

A Textbook of
**POSTPARTUM
HEMORRHAGE**

*A comprehensive guide to evaluation, management
and surgical intervention*

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**Society of Obstetricians and Gynecologists of Canada
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HRH The Princess Royal



BUCKINGHAM PALACE

It is a pleasure to assist in the promotion of improvement in maternal and child health, both in the developed and the developing world. One of the tragedies of modern life is that 90% of maternal deaths are due to delays in decision making, transfer and treatment of critically ill patients who have bled after childbirth. Many of the mothers who die because of these delays die unnecessarily and the tragedy results in the loss of a mother to her whole family.

This textbook is unique because it is the first effort to bring together information on how to treat significant bleeding after childbirth, and I am confident that this British initiative will make an important contribution to the better understanding of how to save these women's lives.

I hope that healthcare communities worldwide will use this material to save lives, and encourage appropriate authorities to provide essential services which will improve the health of both women and their families.

*This book is dedicated to all women who have died
from postpartum hemorrhage and to those who strive to
prevent and overcome it.*

A Textbook of **POSTPARTUM HEMORRHAGE**

*A comprehensive guide to evaluation, management
and surgical intervention*

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*With a Special Message from HRH The Princess Royal
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**SAPIENS
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This book, and other elements in the programme, are being produced and published on a not-for-profit, charitable basis by the proprietors of Sapiens Publishing in loving and grateful memory of their daughter ABIGAIL BLOOMER, who worked alongside them in medical publishing for a number of years and who sadly died at the early age of 31 from breast cancer in December 2001. Abigail was especially involved in publishing on women's health issues. She is greatly missed.

Abigail Bloomer, 1970–2001

The book, which is available through the normal commercial channels in the Western World, is being provided free to a large number of selected physicians in developing countries and at a special low price to members of all national obstetric and gynecological societies worldwide. The whole book is also available entirely free of charge on the internet, via the Publishers' website, where it may be read or downloaded chapter by chapter by anyone at any time.

A CD-ROM of the book, designed as a resource for lecturers and teachers, is being produced. In addition, an aide-mémoire poster on surgical techniques and also practical **Guidelines for Immediate Action** leaflet/wallchart for midwives and clinical assistants are both being published. All these items are being made available free of charge, on a selective basis. Please contact the Publishers at the address below for further information.

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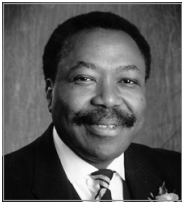
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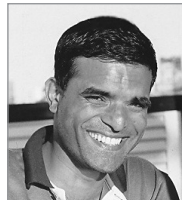
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The surgical illustrations (in color) in this book have been prepared by Philip Wilson, Medical and Scientific Illustrator, Old Coulsdon, Surrey, UK.

Foreword

This book, launched at the Presidential Symposium at the XVIII World Congress of the International Federation of Gynecology and Obstetrics (FIGO) in 2006 in Kuala Lumpur, Malaysia, marks an important day in the battle for improved treatment possibilities for postpartum hemorrhage. Beginning in October 2003 at the World Congress in Santiago, Chile, FIGO launched an international effort with other partners and donors to develop strategies to prevent postpartum hemorrhage and, in the cases where it still occurred, to identify effective medical and surgical treatments.

There is no controversy about the need for prevention and treatment of postpartum hemorrhage. Recent evidence from the World Health Organization strongly suggested that deaths due to postpartum hemorrhage were underestimated and could reach as high as 40% of all maternal mortality in some African countries as well as South Africa, South-East Asia and Latin America. Indeed, postpartum hemorrhage is the cause of close to 50% of maternal mortality in Guatemala and Afghanistan.

In the last 25 years, the world has seen only minimal progress in low-resource countries to reduce the incidence of postpartum hemorrhage and the resulting maternal mortality and morbidity. This new book is part of a world-wide effort to prevent postpartum hemorrhage and offer new perspectives in the medical and surgical treatment options. The first and foremost problem that is addressed is the lack of definition and the difficulty in assessing blood loss during delivery. Amazing as it may sound, blood loss is most often underestimated, and the clinical evaluation is very inaccurate. In the second section of the book, causation is presented, from basic physiology to obstetric trauma. The third section discusses the entire issue of prevention, with an excellent description of the active management of the third stage of labor and how this initiative, undertaken by a number of partners, including the International Confederation of Midwives (ICM), FIGO and the Prevention of Postpartum Haemorrhage Initiative (POPPHI), is beginning to make a difference in many countries. Misoprostol and its use for prevention and treatment are outlined and this will bring the discussion to the forefront on why this low-cost alternative is not more widely used.

Lacerations and trauma following spontaneous instrument delivery are highlighted as well as the management of adherent placenta. Coagulation disorders and disseminated intravascular coagulation are fully reviewed, with a strong chapter on therapy with factor VIIa. Therapy for uterine atony is well illustrated, with a proposal for a postpartum hemorrhage tray in order for midwives and physicians to be prepared for this emergency. In addition, the B-Lynch brace suture is described by the surgeon who first demonstrated its utility. Other new procedures, such as intrauterine tamponade and conservative surgical therapy, are also proposed in detail, with a call for more clinical research about these possible low-cost-effective therapies.

The consequences of postpartum hemorrhage for maternal mortality and morbidity are presented, along with the experiences of Poland, Iran, India and Africa with postpartum hemorrhage.

The FIGO Board, at its December 2005 meeting, approved a motion that calls on all its member countries to delegate to nurses and midwives the use of oxytocin without a doctor's prescription. FIGO has also requested its member countries to work with other health professionals and regulators to ensure that misoprostol is approved for inclusion on the essential drug list. FIGO further developed a questionnaire to evaluate the use of oxytocin and misoprostol as well as the management of the third stage of labor.

