National Institute for Health and Care Excellence

Draft for consultation

Antenatal care

[L] Identification of breech presentation

NICE guideline tbc

Evidence reviews underpinning recommendations 1.2.33 and 1.2.34

February 2021

Draft for Consultation

These evidence reviews were developed by the National Guideline Alliance which is a part of the Royal College of Obstetricians and Gynaecologists

Disclaimer

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or service users. The recommendations in this guideline are not mandatory and the guideline does not override the responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian.

Local commissioners and/or providers have a responsibility to enable the guideline to be applied when individual health professionals and their patients or service users wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with compliance with those duties.

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ISBN:

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Identification of breech presentation

Review question

What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Introduction

Breech presentation in late pregnancy may result in prolonged or obstructed labour for the woman. There are interventions that can correct or assist breech presentation which are important for the woman's and the baby's health. This review aims to determine the most effective way of identifying a breech presentation in late pregnancy.

Summary of the protocol

Please 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	All pregnant women
Intervention	Routine ultrasound scan between 36+0 and 38+6 weeks gestation onwards to establish fetal presentation
Comparison	Palpation with selective ultrasound between 36+0 and 38+6 weeks gestation to establish fetal presentation (UK standard care)

Outcomes	**Critical**
	• Unexpected breech presentation in labour
	• Mode of birth:
	  ○ Caesarean section
	  – Elective
	  – Emergency
	  ○ Vaginal
	
	Important
	• Maternal anxiety
	• Women's experience and satisfaction of care
	• Gestational age at birth
	• Admission to neonatal unit

For further details see the review protocol in appendix A.

Methods and process

This evidence review was developed using the methods and process described in Developing NICE guidelines: the manual 2014. Methods specific to this review question are described in the review protocol in appendix A.

Declarations of interest were recorded according to NICE's conflicts of interest policy.

Clinical evidence

Included studies

One single centre randomised controlled trial (RCT) was included in this review (McKenna 2003). The study was carried out in Northern Ireland, UK. The study compared ultrasound examination at 30-32 and 36-37 weeks with maternal abdomen palpation during the same gestation period. The intervention group in the study had the ultrasound scans in addition to the abdomen palpation, while the control group had only the abdomen palpation. Clinical management options reported in the study based on the ultrasound scan or the abdomen palpation include referral for full biophysical assessment which included umbilical artery Doppler ultrasound, early antenatal review, admission to antenatal ward, and induction of labour.

The included study is 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 are listed, and reasons for their exclusion are provided in appendix K.

Summary of clinical studies included in the evidence review

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

Table 2: Summary of included studies

Study details Study type Country	Participants	Intervention	Comparison	Outcomes
McKenna 2003 Single centre RCT Northern Ireland, UK	N=1998 Low risk pregnancies with gestational age confirmed by early ultrasound examination or 18 to 20 week anomaly scan. Mean maternal age • Study group: 27.7 years • Control group: 27.3 years	Women had an ultrasound examination in addition to the abdomen palpation to assess placental maturity, liquor volume, and estimated fetal weight. Assessments coincided with routine antenatal visits at 30–32 and 36–37 weeks' gestation.	Women had maternal abdomen palpation to determine uterine and fetal size, fetal presentation and position, and amniotic fluid volume. Assessments coincided with routine antenatal visits at 30–32 and 36–37 weeks' gestation.	• Elective caesarean section • Emergency caesarean section • Vaginal birth • Gestational age at birth • Admission to neonatal unit

RCT: Randomised controlled trial

See the full evidence tables in appendix D. No meta-analysis was conducted (and so there are no forest plots in appendix E).

Quality assessment of clinical outcomes included in the evidence review

See the evidence profiles in appendix F.

Economic evidence

Included studies

One study, a cost utility analysis was included (Wastlund 2019).

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

Excluded studies

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

Summary of studies included in the economic evidence review

For full details of the economic evidence, see the economic evidence tables in appendix H and economic evidence profiles in appendix I.

Wastlund (2019) assessed the cost effectiveness of universal ultrasound scanning for breech presentation at 36 weeks' gestational age in nulliparous woman (N=3879). The comparator was selective ultrasound scanning which was reported as current practice. In this instance, fetal presentation was assessed by palpation of the abdomen by a midwife, obstetrician or general practitioner. The sensitivity of this method ranges between 57%-70% whereas ultrasound scanning is detected with 100% sensitivity and 100% specificity. Women in the selective ultrasound scan arm only received an ultrasound scan after detection of a breech presentation by abdominal palpation. Where a breech was detected, a woman was offered external cephalic version (ECV). The structure of the model undertook a decision tree, with end states being the mode of birth; either vaginal, elective or emergency caesarean section. Long term health outcomes were modelled based on the mortality risk associated with each mode of birth. Average lifetime quality-adjusted life years (QALYs) were estimated from Euroqol.

Only the probabilistic results (n=100000 simulations) were reported which showed that on average, universal ultrasound resulted in an absolute decrease in breech deliveries by 0.39% compared with selective ultrasound scanning. The expected cost per person with breech presentation of universal ultrasound was £2957 (95% Credibility Interval [CrI]: £2922 to £2991), compared to £2,949 (95%CrI: £2915 to £2984) from selective ultrasound. The expected QALYs per person was 24.27615 in the universal ultrasound cohort and 24.27582 in the selective ultrasound cohort. The incremental cost effectiveness ratio (ICER) from the probabilistic analysis was £23611 (95%CrI: £8184 to £44851).

A series of one-way sensitivity analysis were conducted which showed that the most important cost parameter was the unit cost of a universal ultrasound scan. This parameter is particularly noteworthy as the study costed this scan at a much lower value than the 'standard antenatal ultrasound' scan in NHS reference costs on the basis that such a scan can be performed by a midwife during a routine antenatal care

visit in primary care. According to the NICE guideline manual economic evaluation checklist this model was assessed as being directly applicable with potentially severe limitations. The limitations were mostly attributable to the limitations of the clinical inputs.

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

Clinical evidence statements

Comparison 1. Routine ultrasound scan versus selective ultrasound scan

Critical outcomes

Unexpected breech presentation in labour

No evidence was identified to inform this outcome.

Mode of birth

- Moderate quality evidence from 1 RCT (N=1993) showed that there is no clinically important difference between routine ultrasound scan at 36-37 weeks and selective ultrasound scan on the number of women who had elective caesarean section: RR 1.22 (95% CI 0.91 to 1.63).
- Moderate quality evidence from 1 RCT (N=1993) showed that there is no clinically important difference between routine ultrasound scan at 36-37 weeks and selective ultrasound scan on number of women who had emergency caesarean section: RR 1.20 (95% CI 0.90 to 1.60).
- High quality evidence from 1 RCT (N=1993) showed that there is no clinically important difference between routine ultrasound scan at 36-37 weeks and selective ultrasound scan on number of women who had vaginal birth: RR 0.95 (95% CI 0.89 to 1.01).

