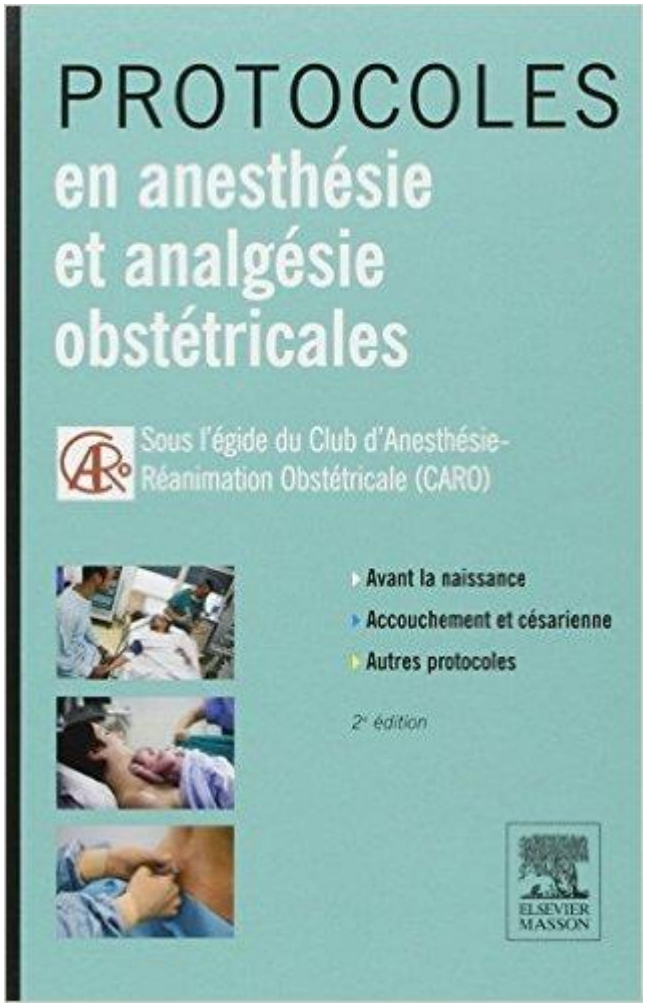
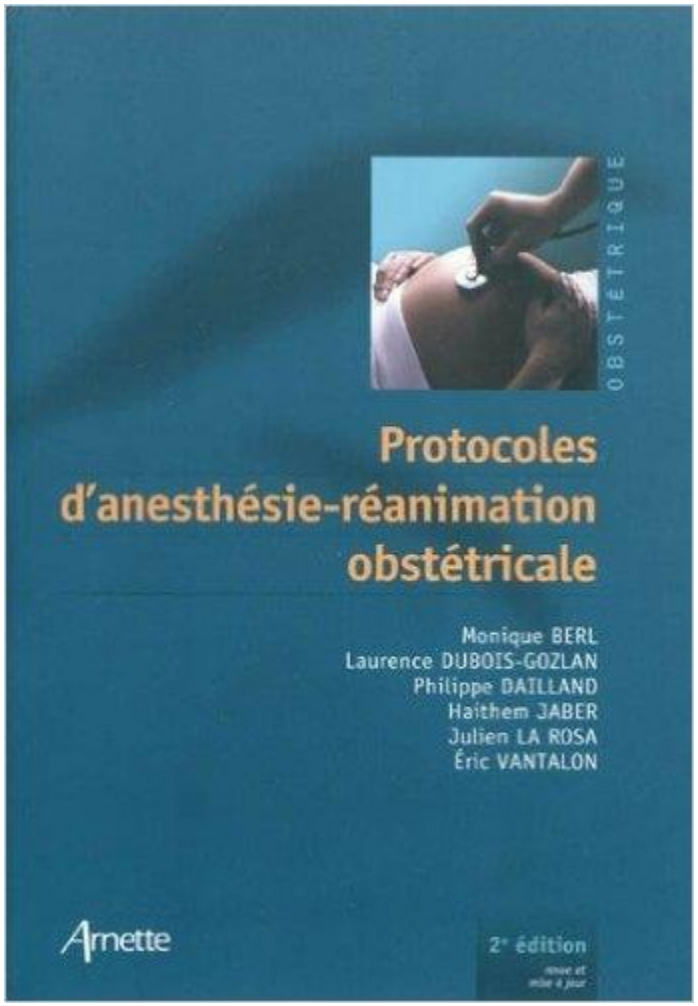
What's up, Doc?

Ruxandra Copotoiu
Strasbourg, France


PROTOCOLES
en anesthésie
et analgésie
obstétricales
Sous l'égide du Club d'Anesthésie-
Réanimation Obstétricale (CARO)
Avant la naissance
Accouchement et césarienne
Autres protocoles
2e édition
ELSEVIER
MASSON


OBSTÉTRIQUE
Protocoles
d'anesthésie-réanimation
obstétricale
Monique BERL
Laurence DUBOIS-GOZLAN
Philippe DAILLAND
Haithem JABER
Julien LA ROSA
Éric VANTALON
Arnette
2e édition

Maternal morbidity and mortality

Key messages from the report

MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

Maternal deaths have decreased

from **11** (2006-08) to **10** (2010-12) per 100,000 women giving birth

Causes of mothers' deaths

Two thirds of mothers died from medical and mental health problems in pregnancy and **only one third** from direct complications of pregnancy such as bleeding.

Three quarters of women who died had medical or mental health problems before they became pregnant.

Women with pre-existing medical and mental health problems need:

- Pre-pregnancy advice
- Joint specialist and maternity care

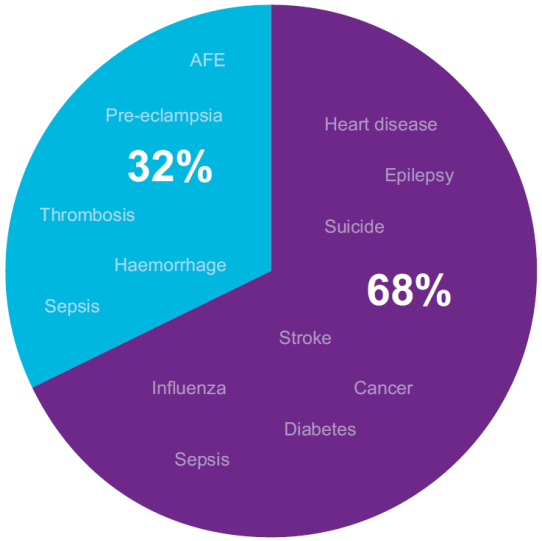
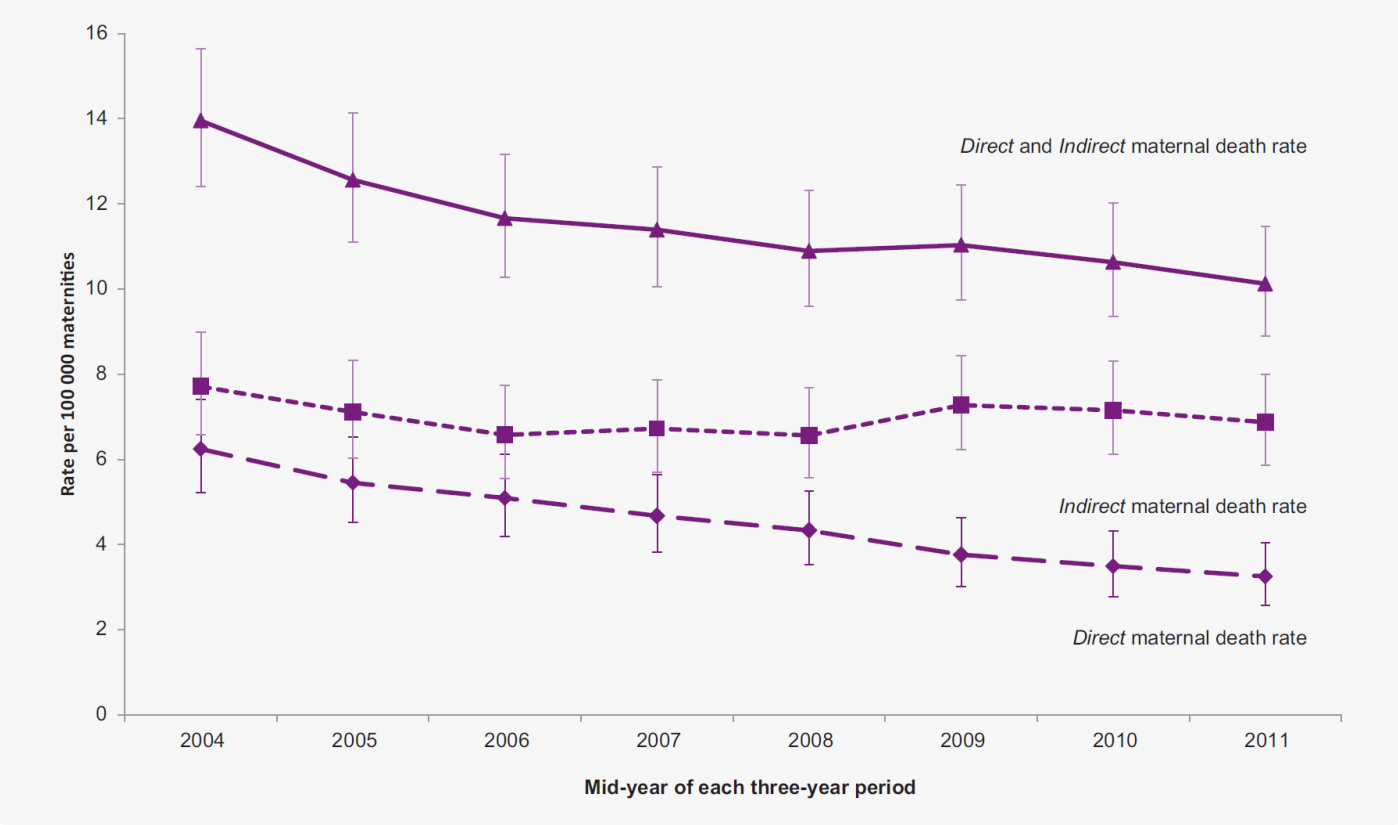
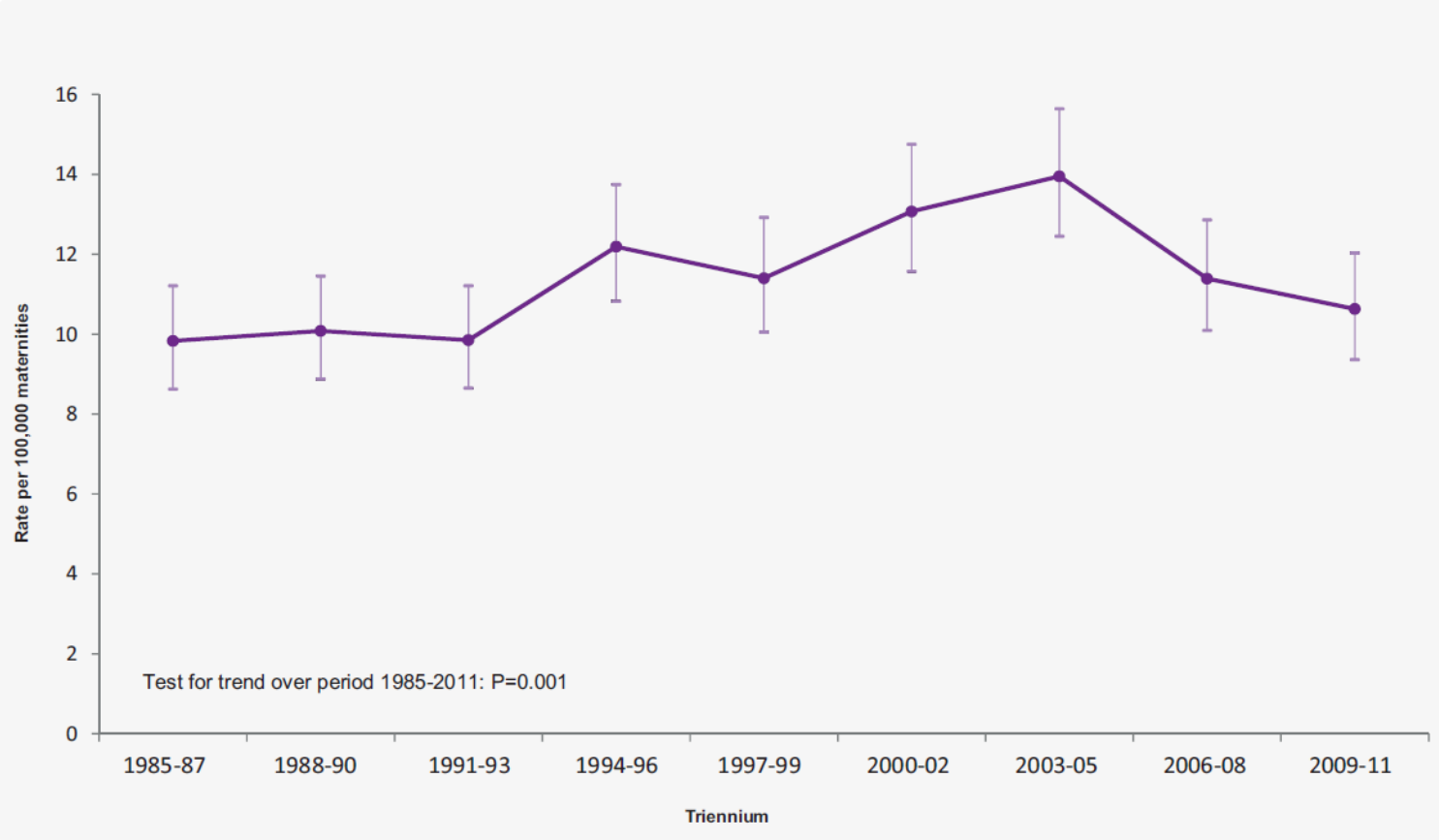


