Royal College of Obstetricians & Gy

Prevention and Management of Postpartum Haemorrhage

Green-top Guideline No. 52

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Prevention and Management of Postpartum Haemorrhage

This is the second edition of this guideline, which was published in 2009 under the same title. The 2009 guideline was based on an earlier guideline on the management of postpartum haemorrhage (PPH) developed in 1998 under the auspices of the Scottish Committee of the Royal College of Obstetricians and Gynaecologists (RCOG) and updated in 2002.[1]

Executive summary of recommendations

Pr ct on an pr v nt on o PPH

What are the risk factors for developing PPH and how can they be minimised?

Risk factors

Risk factors for PPH may present antenatally or intrapartum; care plans must be modified as and when risk factors arise. ✓

Clinicians must be aware of risk factors for PPH and should take these into account when counselling women about place of delivery. ✓

Women with known risk factors for PPH should only be delivered in a hospital with a blood bank on site. D

Minimising risk – treating antenatal anaemia

Antenatal anaemia should be investigated and treated appropriately as this may reduce the morbidity associated with PPH. [New 2016**]**

For women without risk factors for PPH delivering vaginally, oxytocin (10 iu by intramuscular injection) is the agent of choice for prophylaxis in the third stage of labour. A higher dose of oxytocin is unlikely to be beneficial. A

For women delivering by caesarean section, oxytocin (5 iu by slow intravenous injection) should be used to encourage contraction of the uterus and to decrease blood loss. B

Ergometrine–oxytocin may be used in the absence of hypertension in women at increased risk of haemorrhage as it reduces the risk of minor PPH (500–1000 ml). C

For women at increased risk of haemorrhage, it is possible that a combination of preventative measures might be superior to syntocinon alone to prevent PPH. [New 2016**]** ✓

Clinicians should consider the use of intravenous tranexamic acid (0.5–1.0 g), in addition to oxytocin,

Resuscitation

Measures for minor PPH

Measures for minor PPH (blood loss 500–1000 ml) without clinical shock:

- **intravenous access (one 14-gauge cannula)**
- **urgent venepuncture (20 ml) for:**

All delivery units, especially small units without a blood bank on site, should maintain a supply of group O, RhD-negative blood. [New 2016**]** ✓

Intraoperative cell salvage should be considered for emergency use in PPH associated with caesarean section and with vaginal delivery. [New 2016**]** D

Blood components

Transfusion of fresh frozen plasma (FFP)

If no haemostatic results are available and bleeding is continuing, then, after 4 units of red blood cells, FFP should be infused at a dose of 12–15 ml/kg until haemostatic test results are known. [New 2016**]** D

If no haemostatic tests are available, early FFP should be considered for conditions with a suspected coagulopathy, such as placental abruption or amniotic fl

What surgical treatments can be employed to arrest the bleeding?

If pharmacological measures fail to control the haemorrhage, surgical interventions should be initiated sooner rather than later. D

Intrauterine balloon tamponade is an appropriate first-line 'surgical' intervention for most women where uterine atony is the only or main cause of haemorrhage. C

Conservative surgical interventions may be attempted as second line, depending on clinical circumstances and available expertise. C

It is recommended that a laminated diagram of the brace suture technique be kept in theatre. ✓

Resort to hysterectomy sooner rather than later (especially in cases of placenta accreta or uterine rupture)

Documentation

Accurate documentation of a delivery with PPH is essential. ☑

Debriefing

An opportunity to discuss the events surrounding the obstetric haemorrhage should be offered to the woman (possibly with her birthing partner/s) at a mutually convenient time. ☑

1. Purpose and scope

3. Identification and assessment of evidence

This guideline was developed in accordance with standard methodology for producing RCOG Green-top Guidelines. The Cochrane Library (including the Cochrane Database of Systematic Reviews and the Database of Abstracts of Reviews of Effects [DARE]), EMBASE, Trip, MEDLINE and PubMed (electronic databases) were searched for relevant randomised controlled trials, systematic reviews and meta-analyses. The search was restricted to articles published between 2007 and September 2015. The databases were searched using the relevant Medical Subject Headings (MeSH) terms, including all subheadings, and this was combined with a keyword search. Search words included 'postpartum h(a)emorrhage', 'factor VII', 'Syntocinon', 'carbetocin', 'carboprost', 'oxytocics', 'uterotonics', 'B-lynch suture', 'uterine artery embolism', 'bilateral internal iliac ligation', 'balloon, Rusch', 'Sengstaken catheters', 'thromboelastography', 'thromboelastometry', 'fibrinogen concentrate', 'point of care testing' and the search limited to humans and the English language. The National Library for Health and the National Guideline Clearinghouse were also searched for relevant guidelines and reviews. Guidelines and recommendations produced by organisations such as the British Committee for Standards in Haematology Transfusion Taskforce and national bodies were considered.

