The role of the anesthesiologist in the management of massive hemorrhage in obstetrics

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An UGLY obstetric DEATH…

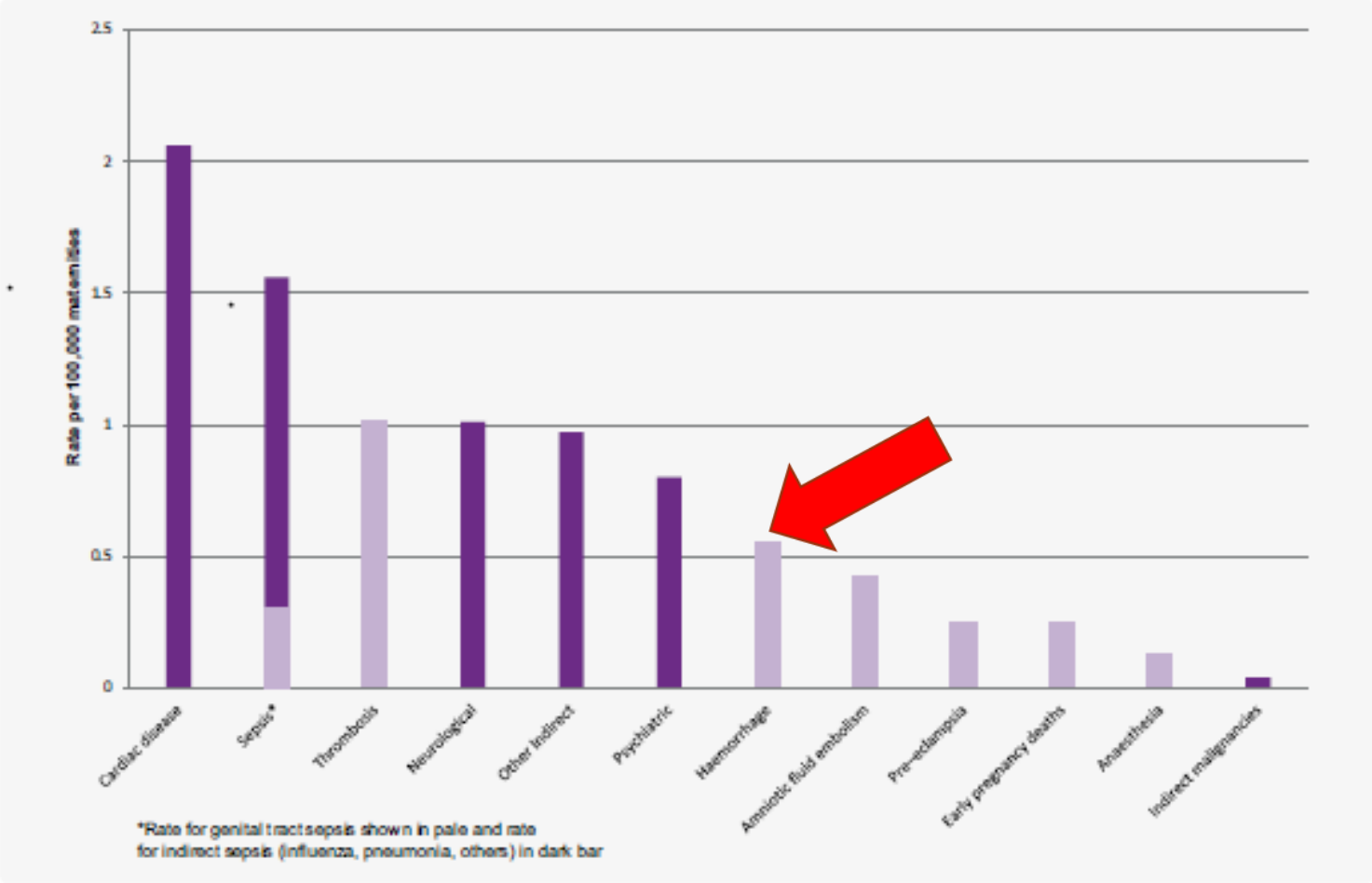
- 32 year old **foreign** parturient
- Went into labour at home
- Tried working out intricacies of accessing medical care with hubby over phone
- Decided to **extricate own baby**
- Failed and sent to hospital **exsanguinated** state
- Both baby and mother died in the process

Overview

- **Magnitude of problem**
- **Unexpected hemorrhage**
- **Expected hemorrhage**
- **Prevention**
- **New prevention strategies**

Maternal mortality by cause UK 2011-13

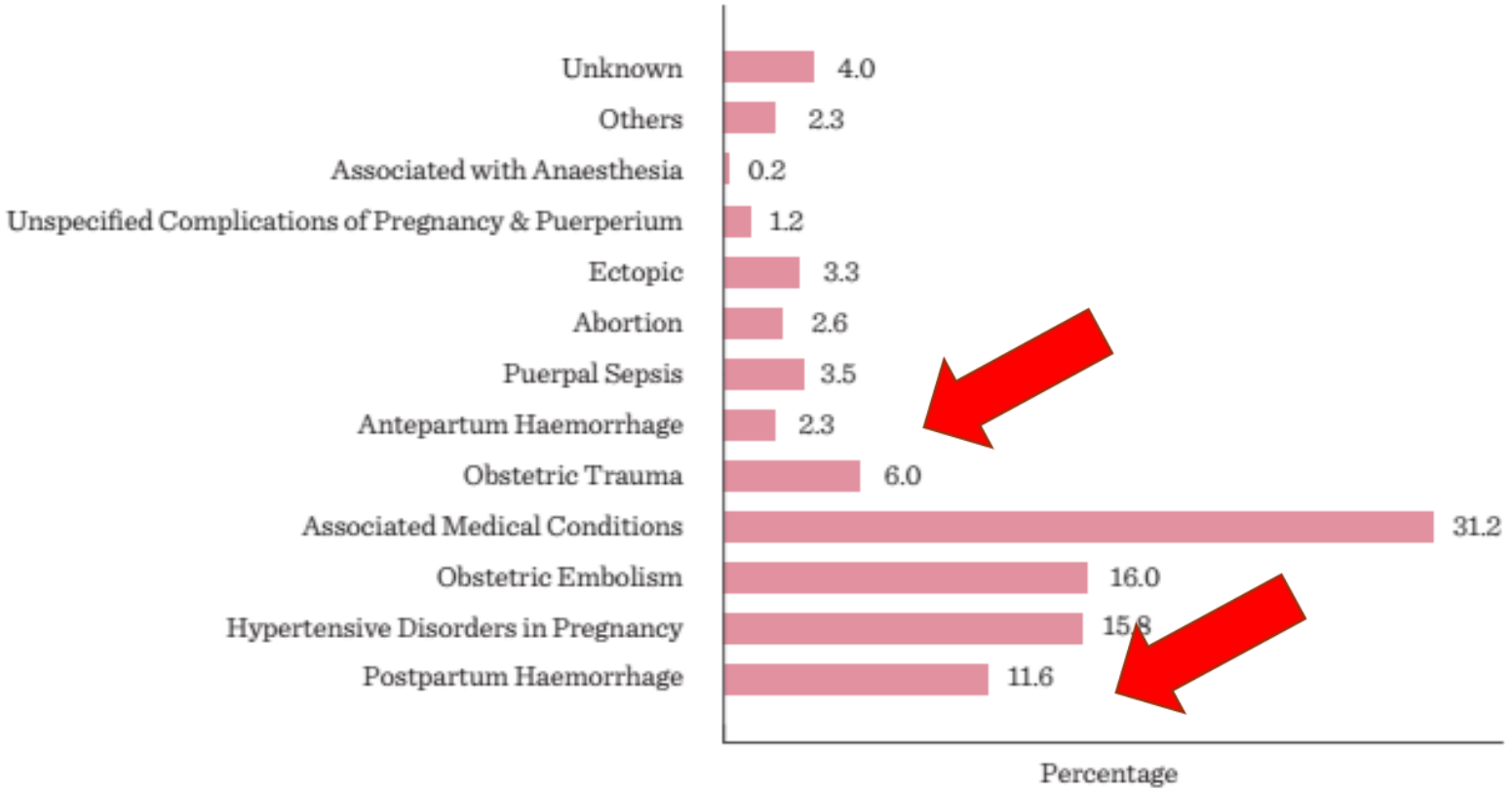
Figure 2.3: Maternal mortality by cause 2011-13



