National Institute for Health and Care Excellence

Final

Intrapartum care for women with existing medical conditions or obstetric complications and their babies

[N] Evidence review for intrapartum haemorrhage

NICE guideline NG121

Evidence reviews for women at high risk of adverse outcomes for themselves and/or their baby because of obstetric complications or other reasons

March 2019

Final

Developed by the National Guideline Alliance hosted by the Royal College of Obstetricians and Gynaecologists

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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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Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

Review question

What is the optimal management for intrapartum haemorrhage?

Introduction

The aim of this review is to determine the optimal management for intrapartum haemorrhage.

Summary of the protocol

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

Table 1: Summary of the protocol (PICO table)

Population	Women with intrapartum haemorrhage. Women with bleeding disorders and those on anti-coagulant therapy will be excluded (they are covered by reviews in the part of the guideline that focuses on women at high risk of adverse outcomes for themselves and/or their baby because of existing maternal medical conditions)
Intervention	Intervention 1 Making a decision on expediting birth based on 1 or more risk factors or intervention thresholds identified by the following observations: • history • heart rate • temperature • respiratory rate • oxygen saturation • urine output • AVPU (‘alert, voice, pain, unresponsive’) • blood pressure • pain (presence/absence or validated pain scale) • amount of bleeding • how the woman is feeling (for example, faint) Intervention 2 Expediting the birth by caesarean section

	Intervention 3 Amniotomy Intervention 4 Oxytocin Intervention 5 Amniotomy plus oxytocin
Comparison	Comparison 1 Making a decision on expediting birth based on different risk factors or intervention thresholds identified by the same observations as in the intervention group: • history • heart rate • temperature • respiratory rate • oxygen saturation • urine output • AVPU ('alert, voice, pain, unresponsive') • blood pressure • pain (presence/ absence or validated pain scales) • amount of bleeding • how the woman is feeling (for example faint) Comparison 2: Expediting the birth by instrumental vaginal birth Comparison 3: No amniotomy Comparison 4: No oxytocin Comparison 5: Amniotomy only, oxytocin only or neither

Outcome	For the woman:
	• major morbidities
	  ○ shock, collapse or need for resuscitation
	  ○ disseminated intravascular coagulation
	  ○ renal failure
	  ○ postnatal haemoglobin level
	  ○ major or severe primary intrapartum haemorrhage (defined as blood loss >1000 ml)
	  ○ postpartum haemorrhage, including secondary postpartum haemorrhage
	• mortality
	• woman's experience of labour and birth, including experience of the birth companion, separation of the woman and baby and breastfeeding initiation

	• mode of birth • further interventions such as additional uterotonics, surgery, brace suture, intrauterine balloon, cell salvage, hysterectomy, major blood vessel ligation, interventional radiology, or transfusion of blood products For the baby: • major morbidities (hypoxic ischaemic encephalopathy (HIE), cerebral palsy/neurodevelopmental disability/developmental delay, or neonatal anaemia) • intrapartum stillbirth

AVPU: Alert, Voice, Pain, Unresponsive

For further details see the full review protocol in Appendix A – Review protocol. The search strategies are presented in Appendix B – Literature search strategies.

Clinical evidence

Included studies

No clinical evidence was identified for this review.

See the study selection flow chart in Appendix C – Clinical evidence study selection.

Excluded studies

Studies not included in this review with reasons for their exclusion are listed in Appendix D.

Summary of clinical studies included in the evidence review

No clinical evidence was identified for this review (and so there are no evidence tables in Appendix E – Clinical evidence tables). No meta-analysis was undertaken for this review (and so there are no forest plots in Appendix F – Forest plots).

Quality assessment of clinical studies included in the evidence review

No clinical evidence was identified for this review (and so no quality assessment was undertaken and there are no GRADE tables in Appendix G – GRADE tables).

Economic evidence

Included studies

No economic evidence was identified for this review.

See the study selection flow chart in Supplement 2 (Health economics).

Excluded studies

No full-text copies of articles were requested for this review and so there is no excluded studies list (see Supplement 2 (Health economics)).

Summary of studies included in the economic evidence review

No economic evidence was identified for this review (and so there are no economic evidence tables in Supplement 2 (Health economics)).

Economic model

No economic modelling was undertaken for this review because the committee agreed that other topics were higher priorities for economic evaluation (see Supplement 2 (Health economics)).

Evidence statements

No clinical evidence was identified for this review.

The committee's discussion of the evidence

Interpreting the evidence

The outcomes that matter most

The committee prioritised major maternal morbidities as critical outcomes, including shock, collapse or need for resuscitation, disseminated intravascular coagulation, renal failure, postnatal haemoglobin level, major or severe primary intrapartum haemorrhage (defined as blood loss >1000 ml), and postpartum haemorrhage, including secondary postpartum haemorrhage. These morbidities have a considerable impact on clinical outcomes as well as the woman's experience of labour and birth, and on costs. The committee also prioritised major morbidities in the baby as critical outcomes, including hypoxic ischaemic encephalopathy (HIE), cerebral palsy, neurodevelopmental disability or developmental delay, and neonatal anaemia. These morbidities affect the rest of the baby's life. The committee prioritised intrapartum stillbirth as a critical outcome because this is the most serious and worst possible outcome for the baby and for the woman's experience. The committee rated maternal mortality as an important rather than critical outcome because it occurs less frequently than maternal morbidity. The committee rated the woman's experience of labour and birth, including experience of her birth companion(s), separation of the woman and baby, and breastfeeding initiation, as an important outcome because interventions for intrapartum haemorrhage can have a considerable impact on birth experience and on future birth choices. Moreover, some interventions can result in separation of the woman and baby, which can impact negatively on breastfeeding and perinatal mental health. The committee rated mode of birth as an important outcome because if different interventions can affect mode of birth, women need to be able to make an informed choice.

The quality of the evidence

No clinical evidence was identified for this review.

Benefits and harms

The committee agreed that where intrapartum haemorrhage has occurred, an initial assessment for shock would be the greatest priority and resuscitation should be conducted immediately.

The committee deemed accurate assessment of the volume of blood loss to be critical. If severe haemorrhage has occurred then there is risk of

inadequate blood flow to the woman's vital organs and to the baby. The woman might have had an internal haemorrhage, and monitoring of vital signs would be needed as the volume of visible blood loss might not give the full picture. The committee agreed, therefore, that any blood loss other than a show (a bloodstained mucus plug) should be considered high risk and prompt transfer to obstetric-led care in line with the NICE guideline on intrapartum care for healthy women and babies (CG190).

The committee agreed that the woman herself can provide information relevant to the situation. For example, the woman may inform a healthcare professional if the blood loss was sudden or in relation to a specific event. Without this discussion the woman may not feel listened to, and there is the possibility that healthcare professionals might miss an opportunity to gain valuable information about the cause or progression of blood loss.

The assessments needed for a woman with intrapartum haemorrhage involve taking a history, assessing the volume of blood loss, carrying out a physical examination, starting continuous cardiotocography and taking a blood sample to determine full blood count and blood group. The possible causes of bleeding should be considered while recognising that often there will be no discernible cause.

The committee discussed that the care plan for an individual woman would depend on the outcome of the recommended assessments, and that the plan might need to be revised in light of ongoing assessments. The committee identified the essential members of an expanded multidisciplinary team needed to care for a woman in labour with vaginal blood loss other than a show as a senior obstetrician, a senior obstetric anaesthetist, a senior midwife, and a labour ward coordinator (who, by definition, would be senior). By senior obstetrician or senior obstetric anaesthetist, the committee meant an obstetrician or obstetric anaesthetist with appropriate experience. For example, a clinician with more than 5 years of specialty (obstetrics or anaesthetic) training and experience.

