National Institute for Health and Care Excellence

Final

Postnatal care

[I] Assessment of secondary postpartum haemorrhage

NICE guideline NG194

Evidence review underpinning recommendations 1.2.3 and 1.2.13 to 1.2.14

April 2021

Final

These evidence reviews were developed by the National Guideline Alliance, 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.

NICE guidelines cover health and care in England. Decisions on how they apply in other UK countries are made by ministers in the Welsh Government, Scottish Government, and Northern Ireland Executive. All NICE guidance is subject to regular review and may be updated or withdrawn.

Copyright

ISBN: 978-1-4731-4078-3

Contents

Assessment of secondary postpartum haemorrhage

Review question

How should early signs and symptoms of postpartum haemorrhage be assessed?

Introduction

Secondary postpartum haemorrhage (PPH) is an important complication postnatally which requires prompt action from professionals. This review was intended to identify the most effective ways of assessing blood loss and identifying those instances where medical intervention would be indicated.

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	Women from 24 hours after birth up to 8 weeks after birth.
Intervention	Systematic strategies to identify secondary postpartum haemorrhage (PPH): Intervention 1. Providing information about bleeding to the woman before transfer to community care Intervention 2. Checklist used at postnatal care contacts to record observations of early signs and symptoms of postpartum haemorrhage Intervention 3. Higher frequency of observations of early signs and symptoms of postpartum haemorrhage than comparator (for example, daily observations)
Comparison	Interventions compared to standard care or to 'no intervention'. In addition, intervention 1 will be compared to comparator 1, 2 will be compared to comparator 2, and intervention 3 will be compared to comparator 3: Comparator 1. Different way of providing information to the woman Comparator 2. Different checklist Comparator 3. Lower frequency of observations than intervention
Outcomes	**Critical:** • maternal death due to PPH • blood loss 24 hours after birth (≥500 ml) • blood transfusion 24 hours after birth **Important:** • severe acute maternal morbidity • women's acceptability of and satisfaction with intervention • discontinuing breastfeeding.

PPH: postpartum haemorrhage

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 2014 conflicts of interest policy until March 2018. From April 2018 until June 2019, declarations of interest were recorded according to NICE's 2018 conflicts of interest policy. From July 2019 onwards, the declarations of interest were recorded according to NICE's 2019 conflicts of interest policy. Those interests declared before July 2019 were reclassified according to NICE's 2019 conflicts of interest policy (see Register of Interests).

Clinical evidence

Included studies

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

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

Excluded studies

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

Summary of clinical studies included in the evidence review

No studies were identified which were applicable to this review question (and so there are no evidence tables in Appendix D). No meta-analysis was undertaken for this review (and so there are no forest plots in Appendix E).

Quality assessment of clinical outcomes included in the evidence review

No studies were identified which were applicable to this review question.

Economic evidence

Included studies

A single economic search was undertaken for all topics included in the scope of this guideline but no economic studies were identified which were applicable to this review question. See the literature search strategy in appendix B and economic study selection flow chart in appendix G.

Excluded studies

No economic studies were reviewed at full text and excluded from this review.

Economic model

No economic modelling was undertaken for this review because, although the review question was considered priority for modelling, no clinical evidence that would allow development of an economic model was identified.

Evidence statements

Clinical evidence statements

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

Economic evidence statements

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

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The committee rated maternal death as a critical outcome because secondary PPH is a life-threatening complication. Early identification of symptoms and signs of secondary PPH would enable early intervention, which could in turn reduce the amount of blood loss and the need for a blood transfusion to replace lost blood. Therefore, blood loss of 500 ml or more and blood transfusion 24 hours after birth were rated as critical outcomes. Severe acute maternal morbidity, which would be a consequence of major haemorrhage, was rated as an important outcome. Women's acceptability of and satisfaction with intervention were also rated as important outcomes because the committee wanted to support women-centred care. Discontinuing breastfeeding was considered an important outcome because major haemorrhage could lead to separation of mother and baby because of the need for clinical care and thus could affect breastfeeding opportunities. It could also be a traumatic experience that might influence breastfeeding uptake.

The quality of the evidence

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

Benefits and harms

On the basis of their expertise the committee agreed that some women may not realise they are experiencing early signs and symptoms of secondary PPH, because they mistake them for normal features of the postpartum experience. Therefore, discussion with women should focus on what to expect in terms of vaginal bleeding and identifying possible symptoms and signs of secondary PPH. The committee mentioned the following symptoms and signs of secondary PPH that would warrant the woman to seek medical advice: sudden and very heavy vaginal bleeding, increasing vaginal bleeding, passing clots or placental tissue or membranes, strong or unpleasant odour of vaginal bleeding or discharge indicating an infection, or other symptoms of infection such as fever, chills, abdominal pain, headache or muscle aches. Retained products of conception (RPOC) is a common cause of secondary PPH and an infection could be an indication of RPOC. The committee also recognised the importance of responding to the concerns of the woman about postpartum bleeding. The committee agreed that this recommendation would benefit women by improving awareness of symptoms and signs of secondary PPH, enabling women to seek advice early on, which would lead to early intervention and reduce the likelihood of secondary PPH resulting in adverse outcomes.

Although all women are at risk of secondary PPH, some women are at higher risk, and so the committee recommended to take into account specific risk factors when assessing the severity of blood loss. The committee acknowledged that the antenatal and intrapartum risk factors for PPH in the NICE guideline on intrapartum care for healthy women and babies applied to postnatal women, therefore the committee agreed to cross refer to this guideline

for the assessment of severity and risk factors for secondary PPH. The committee also noted that the risk of adverse outcomes is higher even with a small amount of bleeding in women with anaemia or lower body weight. The cut-off for booking weight of 50 kg is based on table 4.2 on page 49 in the report (Knight 2014), illustrating estimated blood volumes and the corresponding proportionate losses according to body weight. The committee agreed that this recommendation would benefit women by identifying those with a higher risk of secondary PPH, therefore prompting women to seek help and for healthcare professionals to assess bleeding sooner, which could lead to early intervention and reduce the likelihood of secondary PPH resulting in severe adverse outcomes.

The committee agreed that there is a risk that women would consider normal what is in fact abnormal bleeding. Therefore, they recommended that midwives should assess and specifically ask about vaginal discharge and bleeding and any possible signs or symptoms of anaemia, such as fatigue, feeling faint or dizzy at postnatal contacts. The committee agreed that this recommendation was best placed in the recommendations on the assessment and care of the woman as it is important for midwives to assess at each postnatal contact (see also evidence review F).

The committee agreed that overall the anticipated benefits of these recommendations, for example increased awareness by women and assessment by healthcare midwives outweighed the potential harms. Harms considered included potential additional visits to appropriate health professionals, anxiety of possible short term separation from baby and its potential impact on breastfeeding.

Cost effectiveness and resource use

No economic evidence is available for this review question. The committee agreed that spending time at postnatal contacts to ask women about vaginal bleeding and any concerns they may have, and to assess the severity and risk of vaginal bleeding has low-to-modest resource implications (health professional time). However, it may lead to significant benefits for the woman and cost-savings to the health service if secondary PPH that requires intervention is identified early. This is because late identification, when secondary PPH has become more severe, is associated with higher mortality and morbidity for the woman, and more intensive interventions, such as surgery, and increased length of hospitalisation may be needed. On the other hand, if women are given adequate information and reassurance about normal postpartum vaginal bleeding, they avoid unnecessary concerns and unplanned visits to health services for further evaluation and investigations. Therefore, the committee agreed that the recommendations ensure efficient use of healthcare resources.

Other factors the committee took into account

The committee noted during protocol development that certain subgroups of women may require special consideration due to their potential vulnerability:

- young women (19 years or under)
- women with physical or cognitive disabilities
- women with severe mental health illness
- women who have difficulty accessing postnatal care services.

A stratified analysis was therefore predefined in the protocol based on these subgroups. However, considering the lack of evidence for these sub-groups, the committee agreed not to make separate recommendations and that the recommendations they did make should apply universally as long as communication with the women are tailored according to their needs (this is covered by another section in the guideline, see evidence report G).

