with legs sticking straight up in front of the body and the feet near the head. Secondly, complete breech is where one or both knees are bent. Thirdly, footling breech is where one or both feet are below the breech. Babies born in the breech position (bottom first) may experience some problems during birth such as a pressure on the umbilical cord resulting in decreased oxygen supply.¹² Following the diagnosis of breech presentation, a woman will be assessed for risk factors which will help inform whether a vaginal delivery is preferred to the alternative of a planned (elective) caesarean section. The Royal College of Obstetricians and Gynaecologists (RCOG) in the United Kingdom (UK) suggests that a higher risk vaginal breech birth is expected under the following circumstances: • footling breech (the baby's feet point downward) • the baby is larger or smaller than average (less than tenth centile or more than 3.8 kg) • the baby has cervical hyperextension • antenatal foetal compromise including high blood pressure, or protein in urine This evidence was graded as C (on the RCOG's rating scale of A to D with "A" representing the strongest grading of evidence)⁷ meaning that it was directly applicable to the target population, and demonstrated overall consistency of results. RCOG suggest that women with a breech presentation at term should be offered external cephalic version (ECV). They should be advised on the risks and benefits of ECV and the implications for the mode of delivery. This evidence was graded as A (on the RCOG's rating scale).⁷
Vaginal delivery
Cephalic and breech presentations delivered via the vagina are fundamentally different to standard deliveries. A cephalic presentation typically means that once the head is delivered then the rest of the body will follow without difficulty. With a breech, however, successively larger and less compressible body parts are born. Spontaneous complete expulsion of the foetus is seldom accomplished successfully and the expulsion period is often longer in breech position than for non-breech babies. With all breech deliveries, unless there is considerable relaxation of the perineum, an episiotomy (a surgical incision of the perineum and the posterior vaginal wall generally done by a midwife or obstetrician) will be made.¹² Babies can be successfully born in the breech position. If an ECV (see below) is not feasible or not agreed to, then it may be safe to have a vaginal breech birth (particularly when the baby is close to

being born). Babies can be delivered with the mother being in either a semi-recumbent position (on back) or in an upright position (positioned on all fours, knees or standing)¹¹

Vaginal delivery with external cephalic version

The best outcomes (in terms of reduced complications) for both mothers and babies is when the baby is born head first i.e. the cephalic position.⁴ If the baby is in breech presentation, i.e. bottom-down, the outcomes in childbirth are poorer including the need for caesarean section.⁴ Through the maternal abdomen, ECV is a technique used to manipulate and correct the foetus into a cephalic position.⁸ The technique should only be performed by a trained practitioner typically a midwife or a trainee working under strict supervision; and where facilities for monitoring and surgical delivery are available. No more than four attempts are suggested with a total time of 10 minutes. It is effective in approximately **five** out of **10** women (50% chances of being successful). Rarely, babies with the breech presentation will spontaneously turn to cephalic presentation after an unsuccessful ECV attempt. And vice versa, after successful ECV, babies rarely turn back to breech. This happens to less than five in 100 women.¹³ There is conflicting evidence as to whether the technique reduces the chances of caesarean section. Even though most women tolerate ECV, the technique can be painful. ECV has a very low complication rate, e.g. foetomaternal haemorrhage.¹⁴

Caesarean section

If after 39 weeks of pregnancy, the baby remains in a breech presentation, there is the option of a planned caesarean section. Undergoing such a procedure can reduce some of the anxieties and uncertainties of vaginal delivery.¹⁵ The procedure lasts between 45-60 minutes; and it is carried out in an operating theatre.

There are two types of anaesthetic. Depending on the type of anaesthetic used, the mother is either awake (a regional anaesthetic) or asleep (a general anaesthetic). The majority of women having a planned caesarean section will have a regional anaesthetic (a spinal anaesthetic or an epidural, or a combination of the two). This is where they are awake and will not feel pain although may feel pulling or pressure in the lower body. It is usually safer for mother-to-be and baby than a general anaesthetic and allows the woman and her partner to experience the birth together.^{7, 15}

EVIDENCE SUMMARY

FAQ1: What does it involve?

Different interventions are available

The key planned interventions available for mothers-to-be are vaginal delivery (with or without external cephalic version) or elective caesarean section.

Vaginal delivery

Babies can be successfully born in the breech presentation. Mothers-to-be can be positioned in either a semi-recumbent position, upright position, all fours, or squatting. There are potential risks and benefits associated with vaginal delivery (discussed in the relevant sections).

Vaginal delivery with external cephalic version

External cephalic version (ECV) is a technique performed through the maternal abdomen to manipulate and subsequently correct the foetus into a cephalic position. When performed by a trained practitioner, the technique is successful in 50% of the cases (approximately five out of 10 women). However, ECV may increase risk of late preterm birth if performed before 37 weeks of gestation.

Caesarean section

This is a surgical procedure which is offered as an alternative to vaginal delivery. The procedure typically takes 45 minutes to an hour and can be performed under local or general anaesthesia. There are potential risks and benefits associated with this option (discussed in the relevant sections).

3.4 FAQ2: HOW WILL IT AFFECT SURVIVAL OF THE MOTHER?

3.4.1 All-cause mortality

Currently there is a considerable uncertainty (very low quality of the evidence) whether Caesarean section reduces maternal mortality in women with singleton breech presentation when compared with vaginal delivery. Evidence presented in a Swedish health technology assessment (HTA) report was based on a single RCT conducted at 121 centres in 26 countries involving women with a singleton foetus in a frank or complete breech presentation¹⁰ (see FAQ1). One death occurred in the intended vaginal delivery arm (1/1,042) and no deaths in the intended caesarean section arm (0/1,041) meaning that no conclusions could be drawn in relation the differential mortality. See Table 4. The same HTA also referred to three observational studies, only one of which reported maternal deaths (3/7,938) following vaginal delivery i.e. a study in Denmark conducted between 1982–1995.

3.4.2 Cause-specific mortality

No evidence was found for cause-specific mortality between the two delivery methods.

3.4.3 Survival time

No evidence was found for survival time between the two delivery methods.

Table 4: Mortality outcomes (mother)

Outcome	Author	Number of studies	Average follow up time (months)	Weeks of pregnancy	No events / N caesarean section	No events / N vaginal delivery	RR* (95% CI)	Favoured	Evidence levels
Maternal mortality	Hannah 2000 ¹⁶ as identified in Hofmeyr 2015 ⁵	1	24	>37	0/1041 (0.0%)	1/1042 (0.1%)	3.00 (0.12, 73.49)	No difference	Very low (GRADE)

*Calculated independently using RevMan 5.3

EVIDENCE SUMMARY

FAQ2: How will it affect survival of the mother?

All cause maternal mortality

Maternal death following caesarean section is a very rare event in developed countries. Very low quality (certainty) evidence suggests there may be little or no difference in maternal mortality between caesarean section and vaginal delivery.

3.5 FAQ3: HOW WILL IT AFFECT SURVIVAL OF THE CHILD?

3.5.1 *All-cause child mortality*

Three studies reported quantitative data pertaining to this outcome – see Table 5. Berhan (2016)² pooled data from 27 mainly observational studies originating from multiple countries. That study found that elective caesarean section was associated with a lower perinatal mortality rate 0.46 per 1,000 as opposed to 3.52 per 1,000 for vaginal delivery (RR = 6.3, 95% CI 3.0, 13.4). This finding is broadly consistent with evidence reported in the RCOG guideline 2017⁷ in which the risk of mortality was approximately 0.5/1,000 with caesarean section after 39+0 weeks of gestation; compared with 2.0/1,000 with planned vaginal breech birth. Compared with cephalic delivery, however, the excess risk of breech delivery is (1/1,000). Wängberg Nordborg 2017¹⁰ reported reduced perinatal mortality rates in a single RCT Hannah 2002¹⁷ (RR 0.27 (0.008, 0.97)) and in pooled data from 14 cohort studies RR 0.34 (0.23; 0.49) following elective caesarean section.

3.5.2 *Cause-specific mortality*

No evidence was found on cause-specific mortality between the delivery methods.