The committee agreed that if a woman in labour is experiencing vaginal blood loss other than a show, a multidisciplinary care plan should be agreed (and revised if needed) with the woman. This would ensure that her preferences are taken into account when determining management. Additionally, the committee agreed that it was essential to talk with the woman and her birth companion(s) throughout care to explain what is happening and what may happen. The committee agreed that these recommendations reflected a woman-centred approach to care.

The committee agreed that management for a woman with intrapartum bleeding whose condition is stable should include establishing venous access, maternal monitoring as specified elsewhere in the guideline, and monitoring the fetal heart rate using continuous cardiotocography.

If intrapartum bleeding leads to a large blood loss or if the woman's condition causes concern, intravenous fluids should be given urgently, blood should be taken for full blood count, cross-matching, and advice should be sought from a more experienced healthcare professional. Some or all of the following supplementary management options should also be implemented according to the circumstances: triggering the local major haemorrhage protocol (this would be appropriate only if there was very large blood loss); taking blood for clotting studies (if there are clinical concerns regarding the woman's coagulation status) and blood gases (if there are clinical concerns regarding the woman's oxygenation); use of amniotomy (only if the membranes are still intact) or oxytocin (the clinician would want to think about the woman's contractions before administering oxytocin – they would

want to avoid hyper-stimulation of the uterus); and expediting the birth (the clinician might not want to expedite the birth if, for example, the labour is preterm).

The committee discussed that the recommendations were listed sequentially, although in practice many of the assessments would occur simultaneously. The committee acknowledged that the need to establish venous access was relatively low down the list of recommendations because of the sequence of actions that should take place; however, it was deemed that in clinical practice this would happen while talking to the woman, and making other assessments.

The committee did not want potentially serious blood loss to be overlooked. Any bleeding should, therefore, be considered to be abnormal unless it is confirmed.to be a show. Characteristics of the blood lost are important in helping to identify a potential show or other blood loss (for example, colour and presence of clots, and whether the woman is in pain). Nevertheless, the committee felt it was important to note that some women will have a vaginal bleed and yet they will not need any intervention. The committee recommended, therefore, that if a woman in labour has a vaginal blood loss typical of a show then management should be in line with the NICE guideline on intrapartum care for healthy women and babies (CG190).

Cost effectiveness and resource use

The committee noted that the major maternal morbidities associated with intrapartum haemorrhage have important cost implications in addition to their impact on clinical outcomes. Therefore, they considered that their recommendations would mitigate the risk of these outcomes and thus be cost effective.

The committee considered that good communication with the woman would promote cost effective management as the woman would often be able to provide valuable information on the cause or progression of blood loss. Similarly the committee noted that the recommended assessments would be relatively inexpensive to undertake but could provide important information that would help to prevent costly adverse outcomes for the woman and the baby.

The committee considered that their recommendations largely reflected current practice and therefore they did not anticipate a significant impact on NHS resources.

Other factors the committee took into account

The committee used the recommendations in the NICE guideline on intrapartum care for healthy women and babies (CG190) to help develop their recommendations. In particular, the committee discussed how intrapartum haemorrhage could occur in any care setting and that maternity and ambulance services should, therefore, have strategies in place to respond quickly and appropriately as recommended in the NICE guideline on intrapartum care for healthy women and babies (CG190) in the case of postpartum haemorrhage.

References

No publications (other than publications that are freely available on the Internet) were cited in the review(s) in this document and so there is no reference list.

Appendices

Appendix A – Review protocol

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

Item	Details	Working notes
Area in the scope	Women at high risk of adverse outcomes for themselves and/or their baby because of obstetric complications or other reasons – intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage	
Review question in the scope	What is the optimal management for intrapartum haemorrhage?	
Review question for the guideline	What is the optimal management for intrapartum haemorrhage?	
Objective	The aim of this review is to determine the optimal management for intrapartum haemorrhage. In developing the review protocol the committee was aware that in the UK there were 11 maternal deaths per 100,000 maternities due to haemorrhage between 2010 and 2012 (MBRRACE-UK 2014)	
Population and directness	Women with intrapartum haemorrhage (defined as haemorrhage occurring in the first or second stage of labour) Women with bleeding disorders and women on anti-coagulants will be excluded (they are covered by the medical stream). Studies in which up to 34% of the women have multiple pregnancy will be included. Evidence in which any of the women have multiple pregnancy should be downgraded for indirectness.	
Intervention	<u>Intervention 1</u> Making a decision on expediting birth based on 1 or more risk factors or intervention thresholds identified by the following observations: • history • heart rate • temperature • respiratory rate • oxygen saturation • urine output • AVPU (‘alert, voice, pain, unresponsive’) • blood pressure • pain (presence/absence or validated pain scale) • amount of bleeding	•

Item	Details	Working notes
	• how the woman is feeling (for example, faint) <u>Intervention 2</u> • Expediting the birth by caesarean section <u>Intervention 3</u> • Amniotomy <u>Intervention 4</u> • Oxytocin <u>Intervention 5</u> • Amniotomy plus oxytocin	
Comparison	<u>Comparison 1</u> Making a decision on expediting birth based on different risk factors or intervention thresholds identified by the same observations as in the intervention group: • history • heart rate • temperature • respiratory rate • oxygen saturation • urine output • AVPU ('alert, voice, pain, unresponsive') • blood pressure • pain (presence/ absence or validated pain scales) • amount of bleeding • how the woman is feeling (for example faint) <u>Comparison 2:</u> • Expediting the birth by instrumental vaginal birth <u>Comparison 3:</u> • No amniotomy <u>Comparison 4:</u> • No oxytocin <u>Comparison 5:</u> • Amniotomy only, oxytocin only or neither	
Outcomes	Critical outcomes: • for the woman: o major morbidities - shock/collapse/need for resuscitation - disseminated intravascular coagulation - renal failure - postnatal haemoglobin level	

Item	Details	Working notes
	- major or severe primary intrapartum haemorrhage (defined as blood loss >1000 ml) - postpartum haemorrhage, including secondary postpartum haemorrhage • for the baby: ○ major morbidities (hypoxic ischaemic encephalopathy (HIE), cerebral palsy/neurodevelopmental disability/developmental delay, or neonatal anaemia) ○ intrapartum stillbirth Important outcomes: • for the woman: ○ mortality ○ woman's experience of labour and birth, including experience of the birth companion, separation of the woman and baby and breastfeeding initiation ○ mode of birth (not relevant for comparison 2) Outcomes of limited importance: • for the woman: ○ further interventions such as additional uterotonics, surgery, brace suture, intrauterine balloon, cell salvage, hysterectomy, major blood vessel ligation, interventional radiology, or transfusion of blood products	
Importance of outcomes	Preliminary classification of the outcomes for decision making: • critical (up to 3 outcomes) • important but not critical (up to 3 outcomes) • of limited importance (1 outcome)	
Setting	Any birth setting	
Stratified, subgroup and adjusted analyses	Groups that will be reviewed and analysed separately: • causes of intrapartum haemorrhage: ○ placenta praevia ○ abruption ○ vasa praevia ○ unknown cause • antepartum anaemia • stage of labour • women who decline blood products In the presence of heterogeneity, the following subgroups will be considered for sensitivity analysis: • none Potential confounders: • age • body mass index • antepartum haemorrhage	