References

Knight 2014

Knight, M., Bunch, K., Tuffnell, D., Jayakody, H., Shakespeare, J., Kotnis, R., Kenyon, S., Kurinczuk, JJ (Eds.) on behalf of MBRRACE-UK. Saving Lives, Improving Mothers' Care: Lessons learned to inform future maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2009-2012. Oxford National Perinatal Epidemiology Unit, University of Oxford 2014.

Appendices

Appendix A – Review protocols

Review protocol for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

Table 2: Review protocol

Field (based on PRISMA-P)	Content
Review question	How should early signs and symptoms of postpartum haemorrhage be assessed?
Type of review question	Intervention
Objective of the review	This review aims to determine what actions should be undertaken by women and health care professionals to identify early signs and symptoms of postpartum haemorrhage. This question focuses on signs and symptoms of secondary PPH because the NICE guideline on intrapartum care for healthy women and babies (CG190) covers primary PPH.
Eligibility criteria – population/disease/condition/issue/domain	Women from 24 hours after birth up to 8 weeks after birth. The following populations will be excluded: - women admitted to intensive care after labour and birth and women returning to theatre following a caesarean section - women experiencing these complications intrapartum: primary PPH, massive obstetric haemorrhage; fourth degree tear; caesarean hysterectomy; uterine artery embolisation due to haemorrhage; bladder, ureteric, blood vessel, or bowel injury at Caesarean section; sepsis; venous thromboembolism - women with these complications in pregnancy: gestational diabetes; pre-eclampsia; pregnancy induced hypertension; acute fatty liver of pregnancy - women with pre-existing conditions (for example, type 1 diabetes, type 2 diabetes, essential hypertension; solid organ transplant recipients; renal disease (usually related to hypertension or autoimmune causes); any form of malignancy; sickle cell disease; thalassaemia; cardiac disease; poorly controlled epilepsy; stroke; cerebral venous thrombosis; sub-arachnoid haemorrhage.

Field (based on PRISMA-P)	Content
Eligibility criteria – intervention(s)	Systematic strategies to identify secondary PPH: Intervention 1. Providing information about bleeding to the woman before transfer to community care Intervention 2. Checklist used at postnatal care contacts to record observations of early signs and symptoms of postpartum haemorrhage Intervention 3. Higher frequency of observations of early signs and symptoms of postpartum haemorrhage than comparator (for example, daily observations)
Eligibility criteria – comparator(s)	Intervention 1, 2 and 3 will be compared to standard care or to 'no intervention'. Moreover, intervention 1 will be compared to comparator 1, 2 will be compared to comparator 2, and intervention 3 will be compared to comparator 3: Comparator 1. Different way of providing information to the woman Comparator 2. Different checklist Comparator 3. Lower frequency of observations than intervention Since they are not mutually exclusive, interventions 1.1, 1.2 and 1.3 will not be compared with each other.
Outcomes and prioritisation	**Critical outcomes:** - maternal death due to PPH (any statistically significant change) - blood loss 24 hours after birth (≥500 ml) (default MIDs) - blood transfusion (default MIDs). **Important outcomes:** - severe acute maternal morbidity (default MIDs) - women's acceptability of and satisfaction with intervention (default MIDs) - discontinuing breastfeeding (any statistically significant change).
Eligibility criteria – study design	Include published full text papers: Systematic reviews RCTs Only if RCTs are unavailable: prospective or retrospective comparative cohort studies (with a sample size >100) Prospective study designs will be prioritised over retrospective study designs Exclude:

Field (based on PRISMA-P)	Content
	Conference abstracts Studies with a sample size <100 Case-control studies and case series
Other inclusion exclusion criteria	Studies from low- and middle-income countries will be excluded Date: published from 2000. Practice has changed since 2000 and anything published before this is unlikely to be relevant.
Proposed sensitivity/sub-group analysis, or meta-regression	Groups that will be reviewed and analysed separately: • young women (19 years or under) • women with physical or cognitive disabilities • women with severe mental health illness • women who have difficulty accessing postnatal care services. In the presence of heterogeneity, the following subgroups will be considered for sensitivity analysis: women with risk factors for primary PPH (prolonged labour, retained placenta and physiological management of the third stage of labour, for example no medication given to speed up placental separation) Statistical heterogeneity will be assessed by visually examining the forest plots and by calculating the I^2 inconsistency statistic (with an I2 value of more than 50% indicating considerable heterogeneity) Potential confounders: • age • BMI (both low and high) • Parity • language.
Selection process – duplicate screening/selection/analysis	This review question was prioritised for health economic analysis therefore formal dual weeding (title and abstract) of 10% of items will be undertaken. Any discrepancies will be resolved through discussion between the first and second reviewers or by reference to a third person. (Moreover, internal (NGA) quality assurance processes will include consideration of the outcomes of weeding, study selection and data extraction and the committee will review the results of study selection and data extraction).
Data management (software)	Pairwise meta-analyses will be performed using Cochrane Review Manager (RevMan5).

Field (based on PRISMA-P)	Content
	'GRADEpro' will be used to assess the quality of evidence for each outcome.
Information sources – databases and dates	The following databases will be searched: • CCRCT • CDSR • DARE • Embase • EMCare • HTA Database • MEDLINE and MEDLINE IN-PROCESS Searches will be restricted by: • Date limitations: 2000 to 17th December 2019 • English language • Human studies • Observational studies • RCTs • Systematic reviews Other searches: • Inclusion lists of systematic reviews
Identify if an update	This guideline will update the NICE guideline on postnatal care up to 8 weeks after birth (CG37). All reviews are being conducted afresh. However the CG37 (2006) guideline includes the following recommendations on postpartum haemorrhage: 1.2.5 In the absence of abnormal vaginal loss, assessment of the uterus by abdominal palpation or measurement as a routine observation is unnecessary. [2006] 1.2.6 Assessment of vaginal loss and uterine involution and position should be undertaken in women with excessive or offensive vaginal loss, abdominal tenderness or fever. Any abnormalities in the size, tone and position of the uterus should be evaluated. If no uterine abnormality is found, consider other causes of symptoms (urgent action). [2006] [2006]

Field (based on PRISMA-P)	Content
	1.2.7 Sudden or profuse blood loss, or blood loss accompanied by any of the signs and symptoms of shock, including tachycardia, hypotension, hypoperfusion and change in consciousness, should be evaluated (emergency action).[2006] [2006]
Author contacts	https://www.nice.org.uk/guidance/indevelopment/gid-ng10070
Highlight if amendment to previous protocol	For details please see section 4.5 of Developing NICE guidelines: the manual
Search strategy – for one database	For details please see appendix B.
Data collection process – forms/duplicate	A standardised evidence table format will be used, and published as appendix D (clinical evidence tables) or 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	Standard study checklists were used to critically appraise individual studies. For details please see section 6.2 of Developing NICE guidelines: the manual The risk of bias across all available evidence was evaluated for each outcome using an adaptation of the 'Grading of Recommendations Assessment, Development and Evaluation (GRADE) toolbox' developed by the international GRADE working group http://www.gradeworkinggroup.org/
Criteria for quantitative synthesis (where suitable)	For details please see section 6.4 of Developing NICE guidelines: the manual
Methods for analysis – combining studies and exploring (in)consistency	For a full description of methods see Supplement 1.
Meta-bias assessment – publication bias, selective reporting bias	For details please see section 6.2 of Developing NICE guidelines: the manual.
Assessment of confidence in cumulative evidence	For details please see sections 6.4 and 9.1 of Developing NICE guidelines: the manual
Rationale/context – Current management	For details please see the introduction to the evidence review.

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 Dr David Jewell 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 a full description of methods see Supplement 1.
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	The protocol has not been registered in PROSPERO

CDSR: Cochrane Database of Systematic Reviews; CCRCT: 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 EED: NHS Economic Evaluation Database; RCT: randomised controlled trial

Appendix B – Literature search strategies

Literature search strategies for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

Clinical search

The search for this topic was last run on 17th December 2019.

