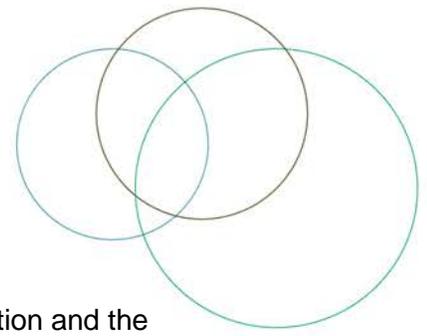


HOSPITAL HARM IMPROVEMENT RESOURCE

# Obstetric Hemorrhage



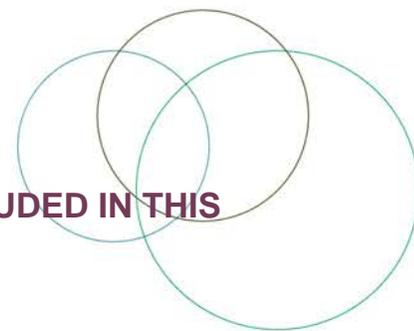
## ACKNOWLEDGEMENTS



The Canadian Institute for Health Information and the Canadian Patient Safety Institute have collaborated on a body of work to address gaps in measuring harm and to support patient safety improvement efforts in Canadian hospitals.

The Hospital Harm Improvement Resource was developed by the Canadian Patient Safety Institute to complement the Hospital Harm measure developed by the Canadian Institute for Health Information. It links measurement and improvement by providing resources that will support patient safety improvement efforts.





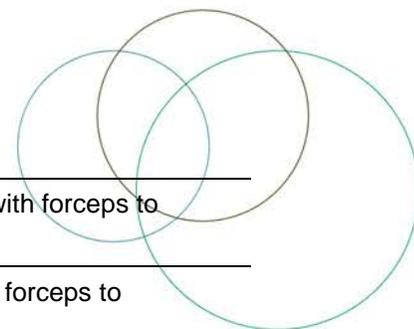
## DISCHARGE ABSTRACT DATABASE (DAD) CODES INCLUDED IN THIS CLINICAL CATEGORY:

### A02: Obstetric Hemorrhage

<b>Concept</b>	Hemorrhage from the pelvic area, genital tract or perineum following non-instrumented vaginal delivery that requires blood transfusion during the delivery episode of care.
<b>Notes</b>	<ol style="list-style-type: none"> <li>1. This clinical group includes hemorrhage due to episiotomy.</li> <li>2. Refer to D02: Obstetric Hemorrhage for hemorrhage after an instrument-assisted delivery or Caesarean section delivery.</li> <li>3. The blood transfusion indicator is optional to code in British Columbia.</li> </ol>
<b>Selection criteria</b>	
O72.002 O72.102 O72.202 O90.202	Identified as diagnosis type (M), (1), (2), (W), (X) or (Y) <b>AND</b> documentation of blood transfusion (blood received indicator=1)
<b>Exclusions</b>	Abstracts with intervention codes for instrument-assisted or Caesarean section delivery (5.MD.53.^, 5.MD.54.^, 5.MD.55.^, 5.MD.56.NN, 5.MD.56.PC, 5.MD.56.NR, 5.MD.56.PF, 5.MD.56.NW, 5.MD.56.PJ or 5.MD.60.^)
<b>Codes</b>	<b>Code descriptions</b>
<b>O72.002</b>	Postpartum third-stage hemorrhage; delivered with mention of postpartum complication
<b>O72.102</b>	Other immediate postpartum hemorrhage; delivered with mention of postpartum complication
<b>O72.202</b>	Delayed and secondary postpartum hemorrhage; delivered with mention of postpartum complication.
<b>O90.202</b>	Hematoma of obstetric wound, delivered with mention of postpartum complication.
<b>Additional codes</b>	<b>Exclusions</b>
<b>5.MD.53.^</b>	Forceps traction and rotation delivery
<b>5.MD.54.^</b>	Vacuum traction delivery
<b>5.MD.55.^</b>	Combination of vacuum and forceps delivery
<b>5.MD.56.NN</b>	Breech delivery without episiotomy, partial breech extraction (assisted breech delivery) with forceps to aftercoming head
<b>5.MD.56.PC</b>	Breech delivery with episiotomy, partial breech extraction (assisted breech delivery) with forceps to aftercoming head