Where possible, recommendations are based on available evidence and the areas where evidence is lacking are annotated as 'good practice points'. Further information about the assessment of evidence and the grading of recommendations may be found in Appendix I.

4. Prediction and prevention of PPH

at ar t r s actors or v op n PPH an ow can t y b ' n ' s

4.1.1 Risk factors

Risk factors for PPH may present antenatally or intrapartum; care plans must be modified as and when risk factors arise. ✓

Clinicians must be aware of risk factors for PPH and should take these into account when counselling women about place of delivery. ✓

4.1.2 Minimising risk – treating antenatal anaemia

Antenatal anaemia should be investigated and treated appropriately as this may reduce the morbidity associated with PPH. D

Guidelines from the National Institute for Health and Care Excellence (NICE)[32] recommend that pregnant women should be offered screening for anaemia. The British Committee for Standards in Haematology[33] has produced guidelines on the investigation and management of anaemia in pregnancy. Haemoglobin (Hb) levels outside the normal UK range for pregnancy (110 g/l at first contact and 105 g/l at 28 weeks) should be investigated and iron supplementation considered if indicated. It is recommended that parenteral iron therapy should be considered antenatally for women with iron deficiency anaemia who do not respond to oral iron.[10] Evidence level 4

A population-based study[34] has indicated an association between antenatal anaemia (Hb less than 90 g/l) and greater blood loss at delivery and postpartum. Evidence level 3

4.1.3 Minimising risk – reducing blood loss at delivery

Uterine massage is of no benefit in the prophylaxis of PPH. A

Prophylactic uterotonics should be routinely offered in the management of the third stage of labour in all women as they reduce the risk of PPH. A

For women without risk factors for PPH delivering vaginally, oxytocin (10 iu by intramuscular injection) is the agent of choice for prophylaxis in the third stage of labour. A higher dose of oxytocin is unlikely to be beneficial. A

For women delivering by caesarean section, oxytocin (5 iu by slow intravenous injection) should be used to encourage contraction of the uterus and to decrease blood loss. B

Ergometrine–oxytocin may be used in the absence of hypertension in women at increased risk of haemorrhage as it reduces the risk of minor PPH (500–1000 ml). C

For women at increased risk of haemorrhage, it is possible that a combination of preventative measures might be superior to syntocinon alone to prevent PPH. ✓

Clinicians should consider the use of intravenous tranexamic acid (0.5–1.0 g), in addition to oxytocin, at caesarean section to reduce blood loss in women at increased risk of PPH. A

Uterine massage

A Cochrane review[35] analysed the effectiveness of uterine massage after birth, and before or after delivery of the placenta, or both, to prevent PPH. Two randomised controlled trials (RCTs) were included and the review found no significant difference between

However, active management results in a lower birthweight, reflecting a lower blood volume from early cord clamping.[39] A systematic review and meta-analysis of controlled trials[40] found that delaying clamping for at least 2 minutes is beneficial to the newborn and that the benefits extend into infancy. Therefore, active management of the third stage that includes routine early clamping of the umbilical cord can no longer be recommended. A detailed consideration of the literature relating to the timing of cord clamping can be found in RCOG Scientific Impact Paper No. 14.[41] Guidance from NICE[9] recommends that the umbilical cord should not be clamped earlier than 1 minute from delivery of the baby if there are no concerns over cord integrity or the baby's wellbeing.

Evidence level 1+

Oxytocin and ergometrine–oxytocin

McDonald and colleagues' meta-analysis[36] addressed prophylactic ergometrine–oxytocin versus oxytocin for the third stage of labour. This review indicated that ergometrine–oxytocin (Syntometrine , Alliance, Chippenham, Wiltshire, UK), oxytocin 5 iu and oxytocin 10 iu have similar efficacy in preventing PPH in excess of 1000 ml.