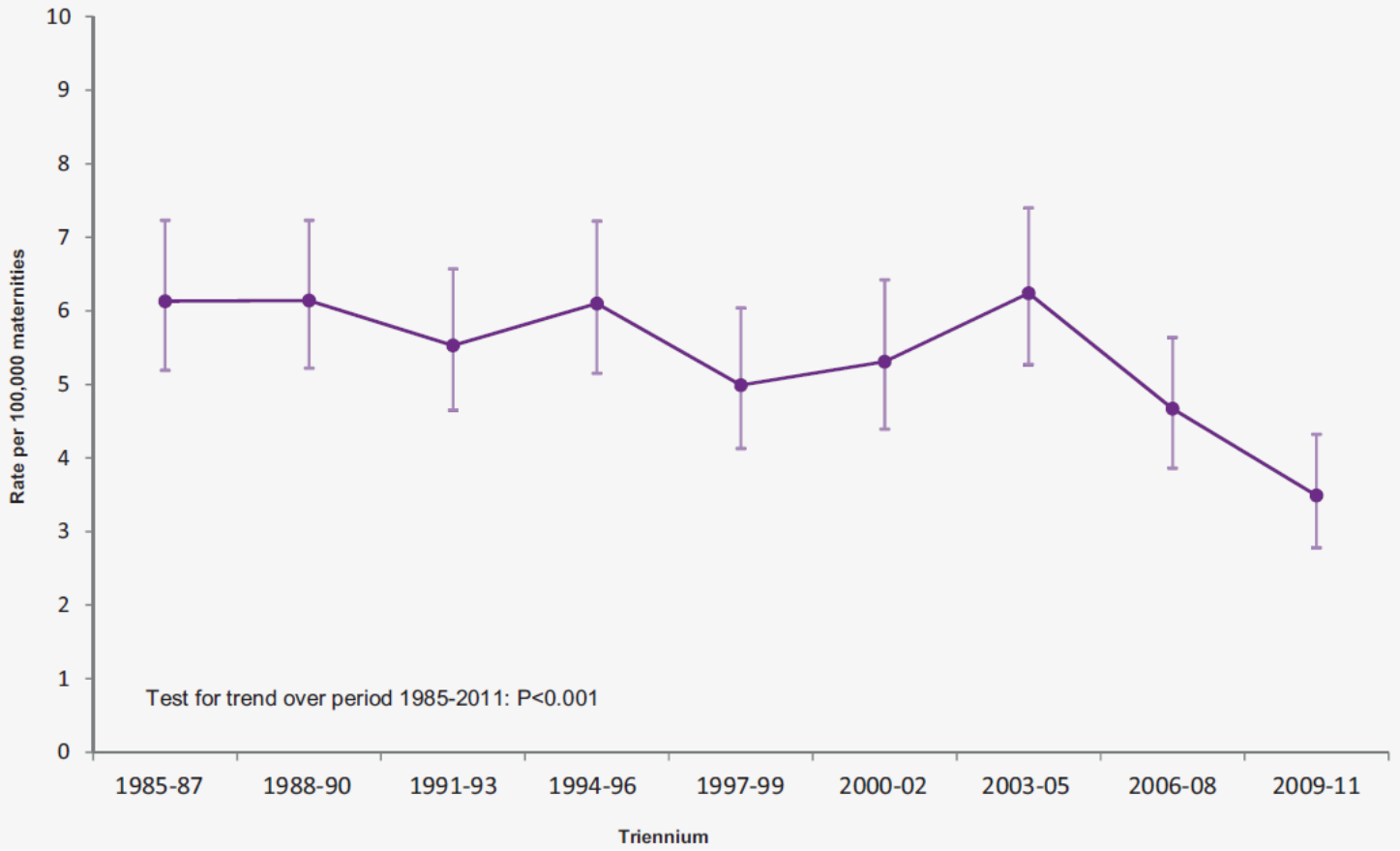
Figure 2.1: *Direct* and *Indirect* maternal mortality rates per 100 000 maternities; rolling three year average rates 2003–12