**HOSPITAL HARM IMPROVEMENT RESOURCE**  
**Obstetric Hemorrhage**



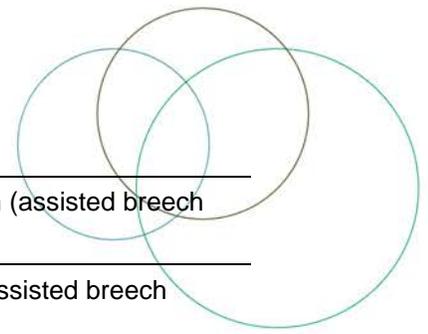
<b>5.MD.56.NR</b>	Breech delivery without episiotomy, total breech extraction with forceps to aftercoming head
<b>5.MD.56.PF</b>	Breech delivery with episiotomy, total breech extraction with forceps to aftercoming head
<b>5.MD.56.NW</b>	Breech delivery without episiotomy, unspecified breech extraction with forceps to aftercoming head
<b>5.MD.56.PJ</b>	Breech delivery with episiotomy, unspecified breech extraction with forceps to aftercoming head
<b>5.MD.60.^</b>	Caesarean section delivery

**D02: Obstetric Hemorrhage**

<b>Concept</b>	Hemorrhage from the pelvic area, genital tract, perineum or surgical incision after an instrument-assisted delivery or Caesarean section delivery that requires blood transfusion.
<b>Notes</b>	<ol style="list-style-type: none"> <li>1. This group includes hemorrhage due to episiotomy.</li> <li>2. Refer to A02: Obstetric Hemorrhage for hemorrhage following vaginal delivery without the assistance of instruments.</li> <li>3. The blood transfusion indicator is optional to code in British Columbia.</li> </ol>
<b>Selection criteria</b>	
O72.002 O72.102 O72.202 O90.202	Identified as diagnosis type (M), (1), (2), (W), (X) or (Y) <b>AND</b> intervention codes 5.MD.53.^, 5.MD.54.^, 5.MD.55.^, 5.MD.56.NN, 5.MD.56.PC, 5.MD.56.NR, 5.MD.56.PF, 5.MD.56.NW, 5.MD.56.PJ or 5.MD.60.^ <b>AND</b> documentation of blood transfusion (blood received indicator=1)
<b>Codes</b>	<b>Code descriptions</b>
<b>O72.002</b>	Postpartum third-stage hemorrhage; delivered with mention of postpartum complication
<b>O72.102</b>	Other immediate postpartum hemorrhage; delivered with mention of postpartum complication
<b>O72.202</b>	Delayed and secondary postpartum hemorrhage; delivered with mention of postpartum complication.
<b>O90.202</b>	Hematoma of obstetric wound, delivered with mention of postpartum complication.
<b>Additional codes</b>	<b>Inclusions</b>
<b>5.MD.53.^</b>	Forceps traction and rotation delivery
<b>5.MD.54.^</b>	Vacuum traction delivery
<b>5.MD.55.^</b>	Combination of vacuum and forceps delivery

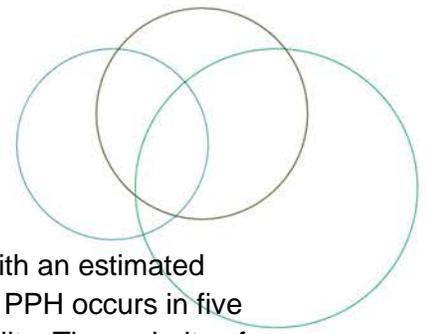


**HOSPITAL HARM IMPROVEMENT RESOURCE**  
**Obstetric Hemorrhage**



<b>5.MD.56.NN</b>	Breech delivery without episiotomy, partial breech extraction (assisted breech delivery) with forceps to aftercoming head
<b>5.MD.56.PC</b>	Breech delivery with episiotomy, partial breech extraction (assisted breech delivery) with forceps to aftercoming head
<b>5.MD.56.NR</b>	Breech delivery without episiotomy, total breech extraction with forceps to aftercoming head
<b>5.MD.56.PF</b>	Breech delivery with episiotomy, total breech extraction with forceps to aftercoming head
<b>5.MD.56.NW</b>	Breech delivery without episiotomy, unspecified breech extraction with forceps to aftercoming head
<b>5.MD.56.PJ</b>	Breech delivery with episiotomy, unspecified breech extraction with forceps to aftercoming head
<b>5.MD.60.^</b>	Caesarean section delivery