3.5.3 *Survival time*

No evidence was found on survival time between the delivery methods.

Table 5: Mortality outcomes (child)

Outcome	Author	Number of studies	Average follow up time (months)	Weeks of pregnancy	No events / N caesarean section	No events / N vaginal delivery	RR (95% CI)	Favoured	Grades of recommendations
Perinatal mortality	Berhan 2016 ^{2a}	13	NR	NR	28/60,442 (0.46/1000)	239/67,806 (3.52/1000)	6.3 (3.0, 13.4)	Caesarean section	NA
	RCOG 2017 ⁷	NR	NR	39	0.5/1000	2.0/1000	NA	Caesarean section	C
	Wängberg Nordborg 2017 ¹⁰	1 RCT Hannah 2002 ^{17}}	NR	NR	0.3%	1.3%	0.27 (0.008, 0.97)	Caesarean section	Low (GRADE)
		14	NR	NR	0-0.15 (% range)	0.07-0.39 (% range)	RR 0.34 (0.23; 0.49)		
Reduction in perinatal mortality	RCOG 2017 ⁷	27	NR	NR	Elective caesarean section associated with a two- to five-fold reduction in perinatal mortality (absolute perinatal mortality rate was 3/1000)		NA	Caesarean section	2++
	^a In countries with low national perinatal mortality rate; 2++ High-quality systematic reviews of case–control or cohort studies or high-quality case–control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal; C- A body of evidence including studies rated as 2+ directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2++. GRADE = Grading of Recommendations, Assessment, Development and Evaluation; NA = not applicable; RCOG = Royal College of Obstetricians and Gynaecologists.								

EVIDENCE SUMMARY

FAQ3: How will it affect survival of the child?

Perinatal mortality rates are very low for either delivery options. However, planned caesarean section results in reduced mortality rates when compared with planned vaginal breech delivery. Any decision to perform surgery needs to be balanced against the potential risks associated with it. The quality of the evidence was low when partly based on data from an RCT using (GRADE criteria). However, RCOG suggests, there was a high probability (causal relation) of reduction in perinatal mortality following caesarean section when based solely on observational data.

3.6 FAQ4: WILL QUALITY OF LIFE FOR THE MOTHER IMPROVE?

3.6.1 *Quality of life*

No evidence was found on quality of life outcomes (using standard measurement instruments such as Short Form-36) between the delivery methods.

3.6.2 *Satisfaction levels*

Two studies reported quantitative data pertaining to this outcome – see Table 6. Hofmeyr 2015⁵ and Wängberg Nordborg 2017¹⁰ found no differences between satisfaction levels (measured using different scales) both at short (three month) and long term follow-up (two years).

3.6.3 *Resolution of adverse symptoms*

No evidence was found on resolution of adverse symptoms between the delivery methods.

3.6.4 *Pain (any)*

Hofmeyr 2015⁵ reported no between group differences for any pain at three months. However, this finding was based on a single study and was rated as low-level evidence. See Table 5.

3.6.5 *Functionality*

No evidence was found on functionality between the delivery methods.

Table 6: Quality of life

Outcome	Author	Number of studies	Average follow-up (months)	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
Dissatisfaction	Hofmeyr 2015 ⁵	1 RCT (Hannah 2000 ¹⁶)	NR	37/798 (4.6%)	37/798 (4.6%)	RR 1.00 (95% CI 0.64 to 1.56)	No difference	Low (GRADE)
Mother's experience (Satisfaction)	Wängberg Nordborg 2017 ¹⁰	1 RCT (Hodnett 2005 ¹⁸)	3 and 24	917		NR	No difference	Moderate (GRADE)
Any pain at 3 months	Hofmeyr 2015 ⁵	1 RCT (Hannah 2000 ¹⁶)	3	217/796 (27.2%)	199/797 (25.0%)	RR 1.09 (95% CI 0.93 to 1.29)	No difference	Low (GRADE)
CI = Confidence Interval; GRADE = Grading of Recommendations, Assessment, Development and Evaluation; NR = not reported; RR = Risk Ratio								

EVIDENCE SUMMARY

FAQ4: Will quality of life for the mother improve?

No studies were found to inform quality of life, resolution of adverse symptoms or functionality. The only available evidence suggests there are no differences in pain and satisfaction levels between planned caesarean section and planned vaginal delivery. The quality of the evidence was, however, predominantly low. The quality of the evidence was low/moderate for satisfaction measures and low for any pain at three months.

3.7 FAQ5: WHEN WILL THE MOTHER RECOVER?

Hofmeyr 2015⁵ and Wängberg Nordborg 2017¹⁰ were the only sources of evidence to answer this frequently asked question. Hofmeyr 2015⁵ is a publication of a high-quality systematic review undertaken by the Pregnancy and Childbirth Cochrane group with the support of the UK National Institute for Health Research. Wängberg Nordborg 2017¹⁰ is a Health Technology Assessment report carried out by the centrum in Västra Götaland (Sweden). See Table 7.

3.7.1 *Time to return to usual activity*

No evidence was found on time to return to usual activity between the delivery methods. However, both studies, Hofmeyr 2015⁵ and Wängberg Nordborg 2017¹⁰ reported on early post-partum and postnatal depression. The findings suggest there are no between group differences in postnatal depression short-term and long-term follow-up of three months and two years respectively. Please note that the variation in denominators reported within studies is a function of many factors, primarily ability to follow up patients over time and willingness of individuals to answer specific questions.

3.7.2 *Time to return to sports*

No evidence was found for this outcome.

3.7.3 *Time to return to sex*

One study reported quantitative data pertaining to this outcome (measured with three different scales) – see Table 7. Hofmeyr 2015⁵ found there were no between group differences in dyspareunia, perception of unhappiness with or sexual problems at either three months or two year follow-ups.

3.7.4 *Time to return to urinary functionality*

Two studies reported quantitative data pertaining to this outcome Hofmeyr 2015⁵ and Wängberg Nordborg 2017¹⁰. Hofmeyr 2015⁵ found there was a higher risk of urinary incontinence following vaginal delivery when compared with caesarean section at three months follow-up. However, that same study found no between group differences in the outcome at two years. Also, Wängberg Nordborg 2017¹⁰ reported no between group differences in incontinence (see Table 7).

3.7.5 *Time to return to bowel functionality*

One study reported quantitative data pertaining to this outcome (measured with two different scales) – see Table 6. Hofmeyr 2015⁵ found there was a lower risk of constipation following vaginal delivery when compared with caesarean section at 24 months follow-up. However, that same study found no between group differences in faecal incontinence at either three months or two-year follow-up respectively (see Table 7).

3.7.6 *Length of hospital stay*

Hannah 2000¹⁶ reported significantly shorter hospital stay (in days) following planned vaginal delivery compared with planned caesarean section (median, interquartile range (IQR

Table 7: Recovery of function

Outcome	Author/year	Number of studies	Average follow-up (months)	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
Postnatal depression	Hofmeyr 2015 ⁵	1 RCT (Hannah 2000 ¹⁶)	3	80/793 (10.1%)	86/793 (10.8%)	RR 0.93 (95% CI 0.70 to 1.24)	No difference	NR
			24	47/457 (10.3%)	53/460 (11.5%)	RR 0.89 (95% CI 0.62 to 1.29)	No difference	NR
Dyspareunia (sexual problems)			3	111/655 (16.9%)	126/674 (18.7%)	RR 0.91 (95% CI 0.72 to 1.14)	No difference	NR
Sexual problems (unhappy)			24	23/353 (6.5%)	26/349 (7.4%)	RR 0.87 (95% CI 0.51 to 1.50)	No difference	NR
Sexual problems			24	36/457 (7.9%)	38/460 (8.3%)	RR 0.95 (95% CI 0.62 to 1.48)	No difference	NR
Urinary incontinence			3	36/798 (4.5%)	58/797 (7.3%)	RR 0.62 (95% CI 0.41 to 0.93)	Caesarean section	NR
			24	81/457 (17.7%)	100/460 (21.7%)	RR 0.82 (95% CI 0.63 to 1.06)	No difference	NR
Faecal incontinence			3	5/619 (0.8%)	9/607 (1.5%)	RR 0.54 (95% CI 0.18 to 1.62)	No difference	NR
			24	11/457 (2.4%)	10/460 (2.2%)	RR 1.11 (95% CI 0.47 to 2.58)	No difference	NR
Constipation				24	124/457 (27.1%)	93/460 (20.2%)	RR 1.34 (95% CI 1.06 to 1.70)	Vaginal delivery
Postpartum depression	Wängberg Nordborg 2017 ¹⁰	1 RCT (Hannah 2002 ¹⁷)	3	80/793 (10.1%)	86/793 (10.8%)	NR	No difference	NR
Major urinary incontinence			24	3/457 (0.7%)	9/460 (2.0%)	NR	No difference	Low
Major faecal incontinence			24	1/457 (0.2%)	3/460 (0.7%)	NR	No difference	Low