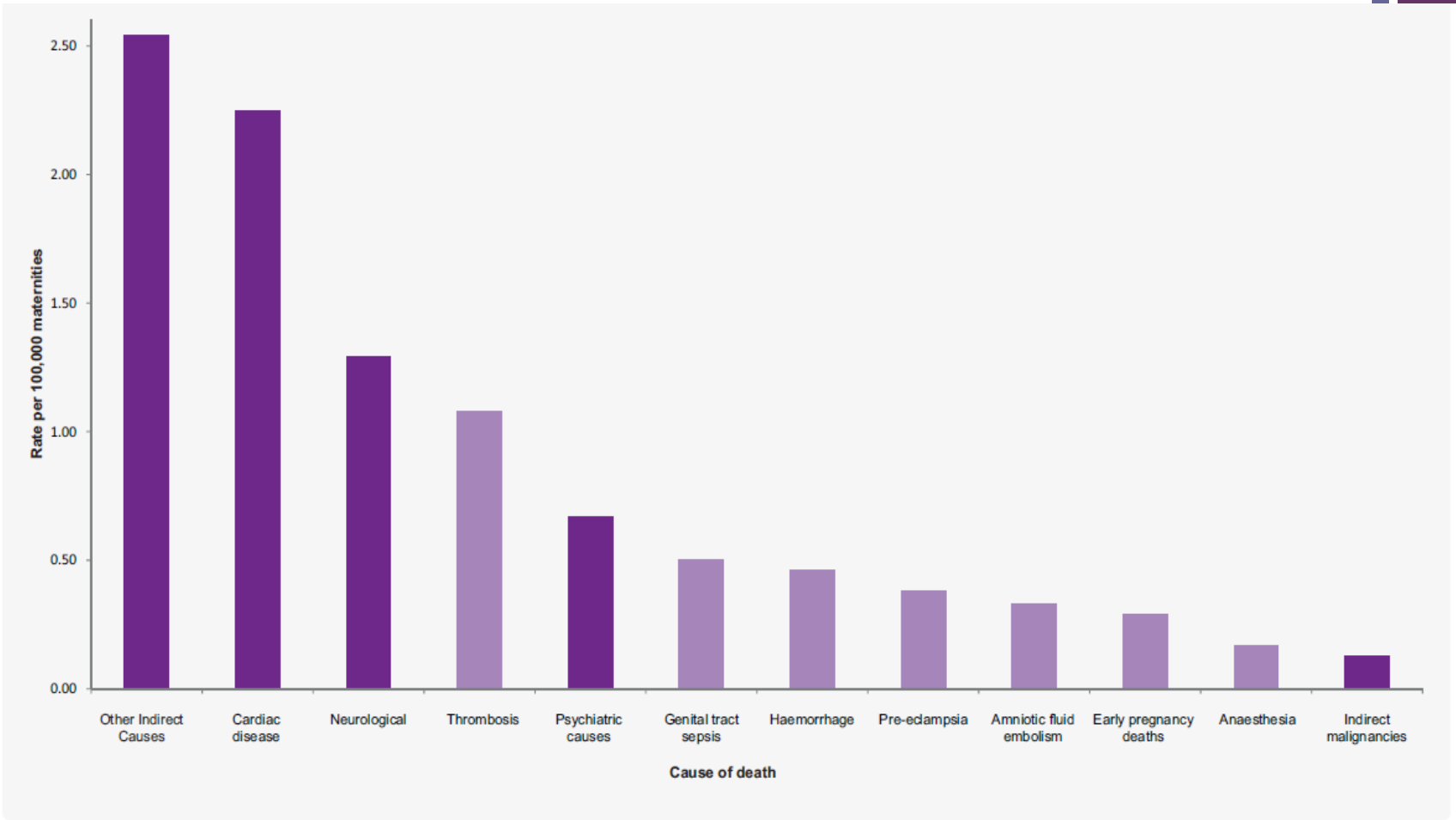
Direct mother mortality



Indirect mother mortality

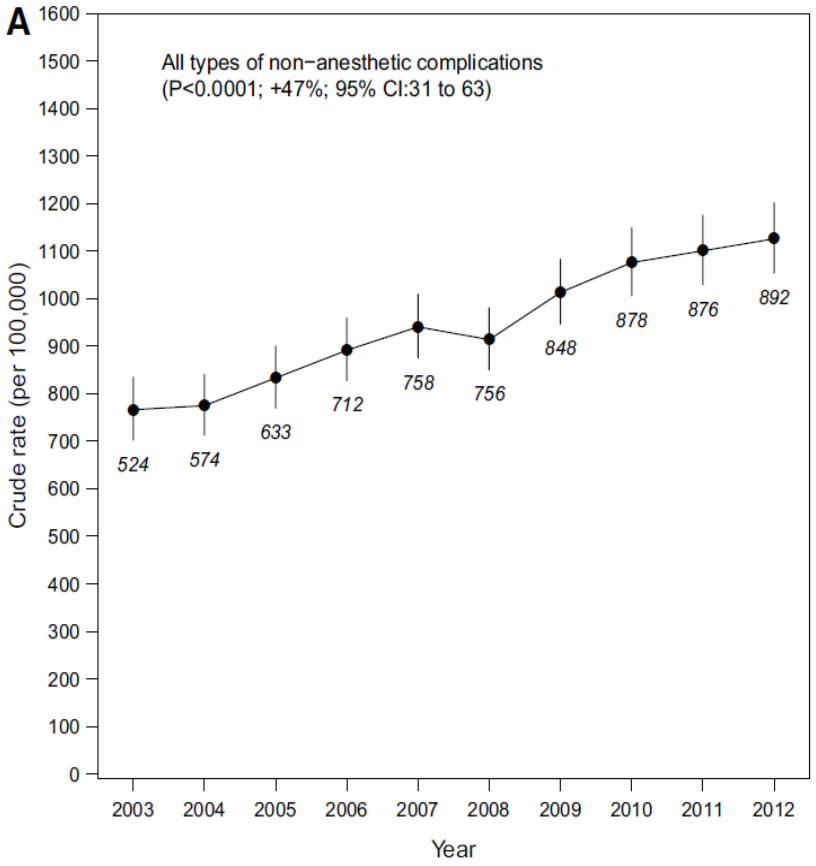


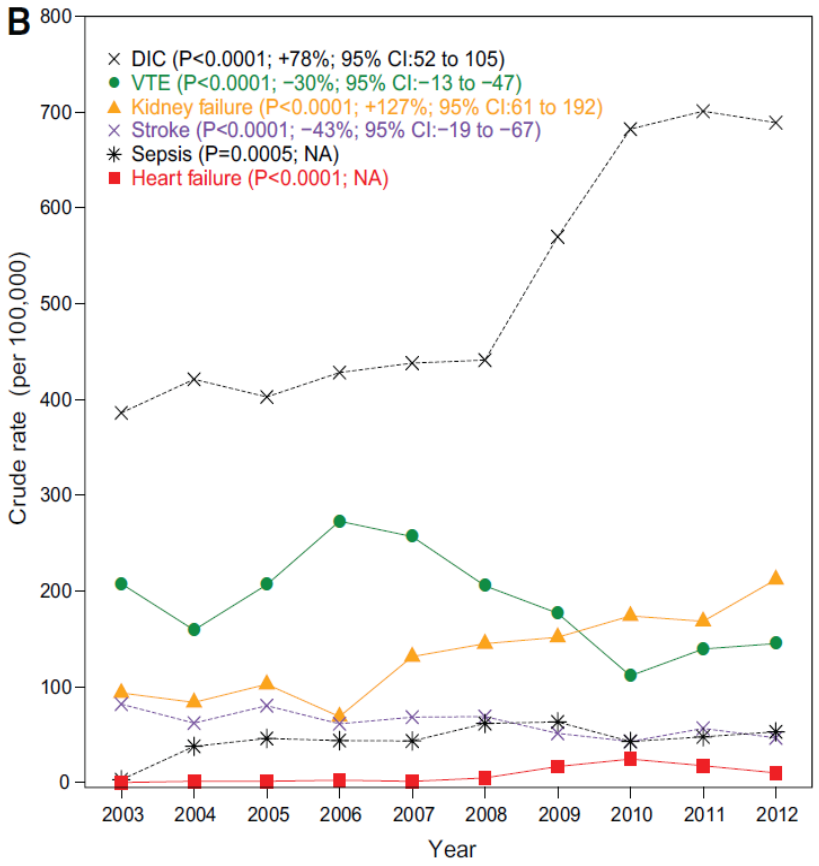
2009-2012



Solid bars indicate indirect causes of death, half tone bars show direct causes of death

Temporal trends in anesthesia-related adverse events in cesarean deliveries, New York State, 2003–2012



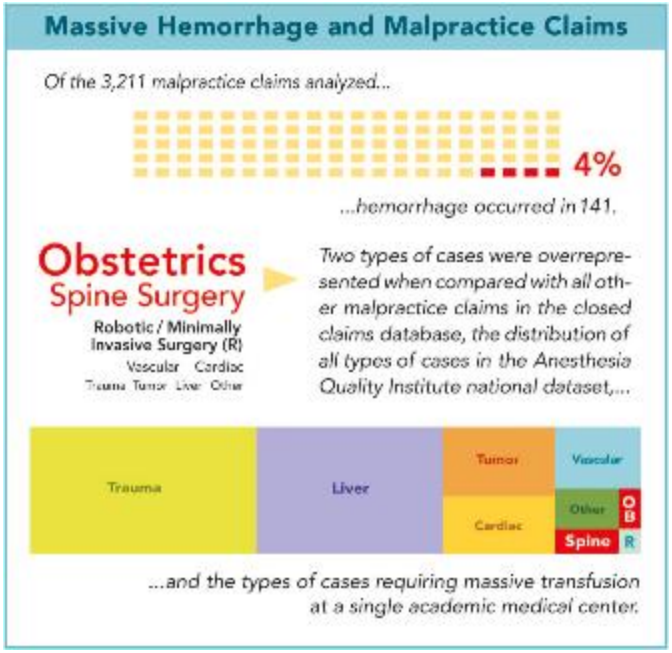


Guglielminotti J et al. Anesthesiology 2015;123:1013-23

ANESTHESIOLOGY
The Journal of the American Society of Anesthesiologists, Inc.

From: Massive Hemorrhage and Malpractice Claims

Anesthesiology. 2014;121(3):A21. doi:10.1097/01.anes.0000452345.99889.fc



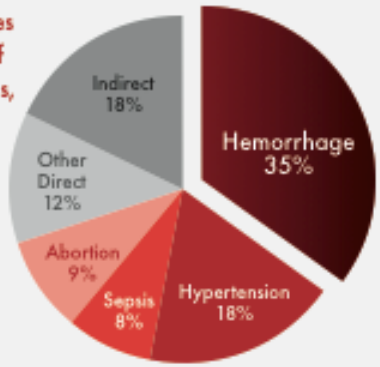
"Post-partum hemorrhage is a nice way of saying we let women bleed to death."

– Dr. Helene D. Gayle, President, CARE USA

Postpartum hemorrhage is the leading cause of maternal death worldwide.

122,500 women bleed to death after childbirth every year.

Global estimates of the causes of maternal deaths, 1997-2007



Treatment options in order:

- More oxytoxic drugs
- Bimanual compression of the uterus
- Aortic Compression
- Anti-shock garment
- Hydrostatic Condom Tamponade
- Bakri balloon
- B-lynch sutures
- Ligation
- Hysterectomy

- **70%** of postpartum hemorrhage is caused by uterine atony
- **40-50%** of uterine atony can be averted by the clinical protocol of 'Active Management of Third Stage of Labor'
  1. Give uterotonic drug after baby is born
  2. Apply controlled cord traction to deliver placenta
  3. Perform uterine massage

- Girls between 10 and 14 are 5x as likely to die in childbirth
- Girls between 14 and 19 are 2x as likely to die in childbirth

maternova

Definition: Postpartum hemorrhage = 500mL of blood; Severe postpartum hemorrhage =1000mL blood

Sources: www.maternova.net; Ghana Health Service 2011 (Sylvia Deganus); Countdown to 2015; Miller S, Turan J, & Dau K 2006.; Pathfinder; POPPHI

Serious Complications Related to Obstetric Anesthesia

The Serious Complication Repository Project of the Society for Obstetric Anesthesia and Perinatology

Robert D'Angelo, M.D., Richard M. Smiley, M.D., Ph.D., Edward T. Riley, M.D.,
Scott Segal, M.D., M.H.C.M.

SOAP SCORE Project

- 30 academic centres 2004-2009
- 256,795 anesthetics in 307,495 deliveries (83%)
- Neuraxial techniques for vaginal deliveries 76.0%
- General anesthesia for cesarean deliveries 5.6%

D'Angelo R Anesthesiology 2014;120:1505-12

Serious Complications Related to Obstetric Anesthesia

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SOAP SCORE Project

Serious Complication	Totals	Incidence	95% CI	Anesthesia Related	Incidence	95% CI
Maternal death	30	1:10,250	1:7,180, 1:15,192	0		
Cardiac arrest	43†	1:7,151	1:5,319, 1:9,615	2	1:128,398	1:35,544, 1:1,060,218
Myocardial infarction	2	1:153,748	1:42,562, 1:1,269,541	2	1:128,398	1:35,544, 1:1,060,218
Epidural abscess/meningitis	4			4	1:62,866	1:25,074, 1:235,620
Epidural hematoma	1			1	1:251,463	1:46,090, 1:10,142,861
Serious neurologic injury	27	1:11,389	1:7,828, 1:17,281	7	1:35,923	1:17,805, 1:91,244
Aspiration	0			0		
Failed intubation	10			10	1:533	1:290, 1:971
High neuraxial block	58			58‡	1:4,336	1:3,356, 1:5,587
Anaphylaxis	5§	1:61,499	1:26,353, 1:189,403	0		
Respiratory arrest in labor suite	25	1:8,455	1:5,714, 1:12,500	16	1:10,042	1:6,172, 1:16,131
Unrecognized spinal catheter	14			14	1:15,435	1:9,176, 1:25,634
Total	157‖	1:1,959	1:1,675, 1:2,294	85#	1:3,021	1:2,443, 1:3,782

D'Angelo R Anesthesiology 2014;120:1505-12

Serious Complications Related to Obstetric Anesthesia

The Serious Complication Repository Project of the Society for Obstetric Anesthesia and Perinatology

Robert D'Angelo, M.D., Richard M. Smiley, M.D., Ph.D., Edward T. Riley, M.D., Scott Segal, M.D., M.H.C.M.

SOAP SCORE Project

Table 5. Causes of Maternal Death

Causes*	Number
Hemorrhage	10
Preexisting cardiac disease	5
Hypertension	3
Amniotic fluid embolism	3
Pulmonary embolism	2
Anaphylaxis	2
Cocaine	2
Infection/sepsis	2
Unreported cause	1
Total	30

Table 6. Causes of Cardiac Arrest

Causes*	Number	Survived Resuscitation
Hemorrhage	12	3
Preexisting cardiac disease	7	2
Amniotic fluid embolism	7	3
Anaphylaxis	3	1
Pulmonary embolism	3	0
Hypoxia	2	2
Cocaine	2	0
Intracranial hemorrhage	2	0
Infection/sepsis	2	0
Local anesthetic toxicity	1	1
Hyperkalemia	1	1
Air embolism	1	1
Total	43	14 (32.6%)

D'Angelo R Anesthesiology 2014;120:1505-12

French Maternal Mortality resulting from PPH is decreasing at last !

Les Morts Maternelles en France

Mieux comprendre pour mieux prévenir

Rapport du
Comité National d'experts sur la Mortalité Maternelle
2007-2009

I Tableau 9 I

Evolution de la mortalité maternelle par causes, effectifs, % et taux pour 100 000 NV, France entière de 2001-03 à 2007-09

Causes de décès	2001-2003			2004-2006			2007-2009[1]		
	n	%	Taux	n	%	Taux	n	%	Taux
Directes	167	66,8	7,0	145	68,1	6,0	133	60,5	5,3
Hémorragies	61	24,4	2,6	55	25,8	2,3	42	19,1	1,6
Embolies amniotiques	23	9,2	1,0	34	16	1,4	19	8,6	0,8
Thrombo-embolies veineuses	26	10,4	1,1	20	9,4	0,8	28	12,7	1,1
Hypertension artérielle	29	11,6	1,2	17	8	0,6	22	10,0	0,9
Infections	12	4,8	0,5	7	3,3	0,3	6	2,7	0,2
Complications d'anesthésie	4	1,6	0,02	3	1,4	0,1	2	0,9	0,1
Autres directes	12	4,8	0,5	9	4,2	0,4	14	6,4	0,6
Indirectes	72	28,8	3,0	57	26,8	2,3	78	35,5	3,2
Maladies cardiaques	15	6,0	0,6	20	9,4	0,8	29	13,2	1,2
Accident vasculaire cérébral	27	10,8	1,1	16	7,5	0,7	19	8,6	0,8
Autres	30	12,0	1,2	21	9,9	0,9	30	13,6	1,3
Causes inconnues	11	4,0	0,5	11	5,1	0,5	9	4,1	0,4
Toutes	250	100,0	10,4	213	100,0	8,7	220	100,0	8,9

[1] *Les chiffres donnés pour 2007-2009 correspondent au nombre de décès maternels "à méthode d'identification égale" par rapport aux périodes précédentes.*

En particulier, le pourcentage des hémorragies du post partum (atonie) a diminué de moitié (8,3% versus 16% en 2004-2006). Cette donnée se répercute sur le chapitre des hémorragies dans son ensemble, puisqu'il ne représente plus que 19% des décès maternels contre 26% antérieurement (baisse non statistiquement significative).