Database: Emcare, Embase, Medline, Medline Ahead of Print and In-Process & Other Non-Indexed Citations – OVID [Multifile]

#	Search
1	perinatal period/ or exp postnatal care/
2	1 use emczd, emcr
3	postpartum period/ or peripartum period/ or postnatal care/
4	3 use ppez
5	(((first time or new) adj mother*) or nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) adj2 birth*)).ti,ab.
6	or/2,4-5
7	postpartum hemorrhage/ use emczd, emcr
8	(bleed* or blood loss or haemorrhag* or hemorrhag* or plasma volume loss or pph or pv loss).ti,ab.
9	or/7-8
10	6 and 9
11	checklist/ or clinical assessment tool/ or differential diagnosis/ or mass screening/ or medical assessment/ or nursing assessment/ or pain assessment/ or pain measurement/ or patient assessment/ or "prediction and forecasting"/ or risk assessment/ or screening test/ or "sensitivity and specificity"/
12	11 use emczd, emcr
13	checklist/ or diagnosis, differential/ or forecasting/ or mass screening/ or nursing assessment/ or pain measurement/ or risk assessment/ or exp "sensitivity and specificity"/
14	13 use ppez
15	(clinical observation or (physical adj2 exam*) or (tak* adj2 clinical histor*)).ti,ab.
16	"signs and symptoms"/ or exp vital signs/ or blood pressure determination/ or syncope/
17	16 use ppez
18	vital sign/ or exp faintness/
19	18 use emczd, emcr
20	(faint* or lighthead* or light head* or syncope or vital sign*).ti,ab.
21	((pad*1 adj3 (clot* or discarded or number* or observation* or rubbish* or thrown away*)) or (pass* adj2 clot**)).ti,ab.
22	((assess* or identif* or observation* or predict* or reassess* or recogni*) adj4 (bleed* or blood loss or haemorrhage* or hemorrhage* or plasma volume loss or pph or pv loss or (sign* or symptom* or ((arterial or blood or pulse) adj pressure) or body temperature or consciousness or fundus or ((heart or respiratory) adj rate) or ((injur* or lacerat*) adj2 (birth canal or genital tract* or placenta)) or (hardness adj2 uterus) or laboratory test or (oxygen adj2 saturation) or (placenta adj2 (completeness or examination*)) or (shock

#	Search
	adj2 (index or indicator)) or urine output or uterine contraction* or vital sign*) or (chart* or checklist* or device* or evaluation or indicator* or instrument* or inventory or measure* or questionnaire* or scale or scales or score or scores or test or tests or tool or tools))).ti,ab.
23	((chart* or checklist* or device* or evaluation or indicator* or instrument* or inventory or measure* or questionnaire* or scale or scales or score or scores or test or tests or tool or tools) adj4 (bleed* or blood loss or haemorrhag* or hemorrhag* or plasma volume loss or pph or pv loss)).ti,ab.
24	((sign* or symptom* or ((arterial or blood or pulse) adj pressure) or body temperature or consciousness or fundus or ((heart or respiratory) adj rate) or ((injur* or lacerat*) adj2 (birth canal or genital tract* or placenta)) or (hardness adj2 uterus) or laboratory test or (oxygen adj2 saturation) or (placenta adj2 (completeness or examination*)) or (shock adj2 (index or indicator)) or urine output or uterine contraction* or vital sign*) adj4 (bleed* or blood loss or haemorrhage* or hemorrhage* or plasma volume loss or pph or pv loss or (chart* or checklist* or device* or evaluation or indicator* or instrument* or inventory or measure* or questionnaire* or scale or scales or score or scores or test or tests or tool or tools))).ti,ab.
25	(early adj (diagnos* or sign* or symptom*) adj6 (bleed* or blood loss or haemorrhag* or hemorrhag* or plasma volume loss or pph or pv loss)).ti,ab.
26	((((daily or frequenc* or number *) adj2 observation*) or (assess* adj2 (cervix or perineum or uterin* or uterus or vagina*))) and (bleed* or blood loss or haemorrhag* or hemorrhag* or plasma volume loss or pph or pv loss)).ti,ab.
27	(vital sign* and (assess* or identif* or observation* or predict* or reassess* or recogni*)).ti,ab.
28	(vital sign* and (chart* or checklist* or device* or evaluation or indicator* or instrument* or inventor*or measure*or questionnaire* or scale* or score* or test* or tool)).ti,ab.
29	((or/12,14-15) and (or/17,19-21)) or (or/22-28)
30	communication/ or computer communication networks/ or consumer health information/ or health education/ or health promotion/ or information dissemination/ or information seeking behaviour/ or internet/ or pamphlets/ or exp patient education as topic/ or posters as topic/ or publications/ or government publications as topic/
31	30 use ppez
32	access to information/ or consumer health information/ or health education/ or health promotion/ or information dissemination/ or information seeking/ or information service/ or internet/ or medical information/ or patient education/ or patient information/ or information/ or publication/
33	32 use emczd, emcr
34	((advice or communicat* or educat* or information or (app* or booklet* or brochure* or dvd or handout* or hand out* or ict or internet* or leaflet* or manual* or media or online* or pamphlet* or phone or publication* or telephone or website* or web site* or web page* or webpage* or web based or written or video*)) adj3 (sign* or symptom* or ((arterial or blood or pulse) adj pressure) or body temperature or consciousness or fundus or ((heart or respiratory) adj rate) or ((injur* or lacerat*) adj2 (birth canal or genital tract* or placenta)) or (hardness adj2 uterus) or laboratory test or (oxygen adj2 saturation) or (placenta adj2 (completeness or examination*)) or (shock adj2 (index or indicator)) or urine output or uterine contraction* or vital sign*) adj4 (bleed* or blood loss or haemorrhag* or hemorrhag* or plasma volume loss or pph or pv loss)).ti,ab.
35	((midwife or midwive* or mother* or parent* or user* or woman or women or worker*) adj3 educat*).ti. or ((midwife or midwive* or mother* or parent* or user* or woman or women or worker*) adj3 educat*).ab. /freq=2
36	((midwife or midwive* or mother* or parent* or user* or woman or women or worker*) adj3 (advice or informat*)).ti,ab.

#	Search
37	((app* or booklet* or brochure* or dvd* or handout* or ict or internet* or leaflet* or manual* or media or online* or pamphlet* or phone or publication* or telephone or video* or web based or web page* or web site* or webpage* or website* or written) adj5 (informat* or educat*)).ti,ab.
38	((midwife or midwive* or mother* or parent* or user* or woman or women or worker*) adj5 (app* or booklet* or brochure* or dvd* or handout* or ict or internet* or leaflet* or manual* or media or online* or pamphlet* or phone or publication* or telephone or video* or web based or web page* or web site* or webpage* or website* or written)).ti,ab.
39	(informat* adj3 (access* or dissem* or model* or need* or program* or provision or requir* or seek* or shar*)).ti,ab.
40	(informat* adj3 (provid* or provision)).ti.
41	((informat* or advice) adj3 (provision or provid*)).ab. and informat*.ab. /freq=2
42	(informat* adj3 (accurat* or barrier* or benefi* or clear* or facilita* or help* or hinder* or hindran* or practical* or support*)).ti,ab.
43	(informat* adj3 (content* or method* or quality or type*)).ti,ab.
44	((added or additional or extra or further) adj3 informat*).ti,ab.
45	((prompt* or time* or timing or when) adj3 informat*).ti,ab.
46	((gave or give* or giving or receive*) adj3 (advice or informat*)).ti,ab.
47	(informat* adj3 (contact* or emergency care or hospital* or red flag* or resource* or service*)).ti,ab.
48	patient education handout.pt.
49	(patient care planning/ or critical pathway/ or clinical protocols/) and information*.ti,ab.
50	49 use ppez
51	(informat* adj3 (care plan* or pathway* or protocol*)).ti,ab.
52	communication barriers/ use ppez
53	((communicat* or language*) adj3 (barrier* or facilitat*)).ti,ab.
54	(communicat* adj3 (bad* or difficult* effect* or encourag* or good or help* or ineffect* or in-effect* or poor* or prevent* or unhelp* or un help*)).ti,ab.
55	(communicat* adj3 (initiat* or time* or timing*)).ti,ab.
56	translating/ use ppez or "translating (language)"/ use emczd, emcr
57	(translat* adj7 (communicat* or informat* or language*)).ti,ab.
58	((midwife or midwive* or mother* or parent* or user* or woman or women or worker*) adj3 (advice or informat*)).ab.
59	health information.tw.
60	*patient care planning/ or *clinical pathway/ or *clinical protocols/
61	60 use emczd, emcr
62	patient care planning/ or critical pathway/ or clinical protocols/
63	62 use ppez
64	informat*.ti,ab.
65	(or/61,63) and 64
66	informat*.ti. or ((advice* or information* or support*) adj5 (selfcare* or self care or selfmanag* or self manag* or selfinstruct* or self instruct* or selfmonitor* or self monitor*)).ti,ab.
67	(or/31,33-48,50-59) or (or/65-66)
68	10 and 29 and 67
69	meta analysis/ or "meta analysis (topic)"/ or systematic review/