Outcome	Author/year	Number of studies	Average follow-up (months)	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
Major flatus incontinence	Wängberg Nordborg 2017 ¹⁰	1 RCT Hannah 2004 ¹⁹	24	5/457 (1.1%)	2/460 (0.4%)	NR	No difference	Low
Length of hospital stay	Hannah 2000 ¹⁶	1	1.5	4.0 days	2.8 days	p<0.0001	Vaginal delivery	High
CI = confidence intervals; GRADE = Grading of Recommendations, Assessment, Development and Evaluations; NR = not reported; RCT = randomised controlled trial; RR= risk ratio								

EVIDENCE SUMMARY

FAQ5: When will the mother recover?

Evidence is either inconclusive or suggests that there are no between group differences in time to return to usual activity (early post-partum or neonatal depression) between the planned caesarean section and planned vaginal delivery. Equally, there were no differences in time to return to sex at either short-term or long-term follow-ups. For time to return to urinary functionality (urinary incontinence), the available evidence favours elective caesarean section over vaginal delivery at short-term follow-up. On the contrary, the available evidence favours vaginal delivery in time to returning to bowel functionality (constipation). Also, one study reported significantly shorter length of hospital stay in days following planned vaginal delivery when compared with planned caesarean section.

3.8 FAQ6: WHAT ARE THE RISKS AND LONG-TERM IMPLICATIONS FOR THE MOTHER?

Three studies reported quantitative data pertaining to the below outcomes Hofmeyr 2015⁵, Wängberg Nordborg 2017¹⁰ and Dixon 2018³. Please see Table 8.

The invasive nature of a caesarean section (like many common surgical procedures) is likely to involve a higher risk of bleeding, postoperative infection and delayed wound healing than non-invasive methods.

3.8.1 *Surgical risks*

No specific evidence was found for this outcome in the population of interest.

3.8.2 *Post-operative risks/complications*

No specific evidence was found for this outcome in the population of interest.

3.8.3 *Surgery complications*

General pain experienced by mothers at three months post-delivery is discussed under FAQ4 no further evidence was found for surgical complications.

3.8.4 *Postoperative pain (specifically, perineal and abdominal pain)*

Perineal and abdominal pain were both reported in Hofmeyr 2015⁵. Hofmeyr 2015⁵ found there was a lower risk of perineal pain following caesarean section when compared with vaginal delivery at three months follow-up, and no difference at 24 months follow-up. That same study reported lower risk of abdominal pain following vaginal delivery when compared with caesarean section at three months follow-up. No long-term follow-up data were available.

3.8.5 *Urinary or bowel dysfunction*

Comparative evidence for urinary or bowel dysfunction is discussed under FAQ5.

3.8.6 *Pelvic floor dysfunction*

No evidence was found for this outcome.

3.8.7 *Maternal morbidity (short-term and long-term)*

Hofmeyr 2015⁵ found there was a lower risk of short-term morbidity following vaginal delivery when compared with caesarean section. The quality of the evidence was low. Dixon 2018³ also found lower risk of long-term morbidity following vaginal delivery when compared with caesarean section. The quality of the evidence was not reported. However Wängberg Nordborg 2017¹⁰ found no difference in short-term morbidity (including puerperal infection) between the groups. The quality of the evidence was also low.

3.8.8 *Implications for family planning or fertility issues*

No evidence was found for this outcome.

3.8.9 *Complications affecting later pregnancies*

The RCOG guideline 2017⁷ suggests that having had a planned caesarean section increases the risk of uterine scarring by threefold. There is also an increased risk of scar rupturing during an attempted vaginal birth (after one caesarean section) as well as abnormally invasive placentation. Also, from NICE Guidelines^{9, 20}, "Concern about the use of single layer closure of

the uterus and scar rupture in future pregnancies have been raised by a cohort study (n = 2142) that reported an increase likelihood of uterine rupture in women who had had a single layer closure of the uterus (OR 3.95, 95% CI 1.35 to 11.49).” However, it should be noted that this observational study from Canada was published in 2002 and may not reflect current experience.

Table 8: Risks and long-term implications for the mother

Outcome	Author	Number of studies	Average follow-up (months)	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
Perineal pain	Hofmeyr 2015 ⁵	1RCT (Hannah 2000 ¹⁶)	3	14/796 (1.8%)	44/797 (5.5%)	RR 0.32 (95% CI 0.18 to 0.58)	Caesarean section	NR
			24	18/457 (3.9%)	28/460 (6.1%)	RR 0.65 (95% CI 0.36 to 1.15)	No difference	NR
Abdominal pain			3	70/796 (8.8%)	37/797 (4.6%)	RR 1.89 (95% CI 1.29 to 2.79)	Vaginal delivery	NR
Short-term morbidity*	Hofmeyr 2015 ⁵	3 RCTs (Collea 1980 ²¹ , Gimovsky 1983 ²² , Hannah 2000 ¹⁶)	Short-term	107/1169 (9.2%)	106/1227 (8.6%)	RR 1.29 (95% CI 1.03 to 1.61)	Vaginal delivery	Low (GRADE)
Short-term morbidity (including puerperal infection)	Wängberg Nordborg 2017 ¹⁰	2 retrospective cohort studies (Krebs 2003 ²³ , Roman 1998 ²⁴)	NR	(0.9-1.5)%	(0.7-1.7)%	RR 1.03 (95% CI 0.67 to 1.56)	No difference	Low (GRADE)
**Risks and longer term morbidity	Dixon 2018 ³	1 retrospective cohort study (Liu et al. 2007 ²⁵)	**Long-term	27.3 per 1000	9.0 per 1000	AOR 3.1 (95% CI 3.0 to 3.3)	Vaginal delivery	NR

Outcome	Author	Number of studies	Average follow-up (months)	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
Long-term morbidity (incontinence, pain at 2 years)	Wängberg Nordborg 2017 ¹⁰	1 RCT (Hannah 2004 ¹⁹)	24	NR	NR	NR	No difference	NR
* Short term morbidity loosely defined in Hofmeyr 2015⁵ as comprising admission to ICU, septicaemia, organ failure as examples. ** Severe maternal morbidity defined as the presence of one or more of the following complications: haemorrhage requiring hysterectomy, haemorrhage requiring blood transfusion, any hysterectomy, uterine rupture, anaesthetic complications (including those arising from the administration of a general or local anaesthetic, analgesic or other sedation during labour and delivery), obstetric shock, cardiac arrest, acute renal failure, assisted ventilation or intubation, puerperal venous thromboembolism, major puerperal infection, in-hospital wound disruption and hematoma (Measured over 14-year period) AOR = adjusted odds ratio; CI = confidence intervals; GRADE = Grading of Recommendations, Assessment, Development and Evaluations; NR = not reported; RR= risk ratio								

EVIDENCE SUMMARY

FAQ6: What are the risks and long-term implications for the mother?

No evidence was found for surgical risks, post-operative risks/complications, surgical complications, implications for family planning or fertility issues, pelvic floor dysfunction, urinary or bowel dysfunction. The available evidence suggests that women experienced less perineal pain but more abdominal pain following caesarean section when compared with vaginal delivery. Furthermore, women are at a lower risk of both short-term (less than 3 months) morbidity e.g. ICU, septicaemia, organ failure as examples and long-term morbidity i.e., more than 3 months following vaginal delivery when compared with caesarean section.