Important outcomes

Maternal anxiety

No evidence was identified to inform this outcome.

Women's experience and satisfaction of care

No evidence was identified to inform this outcome.

Gestational age at birth

- High quality evidence from 1 RCT (N=1993) showed that there is no clinically important difference between routine ultrasound scan at 36-37 weeks and selective ultrasound scan on the number of babies' born between 39-42 gestational weeks: RR 0.98 (95% CI 0.94 to 1.02).

Admission to neonatal unit

- Low quality evidence from 1 RCT (N=1993) showed that there is no clinically important difference between routine ultrasound scan at 36-37 weeks and

selective ultrasound scan on the number of babies admitted into the neonatal unit: RR 0.83 (95% CI 0.51 to 1.35).

Economic evidence statements

One directly applicable cost-utility analysis from the UK with potentially serious limitations compared universal ultrasound scanning for breech presentation at 36 weeks' gestational age with selective ultrasound scanning, stated as current practice. Universal ultrasound scanning was found to be borderline cost effective; the incremental cost-effectiveness ratio was £23611 per QALY gained. The cost of the scan was seen to be a key driver in the cost effectiveness result.

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

Unexpected breech presentation in labour and mode of birth were prioritised as critical outcomes by the committee. This reflects that most women with a known breech presentation at term opt for either external cephalic version or elective caesarean section. This in turn demonstrates that women and/or clinicians are uncomfortable with the risks of aiming for vaginal breech birth and the associated risks such that unexpected breech presentation in labour would ideally be avoided.

As existing evidence suggests that aiming for vaginal breech birth carries greater risk to the fetus than planned caesarean birth, it is important to consider whether earlier detection of the breech presentation would reduce the risk of these outcomes.

The committee agreed that maternal anxiety and women's experience and satisfaction of care were important outcomes to consider as the introduction of an additional routine scan during pregnancy could have a treatment burden for women. Gestational age at birth and admission to neonatal unit were also chosen as important outcomes as the committee wanted to find out whether earlier detection of breech presentation would have an impact on whether the baby was born preterm, and as a consequence admitted to the neonatal unit. These outcomes were agreed to be important rather than critical as they are indirect outcomes of earlier detection of breech presentation.

The quality of the evidence

The quality of the evidence ranged from low to high. Most of the evidence was rated high or moderate, with only 1 outcome rated as low. The quality of the evidence was downgraded due to imprecision around the effect estimates for emergency caesarean section, elective caesarean section and admissions to neonatal unit.

No evidence was identified for the following outcomes: unexpected breech presentation in labour, maternal anxiety, women's experiences and satisfaction of care.

The committee had hoped to find evidence that would inform whether early identification of breech presentation had an impact on preterm births, and although the review reported evidence for gestational age as birth, the available evidence was for births 39-42 weeks of gestation.

Benefits and harms

The available evidence compared routine ultrasound scanning with selective ultrasound scanning, and found no clinically important differences for mode of birth, gestational age at birth, or admissions to the neonatal unit. However, the committee discussed that it was important to note that the study did not focus on identifying breech presentation. The committee discussed the differences between the intervention in the study, which was an ultrasound scan to assess placental maturity, liquor volume, and fetal weight, to an ultrasound scan used to detect breech presentation. Whilst the ultrasound scan in the study has the ability to determine breech presentation, there are additional and costlier training required for the assessment of the other criteria. As such, it is important to separate the interventions. The committee also highlighted that the study did not look at whether an identification of breech presentation had an impact on the outcomes which were selected for this review.

In light of this, the committee felt that they were unable to reach a conclusion as to whether routine scanning to identify breech presentation, was associated with any benefits or harms. The committee agreed that while this review suggests routine ultrasound scanning to be no more effective than selective scanning, it does not definitively establish equivalence. Therefore, the committee agreed to recommend a continuation of the current practice with selective scanning and make a research recommendation to compare the clinical and cost effectiveness of routine ultrasound scanning versus selective ultrasound scanning from 36 weeks to identify fetal breech presentation.

Cost effectiveness and resource use

The committee acknowledged that there was included economic evidence on the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation.

The 1 included study suggested that offering a routine scan for breech is borderline cost effective. A key driver of cost effectiveness was the cost of the scan, which was substantially lower than the figure quoted in NHS reference costs for routine ultrasound scanning. The committee noted that a scan for breech presentation only is a simpler technique and uses a cheaper machine. The committee agreed that the costing assumptions presented in the study seemed appropriate.

However, the committee expressed concerns about the cohort study which underpinned the economic analysis which had a high risk of bias. The committee felt this was important to note as the palpation diagnosis rates quoted in the study were below what was seen from their clinical experience, thus overestimating the cost effectiveness of the routine scan. The committee also noted that, whilst the cost of the scan was fairly inexpensive, the resource impact would be substantial if a routine scan for breech presentation was offered to all pregnant women.

Overall, the committee felt that the clinical and cost effectiveness evidence presented was not strong enough to recommend offering a routine ultrasound scan. Therefore, the recommendation to offer abdominal palpation to all pregnant women, and to offer an ultrasound scan where breech is suspected reflects current practice and so no substantial resource is anticipated.

References

McKenna 2003

McKenna D, Tharmaratnam S, Mahsud S, Bailie C, Harper A, Dornan J, A randomized trial using ultrasound to identify the high-risk fetus in a low-risk population, Obstetrics and Gynecology, 101, 626–32, 2003

Wastlund 2019

Wastlund D, Moraitis A, Mahsud S, Dacey A, Sovio U, Wilson E, Screening for breech presentation using universal late-pregnancy ultrasonography: A prospective cohort study and cost effectiveness analysis, PLOS medicine, 16, 2019

Appendices

Appendix A – Review protocols

Review protocol for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Table 3: Review protocol for Identification of breech presentation

Field (based on PRISMA-P)	Content
Review question	What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?
Type of review question	Intervention review
Objective of the review	The aim of this review is to determine whether a routine presentation scan between 36+0 and 38+6 weeks gestation to establish fetal presentation is more effective than a clinically-indicated (selective) ultrasound on the basis of abdominal palpation.
Eligibility criteria – population	All pregnant women
Eligibility criteria – intervention(s)	Routine ultrasound scan between 36+0 and 38+6 weeks gestation onwards to establish fetal presentation
Eligibility criteria – comparator(s)	Palpation with selective ultrasound between 36+0 and 38+6 weeks gestation to establish fetal presentation (UK standard care)

Field (based on PRISMA-P)	Content

Outcomes and prioritisation	**Critical**
	• Unexpected breech presentation in labour
	• Mode of birth
	  ○ Caesarean section
	  - Elective
	  - Emergency
	  ○ Vaginal
	Important
	• Maternal anxiety
	• Women's experience and satisfaction of care
	• Gestational age at birth
	• Admission to neonatal unit

