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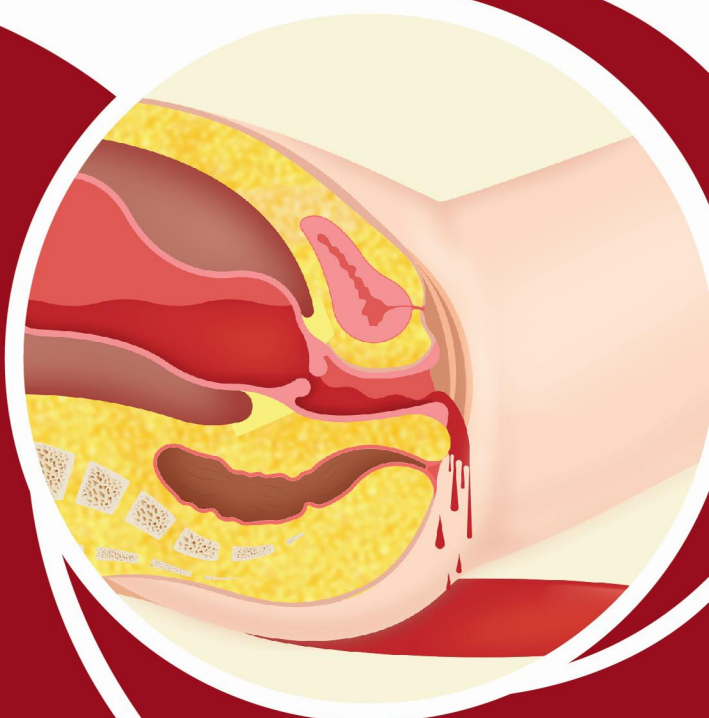
Obs and Gynae PG Focus Series

Postpartum Hemorrhage & Internal Iliac Artery Ligation



Editors
Niranjan Chavan
Komal N Chavan

Co-Editors
Darshana Ajmera
Juili Tadkar

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CHAPTER

Management of Postpartum Hemorrhage: Medical

INTRODUCTION

Managing postpartum hemorrhage (PPH) requires a logical and systematic approach to save lives **(Flowchart 1)**. Confidential inquiries into maternal deaths have consistently highlighted the issue of "too little, too late" as a significant factor contributing to deaths from PPH. Therefore, management should focus on rapid identification and treatment of the specific underlying cause, effective communication, thorough assessment, and the involvement of a multidisciplinary team for resuscitation, monitoring, and management of women who experience massive blood loss.

Chandraharan and Arulkumaran introduced the "HEMOSTASIS" algorithm **(Fig. 1)** to guide the systematic management of PPH. A recent study indicated that using the HEMOSTASIS algorithm provided a timely and structured approach to managing PPH, successfully controlling over 90% of cases involving massive blood loss. In this study, the risk of peripartum hysterectomy in cases of severe PPH was reduced to less than 2%.[1]

Effective communication is essential in managing PPH and requires the involvement of a multidisciplinary team, including senior obstetricians, midwives, anesthetists, and haematologist. It is also important to keep the woman and her family informed, as much as possible, so they can make informed decisions, especially if life-saving interventions like peripartum hysterectomy are being considered.

Assessment should include an evaluation of the woman's overall condition, estimated blood loss (EBL), the identification of the cause of PPH, and monitoring of vital signs.

Resuscitation focuses on ensuring the ABCs:

- *Airway and breathing*: Ensure an open airway and administer oxygen at 8–12 L/min via a face mask, regardless of the woman's oxygen saturation level. If the airway is compromised, anesthesia support should be called immediately.
- *Circulation*: Establish two large-bore (14-gauge) IV lines for rapid fluid administration and simultaneously draw 20 mL of blood for diagnostic tests, including full blood count, urea and electrolytes, coagulation profile, and cross-matching for four units of blood. Blood pressure, pulse, and respiratory rate should be monitored every 15 minutes.