3.9 FAQ7: WHAT ARE THE RISKS AND LONG-TERM IMPLICATIONS FOR THE CHILD?

Four studies reported quantitative data pertaining to the below outcomes Hofmeyr 2015⁵, Berhan 2016², RCOG 2017⁷, Wängberg Nordborg 2017¹⁰. Please see Table 9.

3.9.1 Birth asphyxia

Berhan 2016² reported there was a lower risk of neonatal asphyxia following caesarean section when compared with vaginal delivery.

3.9.2 Apgar score below normal range

The Apgar score is determined by evaluating newborn babies on five criteria (Appearance, Pulse, Grimace, Activity and Respiration) on a scale from zero to two, then summing up the values obtained. Difficult births including breech delivery can result in low Apgar scores. Hofmeyr 2015⁵ reported there was a lower risk of Apgar scores (< 4 at 5 minutes) following caesarean section when compared to vaginal delivery but no difference for Apgar scores (< 7 at five minutes). The remaining three studies RCOG 2017⁷, Berhan 2016², Wängberg Nordborg 2017¹⁰ also reported lower risks of Apgar scores (< 7 at five minutes) in caesarean section as opposed to vaginal delivery. The quality of the evidence was predominantly moderate.

3.9.3 Cord pH below normal range

Cerebral palsy is thought to occur more frequently at an arterial cord pH of <7.00 and a base deficit of ≥ 12 mmol/l.⁷ These criteria, however, have been derived through consensus, not through evaluation of collated summaries of evidence. Nevertheless, a systematic review of umbilical cord pH and perinatal and long term outcomes concluded that *“low arterial cord pH showed strong, consistent, and temporal associations with clinically important neonatal outcomes that are biologically plausible”*.²⁶ Hofmeyr 2015⁵ reported there was a lower risk of cord pH below normal range (< 7.0) following caesarean section when compared to vaginal delivery.

3.9.4 Injuries to child (birth trauma)

RCOG 2017⁷, Berhan 2016² and Wängberg Nordborg 2017 (based on seven cohort studies)¹⁰ reported lower rates of birth trauma following caesarean section when compared with vaginal delivery whereas Hofmeyr 2015⁵ and Wängberg Nordborg 2017 (based on one RCT)¹⁰ reported no between group differences. Hofmeyr 2015⁵ reported no between group differences for brachial plexus injury based on data from three studies. For serious neonatal morbidity (composite outcome), RCOG 2017⁷ reported favourable evidence following caesarean section when compared to vaginal delivery. The evidence was mostly of low quality.

3.9.5 NICU admission

Berhan 2016² reported lower rates of perinatal intensive care unit (ICU) admission following caesarean section when compared with vaginal delivery whereas RCOG 2017⁷ and Wängberg Nordborg 2017¹⁰ reported no between group differences. There was conflicting evidence in Wängberg Nordborg 2017¹⁰ for perinatal ICU stay of more than four days with the data from RCT showing no difference and data from three cohorts favouring caesarean section. There

were no between differences in hospital re-admissions at three months Wängberg Nordborg 2017¹⁰.

3.9.6 Breathing problems

No evidence was found for this outcome.

3.9.7 Neurological morbidity

Berhan 2016² reported lower rates of neurological morbidity following caesarean section when compared with vaginal delivery in the seven days following birth. However, Hofmeyr 2015⁵ reported no between differences in neurodevelopmental delay when measured at 24 months.

3.9.8 Hypoxic ischemic encephalopathy (HIE)

No evidence was found for this outcome.

3.9.9 Intracranial bleeding

No evidence was found for this outcome.

3.9.10 Long-term implications for child: adjustment disorder, asthma, diabetes, various food allergies, allergic rhinitis

Wängberg Nordborg 2017¹⁰ reported a composite measure of long term morbidity from an RCT with follow up of 24 months. No differences were found between delivery methods in terms of long-term morbidity.

Table 9: Risks and long-term implications for the child

Outcome	Author	Number of studies	Number of children	Average follow-up	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
Neonatal asphyxia	Berhan 2016 ²	8	10,261	NR	35/5,554 (0.23%)	157/4,707 (3.34%)	RR 4.7 (95% CI 3.2 to 6.8)	Caesarean section	NR
Apgar scores (< 4 at 5 minutes)	Hofmeyr 2015 ⁵	1RCT (Hannah 2000 ¹⁶)	2,062	5 minutes	11/1,036 (1.06%)	9/1,026 (0.88%)	RR 0.11 (95% CI 0.01 to 0.87)	Caesarean section	NR
Apgar scores (< 7 at 5 minutes)	Hofmeyr 2015 ⁵	3	2,375		11/1,164 (0.95%)	38/1,211 (3.14%)	RR 0.43 (95% CI 0.12 to 1.47)	No difference	NR
	RCOG 2017 ⁷	NR	NR		NR	NR	OR 3.20 (95% CI 1.93 to 5.30)	Caesarean section	2++
	Berhan 2016 ²	21	134,964		216/63,735 (0.34%)	1,709/70,959 (2.41%)	RR 5.1 (95% CI 3.9 to 6.6)	Caesarean section	NR
	Wängberg Nordborg 2017 ¹⁰	1RCT (Hannah 2000 ¹⁶)	2,033		0.8%	3%	RR 0.27 (95% CI 0.12 to 0.58)	Caesarean section	Moderate (GRADE)
	Wängberg Nordborg 2017 ¹⁰	14 Cohorts	348,783		0.18-2.2 (% range)	0.09-5.9 (% range)	RR 0.23 (95% CI 0.16 to 0.33)	Caesarean section	Moderate (GRADE)
Cord blood pH < 7.0	Hofmeyr 2015 ⁵	1RCT (Hannah 2000 ¹⁶)	1,013	NR	2/510 (0.39%)	13/503 (2.58%)	RR 0.15 (95% CI 0.03 to 0.67)	Caesarean section	NR
Birth Trauma	Hofmeyr 2015 ⁵	1RCT (Hannah 2000 ¹⁶)	2,062	NR	6/1,036 (0.58%)	14/1,026 (1.36%)	RR 0.42 (95% CI 0.16 to 1.10)	No difference	Low

Outcome	Author	Number of studies	Number of children	Average follow-up	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
	RCOG 2017 ⁷	NR	NR	NR	NR	NR	OR 0.24 (95% CI 0.15 to 0.37)	Caesarean section	2++
	Berhan 2016 ²	19	112,213	NR	80/48,315 (0.166%)	421/63,898 (0.66%)	RR 4.2 (95% CI 3.3 to 5.4)	Caesarean section	NR
	Wängberg Nordborg 2017 ¹⁰	1RCT (Hannah 2000 ¹⁶)	2,000	NR	0.6%	1.4%	RR 0.43 (95% CI 0.17 to 1.11)	No difference	Low (GRADE)
	Wängberg Nordborg 2017 ¹⁰	7 Cohorts	132,671	NR	0-0.9 (% range)	0-3.2 (% range)	RR 0.19 (95% CI 0.11 to 0.32)	Caesarean section	Low (GRADE)
Brachial plexus injury	Hofmeyr 2015 ⁵	3	2,375	NR	2/1,164 (0.17%)	7/1,211 (0.58%)	RR 0.35 (95% CI 0.08 to 1.47)	No difference	NR
Serious neonatal morbidity (composite outcome)	RCOG 2017 ⁷	1	NR	NR	NR	NR	RR 0.36 (95% CI 0.19 to 0.65)	Caesarean section	1+
Perinatal Intensive Care Unit admission	Berhan 2016 ²	15	41,306	NR	680/26,269 (2.59%)	693/15,037 (4.61%)	RR 1.8 (95% CI 1.4 to 2.2)	Caesarean section	NR
	RCOG 2017 ⁷	NR	NR	NR	NR	NR	OR 1.33 (95% CI 0.94 to 1.86)	No difference	2++
	Wängberg Nordborg 2017 ¹⁰	4 Cohorts	8,431	NR	NR	NR	RR 0.82 (95% CI 0.61 to 1.09)	No difference	NR