#	Search
70	69 use emczd, emcr
71	meta analysis.sh,pt. or "meta-analysis as topic"/ or "review literature as topic"/
72	71 use ppez
73	(exp bibliographic database/ or (((electronic or computer* or online) adj database*) or bids or cochrane or embase or index medicus or isi citation or medline or psyclit or psychlit or scisearch or science citation or (web adj2 science)).ti,ab.) and (review*.ti,ab,sh,pt. or systematic*.ti,ab.)
74	73 use emczd, emcr
75	(exp databases, bibliographic/ or (((electronic or computer* or online) adj database*) or bids or cochrane or embase or index medicus or isi citation or medline or psyclit or psychlit or scisearch or science citation or (web adj2 science)).ti,ab.) and (review*.ti,ab,sh,pt. or systematic*.ti,ab.)
76	75 use ppez
77	((analy* or assessment* or evidence* or methodol* or quantativ* or systematic*) adj2 (overview* or review*)).tw. or ((analy* or assessment* or evidence* or methodol* or quantativ* or systematic*).ti. and review*.ti,pt.) or (systematic* adj2 search*).ti,ab.
78	(metaanal* or meta anal*).ti,ab.
79	(research adj (review* or integration)).ti,ab.
80	reference list*.ab.
81	bibliograph*.ab.
82	published studies.ab.
83	relevant journals.ab.
84	selection criteria.ab.
85	(data adj (extraction or synthesis)).ab.
86	(handsearch* or ((hand or manual) adj search*)).ti,ab.
87	(mantel haenszel or peto or dersimonian or der simonian).ti,ab.
88	(fixed effect* or random effect*).ti,ab.
89	((pool* or combined or combining) adj2 (data or trials or studies or results)).ti,ab.
90	or/70,72,74,76-89
91	exp "clinical trial (topic)"/ or exp clinical trial/ or crossover procedure/ or double blind procedure/ or placebo/ or randomization/ or random sample/ or single blind procedure/
92	91 use emczd, emcr
93	exp clinical trial/ or exp "clinical trials as topic"/ or cross-over studies/ or double-blind method/ or placebos/ or random allocation/ or single-blind method/
94	93 use ppez
95	(clinical adj2 trial*).ti,ab.
96	(crossover or cross over).ti,ab.
97	(((single* or doubl* or trebl* or tripl*) adj2 blind*) or mask* or dummy or doubleblind* or singleblind* or trebleblind* or tripleblind*).ti,ab.
98	(placebo* or random*).ti,ab.
99	or/92,94-98
100	exp case control study/ or cohort analysis/ or cross-sectional study/ or follow up/ or longitudinal study/ or observational study/ or prospective study/ or retrospective study/
101	100 use emczd, emcr
102	exp case control studies/ or exp cohort studies/ or cross-sectional studies/ or epidemiologic studies/ or observational study/

#	Search
103	102 use ppez
104	(cohort*1 or cross section* or crosssection* or followup* or follow up* or followed or longitudinal* or prospective* or retrospective*).ti,ab.
105	(case adj2 (control or series)).ti,ab.
106	or/101,103-105
107	or/90,99,106
108	10 and 29 and 107
109	or/68,108
110	animals/ not human*.mp. use emczd, emcr
111	animal*/ not human*/ use ppez
112	or/110-111
113	109 not 112
114	limit 113 to english language
115	limit 114 to yr="2000 -current"

Database: CDSR, CCRCT [Wiley]

#	Search
#1	mesh descriptor: [postpartum period] this term only
#2	mesh descriptor: [peripartum period] this term only
#3	mesh descriptor: [postnatal care] this term only
#4	((((“first time” or new) near/1 mother*) or nullipara* or "peri natal*" or perinatal* or postbirth or "post birth" or postdelivery or "post delivery" or postnatal* or "post natal*" or postpartum* or "post partum*" or primipara* or puerpera* or puerperium* or ((after or follow*) near/2 birth*))):ti,ab,kw
#5	#1 or #2 or #3 or #4
#6	mesh descriptor: [postpartum hemorrhage] this term only
#7	((bleed* or "blood loss" or haemorrhag* or hemorrhag* or "plasma volume loss" or pph or "pv loss")):ti
#8	((bleed* or "blood loss" or haemorrhag* or hemorrhag* or "plasma volume loss" or pph or "pv loss")):ab
#9	#6 or #7 or #8
#10	#5 and #9
#11	mesh descriptor: [checklist] explode all trees
#12	mesh descriptor: [diagnosis, differential] this term only
#13	mesh descriptor: [sensitivity and specificity] explode all trees
#14	mesh descriptor: [mass screening] this term only
#15	mesh descriptor: [nursing assessment] this term only
#16	mesh descriptor: [physical examination] this term only
#17	mesh descriptor: [risk assessment] this term only
#18	((“clinical observation” or (physical near/2 exam*) or (take near/2 “clinical histor*”))):ti,ab,kw
#19	#11 or #12 or #13 or #14 or #15 or #16 or #17 or #18
#20	mesh descriptor: [signs and symptoms] this term only
#21	mesh descriptor: [vital signs] this term only
#22	mesh descriptor: [blood pressure determination] this term only

#	Search
#23	mesh descriptor: [syncope] this term only
#24	((faint* or lighthead* or “light head*” or syncope or “vital sign*”)):ti,ab,kw
#25	(((pad* near/3 (clot* or discarded or number* or observation* or rubbish* or “thrown away*”)) or (pass* near/2 clot**))):ti,ab,kw
#26	#20 or #21 or #22 or #23 or #24 or #25
#27	#19 and #26
#28	(((assess* or identif* or observation* or predict* or reassess* or recogni*) near/4 (bleed* or “blood loss” or haemorrhag* or hemorrhag* or “plasma volume loss” or pph or pv loss or (sign* or symptom* or ((arterial or blood or pulse) near/1 pressure) or “body temperature” or consciousness or fundus or ((heart or respiratory) near/1 rate) or ((injur* or lacerat*) near/2 (“birth canal” or “genital tract*” or placenta)) or (hardness near/2 uterus) or “laboratory test” or (oxygen near/2 saturation) or (placenta near/2 (completeness or examination*)) or (shock near/2 (index or indicator)) or “urine output” or “uterine contraction*” or “vital sign*”) or (chart* or checklist* or device* or evaluation or indicator* or instrument* or inventory or measure* or questionnaire* or scale or scales or score or scores or test or tests or tool or tools)))):ti,ab,kw
#29	(((chart* or checklist* or device* or evaluation or indicator* or instrument* or inventory or measure* or questionnaire* or scale or scales or score or scores or test or tests or tool or tools) near/4 (bleed* or blood loss or haemorrhage* or hemorrhage* or plasma volume loss or pph or “pv loss”))):ti,ab,kw
#30	(((sign* or symptom* or ((arterial or blood or pulse) near/1 pressure) or “body temperature” or consciousness or fundus or ((heart or respiratory) near/1 rate) or ((injur* or lacerat*) near/2 (“birth canal” or “genital tract*” or placenta)) or (hardness near/2 uterus) or “laboratory test” or (oxygen near/2 saturation) or (placenta near/2 (completeness or examination*)) or (shock near/2 (index or indicator)) or “urine output” or “uterine contraction*” or “vital sign*”) near/4 (bleed* or “blood loss” or haemorrhag* or hemorrhag* or “plasma volume loss” or pph or “pv loss” or (chart* or checklist* or device* or evaluation or indicator* or instrument* or inventory or measure* or questionnaire* or scale or scales or score or scores or test or tests or tool or tools)))):ti,ab,kw
#31	((early near/1 (diagnos* or sign* or symptom*) near/6 (bleed* or blood loss or haemorrhage* or hemorrhage* or “plasma volume loss” or pph or pv loss))):ti,ab,kw
#32	(((((daily or frequenc* or number *) near/2 observation*) or (assess* near/2 (cervix or perineum or uterin* or uterus or vagina*))) and (bleed* or “blood loss” or haemorrhage* or hemorrhage* or “plasma volume loss” or pph or “pv loss”))):ti,ab,kw
#33	((“vital sign*” and (assess* or identif* or observation* or predict* or reassess* or recogni*))):ti,ab,kw
#34	((“vital sign*” and (chart* or checklist* or device* or evaluation or indicator* or instrument* or inventor*or measure* or questionnaire* or scale* or score* or test* or tool))):ti,ab,kw
#35	#27 or #28 or #29 or #30 or #31 or #32 or #33 or #34
#36	#10 and #35
#37	#36 with cochrane library publication date between jan 2000 and dec 2019