Rapportées aux naissances, les décès maternels par hémorragie donnent le taux de 1,9 p 100 000. Ce taux est en diminution notable puisqu'il était de 2,6 en 2001-2003 et se rapproche peu à peu des valeurs observées au Royaume Uni et aux Pays Bas, tout en leur restant supérieur (respectivement 0,65 période 2006-08 et 0,70 période 1993-2005) [22, 30], mais les comparaisons souffrent de différences assez importantes de classification des pathologies selon les pays [15, 16]. Toutefois, au sein du groupe des hémorragies, le nombre de décès dus aux hémorragies du post partum (HPP) par atonie utérine est passé de 33 en 2004-2006 à 21 en 2007-2009 et le taux spécifique de mortalité par HPP, à méthode d'identification constante, a diminué de 1,3 à 0,8 p 100 000 (baisse significative, p=0,05) entre les deux périodes.

Le résultat montrant une baisse de la mortalité par HPP est d'autant plus intéressant que l'exhaustivité du recueil s'est améliorée et qu'il y a au total plus de décès maternels captés par l'étude aujourd'hui qu'au début des années 2000. La diminution des décès dus aux hémorragies du post partum, ne dépend ni de l'augmentation d'autres causes ni de l'amélioration du recueil du nombre de décès maternels obtenus par les chaînages réalisés en 2007-09 puisque les données du tableau 9 pour l'évolution sont calculées à méthode constante.

Enquête nationale confidentielle sur les morts maternelles

Inserm

caro-club.univ-lyon1.fr

Stemming the Tide of Obstetric Morbidity

An Opportunity for the Anesthesiologist to Embrace the Role of Peridelivery Physician

Jill M. Mhyre, M.D., Brian T. Bateman, M.D., M.Sc.

Anesthesiology 2015; 2015: 986-9

PPH

- Still an issue

- New recommendations !!!
- Pharmacological treatment ???

« Appropriation »

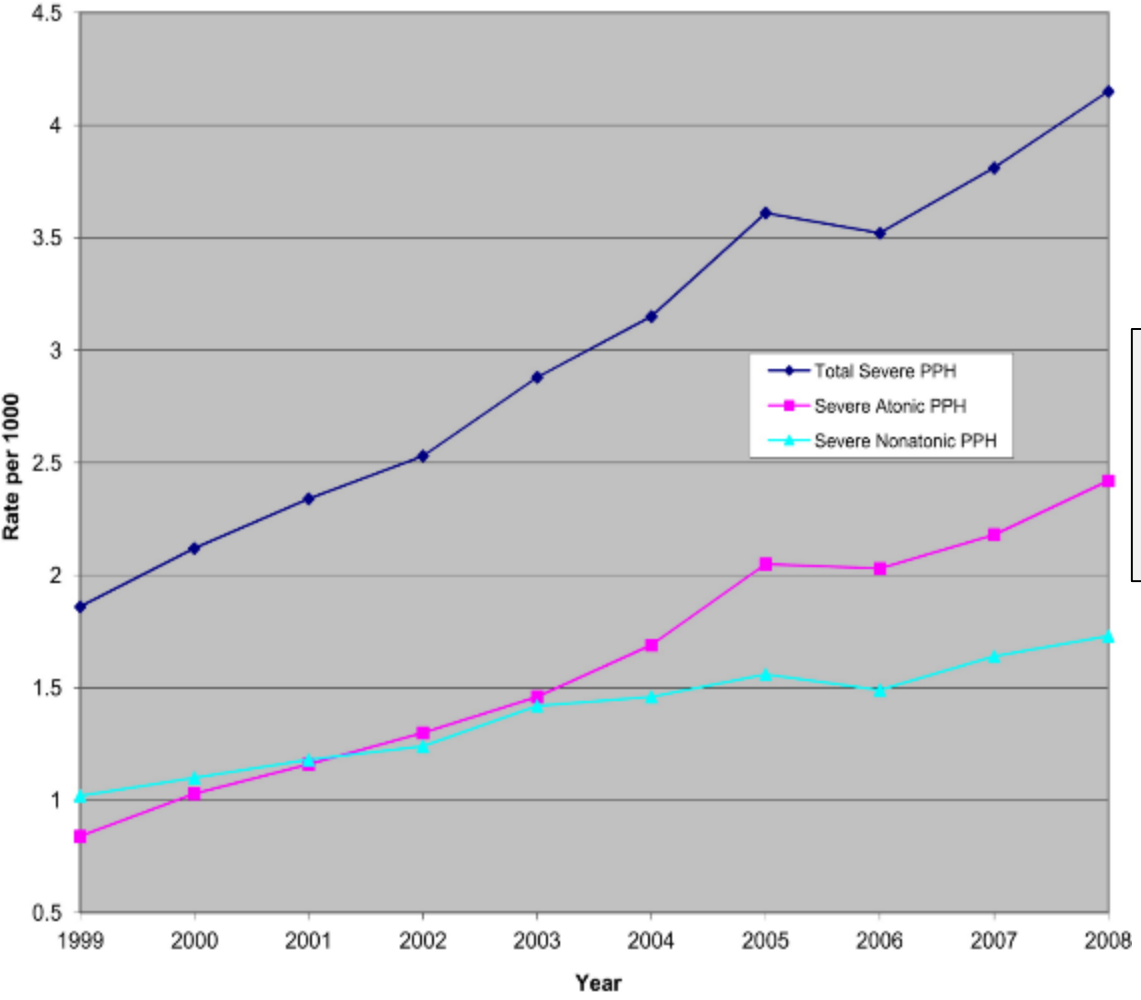
The Use of Postpartum Hemorrhage Protocols in United States Academic Obstetric Anesthesia Units

Rachel M. Kacmar, MD,* Jill M. Mhyre, MD,† Barbara M. Scavone, MD,‡ Andrea J. Fuller, MD,§ and Paloma Toledo, MD, MPH*

Despite increasing emphasis on national quality improvement in patient safety, there are no PPH protocols in at least 20% of U.S. academic obstetric anesthesia units.

Kacmar RM et al. Anesth Analg 2014;119:906-10

Incidence, risk factors, and temporal trends in severe postpartum hemorrhage



Severe:

- **Transfusion**
- **Hysterectomy**
- **Surgical repair of the uterus**

Kramer MS et al. Am J Obstet Gynecol. 2013;209:449.e1-7

Epidemiology

Tableau 2 Mortalité maternelle par hémorragie en France et au Royaume-Uni.
Maternal mortality due to haemorrhage in France and the United Kingdom.

	Royaume-Uni 2006–2008 [3]		France 2007–2009 [2]
Toutes morts maternelles (n)	261		254
MM directe (RMM/100 000 NV)	4,7		5,3
Mortalité maternelle par hémorragie			
n (% de la MM directe)	15 (14 %)		46 (31 %)
RMM (/100 000 NV)	0,6	<	1,9
Mortalité maternelle par hémorragie obstétricale (hors 1er trimestre)			
n (% de la MM directe)	9 (8 %)		39 (27 %)
RMM (/100 000 NV)	0,4	<<	1,6
Mortalité maternelle par HPP par atonie utérine			
n (% de la MM directe)	2 (2 %)		21 (14 %)
RMM (/100 000 NV)	0,1	<<<	0,8

MM : mortalité maternelle ; RMM : ratio de mortalité maternelle ; NV : naissances vivantes

Incidence 5% (10%)
Maternal mortality 1.6/100000 live births
Avoidable 80%

TONE

Abnormal uterine contractility

Uterine atony, overdistension and muscle fatigue

risk factors include prolonged labour, multiple gestation, oxytocin augmentation, polyhydramnios

Inflammation due to infection

e.g. chorioamnionitis

TISSUE

Placental complications

Placenta accreta, increta, percreta

retained placental products, risk factors include multiple gestation

Placenta praevia

placental blockage of cervix

Placental abruption

TRAUMA

Physical injury

Laceration of cervix, vagina or perineum

causes include malpresentation and instrumental delivery

Injury during Caesarean section

Uterine rupture

Previous trauma

Grand multiparity
Previous vertical uterine incision

THROMBIN

Congenital coagulation disorders

e.g. haemophilia, vWD

Acquired coagulopathy

e.g. DIC, hyperfibrinolysis, pharmacologic anticoagulation

The major coagulopathy independently associated with PPH is low FIBRINOGEN levels

21

Hémorragie en salle de naissance

Noter heure

Installer monitorage

Appeler aide

DA + RU

Examen sous valves → sutures

Vidange vésicale

Oxytocine

10-20 UI perf ± IVL

Massage utérin

Oxygène

Remplissage: Cristalloïdes, colloïdes

± éphédrine

± taux d'Hb in situ

Vérifier 2 déter + RAI

2ème voie ± NFS-Coag

± Vérifier disponibilité sang

T30

Sonde urinaire

Diurèse horaire

Antibiothérapie

Réchauffement patiente

Sulprostone:

500µg/50ml PSE

1ère amp en 1h mini

± 1ème amp en 5h

Bilan biologique complet

CG pour Hb > 7g

PFC fct clinique et TP

Plaquettes si Pl<50000

± Fibrinogène

Maintien PAM 60-80 mm Hg

Si besoin: noradrénaline: 0,5mg/h à adapter

Si VVC: fémorale G

T60

Ligatures vasculaires

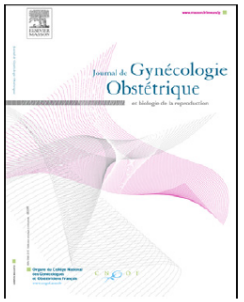
Embolisation

(minutes)

Hystérectomie

RPC HPP, dec. 2004

Journal de Gynécologie Obstétrique et Biologie de la Reproduction (2014) 43, 1170—1179



HÉMORRAGIE DU POST-PARTUM

Hémorragie du post-partum : recommandations pour la pratique clinique — Texte des recommandations (texte court)

Postpartum hemorrhage: Guidelines for clinical practice — Text of the Guidelines (short text)

http://www.cngof.asso.fr/data/RCP/CNGOF_2014_HPP.pdf

Questions

1. Epidemiology
2. Antenatal management for patients with increased risk of PPH (excluding abnormal placentation)
3. Clinical and pharmacological prevention
4. Initial obstetrical management
5. Anesthesiologists at the initial phase of PPH
6. Obstetric management of severe or worsening PPH
7. Anesthetic management of severe or worsening PPH
8. Role of arterial embolization in the management of PPH
9. Surgical management
10. Management of C section PPH
11. Interhospital transfer
12. Transfusion
13. Management of placenta praevia and accrete
14. Management of secondary PPH

Questions

1. Epidemiology
2. Antenatal management for patients with increased risk of PPH (excluding abnormal placentation)
3. Clinical and pharmacological prevention
4. Initial obstetrical management
5. **Anesthesiologists at the initial phase of PPH**
6. Obstetric management of severe or worsening PPH
7. **Anesthetic management of severe or worsening PPH**
8. *Role of arterial embolization in the management of PPH*
9. Surgical management
10. *Management of C section PPH*
11. **Interhospital transfer**
12. **Transfusion**
13. Managenet of placenta praevia and accrete
14. Management of secondary PPH

Anesthesiologists at the initial phase of PPH

- Quantify
- Communicate
- Note
- Anticipate

Anesthetic management of severe or worsening PPH

- Lab/biology
  - What?
  - When?
- Transfusion
  - What?
  - Objectives?