Guidelines from the Society of Obstetricians and Gynaecologists of Canada[30] recommend that carbetocin (100 micrograms given as an intravenous bolus over 1 minute) should be used for the prevention of PPH in elective caesarean deliveries. Randomised trials[45–50] have compared different uterotonics (oxytocin, ergometrine–oxytocin, misoprostol, carbetocin and 15-methyl prostaglandin $F_{2\alpha}$) for prophylaxis in women delivering by caesarean section. Appraisal of the evidence from these trials, together with consideration of standard practice in the UK, led the development group for the NICE caesarean section guideline[51] to recommend oxytocin 5 iu by slow intravenous injection for prophylaxis in the context of caesarean delivery.

Evidence level 1+

Tranexamic acid

The use of tranexamic acid in the prevention of PPH in women considered to be at low risk of PPH was addressed in a Cochrane review.[52]

In nonpregnant patients, the shock index, calculated from the heart rate/systolic blood pressure, has been employed as an early marker of haemodynamic compromise.[61] A retrospective cohort study[62] concluded that the shock index identifies women at risk of adverse outcomes secondary to PPH (e.g. admission to an intensive care unit) and compares favourably with conventional vital signs.

Evidence level 2

Clinicians and blood transfusion staff should liaise at a local level to agree:

- **a standard form of words (such as 'we need compatible blood now' or 'group-specific blood') to be used in cases of major obstetric haemorrhage**
- **a timescale in which to deliver various blood components.**

The use of the term 'controlled major obstetric haemorrhage' or 'ongoing major obstetric haemorrhage' may be used to define the urgency to the team.

Senior obstetric staff must be receptive to concerns expressed by less experienced or junior medical practitioners, and by midwives. The RCOG recommends that the consultant obstetrician should attend in person when there is a PPH of more than 1500 ml where the haemorrhage is continuing.[63] **Evidence level 4**

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5.3.1 Measures for minor PPH

Measures for minor PPH (blood loss 500–1000 ml) without clinical shock: ✓

- **intravenous access (one 14-gauge cannula)**
- **urgent venepuncture (20 ml) for:**
  - **group and screen**
  - **full blood count**
  - **coagulation screen, including fibrinogen**
- **pulse, respiratory rate and blood pressure recording every 15 minutes**
- **commence warmed crystalloid infusion.**

5.3.2 Measures for major PPH

Full protocol for major PPH (blood loss greater than 1000 ml) and continuing to bleed or clinical shock (see Appendix III): ✓

- **A and B – assess airway and breathing**
- **C – evaluate circulation**
- **position the patient flat**
- **keep the woman warm using appropriate available measures**
- **transfuse blood as soon as possible, if clinically required**
- **until blood is available, infuse up to 3.5 l of warmed clear fluids, initially 2 l of warmed isotonic crystalloid. Further fluid resuscitation can continue with additional isotonic crystalloid or colloid (succinylated gelatin). Hydroxyethyl starch should not be used.**
- **the best equipment available should be used to achieve rapid warmed infusion of fluids**
- **special blood filters should not be used, as they slow infusions.**

A high concentration of oxygen (10–15 l/min) via a facemask should be administered, regardless of maternal oxygen concentration. If the airway is compromised owing to impaired conscious level, anaesthetic assistance should be

Selection of red cell units for transfusion.

Major obstetric haemorrhage protocols must include the provision of emergency blood with immediate issue of group O, rhesus D (RhD)-negative and K-negative units, with a switch to group-specific blood as soon as feasible. D

If clinically significant red cell antibodies are present, close liaison with the transfusion laboratory is essential to avoid delay in transfusion in life-threatening haemorrhage. D

All delivery units, especially small units without a blood bank on site, should maintain a supply of group O, RhD-negative blood. ✓

Intraoperative cell salvage should be considered for emergency use in PPH associated with caesarean section and with vaginal delivery. D

Cytomegalovirus (CMV) status

Point of care testing using viscoelastometry, such as thromboelastography (TEG , Haemonetics, Braintree, Massachusetts, USA) and rotational thromboelastometry (ROTEM , Tem, Munich, Germany), combined with an agreed treatment algorithm, has been associated with decreased blood loss and blood product use, both outside and within the obstetric setting.[89,93,94] The main advantage is that results are known sooner than for laboratory tests. Point of care testing using TEG and ROTEM has been recommended by the Obstetric Anaesthetists' Association/Association of Anaesthetists of Great Britain and Ireland.[95] However, NICE has concluded that there is insufficient evidence to recommend the routine adoption of viscoelastometric point of care testing in the management of PPH.[96]