Eligibility criteria – study design	INCLUDE: • Systematic review of randomised controlled trials • Randomised controlled trials If no evidence of these types is found, the following non-randomised studies in order of priority will be considered: • Non-randomised controlled trials • Cohort studies

Field (based on PRISMA-P)	Content
Other inclusion exclusion criteria	Exclusion POPULATION: • Multiple pregnancy STUDY DESIGN: • Case-control studies • Cross-over studies • Cross-sectional studies • Epidemiological reviews or reviews on associations • Non-comparative studies PUBLICATION STATUS: • Conference abstract LANGUAGE: • Non-English Inclusion COUNTRY: • Only studies conducted in high-income countries, as defined by the World Bank, will be included (see https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups for classification of countries).
Proposed sensitivity/sub-group analysis, or meta-regression	In the presence of heterogeneity, the following subgroup analyses will be conducted: • Parity status (nulliparous; parous) In addition to the above factors, cohort studies should control for all of the following factors: • Age • Ethnicity • Socioeconomic status Statistical heterogeneity will be assessed by visually examining the forest plots of the primary outcome-pair measure and by calculating the I^2 inconsistency statistic (with an I^2 value≥50% indicating serious heterogeneity, and ≥80% indicating very serious heterogeneity).

Field (based on PRISMA-P)	Content
Selection process – duplicate screening/selection/analysis	Review questions selected as high priorities for health economic analysis (and those selected as medium priorities and where health economic analysis could influence recommendations) will be subject to dual weeding and study selection; any discrepancies above 10% of the dual weeded resources will be resolved through discussion between the first and second reviewers or by reference to a third person. All data extraction will quality assured by a senior reviewer. Draft excluded studies and evidence tables will be circulated to the Topic Group for their comments. Resolution of disputes will be by discussion between the senior reviewer, Topic Advisor and Chair.
Data management (software)	NGA STAR software will be used to generate bibliographies/citations, and conduct study sifting and data extraction. Pairwise meta-analyses, if possible, will be performed using Cochrane Review Manager (RevMan5). For details please see Supplement 1: methods.
Information sources – databases and dates	Sources to be searched: Medline, Medline In-Process, CCTR, CDSR, DARE, HTA, Embase. Limits: • Date limit: 2006 (date of last search for the 2008 NICE guideline on antenatal care for uncomplicated pregnancies (CG62)) • Apply standard animal/non-English language exclusion • Limit to RCTs and systematic reviews in first instance but download all results.
Identify if an update	This antenatal care update will replace the 2008 NICE guideline on antenatal care for uncomplicated pregnancies (CG62) which will be taken down in due course. The following recommendations are on identifying fetal malpresentation during pregnancy from the 2008 NICE guideline on antenatal care for uncomplicated pregnancies (CG62): 1.10 Fetal growth and well-being 1.10.4 Fetal presentation should be assessed by abdominal palpation at 36 weeks or later, when presentation is likely to influence the plans for the birth. Routine assessment of presentation by abdominal palpation should not be offered before 36 weeks because it is not always accurate and may be uncomfortable. [C] 1.10.5 Suspected fetal malpresentation should be confirmed by an ultrasound assessment. [Good practice point]
Author contacts	Developer: National Guideline Alliance.
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.

Field (based on PRISMA-P)	Content
Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as appendix D (clinical evidence tables) or 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 H (economic evidence tables).
Methods for assessing bias at outcome/study level	Quality assessment of individual studies will be performed using the following checklists: • ROBIS for systematic reviews • Cochrane RoB tool, v.2, for randomised controlled trials • Cochrane ROBINS-I checklist for non-randomised controlled trials and cohort studies For details please see section 6.2 of Developing NICE guidelines: the manual. The risk of bias across all available evidence will be evaluated for each outcome using an adapted version 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	For details please see Supplement 1: methods.
Meta-bias assessment – publication bias, selective reporting bias	For details please see Supplement 1: methods and 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. Trial registries will be examined to identify missing evidence: Clinical trials.gov, NIHR Clinical Trials Gateway.
Assessment of confidence in cumulative evidence	For further 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.

Field (based on PRISMA-P)	Content
Describe contributions of authors and guarantor	A multidisciplinary committee developed the guideline. The committee was convened by the National Guideline Alliance and chaired by Miss Kate Harding in line with section 3 of Developing NICE guidelines: the manual. Staff from the National Guideline Alliance undertook systematic literature searches, appraised the evidence, conducted meta-analysis and cost-effectiveness analysis where appropriate, and drafted the guideline in collaboration with the committee. For details please see the supplement 1: methods.
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	This protocol is not registered with PROSPERO.

CDSR: Cochrane Database of Systematic Reviews; CCTR: Cochrane Central Register of Controlled Trials; DARE: Database of Abstracts of Reviews of Effects; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HTA: Health Technology Assessment; MID: minimally important difference; NGA: National Guideline Alliance; NHS: National health service; NICE: National Institute for Health and Care Excellence; NIHR: National Institute for Health Research; RCT: randomised controlled trial; RoB: risk of bias; SD: standard deviation

Appendix B – Literature search strategies

Literature search strategies for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Database(s): Medline & Embase (Multifile)
Last searched on **Embase Classic+Embase** 1947 to 2020 September 04, **Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily** 1946 to September 04, 2020
Date of last search: 7th September 2020
Multifile database codes: emczd = Embase Classic+Embase; ppez= MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily

#	Searches
1	(exp Labor Presentation/ or Breech Presentation/) use ppez
2	breech presentation/ use emczd
3	breech$.tw,kw.
4	abnormal lie.tw,kw.
5	((abnormal$ or transvers$ or anterior$ or posterior$ or face$ or brow$ or compound$ or breach$) adj2 (position$ or presentation$)).tw,kw.
6	((occiput$ or cephalic$ or non-cephalic$) adj3 (position$ or presentation$)).tw,kw.
7	((foetal$ or fetal$ or foetus$ or fetus$ or breech$) adj2 (malposition$ or malpresentation$)).tw,kw.
8	1 or 2 or 3 or 4 or 5 or 6 or 7
9	Palpation/ use ppez
10	palpation/ use emczd
11	((abdom$ or clinical$ or manual$ or bimanual$ or digital$) adj palpat$).tw,kw.
12	(palpat$ adj3 (abdomen$ or presentation$)).tw,kw.
13	palpat$.kw.
14	clinical$ exam$.tw,kw.
15	(leopold$ adj (maneuv$ or manoeuv$)).tw,kw.
16	9 or 10 or 11 or 12 or 13 or 14 or 15
17	8 and 16
18	(*Ultrasonography, Prenatal/ or *Ultrasonography/) use ppez
19	(*fetus echography/ or *echography/ or *ultrasound/) use emczd
20	18 or 19
21	(Pregnancy Trimester, Third/ or Prenatal Care/) use ppez
22	(third trimester pregnancy/ or prenatal care/) use emczd
23	21 or 22
24	8 and 20 and 23
25	(third$ adj trimester$ adj2 scan$).tw,kw.
26	8 and 25
27	breech presentation/di
28	breech presentation/dg
29	diagnosis/ and breech presentation/
30	breech presentation/ and ((diagnos$ or identif$ or screen$) adj5 breech$).tw,kw.
31	(presentation adj scan$).tw,kw.
32	17 or 24 or 26 or 27 or 28 or 29 or 30 or 31
33	breech presentation.mp.
34	physical$ exam$.mp.
35	33 and 34
36	32 or 35
37	limit 36 to english language
38	limit 37 to yr="2006 -Current"
39	letter/
40	editorial/
41	news/
42	exp historical article/
43	Anecdotes as Topic/
44	comment/
45	case report/
46	(letter or comment*).ti.
47	39 or 40 or 41 or 42 or 43 or 44 or 45 or 46
48	randomized controlled trial/ or random*.ti,ab.
49	47 not 48
50	animals/ not humans/