Database: DARE, HTA (global) [CRD Web]

#	Search
1	mesh descriptor postpartum period in dare,hta
2	mesh descriptor peripartum period in dare,hta
3	mesh descriptor postnatal care in dare,hta
4	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or

#	Search
	primipara* or puerpera* or puerperium* or ((after or follow*) near2 birth*)) in dare, hta
5	#1 or #2 or #3 or #4
6	mesh descriptor breast feeding explode all trees in dare,hta
7	mesh descriptor lactation in dare,hta
8	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing next (baby or infant* or mother* or neonate* or newborn*))) in dare, hta
9	#6 or #7 or #8
10	mesh descriptor bottle feeding in dare,hta
11	mesh descriptor infant formula in dare,hta
12	(((bottle or formula or synthetic) near2 (artificial or fed or feed* or infant* or milk*)) or (artificial next (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk near2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) next supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) next (formula* or milk)) or formulafeed or formulated or (milk near2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) next bottle*) or infant feeding or bottle nipple* or milk pump*)) in dare, hta
13	#10 or #11 or #12
14	#5 or #9 or #13

Health economic search

The search for this topic was last run on 5th December 2019.

Database: Emcare, Embase, Medline, Medline Ahead of Print and In-Process & Other Non-Indexed Citations (global) – OVID [Multifile]

#	Search
1	puerperium/ or perinatal period/ or postnatal care/
2	1 use emczd, emcr
3	postpartum period/ or peripartum period/ or postnatal care/
4	3 use ppez
5	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) adj2 birth*)).ti,ab.
6	or/2,4-5
7	breast feeding/ or breast feeding education/ or lactation/
8	7 use emczd, emcr
9	exp breast feeding/ or lactation/
10	9 use ppez
11	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing adj (baby or infant* or mother* or neonate* or newborn*))).ti,ab.
12	or/8,10-11
13	artificial food/ or bottle feeding/ or infant feeding/
14	13 use emczd, emcr
15	bottle feeding/ or infant formula/

#	Search
16	15 use ppez
17	(((bottle or formula or synthetic) adj2 (artificial or fed or feed* or infant* or milk*)) or (artificial adj (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk adj2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) adj supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) adj (formula* or milk)) or formulafeed or formulated or (milk adj2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) adj bottle*) or infant feeding or bottle nipple* or milk pump*)).ti,ab.
18	or/14,16-17
19	or/6,12,18
20	budget/ or exp economic evaluation/ or exp fee/ or funding/ or exp health care cost/ or health economics/
21	20 use emczd, emcr
22	exp budgets/ or exp "costs and cost analysis"/ or economics/ or exp economics, hospital/ or exp economics, medical/ or economics, nursing/ or economics, pharmaceutical/ or exp "fees and charges"/ or value of life/
23	22 use ppez
24	budget*.ti,ab. or cost*.ti. or (economic* or pharmaco?economic*).ti. or (price* or pricing*).ti,ab. or (cost* adj2 (effective* or utilit* or benefit* or minimi* or unit* or estimat* or variable*)).ab. or (financ* or fee or fees).ti,ab. or (value adj2 (money or monetary)).ti,ab.
25	or/21,23-24
26	economic model/ or quality adjusted life year/ or "quality of life index"/
27	(cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.)
28	((quality of life or qol).tw. and cost benefit analysis.sh.)
29	or/26-28 use emczd, emcr
30	models, economic/ or quality-adjusted life years/
31	(cost-benefit analysis.sh. and (cost-effectiveness ratio* and (perspective* or life expectanc*)).tw.)
32	((quality of life or qol).tw. and cost-benefit analysis.sh.)
33	or/30-32 use ppez
34	(eq-5d* or eq5d* or eq-5* or eq5* or euroqual* or euro qual* or euroqual 5d* or euro qual 5d* or euro qol* or euroqol*or euro quol* or euroquol* or euro quol5d* or euroquol5d* or eur qol* or eurqol* or eur qol5d* or eurqol5d* or eur?qul* or eur?qul5d* or euro* quality of life or european qol).tw.
35	(euro* adj3 (5 d* or 5d* or 5 dimension* or 5dimension* or 5 domain* or 5domain*)).tw.
36	(hui or hui2 or hui3).tw.
37	(illness state* or health state*).tw.
38	(multiattibute* or multi attribute*).tw.
39	(qaly* or qal or qald* or qale* or qtime* or qwb* or daly).tw.
40	(quality adjusted or quality adjusted life year*).tw.
41	(sf36 or sf 36 or sf thirty six or sf thirtysix).tw.
42	sickness impact profile.sh.
43	(time trade off*1 or time tradeoff*1 or tto or timetradeoff*1).tw.

#	Search
44	(utilit* adj3 (score*1 or valu* or health* or cost* or measur* or disease* or mean or gain or gains or index*)).tw.
45	utilities.tw.
46	((qol or hrqol or quality of life).tw. or *quality of life/) and ((qol or hrqol* or quality of life) adj2 (change*1 or declin* or decreas* or deteriorat* or effect or effects or high* or impact*1 or impacted or improve* or increas* or low* or reduc* or score or scores or worse)).ab.
47	quality of life.sh. and ((health-related quality of life or (health adj3 status) or ((quality of life or qol) adj3 (chang* or improv*)) or ((quality of life or qol) adj (measure*1 or score*1))).tw. or (quality of life or qol).ti. or ec.fs.)
48	or/29,33-47
49	or/25,48
50	19 and 50
51	limit 50 to english language
52	(animals/ not humans/) or exp animals, laboratory/ or exp animal experimentation/ or exp models, animal/ or exp rodentia/
53	52 use ppez
54	(animal/ not human/) or nonhuman/ or exp animal experiment/ or exp experimental animal/ or animal model/ or exp rodent/
55	54 use emczd, emcr
56	(rat or rats or mouse or mice).ti.
57	or/53,55-56
58	51 not 57

Database: HTA, NHS EED (global) [CRD Web]

