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.

Evidence level 3

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] Transcatheter arterial embolisation[193] and balloon tamponade[194] have been employed in cases of secondary PPH with ongoing bleeding.

7. Risk management

7.1 *Training and preparation: what measures can be taken to ensure optimal management of PPH?*

Every maternity unit should have a multidisciplinary protocol for the management of PPH. ✓

All staff involved in maternity care should receive training in the management of obstetric emergencies, including the management of PPH. B

Training for PPH should be multiprofessional and include team rehearsals. B

All cases of PPH involving a blood loss of greater than 1500 ml should be the subject of a formal clinical incident review. D

To ensure optimal management of PPH, every unit should have a multidisciplinary protocol with which staff should be familiar (see section 5). Updates on the management of obstetric emergencies (including the management of PPH) are a proactive approach to risk management. Skills drills should ensure that all members of staff, including those working in the transfusion laboratory, are aware of their role in the management of PPH. A systematic review[195] of the effectiveness of multidisciplinary simulation training in obstetric emergencies (including PPH) showed that teamwork training in a simulation setting resulted in improvement of knowledge, practical skills, communication and team performance. Training in a simulation centre did not further improve outcome compared with training at a local unit.

Evidence level 2++

The RCOG recommends that all cases of PPH with an estimated blood loss of more than 1500 ml should be the subject of a formal clinical incident review.[196]

Evidence level 4

7.2 *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.

7.3 *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. ✓

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 future pregnancy, including the likelihood of a repeat PPH and any fears regarding pregnancy and childbirth that the woman may have should be addressed. This should include arrangements for appropriate investigations as necessary, such as testing for coagulopathies if there are other indicators and screening for the rare complication of postpartum hypopituitarism (Sheehan syndrome) secondary to hypotension.[199]

Evidence level 4

8. Recommendations for future research

- RCTs are required to identify the best drug combinations, route and dose of uterotonics for the treatment of primary PPH.
- The role of viscoelastometric point of care tests using TEG® and ROTEM® in the management of PPH requires evaluation.
- Studies are required to determine the optimal ratio of packed red cells to FFP in the management of obstetric haemorrhage.

- Studies are required to determine the role of fibrinogen concentrate in the management of PPH.
- The role of prothrombin complex concentrate in the management of PPH requires evaluation.
- RCTs are required to investigate the role of uterotonic agents (misoprostol and ergometrine) in the management of secondary PPH.

9. Auditable topics

- The proportion of women who are screened for antenatal anaemia (100%).
- The proportion of women who are offered uterotonics for the third stage of labour (100%).
- The proportion of women undergoing an assessment of risk factors for PPH when they present in labour (100%).
- Appropriate documentation of management, especially with the timing of events for women who have had PPH (100%).
- Notification to the risk management team of women with PPH involving a blood loss greater than 1500 ml (100%).
- Proportion of the multidisciplinary team who have undergone skills drills training in PPH (100%).

10. Useful links and support groups

- Royal College of Obstetricians and Gynaecologists. *Heavy bleeding after birth (postpartum haemorrhage). Information for you*. London: RCOG; 2016 [https://www.rcog.org.uk/en/patients/patient-leaflets/heavy-bleeding-after-birth-postpartum-haemorrhage/].
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- Patient. *Postpartum Haemorrhage* [www.patient.co.uk/showdoc/40000261].
- Netdoctor.co.uk. *I suffered with postpartum haemorrhage* [www.netdoctor.co.uk/ate/womenshealth/207160.html].

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