Tranexamic acid for the prevention and treatment of postpartum haemorrhage

- Nevertheless, the current level of evidence supporting its efficacy is insufficient, as are the data about its benefit:harm ratio.
- Large, adequately powered multicentre RCTs are required before its widespread use for preventing and treating PPH can be recommended.

Sentilhes L et al. Br J Anaesth 2015;114:576-587

Pre-emptive treatment with fibrinogen concentrate for postpartum haemorrhage

Table 2 Primary and secondary outcomes, intention to treat. RBC, red blood cell. Data are presented as the median [IQR] or *n* (%). *One hundred and forty-eight values are missing (61%). †Mean difference with 95% confidence interval (CI; Student's *t*-test). ‡Wilcox rank sum test

Outcome	Fibrinogen (*n*=123)	Placebo (*n*=121)	Relative risk (95% CI)	*P*-value
Primary outcome				
Need for RBC transfusion (during the 6 week period postpartum)	25 (20.3%)	26 (21.5%)	0.95 (0.58–1.54)	0.88
Secondary outcomes				
Estimated blood loss after study drug (ml)	1700 [1500–2000]	1700 [1400–2000]	66 [−78; 210]†	0.37
Need for RBC transfusion (up to 4 h after study drug)	4 (3.3%)	10 (8.3%)	0.39 (0.13–1.22)	0.11
Need for RBC transfusion (up to 24 h after study drug)	14 (11.4%)	19 (15.7%)	0.72 (0.38–1.38)	0.35
Need for RBC transfusion (up to 7 days after study drug)	25 (20.3%)	26 (21.5%)	0.95 (0.58–1.54)	0.88
Total amount of blood transfused	0 [0,0]	0 [0,0]	‡	0.83
Range [min, max]	[0,7]	[0,4]		
Severe PPH*	20 (40.0%)	24 (52.2%)	0.77 (0.49–1.19)	0.31
Death	0 (0.0%)	0 (0.0%)	–	
Haemostatic intervention	0 (0.0%)	0 (0.0%)	–	
Transfusion of ≥4 units of RBCs	8 (6.5%)	3 (2.5%)	2.62 (0.71–9.65)	0.22
Decrease in haemoglobin >40 g litre^{-1}*	20 (40.0%)	24 (52.2%)	0.77 (0.49–1.19)	0.31
Rebleeding	2 (1.6%)	2 (1.7%)	0.98 (0.14–6.87)	1.00
Lowest haemoglobin <58 g litre^{-1}	1 (0.8%)	5 (4.1%)	0.20 (0.02–1.66)	0.12

Inclusion: Severe PPH
Treatment: Fibrinogen 2 gr single dose
Outcome: RBC transfusion up to 6 weeks postpartum
At inclusion : Blood loss 1459 ml and fibrinogen 4.5 g/l

Wikkelso AJ et al. Br J Anaesth 2015;114:623-633

Pre-emptive treatment with fibrinogen concentrate for postpartum haemorrhage

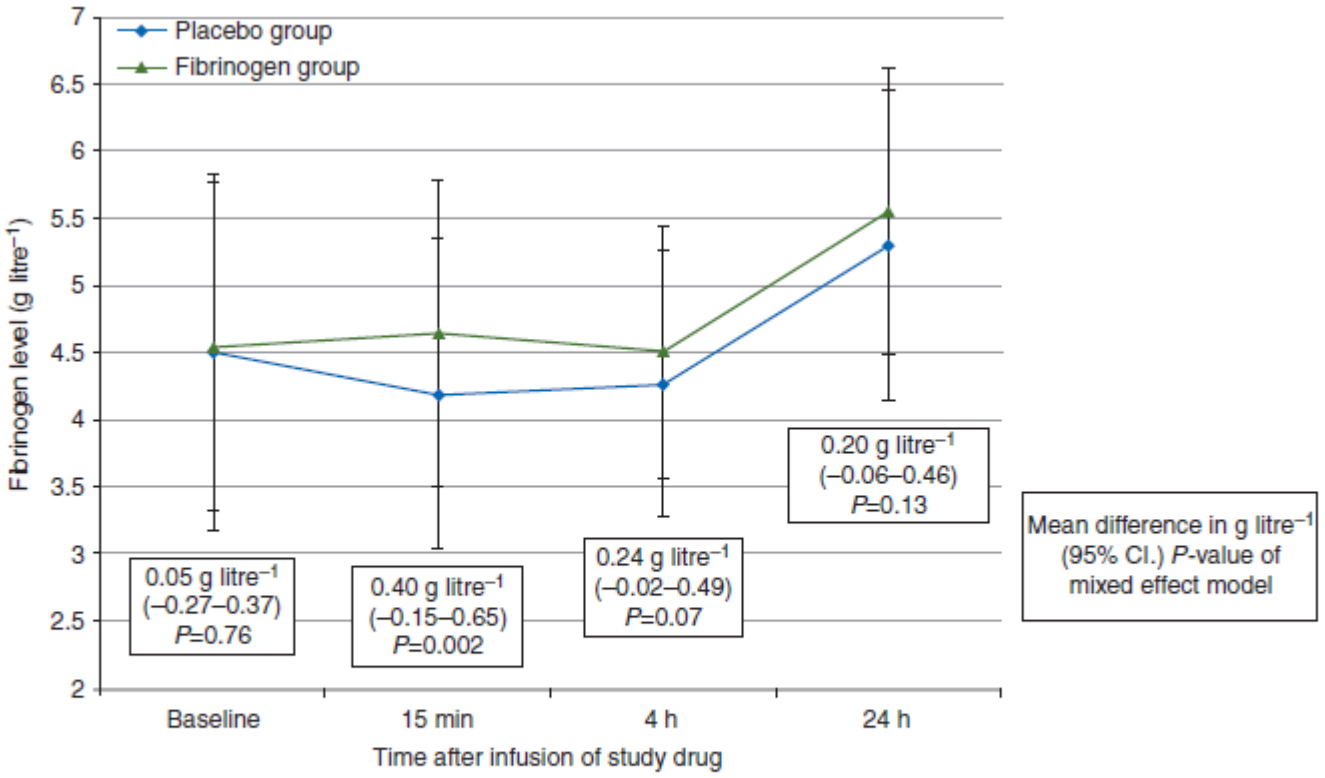


Fig 2 Mean fibrinogen concentrations in placebo and fibrinogen groups from baseline to 24 h after study drug administration, with whiskers indicating standard deviation. Mean difference of the fibrinogen concentration between the fibrinogen and placebo group is given below at each time point from baseline to 24 h after the study drug administration, with 95% confidence interval (CI) given in parenthesis and *P*-value.

Wikkelso AJ et al. Br J Anaesth 2015;114:623-633

Trial record 5 of 11 for: lfb

« Previous Study | Return to List | Next Study »

Fibrinogen in Haemorrhage of Delivery (FIDEL)

This study is currently recruiting participants. (see Contacts and Locations)

Verified July 2014 by Laboratoire français de Fractionnement et de Biotechnologies

Sponsor:
Laboratoire français de Fractionnement et de Biotechnologies

Information provided by (Responsible Party):
Laboratoire français de Fractionnement et de Biotechnologies

ClinicalTrials.gov Identifier:
NCT02155725

First received: May 20, 2014
Last updated: September 5, 2014
Last verified: July 2014
History of Changes

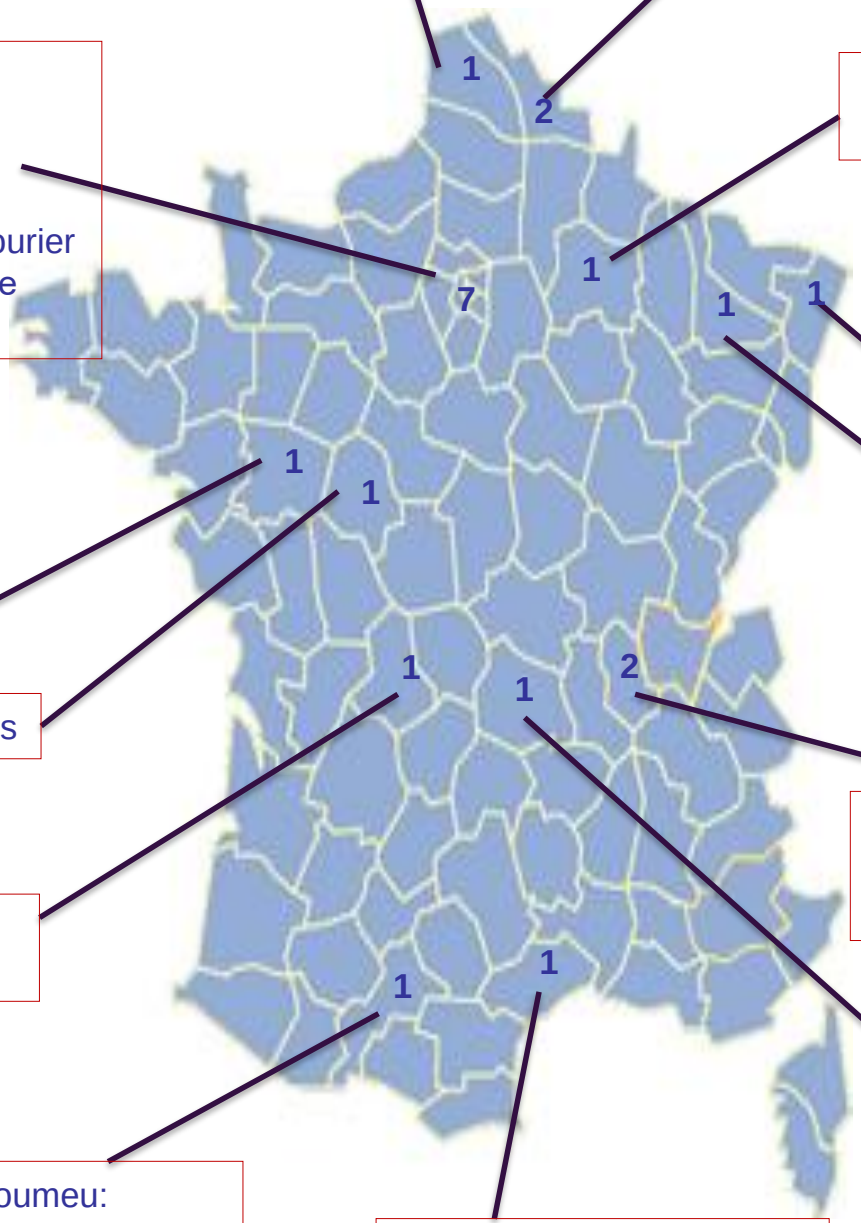
Full Text View | Tabular View | No Study Results Posted | Disclaimer | How to Read a Study Record

Purpose

The purpose of the study is to assess the benefits of a therapeutic strategy that associates an early administration of human fibrinogen concentrate in the management of PPH on the reduction of bleeding after the initiation of prostaglandins intravenous infusion, following vaginal delivery.