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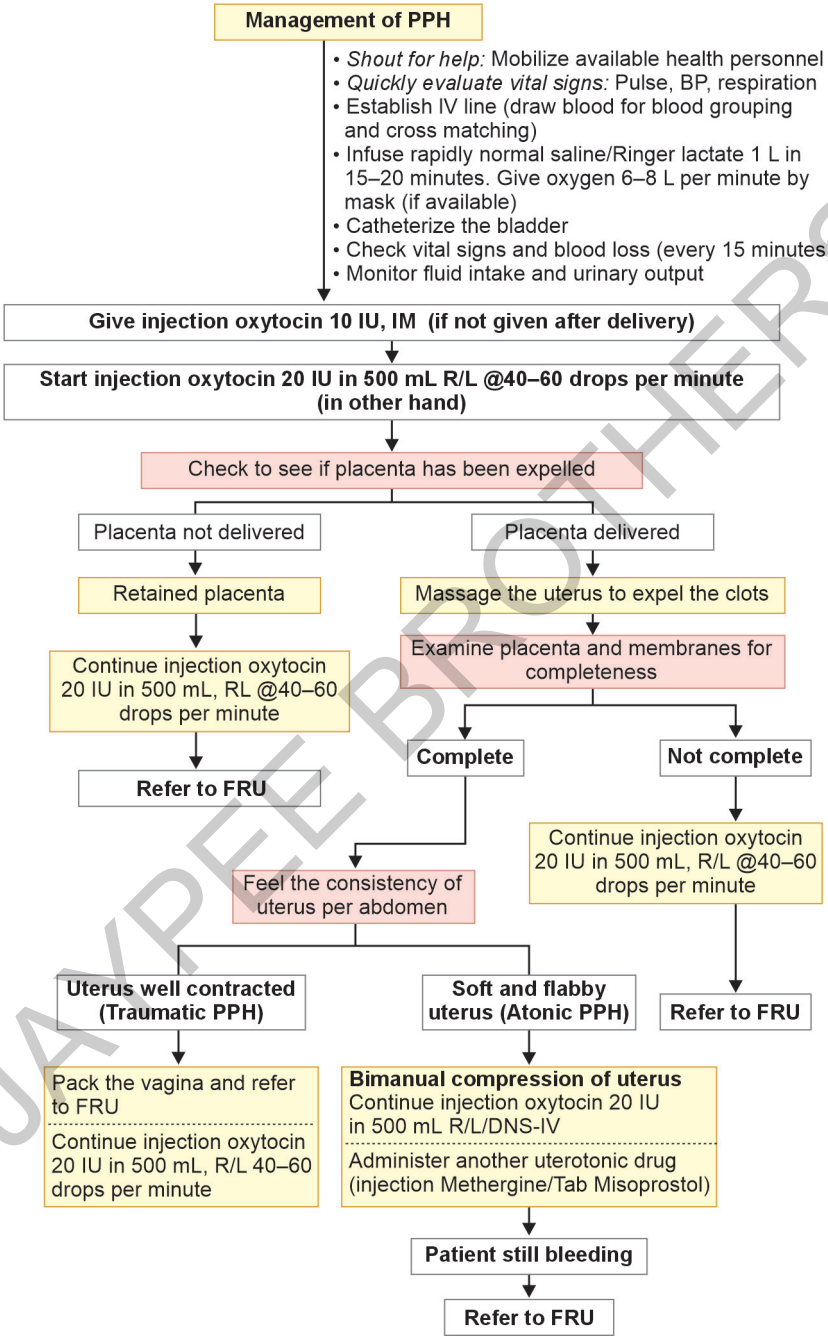
Flowchart 1: Medical management of PPH.