Outcome	Author	Number of studies	Number of children	Average follow-up	Estimates for elective caesarean section	Estimates for planned vaginal delivery	Outcome measure	Favoured	Evidence levels
Perinatal Intensive Care Unit stay > 4 days	Wängberg Nordborg 2017 ¹⁰	1RCT (Hannah 2000 ¹⁶)	2,078	> 4 days	0.4%	0.6%	RR 0.67 (95% CI 0.19 to 2.36)	No difference	Low (GRADE)
		3 Cohorts	37,980	> 4 days	0.9-3.4 (% range)	4.4%	RR 0.69 (95% CI 0.54 to 0.87)	Caesarean section	Low (GRADE)
Re-admission to hospital	Wängberg Nordborg 2017 ¹⁰	1RCT (Hannah 2000 ¹⁶)	1,457	3 months	2.7%	4%	RR 0.69 (95% CI 0.39 to 1.20)	No difference	Low (GRADE)
Neurological morbidity	Berhan 2016 ²	8	18,009	7 days	13/10,843 (0.12%)	50/7,166 (0.70%)	RR 2.9 (95% CI 1.3 to 6.6)	Caesarean section	NR
Neurodevelopmental delay	Hofmeyr 2015 ⁵	1RCT (Hannah 2000 ¹⁶)	920	24 months	12/457 (2.63%)	7/463 (1.51%)	RR 1.74 (95% CI 0.69 to 4.37)	No difference	NR
** Long term morbidity	Wängberg Nordborg 2017 ¹⁰	1RCT (Whyte 2004 ²⁷)	920	24 months	14/457 (3.1%)	13/463 (2.8%)	RR 1.09(95% CI 0.52 to 2.3)	No difference	Low (GRADE)
1+ Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias. 2++ High-quality systematic reviews of case-control or cohort studies or high-quality case-control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal. * All estimates from Wängberg Nordborg 2017 are absolute effects. ** Defined as death or neurodevelopmental delay at two years. CI = confidence intervals; GRADE = Grading of Recommendations, Assessment, Development and Evaluations; NR = not reported; OR = odds ratio; RCOG = Royal College of Obstetricians and Gynaecologists; RCT = randomised controlled trials; RR= risk ratio									

EVIDENCE SUMMARY

FAQ7: *What are the risks and long-term implications for the child?*

We found no evidence for breathing problems, hypoxic ischemic encephalopathy, intracranial bleeding and long-term implications for child. The available evidence suggests that planned vaginal delivery increases the risk of low Apgar scores (<7 at five minutes; and <4 at five minutes), neonatal trauma and serious short-term complications, including asphyxia, cord pH below normal range. We found conflicting evidence for neonatal ICU admission and neurological morbidity. The quality of the evidence was moderate for Apgar scores (<7 at five minutes); and low for birth trauma, perinatal/neonatal death or severe neonatal morbidity, perinatal intensive care unit stay of more than four days, re-admission to hospital and long-term morbidity. For serious neonatal morbidity and neurodevelopmental delay or death and perinatal intensive care unit admission, the evidence was of unrated quality.

3.10 FAQ8: WILL THE MODE OF BIRTH AFFECT THE RELATIONSHIP BETWEEN MOTHER AND CHILD?

One study reported quantitative data pertaining to the below outcomes Hofmeyr 2015.⁵
Please see Table 10.

3.10.1 *Problems with mother-child relationships after birth*

Hofmeyr 2015⁵ reported no between group differences in difficulties caring for child.

3.10.2 *Complicated breastfeeding*

Hofmeyr 2015⁵ reported no between group differences in for this outcome.

3.10.3 *Bonding/relationship with baby*

No evidence was found for this outcome.

Table 10: Will the mode of birth affect the relationship between mother and child?

Outcome	Author	Number of studies	Number of children	Average follow-up (months)	Elective Caesarean section	Planned vaginal delivery	Outcome measure (RR, 95% CI)*	Favoured	Evidence levels
Difficulty caring for child	Hofmeyr 2015 ⁵	1RCT (Hannah 2000 ¹⁶)	873	24	73/430 (17.0%)	78/443 (17.6%)	0.96 (0.72 to 1.29)	No difference	NR
Not breastfeeding	Hofmeyr 2015 ⁵	1RCT (Hannah 2000 ¹⁶)	1,557	3	248/781 (31.75%)	237/776 (30.54%)	1.04 (0.90 to 1.21)	No difference	NR

* Calculated from available data

CI = confidence interval; NR = not reported; RR = risk ratio

EVIDENCE SUMMARY

FAQ8: *Will the mode of birth affect the relationship between mother and child?*

We found no evidence for bonding/relationship with the baby. However, the available evidence suggests no differences between the two modes of delivery in terms of difficulties caring for child or complicated breastfeeding. One primary study each provided data under this outcome. The quality of the evidence was not reported for either of these outcomes.

4. ASSESSMENT OF THE CLINICAL REVIEW EVIDENCE

The available evidence focuses on two different approaches breech delivery namely vaginal delivery (with or without ECV) and caesarean section. Please see Table 11.

Table 11: Overview of the clinical evidence

Study ID	Participants	Interventions	Outcomes	Study Design	Follow-up
Berhan 2016 ²	27 articles (258,953 women)	1. VD 2. CS	• Perinatal mortality • Long-term implications for the child	SR	7 days
Dixon 2018 ³	37 reports clinical studies, systematic reviews, professional guidelines*	1. VD 2. CS	• Long-term implications for the mother • Relationship between mother and child	SR	Long-term
Hannah 2002 ¹⁷	One randomised controlled study (2088 women)	1. VD 2. CS	• Length of hospital stay	RCT	2 years
Hofmeyr 2015 ⁴	Eight randomised controlled studies (1308 women)	ECV	• What does the procedure involve	SR	NM
Hofmeyr 2015 ⁵	Three randomised controlled studies (2396 women)	1. VD 2. CS	• Quality of life • Recovery time • Risks and long-term implications for the mother • Risks and long-term implications for the child • Relationship between mother and child	SR	3 and 24 months
Hutton 2015 ⁶	Five randomised controlled studies (2187 women)	ECV	• What does the procedure involve	SR	NM
RCOG 2017 ⁷	Systematic reviews, non-systematic reviews, observational studies*	1. VD 2. CS	• What does the procedure involve • Perinatal mortality • Risks and long-term implications for the child • Relationship between mother and child	Guideline	NM

Study ID	Participants	Interventions	Outcomes	Study Design	Follow-up
RCOG 2017 ⁸	Systematic reviews, non-systematic reviews, observational studies*	ECV	What does ECV involve	Guideline	NM
Wängberg Nordborg 2017 ¹⁰	1 randomised controlled study, 20 cohort studies, 2 case series*	1. VD 2. CS	- What does the procedure involve - Maternal mortality - Quality of life - Recovery time - Risks and long-term implications for the child - Relationship between mother and child	HTA	3 and 24 months
Louwen 2017 ¹¹	750 women	VD	What does the procedure involve	Retrospective Cohort Study	NM
* Total number of participants – inestimable. CS = caesarean section; ECV = external cephalic version; HTA = Health Technology Assessment; NM = not mentioned; RCT = randomised controlled trial; SR = systematic review; VD = vaginal delivery					

5. DISCUSSION

5.1 STRENGTHS, LIMITATIONS AND UNCERTAINTIES

This report was developed based on evidence from systematic reviews, health technology assessments and clinical practice guidelines. Strengths of this report include a thorough literature searches and the inclusion of the most recent evidence. The report also covered a wide range of outcomes of interest.

Clinical impacts on mothers (FAQ5: When will I recover? and FAQ6: What are the risks and long-term implications for the mother?) and clinical impact on babies (FAQ7: What are the risks and long-term implications for the child?) were areas where considerable evidence was found. Less evidence was found in regard to mortality (FAQ2: How will it affect survival of the mother? and FAQ3: Will my child live longer?) and quality of life (FAQ4: Will my quality of life get better?) or mother/baby relationships (FAQ8: Will the mode of birth affect the relationship between mother and child?). It is important to bear in mind that a lack of credible evidence should in no way diminish the importance of these issues in the decision-making process. Where evidence is not available, it will be important to monitor emerging primary studies and consensus expert opinion.