Dark bars indicate indirect causes of death, pale bars show direct causes of death; Source: MBRRACE-UK

Causes of maternal deaths, Malaysia(2009-11)

Fig. 1.2: Proportion of maternal deaths by causes for year 2009 to 2011



Trends over the years…

Table 1.4 Number of maternal deaths reported to the Enquiry by cause; United Kingdom 1985–2002*

Chapter	Cause	1985–87	1988–90	1991–93	1994–96	1997–99	2000–02
Direct deaths (occurring during pregnancy and up to and including 42 days inclusive after delivery)							
2	Thrombosis and thromboembolism	32	33	35	48	35	30
3	Hypertensive disease of pregnancy	27	27	20	20	15	14
4	Haemorrhage	10	22	15	12	7	17
5	Amniotic fluid embolism	9	11	10	17	8	5
6	Deaths in early pregnancy total	22	24	18	15	17	15
	Ectopic	16	15	8	12	13	11
	Spontaneous miscarriage	5	6	3	2	2	1
	Legal termination	1	3	5	1	2	3
	Other	0	0	2	0	0	0
7	Genital tract sepsis	6**	7**	9**	14***	14***	11***
8	Other *Direct* total	27	17	14	7	7	8
	Genital tract trauma	6	3	4	5	2	1
	Fatty liver	6	5	2	2	4	3
	Other	15	9	8	0	1	4
9	Anaesthetic	6	4	8	1	3	6
Total number of *Direct* deaths		139	145	128	134	106	106

Maternal deaths by PPH, Malaysia 2009-11 by place of delivery

Table 2.11: Number and percentage of maternal deaths from PPH by place of delivery

Place of delivery	2009		2010		2011	
	n	%	n	%	n	%
State Hospital	3	15	0	0	4	21.1
Hospital with obstetrician	4	20	2	18.2	4	21.1
Hospital without obstetrician	4	20	0	0	2	10.5
Private hospital with obstetrician	3	15	5	45.5	3	15.8
Enroute	1	5	0	0	0	0
Home	3	15	4	36.4	6	31.6
Health facility	2	10	0	0	0	0
Total	20	100	11	100	19	100

Mortality reports represent the tip of the ice-berg…

ICNARC Case Mix Prog Database UK (1995-2003)

Table 3

Prevalence of obstetric conditions in any of the four ICNARC Coding Method fields in the CMPD

ICNARC Coding Method condition	*n*	% of all obstetric admissions	Ultimate hospital mortality (*n* [%])
Peripartum or postpartum haemorrhage	553	29.1	3 (0.6)
Pre-eclampsia	347	18.2	7 (2.0)
HELLP syndrome	239	12.6	6 (2.6)
Eclampsia	141	7.4	5 (3.5)
Ectopic pregnancy	104	5.5	1 (1.0)
Intrauterine death	95	5.0	6 (6.3)
Antepartum haemorrhage	71	3.7	5 (7.2)
Infected retained products of conception	26	1.4	1 (3.8)
Amniotic fluid embolus	22	1.2	2 (9.1)
Septic abortion	18	0.9	2 (11.1)
Amnionitis	7	0.4	1 (16.7)
Molar pregnancy	4	0.2	1 (25.0)
Any obstetric condition	1496	78.7[a]	37 (2.5)

Note that the columns do not sum to the values in the 'Any obstetric condition' row because some admissions had more than one obstetric condition recorded in the four fields. [a]The remaining 406 obstetric admissions (21.3%) were identified from a partial obstetric code (234) or by the text field search (172). CMPD, Case Mix Programme Database; HELLP, haemolysis, elevated liver enzymes and low platelets; ICNARC, Intensive Care National Audit and Research Centre.

The causes of obstetric haemorrhage

- **T**one (uterine atony)
- **T**rauma (cervical and vagina tear)
- **T**issue (placenta praevia, accreta)
- **T**hrombin (coagulation disorder, abruptio)

Causes of obstetric haemorrhage

United Kingdom: 1985-2005.

Cause of Haemorrhage										
Triennium	Placental abruption	Placenta praevia	Postpartum haemorrhage	Total				Genital tract trauma*	Overall total	
	Number	Number	Number	Number	Rate	95 per cent	CI	Number	Number	Rate
1985-87	4	0	6	**10**	0.44	0.24	0.8	6	16	0.71
1985-87	6	5	11	**22**	0.93	0.62	1.4	3	25	1.06
1991-93	3	4	8	**15**	0.65	0.39	1.1	4	19	0.82
1994-96	4	3	5	**12**	0.55	0.31	1	5	17	0.77
1997-99	3	3	1	**7**	0.33	0.16	0.7	2	9	0.42
2000-02	3	4	10	**17**	0.85	0.53	1.4	1	18	0.90
2003-05	2	3	9	**14**	0.66	0.39	1.1	3	17	0.80

* Includes ruptured uterus. These deaths were discussed in a separate Chapter in previous Reports.

Causes of obstetric haemorrhage

Table 4.1 Direct deaths by type of obstetric haemorrhage 1994–2012

Time period	Placental Abruption	Placenta praevia	Postpartum haemorrhage		Total deaths from haemorrhage	Direct haemorrhage death rate per 100,000 maternities	
			Atony	Genital Tract Trauma		rate	CI
1994–06	4	3	5	5	17	0.77	0.45–1.24
1997–99	3	3	1	2	9	0.42	0.19–0.80
2000–02	3	4	10	1	18	0.9	0.53–1.42
2003–05	2	3	9	3	17	0.8	0.47–1.29
2006–08	2	2	3 +2	(0/2)	9	0.39	0.18–0.75
2009–12†	2	1*	7**	7***	17	0.49	0.29–0.78

†Figures for UK and Ireland. All ot[illegible]gures are UK only.

*One placenta praevia percret[illegible]

**Includes one woman who had a portion of retained placenta which contributed to the bleeding, and one who also sustained vaginal tears.

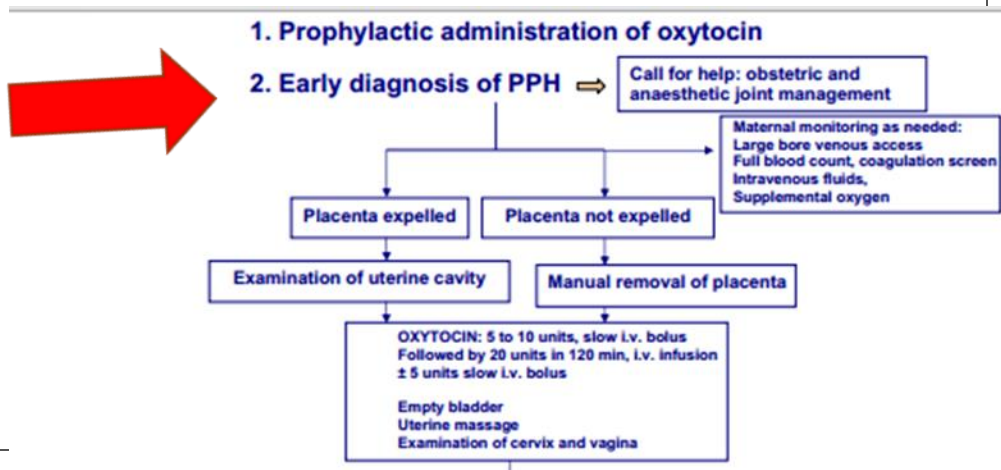
***there were four ruptured uteri, two others were lower genital tract trauma, and one had trauma sustained in the form of angle extensions at caesarean section

Why is obstetric haemorrhage a KILLER?