(FRU: first referral unit; PPH: postpartum hemorrhage)

Source: https://x.com/USAID_RMNCHA/status/820519217657159681

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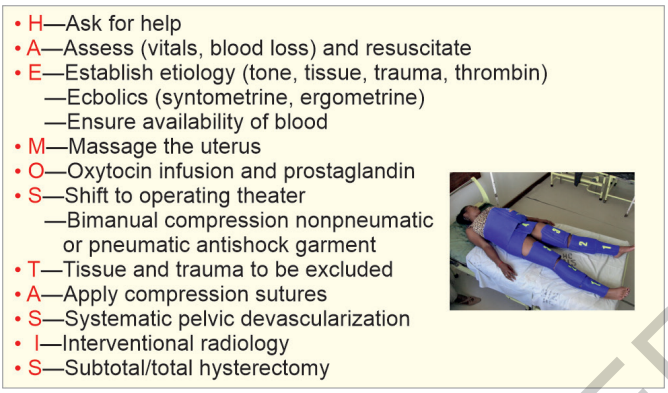

Fig. 1: "HEMOSTASIS" algorithm.
Source: Chandraharan E, Krishna A. Diagnosis and management of postpartum haemorrhage. BMJ. 2017;358:j3875.

It is recommended to have a dedicated PPH trolley stocked with the necessary drugs and equipment for initial management. If massive blood loss (over 2 L) is suspected, a "Massive Obstetric Hemorrhage Protocol," such as declaring a "Code Blue," should be activated immediately. Additional interventions include lowering the head of the bed to enhance venous return and cerebral circulation and preventing hypothermia by using warmed air blankets and prewarmed fluids during resuscitation.[2]

FLUID THERAPY

The primary goal of fluid therapy is to restore blood volume, maintain oxygen-carrying capacity, and replenish depleted coagulation factors. While the ideal replacement is blood and blood products, until these become available, a rapid infusion of prewarmed crystalloids (such as 2 L of Hartmann's solution) and colloids (1.5 L) should be administered.

If, after 3.5 L of fluid resuscitation, fully cross-matched blood is still unavailable and the bleeding continues or the patient's condition worsens, uncross-matched group-specific blood or O RhD-negative blood may be administered as clinically necessary.

Platelet concentrates should be given if platelet count is <50,000.

When 4 units of red cells have been transfused or if activated partial thromboplastin time (aPTT) or prothrombin time (PT) >1.5 then 4 units of fresh frozen plasma (FFP) should be administered.[3]

MECHANICAL METHODS

If the placenta has been delivered and there is persistent bleeding from a boggy (i.e., atonic) uterus, uterine fundal massage or bimanual uterine compression should be performed to stimulate uterine contractions.

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This "uterine massage" aids in both the contraction and retraction of the uterus and helps expel blood clots.

In some cases, the uterine fundus may be firm and contracted while the lower segment remains dilated and atonic. In such situations, the approach involves manually removing any clots and applying bimanual compression to reduce blood flow while waiting for uterotonic agents to take effect. Additionally, inserting an indwelling urinary catheter to empty the bladder can help promote uterine contraction and retraction.

PHARMACOLOGICAL METHODS

Uterotonic Agents

Oxytocin (Syntocinon) 5 IU via slow IV injection is the first-line treatment for atonic PPH. It can be combined with 0.5 mg of ergometrine (Syntometrine). Oxytocin works by stimulating rhythmic contractions in the fundal myometrium, which constricts the spiral arteries and reduces uterine blood flow. Alternatively, a slow IV/IM injection of 0.5 mg of ergometrine can be administered, which induces a generalized tetanic contraction of the myometrium, affecting both the upper and lower uterine segments. However, ergometrine can cause intense peripheral vasoconstriction and increase blood pressure, making it contraindicated in women with hypertension or cardiac conditions.

If the bleeding persists, an oxytocin infusion should be started at a rate of 125 mL/h (10 units of oxytocin/h) by adding 40 IU of Syntocinon to 500 mL of Hartmann solution.

Prostaglandins

Prostaglandins are used to enhance uterine contractions and promote vasoconstriction. The most commonly used is carboprost (Hemabate), a 15-methyl prostaglandin F2α. Carboprost 0.25 mg (250 mcg) can be given intramuscularly and repeated every 15 minutes for up to eight doses (maximum 2 mg). Although effective in 87% of patients, carboprost is contraindicated in individuals with bronchial asthma due to the risk of bronchoconstriction. Caution is also needed for intramyometrial injections, as accidental injection into the uterine veins can lead to maternal cardiac arrest.