Item	Details	Working notes
Language	English	
Study design	• Published full text papers only • Systematic reviews • RCTs • Only if RCTs unavailable or there is limited data to inform decision making: ○ prospective or retrospective comparative observational studies (including cohort and case-control studies) • Prospective study designs will be prioritised over retrospective study designs • Conference abstracts will not be considered	
Search strategy	Sources to be searched: Medline, Medline In-Process, CCTR, CDSR, DARE, HTA and Embase. Limits (e.g. date, study design): All study designs. Apply standard animal/non-English language filters. No date limit. Supplementary search techniques: No supplementary search techniques were used. See Appendix B – Literature search strategies for full strategies	
Review strategy	Appraisal of methodological quality: • the methodological quality of each study will be assessed using checklists recommended in the NICE guidelines manual 2014 (for example, AMSTAR or ROBIS for systematic reviews, and Cochrane RoB tool for RCTs) and the quality of the evidence for each outcome (that is, across studies) will be assessed using GRADE • if studies report only p-values, this information will be recorded in GRADE tables without an assessment of imprecision Synthesis of data: • meta-analysis will be conducted where appropriate • default MIDs will be used; 0.8 and 1.25 for dichotomous outcomes; 0.5 times the SD of the measurement in the control arm (or median score across control arms if multiple studies are included) for continuous outcomes • for continuous data, change scores will be used in preference to final scores for data from non-RCT studies; final and change scores will not be pooled; if any study reports both, the method used in the majority of studies will be adopted	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 will be resolved through discussion between the first and second reviewers or by reference to a third person. This review question was not prioritised for health economic analysis and so no formal dual weeding, study selection (inclusion/exclusion) or data extraction into evidence tables will be undertaken. However, internal (NGA) quality assurance processes

Item	Details	Working notes
		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
Equalities	Equalities considerations will be considered systematically in relation to the available evidence and draft recommendations. The guideline scope includes women with cognitive or physical disability as populations for whom there may be equalities issues. Women who have received no antenatal care will be considered as a subgroup for all systematic reviews performed within the medical conditions work stream and a specific question has been included in the obstetric complications work stream for this population.	
Notes/additional information	None	
Key papers	• MBRRACE-UK: Saving Lives, Improving Mothers' Care, 2014 (https://www.npeu.ox.ac.uk/downloads/files/mbrrace-uk/reports/Saving%20Lives%20Improving%20Mothers%20Care%20report%202014%20Full.pdf)	

AMSTAR: Assessing the Methodological Quality of Systematic Reviews; CDSR: Cochrane Database of Systematic Reviews; CENTRAL: Cochrane Central Register of Controlled Trials; CTG: cardiotocography; DARE: Database of Abstracts of Reviews of Effects; FBS: fetal blood sampling; GRADE: Grading of Recommendations Assessment, Development and Evaluation; HTA: Health Technology Assessment; MID: minimally important difference; NGA: National Guideline Alliance; NICE: National Institute for Health and Care Excellence; NICU: neonatal intensive care unit; RCT: randomised controlled trial; RoB: risk of bias; SD: standard deviation; ROBIS: Risk of Bias in Systematic Reviews

Appendix B – Literature search strategies

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

Database: Medline; Medline EPub Ahead of Print; and Medline In-Process & Other Non-Indexed Citations

#	Searches
1	PERIPARTUM PERIOD/
2	PARTURITION/
3	LABOR, OBSTETRIC/
4	UTERINE CONTRACTION/
5	LABOR ONSET/
6	LABOR STAGE, FIRST/
7	LABOR STAGE, SECOND/
8	OBSTETRIC LABOR, PREMATURE/
9	DELIVERY, OBSTETRIC/
10	(labo?r or partur$ or intra?part$ or peri?part$).ti,ab.
11	or/1-10
12	HEMORRHAGE/
13	SHOCK, HEMORRHAGIC/
14	UTERINE HEMORRHAGE/
15	or/12-14
16	11 and 15
17	(intra?part$ adj5 (h?emorrhag$ or bleed$)).ti,ab.
18	((labo?r or partur$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
19	or/16-18
20	expedi?t$.ti,ab.
21	(deliver$ adj1 immediat$).ti,ab.
22	DECISION MAKING/
23	((make? or making) adj3 decision?).ti,ab.
24	RISK ASSESSMENT/
25	(risk? adj3 (assess$ or stratif$ or screen$ or manag$)).ti,ab.
26	MEDICAL HISTORY TAKING/
27	(history adj3 (take or taking)).ti,ab.
28	(history adj3 (clinical or obstetric$)).ti,ab.
29	exp VITAL SIGNS/
30	Vital Sign?.ti,ab.
31	Heart Rate?.ti,ab.
32	Temperature?.ti,ab.

#	Searches
33	(Respirat$ adj3 rate?).ti,ab.
34	OXIMETRY/
35	oximetr$.ti,ab.
36	(oxygen adj3 saturat$).ti,ab.
37	(urin$ adj3 output?).ti,ab.
38	"alert voice pain unresponsive".ti,ab.
39	AVPU.ti,ab.
40	((Blood or systolic or diastolic) adj3 pressure?).ti,ab.
41	PAIN/
42	ACUTE PAIN/
43	CHRONIC PAIN/
44	Pain$.ti,ab.
45	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj5 Blood adj3 (loss or losing)).ti,ab.
46	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj3 Bleed$).ti,ab.
47	(wom?n? adj3 feel$).ti,ab.
48	SYNCOPE/
49	syncope.ti,ab.
50	(fainting or fainted).ti,ab.
51	(feel$ adj3 faint$).ti,ab.
52	(light headed$ or lightheaded$).ti,ab.
53	or/20-52
54	exp CESAREAN SECTION/
55	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
56	or/54-55
57	exp EXTRACTION, OBSTETRICAL/
58	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).ti,ab.
59	(vacuum$ adj3 extract$).ti,ab.
60	ventouse?.ti,ab.
61	OBSTETRICAL FORCEPS/
62	forcep?.ti,ab.
63	((assist$ or instrument$) adj3 (birth$ or born or deliver$)).ti,ab.
64	or/57-63
65	*DELIVERY, OBSTETRIC/mt [Methods]
66	(mode? adj3 birth?).ti,ab.
67	((route? or mode?) adj3 deliver$).ti,ab.
68	or/65-67
69	AMNION/su [Surgery]

#	Searches
70	Amniotom$.ti,ab.
71	(artificial$ adj3 ruptur$ adj3 membrane?).ti,ab.
72	AROM.ti,ab.
73	or/69-72
74	OXYTOCIN/
75	(Oxytocin? or Pitocin? or syntocinon?).mp.
76	or/74-75
77	UK Obstetric Surveillance System.ti,ab.
78	UKOSS.ti,ab.
79	"Mothers and babies? reducing risk through audits and confidential enquiries across the UK".ti,ab.
80	MBRRACE.ti,ab.
81	Scottish confidential audit of severe maternal morbidity.ti,ab.
82	SCASMM.ti,ab.
83	"Confidential Enquiry into Maternal and Child Health".ti,ab.
84	CEMACH.ti,ab.
85	or/77-84
86	*HEMORRHAGE/pc [Prevention & Control]
87	((labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$) adj10 (guideline? or protocol? or pathway? or care plan$)).ti,ab.
88	(manag$ adj3 (labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
89	19 and 53
90	19 and 56 and 64
91	19 and 68
92	19 and 73
93	19 and 76
94	19 and 85
95	11 and 86
96	or/87-95
97	limit 96 to english language
98	LETTER/
99	EDITORIAL/
100	NEWS/
101	exp HISTORICAL ARTICLE/
102	ANECDOTES AS TOPIC/
103	COMMENT/
104	CASE REPORT/
105	(letter or comment*).ti.
106	or/98-105
107	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.