- **SUDDEN**
- **UNEXPECTED**
- **ASSOCIATEDCOAGULOPATHY**

Overall Management Plan

- **ALWAYS BE ON THE READY FOR EVENTUALITY**
- **Well trained staff – early recognition, do correct things and alert for help early**
- **Protocols, drills and facilities in place**
- **Educate patients of risks**



Prompt recognition, preparedness, proper management

Clinics in Perinatology
Volume 35, Issue 3, September 2008, Pages 531–547
Cesarean Delivery: Its Impact on the Mother and Newborn, Part II

Mechanisms of Hemostasis at Cesarean Delivery

Clarissa Bonanno, MD · , Sreedhar Gaddipati, MD

Available online 7 November 2008

Postpartum hemorrhage is an obstetric emergency that represents a major cause of maternal morbidity and mortality. With the recent rise in the cesarean delivery rate, prompt recognition and proper management at the time of cesarean delivery are becoming increasingly important for providers of obstetrics. Preparedness for hemorrhage can be achieved by recognition of prior risk factors and implementation of specific hemorrhage protocols. Medical and surgical therapies are available to treat obstetric hemorrhage after cesarean delivery.

Readiness with adequate facilities

Anaesthesia and Intensive Care

Home | Volume 33, Issue 6

Provision for major obstetric haemorrhage: an Australian and New Zealand survey and review

SJ Fowler

Wellington Hospital, Wellington, New Zealand

314 hospitals surveyed in 2005; 76.4% responded

Summary

Obstetric haemorrh … bidity. Maternal mortality a … ed outcome. The aim of this stud … alia and New Zealand that c … cilities, staffing, policies an … nd free comments. Respon … e hundred and nine units (45% … Of the 90 hospitals (38.1%) w … 121) had on-site intensive ca … of units (n=141) had a writt … ce-based guidelines. Haemo … blems is required. In our reg … es. Where facilities are limited …

36.1% without blood banks

50% had onsite ICU facilities

72.9% had onsite cardiac arrest team

58.8% had a written protocol to manage haemorrhage

Readiness with adequate facilities

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Frequency of Delays in obtaining blood products when needed
By Individual Respondents n (% by row)

Hospital Size: # Live Births (2005)	No Delay	No Blood Bank on-site	Lack of Pre-natal Record	Blood Bank hesitancy to release O-	Blood bank closed/off hours	Blood Bank is busy	Total
<1000 (33)	24 (73)	2 (6)	0 (0)	2 (6)	0 (0)	3 (9)	31 (94)
1001-3000 (121)	59 (49)	6 (5)	9 (7)	15 (12)	0 (0)	13 (11)	102 (84)
>3000 (86)	47 (55)	2 (2)	5 (6)	13 (15)	0 (0)	12 (14)	79 (92)
Total (240)	130 (54)	10 (4)	14 (6)	30 (12)	0 (0)	28 (12)	212* (88)

*n=28 Missing responses

Unexpected Haemorrhage

- Recognition and communication with team
- RA to GA (narcotics, less inhalational)
- Resuscitation, ABC, 100% oxygen
- More large bore IV access/ blood matched/ brought into OT, pressure infuser or rapid warm infuser
- Senior obstetrician/anesthesiologist to be brought into OT
- Uterotonic Drugs
- Recombinant Factor 7
- Post delivery care

General anaesthesia vs Regional

- **GA** preferred especially if high risk of bleeding as it will allow **better control** of situation by provider

Uterotonics

Syntometrine (syntocinon 5 units with ergometrine 500 mcg im)

Syntocinon 5 units repeated once if necessary

Followed by 30units/500mls infusion 125ml/h

Ergometrine: 0.5mg im. Give iv if bleeding continues and remains hypovolaemic. May cause hypertension and is relatively contraindicated in hypertensive conditions of pregnancy. High risk of vomiting.

Carboprost (Hemabate or prostaglandin F_{2a})

For uterine atony unresponsive to ergometrine or Syntocinon. Give 250mcg IM (not iv). May cause bronchospasm, flushing and hypertension.

Misoprostal 100mcg pr

Dr Kath Davies Specialist Registrar in Anaesthesia
Dr Matt Rucklidge Consultant Anaesthetist
Royal Devon and Exeter Hospital, UK

Anesthesia UK - World Anesthesia (Jan 2007)

Uterotonics: practical tips

Table 3 Postpartum haemorrhage at vaginal delivery: prevention practices (n = 896)

Prophylactic use of a uterotonic	418 (46.7)
Timing*	
before delivery of placenta	346 (82.7)
at anterior shoulder	127 (36.7)
after the birth	47 (11.2)
exact timing not specified	172 (41.1)
after delivery of placenta	69 (16.5)

Data are n(%).
*Data for three patients unavailable.

Incidence and management of postpartum haemorrhage following the dissemination of guidelines in a network of 16 maternity units in France

C. Dupont, S. Touzet, C. Colin, C. Deneux-Tharaux, M. Rabilloud, H.J. Clement, J. Lansac, M.H. Bouvier Colle, R.C. Rudigoz, on behalf of Groupe PITHAGORE 6

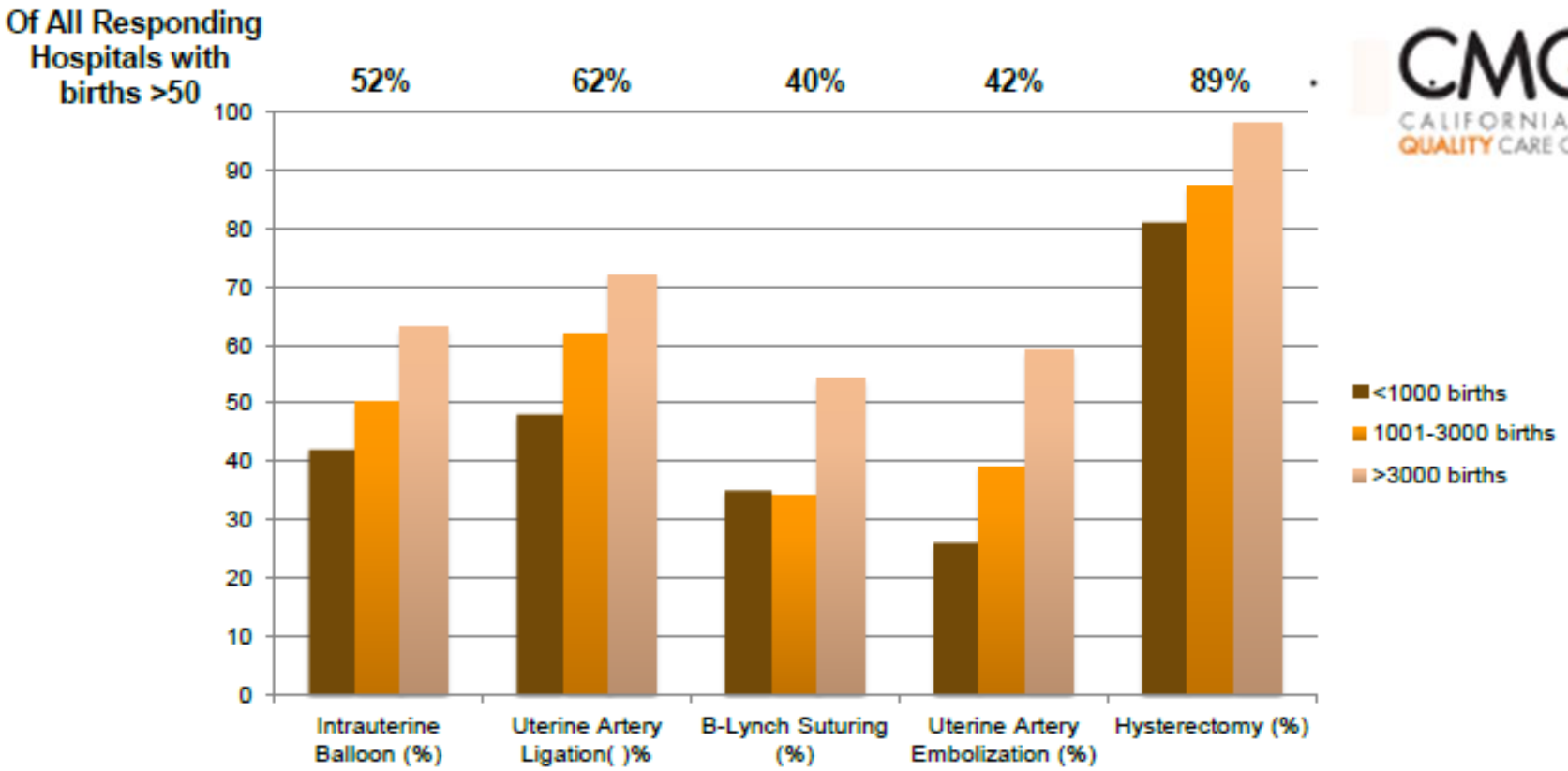
International Journal of Obstetric Anesthesia (2009) 18, 320–327
0959-289X/$ - see front matter
doi:10.1016/j.ijoa.2009.02.017