## OVERVIEW

Postpartum hemorrhage is the leading cause of maternal death worldwide, with an estimated mortality rate of 140 000 per year, or one maternal death every four minutes. PPH occurs in five per cent of all deliveries and is responsible for a major part of maternal mortality. The majority of these deaths occur within four hours of delivery, which indicates that they are a consequence of the third stage of labour. Nonfatal PPH results in further interventions, such as uterine exploration, evacuation or surgical procedures. Other implications include: iron deficiency anemia, exposure to blood products, coagulopathy, and organ damage with associated hypotension and shock which has the potential to jeopardize future fertility (Leduc et al. 2018).

Despite the use of uterotonics and active management of third stage of labour to prevent PPH, increases in PPH rates have been reported from high income countries, including Canada, the United States, the United Kingdom and Australia. Rates of severe PPH and of transfusion for treatment also appear to be rising. Rates of postpartum hemorrhage and severe postpartum hemorrhage continued to increase in Canada between 2003 and 2010 [from 3.9 per cent in 2003 to 5.0 per cent in 2010] and occurred in most provinces and territories. The increase could not be explained by maternal, fetal, or obstetric factors. Routine audits of severe postpartum hemorrhage are recommended for ensuring optimal management and patient safety (Mehrabadi et al. 2014).

**Primary Postpartum Hemorrhage (PPH)** is defined as excessive bleeding that occurs within the first 24 hours after delivery. Traditionally the definition of PPH has been blood loss in excess of 500 mL after vaginal delivery and in excess of 1000 mL after abdominal delivery. For clinical purposes, any blood loss that has the potential to produce hemodynamic instability should be considered PPH. The amount of blood loss required to cause hemodynamic instability will depend on the pre-existing condition of the woman. Hemodynamic compromise is more likely to occur when conditions such as anemia (e.g., iron deficiency, thalassemia) or volume-contracted states (e.g., dehydration, gestational hypertension with proteinuria) (Leduc et al. 2018) are present.

PPH is one of the few obstetric complications with an effective preventive intervention and it is generally assumed that by preventing and treating PPH, most PPH-associated deaths could be avoided (Mathai et al. 2007; WHO 2012). Specifically, 54-93% of maternal deaths due to obstetric hemorrhage may be prevented. Imprecise healthcare provider estimation of actual blood loss during birth and the immediate postpartum period is the leading cause of delayed response to hemorrhage (The American College of Obstetricians and Gynecologists 2019). Blood loss is difficult to estimate and is frequently underestimated when volumes are high and overestimated when volumes are low (The American College of Obstetricians and Gynecologists 2019; Lyndon et al. 2015).

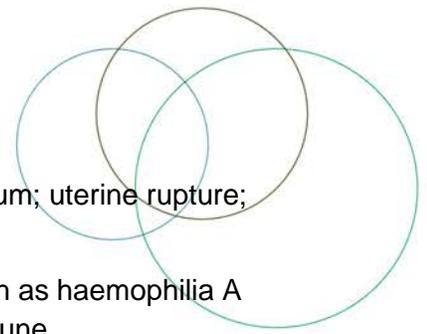
There are several possible reasons for severe bleeding during and after the third stage of labour, often referred to as the four **T's**:

- **Tone** or uterine atony: abnormalities of uterine contraction;
- **Tissue**: retained placenta, products of conception;



## HOSPITAL HARM IMPROVEMENT RESOURCE

### Obstetric Hemorrhage



- Trauma of the genital tract: lacerations of the cervix, vagina or perineum; uterine rupture; uterine inversion; and
- Thrombin: abnormalities of coagulation due to pre-existing states such as haemophilia A and von Willebrand's Disease, or acquired in pregnancy such as Immune Thrombocytopenic Purpura (ITP) or Disseminated Intravascular Coagulation (DIC) (Leduc, et al. 2018).

**Secondary PPH** is defined as excessive vaginal bleeding from 24 hours after delivery, to up to six weeks postpartum. Most cases of secondary PPH are due to retained products of conception, infection, subinvolution of the placental site and inherited coagulation defects such as von Willebrand (The American College of Obstetricians and Gynecologist 2017).