Whilst most of the evidence originates from middle- and high-income countries, it is reasonable to assume that variations in the quantity and quality of local service provision might, in part, explain differences in outcome (particularly those reported from cohort studies). For example, adverse events associated with vaginal delivery might be more prevalent with smaller less experienced teams than in centres of expertise with larger teams and experience. Furthermore, for certain outcomes, e.g. neurodevelopmental delay, relatively wide confidence intervals led to imprecision, and reduced certainty in the effect estimates.

Methodological limitations of this review are that the searches were restricted to publications dated from 2012, that the selection of the records was mainly based on other evidence syntheses and not primary studies, and that no information on the risk of bias assessments was reported. However, as this review was based on secondary research, findings published by relevant primary studies and earlier reviews may be assumed to have been largely collected. Notwithstanding, it is necessary to highlight how quantitative data for numerous outcomes has been solely provided by one study - the International Term Breech Trial. This study included up to 2088 women across 121 centres in 26 different countries. It is worth noting, the study dates from 2000 and some of the medical procedures may have changed since then. According to Hofmeyr 2015, other publications mentioned potential biases in the International Term Breech Trial which could result in overestimating the benefits of caesarean section.⁵ This may be particularly problematic as it seems that the trial was stopped early for benefit of caesarean section.⁵ In those instances where review authors provided information on the certainty of the evidence it has been presented in this report and should have taken into account any issues regarding risk of bias.

Also, there was an unequal distribution of data/outcomes under respective FAQs. More specifically, for some crucial outcomes such as cause-specific mortality or mothers' survival time, there was no evidence. Even though an approximate effectiveness of ECV was reported, no evidence was found on safety, tolerability and acceptability of the procedure. Similarly, very limited evidence was found investigating whether positioning of women during vaginal breech birth (semi recumbent position, upright position, all fours, or squatting) impacts any of the birth outcomes.¹¹ Only one additional report (provided by the team at Universitätsklinikum Schleswig-Holstein/Campus Kiel) focussed on that issue. The authors suggest that upright deliveries were associated significantly fewer delivery manoeuvres, neonatal birth injuries and shorter delivery times.¹¹

In general terms, the evidence tends to suggest that caesarean section is a preferable option in terms of short-term acute problems rather than longer lasting effects that might be experienced by the child. An example of this would be evidence on short-term neurological morbidity and longer-term neurodevelopmental delay. In the case of the former, there appeared to be clear advantages associated with caesarean section, whereas in the case of the latter no meaningful difference was detected (although absolute numbers favoured vaginal delivery as the method associated with less morbidity). Vaginal delivery was found to be preferable for mothers in regard of short-term constipation, post-operative pain and maternal morbidity. However, in approximately 40% (range 29% to 45%) of women planning vaginal breech delivery, an emergency caesarean section is needed. For short-term morbidity (including puerperal infection), the evidence was of low quality and not reported for the remaining outcomes.

Table 12: Summary of evidence

Evidence	Favours CS	Favours VD	Notes
FAQ2: How will it affect survival of the mother?			
All-cause mortality	-		No conclusions can be drawn in relation the differential mortality
FAQ3: Will the child live longer?			
Perinatal mortality	✓		Evidence reported from analysis of multiple studies suggests that elective caesarean section is associated with a two- to five-fold reduction in perinatal mortality compared to vaginal delivery in breech. Estimates for caesarean section ranged from 0.46 to 0.5 per 1000 whereas results for vaginal delivery range from 2.0 to 3.52 per 1000
FAQ4: Will mother's quality of life get better?			
Satisfaction levels (short term and long term)	-	-	Evidence rated of low to moderate quality suggests there were no differences in satisfaction levels between delivery methods in either the short (3 months) or the long term (24 months).
Reporting any pain	-	-	Evidence rated of low quality suggests there were no differences in self-reported pain levels between delivery methods in the short (3 months) term.
FAQ5: When will the mother recover?			
Time to return to usual activity - depression	-	-	No evidence was found on time to return to usual activity between the delivery methods. However, two studies reported on postnatal depression levels and found no differences between delivery methods in either the short (3 months) or the long term (24 months).
Sexual problems	-	-	Evidence of unrated quality suggests there were no differences in reporting of sexual problems between delivery methods in either the short (3 months) or the long term (24 months).
Urinary incontinence	✓		Evidence of unrated quality suggests there was a meaningful difference in urinary incontinence levels in the short term in favour of caesarean section but in the long term (24 months) no difference was detectable. Evidence rated as low suggests there were no differences in major urinary incontinence (24 months).
Faecal incontinence	-	-	Evidence of unrated quality suggests there were no differences in faecal incontinence between delivery methods in either the short (3 months) or the long term (24 months). Evidence rated as low suggests there were no differences in major faecal incontinence (24 months).
Major flatus incontinence	-	-	Evidence rated as low suggests there were no differences in major flatus incontinence (24 months).
Constipation		✓	Evidence of unrated quality suggests there was a meaningful difference in constipation levels in the short term in favour of vaginal delivery

Evidence	Favours CS	Favours VD	Notes
Length of hospital stay		✓	High quality suggests there was a significantly shorter length of hospital stay (in days) following planned vaginal delivery when compared with planned caesarean section.
FAQ6: What are the risks and long-term implications for the mother?			
Post-operative pain - perineal	✓		Evidence of unrated quality suggests a lower risk of perineal pain associated with caesarean section when compared with vaginal delivery at 3 months follow-up but no difference was observed at 24 months follow-up.
Post-operative pain - abdominal		✓	Evidence of unrated quality suggests a lower risk of abdominal pain associated with vaginal delivery compared with caesarean section at 3 months follow-up but no long-term reporting was found.
Maternal morbidity		✓	Evidence of low or unrated quality suggests either a small short-term advantage associated with vaginal delivery or no discernible difference (depending on which study and which definition of morbidity is used). One study did detect advantages in terms of long-term maternal morbidity of vaginal delivery over caesarean section in the longer term but the quality of this evidence was not assessed and the definition of long term or morbidity was not explicit.
FAQ7: What are the risks and long-term implications for the child?			
Neonatal asphyxia	✓		Evidence of unrated quality suggests a meaningful advantage for caesarean section over vaginal delivery in regard to neonatal asphyxia.
Apgar scores (< 4 at 5 minutes) and (< 7 at 5 minutes)	✓		Of the four studies reporting on Apgar scores only one detected no difference between the procedures (Apgar scores (< 7 at 5 minutes)). The overwhelming balance of evidence suggests an advantage of caesarean section over vaginal delivery. Whilst most of the evidence was judged to be of low quality, one review (judged to be of high quality) reported a marked advantage for caesarean section (Apgar scores (< 7 at 5 minutes)). Another study of unrated quality also reported an advantage in terms of a more severe classification of Apgar score (< 4 at 5 minutes). The extent to which Apgar scores are merely a reflection of a relatively difficult birth or reflective of some other underlying problems are a matter of conjecture.
Cord blood pH < 7.0	✓		Evidence of unrated quality suggests an advantage of caesarean section over vaginal delivery in terms of cord blood pH < 7.0, which has been associated with clinically important neonatal outcomes like cerebral palsy.
Birth Trauma	✓		Evidence, which was mainly of low or unknown quality, reported lower rates of birth trauma following caesarean section when compared with vaginal delivery. However, the picture was mixed with two studies reporting no difference.
Brachial plexus injury	-	-	Evidence of unrated quality suggests no difference in brachial plexus injury following either delivery method