Postpartum hemorrhage continues to threaten women's lives in low- and high-resource countries and is the most important cause of maternal mortality in low-resource countries. The majority of cases of postpartum hemorrhage are due to uterine atony and the prevention and treatment are simple, using low-cost technology that unfortunately is not applied.

ICM and FIGO have joined international agencies, in particular USAID, to train and implement active management of the third stage of labor as well as propose low-cost technologies to be used by health-care professionals. FIGO and ICM are calling upon UN agencies and major donors from high-resource countries to support the ongoing effort to reduce maternal mortality due to postpartum hemorrhage. As part of this effort, we heartily endorse this book which is the first-ever compendium of information on a topic that is of vital interest to the medical professions world-wide.

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Editors' Foreword

The genesis of this book is unusual in that it was not conceived by any Institution, Organization or Medical College. Rather, it came forth from a perceived need by three individual physicians working in separate institutions (LK, MK and CBL). They decided to initiate the effort and act as Editors. The fourth editor (AL) joined later when he was informed of the project.

Each author who was asked to contribute enthusiastically agreed to do so, often at very short notice in view of the desire to distribute this volume at the XVIII World Congress of the International Federation of Gynecology and Obstetrics (FIGO) in Kuala Lumpur, Malaysia in early November, 2006. Moreover, every author agreed to write with no remuneration whatsoever, having been informed from the outset that the entire project was charitable in nature. With this in mind, decisions were eventually made to make the book available on the internet and to make translation rights by any of the national member societies of FIGO possible at a nominal charge.

The Editors were extremely fortunate to find a like-minded publisher, David Bloomer of Sapiens Publishing in the United Kingdom, who undertook this project in memory of his late daughter, Abigail, who died well before her time of that other scourge of women, namely breast cancer.

The careful reader will undoubtedly note certain duplications in the text. These could have been removed if the book were meant to be read seriatim from cover to cover. However, the Editors are of the opinion that many readers will focus on specific chapters or series of chapters, at least in the beginning, so the duplications were left to stand. We apologize for any inconvenience this may cause an individual reader.

As with any dynamic topic, last-minute changes had to be made to accommodate 'late-breaking news', foremost of which was that which came to light at the International Congress on the Prevention of Post Partum Hemorrhage, held in Goa, India, July 12–16, 2006. Although the manuscript was already in pages, a new section on Specific preventive measures was added to reflect evidence which was not known when the chapters were commissioned. Credit for the incorporation of these changes into the already completely set book goes to Mrs Jean Wright, a senior and experienced editor *par excellence*, who has worked with David Bloomer for many years. Credit and many heartfelt thanks are also due to Mrs Nora Horner, private secretary to Mr B-Lynch, who managed all the e-mail traffic between the Editors and authors connected with the transmission of all manuscripts in electronic format, a formidable task to say the least.

Finally, the Editors join David Bloomer in thanking HRH The Princess Royal for writing a Special Message for this volume and for speaking at the launch held at Chandos House, the Royal Society of Medicine, London, on October 11, 2006.

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We sincerely hope that our effort helps all levels of health-care practitioners to work more effectively to save women's lives when postpartum hemorrhage occurs. If that happens but once, then our combined efforts will have been worthwhile.

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Maternal mortality in the developing world – and the special challenge in Africa

The publication of this textbook marks a great milestone in our joint efforts at achieving the Millennium Development Goal 5, which aims to reduce maternal mortality by three-quarters, a daunting task indeed for most developing countries. The African region, especially Eastern and Western Africa, has the highest ratio of women dying as a result of pregnancy or childbirth in the world, estimated at an average of 1000 per 100 000 live births. Half of all the maternal deaths world-wide occur in the African Region, a region that accounts for only 12% of the world's population and about 20% of births. A lifetime risk of 1 in 3000, as is the case in high-income countries, represents a low risk of dying from pregnancy and childbirth, while 1 in 100 is considered a high risk. In Sub-Saharan Africa, for every 16 women, one will die of pregnancy and childbirth-related conditions. It is obvious that a lifetime risk of 1 in 16 is extremely high. This is a direct result of the defects in the social, cultural and economic status of women as well as inadequacies in existing health systems. Available evidence shows that the causes of maternal death include obstructive labor (8%), hypertension disorders (12%), abortion (13%), sepsis (15%), indirect causes such as malaria, anemia and HIV/AIDS (20%) and other direct causes (ectopic pregnancy, embolism and anesthesia-related problems (7%)). Postpartum hemorrhage accounts for 25% of the etiology of maternal mortality; however, it accounts for a third or more maternal deaths in certain countries of the Region. Malaria in pregnancy predisposes women to a number of complications including anemia, which places them at a higher risk of mortality from hemorrhage. Only an estimated 46% of the deliveries in the African Region are assisted by qualified health personnel.

The above situation makes reduction of maternal mortality one of the priorities of the WHO Regional Office for Africa – and we are making strenuous efforts towards improving maternal health and reducing maternal mortality.

This book provides evidence-based practical guidance to build the capacity of health providers in the management of postpartum hemorrhage in both pre-service and in-service training of health providers. As developing countries gear up to increase the availability of qualified personnel with the necessary skills to provide safe motherhood services, drawing on the guidance that this book provides will further urge us to promote safer practices.

The gap between the mortality rates from postpartum hemorrhage in developed countries and developing countries underscores the need for effectiveness and timeliness of the health systems in responding to pregnancy and childbirth-related complications. There is also an urgent need to find low-cost interventions that can