Stor obstetrisk blödning, vad gör man?

Höstkongressen 2024

Ove Karlsson, MD docent

Sahlgrenska, Sverige och världen

Kvinna född 1988

- En kväll i december
- KL 18.08 ringer patient
  - 4 gravida 3 para
  - Gravid vecka 41+4
  - Smärta mage, stenhård uterus
  - Yr och illamående

En kväll i december

- Ca kl 18-19
  - Ambulans
    - systoliskt blodtryck 70 mm Hg
  - Larm till flera sjukhus

- Kl 19.38
  - Specialförlossningen
  - Kallsvettig och smärtpåverkad
  - Svårpalperade pulsationer

En kväll i december

- Kl 19.48
  - Knivstart larmsnitt (urakut snitt)
  - Gynekologen slog ut larmsnitt, på mamma indikation
  - Anestesiologen söver, tror på barn indikation
- Kl 19.49
  - Slapp och blekt barn
  - Placenta fritt i uteruskavitet, dvs ablatio
  - Riklig blödning, även diffus
  - Anestesiolog ringer dit bakjour

Operation 19.48 – 23.20

Klinik	Åtgärd
• Atoni	• Oxytocin, metylergometrine, karboprost, misoprostol • Ballong
• Blödning 4000 ml	• Tranexamsyra • Blod/plasma/trombocyter
• Prover kl 19.46	• Hb 120, TPK 204, APTT 51, PK 0.9, Fibrinogen <0.6
• Prover kl 20.51	• Hb 59, TPK 73, APTT 92, PK 1.2, Fibrinogen <0.6

Epikris

- Vårdtid 4-10/12
- Diagnos ablatio och hemostasrubbning
- Under vårdtiden infektionskomplikation

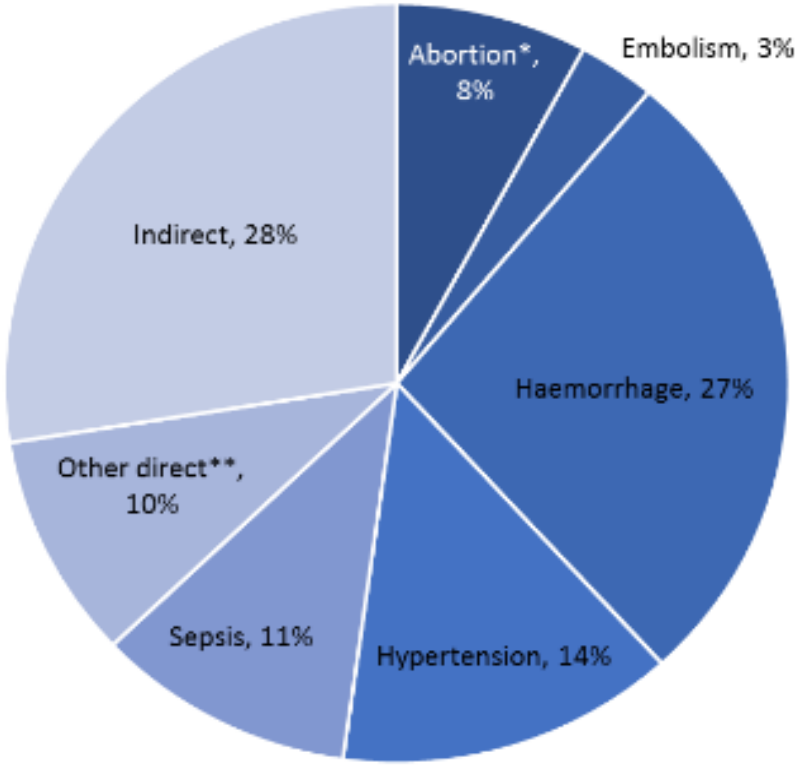
Reflektioner

- Hur kommunicera vid larmsnitt (urakut)
- Första Hb värdet 120 g/l
- Kunskap om hemostas vid ablatio

Trends in maternal mortality 2000 to 2020

Estimates by WHO, UNICEF, UNFPA, World Bank Group

Haemorrhage, 27%



World	**339**	**446 000**	**223**	**287 000**	**34.3**

d subregion	MMR[a] point estimate and range of uncertainty interval (UI: 80%)			Number of maternal deaths[b]
	Lower UI	Point estimate	Upper UI	
	202	**223**	**255**	**287 000**
ca	616	754	1024	111 000
New Zealand	**3**	**4**	**4**	**13**
ope	5	6	7	110
erica	16	20	26	810
outh Sudan	746	1 223	2 009	3 800