Evidence	Favours CS	Favours VD	Notes
Serious neonatal morbidity (composite outcome)	✓		One well-conducted meta-analysis suggested that caesarean section was associated with less incidence of serious neonatal morbidity than vaginal delivery.
Perinatal Intensive Care Unit admission	✓		Three evidence sources were found for Perinatal Intensive Care Unit admission. One of these, with unrated quality, suggested that caesarean section resulted in fewer admissions. However, the other two evidence sources, one of which was based on a well-conducted meta-analysis reported no difference between caesarean section and vaginal delivery.
Perinatal Intensive Care Unit stay > 4 days	✓		Two low grade studies reported on proportions of new-borns who spent more than 4 days in a Perinatal Intensive Care Unit. Evidence from an RCT suggested no difference according to delivery method. Evidence based on 3 cohort studies, however, suggested that babies born as a result of vaginal delivery were more likely to have long stays in Perinatal Intensive Care Unit stay than babies born via caesarean section.
Re-admission to hospital	-	-	Evidence of low quality suggests no difference in re-admission to hospital at 3 months of follow up following either delivery method
Neurological morbidity	✓		Evidence of unrated quality suggests that neurological morbidity (within 7 days) was less likely for babies born via caesarean section than those born as a result of vaginal delivery.
Neurodevelopmental delay		✓	Evidence of unrated quality suggests slightly lower rates of neurodevelopment delay at 24 months of follow-up following vaginal delivery. However, wide confidence intervals reflect a degree of uncertainty in relation to this finding.
Long term morbidity	-	-	Evidence of low quality suggests no difference in long term morbidity at 24 months of follow up following either delivery method
FAQ8: Will the mode of birth affect the relationship between mother and child?			
Difficulty caring for child	-	-	Evidence of unrated quality suggests no difference in difficulty caring for the child at 24 months of follow up following either delivery method
Breastfeeding	-	-	Evidence of unrated quality suggests no difference in breastfeeding issues at 24 months of follow up following either delivery method
KEY			
-	No noticeable difference		
✓	Noticeably better but not statistically or clinically significant (or subject to probable bias). Any advantage not sustained in the long term		
✓	Statistically significantly better or guideline recommendation		
FAQ = frequently asked question; NA = Not applicable			

6. REFERENCES

- [1] PRISMA Group. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement [Internet]. [accessed 10.9.19]. Available from: <http://prisma-statement.org/>
- [2] Berhan Y, Haileamlak A. The risks of planned vaginal breech delivery versus planned caesarean section for term breech birth: a meta-analysis including observational studies. *BJOG* 2016;123(1):49-57.
- [3] Dixon L, Gray E, MacDonald C, Gullam J, Powell R. Singleton breech presentation at term: review of the evidence and international guidelines for application to the New Zealand context. *J N Z Coll Midwives* 2018(54):5-14.
- [4] Hofmeyr GJ, Kulier R, West HM. External cephalic version for breech presentation at term. *Cochrane Database of Systematic Reviews* 2015, Issue 4. Art. No.: CD000083. DOI: 10.1002/14651858.CD000083.pub3.
- [5] Hofmeyr GJ, Hannah M, Lawrie TA. Planned caesarean section for term breech delivery. *Cochrane Database of Systematic Reviews* 2015, Issue 7. Art. No.: CD000166. DOI: 10.1002/14651858.CD000166.pub2.
- [6] Hutton EK, Hofmeyr GJ, Dowswell T. External cephalic version for breech presentation before term. *Cochrane Database of Systematic Reviews* 2015, Issue 7. Art. No.: CD000084. DOI: 10.1002/14651858.CD000084.pub3.
- [7] Royal College of Obstetricians and Gynaecologists (RCOG). *Management of breech presentation (Green-top Guideline No. 20b)* [Internet]. London: Royal College of Obstetricians and Gynaecologists, 2017 [accessed 26.9.2019] Available from: <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg20b/>
- [8] Royal College of Obstetricians and Gynaecologists (RCOG). *External cephalic version and reducing the incidence of term breech presentation (Green-top Guideline No. 20a)* [Internet]. London: Royal College of Obstetricians and Gynaecologists, 2017 [accessed 26.9.2019] Available from: <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg20a/>
- [9] National Collaborating Centre for Women's and Children's Health, Royal College of Obstetricians and Gynaecologists, The Royal College of Midwives. *Caesarean section. November 2011. NICE clinical guideline. Commissioned by the National Institute for Health and Clinical Excellence.* [Internet]. London: Royal College of Obstetricians and Gynaecologists, 2011 [accessed 14.1.20] Available from: <https://www.nice.org.uk/guidance/cg132/evidence/full-guideline-pdf-184810861>
- [10] Wängberg Nordborg J, Alkmark M, Carlsson Y, Eriksson Orrskog M, Jivegård L, Stadig I, et al. *Term breech presentation - Caesarean section versus vaginal delivery [Sätesändläge i fullgången tid - kejsarsnitt eller vaginal förlossning?]*. Göteborg: Västra Götalandsregionen, Sahlgrenska Universitetssjukhuset, HTA-centrum, 2017

[11] Louwen F, Daviss BA, Johnson KC, Reitter A. Does breech delivery in an upright position instead of on the back improve outcomes and avoid cesareans? *Int J Gynaecol Obstet* 2017;136(2):151-61.

[12] Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ. *Williams obstetrics*. 23rd ed. New York: McGraw-Hill Education, 2010.

[13] Royal College of Obstetricians and Gynaecologists. *Patient information leaflets. Breech baby at the end of pregnancy [Internet]*: Royal College of Obstetricians and Gynaecologists, 2017 [accessed 24.10.19] Available from: <https://www.rcog.org.uk/en/patients/patient-leaflets/breech-baby-at-the-end-of-pregnancy/>

[14] Boucher M, Marquette GP, Varin J, Champagne J, Bujold E. Fetomaternal hemorrhage during external cephalic version. *Obstet Gynecol* 2008;112(1):79-84.

[15] Royal College of Obstetricians and Gynaecologists. *Patient information leaflets. Choosing to have a caesarean section [Internet]*: Royal College of Obstetricians and Gynaecologists, 2015 [accessed 24.10.19] Available from: <https://www.rcog.org.uk/en/patients/patient-leaflets/choosing-to-have-a-caesarean-section/>

[16] Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willan AR, et al. Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial. *Lancet* 2000;356(9239):1375-83.

[17] Hannah ME, Hannah WJ, Hodnett ED, Chalmers B, Kung R, Willan A, et al. Outcomes at 3 months after planned cesarean vs planned vaginal delivery for breech presentation at term: the international randomized Term Breech Trial. *JAMA* 2002;287(14):1822-31.

[18] Hodnett ED, Hannah ME, Hewson S, Whyte H, Amankwah K, Cheng M, et al. Mothers' views of their childbirth experiences 2 years after planned Caesarean versus planned vaginal birth for breech presentation at term, in the international randomized Term Breech Trial. *J Obstet Gynaecol Can* 2005;27(3):224-31.

[19] Hannah ME, Whyte H, Hannah WJ, Hewson S, Amankwah K, Cheng M, et al. Maternal outcomes at 2 years after planned cesarean section versus planned vaginal birth for breech presentation at term: the international randomized Term Breech Trial. *Am J Obstet Gynecol* 2004;191(3):917-27.

[20] National Institute for Health and Care Excellence. *Caesarean section. NICE Clinical guideline 132 [Internet]*. London: National Institute for Health and Care Excellence, 2011 [accessed 11.9.19] Available from: <https://www.nice.org.uk/guidance/cg132>

[21] Collea JV, Chein C, Quilligan EJ. The randomized management of term frank breech presentation: a study of 208 cases. *Am J Obstet Gynecol* 1980;137(2):235-44.

[22] Gimovsky ML, Wallace RL, Schiffrin BS, Paul RH. Randomized management of the nonfrank breech presentation at term: a preliminary report. *Am J Obstet Gynecol* 1983;146(1):34-40.

- [23] Krebs L, Langhoff-Roos J. Elective cesarean delivery for term breech. *Obstet Gynecol* 2003;101(4):690-6.
- [24] Roman J, Bakos O, Chattingius S. Pregnancy outcomes by mode of delivery among term breech births: Swedish experience 1987-1993. *Obstet Gynecol* 1998;92(6):945-50.
- [25] Liu S, Liston RM, Joseph KS, Heaman M, Sauve R, Kramer MS, et al. Maternal mortality and severe morbidity associated with low-risk planned cesarean delivery versus planned vaginal delivery at term. *Can Med Assoc J* 2007;176(4):455-60.
- [26] Malin GL, Morris RK, Khan KS. Strength of association between umbilical cord pH and perinatal and long term outcomes: systematic review and meta-analysis. *BMJ* 2010;340:c1471.
- [27] Whyte H, Hannah ME, Saigal S, Hannah WJ, Hewson S, Amankwah K, et al. Outcomes of children at 2 years after planned cesarean birth versus planned vaginal birth for breech presentation at term: the International Randomized Term Breech Trial. *Am J Obstet Gynecol* 2004;191(3):864-71.