#	Searches
51	exp Animals, Laboratory/
52	exp Animal Experimentation/
53	exp Models, Animal/
54	exp Rodentia/
55	(rat or rats or mouse or mice).ti.
56	49 or 50 or 51 or 52 or 53 or 54 or 55
57	letter.pt. or letter/
58	note.pt.
59	editorial.pt.
60	case report/ or case study/
61	(letter or comment*).ti.
62	57 or 58 or 59 or 60 or 61
63	randomized controlled trial/ or random*.ti,ab.
64	62 not 63
65	animal/ not human/
66	nonhuman/
67	exp Animal Experiment/
68	exp Experimental Animal/
69	animal model/
70	exp Rodent/
71	(rat or rats or mouse or mice).ti.
72	64 or 65 or 66 or 67 or 68 or 69 or 70 or 71
73	56 use ppez
74	72 use emczd
75	73 or 74
76	38 and 75
77	38 not 76

Database(s): Cochrane Library

Last searched on **Cochrane Database of Systematic Reviews**, Issue 9 of 12, September 2020, **Cochrane Central Register of Controlled Trials**, Issue 9 of 12, September 2020

Date of last search: 7th September 2020

#	Searches
#1	MeSH descriptor: [Labor Presentation] explode all trees
#2	MeSH descriptor: [Breech Presentation] this term only
#3	(breech*):ti,ab,kw
#4	("abnormal lie"):ti,ab,kw
#5	(((abnormal* or transvers* or anterior* or posterior* or face* or brow* or compound* or breach*) NEAR/2 (position* or presentation*))):ti,ab,kw
#6	(((occiput* or cephalic* or non-cephalic*) NEAR/3 (position* or presentation*))):ti,ab,kw
#7	(((foetal* or fetal* or foetus* or fetus* or breech*) NEAR/2 (malpresentation* or malposition*))):ti,ab,kw
#8	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7
#9	MeSH descriptor: [Palpation] this term only
#10	(((abdom* or clinical* or manual* or bimanual* or digital*) NEXT palpat*)):ti,ab,kw
#11	((palpat* NEAR/3 (abdomen* or presentation*))):ti,ab,kw
#12	(palpat*):kw
#13	(clinical* NEXT exam*):ti,ab,kw
#14	((leopold* NEXT (maneuv* or manoeuv*))):ti,ab,kw
#15	#9 OR #10 OR #11 OR #12 OR #13 OR #14
#16	#8 AND #15
#17	MeSH descriptor: [Ultrasonography, Prenatal] this term only
#18	MeSH descriptor: [Ultrasonography] this term only
#19	#17 OR #18
#20	MeSH descriptor: [Pregnancy Trimester, Third] this term only
#21	MeSH descriptor: [Prenatal Care] this term only
#22	#20 OR #21
#23	#8 AND #19 AND #22
#24	((third* NEXT trimester* NEAR/2 scan*)):ti,ab,kw
#25	#8 AND #24
#26	MeSH descriptor: [Breech Presentation] this term only and with qualifier(s): [diagnostic imaging - DG, diagnosis - DI]
#27	MeSH descriptor: [Breech Presentation] this term only
#28	MeSH descriptor: [Diagnosis] explode all trees
#29	(((diagnos* or identif* or screen*) NEAR/5 breech*)):ti,ab,kw
#30	#28 or #29
#31	#27 AND #30
#32	((presentation NEXT scan*)):ti,ab,kw
#33	#16 OR #23 OR #25 OR #26 OR #31 OR #32
#34	(breech presentation)

#	Searches
#35	(physical* NEXT exam*)
#36	#34 AND #35
#37	((routine NEAR/2 ultrasound)):ti,ab,kw
#38	#22 AND #37
#39	#33 OR #36 OR #38 Publication Year from 2006 to current

Database(s): CRD: Database of Abstracts of Reviews of Effects (DARE), HTA Database
Date of last search: 7th September 2020

#	Searches
1	MeSH DESCRIPTOR labor presentation EXPLODE ALL TREES IN DARE,HTA
2	MeSH DESCRIPTOR breech presentation IN DARE,HTA
3	((breech*)) IN DARE, HTA
4	((abnormal lie)) IN DARE, HTA
5	((((abnormal* or transvers* or anterior* or posterior* or face* or brow* or compound* or breach*) NEAR2 (position* or presentation*)))) IN DARE, HTA
6	((((occiput* or cephalic* or non-cephalic*) NEAR3 (position* or presentation*)))) IN DARE, HTA
7	(((foetal* or fetal* or foetus* or fetus* or breech*) NEAR2 (malposition* or malpresentation*))) IN DARE, HTA
8	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7
9	MeSH DESCRIPTOR Palpation IN DARE,HTA
10	(((abdom* or clinical* or manual* or bimanual* or digital*) NEXT palpat*)) IN DARE, HTA
11	((palpat* NEAR3 (abdomen* or presentation*))) IN DARE, HTA
12	(palpat*) IN DARE, HTA
13	(clinical* NEXT exam*) IN DARE, HTA
14	((leopold* NEXT (maneuv* or manoeuv*))) IN DARE, HTA
15	#9 OR #10 OR #11 OR #12 OR #13 OR #14
16	#8 AND #15
17	MeSH DESCRIPTOR Ultrasonography, Prenatal IN DARE,HTA
18	MeSH DESCRIPTOR Ultrasonography IN DARE,HTA
19	#17 OR #18
20	MeSH DESCRIPTOR Pregnancy Trimester, Third IN DARE,HTA
21	MeSH DESCRIPTOR Prenatal Care IN DARE,HTA
22	#20 OR #21
23	#8 AND #19 AND #22
24	((third* NEXT trimester* NEAR2 scan*)) IN DARE, HTA
25	#8 AND #24
26	MeSH DESCRIPTOR breech presentation WITH QUALIFIERS DI, DG IN DARE,HTA
27	MeSH DESCRIPTOR breech presentation IN DARE,HTA
28	MeSH DESCRIPTOR Diagnosis IN DARE,HTA
29	#27 AND #28
30	(((diagnos* or identif* or screen*) NEAR5 breech*)) IN DARE, HTA
31	#27 AND #30
32	((presentation NEXT scan*)) IN DARE, HTA
33	#16 OR #23 OR #25 OR #26 OR #29 OR #31 OR #32
34	(breech NEXT presentation) IN DARE, HTA
35	(physical* NEXT exam*) IN DARE, HTA
36	#34 AND #35
37	((routine NEAR2 ultrasound)) IN DARE, HTA
38	#22 AND #37
39	#33 OR #36 OR #38 Publication Year from 2006 to current