Uterotonic drugs work on the uterus – needs to be brought there by **GOOD blood flow** so administer this **EARLY at the time of delivery**…

Surgical/other interventional treatment

Availability of Invasive Treatments as Reported by Hospital

Response shown is % Yes; alternative responses: No, Unknown, and Missing are not shown



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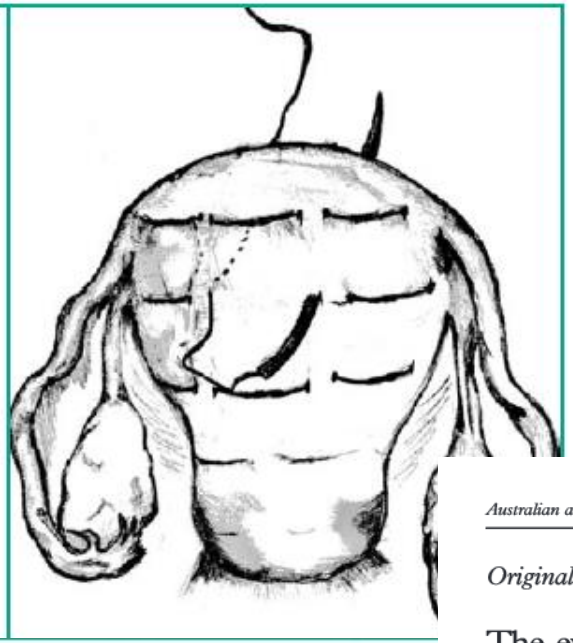
Surgical/other interventional treatment

Figure 5
Multiple U-suture. Reproduced with permission from Hackethal *et al.*[13]



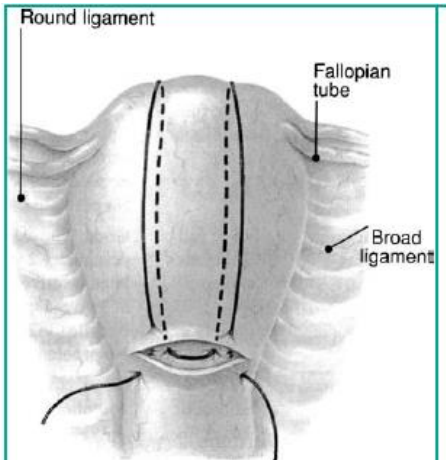
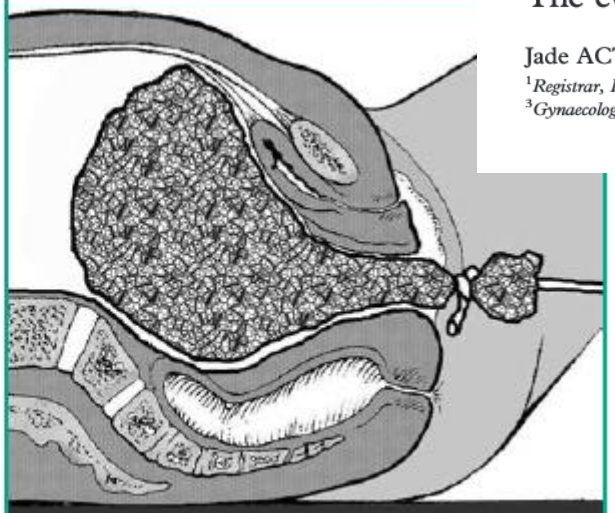


Figure 3
B-Lynch suture. Reproduced with permission from Lynch *et al.*[11]

re 8
ethotopulos pack[32]



Australian and New Zealand Journal of Obstetrics and Gynaecology 2013 DOI: 10.1111/ajo.12146

Original Article

The evolving role of a gynaecologic oncologist in a tertiary hospital

Jade ACTON,[1] Yee LEUNG,[2] Jason TAN[3] and Stuart SALFINGER[3]
[1]*Registrar, King Edward Memorial Hospital,* [2]*Head of Department of Gynaecologic Oncology, King Edward Memorial Hospital, and* [3]*Gynaecologic Oncologist, King Edward Memorial Hospital, Perth, WA, Australia*

surgeon familiar with this procedure, for example, a gynaecological oncologist or vascular surgeon.

Request for the help of a gynaecological oncologist

stabilise the situation and arterial embolisation can

Involving an obstetric anaesthetist early

CHAPTER 9
Anaesthesia
GRISELDA M COOPER and JOHN H McCLURE on behalf of the Editorial Board

Individual practitioners

Invasive monitoring via appropriate routes should be used, particularly when the cardiovascular system is compromised by haemorrhage or disease. Invasive central venous and arterial pressure measurement can provide vital information about the cardiovascular system. Samples for arterial blood gas estimation should be taken early and any metabolic acidosis should be taken seriously.