5.3.6 Is there a role for antifibrinolytic drugs?

Consideration should be given to the use of tranexamic acid in the management of PPH. B

A large RCT[118] found that early administration of tranexamic acid in the management of trauma in nonpregnant patients resulted in a significant reduction in death from haemorrhage. The dose employed in this study was 1 g intravenously over 10 minutes followed by an infusion of 1 g over 8 hours. One RCT[119] assessed the role of high-dose tranexamic acid in PPH. Women with PPH greater than 800 ml following vaginal delivery were randomly assigned to receive tranexamic acid (loading dose 4 g over 1 hour, then infusion of 1 g/hour over 6 hours) or not; the study concluded that high-dose tranexamic acid can reduce blood loss, fall in Hb and the need for blood transfusion. The study was not powered to address safety issues and specifically, the risk of the treatment causing deep vein thrombosis.

A Cochrane review[2] on treatments for PPH found that trials testing the effectiveness of tranexamic acid were too small to draw meaningful conclusions. A large trial[120] is currently in progress aiming to

The use of rFVIIa may be considered as a treatment for life-threatening PPH, but should not delay or be considered a substitute for a life-saving procedure, such as embolisation or surgery, or transfer to a referral centre.

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Full protocol for monitoring and investigation in major PPH (blood loss greater than 1000 ml) and ongoing haemorrhage or clinical shock: D

- **immediate venepuncture (20 ml) for:**
  - **cross-match (4 units minimum)**
  - **full blood count**
  - **coagulation screen, including fibrinogen**
  - **renal and liver function for baseline**
- **monitor temperature every 15 minutes**
- **continuous pulse, blood pressure recording and respiratory rate (using oximeter, electrocardiogram and automated blood pressure recording)**
- **Foley catheter to monitor urine output**
- **two peripheral cannulae, 14 gauge**
- **consider arterial line monitoring (once appropriately experienced staff available for insertion)**
- **consider transfer to intensive therapy unit once the bleeding is controlled or monitoring at high dependency unit on delivery suite, if appropriate**
- **recording of parameters on a modified early obstetric warning score (MEOWS) chart (see Appendix IV)**
- **acting and escalating promptly when abnormal scores from a MEOWS chart are observed**
- **documentation of fluid balance, blood, blood products and procedures.**

Continuous physiological monitoring is necessary and the recording of parameters over time on a flow chart that will give the reader good visu29930v9407.8flow wa847(cordi-332.187(onm8a-4433457tCrin-14.6277(ma1.7712.40id)396(f(wa847.80co

It is also important that once the bleeding is arrested and any coagulopathy is corrected, chemical thromboprophylaxis is administered, as there is a high risk of thrombosis. Alternatively, anti-embolism stockings, foot impulse devices or intermittent pneumatic compression devices can be used if chemical thromboprophylaxis is contraindicated, for example, in cases of thrombocytopenia.[132]

Evidence level 4

The most common cause of primary PPH is uterine atony.[27] The initial management of PPH should, therefore, involve measures to stimulate myometrial contractions. The following mechanical and

Two systematic reviews,[2,139] which includes the 2014 Cochrane review, focused on misoprostol to treat

5.6.2.1 Uterine balloon tamponade

Tamponade using various types of hydrostatic balloon catheter has superseded uterine packing for the control of atonic PPH.[143] Case series have used a Foley catheter,[144] Bakri balloon,[145] Sengstaken–Blakemore oesophageal catheter[146,147] and a condom catheter.[148] The urological Rusch balloon has been described as preferable by virtue of larger capacity, ease of use and low cost.[149] A detailed protocol for uterine tamponade using the Rusch balloon is available.[149] The 2014 Scottish Confidential Audit of Severe Maternal Morbidity report identified 339 women who had an estimated blood loss of 2500 ml or higher; in 82 cases, balloon tamponade was employed, successfully avoiding hysterectomy in 75 (91%) women.[150] This success rate is of the same order as that reported in other case series.

Evidence level 3

Some of the reports of balloon tamponade

The 2014 Scottish Confidential Audit of Severe Maternal Morbidity report[150] identified 21 cases where haemostatic brace suturing was used for the management of PPH (greater than or equal to 2500 ml); hysterectomy was averted in 16 (76%) women. Again, this success rate is of the same order as that reported in other case series.