#	Searches
108	106 not 107
109	ANIMALS/ not HUMANS/
110	exp ANIMALS, LABORATORY/
111	exp ANIMAL EXPERIMENTATION/
112	exp MODELS, ANIMAL/
113	exp RODENTIA/
114	(rat or rats or mouse or mice).ti.
115	or/108-114
116	97 not 115

Database: Cochrane Central Register of Controlled Trials

#	Searches
1	PERIPARTUM PERIOD/
2	PARTURITION/
3	LABOR, OBSTETRIC/
4	UTERINE CONTRACTION/
5	LABOR ONSET/
6	LABOR STAGE, FIRST/
7	LABOR STAGE, SECOND/
8	OBSTETRIC LABOR, PREMATURE/
9	DELIVERY, OBSTETRIC/
10	(labo?r or partur$ or intra?part$ or peri?part$).ti,ab.
11	or/1-10
12	HEMORRHAGE/
13	SHOCK, HEMORRHAGIC/
14	UTERINE HEMORRHAGE/
15	or/12-14
16	11 and 15
17	(intra?part$ adj5 (h?emorrhag$ or bleed$)).ti,ab.
18	((labo?r or partur$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
19	or/16-18
20	expedi?t$.ti,ab.
21	(deliver$ adj1 immediat$).ti,ab.
22	DECISION MAKING/
23	((make? or making) adj3 decision?).ti,ab.
24	RISK ASSESSMENT/
25	(risk? adj3 (assess$ or stratif$ or screen$ or manag$)).ti,ab.
26	MEDICAL HISTORY TAKING/
27	(history adj3 (take or taking)).ti,ab.
28	(history adj3 (clinical or obstetric$)).ti,ab.

#	Searches
29	exp VITAL SIGNS/
30	Vital Sign?.ti,ab,kw.
31	Heart Rate?.ti,ab,kw.
32	Temperature?.ti,ab.
33	(Respirat$ adj3 rate?).ti,ab.
34	OXIMETRY/
35	oximetr$.ti,ab,kw.
36	(oxygen adj3 saturat$).ti,ab.
37	(urin$ adj3 output?).ti,ab.
38	"alert voice pain unresponsive".ti,ab.
39	AVPU.ti,ab.
40	((Blood or systolic or diastolic) adj3 pressure?).ti,ab.
41	PAIN/
42	ACUTE PAIN/
43	CHRONIC PAIN/
44	Pain$.ti,ab.
45	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj5 Blood adj3 (loss or losing)).ti,ab.
46	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj3 Bleed$).ti,ab.
47	(wom?n? adj3 feel$).ti,ab.
48	SYNCOPE/
49	syncope.ti,ab,kw.
50	(fainting or fainted).ti,ab.
51	(feel$ adj3 faint$).ti,ab.
52	(light headed$ or lightheaded$).ti,ab.
53	or/20-52
54	exp CESAREAN SECTION/
55	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
56	or/54-55
57	exp EXTRACTION, OBSTETRICAL/
58	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).ti,ab.
59	(vacuum$ adj3 extract$).ti,ab.
60	ventouse?.ti,ab.
61	OBSTETRICAL FORCEPS/
62	forcep?.ti,ab,kw.
63	((assist$ or instrument$) adj3 (birth$ or born or deliver$)).ti,ab.
64	or/57-63
65	*DELIVERY, OBSTETRIC/mt [Methods]

#	Searches
66	(mode? adj3 birth?).ti,ab.
67	((route? or mode?) adj3 deliver$).ti,ab.
68	or/65-67
69	AMNION/su [Surgery]
70	Amniotom$.ti,ab,kw.
71	(artificial$ adj3 ruptur$ adj3 membrane?).ti,ab.
72	AROM.ti,ab.
73	or/69-72
74	OXYTOCIN/
75	(Oxytocin? or Pitocin? or syntocinon?).mp.
76	or/74-75
77	UK Obstetric Surveillance System.ti,ab.
78	UKOSS.ti,ab.
79	"Mothers and babies? reducing risk through audits and confidential enquiries across the UK".ti,ab.
80	MBRRACE.ti,ab.
81	Scottish confidential audit of severe maternal morbidity.ti,ab.
82	SCASMM.ti,ab.
83	"Confidential Enquiry into Maternal and Child Health".ti,ab.
84	CEMACH.ti,ab.
85	or/77-84
86	*HEMORRHAGE/pc [Prevention & Control]
87	((labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$) adj10 (guideline? or protocol? or pathway? or care plan$)).ti,ab.
88	(manag$ adj3 (labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
89	19 and 53
90	19 and 56 and 64
91	19 and 68
92	19 and 73
93	19 and 76
94	19 and 85
95	11 and 86
96	or/87-95

Database: Cochrane Database of Systematic Reviews

#	Searches
1	PERIPARTUM PERIOD.kw.
2	PARTURITION.kw.
3	LABOR, OBSTETRIC.kw.
4	UTERINE CONTRACTION.kw.

#	Searches
5	LABOR ONSET.kw.
6	LABOR STAGE, FIRST.kw.
7	LABOR STAGE, SECOND.kw.
8	OBSTETRIC LABOR, PREMATURE.kw.
9	DELIVERY, OBSTETRIC.kw.
10	(labo?r or partur$ or intra?part$ or peri?part$).ti,ab.
11	or/1-10
12	HEMORRHAGE.kw.
13	SHOCK, HEMORRHAGIC.kw.
14	UTERINE HEMORRHAGE.kw.
15	or/12-14
16	11 and 15
17	(intra?part$ adj5 (h?emorrhag$ or bleed$)).ti,ab.
18	((labo?r or partur$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
19	or/16-18
20	expedi?t$.ti,ab.
21	(deliver$ adj1 immediat$).ti,ab.
22	DECISION MAKING.kw.
23	((make? or making) adj3 decision?).ti,ab.
24	RISK ASSESSMENT.kw.
25	(risk? adj3 (assess$ or stratif$ or screen$ or manag$)).ti,ab.
26	MEDICAL HISTORY TAKING.kw.
27	(history adj3 (take or taking)).ti,ab.
28	(history adj3 (clinical or obstetric$)).ti,ab.
29	VITAL SIGNS.kw.
30	Vital Sign?.ti,ab.
31	Heart Rate?.ti,ab.
32	Temperature?.ti,ab.
33	(Respirat$ adj3 rate?).ti,ab.
34	OXIMETRY.kw.
35	oximetr$.ti,ab.
36	(oxygen adj3 saturat$).ti,ab.
37	(urin$ adj3 output?).ti,ab.
38	"alert voice pain unresponsive".ti,ab.
39	AVPU.ti,ab.
40	((Blood or systolic or diastolic) adj3 pressure?).ti,ab.
41	PAIN.kw.
42	ACUTE PAIN.kw.
43	CHRONIC PAIN.kw.
44	Pain$.ti,ab.

#	Searches
45	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj5 Blood adj3 (loss or losing)).ti,ab.
46	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj3 Bleed$).ti,ab.
47	(wom?n? adj3 feel$).ti,ab.
48	SYNCOPE.kw.
49	syncope.ti,ab.
50	(fainting or fainted).ti,ab.
51	(feel$ adj3 faint$).ti,ab.
52	(light headed$ or lightheaded$).ti,ab.
53	or/20-52
54	CESAREAN SECTION.kw.
55	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
56	or/54-55
57	EXTRACTION, OBSTETRICAL.kw.
58	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).ti,ab.
59	(vacuum$ adj3 extract$).ti,ab.
60	ventouse?.ti,ab.
61	OBSTETRICAL FORCEPS.kw.
62	forcep?.ti,ab.
63	((assist$ or instrument$) adj3 (birth$ or born or deliver$)).ti,ab.
64	or/57-63
65	(mode? adj3 birth?).ti,ab.
66	((route? or mode?) adj3 deliver$).ti,ab.
67	or/65-66
68	Amniotom$.ti,ab.
69	(artificial$ adj3 ruptur$ adj3 membrane?).ti,ab.
70	AROM.ti,ab.
71	or/68-70
72	OXYTOCIN.kw.
73	(Oxytocin? or Pitocin? or syntocinon?).mp.
74	or/72-73
75	UK Obstetric Surveillance System.ti,ab.
76	UKOSS.ti,ab.
77	"Mothers and babies? reducing risk through audits and confidential enquiries across the UK".ti,ab.
78	MBRRACE.ti,ab.
79	Scottish confidential audit of severe maternal morbidity.ti,ab.
80	SCASMM.ti,ab.