Database(s): Cinahl Plus
Date of last search: 7th September 2020

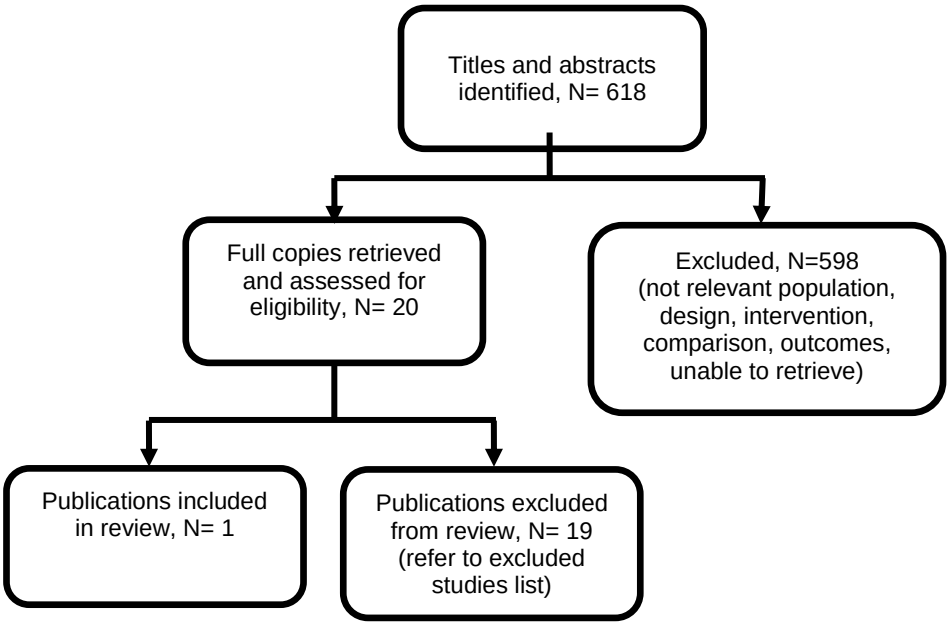
#	Searches
S34	S32 NOT S33 Limiters - Publication Year: 2006-2020; English Language;
S33	PT anecdote or PT audiovisual or PT bibliography or PT biography or PT book or PT book review or PT brief item or PT cartoon or PT commentary or PT computer program or PT editorial or PT games or PT glossary or PT historical material or PT interview or PT letter or PT listservs or PT masters thesis or PT obituary or PT pamphlet or PT pamphlet chapter or PT pictorial or PT poetry or PT proceedings or PT “questions and answers” or PT response or PT software or PT teaching materials or PT website
S32	S26 OR S29 OR S31
S31	S16 AND S30
S30	TI (routine N2 ultrasound) OR AB (routine N2 ultrasound)
S29	S27 AND S28
S28	(MH "Physical Examination") OR "physical exam"
S27	(MH "Breech Presentation") OR "breech presentation"
S26	S14 OR S17 OR S19 OR S22 OR S24 OR S25
S25	TI (presentation N1 scan*) OR AB (presentation N1 scan*)
S24	S20 AND S23
S23	TI ((diagnos* or identif* or screen*) N5 breech*) OR AB ((diagnos* or identif* or screen*) N5 breech*)

#	Searches
S22	S20 AND S21
S21	(MH "Diagnosis")
S20	(MH "Breech Presentation")
S19	S7 AND S18
S18	TI (“third* trimester*” N2 scan*) OR AB (“third* trimester*” N2 scan*)
S17	S7 AND S15 AND S16
S16	(MH "Pregnancy Trimester, Third") OR (MH "Prenatal Care")
S15	(MM "Ultrasonography, Prenatal") OR (MM "Ultrasonography")
S14	S7 AND S13
S13	S8 OR S9 OR S10 OR S11 OR S12
S12	TI (leopold* N1 (maneuv* or manoeuv*)) OR AB (leopold* N1 (maneuv* or manoeuv*))
S11	TI "clinical* exam*" OR AB "clinical* exam*"
S10	TI (palpat* N3 (abdomen* or presentation*)) OR AB (palpat* N3 (abdomen* or presentation*))
S9	TI ((abdom* or clinical* or manual* or bimanual* or digital*) N1 palpat*) OR AB ((abdom* or clinical* or manual* or bimanual* or digital*) N1 palpat*)
S8	(MH "Palpation")
S7	S1 OR S2 OR S3 OR S4 OR S5 OR S6
S6	TI ((foetal* or fetal* or foetus* or fetus* or breech*) N2 (malposition* or malpresentation*)) OR AB ((foetal* or fetal* or foetus* or fetus* or breech*) N2 (malposition* or malpresentation*))
S5	TI ((occiput* or cephalic* or non-cephalic*) N3 (position* or presentation*)) OR AB ((occiput* or cephalic* or non-cephalic*) N3 (position* or presentation*))
S4	TI ((abnormal* or transvers* or anterior* or posterior* or face* or brow* or compound* or breach*) N2 (position* or presentation*)) OR AB ((abnormal* or transvers* or anterior* or posterior* or face* or brow* or compound* or breach*) N2 (position* or presentation*))
S3	TI "abnormal lie" OR AB "abnormal lie"
S2	TI breech* OR AB breech*
S1	(MH "Labor Presentation+") OR (MH "Breech Presentation")

Appendix C – Clinical evidence study selection

Clinical study selection for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Figure 1: Study selection flow chart



Appendix D – Clinical evidence tables

Clinical evidence tables for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Table 4: Clinical evidence tables