Evidence level 3

These observational data suggest that haemostatic suture techniques are effective in controlling severe PPH and in reducing the need for hysterectomy. In the absence of comparative data to demonstrate that any one variant is superior to another, obstetricians are encouraged to familiarise themselves with one technique under the supervision of an experienced colleague. It is recommended that a laminated diagram of the brace suture technique be kept in theatre.

A systematic review[162] has concluded that compression sutures are associated with a low complication rate. A higher risk of uterine ischaemia appeared to be caused when the procedure was combined with vessel ligation. No negative impact on fertility has been reported.

Case series have reported the combined use of haemostatic suturing and balloon tamponade in the management of PPH.[163–165]

Evidence level 3

5.6.2.3 Stepwise uterine devascularisation and internal iliac artery ligation

Stepwise uterine devascularisation describes the successive ligation of (i) one uterine artery, (ii) both uterine arteries, (iii) low uterine arteries, (iv) one ovarian artery and (v) both ovarian arteries, in the management of PPH.[166] The original case series[167] of 103 patients with intractable PPH not responding to medical management was effective in all cases without the need for hysterectomy, leading some clinicians to propose that stepwise uterine devascularisation should be the first-line conservative surgical treatment to control PPH.

When internal iliac artery ligation is being considered, a senior gynaecologist or vascular surgeon should be informed and involved since this technique requires a high degree of surgical skill and training, and may be

5.6.2.4 Selective arterial occlusion or embolisation by interventional radiology

A large retrospective study[171] has evaluated arterial embolisation in 251 patients after PPH. It was successful in arresting the bleeding in 86.5% (217/251). The analysis suggested that caesarean section delivery, disseminated intravascular coagulation and transfusion of more than 10 units of packed red cells were related to failed embolisation.

Evidence level 3

The logistics of performing arterial occlusion or embolisation where the equipment or an interventional radiologist may not be available mean that uterine balloon tamponade is a more appropriate first-line treatment.

Follow-up studies of 17[172] and 25[173] women who underwent arterial embolisation for treatment of PPH suggest that the intervention does not impair subsequent menstruation, fertility and obstetric outcomes. Selective arterial occlusion may also be effective after failed internal iliac artery ligation.[174]

Evidence level 3

5.6.2.5 Hysterectomy

The decision for hysterectomy should be made by an experienced consultant clinician and the decision preferably discussed with a second experienced clinician when feasible.[29] Early recourse to hysterectomy is recommended, especially where bleeding is associated with placenta accreta or uterine rupture.[12] Hysterectomy should not be delayed until the woman is in extremis or while less definitive procedures with which the surgeon has little experience are attempted. The procedure should be carried out by a surgeon who is experienced in carrying out hysterectomies. Subtotal hysterectomy is the operation of choice in many instances of PPH requiring hysterectomy, unless there is trauma to the cervix or a morbidly adherent placenta in the lower segment.

Evidence level 4

Sequential reports of the Scottish Confidential Audit of Severe Maternal Morbidity from 2003 until 2012, summarised in the final 2014 publication,[150] have shown a statistically significant fall in the proportion of women with PPH (with blood loss greater than or equal to 2500 ml) requiring a hysterectomy to control the bleeding, and an increase in the use of conservative surgical techniques.

Evidence level 3

5.6.3 Intensive and high dependency units and post-PPH care

The 2006–08 CMACE reportT9twACE

6. How should secondary PPH be managed?

In women presenting with secondary PPH, an assessment of vaginal microbiology should be performed (high vaginal and endocervical swabs) and appropriate use of antimicrobial therapy should be initiated when endometritis is suspected. D

A pelvic ultrasound may help to exclude the presence of retained products of conception (RPOC), although the diagnosis of retained products is unreliable. C

Surgical evacuation of retained placental tissue should be undertaken or supervised by an experienced clinician. D

The causes of secondary PPH are numerous and include endometritis, RPOC and subinvolution of the placental implantation site.[177,178] The management of women presenting with secondary PPH should include an assessment of their haemodynamic status, an assessment of the blood loss and an evaluation of the woman's concerns (for example, is her bleeding becoming inconvenient because it has persisted longer than she had expected?). Evidence level 4

Investigations should include bacteriological testing for endometritis (high vaginal swab), although a low yield of positive vaginal swab results has been reported in patients with secondary PPH.[179] In contrast, Pather et al.[180] found a high incidence of abnormal vaginal microbiology (52%) and endometritis in their case series, supporting the practice of routine assessment of vaginal microbiology and appropriate use of antimicrobial therapy in women presenting with secondary PPH. Evidence level 3