**Instrumentation and Caesarean Section:** Some obstetrical interventions are found to consistently be associated with higher rates of blood loss at the time of delivery thus predisposing patients to developing PPH. Included interventions are instrumental deliveries, episiotomy and caesarean sections, with emergency caesarean sections associated with higher rates of blood loss. It is important to note that more recent studies suggest that some obstetrical interventions increase the likelihood of PPH in a subsequent pregnancy, and that the recent increase in PPH in developed countries, which cannot seem to be wholly explained by factors related to the current pregnancy and delivery, may be due to more distal contributory factors (Roberts et al. 2009; Briley et al. 2014).

## GOAL

To prevent obstetrical hemorrhage from the pelvic area, genital tract, or perineum following vaginal delivery and from surgical incision after an instrument-assisted delivery or Caesarean section.

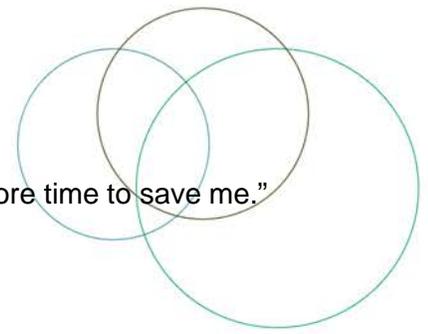
## IMPORTANCE FOR PATIENTS AND FAMILIES

By following the recommended strategies for active management of the third stage of labour, a hospital team can reduce the incidence of harm and/or death from obstetrical hemorrhage.

### Patient Story

Melissa Price, the patient representative on the hemorrhage task force, had a late postpartum hemorrhage. Melissa ended up with a hysterectomy and about 12 units of blood transfused. While in the Emergency Department, Melissa recalls asking the nurses how they could tell how much blood she was losing – the nurses never weighed the blood, and dumped it from a bed pan into a portable toilet. After Melissa's obstetrician got the bleeding to stop, she was left alone behind a curtain and checked on infrequently. Melissa recalls the feeling sheer panic when the bleeding started up again with 'enormous clots'... "I screamed and I will never forget the look on the nurse's face when she lifted up that blanket. After that, ER staff was running around everywhere. Rushing to call my OB, rushing to get an OR suite, rushing to figure out how to get my insulin





pump turned off. I just kept thinking, God give them more time. They need more time to save me.” (Lyndon et al. 2015).

## **CLINICAL AND SYSTEM REVIEWS, INCIDENT ANALYSES**

Given the broad range of potential causes of obstetrical hemorrhage, clinical and system reviews should be conducted to identify potential causes and determine appropriate recommendations.

Occurrences of harm are often complex with many contributing factors. Organizations need to:

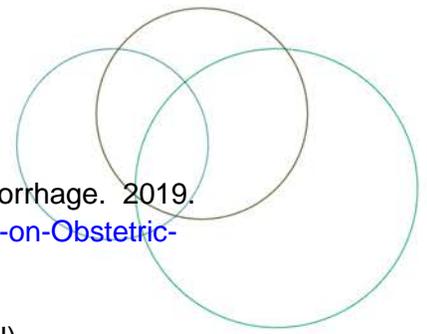
1. Measure and monitor the types and frequency of these occurrences.
2. Use appropriate analytical methods to understand the contributing factors.
3. Identify and implement solutions or interventions that are designed to prevent recurrence and reduce risk of harm.
4. Have mechanisms in place to mitigate consequences of harm when it occurs.

To develop a more in-depth understanding of the care delivered to patients, chart audits, incident analyses and prospective analyses can be helpful in identifying quality improvement opportunities. Links to key resources for [conducting chart audits](#) and [analysis methods](#) are included in the [Hospital Harm Improvement Resources Introduction](#)

If your review reveals that your cases of obstetric Hemorrhage are linked to specific processes or procedures, you may find these resources helpful:

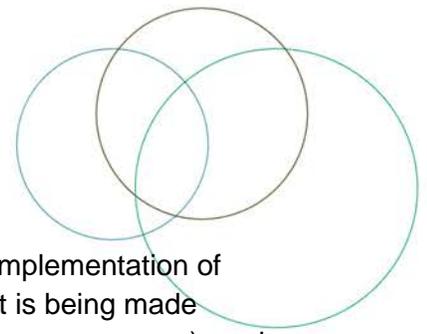
- Association of Ontario Midwives. <https://www.ontariomidwives.ca/>
  - Postpartum Hemorrhage. 2016. <https://www.ontariomidwives.ca/sites/default/files/CPG%20full%20guidelines/CPG-Postpartum-hemorrhage-PUB.pdf>
- American College of Obstetricians and Gynecologists (ACOG). <https://www.acog.org/>
  - Obstetrics & Gynecology. *ACOG Practice Bulletin: Postpartum Hemorrhage*. 2017. DOI: [https://journals.lww.com/greenjournal/Abstract/2017/10000/Practice\\_Bulletin\\_No\\_\\_183\\_\\_Postpartum\\_Hemorrhage.56.aspx](https://journals.lww.com/greenjournal/Abstract/2017/10000/Practice_Bulletin_No__183__Postpartum_Hemorrhage.56.aspx)
  - Obstetric Hemorrhage Bundle, Guidance Documents, and Additional Resources <https://www.acog.org/About-ACOG/ACOG-Districts/District-II/SMI-OB-Hemorrhage?IsMobileSet=false>
  - Committee Opinion: Preparing for Clinical Emergencies in Obstetrics and Gynecology. 2014. <https://www.acog.org/-/media/Committee-Opinions/Committee-on-Patient-Safety-and-Quality-Improvement/co590.pdf?dmc=1&ts=20200212T1519391856>





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- Association of Women's Health Obstetric Neonatal Nurses (AWHONN). <https://awhonn.org/>
  - Postpartum Hemorrhage. <http://pphproject.org/>
- California Maternal Quality Care Collaborative. <https://www.cmqcc.org/>
  - OB Hemorrhage Toolkit V 2.0. 2015. <https://www.cmqcc.org/resources-toolkits/toolkits/ob-hemorrhage-toolkit>
- Institute for Healthcare Improvement (IHI). [www.ihl.org](http://www.ihl.org)
  - How-to Guide: Prevent obstetrical adverse events. 2012. <http://www.ihl.org/resources/Pages/Tools/HowtoGuidePreventObstetricalAdverseEvents.aspx>
- National Institute for Health and Care Excellence (NICE) [www.nice.org.uk](http://www.nice.org.uk)
  - Intrapartum care for healthy women and babies: Clinical guideline [CG190]. Published date: 2014 Last updated: 2017 <https://www.nice.org.uk/guidance/cg190/chapter/Recommendations#third-stage-of-labour>
- The Global Library of Women's Medicine. <https://www.glowm.com/>
  - A Comprehensive Textbook of Postpartum Hemorrhage 2nd Edition. [https://www.glowm.com/resource\\_contents/resource\\_doc/675](https://www.glowm.com/resource_contents/resource_doc/675)
- The Society of Obstetricians and Gynaecologists of Canada (SOGC) - <https://www.sogc.org/en/>
  - Journal of Obstetrics and Gynaecology of Canada (JOGC). No. 235-Active Management of the Third Stage of Labour: Prevention and Treatment of Postpartum Hemorrhage. 2018. [https://www.jogc.com/article/S1701-2163\(18\)30766-7/fulltext](https://www.jogc.com/article/S1701-2163(18)30766-7/fulltext)
- World Health Organization
  - WHO recommendations for the prevention and treatment of postpartum haemorrhage. 2012. [https://www.who.int/iris/bitstream/10665/75411/1/9789241548502\\_eng.pdf?ua=1](https://www.who.int/iris/bitstream/10665/75411/1/9789241548502_eng.pdf?ua=1)
  - Uterotonics for the prevention of postpartum haemorrhage. 2018. <http://apps.who.int/iris/bitstream/handle/10665/277276/9789241550420-eng.pdf?ua=1&ua=1>
  - WHO Recommendations: Uterotonics for the prevention of postpartum haemorrhage Power Point Presentation. <https://www.who.int/reproductivehealth/uterotonics-for-PPH-prevention-slidedoc.pptx?ua=1>