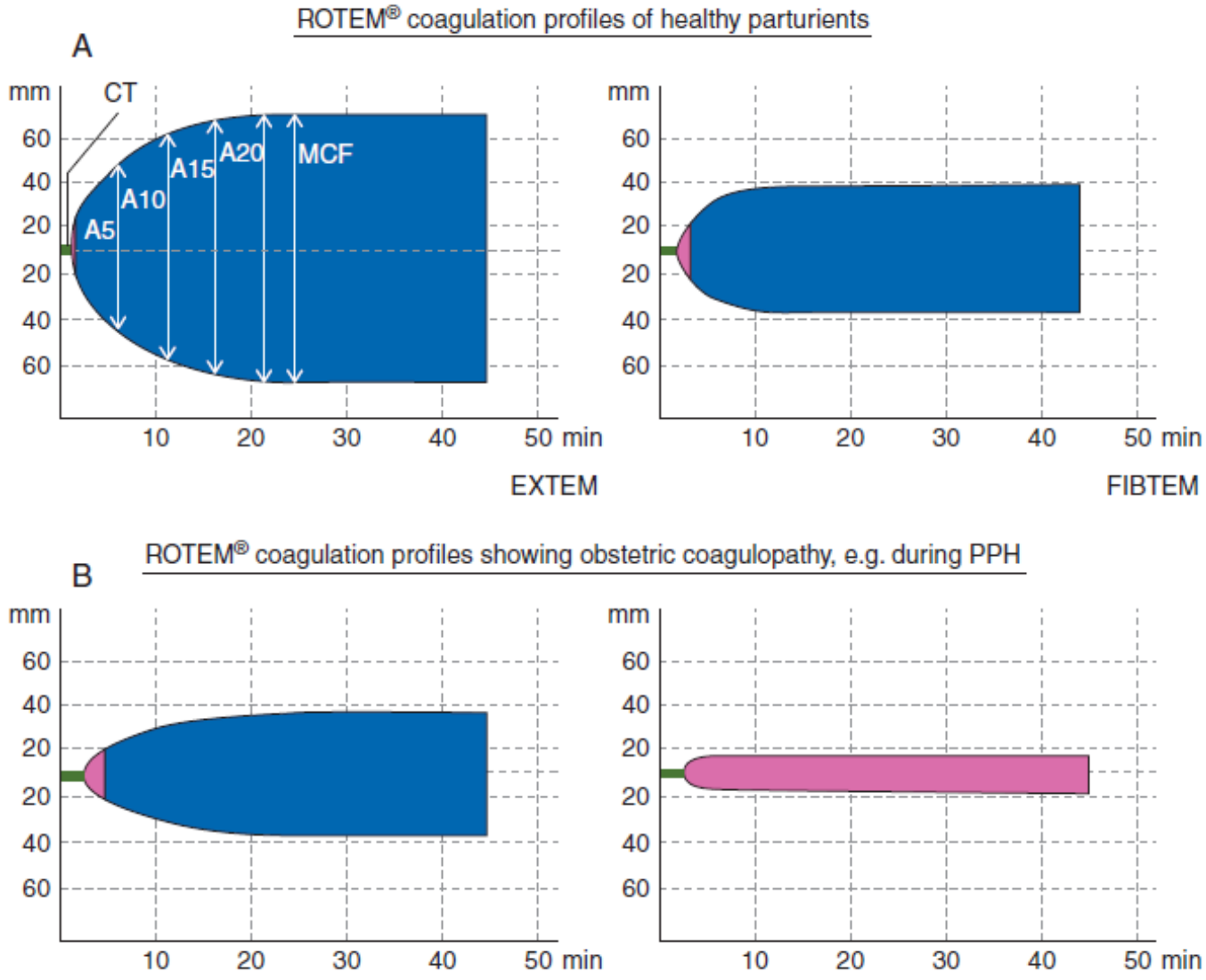
Care of women at high risk of, or with, major haemorrhage must involve a consultant obstetric anaesthetist at the earliest possible time.

Involve a consultant obstetric anaesthesiologist early

consultant to consultant help with the early

Women with suspected raised intracranial pressure require a full neurological assessment to help determine the optimal mode of delivery and type of anaesthesia or analgesia if required.

Monitoring- hemostasis



Monitoring-hemodynamic

CHAPTER 9
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Individual practitioners

Invasive monitoring via appropriate routes should be used, particularly when the cardiovascular system is compromised by haemorrhage or disease. Invasive central venous and arterial pressure measurement can provide vital information about the cardiovascular system. Samples for arterial blood gas estimation should be taken early and any metabolic acidosis should be taken seriously.

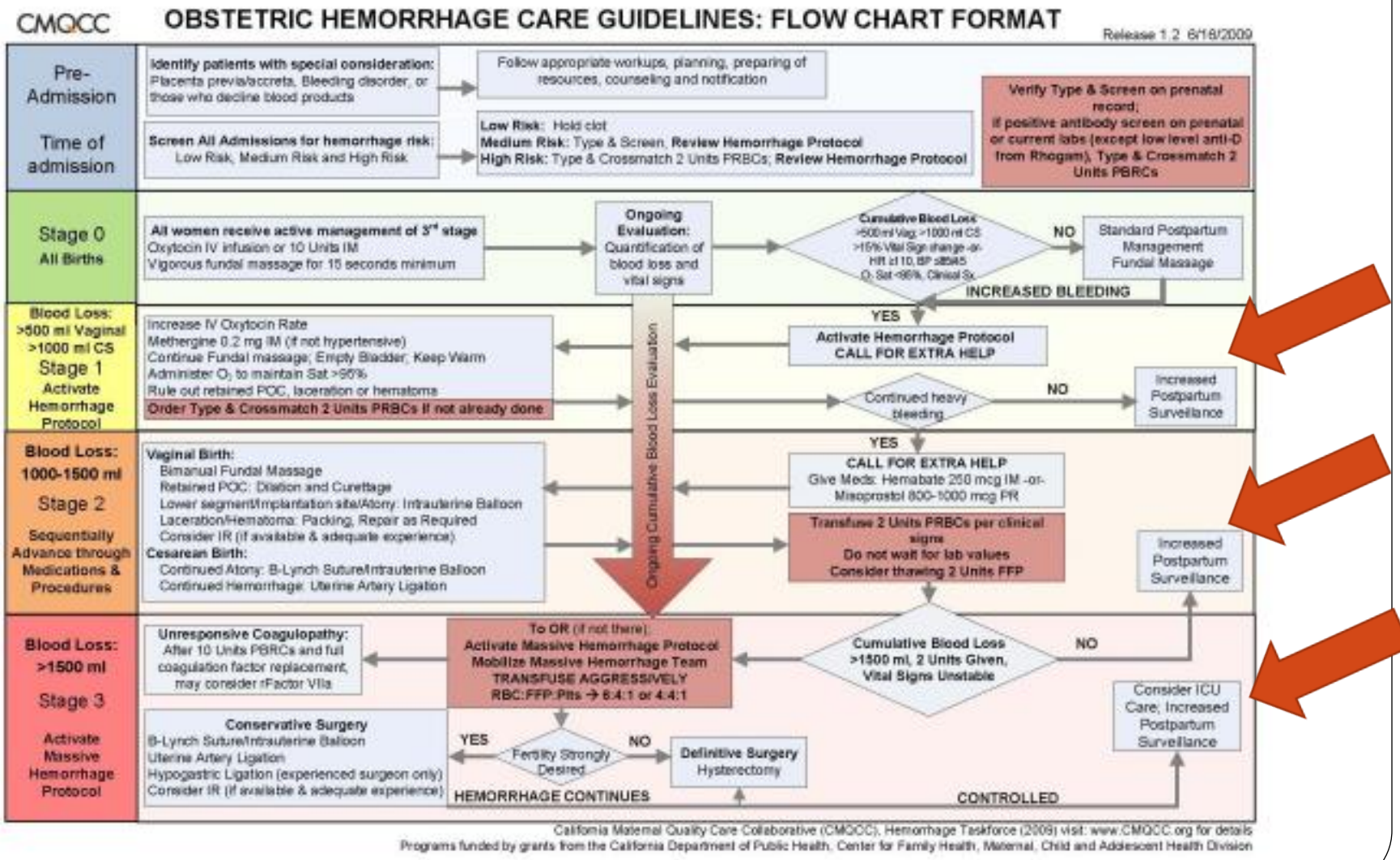
Care of women at high risk of, or with, major haemorrhage must involve a consultant obstetric anaesthetist at the earliest possible time.

Intensive care beds may not be available in an emergency. Early consultant to consultant referral is recommended to facilitate the creation of a bed and to help with the early institution of intensive therapy while awaiting bed availability.

Women with suspected raised intracranial pressure require a full neurological assessment to help determine the optimal mode of delivery and type of anaesthesia or analgesia if required.