#	Search
1	mesh descriptor postpartum period in hta, nhs eed
2	mesh descriptor peripartum period in hta, nhs eed
3	mesh descriptor postnatal care in hta, nhs eed
4	(nullipara* or peri natal* or perinatal* or postbirth or post birth or postdelivery or post delivery or postnatal* or post natal* or postpartum* or post partum* or primipara* or puerpera* or puerperium* or ((after or follow*) near2 birth*)) in hta, nhs eed
5	#1 or #2 or #3 or #4
6	mesh descriptor breast feeding explode all trees in hta, nhs eed
7	mesh descriptor lactation in hta, nhs eed
8	(breastfeed* or breast feed* or breastfed* or breastfeed* or breast fed or breastmilk or breast milk or expressed milk* or lactat* or (nursing next (baby or infant* or mother* or neonate* or newborn*))) in hta, nhs eed
9	#6 or #7 or #8
10	mesh descriptor bottle feeding in hta, nhs eed
11	mesh descriptor infant formula in hta, nhs eed
12	(((bottle or formula or synthetic) near2 (artificial or fed or feed* or infant* or milk*)) or (artificial next (formula or milk)) or bottlefed or bottlefeed or cup feeding or (milk near2 (substitut* or supplement*)) or ((infant or milk or water or glucose or dextrose or formula) next supplement) or formula supplement* or supplement feed or milk feed or ((baby or babies or infant* or neonate* or newborn*) next (formula* or milk)) or formula feed or formulated or (milk near2 powder*) or hydrolyzed formula* or (((feeding or baby or infant) next bottle*) or infant feeding or bottle nipple* or milk pump*)) in hta, nhs eed
13	#10 or #11 or #12

#	Search
14	#5 or #9 or #13

Appendix C – Clinical evidence study selection

Clinical study selection for: How should early signs and symptoms of postpartum haemorrhage be assessed?

Figure 1: Study selection flow chart for RCT database

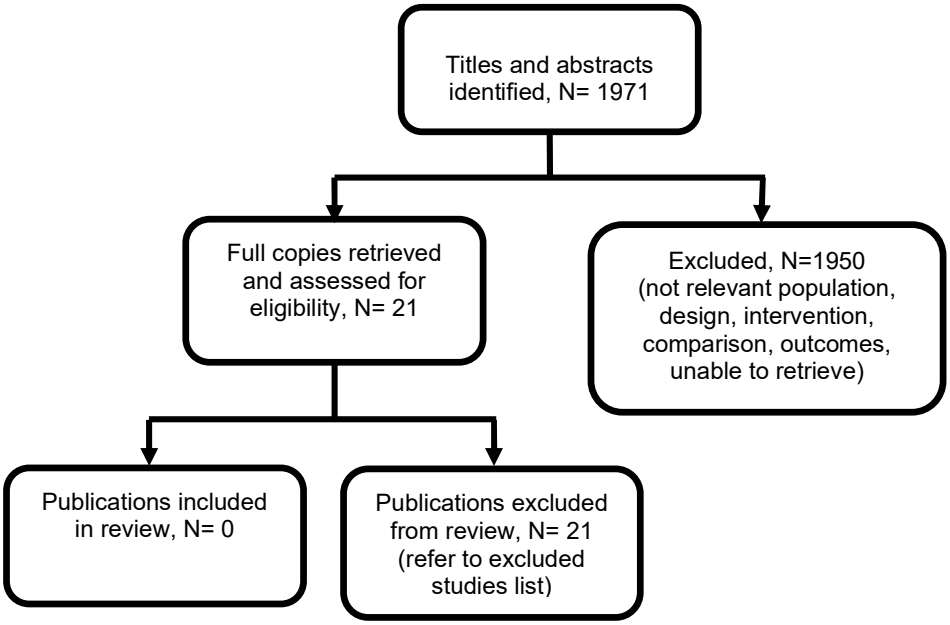
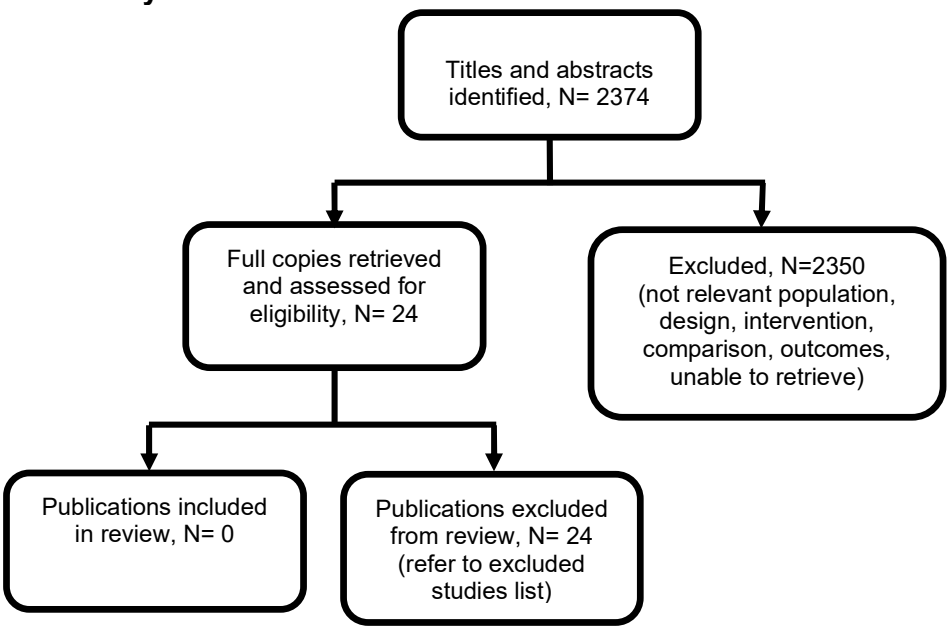


Figure 2: Study selection flow chart for non-RCT database



Appendix D – Clinical evidence tables

Clinical evidence tables for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

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

Appendix E – Forest plots

Forest plots for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

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

Appendix F – GRADE tables

GRADE tables for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

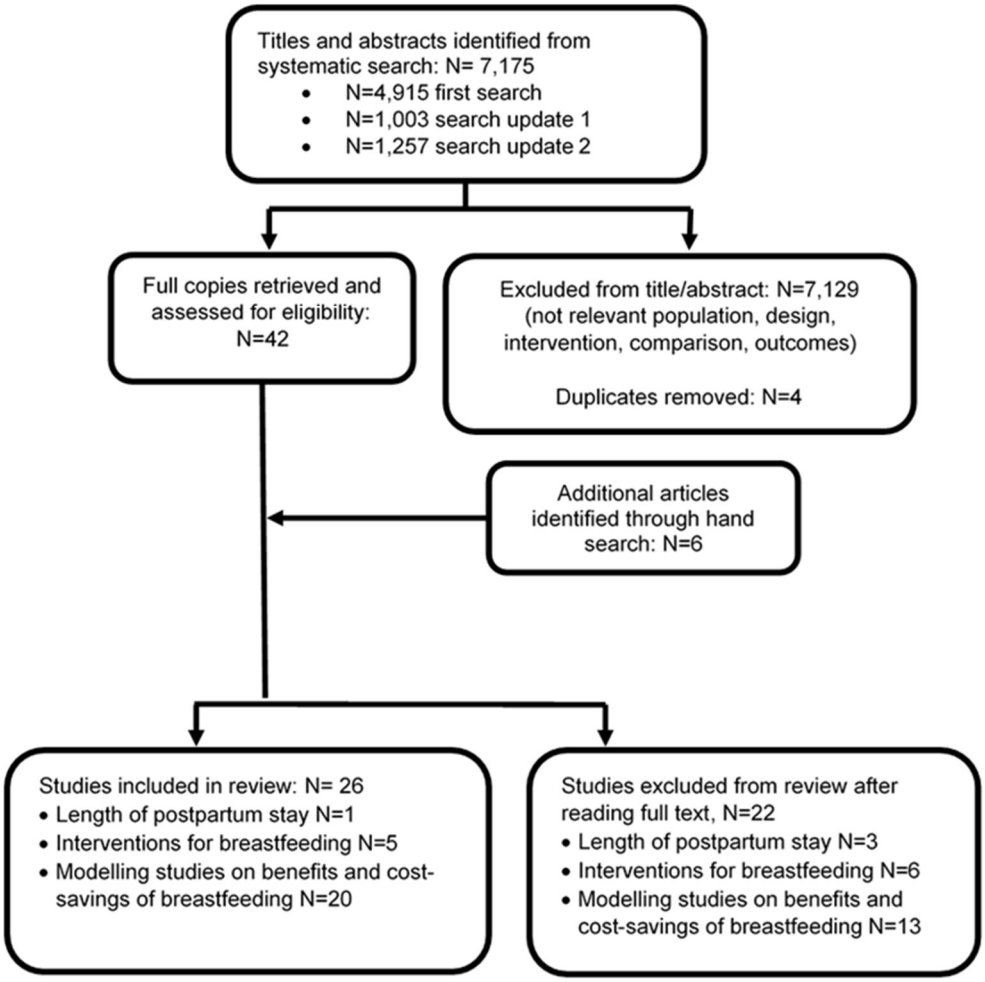
No evidence was identified which was applicable to this review question.