Misoprostol is another effective prostaglandin for treating atonic PPH, though it often causes side effects like nausea, vomiting, and diarrhea, which may limit its use in some settings. It can be administered sublingually, orally, vaginally, or rectally, with doses ranging from 200 to 1000 mcg. The International Federation of Gynaecology and Obstetrics (FIGO) recommends a sublingual dose of 800 mcg (four 200 mcg tablets). Carbetocin, a long-acting oxytocin derivative, is not currently supported by evidence as a first-line treatment for PPH.[4]

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Niranjan Chavan MD FICOG FCPS DGO DFP MICOG DICOG Diploma in Endoscopy (USA) is Professor and Unit Chief, Department of Obstetrics and Gynaecology, Lokmanya Tilak Medical College and General Hospital (LTMC & GH) of Maharashtra University of Health Sciences (MUHS), Mumbai, Maharashtra, India. He pursued MBBS (1989) from King Edward Memorial Hospital and Seth Gordhandas Sunderdas Medical College and did MD (Obs/Gynae) (1993) from LTMM College. He did Diploma in Endoscopy (1997) from Staten Island, USA, and went to hone his minimal invasive surgical skills in endoscopy at Royal Free Hospital, Hampstead, UK, in 2000. With a remarkable 32 years of teaching experience, he has made significant contributions to the education and mentorship of undergraduate and postgraduate medical students, playing a key role in shaping the next generation of medical professionals. He has been bestowed with 30 awards and is an Editor-in-Chief of three journals. He has edited 12 textbooks, written more than 100 chapters, and delivered more than 800 lectures, keynote addresses, and 5 orations in international and national conferences, CMEs, and workshops. He has to his credit 88 scientific papers with 222 citations. His fields of interest are endoscopy, high-risk obstetrics, oncology, and infertility. He is currently Organizing Secretary, AICOG-Mumbai, 2025; Treasurer, FOGSI (2025–2027) and Vice President, AFG (2025–2026) and has served as the President of the prestigious Mumbai Obstetric and Gynaecological Society (2022–2023). He has been the Chairperson, FOGSI Oncology Committee (2012–2014) and contributed to oncology-focused roles as an Executive Member in SAFOG and AOFOG.



Komal N Chavan MD DNB MNAMS FCPS DGO FICOG and Diploma in Reproductive Medicine (UK-SH Germany) is a distinguished Senior Consultant and Unit Chief, Department of Obstetrics and Gynaecology, VN Desai Hospital, Mumbai, Maharashtra, India. With over 16 years of teaching experience, she serves as a DNB Teacher and has been a Postgraduate Examiner, contributing significantly to the education of future medical professionals. She is currently Vice President, FOGSI (2025–2026). She is actively involved in various professional organizations, including the ICOG Governing Council, MOGS, AFG, Mumbai Menopause Society, and ISOPARB Mumbai Society, where she holds several key positions. She is recognized for her expertise, having been an invited faculty member at numerous international and national conferences, where she has delivered keynote addresses, guest lectures, and moderated panel discussions. Her scholarly contributions are extensive, with over 24 publications in international and national journals. She has edited 33 books and newsletters. She has also contributed chapters to FOGSI Focus and various textbooks, and her work includes contributions to FOGSI GCPRs, protocols, and checklists. Her dedication to women's health and education has earned her 20 prestigious awards, to name a few the FOGSI's Dr Mehroo Dara Hansotia Best Committee Award, AMOGS—Best Committee Award, MOGS—Dr Rishma Pai Personality of the Year Award for 2023, MOGS—Dr Ganatra Charitable Trust Award 2023, and MOGS—Dr Pramila Bhatia Scientist Award 2022. Her commitment to excellence continues to inspire her peers and students alike.



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