Postoperative Care

- **Identify women at high risk** of postpartum haemorrhage;
- **Adhere to accepted nursing norms** in observing these postpartum women;
- Keep patients under **observation for longer in the labour wards**;
- **Ensure ongoing observations** once transferred to postnatal wards.



Use of recombinant activated factor FVIIa

Anesth Analg 2009;109(6):1908-15

Recombinant Activated Factor VII in Obstetric Hemorrhage: Experiences from the Australian and New Zealand Haemostasis Registry

Louise E. Phillips, PhD*
Claire McLintock, MBBS†
Wendy Pollock, PhD‡
Stephen Gatt, MD§
Philip Popham, MD‖
Gary Jankelowitz, MBBS¶
F
Peter

OBJECTIVE: Through the Australian and New Zealand Haemostasis Registry, we report on the Australian and New Zealand experience with recombinant activated factor VII (rFVIIa) in obstetric patients.

METHODS: The role of rFVIIa for off-label indications, including trauma, cardiac surgery, and severe postpartum hemorrhage, remains controversial. The Haemostasis Registry established by Monash University in Melbourne, Australia monitors off-label use of rFVIIa across Australia and New Zealand. The purpose of this study was to summarize Registry data for all obstetric hemorrhage patients treated with rFVIIa at participating hospitals between January 2002 and July 2008. The primary outcome measures were reduction or cessation of bleeding (positive therapeutic response), mortality, and hysterectomy rate.

RESULTS: During the study period, the Registry received data for 2128 patients. This

Median interquartile range individual doses of 92 mcg/kg

78% received only single dose

21% required hysterectomy after rFV11a therapy

2 thromboembolic event (1 PE & 1 DVT)

Use of recombinant activated factor FVIIa

Anesth Analg 2009;109(6):1908-15

Table 1. Primary Obstetric Cause of Hemorrhage for Cases Received by the Australian and New Zealand Haemostasis Registry

	No. (%) of patients	No. of deaths
Total[a]	105 (100)	9
Uterine atony	19 (18)	1
Uterine rupture	3 (3)	
Placenta accreta/percreta	17 (16)	
Placental abruption	9 (9)	1
Placenta previa	13 (12)	2
Preeclampsia/eclampsia	6 (6)	1
Intrauterine fetal death	9 (9)	1
Acute fatty liver of pregnancy	3 (3)	
Amniotic fluid embolism	3 (3)	1
Retained products of conception	4 (4)	
Obstetric injury	4 (4)	
No identifiable cause of hemorrhage	5 (5)	
Other[b]	10 (10)	2

[a] Five cases excluded where use of recombinant activated factor VII (rFVIIa) was for prophylaxis.

[b] Includes aortic dissection (1), severe Systemic Lupus Erythematosus and thrombophilia (1), sepsis (1), splenic artery aneurysm (1), bladder rupture (1), cord prolapse (1), broad ligament hematoma (1), uterine fibroids (1), congenital macrothrombocytopenia (1), pulseless electrical activity due to pulmonary embolus (1).

Expected hemorrhage

- Plan A
- Plan B

BS1-04442C © Charly Franklin • VCL

Recognize those who are likely to bleed and have plans for them…

Al-Zirqi I, Vangen S, Forsen L, Stray-Pedersen B. Prevalence and risk factors of severe obstetric haemorrhage.

BJOG 2008;115:1265–1272.

Risk factor	Number (%)	Percentage with severe haemorrhage	Adjusted OR (95% CI), multivariate*
Medical factors			
Cardiac disease	1489 (0.50)	1.10	1.50 (1.02–2.18)
Von Willebrand's disease	65 (0.02)	4.60	3.31 (1.01–10.85)
Pregnancy/labour factors			
Multiple pregnancies	6361 (2.10)	3.40	2.34 (2.02–2.70)
Anaemia (haemoglobin <9 g/dl)	1445 (0.50)	2.70	2.20 (1.63–3.15)
Previous caesarean delivery	15 811 (5.14)	2.30	1.46 (1.02–2.20)
HELLP syndrome	514 (0.20)	4.10	1.88 (1.15–2.84)
Induction of labour	33 228 (10.80)	1.90	1.60 (1.46–1.75)
Prolonged labour	20 301 (6.60)	2.40	1.14 (1.02–1.29)
Birth weight ≥4.5 kg	14 490 (4.71)	2.30	1.93 (1.71–2.17)
Mode of delivery			
Normal vaginal (reference)	238 393 (77.50)	0.80	1
Forceps	3465 (1.12)	1.70	1.87 (1.40–2.42)
Vacuum	19 436 (6.32)	1.70	1.83 (1.56–2.07)
Elective caesarean section	162 68 (5.30)	2.20	2.47 (2.18–2.80)
Emergency caesarean section	26 099 (8.50)	3.40	3.61 (3.28–3.9
Assisted breech	3754 (1.22)	0.80	0.95 (0.60–1.39)

Risk of placenta praevia and accreta versus previous LSCS

Risk of placenta praevia

No previous scar – 0.44%

With previous scar – 2.54%

European Journal of Obstetrics & Gynecology and Reproductive Biology

Volume 52, Issue 3, 30 December 1993, Pages 151-156

Placenta praevia and accreta after previous caesarean section

Sisir K. Chattopadhyay, Hessa Kharif, Mariam M. Sherbeeni

A prospective study was undertaken to determine the relationship between previous caesarean section (CS), placenta praevia and placenta praevia accreta. Of 41 206 evious caesarean section and 222 had ıta praevia, 175 occurred in the uterus and 47 aevia complicated 2.54% of cases with a ith 0.44% of cases with no scar — a 5-fold ia occurring with a previous scar, 18 were) compared with only 8 (4.5%) in unscarred nta praevia was complicated by accreta in was 59.2%. The risk of hysterectomy with 0% but with placenta praevia accreta it was he placenta praevia accreta group.