#	Searches
81	"Confidential Enquiry into Maternal and Child Health".ti,ab.
82	CEMACH.ti,ab.
83	or/75-82
84	((labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$) adj10 (guideline? or protocol? or pathway? or care plan$)).ti,ab.
85	(manag$ adj3 (labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
86	19 and 53
87	19 and 56 and 64
88	19 and 67
89	19 and 71
90	19 and 74
91	19 and 83
92	or/84-91

Database: Database of Abstracts of Reviews of Effects

#	Searches
1	PERIPARTUM PERIOD.kw.
2	PARTURITION.kw.
3	LABOR, OBSTETRIC.kw.
4	UTERINE CONTRACTION.kw.
5	LABOR ONSET.kw.
6	LABOR STAGE, FIRST.kw.
7	LABOR STAGE, SECOND.kw.
8	OBSTETRIC LABOR, PREMATURE.kw.
9	DELIVERY, OBSTETRIC.kw.
10	(labo?r or partur$ or intra?part$ or peri?part$).tw,tx.
11	or/1-10
12	HEMORRHAGE.kw.
13	SHOCK, HEMORRHAGIC.kw.
14	UTERINE HEMORRHAGE.kw.
15	or/12-14
16	11 and 15
17	(intra?part$ adj5 (h?emorrhag$ or bleed$)).tw,tx.
18	((labo?r or partur$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).tw,tx.
19	or/16-18
20	expedi?t$.tw,tx.
21	(deliver$ adj1 immediat$).tw,tx.
22	DECISION MAKING.kw.
23	((make? or making) adj3 decision?).tw,tx.

#	Searches
24	RISK ASSESSMENT.kw.
25	(risk? adj3 (assess$ or stratif$ or screen$ or manag$)).tw,tx.
26	MEDICAL HISTORY TAKING.kw.
27	(history adj3 (take or taking)).tw,tx.
28	(history adj3 (clinical or obstetric$)).tw,tx.
29	VITAL SIGNS.kw.
30	Vital Sign?.tw,tx.
31	Heart Rate?.tw,tx.
32	Temperature?.tw,tx.
33	(Respirat$ adj3 rate?).tw,tx.
34	OXIMETRY.kw.
35	oximetr$.tw,tx.
36	(oxygen adj3 saturat$).tw,tx.
37	(urin$ adj3 output?).tw,tx.
38	"alert voice pain unresponsive".tw,tx.
39	AVPU.tw,tx.
40	((Blood or systolic or diastolic) adj3 pressure?).tw,tx.
41	PAIN.kw.
42	ACUTE PAIN.kw.
43	CHRONIC PAIN.kw.
44	Pain$.tw,tx.
45	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj5 Blood adj3 (loss or losing)).tw,tx.
46	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj3 Bleed$).tw,tx.
47	(wom?n? adj3 feel$).tw,tx.
48	SYNCOPE.kw.
49	syncope.tw,tx.
50	(fainting or fainted).tw,tx.
51	(feel$ adj3 faint$).tw,tx.
52	(light headed$ or lightheaded$).tw,tx.
53	or/20-52
54	CESAREAN SECTION.kw.
55	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).tw,tx.
56	or/54-55
57	EXTRACTION, OBSTETRICAL.kw.
58	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).tw,tx.
59	(vacuum$ adj3 extract$).tw,tx.
60	ventouse?.tw,tx.

#	Searches
61	OBSTETRICAL FORCEPS.kw.
62	forcep?.tw,tx.
63	((assist$ or instrument$) adj3 (birth$ or born or deliver$)).tw,tx.
64	or/57-63
65	(mode? adj3 birth?).tw,tx.
66	((route? or mode?) adj3 deliver$).tw,tx.
67	or/65-66
68	Amniotom$.tw,tx.
69	(artificial$ adj3 ruptur$ adj3 membrane?).tw,tx.
70	AROM.tw,tx.
71	or/68-70
72	OXYTOCIN.kw.
73	(Oxytocin? or Pitocin? or syntocinon?).mp.
74	or/72-73
75	UK Obstetric Surveillance System.tw,tx.
76	UKOSS.tw,tx.
77	"Mothers and babies? reducing risk through audits and confidential enquiries across the UK".tw,tx.
78	MBRRACE.tw,tx.
79	Scottish confidential audit of severe maternal morbidity.tw,tx.
80	SCASMM.tw,tx.
81	"Confidential Enquiry into Maternal and Child Health".tw,tx.
82	CEMACH.tw,tx.
83	or/75-82
84	((labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$) adj10 (guideline? or protocol? or pathway? or care plan$)).tw,tx.
85	(manag$ adj3 (labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).tw,tx.
86	19 and 53
87	19 and 56 and 64
88	19 and 67
89	19 and 71
90	19 and 74
91	19 and 83
92	or/84-91

Database: Health Technology Assessment

#	Searches
1	PERIPARTUM PERIOD/
2	PARTURITION/
3	LABOR, OBSTETRIC/

#	Searches
4	UTERINE CONTRACTION/
5	LABOR ONSET/
6	LABOR STAGE, FIRST/
7	LABOR STAGE, SECOND/
8	OBSTETRIC LABOR, PREMATURE/
9	DELIVERY, OBSTETRIC/
10	(labo?r or partur$ or intra?part$ or peri?part$).tw.
11	or/1-10
12	HEMORRHAGE/
13	SHOCK, HEMORRHAGIC/
14	UTERINE HEMORRHAGE/
15	or/12-14
16	11 and 15
17	(intra?part$ adj5 (h?emorrhag$ or bleed$)).tw.
18	((labo?r or partur$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).tw.
19	or/16-18
20	expedi?t$.tw.
21	(deliver$ adj1 immediat$).tw.
22	DECISION MAKING/
23	((make? or making) adj3 decision?).tw.
24	RISK ASSESSMENT/
25	(risk? adj3 (assess$ or stratif$ or screen$ or manag$)).tw.
26	MEDICAL HISTORY TAKING/
27	(history adj3 (take or taking)).tw.
28	(history adj3 (clinical or obstetric$)).tw.
29	Vital Sign?.tw.
30	Heart Rate?.tw.
31	Temperature?.tw.
32	(Respirat$ adj3 rate?).tw.
33	OXIMETRY/
34	oximetr$.tw.
35	(oxygen adj3 saturat$).tw.
36	(urin$ adj3 output?).tw.
37	"alert voice pain unresponsive".tw.
38	AVPU.tw.
39	((Blood or systolic or diastolic) adj3 pressure?).tw.
40	PAIN/
41	ACUTE PAIN/
42	CHRONIC PAIN/
43	Pain$.tw.

#	Searches
44	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj5 Blood adj3 (loss or losing)).tw.
45	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj3 Bleed$).tw.
46	(wom?n? adj3 feel$).tw.
47	SYNCOPE/
48	syncope.tw.
49	(fainting or fainted).tw.
50	(feel$ adj3 faint$).tw.
51	(light headed$ or lightheaded$).tw.
52	or/20-51
53	exp CESAREAN SECTION/
54	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).tw.
55	or/53-54
56	exp EXTRACTION, OBSTETRICAL/
57	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).tw.
58	(vacuum$ adj3 extract$).tw.
59	ventouse?.tw.
60	OBSTETRICAL FORCEPS/
61	forcep?.tw.
62	((assist$ or instrument$) adj3 (birth$ or born or deliver$)).tw.
63	or/56-62
64	*DELIVERY, OBSTETRIC/mt [Methods]
65	(mode? adj3 birth?).tw.
66	((route? or mode?) adj3 deliver$).tw.
67	or/64-66
68	AMNION/su [Surgery]
69	Amniotom$.tw.
70	(artificial$ adj3 ruptur$ adj3 membrane?).tw.
71	AROM.tw.
72	or/68-71
73	OXYTOCIN/
74	(Oxytocin? or Pitocin? or syntocinon?).mp.
75	or/73-74
76	UK Obstetric Surveillance System.tw.
77	UKOSS.tw.
78	"Mothers and babies? reducing risk through audits and confidential enquiries across the UK".tw.
79	MBRRACE.tw.