Condition	Intervention	Phase
Post-Partum Hemorrhage	Drug: Human Fibrinogen concentrate Drug: Placebo	Phase 4

21centres investigateurs



- Dr Mallat : Lens
- Dr Ducloy-Bouthors/Dr Corouge : Lille
- Dr Chonow : Valenciennes
- Pr Mignon : Cochin
- Dr Bonnet : Tenon
- Dr Rigouzzo : Trousseau
- Pr Fischler : Foch
- Pr Keita-Meyer : Louis Mourier
- Dr Kfoury : Kremlin-Bicêtre
- Pr Mercier : Béclère
- Pr Malinovsky : Reims
- Pr Diemunsch : Strasbourg
- Dr Vial : Nancy
- Dr Lasocki : Angers
- Dr Mangin : Tours
- Dr Broisin / Dr Huissoud : Lyon
- Pr Chassard : Lyon
- Pr Nathan : Limoges
- Dr Bonnin : Clermont-Ferrand
- Dr Bayoumeu: Toulouse
- Dr Morau : Montpellier

Fibrinogen and PPH: key messages

- Normal Fibrinogen value in pregnant women
  - Mean = 5 g/L - IC90 = [3.5-6.5] & IC99 = [3.0-8.0] g/L
- Plasma Fg level to target during active PPH: likely ≥ 2.0 g/L
- Advantages of Fb concentrates include:
  - Easy storage (room T°) & readily available (no thawing needed)
  - No significant hemodilution (versus FFP)
  - Precise dosage
  - Virtually no infectious / viral contamination risk
  - No need to be screened for blood type

J Thromb Haemost. 2015 Jan 16. doi: 10.1111/jth.12844. [Epub ahead of print]

Recombinant human FVIIa for reducing the need of invasive second-line therapies in severe refractory postpartum hemorrhage:A multicenter, randomized, open controlled trial.

Lavigne-Lissalde G[1], Aya AG, Mercier FJ, Roger-Christoph S, Chauleur C, Morau E, Ducloy-Bouthors AS, Mignon A, Raucoules M, Bongain A, Boehlen F, de Moerloose P, Bouvet S, Fabbro-Peray P, Gris JC.

Author information

Abstract

BACKGROUND: Case reports on recombinant human factor VIIa (rhuFVIIa) use in women with severe postpartum hemorrhage (PPH) showed encouraging results, but no randomized controlled trial (RCT) is available.

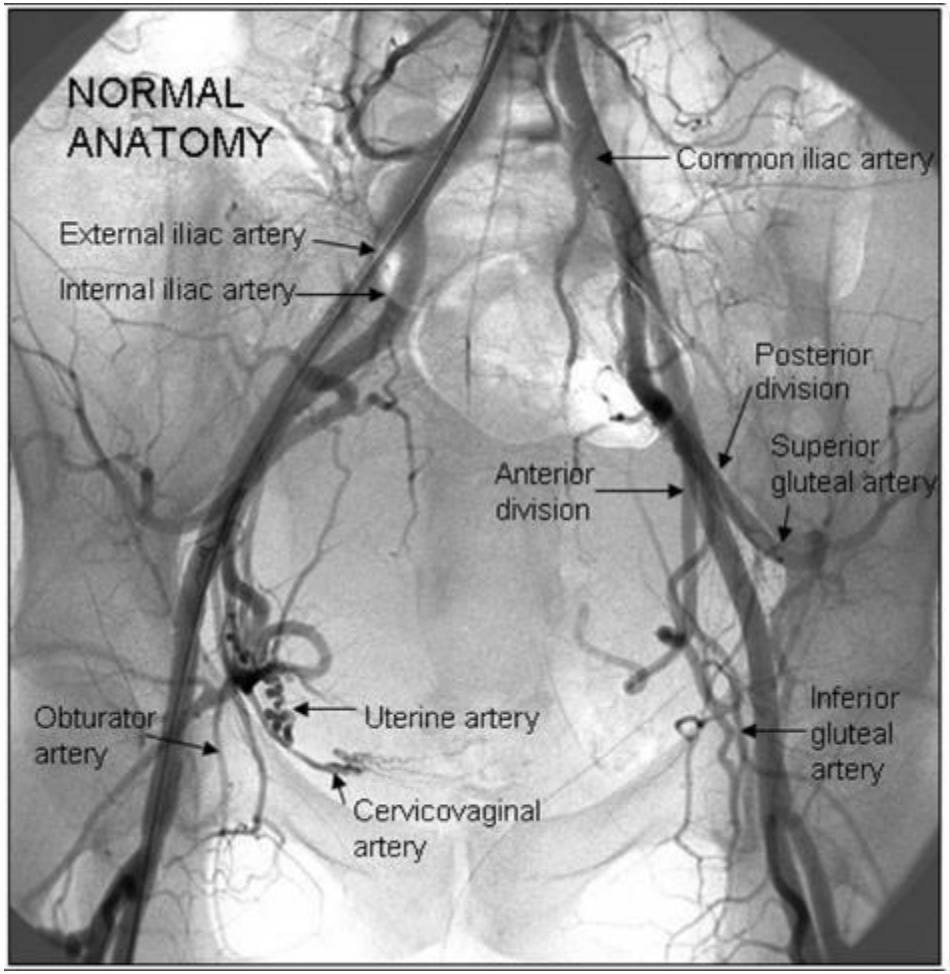
PATIENTS AND METHODS: Eighty-four women with severe PPH unresponsive to uterotonics were randomized to receive one early single rhuFVIIa infusion (n=42) or standard care (no rhuFVIIa; n=42). The primary efficacy outcome measure was the reduction of the need of specific second-line therapies, such as interventional hemostatic procedures, of blood loss and of transfusions. The primary safety outcome measure was the number of deaths and thrombotic events during the five days following rhuFVIIa infusion.

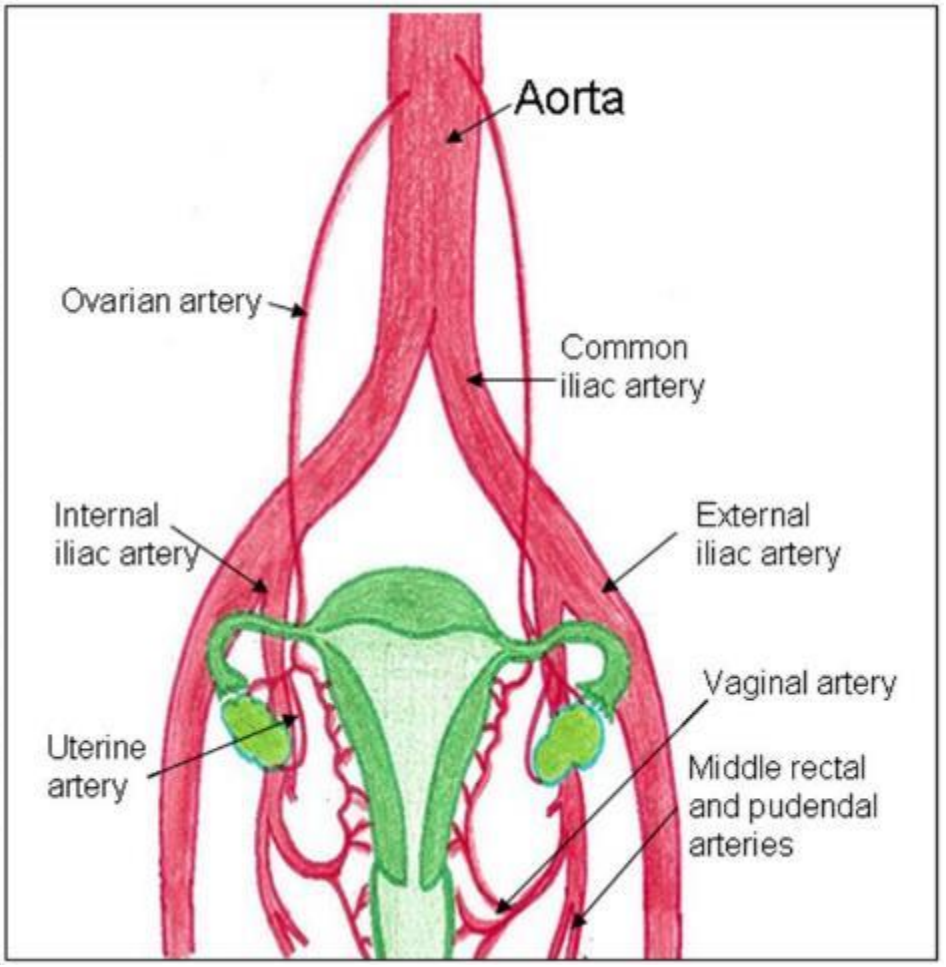
RESULTS: rhuFVIIa was associated with a reduction in the number of patients who needed second-line therapies compared to controls (standard care). Specifically, 39/42 (93%) patients in the standard care arm received second-line therapies and 22/42 (52%) patients in the rhuFVIIa arm (absolute difference: 41%, range 18%-63%; relative risk RR: 0.56 (0.42-0.76),). The delivery mode (vaginal or caesarean section) did not affect the primary outcome. No death occurred. Blood loss failed to be measured and transfusion needs did not differ. Two venous thrombotic events were recorded in the rhuFVIIa arm: one ovarian vein thrombosis and one deep vein thrombosis with a non-severe pulmonary embolism.

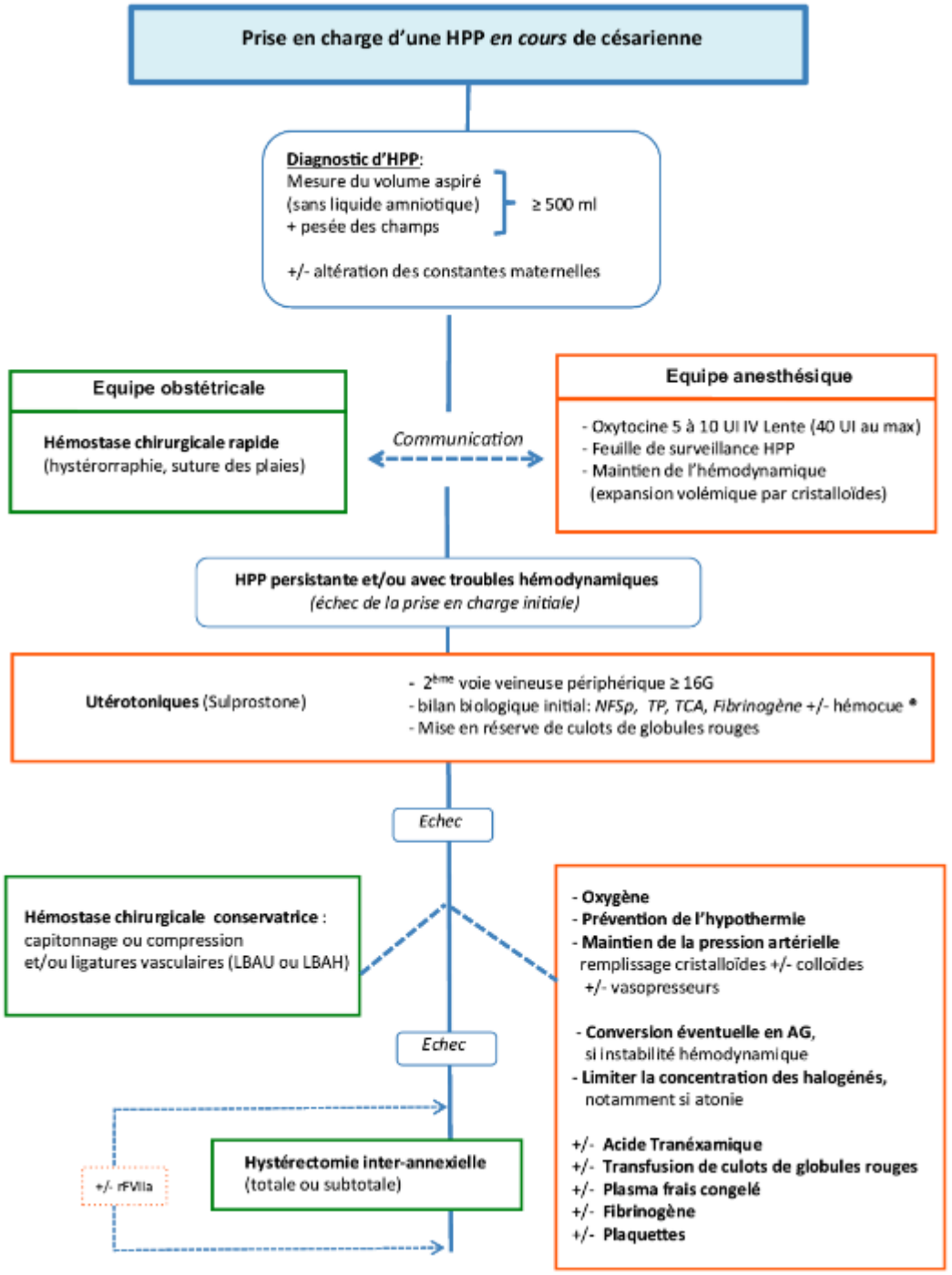
CONCLUSION: This open RCT in women with severe PPH refractory to uterotonics shows that rhuFVIIa reduces the need of specific second-line therapies in about one in three patients, with the occurrence of non-fatal venous thrombotic events in one in 20 patients. This article is protected by copyright. All rights reserved.