## **MEASURES**

Vital to quality improvement is measurement, and this applies specifically to implementation of interventions. The chosen measures will help to determine whether an impact is being made (primary outcome), whether the intervention is actually being carried out (process measures), and whether any unintended consequences ensue (balancing measures). In selecting your measures, consider the following:

- Whenever possible, use measures you are already collecting for other programs.
- Evaluate your choice of measures in terms of the usefulness of the final results and the resources required to obtain them; try to maximize the former while minimizing the latter.
- Try to include both process and outcome measures in your measurement scheme.
- You may use different measures or modify the measures described below to make them more appropriate and/or useful to your particular setting. However, be aware that modifying measures may limit the comparability of your results to others.
- Posting your measure results within your hospital is a great way to keep your teams motivated and aware of progress. Try to include measures that your team will find meaningful and exciting (IHI, 2012).

## **GLOBAL PATIENT SAFETY ALERTS**

[Global Patient Safety Alerts](#) (GPSA) provides access and the opportunity to learn from other organizations about specific patient safety incidents including alerts, advisories, recommendations and solutions for improving care and preventing incidents.

### **Recommended search terms:**

- Postpartum Hemorrhage
- Obstetric Hemorrhage
- Oxytocin
- Maternal Death

## **SUCCESS STORY**

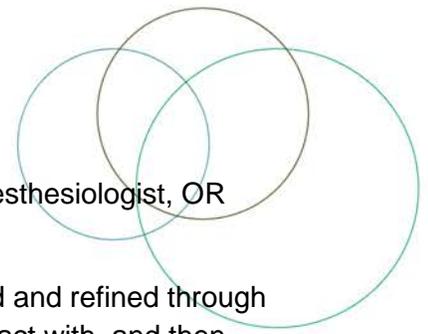
### **Grand Rounds: Ob Team Stat: Developing a better L&D rapid response team**

The recommended 30 minute “decision to incision” response time to obstetric emergency is not adequate to prevent adverse outcomes in certain scenarios. Improving on the current sequential team activation response to emergency, Allan Bombard, M.D., along with Karyn Almyrde, BSN and Val Catanzarite, MD PhD, developed the “Ob Team Stat” rapid response team. They utilized the Lockheed Martin “Skunk Works” approach to team project development, often employed in the business world. “Ob Team Stat” employs a simultaneous team activation approach to obstetric emergency. The system is activated by any team member, who simultaneously



## HOSPITAL HARM IMPROVEMENT RESOURCE

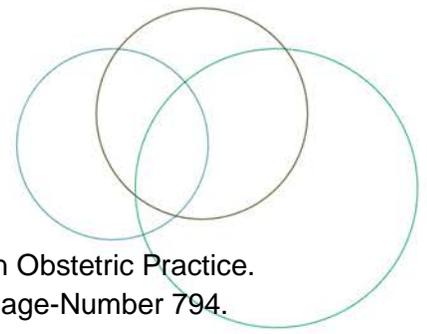
### Obstetric Hemorrhage



overhead pages and beeps the L&D charge nurse, in-house obstetrician, anesthesiologist, OR surgical team, neonatologist, and NICU team.

After approval for a new hospital procedure, the team concept was discussed and refined through the Hospital Committees of all the team members and those they would interact with, and then put into operation within a week. Review of six months of data after “Ob Stat Team” introduction revealed the time from team activation to delivery had a mean of 10.9+/- 4.0 minutes, with a range of four to 19 minutes. In a team activation for uterine rupture during a VBAC, delivery was within six minutes and 30 seconds from onset of bradycardia. A different approach to problem solving by a small team, followed by continual monitoring and adaptation of the “Ob Stat Team” dramatically improved response times to obstetric emergencies compared with other institutions (Catanzarite, Almryde, Bombard 2007).



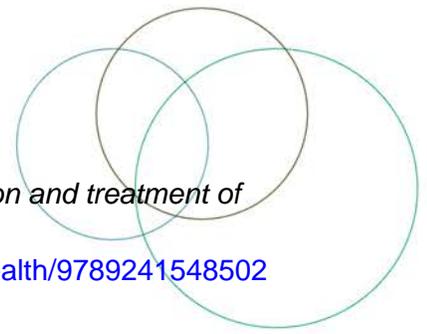


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[http://www.who.int/reproductivehealth/publications/maternal\\_perinatal\\_health/9789241548502/en/](http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/)