#	Searches
80	Scottish confidential audit of severe maternal morbidity.tw.
81	SCASMM.tw.
82	"Confidential Enquiry into Maternal and Child Health".tw.
83	CEMACH.tw.
84	or/76-83
85	*HEMORRHAGE/pc [Prevention & Control]
86	((labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$) adj10 (guideline? or protocol? or pathway? or care plan$)).tw.
87	(manag$ adj3 (labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).tw.
88	19 and 52
89	19 and 55 and 63
90	19 and 67
91	19 and 72
92	19 and 75
93	19 and 84
94	11 and 85
95	or/86-94

Database: Embase

#	Searches
1	*BIRTH/
2	*LABOR/
3	*UTERUS CONTRACTION/
4	*LABOR ONSET/
5	LABOR STAGE 1/
6	LABOR STAGE 2/
7	*PREMATURE LABOR/
8	*OBSTETRIC DELIVERY/
9	INTRAPARTUM CARE/
10	(labo?r or partur$ or intra?part$ or peri?part$).ti,ab.
11	or/1-10
12	*BLEEDING/
13	*HEMORRHAGIC SHOCK/
14	*UTERUS BLEEDING/
15	or/12-14
16	11 and 15
17	INTRAPARTUM HEMORRHAGE/
18	(intra?part$ adj5 (h?emorrhag$ or bleed$)).ti,ab.
19	((labo?r or partur$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
20	or/16-19

#	Searches
21	expedi?t$.ti,ab.
22	(deliver$ adj1 immediat$).ti,ab.
23	*DECISION MAKING/
24	((make? or making) adj3 decision?).ti,ab.
25	*RISK ASSESSMENT/
26	(risk? adj3 (assess$ or stratif$ or screen$ or manag$)).ti,ab.
27	*ANAMNESIS/
28	(history adj3 (take or taking)).ti,ab.
29	(history adj3 (clinical or obstetric$)).ti,ab.
30	*VITAL SIGN/
31	*HEART RATE MEASUREMENT/
32	*BODY TEMPERATURE MEASUREMENT/
33	*BREATHING RATE/
34	Vital Sign?.ti,ab.
35	Heart Rate?.ti,ab.
36	Temperature?.ti,ab.
37	(Respirat$ adj3 rate?).ti,ab.
38	*OXIMETRY/
39	*OXYGEN SATURATION/
40	oximetr$.ti,ab.
41	(oxygen adj3 saturat$).ti,ab.
42	*URINE VOLUME/
43	(urin$ adj3 output?).ti,ab.
44	"alert voice pain unresponsive".ti,ab.
45	AVPU.ti,ab.
46	*BLOOD PRESSURE MEASUREMENT/
47	((Blood or systolic or diastolic) adj3 pressure?).ti,ab.
48	*PAIN/
49	*CHRONIC PAIN/
50	Pain$.ti.
51	Pain$.ab. /freq=2
52	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj5 Blood adj3 (loss or losing)).ti,ab.
53	((grade? or grading or severit$ or classif$ or index$ or indices or degree? or threshold? or define? or defining or criteri$ or cut off? or parameter? or below or minimal or low$ or decreas$ or abnormal$ or excessive$ or concern$) adj3 Bleed$).ti,ab.
54	(wom?n? adj3 feel$).ti,ab.
55	*FAINTNESS/
56	syncope.ti,ab.
57	(fainting or fainted).ti,ab.

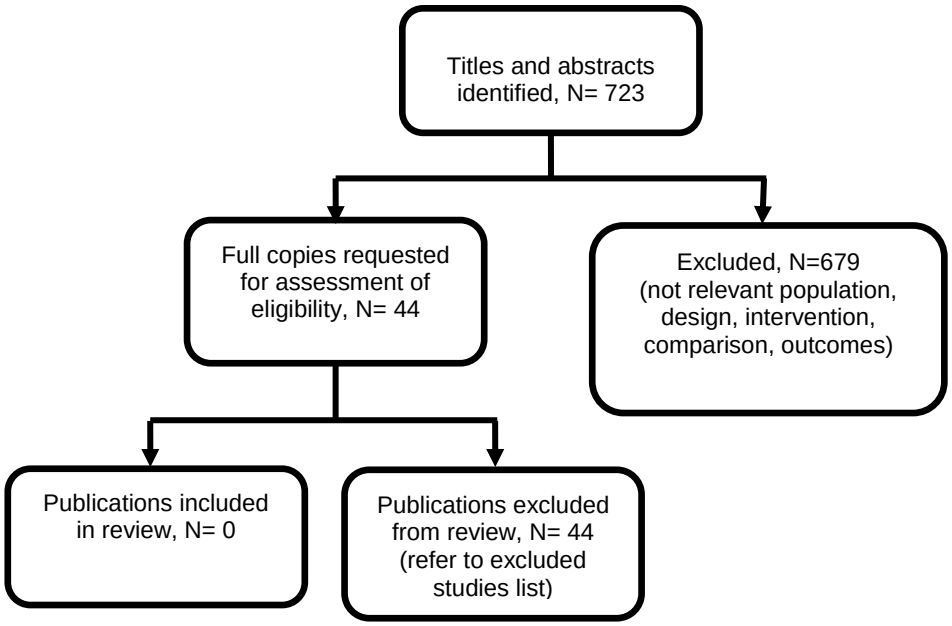
#	Searches
58	(feel$ adj3 faint$).ti,ab.
59	(light headed$ or lightheaded$).ti,ab.
60	or/21-59
61	exp CESAREAN SECTION/
62	(c?esar#an$ or c section$ or csection$ or (deliver$ adj3 abdom$)).ti,ab.
63	or/60-61
64	VACUUM EXTRACTION/
65	((extract$ or vacuum$) adj3 (birth$ or born or deliver$ or obstetric$)).ti,ab.
66	(vacuum$ adj3 extract$).ti,ab.
67	ventouse?.ti,ab.
68	FORCEPS DELIVERY/
69	OBSTETRICAL FORCEPS/
70	forcep?.ti,ab.
71	((assist$ or instrument$) adj3 (birth$ or born or deliver$)).ti,ab.
72	or/64-71
73	(mode? adj3 birth?).ti,ab.
74	((route? or mode?) adj3 deliver$).ti,ab.
75	or/73-74
76	AMNIOTOMY/
77	Amniotom$.ti,ab.
78	(artificial$ adj3 ruptur$ adj3 membrane?).ti,ab.
79	AROM.ti,ab.
80	or/76-79
81	OXYTOCIN/
82	(Oxytocin? or Pitocin? or syntocinon?).mp.
83	or/81-82
84	UK Obstetric Surveillance System.ti,ab.
85	UKOSS.ti,ab.
86	"Mothers and babies? reducing risk through audits and confidential enquiries across the UK".ti,ab.
87	MBRRACE.ti,ab.
88	Scottish confidential audit of severe maternal morbidity.ti,ab.
89	SCASMM.ti,ab.
90	"Confidential Enquiry into Maternal and Child Health".ti,ab.
91	CEMACH.ti,ab.
92	or/84-91
93	INTRAPARTUM HEMORRHAGE/pc [Prevention]
94	INTRAPARTUM HEMORRHAGE/th [Therapy]
95	((labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$) adj10 (guideline? or protocol? or pathway? or care plan$)).ti,ab.