Study details	Participants	Interventions	Outcomes and Results	Comments
Full citation McKenna D, Tharmaratnam S, Mahsud S, Bailie C, Harper A, Dornan J, A randomized trial using ultrasound to identify the high-risk fetus in a low-risk population, Obstetrics and Gynecology, 101, 626–32, 2003 **Ref Id** 1094460 **Country/ies where the study was carried out** Northern Ireland, UK **Study type** Randomised controlled trial **Aim of the study** • To study the effect of the introduction of a real-time ultrasound examination at 30–32 weeks' gestation and at 36–37 weeks' gestation to assess placental maturity,	**Sample size** N=1998 pregnant women Study group: n= 999 Control group: n= 999 **Inclusion criteria** • Women recruited at 30 weeks gestation assessed as low risk with singleton pregnancy with gestational age confirmed by early ultrasound examination or 18 to 20 week anomaly scan. **Exclusion criteria** • Known maternal medical problems or previous obstetric complications or known fetal anomaly. **Characteristics** Maternal Age (years)-mean • Study group: 27.7 years • Control group: 27.3 years Parity	**Interventions** • Assessments for both groups coincided with routine antenatal visits at 30–32 and 36–37 weeks' gestation. • Control group: had maternal abdomen palpation to determine uterine and fetal size, fetal presentation and position, and amniotic fluid volume. • Study group: in addition to the abdomen palpation, women had an ultrasound examination to assess placental maturity, liquor volume, and estimated fetal weight. **Details** • At the end of each antenatal visit, the clinician made a management decision on the basis of the abdomen palpation or the ultrasound scan result for women in the study group. Options for antenatal interventions were: 1) reviewing the patients	**Results** Outcomes: Critical outcomes: **Mode of birth** Elective caesarean: Study group: n=91 Control group: n=75 RR:(95% CI)=1.25 (0.94 to 1.67) Emergency caesarean: Study group: n=92 Control group: n=77 RR:(95% CI)=1.23 (0.93 to 1.64) Normal vaginal delivery: Study group: n=671 Control group: n=711 RR: (95% CI)=1. Important outcomes: **Gestational age (week)** Gestational age: 39-42 weeks: Study group: n=800 Control group: n=821 RR:(95% CI)=1.	**Limitations** Cochrane risk of bias tool V2: Randomisation process: Low risk. (Allocation sequence was computer generated. Randomisation was done by sealed envelopes. No significant baseline difference between groups). Deviations from intended interventions: Low risk. (Blinding was not reported, but may not be feasible. Blinding was not reported, but may not be feasible. There were no deviations because of the experimental context. Missing outcome data for 5 participants were excluded only for some outcomes). Missing outcome data: Low risk. (Nearly all outcome data were available). Measurement of the outcome: Low risk. (Methods of measurement of the outcomes were defined and plausible. Methods of outcome measurement are the same. Blinding was not reported but may not be feasible. Outcomes were observer reported without judgements or decision

Study details	Participants	Interventions	Outcomes and Results	Comments
amniotic fluid volume, and estimated fetal weight in a previously identified low-risk pregnancy. **Study dates** • Not mentioned. **Source of funding** • Study funded with a £29500 grant from the Northern Ireland Mother and Baby Appeal (registered charity number XN75792/1).	<u>Parity 0-number(%):</u> Study group: n=413 (41.3%) Control group: n=388 (38.7%) <u>Parity 1-2-number(%):</u> Study group: n=465 (46.5%) Control group: n=457 (45.7%) <u>Parity 3-4-number(%):</u> Study group: n=97 (9.7%) Control group: n=134 (13.4%) <u>Parity ≥5-number(%):</u> Study group: n=24 (2.4%) Control group: n=22 (2.2%)	earlier at the antenatal clinic; 2) referral for full biophysical fetal assessment including umbilical artery Doppler ultrasound; 3) admission to the antenatal ward; and 4) induction of labour. • **Primary outcome measures:** small for gestational age at birth (less than 10th percentile at birth), antenatal interventions, and admissions to the neonatal intensive care unit. • **Secondary outcome measures:** overall induction of labour rates, induction of labour for suspected fetal compromise, gestational age at delivery, mode of birth, non-reassuring fetal status in labour, Apgar scores at 1 and 5 minutes, resuscitation of neonate, and fetal abnormalities. Power analysis: A recruitment target of 2000 patients enabled the study to have 80% power to detect as statistically significant ($p<0.05$) for the specified outcomes. Statistical analysis Carried out by using Epi-Info 6 and SPSS. Primary outcome measures were compared between groups using Chi square test with Yates' correction, and relative risks with 95% CI were also	**Admission to neonatal unit:** Study group: n=28/994 Control group: n=34/999 RR:(95% CI)=0.83 (0.51 to 1.35).	outcomes). Selection of the reported result: Low risk. (All pre-specified outcomes in protocol reported. All eligible reported results correspond with pre-specified outcomes). Overall bias: Low risk

Study details	Participants	Interventions	Outcomes and Results	Comments
		calculated. The Mantel-Haenszel stratified relative risk was used to adjust for the potential confounding effect of maternal smoking. Intention-to-treat analysis Not mentioned.		

CI: confidence interval; RR: risk ratio

Appendix E – Forest plots

Forest plots for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

This section includes forest plots only for outcomes that are meta-analysed. Outcomes from single studies are not presented here, but the quality assessment for these outcomes is provided in the GRADE profiles in appendix F.

Appendix F – GRADE tables

GRADE tables for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Table 5: Clinical evidence profile for routine ultrasound scan versus selective ultrasound scan

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Routine ultrasound	Selective ultrasound	Relative (95% CI)	Absolute		
Mode of birth - caesarean-section (elective)												
1 (McKenna 2003)	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[1]	none	91/994 (9.2%)	75/999 (7.5%)	RR 1.22 (0.91 to 1.63)	17 more per 1000 (from 7 fewer to 47 more)	⊕⊕⊕O MODERATE	CRITICAL
Mode of birth - caesarean-section (emergency)												
1 (McKenna 2003)	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	serious[1]	none	92/994 (9.3%)	77/999 (7.7%)	RR 1.20 (0.90 to 1.60)	15 more per 1000 (from 8 fewer to 46 more)	⊕⊕⊕O MODERATE	CRITICAL
Mode of birth - vaginal delivery												
1 (McKenna 2003)	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	671/994 (67.5%)	711/999 (71.2%)	RR 0.95 (0.89 to 1.01)	36 fewer per 1000 (from 78 fewer to 7 more)	⊕⊕⊕⊕ HIGH	CRITICAL
Gestational age at birth - 39-42 weeks												
1 (McKenna 2003)	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	800/994 (80.5%)	821/999 (82.2%)	RR 0.98 (0.94 to 1.02)	16 fewer per 1000 (from 49 fewer to 16 more)	⊕⊕⊕⊕ HIGH	IMPORTANT
Admission to neonatal unit												
1 (McKenna 2003)	randomised trials	no serious risk of bias	no serious inconsistency	no serious indirectness	very serious[2]	none	28/994 (2.8%)	34/999 (3.4%)	RR 0.83 (0.51 to 1.35)	6 fewer per 1000 (from 17 fewer to 12 more)	⊕⊕OO LOW	IMPORTANT

CI: confidence interval; RR: risk ratio
1. Evidence downgraded by 1 levels because 95% CI crosses 1 default MIDs for dichotomous outcomes (1.25).