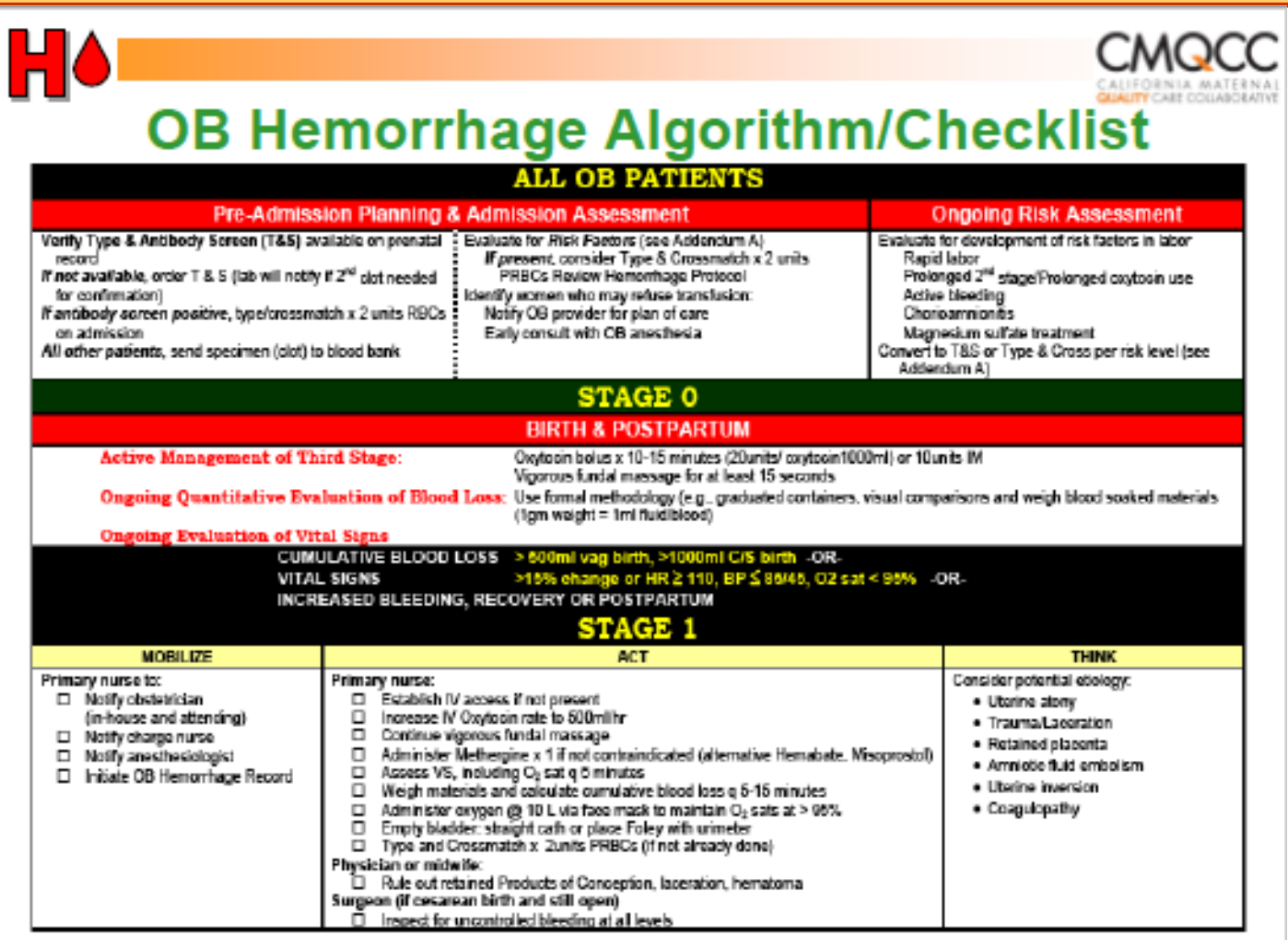
Risk of placenta accreta in placenta praevia

No previous scar - 4.5%

With previous LSCS – 38.2%

With 1 LSCS – 10%; >2 or more – 59.2%

Algorithm in place



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OB Hemorrhage Algorithm/Checklist

ALL OB PATIENTS

Pre-Admission Planning & Admission Assessment

Verify Type & Antibody Screen (T&S) available on prenatal record
If not available, order T & S (lab will notify if 2nd clot needed for confirmation)
If antibody screen positive, type/crossmatch x 2 units RBCs on admission
All other patients, send specimen (clot) to blood bank

Evaluate for *Risk Factors* (see Addendum A)
If present, consider Type & Crossmatch x 2 units
PRBCs Review Hemorrhage Protocol
Identify women who may refuse transfusion:
Notify OB provider for plan of care
Early consult with OB anesthesia

Ongoing Risk Assessment

Evaluate for development of risk factors in labor
Rapid labor
Prolonged 2nd stage/Prolonged oxytocin use
Active bleeding
Chorioamnionitis
Magnesium sulfate treatment
Convert to T&S or Type & Cross per risk level (see Addendum A)

STAGE 0

BIRTH & POSTPARTUM

Active Management of Third Stage: Oxytocin bolus x 10-15 minutes (20units/ oxytocin1000ml) or 10units IM
Vigorous fundal massage for at least 15 seconds

Ongoing Quantitative Evaluation of Blood Loss: Use formal methodology (e.g., graduated containers, visual comparisons and weigh blood soaked materials (1gm weight = 1ml fluid/blood)

Ongoing Evaluation of Vital Signs

CUMULATIVE BLOOD LOSS >500ml vag birth, >1000ml C/S birth -OR-
VITAL SIGNS >15% change or HR ≥ 110, BP ≤ 80/45, O2 sat < 95% -OR-
INCREASED BLEEDING, RECOVERY OR POSTPARTUM

STAGE 1

MOBILIZE

Primary nurse to:
- ☐ Notify obstetrician (in-house and attending)
- ☐ Notify charge nurse
- ☐ Notify anesthesiologist
- ☐ Initiate OB Hemorrhage Record

ACT

Primary nurse:
- ☐ Establish IV access if not present
- ☐ Increase IV Oxytocin rate to 500ml/hr
- ☐ Continue vigorous fundal massage
- ☐ Administer Methergine x 1 if not contraindicated (alternative Hemabate, Misoprostol)
- ☐ Assess VS, including O_2 sat q 5 minutes
- ☐ Weigh materials and calculate cumulative blood loss q 5-15 minutes
- ☐ Administer oxygen @ 10 L via face mask to maintain O_2 sats at > 95%
- ☐ Empty bladder: straight cath or place Foley with urimeter
- ☐ Type and Crossmatch x 2units PRBCs (if not already done)

Physician or midwife:
- ☐ Rule out retained Products of Conception, laceration, hematoma

Surgeon (if cesarean birth and still open)
- ☐ Inspect for uncontrolled bleeding at all levels

THINK

Consider potential etiology:
- Uterine atony
- Trauma/Laceration
- Retained placenta
- Amniotic fluid embolism
- Uterine inversion
- Coagulopathy

GA versus RA to reduce blood loss

Table 2. Anesthetic and operative management

	General group ($n = 12$)	Epidural group ($n = 13$)
Operating time (min)	60.4 ± 10.4	70.2 ± 15.2
Incision-delivery time (min)	5.8 ± 1.5	6.0 ± 1.7
Estimated blood loss (mL)		
All patients	1623 ± 775	1418 ± 996
Posterior placenta	1459 ± 672	1269 ± 760
Anterior placenta	2094 ± 872	1000
Lateral placenta	880	2375 ± 2114
Collected amniotic fluid (mL)	329 ± 108	292 ± 103
Administered fluid (mL)	2042 ± 485	2218 ± 787
Postoperative transfusion (unit)	1.08 ± 1.6	0.38 ± 0.9*
Urine output (mL)	118 ± 73.6	153 ± 127
Ephedrine (mg)	0	5.4 ± 8.8*
Apgar score (1 min)	8 (4–9)	8 (7–9)
Apgar score (5 min)	10 (6–10)	9 (9–10)

Values are mean ± SD or median (range).
* $P < 0.05$ compared to the general group.

International Journal of Obstetric Anesthesia (2003) 12, 12–16

Comparison of general and epidural anesthesia in elective cesarean section for placenta previa totalis: maternal hemodynamics, blood loss and neonatal outcome

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Prevention

BS1-04553C © O'Brien & Mayor Photography • VCL

Women who refuse blood products

CARE PLAN FOR WOMEN IN LABOUR REFUSING A BLOOD TRANSFUSION

(as referred to in the RCOG News (October 2000) of the Royal College of Obstetricians and Gynaecologists)

Please ensure that the consultant obstetrician is aware a Jehovah's Witness is being admitted in labour.

All such patients should have the third stage of labour actively managed with oxytocic drugs together with early cord clamping and controlled cord traction after placental separation. Do not leave the patient alone for the first hour after delivery.