#	Searches
96	(manag$ adj3 (labo?r or partur$ or intra?part$ or peri?part$) adj3 (h?emorrhag$ or bleed$)).ti,ab.
97	20 and 60
98	20 and 63 and 72
99	20 and 75
100	20 and 80
101	20 and 83
102	20 and 92
103	or/93-102
104	limit 103 to english language
105	letter.pt. or LETTER/
106	note.pt.
107	editorial.pt.
108	CASE REPORT/ or CASE STUDY/
109	(letter or comment*).ti.
110	or/105-109
111	RANDOMIZED CONTROLLED TRIAL/ or random*.ti,ab.
112	110 not 111
113	ANIMAL/ not HUMAN/
114	NONHUMAN/
115	exp ANIMAL EXPERIMENT/
116	exp EXPERIMENTAL ANIMAL/
117	ANIMAL MODEL/
118	exp RODENT/
119	(rat or rats or mouse or mice).ti.
120	or/112-119
121	104 not 120

Appendix C – Clinical evidence study selection

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

Figure 1: Flow diagram of clinical article selection for intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage



Appendix D – Excluded studies

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

Clinical studies

Study	Reason for exclusion
Alexander, J. M., Wortman, A. C., Intrapartum Hemorrhage, Obstetrics and Gynecology Clinics of North America, 40, 15-26, 2013	Narrative article about causes and management of intrapartum haemorrhage
Artymuk, N., Surina, M., Risk factors for postpartum haemorrhage in high-risk obstetric hospital, Journal of Perinatal Medicine, 41, 2013	Conference abstract
Baird, Emily J., Identification and Management of Obstetric Hemorrhage, Anesthesiology clinics, 35, 15-34, 2017	Narrative article about the definition, cause and management of obstetric haemorrhage
Beltman, Jogchum, Van Den Akker, Thomas, Van Lonkhuijzen, Luc, Schmidt, Aniek, Chidakwani, Richard, Van Roosmalen, Jos, Beyond maternal mortality: obstetric hemorrhage in a Malawian district, Acta Obstetricia et Gynecologica Scandinavica, 90, 1423-7, 2011	Describes the incidence of antepartum and postpartum haemorrhage, and associated obstetric outcomes. No relevant comparison was reported
Blackwell, Sean C., Timing of delivery for women with stable placenta previa, Seminars in Perinatology, 35, 249-51, 2011	Narrative article about decision making for timing of birth across the late preterm and early-term periods
Calder, A. A., Oxytocics and tocolytics, Clinics in obstetrics and gynaecology, 8, 507-20, 1981	Narrative article about the use of oxytocics and tocolytics to control the uterus
Chervenak, F. A., Lee, Y., Hendler, M. A., Role of attempted vaginal delivery in the management of placental previa, Obstetrics and Gynecology, 64, 798-801, 1984	The study authors describe their experience with intrapartum management of placenta praevia. No relevant comparison was reported
Clark, B. F., Pitocin in obstetrics with suggested uses for conservation of blood in normal and complicated delivery, The Journal of the Maine Medical Association, 48, 115-7, 1957	A full-text copy of the article could not be obtained
Crochetiere, C., Obstetric emergencies, Anesthesiology Clinics of North America, 21, 111-25, 2003	Narrative article about the anaesthesiologist's role in managing critical obstetric events, including obstetric haemorrhage
Danisman, N., Kahyaoglu, S., Celen, S., Akselim, B., Tuncer, E. G., Timur, H., Kaymak, O., Kahyaoglu, I., The outcomes of surgical treatment modalities to decrease "near miss" maternal morbidity caused by peripartum hemorrhage, European review for medical and pharmacological sciences, 18, 1092-7, 2014	Assesses different management strategies for women with severe peripartum haemorrhage. No relevant comparison was reported
Dilla, Andrew J., Waters, Jonathan H., Yazer, Mark H., Clinical validation of risk stratification criteria for	Examines whether risk groups established in the California Maternal Quality Care Collaborative guidelines

Study	Reason for exclusion
peripartum hemorrhage, Obstetrics and Gynecology, 122, 120-6, 2013	predict the risk of a significant peripartum haemorrhage in women undergoing labour
Ebrahim, M. A., Zaiton, F., Elkamash, T. H., Clinical and ultrasound assessment in patients with placenta previa to predict the severity of intrapartum hemorrhage, Egyptian Journal of Radiology and Nuclear Medicine, 44, 657-663, 2013	Examines the predictors of major bleeding during caesarean section
Golditch, I. M., Boyce, N. E., Jr., Management of abruptio placentae, JAMA, 212, 288-93, 1970	Lack of clarity in reporting prevents assessment of whether the population is relevant
Grimes, W. H., Jr., Bartholomew, R. A., A comparison of intravenous oxytocin and ergonovine in the control of hemorrhage attending delivery, Southern Medical Journal, 41, 980-7, 1948	No relevant population. The study authors compare oxytocin and ergonovine used during the third stage of labour
Haynes, D. M., Managing third trimester bleeding, Postgraduate Medicine, 42, 319-26, 1967	Non-systematic literature review
Hnat, Michael D., Mercer, Brian M., Thurnau, Gary, Goldenberg, Robert, Thom, Elizabeth A., Meis, Paul J., Moawad, Atef H., Iams, Jay D., Van Dorsten, J. Peter, National Institute of Child, Health, Human Development Network of Maternal-Fetal Medicine, Units, Perinatal outcomes in women with preterm rupture of membranes between 24 and 32 weeks of gestation and a history of vaginal bleeding, American Journal of Obstetrics and Gynecology, 193, 164-8, 2005	No relevant comparison
Hogberg,U., Holmgren,P.A., Infant mortality of very preterm infants by mode of delivery, institutional policies and maternal diagnosis, Acta Obstetricia et Gynecologica Scandinavica, 86, 693-700, 2007	No relevant population. This article compares vaginal births and caesarean sections in cases of antepartum haemorrhage
Hurd, W. W., Miodovnik, M., Hertzberg, V., Lavin, J. P., Selective management of abruptio placentae: a prospective study, Obstetrics and Gynecology, 61, 467-73, 1983	No relevant population. Some diagnoses of abruptio placentae were done antenatally and some of these were followed by caesarean section. The study authors compare fetal mortality between vaginal births and caesarean sections, but they do not present separate outcome data relating to women with abruptio placentae in labour
Jakobsson, Maija, Gissler, Mika, Tapper, Anna-Maija, Risk factors for blood transfusion at delivery in Finland, Acta Obstetricia et Gynecologica Scandinavica, 92, 414-20, 2013	No relevant population
Lankoande, M., Bonkoungou, P., Ouandaogo, S., Dayamba, M., Ouedraogo, A., Veyckmans, F., Ouedraogo, N., Incidence and outcome of severe ante-partum hemorrhage at the Teaching Hospital Yalgado Ouedraogo in Burkina Faso, BMC Emergency Medicine, 17, 17, 2017	No relevant population. According to the definition in the study, "severe ante-partum hemorrhage" includes both antepartum and intrapartum haemorrhage. However no subgroup analysis is performed for intrapartum haemorrhage