2. Evidence downgraded by 2 levels because 95% CI crosses 2 default MIDs for dichotomous outcomes (0.8 and 1.25).

Appendix G – Economic evidence study selection

Economic evidence study selection for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

A single economic search was undertaken for all topics included in the scope of this guideline. One economic study was identified which was applicable to this review question. See supplementary material 2 for details.

Appendix H – Economic evidence tables

Economic evidence tables for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Table 6: Economic evidence tables

Study Country Study type	Intervention & comparator	Study population Study design Data sources	Costs: description and values Outcomes: description and values	Results	Comments
Author & year: Wastund 2019 Country: UK Type of economic analysis: Cost utility analysis Source of funding: NIHR - HTA	Interventions: Universal ultrasound scanning for breech presentation near term (36 weeks gestational age in nulliparous women): Study assumes that all breech presentations at time of scanning would be detected (100% sensitivity and 100% specificity). Comparator: Selective ultrasound (current practice): Diagnosed clinically by abdominal palpation followed by ultrasound for confirmation, or as an incidental finding during a scan for a different indication. The comparator is stated as	Study population: Nulliparous women Modelling: Decision analytic model Prospective cohort study: 3879 nulliparous women. 'Pregnancy and outcome (POP)' study Source of efficacy data: POP study (N=3879) Source of resource use data: POP study Source of unit costs: NHS reference costs, PSSRU, NHS staff earnings, expert opinion and published studies.	Costs: NHS perspective. Ultrasound scanning, external cephalic version, modes of delivery. Primary outcomes: Mortality risk associated with each mode of birth. Total cost per patient: Universal ultrasound: £2957 Selective ultrasound: £2949 Difference: £7.29 Total expected QALYs per patient: Universal ultrasound: 24.27615 Selective ultrasound:	ICER: £23,611 Probability of being cost effective: Not reported. Credible intervals of the ICER are (95% CrI: 8,184, 44851). Subgroup analysis: None conducted Sensitivity analysis: Probabilistic sensitivity analysis (PSA) and univariate sensitivity analysis. Uncertainty not specifically addressed in the model (no cost effectiveness plane or acceptability curve).	Perspective: NHS Currency: UK pounds Cost year: 2016 Time horizon: Lifetime from birth Discounting: 3.5% for QALYs Applicability: Directly applicable Quality: Potentially severe limitations Comments: A key driver of the model, the cost of ultrasound scanning, was not extracted from NHS reference costs. It is explained that the cost as cited in NHS reference costs (NZ21Z) uses multiple measurements,

Study Country Study type	Intervention & comparator	Study population Study design Data sources	Costs: description and values Outcomes: description and values	Results	Comments
	current practice.		24.27582 Difference:0.000327		whereas an ultrasound for foetal presentation alone is technically simple. Costing for ultrasound is undertaken on the basis that such a scan is provided by a midwife in conjunction with a standard antenatal visit in primary care, using basic ultrasound equipment. The cost of an ultrasound includes; a midwife's time, cost of equipment and room. Unit cost of scan was informed using uniform distributions and 100,000 simulations. At £20,000 threshold, universal ultrasound would be cost effective at £19.80 or less. At £30,000 threshold, universal ultrasound scanning would be cost effective at £23.80 or less. A key limitation is that the probability of being

Study Country Study type	Intervention & comparator	Study population Study design Data sources	Costs: description and values Outcomes: description and values	Results	Comments
					cost effective at each threshold is not reported. In addition, there may be severe limitations with key input parameters being extracted from the accompanying cohort study.

Appendix I – Economic evidence profiles

Economic evidence profiles for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Table 7: Economic evidence profiles

Study and country	Limitations	Applicability	Other comments	Incremental costs	Incremental effects	ICER	Uncertainty
Author & year: Wastlund 2019 Country: UK	Potentially severe*[1]	Directly applicable* [2]	Type of economic analysis: Cost utility analysis Time horizon: lifetime QALYs Primary measure of outcome: Neonatal mortality	7.29	0.000327	Reported: £23,611 Calculated: £22,394	Deterministic sensitivity analyses: Univariate sensitivity analysis conducted on all input parameters. Cost of ultrasound a key driver in the model. Deterministic results not reported. PSA: 100,000 simulations. Each parameter in the model has an assigned probability distribution, each appropriate to the characteristic of the relevant input. No sensitivity analysis on a

Study and country	Limitations	Applicability	Other comments	Incremental costs	Incremental effects	ICER	Uncertainty
							range of plausible values key input parameters. Tornado diagram does not assess changes to net monetary benefit or ICER.

* According to NICE guideline manual: Appendix H – Economic evaluation checklist

1. Appropriate time horizon for QALYs though may not capture all relevant costs; Includes probabilistic sensitivity analysis (PSA), though deterministic result not reported. PSA not accompanied with additional markers of uncertainty such as a cost effectiveness plane or cost effectiveness acceptability curve. Potentially severe limitations in key input parameters from the accompanying cohort study.
2. Population appropriate for this review; Interventions appropriate; UK context; Includes QALYs

Appendix J – Economic analysis

Economic evidence analysis for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

No economic analysis was conducted for this review question.

Appendix K – Excluded studies

Excluded clinical and economic studies for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Clinical studies

Table 8: Excluded studies and reasons for their exclusion

Study	Reason for exclusion
Abuhamad, A., Zhao, Y., Abuhamad, S., Sinkovskaya, E., Rao, R., Kanaan, C., Platt, L., Standardized Six-Step Approach to the Performance of the Focused Basic Obstetric Ultrasound Examination, American Journal of Perinatology, 33, 90-8, 2016	Prospective cohort study - no relevant comparison
Balogun, O. A. A., Pedroza, C., Sibai, B. M., Blackwell, S. C., Chauhan, S. P., Serial third trimester ultrasound vs. routine care in uncomplicated pregnancies: a randomized controlled trial (UP trial), American Journal of Obstetrics and Gynecology, 218, S92, 2018	Conference abstract
Belanger K, Hobbins JC, Muller JP, Howard S, Neurological testing in ultrasound exposed infants, American Journal of Obstetrics and Gynecology, 174, 413, 1996	Conference abstract
Bricker, L., Medley, N., Pratt, J. J., Routine ultrasound in late pregnancy (after 24 weeks' gestation), Cochrane Database of Systematic Reviews, 2015	Systematic review. references checked, 2 additional studies included (McKenna 2003; Wladimiroff 1980)
Carbillon, L., Benbara, A., Tigaizin, A., Murtada, R., Fermaut, M., Belmaghni, F., Bricou, A., Boujenah, J., Revisiting the management of term breech presentation: a proposal for overcoming some of the controversies, BMC Pregnancy and Childbirth, 20, 263, 2020	Study design does not meet inclusion criteria. Debate article.
Ciobanu, A., Formuso, C., Syngelaki, A., Akolekar, R., Nicolaides, K. H., Prediction of small-for-gestational-age neonates at 35-37 weeks' gestation: contribution of maternal factors and growth velocity between 20 and 36 weeks, Ultrasound in obstetrics & gynecology, 53, 488-495, 2019	Prediction model study - no relevant comparison
Lalor,J., Russell,N., McParland,P., Routine screening and detection of fetal anomalies in a predominantly midwifery-led ultrasound service, Evidence Based Midwifery, 6, 87-94, 2008	No relevant comparison
Lindqvist, P. G., Pettersson, K., Moren, A., Kublickas, M., Nordstrom, L., Routine ultrasound examination at 41 weeks of gestation and risk of post-term severe adverse fetal outcome: A retrospective evaluation of two units, within the same hospital, with different guidelines, BJOG: An International Journal of Obstetrics and Gynaecology, 121, 1108-1115, 2014	No relevant intervention and comparison and study design does not meet inclusion criteria. A retrospective Cohort study