APPENDIX 1: SEARCH STRATEGIES

Systematic reviews and guideline search results

Database	Dates	Results
CDSR	2012 – Issue 9, September 2019	40
DARE	2012 to 31 March 2015	30
HTA	2012 to 11 March 2018	3
KSR Evidence	2012-2019	46
Epistemonikos	2012-2019	83
NICE Evidence	01/01/2015 – 11/09/2019	43
NICE Guidance	2012-2019	24
GIN	2012-2019	29
ECRI	2012-2019	4
Total		302
Total after de-duplication		210

Search strategies

Cochrane Database of Systematic Reviews (CDSR) (Wiley): Issue 9 of 12, September 2019
Searched: 11.9.19

#1 MeSH descriptor: [Labor Presentation] explode all trees 176
 #2 breech:ti,ab,kw 338
 #3 (nonvertex or "non vertex"):ti,ab,kw 16
 #4 (malpresentation* or malposition):ti,ab,kw 322
 #5 ((labour or labor or baby or babies or foetal or fetal or foetus* or fetus*) NEAR/3 (present* or position*)):ti,ab,kw 937
 #6 #1 or #2 or #3 or #4 or #5 with Cochrane Library publication date Between Jan 2012 and Sep 2019, in Cochrane Reviews, Cochrane Protocols 40

Database of Abstracts of Reviews of Effects (DARE) (CRD): 2012 to 31 March 2015
Health Technology Assessment Database (HTA) (CRD): 2012 to 31 March 2018
<https://www.crd.york.ac.uk/CRDWeb/>

Searched: 11.9.19

1 MeSH DESCRIPTOR Labor Presentation EXPLODE ALL TREES 28
 2 (breech) 60
 3 (nonvertex or "non vertex") 10
 4 (malpresentation* or malposition*) 24
 5 ((labour or labor or baby or babies or foetal or fetal or foetus* or fetus*) NEAR (present* or position*)) 59
 6 #1 OR #2 OR #3 OR #4 OR #5 123
 7 * IN DARE FROM 2012 TO 2019 22560
 8 * IN HTA FROM 2012 TO 2019 5598
 9 #6 AND #7 30
 10 #6 AND #8 3

KSR Evidence (Internet): Database last updated 11 September 2019

www.ksrevidence.com

Searched: 11.9.19

- 1 breech in All text 19
- 2 nonvertex OR "non vertex" OR malpresentation* in All text 8
- 3 (labour OR labor OR baby OR babies OR foetal OR fetal OR foetus* OR fetus*) AND (present* OR position*) in Bottom line 29
- 4 "labour present" OR "labour presents" OR "labour presentation" OR "labour presented" OR "labor present" OR "labor presents" OR "labor presentation" OR "labor presented" OR "baby present" OR "baby presents" OR "baby presentation" OR "baby presented" OR "babies present" OR "babies presents" OR "babies presentation" OR "babies presented" OR "foetal present" OR "foetal presents" OR "foetal presentation" OR "foetal presented" OR "fetal present" OR "fetal presents" OR "fetal presentation" OR "fetal presented" OR "foetus present" OR "foetus presents" OR "foetus presentation" OR "foetus presented" OR "fetus present" OR "fetus presents" OR "fetus presentation" OR "fetus presented" in All text 3
- 5 "labour position" OR "labour positions" OR "labour positioned" OR "labour positioning" OR "labor position" OR "labor positions" OR "labor positioned" OR "labor positioning" OR "baby position" OR "baby positions" OR "baby positioned" OR "baby positioning" OR "babies position" OR "babies positions" OR "babies positioned" OR "babies positioning" OR "foetal position" OR "foetal positions" OR "foetal positioned" OR "foetal positioning" OR "fetal position" OR "fetal positions" OR "fetal positioned" OR "fetal positioning" OR "foetus position" OR "foetus positions" OR "foetus positioned" OR "foetus positioning" OR "fetus position" OR "fetus positions" OR "fetus positioned" OR "fetus positioning" in All text-
- 6 #1 OR #2 OR #3 OR #4 OR #5 52
- 7 **Filtered by Publication date: 2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012**
46

Database last updated 11 Sep 2019, 11:37 a.m.

Epistemonikos (Internet): up to 11 September 2019

<https://www.epistemonikos.org/en/>

Searched: 11.9.19

(title:(breech OR nonvertex OR "non vertex" OR malpresentation*) OR abstract:(breech OR nonvertex OR "non vertex" OR malpresentation*)) OR title:((labour OR labor OR baby OR babies OR foetal OR fetal OR foetus* OR fetus*) AND (present* OR position*)) OR (title:("labour present" OR "labour presents" OR "labour presentation" OR "labour presented" OR "labor present" OR "labor presents" OR "labor presentation" OR "labor presented" OR "baby present" OR "baby presents" OR "baby presentation" OR "baby presented" OR "babies present" OR "babies presents" OR "babies presentation" OR "babies presented" OR "foetal present" OR "foetal presents" OR "foetal presentation" OR "foetal presented" OR "fetal present" OR "fetal presents" OR "fetal presentation" OR "fetal presented" OR "foetus present" OR "foetus presents" OR "foetus presentation" OR "foetus presented" OR "fetus present" OR "fetus presents" OR "fetus presentation" OR "fetus presented" OR "labour position" OR "labour positions" OR "labour positioned" OR "labour positioning" OR "labor position" OR "labor positions" OR "labor positioned" OR "labor positioning" OR "baby position" OR "baby positions" OR "baby positioned" OR "baby

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83 records

Guidelines International Network (GIN) Library (Internet): up to 11 September 2019

<http://www.g-i-n.net>

Searched: 11.9.19

Search terms	Results
breech OR nonvertex OR "non vertex" OR malpresentation*	0
caesarian OR cesarean OR caesarian OR cesarian OR caesarien OR cesarien	6
childbirth OR birth OR parturition	37
labour OR labor	35
"external cephalic version" OR "external version" OR "cephalic version" OR "foetal version" OR "fetal version" OR ECV	0
Total retrieved	78
Total (without duplicates)	67
Total 2012-2019	29

NICE Evidence Search (Internet): up to 11 September 2019

<https://www.evidence.nhs.uk/>

Searched 11.9.19

Search terms	Results (Guidance; Systematic Reviews): 01/01/2015-11/09/2019
Breech	75
Nonvertex	2

"non vertex"	0
malpresentation*	11
Total retrieved	88
Total (without duplicates)	80
Sifted for relevance	43

National Institute for Health and Care Excellence (NICE): Guidelines

<https://www.nice.org.uk/>

Searched 11.9.19

1. NICE Guidance; Conditions and diseases; Fertility, pregnancy and childbirth; Intrapartum care

Guidance 9 (potentially relevant 5)

NICE advice 4 (potentially relevant 0)

Quality standards 6 (potentially relevant 3)

NICE Pathways 9 (potentially relevant 5)

2. NICE Guidance; Conditions and diseases; Fertility, pregnancy and childbirth; Pregnancy

Guidance 16 (potentially relevant 4)

NICE advice 3 (potentially relevant 0)

Quality standards 9 (potentially relevant 5)

NICE Pathways 15 (potentially relevant 3)

Relevant documents: 24

ECRI Institute Guidelines Trust (Internet): up to 11 September 2019

<https://guidelines.ecri.org/>

Searched: 11.9.19

breech OR nonvertex OR "non vertex" OR malpresentation* OR ((labour OR labor OR baby OR babies OR foetal OR fetal OR foetus* OR fetus*) AND (present* OR position*))

44 records retrieved; 4 relevant records