Appendix G – Economic evidence study selection

Economic evidence study selection for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

A global health economics search was undertaken for all areas covered in the guideline. Figure 3 shows the flow diagram of the selection process for economic evaluations of postnatal care interventions, including modelling studies on the benefits and cost-savings of breastfeeding.

Figure 3. Flow diagram of selection process for economic evaluations of postnatal care interventions and modelling studies on the benefits and cost-savings of breastfeeding



Appendix H – Economic evidence tables

Economic evidence tables for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

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

Appendix I – Economic evidence profiles

Economic evidence profiles for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

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

Appendix J – Economic analysis

Economic analysis for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

No economic analysis was conducted for this review question.

Appendix K – Excluded studies

Excluded clinical and economic studies for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

Clinical studies

Table 3: Excluded studies and reasons for their exclusion (RCT database)

Study	Reason for exclusion
Al Wattar, B. H., Tamblyn, J. A., Parry-Smith, W., Prior, M., Van Der Nelson, H., Management of obstetric postpartum hemorrhage: a national service evaluation of current practice in the UK, Risk management and healthcare policy, 10, 2017	No relevant comparison.
Anonymous,, Blair Bell Research Society Competition Meeting, BJOG: An International Journal of Obstetrics and Gynaecology, Conference, Blair Bell Research Society Competition Meeting. Manchester United Kingdom. Conference Start: 20081215. Conference End: 20081216. Conference Publication: (var.pagings). 116 (10) (no pagination), 2009	Conference abstracts.
Cho, H. Y., Na, S., Kim, M. D., Park, I., Kim, H. O., Kim, Y. H., Park, Y. W., Chun, J. H., Jang, S. Y., Chung, H. K., Chung, D., Jung, I., Kwon, J. Y., Implementation of a multidisciplinary clinical pathway for the management of postpartum hemorrhage: a retrospective study, International Journal for Quality in Health Care, 27, 459-65, 2015	No relevant intervention.
Daly, N., Summerhill, N., Shortall, E., O'Coigligh, S., "That was then, this is now." the effect of introduction of an early warning score system: A retrospective cohort study of maternal morbidity at our lady of lourdes hospital, Drogheda, Irish Journal of Medical Science, 180, S122, 2011	Conference abstract.
de Visser, S. M., Woiski, M. D., Grol, R. P., Vandenbussche, Fpha, Hulscher, Mejl, Scheepers, H. C. J., Hermens, Rpmg, Development of a tailored strategy to improve postpartum hemorrhage guideline adherence, BMC Pregnancy & ChildbirthBMC Pregnancy Childbirth, 18, 49, 2018	No relevant comparison.
Dilla, A. J., Waters, J. H., Yazer, M. H., Clinical validation of risk stratification criteria for peripartum hemorrhage, Obstetrics and Gynecology, 122, 120-126, 2013	No relevant intervention. This study is about risk stratification to predict peripartum haemorrhage rather than about assessment of early signs and symptoms of secondary postpartum haemorrhage.
Gayat,E., Resche-Rigon,M., Morel,O., Rossignol,M., Mantz,J., Nicolas-Robin,A., Nathan-Denizot,N., Lefrant,J.Y., Mercier,F.J., Samain,E., Fargeaudou,Y., Barranger,E., Laisne,M.J., Brechat,P.H., Luton,D.,	No relevant comparison.

Study	Reason for exclusion
Ouanounou,I., Plaza,P.A., Broche,C., Payen,D., Mebazaa,A., Predictive factors of advanced interventional procedures in a multicentre severe postpartum haemorrhage study, Intensive Care Medicine, 37, 1816-1825, 2011	
Girard, T., Mortl, M., Schlembach, D., New approaches to obstetric hemorrhage: The postpartum hemorrhage consensus algorithm, Current Opinion in Anaesthesiology, 27, 267-274, 2014	This paper presents an algorithm to manage postpartum haemorrhage. This algorithm was developed based on the consensus of a group of experts.
Kasai, M., Aoki, S., Ogawa, M., Kurasawa, K., Takahashi, T., Hirahara, F., Prediction of perinatal outcomes based on primary symptoms in women with placental abruption, Journal of Obstetrics & Gynaecology Research, 41, 850-6, 2015	No relevant comparison.
Liang, J. H., Luo, R. L., Wang, D. F., Analysis on neonate prognosis and postpartum hemorrhage in labor and after laber by C-sect, Modern journal of integrated traditional chinese and western medicine [xian dai zhong xi yi jie he za zhi], 17, 38, 2008	Not in English language.
Main, E. K., Cape, V., Abreo, A., Vasher, J., Woods, A., Carpenter, A., Gould, J. B., Reduction of severe maternal morbidity from hemorrhage using a state perinatal quality collaborative, American Journal of Obstetrics & Gynecology, 216, 298.e1-298.e11, 2017	No relevant intervention.
Marchant, S., Alexander, J., Garcia, J., Postnatal vaginal bleeding problems and general practice, Midwifery, 18, 21-24, 2002	No relevant intervention.
McHugh, D., Garry, N., McAuliffe, F., Higgins, M., Educational interventions to teach recognition and management of post partum haemorrhage: A systematic review, Irish Journal of Medical Science, 185, S205, 2016	Conference abstract.
Mei, Y., Lin, Y., Clinical significance of primary symptoms in women with placental abruption.[Erratum appears in J Matern Fetal Neonatal Med. 2018 Nov;31(21):2932; PMID: 28756712], Journal of Maternal-Fetal & Neonatal Medicine, 31, 2446-2449, 2018	No relevant comparison. The study was conducted in China, however the present review only focuses on high-income countries.
Nadisauskiene, R. J., Kliucinskas, M., Dobozinskas, P., Kacerauskiene, J., The impact of postpartum haemorrhage management guidelines implemented in clinical practice: a systematic review of the literature, European Journal of Obstetrics, Gynecology, & Reproductive Biology, 178, 21-6, 2014	Included studies conducted in high-income countries were assessed for inclusion in the present review. A study by Althabe (2008) was deemed not relevant based on the abstract and therefore no full-text copy was requested. The following studies were excluded after checking a full-text copy: Audureau 2009, Rizvi 2004, Shields 2011, Skupski 2006. Please see relevant rows in the next table for exclusion reasons.
Pendry, K., Delivering quickly: Does it make a difference? Do major haemorrhage protocols work?, Transfusion Medicine, 23, 23, 2013	Conference abstract.

Study	Reason for exclusion
Plough, A. C., Galvin, G., Li, Z., Lipsitz, S. R., Alidina, S., Henrich, N. J., Hirschhorn, L. R., Berry, W. R., Gawande, A. A., Peter, D., et al.,, Relationship between Labor and Delivery Unit Management Practices and Maternal Outcomes, Obstetrics and Gynecology, 130, 358â 365, 2017	No relevant intervention.
Prata,N., Gerdts,C., Measurement of postpartum blood loss, BMJ, 340, 274-, 2010	Editorial.
Reynen, E., Grabell, J., Ellis, A. K., James, P., Let's Talk Period! Preliminary results of an online bleeding awareness knowledge translation project and bleeding assessment tool promoted on social media, Haemophilia, 23, e282-e286, 2017	No relevant comparison.
Woiski, M. D., Belfroid, E., Liefers, J., Grol, R. P., Scheepers, H. C., Hermens, R. P., Influencing factors for high quality care on postpartum haemorrhage in the Netherlands: Patient and professional perspectives, BMC Pregnancy and Childbirth, 15 (1) (no pagination), 2015	No relevant study design. Qualitative study and survey.
Yonemoto, N., Dowswell, T., Nagai, S., Mori, R., Schedules for home visits in the early postpartum period, Cochrane Database of Systematic Reviews, 8, CD009326, 2017	This review focused on the frequency of home visits but it did not focus specifically on the frequency of observations of early signs and symptoms of postpartum haemorrhage. One of the outcomes was secondary postpartum haemorrhage but the only included studies reporting this outcome were from Syria, and the present review only focuses on high-income countries.