Study	Reason for exclusion
Ledger, W. J., Identification of the high risk mother and fetus--does it work?, Clinics in Perinatology, 7, 125-34, 1980	Non-systematic literature review
Lindquist, Anthea, Knight, Marian, Kurinczuk, Jennifer J., Variation in severe maternal morbidity according to socioeconomic position: a UK national case-control study, BMJ open, 3, 2013	No relevant comparison. This article focuses on maternal characteristics associated with the composite outcome "severe maternal morbidity". Therapies for major peripartum haemorrhage are part of the composite outcome
Magann, Everett F., Evans, Sharon, Hutchinson, Maureen, Collins, Robyn, Howard, Bobby C., Morrison, John C., Postpartum hemorrhage after vaginal birth: an analysis of risk factors, Southern Medical Journal, 98, 419-22, 2005	No relevant population or comparison. This article focuses on the association between postpartum haemorrhage and several risk factors, including intrapartum haemorrhage
Malinowska-Polubiec, Aneta, Romejko-Wolniewicz, Ewa, Zareba-Szczudlik, Julia, Dobrowolska-Redo, Agnieszka, Sotowska, Agnieszka, Smolarczyk, Roman, Wilczynski, Jan, Czajkowski, Krzysztof, Emergency peripartum hysterectomy - a challenge or an obstetrical defeat?, Neuro endocrinology letters, 37, 389-394, 2016	A full-text copy of the article could not be obtained
Mastrolia, Salvatore Andrea, Baumfeld, Yael, Loverro, Giuseppe, Yohai, David, Hershkovitz, Reli, Weintraub, Adi Yehuda, Placenta previa associated with severe bleeding leading to hospitalization and delivery: a retrospective population-based cohort study, The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians, 29, 3467-71, 2016	No relevant population or comparison. This study compares cases of placenta praevia with severe bleeding to cases of placenta praevia without severe bleeding. Bleeding seems to be antepartum based on keywords in the article but this is not completely clear from the text. No subgroup analysis of women with severe bleeding
Moir, D. D., Amoa, A. B., Ergometrine or oxytocin? Blood loss and side-effects at spontaneous vertex delivery, British Journal of Anaesthesia, 51, 113-117, 1979	No relevant population. This study is on a general population of primigravidae with spontaneous, single, vertex births in the dorsal position. Only 4 women lost more than 500 ml of blood
Moller, H. J., Fuchs, F., The prophylactic use of methergin in deliveries, Danish medical bulletin, 3, 47-51, 1956	No relevant population
Moodie, J. E., Moir, D. D., Ergometrine, oxytocin and extradural analgesia, British Journal of Anaesthesia, 48, 571-574, 1976	No relevant population. Only 24 out of 80 women lost more than 500 ml of blood; no subgroup analysis was made for these women and it is unclear if haemorrhage occurred intrapartum or postpartum
Nair, M., Kurinczuk, J. J., Brocklehurst, P., Sellers, S., Lewis, G., Knight, M., Factors associated with maternal death from direct pregnancy complications: a UK national case-control study, BJOG: An International Journal of Obstetrics & Gynaecology, 122, 653-62, 2015	No relevant population. No subgroup analysis for women with intrapartum haemorrhage. No relevant intervention

Study	Reason for exclusion
Nirmala,K., Zainuddin,A.A., Ghani,N.A.A., Zulkifli,S., Jamil,M.A., Carbetocin versus syntometrine in prevention of post-partum hemorrhage following vaginal delivery, Journal of Obstetrics and Gynaecology Research, 35, 48-54, 2009	No relevant population
Oueslati, D., Chelli, D., Peripartum haemorrage: Value of surgical treatment, International Journal of Gynecology and Obstetrics, 119, S794-S795, 2012	Conference abstract
Parazzini, Fabio, Ricci, Elena, Cipriani, Sonia, Chiaffarino, Francesca, Bortolus, Renata, Chiantera, Vito, Bulfoni, Giuseppe, Temporal trends and determinants of peripartum hysterectomy in Lombardy, Northern Italy, 1996-2010, Archives of Gynecology and Obstetrics, 287, 223-8, 2013	No relevant population
Perkins,R.P., The neonatal significance of selected perinatal events among infants of low birth weight. II. The influence of ruptured membranes, American Journal of Obstetrics and Gynecology, 142, 7-16, 1982	No relevant population. No separate data for women with intrapartum haemorrhage
Reron, A., Jaworowski, A., Ossowski, P., Perinatal haemorrhages - Methods of management, Ginekologia i Poloznictwo, 13, 32-40, 2009	A full-text copy of the article could not be obtained
Riveros-Perez, E., Wood, C., Retrospective analysis of obstetric and anesthetic management of patients with placenta accreta spectrum disorders, International Journal of Gynecology and Obstetrics, 140, 370-374, 2018	A descriptive retrospective study in women with placenta accreta spectrum disorders. No relevant population, intervention, comparison, or outcome
Rocha Filho, Edilberto A., Costa, Maria L., Cecatti, Jose G., Parpinelli, Mary A., Haddad, Samira M., Sousa, Maria H., Melo, Elias F., Jr., Surita, Fernanda G., Souza, Joao P., Brazilian Network for Surveillance of Severe Maternal Morbidity Study, Group, Contribution of antepartum and intrapartum hemorrhage to the burden of maternal near miss and death in a national surveillance study, Acta Obstetricia et Gynecologica Scandinavica, 94, 50-8, 2015	Population is women with antepartum and intrapartum harmorrhage (not reported separately). No relevant intervention and comparison
Skye, D. V., Management of peripartum hemorrhage, WMJ, 97, 43-6, 1998	Narrative article on management of peripartum haemorrhage. No data or references on relevant interventions presented
Su, Lin Lin, Chong, Yap Seng, Massive obstetric haemorrhage with disseminated intravascular coagulopathy, Best practice & research. Clinical obstetrics & gynaecology, 26, 77-90, 2012	Narrative review on the management of massive obstetric haemorrhage (focus on antepartum and postpartum haemorrhage). Interventions relevant to the review protocol not mentioned
Tarcomnicu, I., Dimitriu, M. C. T., Pacu, I., Gheorghiu, D. C., Calin, D. F., Hardja, H., Vladescu, T., Banacu, M., Ciobanu, A., Popescu, I., Jitianu, R. C., Constantin, V. D., Popa, F., Paunica-Panea, G., Bacalbaaea, N., Ionescu, C. A., Obstetric haemorrhages, a reality in	Descriptive study on all obstetric haemorrhages in the study authors' hospital in Romania. No relevant data presented

Study	Reason for exclusion
spite of modern obstetrics!, Archives of the Balkan Medical Union, 50, 513-517, 2015	
Vergani, Patrizia, Ornaghi, Sara, Pozzi, Ilaria, Beretta, Pietro, Russo, Francesca Maria, Follesa, Ilaria, Ghidini, Alessandro, Placenta previa: distance to internal os and mode of delivery, American Journal of Obstetrics and Gynecology, 201, 266.e1-5, 2009	Population in this study is women with placenta praevia, not women with intrapartum bleeding. The study compares outcomes in 2 groups depending on the location of the placenta in relation to the internal orifice of the uterus. No relevant data
Walfish, M., Neuman, A., Wlody, D., Maternal haemorrhage, British Journal of Anaesthesia, 103 Suppl 1, i47-56, 2009	Narrative article on risk factors for and management of maternal haemorrhage focusing on antepartum and postpartum haemorrhage. No relevant data or references are presented
Weinstein, L., Farabow, W. S., Gusdon, J. P., Jr., Third stage of labor and transplacental hemorrhage, Obstetrics and Gynecology, 37, 90-3, 1971	Placental delivery and transplacental haemorrhage (during third stage of labour), thus, not relevant to this review
Wise, Arlene, Clark, Vicki, Challenges of major obstetric haemorrhage, Best practice & research. Clinical obstetrics & gynaecology, 24, 353-65, 2010	Narrative article on major obstetric haemorrhage, mainly focusing on postpartum haemorrhage. No relevant data or references presented
Wortman, Alison C., Twickler, Diane M., McIntire, Donald D., Dashe, Jodi S., Bleeding complications in pregnancies with low-lying placenta, The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians, 29, 1367-71, 2016	Study looking at mode of birth and incidence of postpartum haemorrhage in women with low-lying placenta. No relevant data presented

Economic studies

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix E – Clinical evidence tables

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

No clinical evidence was identified for this review and so there are no evidence tables.

Appendix F – Forest plots

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

No meta-analysis was undertaken for this review and so there are no forest plots.

Appendix G – GRADE tables

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

No clinical evidence was identified for this review and so there are no GRADE tables.

Appendix H – Economic evidence study selection

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix I – Economic evidence tables

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix J – Health economic evidence profiles

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix K – Health economic analysis

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

See Supplement 2 (Health economics) for details of economic evidence reviews and health economic modelling.

Appendix L – Research recommendations

Intrapartum care for women with intrapartum haemorrhage – management of intrapartum haemorrhage

No research recommendations were made for this review.