KEYWORDS: FVIIa activated; Postpartum Hemorrhage; hysterectomy; treatment efficacy; treatment outcome

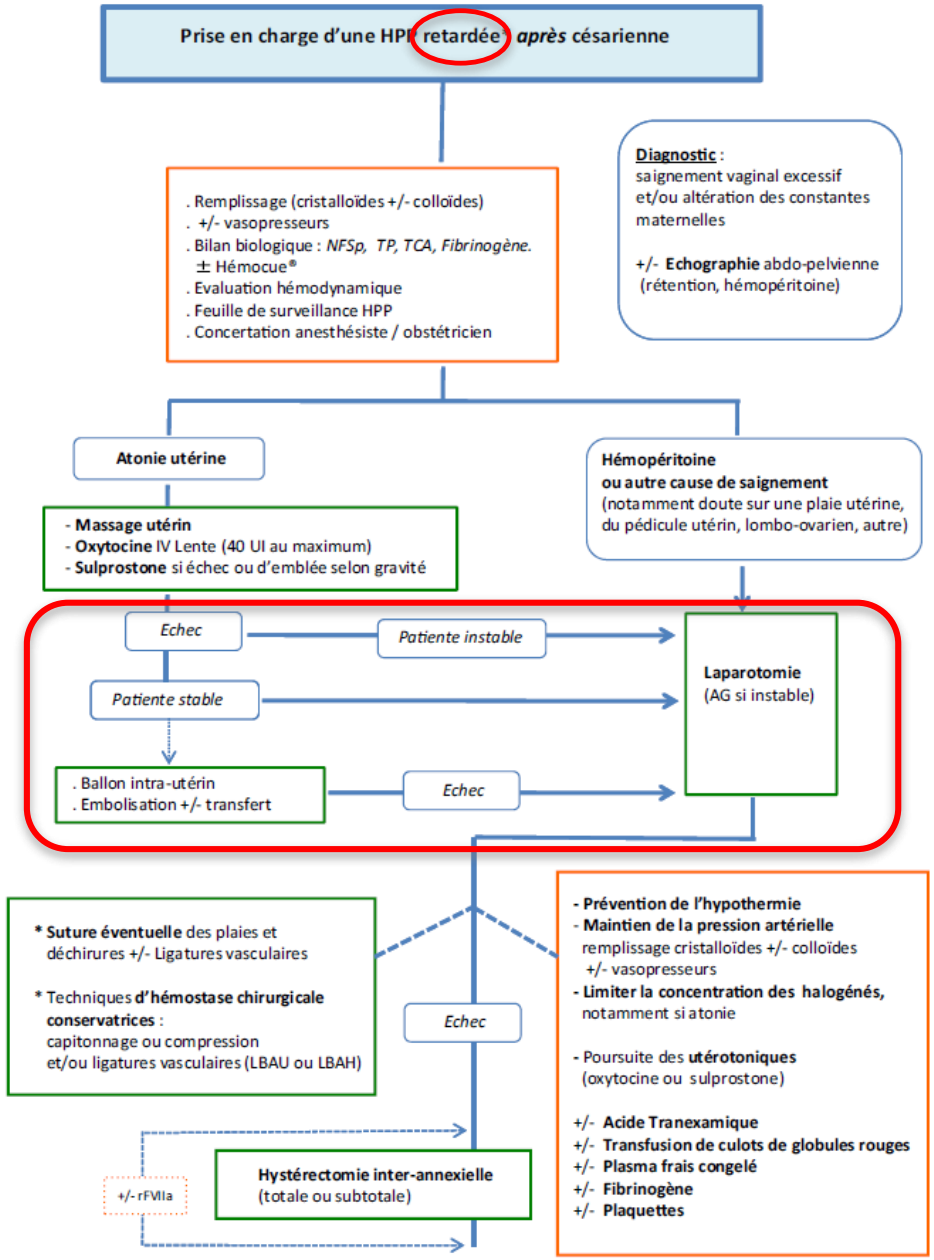
Interventional radiology






Prise en charge d'une HPP *en cours* de césarienne
Diagnostic d'HPP:
Mesure du volume aspiré (sans liquide amniotique) + pesée des champs
≥ 500 ml
+/- altération des constantes maternelles
Equipe obstétricale
Hémostase chirurgicale rapide (hystérorraphie, suture des plaies)
Communication
Equipe anesthésique
- Oxytocine 5 à 10 UI IV Lente (40 UI au max)
- Feuille de surveillance HPP
- Maintien de l'hémodynamique (expansion volémique par cristalloïdes)
HPP persistante et/ou avec troubles hémodynamiques
(échec de la prise en charge initiale)
Utérotoniques (Sulprostone)
- 2ème voie veineuse périphérique ≥ 16G
- bilan biologique initial: *NFSp, TP, TCA, Fibrinogène* +/- hémocue *
- Mise en réserve de culots de globules rouges
Echec
Hémostase chirurgicale conservatrice : capitonnage ou compression et/ou ligatures vasculaires (LBAU ou LBAH)
- **Oxygène**
- **Prévention de l'hypothermie**
- **Maintien de la pression artérielle** remplissage cristalloïdes +/- colloïdes +/- vasopresseurs
- **Conversion éventuelle en AG,** si instabilité hémodynamique
- **Limiter la concentration des halogénés,** notamment si atonie
+/- **Acide Tranéxamique**
+/- **Transfusion de culots de globules rouges**
+/- **Plasma frais congelé**
+/- **Fibrinogène**
+/- **Plaquettes**
Echec
+/- rFVIIa
Hystérectomie inter-annexielle (totale ou subtotale)

C section


Prise en charge d'une HPP retardée* *après* césarienne
. Remplissage (cristalloïdes +/- colloïdes)
. +/- vasopresseurs
. Bilan biologique : *NFSp, TP, TCA, Fibrinogène.* ± Hémocue®
. Evaluation hémodynamique
. Feuille de surveillance HPP
. Concertation anesthésiste / obstétricien
Diagnostic :
saignement vaginal excessif et/ou altération des constantes maternelles
+/- **Echographie** abdo-pelvienne (rétention, hémopéritoine)
Atonie utérine
- **Massage utérin**
- **Oxytocine** IV Lente (40 UI au maximum)
- **Sulprostone** si échec ou d'emblée selon gravité
Hémopéritoine ou autre cause de saignement (notamment doute sur une plaie utérine, du pédicule utérin, lombo-ovarien, autre)
Echec
Patiente instable
Patiente stable
Laparotomie (AG si instable)
. Ballon intra-utérin
. Embolisation +/- transfert
Echec
* **Suture éventuelle** des plaies et déchirures +/- Ligatures vasculaires
* Techniques **d'hémostase chirurgicale conservatrices** : capitonnage ou compression et/ou ligatures vasculaires (LBAU ou LBAH)
Echec
- **Prévention de l'hypothermie**
- **Maintien de la pression artérielle** remplissage cristalloïdes +/- colloïdes +/- vasopresseurs
- **Limiter la concentration des halogénés,** notamment si atonie
- Poursuite des **utérotoniques** (oxytocine ou sulprostone)
+/- **Acide Tranexamique**
+/- **Transfusion de culots de globules rouges**
+/- **Plasma frais congelé**
+/- **Fibrinogène**
+/- **Plaquettes**
+/- rFVIIa
Hystérectomie inter-annexielle (totale ou subtotale)

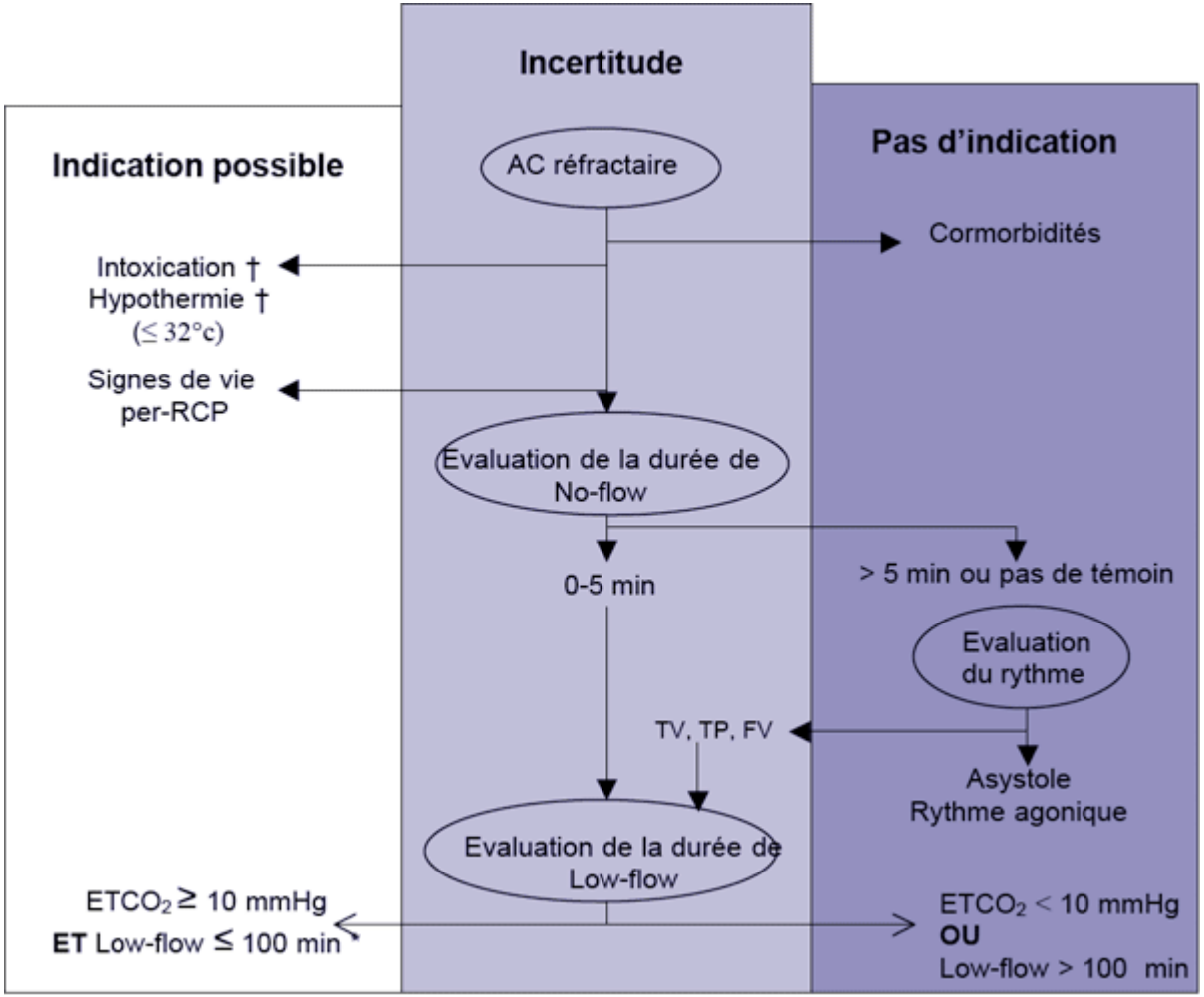
Transportation

Transfusion

Tableau 2 Calendrier de surveillance de la recherche d'agglutinines irrégulières (RAI) durant la grossesse.
Monitoring schedule antibody screening during pregnancy.