Neilson JP, Munjanja SP, Whitfield CR, Screening for small for dates fetuses: a controlled trial, BMJ, 289, 1179-82, 1984	No relevant comparison
Newnham JP, Evans SF, Michael CA, et al., Effects of frequent ultrasound during pregnancy: a randomised controlled trial, Lancet, 342, 887-91, 1993	No relevant comparison
Odibo, A. O., Routine ultrasound examination at 41 weeks of gestation does not improve perinatal outcomes, BJOG: An International Journal of Obstetrics and Gynaecology, 121, 1116, 2014	Commentary on Lindqvist 2014 (an included study).
Oniya, O., Ledingham, M., Duncan, A., Ultrasound surveillance in the high risk patient-does it deliver?, BJOG: An International Journal of Obstetrics and Gynaecology, 120, 135, 2013	Conference abstract
Ray, C. L., Morin, L., Routine Versus Indicated Third Trimester Ultrasound: Is a Randomized Trial Feasible?, Journal of Obstetrics and Gynaecology Canada, 31, 113-119, 2009	Mixed methods study examining viability of conducting RCT of routine vs indicated ultrasound scan - no relevant data
Revankar, K. G., Dhumale, H., Pujar, Y., A randomized controlled study to assess the role of routine third trimester ultrasound in low-risk pregnancy on antenatal interventions and perinatal outcome, Journal of SAFOG, 6, 139-143, 2014	Study not conducted in Work Bank high-income country
Skrastad,R.B., Eik-Nes,S.H., Sviggum,O., Johansen,O.J., Salvesen,K.A., Romundstad,P.R., Blaas,H.G., A randomized controlled trial of third-trimester routine ultrasound in a non-selected population, Acta Obstetricia et Gynecologica Scandinavica, 92, 1353-1360, 2013	No relevant comparison - RCT comparing routine ultrasound at 33 weeks to clinically-indicated ultrasound only, to detect SGA or LGA babies
Triunfo, S., Crovetto, F., Scazzocchio, E., Parra-Saavedra, M., Gratacos, E., Figueras, F., Contingent versus routine third-trimester screening for late fetal growth restriction, Ultrasound in obstetrics & gynecology, 47, 81-8, 2016	Prediction model study - no relevant data
Wastlund, D., Moraitis, A. A., Dacey, A., Sovio, U., Wilson, E. C. F., Smith, G. C. S., Screening for breech presentation using universal late-pregnancy ultrasonography: A prospective cohort study and cost effectiveness analysis, PLoS Medicine / Public Library of SciencePLoS Med, 16, e1002778, 2019	Conference abstract
Wastlund, D., Moraitis, A., Dacey, A., Sovio, U., Wilson, E., Smith, G., Screening for breech presentation using late pregnancy ultrasonography: A prospective cohort study and cost-effectiveness analysis, BJOG: An International Journal of Obstetrics and Gynaecology, 126, 125, 2019	Prospective cohort study examining routine vs indicated scan - data reported according to type of presentation rather than type of intervention received.
Wladimiroff JW, Laar J, Ultrasonic measurement of fetal body size. A randomized controlled trial, Acta Obstetricia et Gynecologica Scandinavica, 59, 177-9, 1980	No relevant intervention or comparison. Routine ultrasound between 32 and 36 weeks compared to selective ultrasound based on abdominal palpation.

Economic studies

A single economic search was undertaken for all topics included in the scope of this guideline. No economic studies were identified which were applicable to this review question. See supplementary material 2 for details.

Appendix L – Research recommendations

Research recommendations for review question: What is the effectiveness of routine scanning between 36+0 and 38+6 weeks of pregnancy compared to standard care regarding breech presentation?

Research question

What is the clinical and cost effectiveness of routine ultrasound from 36+0 weeks compared with selective ultrasound in identifying breech presentation?

Why this is important

The committee made the research recommendation because the review evidence is insufficient to determine the clinical effectiveness of routine ultrasound scan at 36 to 38+6 weeks for the identification of breech presentation.

Table 9: Research recommendation rationale

Research question	**What is the effectiveness of routine ultrasound from 36 weeks compared to selective ultrasound in identification of breech presentation?**
Why is this needed	
Importance to 'patients' or the population	Women and/or health care professionals may be concerned about the risks associated with vaginal breech delivery. Particularly those women who present in labour with an unexpected breech presentation with no prior counselling about the risks. Ultrasound diagnosis of breech presentation before the onset of labour will allow time for counselling and discussion with the woman about her options for delivery. Due to the limitations with the quality of evidence, it does not support the routine use of ultrasound scanning at 36-38+6 weeks in low risk, singleton pregnancies to identify breech however it does not definitively establish equivalence.
Relevance to NICE guidance	Routine ultrasound scanning to identify breech presentation has been considered in this guideline however there were concerns regarding the quality of the evidence, and while the review suggests routine ultrasound scanning to be no more effective than selective scanning, it does not definitively establish equivalence. There were also concerns regarding the high risk of bias in the study which underpinned the economic analysis. Overall the committee felt there was a lack of clinical and economic evidence to answer the question.
Relevance to the NHS	Existing evidence suggests that aiming for vaginal breech birth carries greater risk to the fetus than planned caesarean birth. It is therefore important for the NHS to consider whether improved earlier diagnosis of breech presentation would reduce the risk of these outcomes and costs associated with it.

Research question	What is the effectiveness of routine ultrasound from 36 weeks compared to selective ultrasound in identification of breech presentation?
National priorities	High
Current evidence base	Minimal long-term data
Equality considerations	None known
Feasibility	No concerns
Other comments	-

Table 10: Research recommendation modified PICO table

Criterion	Explanation
Population	Women with uncomplicated low risk pregnancies.
Intervention	Routine ultrasound from 36 weeks gestation to identify breech presentation.
Comparator	Selective ultrasound from 36 weeks gestation to identify breech presentation.
Outcomes	Unexpected breech presentation in labour Mode of birth Maternal anxiety Women's experience and satisfaction with care Gestational age at birth Admission to neonatal unit
Study design	RCT
Timeframe	No minimum duration of follow-up
Additional information	-

RCT: randomised controlled trial