Risk factors predisposing to postpartum haemorrhage
If the patient has any of the risk factors below, an IV infusion of Syntocinon should be considered after delivery of the baby

- Previous history of bleeding, post or antepartum haemorrhage
- Large baby (>3.5kg)
- Prolonged labour (especially when augmented with syntocinon
- Polyhydramnios
- Multiple pregnancy and/or $\geq$ 4 children
- Difficult operative delivery

Women who refuse blood products

Women who refused blood products

Two women who died from haemorrhage declined blood transfusion due to their religious beliefs. This was their free choice. However, it is almost certain that if they had received blood products they would have survived. One other woman who refused blood products died of an amniotic fluid embolus and her case is counted and discussed in Chapter 5. Despite their care being generally of a high standard, there are some general points in the care of these women that need to be re-emphasised:

- Consultant obstetric and anaesthetic involvement is necessary during the antenatal period in order to develop a care plan together with the woman, her husband and family, and, if necessary, religious advisors, should any difficulty occur.
- Informed consent for red blood cell salvage during surgery and infusion of salvaged blood should be sought and clearly recorded in the case notes. This facility should be provided for all women who give consent
- All women wh
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Consultant Obstetrician & Anaesthetist aware of wish

Red cell salvage offered as alternative

Consultants in attendance at time of delivery

Drills and Simulations…

Importance of Drills / Simulations

Safety and QI Leader: Paul Preston, MD

"Medicine is the last high-risk industry that expects people to perform perfectly in complex, rare emergencies but does not support them with high-quality training and practice throughout their careers."

"Certain individual and team skills require regular practice that cannot ethically occur in routine care."

Use of new strategies

Bloodless trilogy? Anesthesia, obstetrics and interventional radiology for cesarean delivery

International Journal of Obstetric Anesthesia (2010) **19**, 131–132

Use of cell saver in obstetrics

Indication	Total number of patients	Number where processed blood was returned
Placenta praevia	10	4
Fibroids	7	3
Low pre-operative haemoglobin	7	3
Previous post partum haemorrhage	5	2
Intraoperative bleeding	5	5
Multiple repeat caesarean section	5	2
Twins	5	2
High body mass index	3	1
Caesarean section at full dilatation	3	0
Pregnancy induced hypertension	2	0
Transfusion refusal	2	2
Ante partum haemorrhage	2	0
Suspected placental abruption	1	0
Adhesions	1	0
Low platelet count	1	1

Introduction of cell salvage to a large obstetric unit: the first six months

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International Journal of Obstetric Anesthesia (2009) **18**, 111–117

ABSTRACT

Background: We introduced red-cell salvage to our obstetric unit following a two-month period of training and education. We report a service evaluation of the first six months of activity from May to October 2007.

Methods: The indications for using cell salvage were: placenta praevia, suspected placental abruption, multiple pregnancy, multiple repeat caesarean, previous history of post partum haemorrhage, refusal of blood transfusion, caesarean section at full dilatation, low preoperative haemoglobin and at the discretion of the theatre team.

Results: The cell saver was used for 46 patients with a blood loss (median; range) of 800 (200–2000) mL and a heterologous transfusion rate of 22% (10 cases). Blood was processed and returned in 19 cases of which nine were emergency and 10 elective. The median volume (range) of blood returned was 390 (200–800) mL. For the unit as a whole the percentage of all theatre cases who received a heterologous transfusion fell from 10.2% for the equivalent time period in the preceding year to 7.9% during the six month period that cell salvage was in use ($P = 0.126$, χ^2). There were no adverse reactions following the administration of processed blood.

Conclusion: We have successfully introduced cell salvage to our unit in a relatively short period of time and have used it for the largest series of patients reported in the UK.

Keywords: Cell salvage; Obstetric haemorrhage; Caesarean section; Autologous transfusion

Use of AUDIT to improve…

Al-Zirqi I, Vangen S, Forsen L, Stray-Pedersen B. Prevalence and risk factors of severe obstetric haemorrhage.

BJOG 2008;115:1265–1272.

Table 1. Causes of severe obstetric haemorrhage (>1500 ml) in Norway, 1999–2004

Cause	Number	Percentage
Uterine atony*	1054	30.10
Retained placenta or placental fragments	664	18.97
Trauma**	488	13.94
Placental abruption	105	3.00
Placenta praevia	88	2.51
Coagulopathy	24	0.68
Not identified	1078	30.79
Total	3501	100.00

Risk factor	Number (%)	Percentage with severe haemorrhage	Adjusted OR (95% CI), multivariate*
Medical factors			
Cardiac disease	1489 (0.50)	1.10	1.50 (1.02–2.18)
Von Willebrand's disease	65 (0.02)	4.60	3.31 (1.01–10.85)
Pregnancy/labour factors			
Multiple pregnancies	6361 (2.10)	3.40	2.34 (2.02–2.70)
Anaemia (haemoglobin <9 g/dl)	1445 (0.50)	2.70	2.20 (1.63–3.15)
Previous caesarean delivery	15 811 (5.14)	2.30	1.46 (1.02–2.20)
HELLP syndrome	514 (0.20)	4.10	1.88 (1.15–2.84)
Induction of labour	33 228 (10.80)	1.90	1.60 (1.46–1.75)
Prolonged labour	20 301 (6.60)	2.40	1.14 (1.02–1.29)
Birth weight ≥4.5 kg	14 490 (4.71)	2.30	1.93 (1.71–2.17)
Mode of delivery			
Normal vaginal (reference)	238 393 (77.50)	0.80	1
Forceps	3465 (1.12)	1.70	1.87 (1.40–2.42)
Vacuum	19 436 (6.32)	1.70	1.83 (1.56–2.07)
Elective caesarean section	162 68 (5.30)	2.20	2.47 (2.18–2.80)
Emergency caesarean section	26 099 (8.50)	3.40	3.61 (3.28–3.95)
Assisted breech	3754 (1.22)	0.80	0.95 (0.60–1.39)

Use of AUDIT to improve…

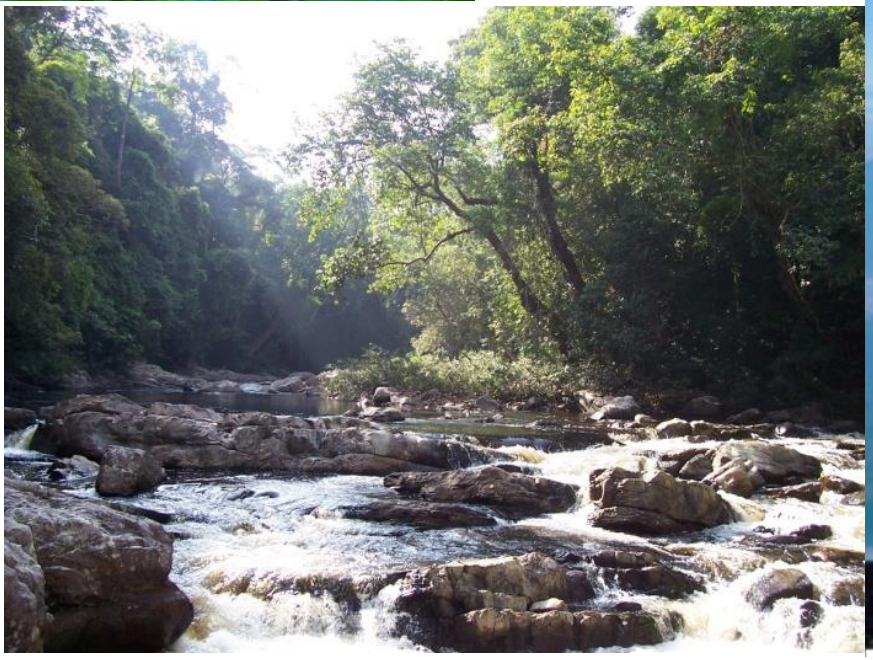
Issues with Hemorrhage Response in Obstetrics (from case reviews)

- Denial, Delay…
- Poor quantification of blood loss
- Lack of step-wise progression
- Underutilization of non-pharmacologic approaches
- Poor utilization of blood products
  - "Too little, too late"—Resuscitation v. Treatment
  - "Old wine in new bottles"—"Whole blood" v. PRBCs
- Communications!

Summary

- Obs Haemorrhage is preventable
- Upgrade levels of care – drills,protocols
- Recognize early –refer consultant
- Plan, plan, plan whether elective or emergency
- Monitoring- intra and post op to detect problems early

Thank you



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