Avant le 3e mois	Toute femme enceinte
6e mois	Femme Rhésus négatif (RH-1) Femme avec antécédent transfusionnel
8e ou 9e mois	Toute femme enceinte
8e et 9e mois	Femme Rhésus négatif (RH-1) Femme avec antécédent transfusionnel

ECMO


Incertitude
Indication possible
Pas d'indication
AC réfractaire
Cormorbidités
Intoxication †
Hypothermie †
(≤ 32°c)
Signes de vie
per-RCP
Evaluation de la durée de
No-flow
0-5 min
> 5 min ou pas de témoin
Evaluation
du rythme
TV, TP, FV
Asystole
Rythme agonique
Evaluation de la durée de
Low-flow
ETCO2 ≥ 10 mmHg
ET Low-flow ≤ 100 min
ETCO2 < 10 mmHg
OU
Low-flow > 100 min

Hémorragie en salle de naissance

Noter heure | Installer monitorage | Appeler aide

DA + RU
Examen sous valves → sutures

Vidange vésicale
Oxytocine
10-20 UI perf ± IVL
Massage utérin

Oxygène
Remplissage: Cristalloïdes, colloïdes
± éphédrine
± taux d'Hb in situ

Vérifier 2 déter + RAI
2ème voie ± NFS-Coag
± Vérifier disponibilité sang

T30

acide tranéxamique
(1g IVL ± 1g)

Sonde urinaire
Diurèse horaire

Antibiothérapie

Réchauffement patiente

Sulprostone:
500µg/50ml PSE
1ère amp en 1h mini
± 1ème amp en 5h

Bilan biologique complet

CG pour Hb ≈ 8-10 g/dL

PFC:CG ≈ 1:1 si besoin
Plaquettes si < 50-100.000
+ Fibri si < 2g

Maintien PAM 60-70 mm Hg

Si besoin: noradrénaline: 0,5mg/h à adapter

Voie centrale/écho ?
Voie artérielle ?

T60

Ballon de Bakri

Ligatures vasculaires

Embolisation

rFVIIa

(minutes) → **Hystérectomie**

Algorithme HPP complet, 2014

British Journal of Anaesthesia **108** (5): 723–6 (2012)
doi:10.1093/bja/aes124

EDITORIAL I

Perioperative medicine: the future of anaesthesia?

M. P. W. Grocott[1,2,3]* and R. M. Pearse[4]

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[2] Integrative Physiology and Critical Illness Group, Clinical and Experimental Sciences, University of Southampton, Southampton SO16 6YD, UK
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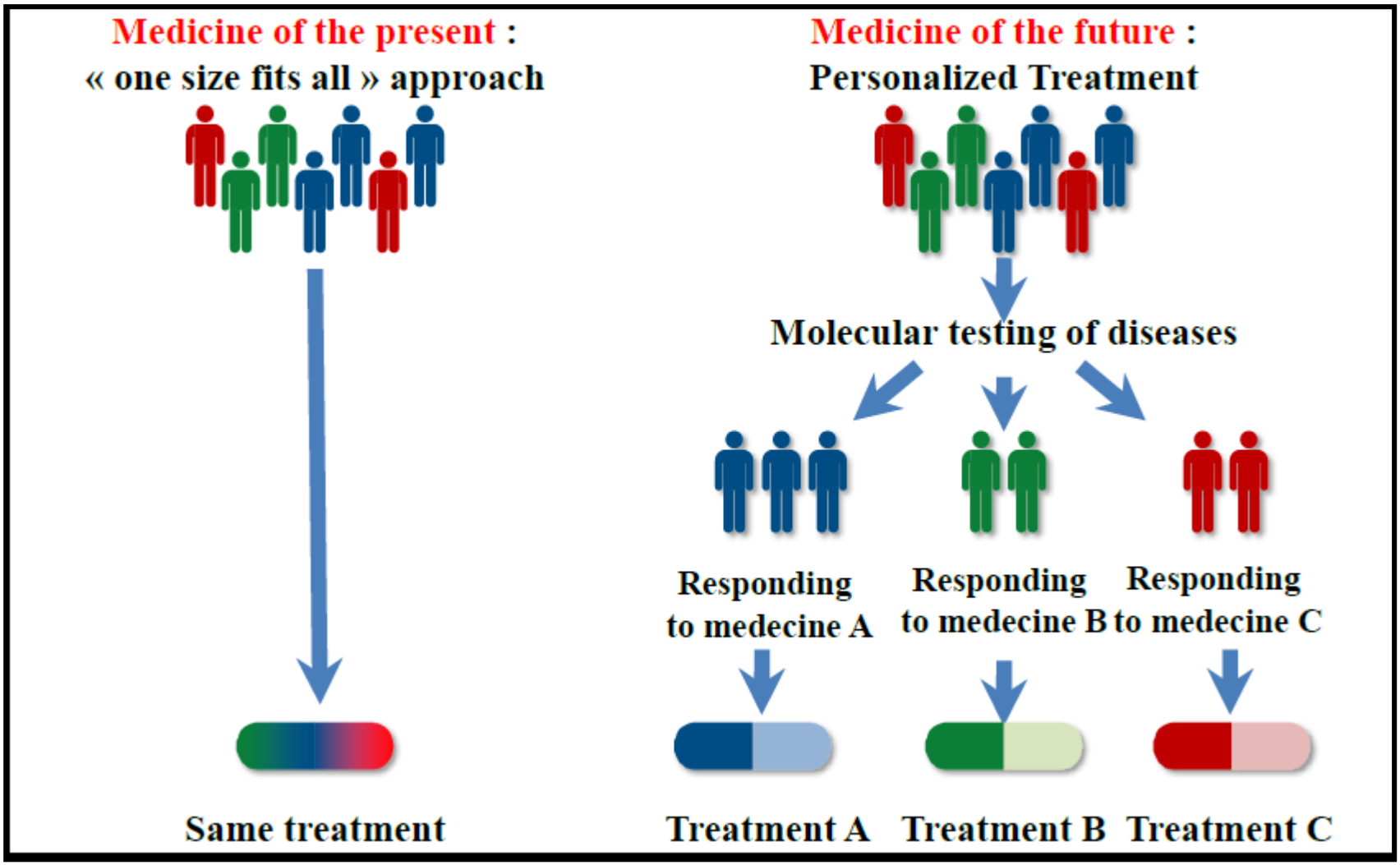
> For time and the world do not stand still. Change is the law of life. And those who look only to the past or the present are certain to miss the future.
>
> *US President John F. Kennedy, Frankfurt, June 25, 1963.*

opportunities presented by the broader role of the perioperative physician encompassing many aspects of the 'non-operative' care of the patient undergoing major surgery. Along with the many other aspects of anaesthetic practice,

"And those who look only to the past or the present are certain to miss the future" JFK


Medicine of the present :
« one size fits all » approach
Same treatment
Medicine of the future :
Personalized Treatment
Molecular testing of diseases
Responding to medecine A
Responding to medecine B
Responding to medecine C
Treatment A
Treatment B
Treatment C

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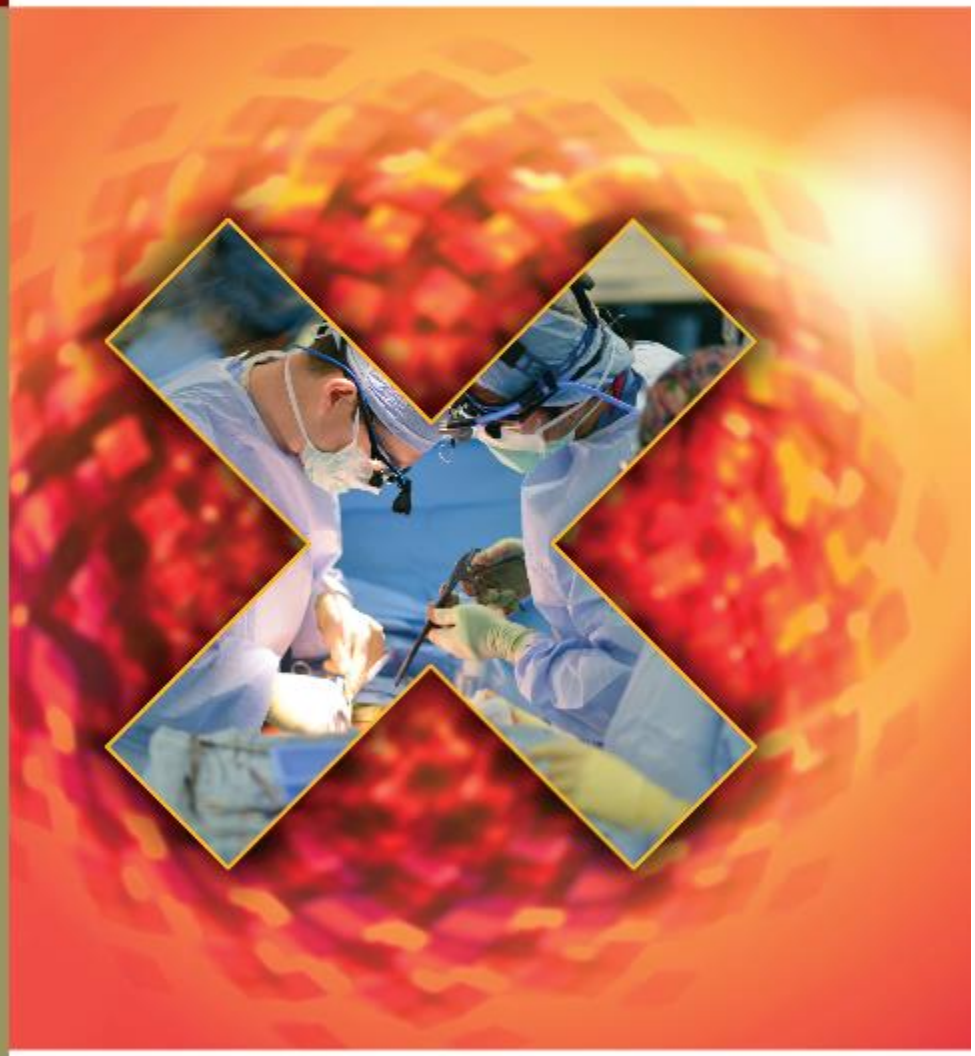

Preparation for and Response to Massive Hemorrhage