A Cochrane review investigated the effect of different antibiotic regimens for the treatment of postpartum endometritis.[181] This review concluded that a combination of clindamycin and gentamicin is appropriate, and that once uncomplicated endometritis has clinically improved with intravenous therapy, there is no

Surgical evacuation of the uterus for RPOC is not without morbidity and can result in uterine perforation (1.5%)[180,191] and Asherman's syndrome.[192] It is, therefore, recommended that surgical evacuation of retained placental tissue should be undertaken or supervised by an experienced clinician. An appropriately trained clinician may consider performing uterine evacuation under direct ultrasound guidance.

A 2002 Cochrane review (assessed as up-to-date in January 2008) addressed treatments for secondary PPH.[4] No trials were identified which met the review group's inclusion criteria and no recommendations were made regarding effective treatments. Uterotonics, such as misoprostol and ergometrine, have been recommended in the management of secondary PPH, although evidence to support their use is limited.[178]

Documentation

Accurate documentation of a delivery with PPH is essential. ✓

Accurate documentation is important for further clinical management, continuity of care and team work. In addition, inadequate documentation can contribute to the likelihood of there being medicolegal consequences.[197] The team member recording events on the structured proforma, the scribe, is crucial in the management of PPH (see Appendix V); the proforma is effectively a checklist of available interventions, and team leaders should communicate with the scribe during the PPH to ensure that no steps have been omitted. PPH should be notified through a clinical incident reporting or risk management system.

Evidence level 4

It is important to record:

- **the staff in attendance and the time they arrived**
- **the sequence of events**
- **the administration of different pharmacological agents, their timing and sequence**
- **the time of surgical intervention, where relevant**
- **the condition of the mother throughout the different steps**
- **the timing of the fluid and blood products given.**

Debrief

An opportunity to discuss the events surrounding the obstetric haemorrhage should be offered to the woman (possibly with her birthing partner/s) at a mutually convenient time. ✓

After obstetric emergencies, women can be psychologically affected by postnatal depression or fear of further childbirth. Major PPH can be traumatic to women and their families and has been associated with the subsequent development of post-traumatic stress disorder.[198] Women who have experienced a major PPH should be offered an opportunity to discuss the events surrounding their delivery. A discussion of

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Appendix I: Explanation of guidelines and evidence levels

Clinical guidelines are: 'systematically developed statements which assist clinicians and patients in making decisions about appropriate treatment for specific conditions'. Each guideline is systematically developed using a standardised methodology. Exact details of this process can be found in Clinical Governance Advice No. 1 *Development of RCOG Green-top Guidelines* **(available on the RCOG website at www.rcog.org.uk/green-top-development). These recommendations are not intended to dictate an exclusive course of management or treatment. They must be evaluated with reference to individual patient needs, resources and limitations unique to the institution and variations in local populations. It is hoped that this process of local ownership will help to incorporate these guidelines into routine practice. Attention is drawn to areas of clinical uncertainty where further research may be indicated.**

The evidence used in this guideline was graded using the scheme below and the recommendations formulated in a similar fashion with a standardised grading scheme.