Table 4: Excluded studies and reasons for their exclusion (non-RCT database)

Study	Reason for exclusion
Audureau, E., Deneux-Tharaux, C., Lefevre, P., Brucato, S., Morello, R., Dreyfus, M., Bouvier-Colle, M. H., Practices for prevention, diagnosis and management of postpartum haemorrhage: impact of a regional multifaceted intervention, BJOG: An International Journal of Obstetrics & Gynaecology, 116, 1325-33, 2009	No relevant intervention.
Austin, D. M., Sadler, L., McLintock, C., McArthur, C., Masson, V., Farquhar, C., Rhodes, S., Early detection of severe maternal morbidity: a retrospective assessment of the role of an Early Warning Score System, Australian & New Zealand Journal of Obstetrics & Gynaecology, 54, 152-5, 2014	No relevant study design.
Eppes, C. S., Lundeen, S., Bland, M., Darden, M., Preston, D., Bivens, L. S., The effect of a maternal early warning system on adverse obstetrical events, American Journal of Obstetrics and Gynecology, 216 (1 Supplement 1), S472, 2017	Conference abstract.

Study	Reason for exclusion
Etuk, S. J., Asuquo, E. E., Effects of community and health facility interventions on postpartum hemorrhage, International Journal of Gynaecology & Obstetrics, 70, 381-3, 2000	No relevant study setting (Nigeria). No relevant intervention.
Galloway, S., Mary, N., The NHS Lothian PPH risk assessment tool: Is it effective in its current form?, BJOG: An International Journal of Obstetrics and Gynaecology, 124 (Supplement 2), 72, 2017	Conference abstract.
Kohn, J. R., Dildy, G. A., Eppes, C. S., Shock index and delta-shock index are superior to existing maternal early warning criteria to identify postpartum hemorrhage and need for intervention, Journal of Maternal-Fetal and Neonatal Medicine, 1-7, 2018	This study does not specify whether it focuses on primary or secondary postpartum haemorrhage. The focus seems to be primary postpartum haemorrhage because observations were performed at last antenatal visit prior to admission, upon facility admission, immediately prior to delivery, and at the peak shock index during hospitalisation.
Marchant,S., Alexander,J., Thomas,P., Garcia,J., Brocklehurst,P., Keene,J., Risk factors for hospital admission related to excessive and/or prolonged postpartum vaginal blood loss after the first 24 h following childbirth, Paediatric and Perinatal Epidemiology, #20, 392-402, 2006	No relevant intervention.
Mathai,M., Gulmezoglu,A.M., Hill,S., Saving women's lives: Evidence-based recommendations for the prevention of postpartum haemorrhage, Bulletin of the World Health Organization, 85, 322-323, 2007	Literature review / discussion paper.
Matijevic,R., Knezevic,M., Grgic,O., Zlodi-Hrsak,L., Diagnostic accuracy of sonographic and clinical parameters in the prediction of retained products of conception, Journal of Ultrasound in Medicine, 28, 295-299, 2009	No relevant intervention.
Precious, E. M., Alikhan, R., Lilley, G., Astr, B. St L., Rayment, R., Collis, R., Collins, P. W., A prospective study to evaluate early clauss fibrinogen and fibtem as predictors of progression of major obstetric haemorrhage, Journal of Thrombosis and Haemostasis, 11, 425, 2013	Conference abstract.
Rizvi, F., Mackey, R., Barrett, T., McKenna, P., Geary, M., Successful reduction of massive postpartum haemorrhage by use of guidelines and staff education, BJOG: An International Journal of Obstetrics and Gynaecology, 111, 495-498, 2004	No relevant intervention. This paper focuses on primary postpartum haemorrhage.
Saxena, S., Chevalier, J., Postpartum haemorrhage-a multidisciplinary approach to management with risk stratification, Anaesthesia, 70, 17, 2015	Conference abstract.
Shaamash, A. H., Ahmed, A. G. M., Abdel Latef, M. M., Abdullah, S. A., Routine postpartum ultrasonography in the prediction of puerperal	No relevant intervention.

Study	Reason for exclusion
uterine complications, International Journal of Gynecology and Obstetrics, 98, 93-99, 2007	
Shalev, J., Royburt, M., Fite, G., Mashiach, R., Schoenfeld, A., Bar, J., Ben-Rafael, Z., Meizner, I., Sonographic evaluation of the puerperal uterus: Correlation with manual examination, Gynecologic and Obstetric Investigation, 53, 38-41, 2002	No relevant intervention.
Shields LE1, Smalarz K, Reffigee L, Mugg S, Burdumy TJ, Propst M., Comprehensive maternal hemorrhage protocols improve patient safety and reduce utilization of blood products., Am J Obstet Gynecol., 205, e1-8 , 2011	No relevant intervention.
Shields, L. E., Wiesner, S., Fulton, J., Pelletreau, B., Comprehensive maternal hemorrhage protocols reduce the use of blood products and improve patient safety, American Journal of Obstetrics & GynecologyAm J Obstet Gynecol, 212, 272-80, 2015	No relevant intervention.
Skupski DW1, Lowenwirt IP, Weinbaum FI, Brodsky D, Danek M, Eglinton GS., Improving hospital systems for the care of women with major obstetric hemorrhage, Obstet Gynecol., 107, 977-83, 2006	No relevant intervention.
Suplee, P. D., Bingham, D., Kleppel, L., Nurses' Knowledge and Teaching of Possible Postpartum Complications, Mcn, The American journal of maternal child nursing. 42, 338-344, 2017	No relevant comparison.
Suplee, P. D., Kleppel, L., Santa-Donato, A., Bingham, D., Improving Postpartum Education About Warning Signs Of Maternal Morbidity and Mortality, Nursing for women's health, 20, 552-567, 2016	No relevant study design. Descriptive study and survey.
Upadhyay, K., Scholefield, H., Risk management and medicolegal issues related to postpartum haemorrhage, Best Practice & Research in Clinical Obstetrics & GynaecologyBest Pract Res Clin Obstet Gynaecol, 22, 1149-69, 2008	Literature review / discussion paper.
Vendittelli,, Barasinski, C., Legrand, A., Lemery, D., Does the quality of postpartum hemorrhage protocols (PPH) improve its identification and management?, International Journal of Gynecology and Obstetrics, 143 (Supplement 3), 236-237, 2018	Conference abstract.
Weeks, A. D., Secondary prevention: A new era for postpartum haemorrhage?, BJOG: An International Journal of Obstetrics and Gynaecology, 123, 128, 2016	Discussion paper.
Woiski, M. D., van Vugt, H. C., Dijkman, A., Grol, R. P., Marcus, A., Middeldorp, J. M., Mol, B. W., Mols, F., Oudijk, M. A., Porath, M., Scheepers, H. J., Hermens, R. P., From Postpartum Haemorrhage Guideline to Local	No relevant study design.

Study	Reason for exclusion
Protocol: A Study of Protocol Quality, Maternal and child health journal, 20, 2160-2168, 2016	
Wu, E., Jolley, J. A., Hargrove, B. A., Caughey, A. B., Chung, J. H., Implementation of an obstetric hemorrhage risk assessment: Validation and evaluation of its impact on pretransfusion testing and hemorrhage outcomes, Journal of Maternal-Fetal and Neonatal Medicine, 28, 71-76, 2015	The risk assessment tool was applied at the time of admission for labour and birth.

Economic studies

No economic evidence was identified for this review.

Appendix L – Research recommendations

Research recommendations for review question: How should early signs and symptoms of postpartum haemorrhage be assessed?

No research recommendations were made for this review question.