Classification of evidence levels

1++ High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias

1– Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias

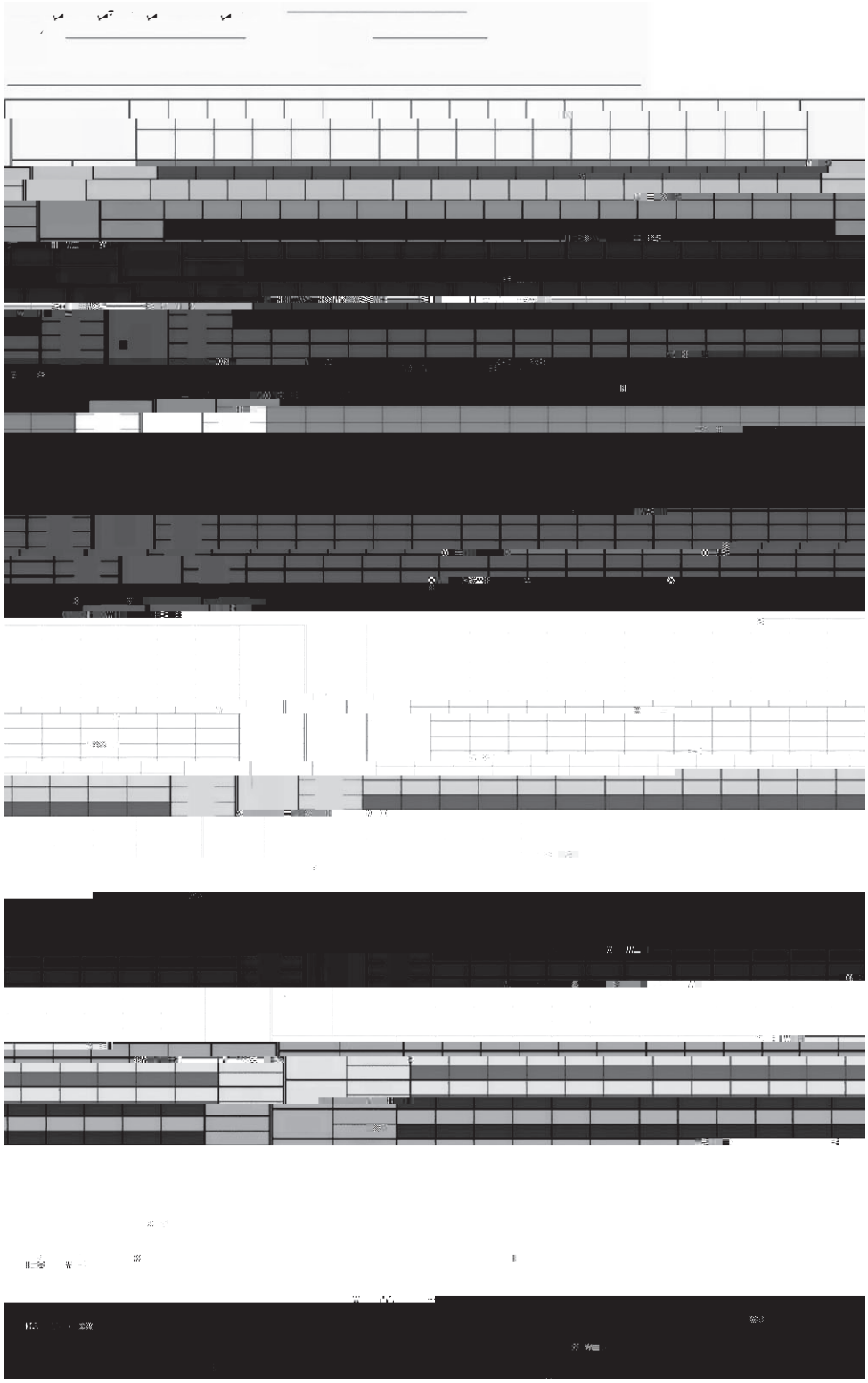
Grades of recommendations

A At least one meta-analysis, systematic reviews or RCT rated as 1++, and directly applicable to the target population; or
A systematic review of RCTs or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results

B A body of evidence including studies rated as 2

Appendix III: A

Appendix IV: Obstetric early warning chart



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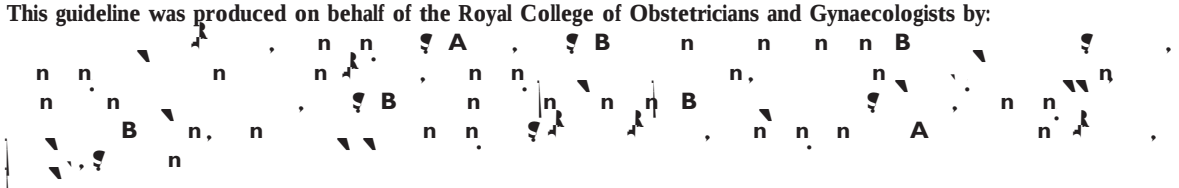

and peer reviewed by:

Advisory Committee on the Safety of Blood, Tissues and Organs, London; Dr J Ahonen, Helsinki University Hospital, Helsinki, Finland; Dr TSA Arab, Jeddah University, Jeddah, Kingdom of Saudi Arabia; Sir S Arulkumaran FRCOG, London; Dr P Barclay, Liverpool Women's Hospital; British Maternal and Fetal Medicine Society, London; Dr M Boucher, Centre d'Obstétrique-Gyn ´