Maternal, Newborn and Infant Clinical Outcome Review Programme

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

Saving Lives, Improving Mothers' Care

Lessons learned to inform maternity care from
and Ireland Confidential Enquiries into Materna
and Morbidity 2020-22

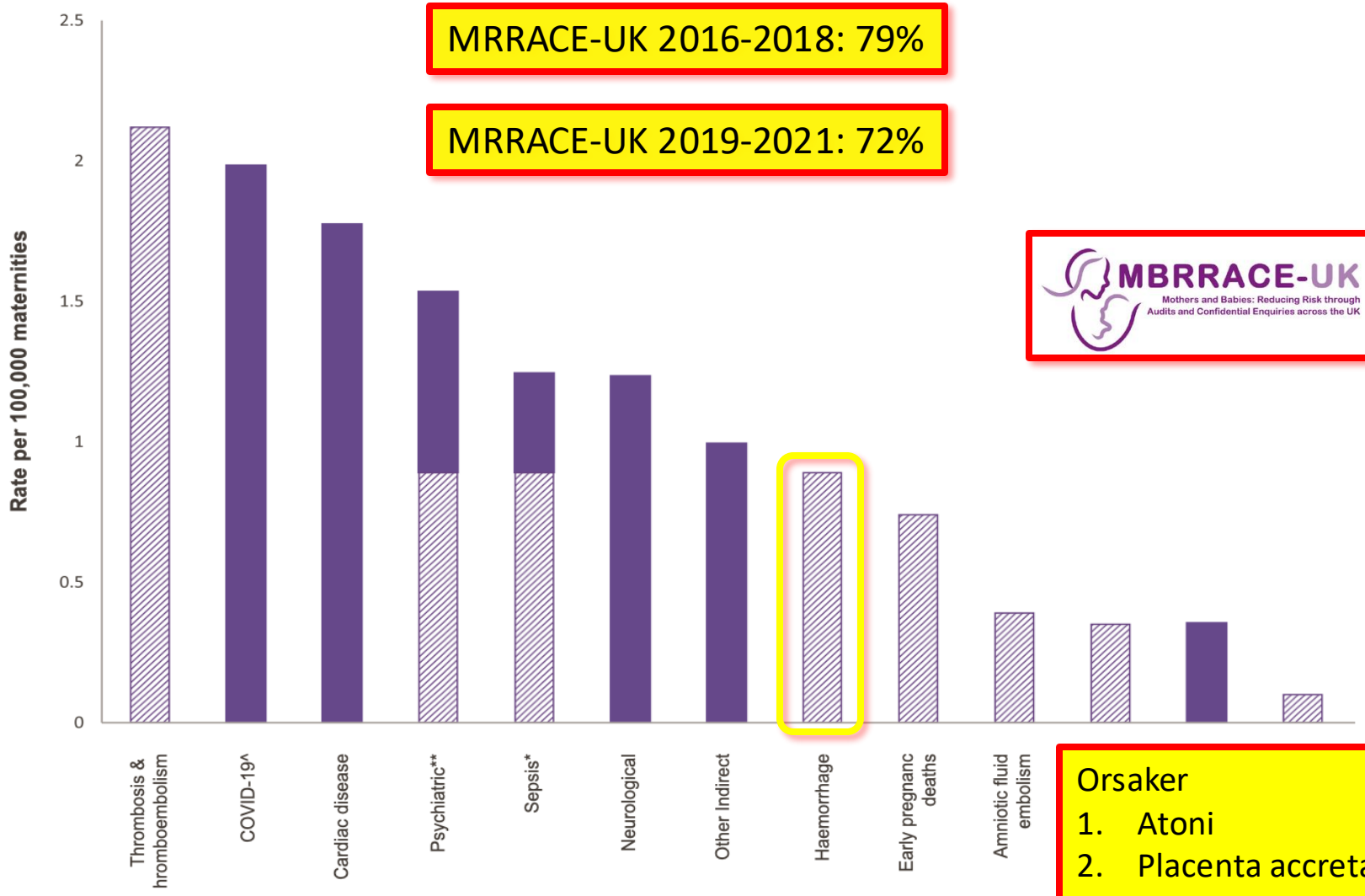
45 % av fallen bedömda att ett bättre omhändertagande skulle gjort skillnad för utfallet!

13.6 per 100.000 maternities

MBRRACE-UK 2009-2012: In all patients (100 %) with mortality due to haemorrhage, improvements in care may have made a difference to the outcome

MRRACE-UK 2016-2018: 79%

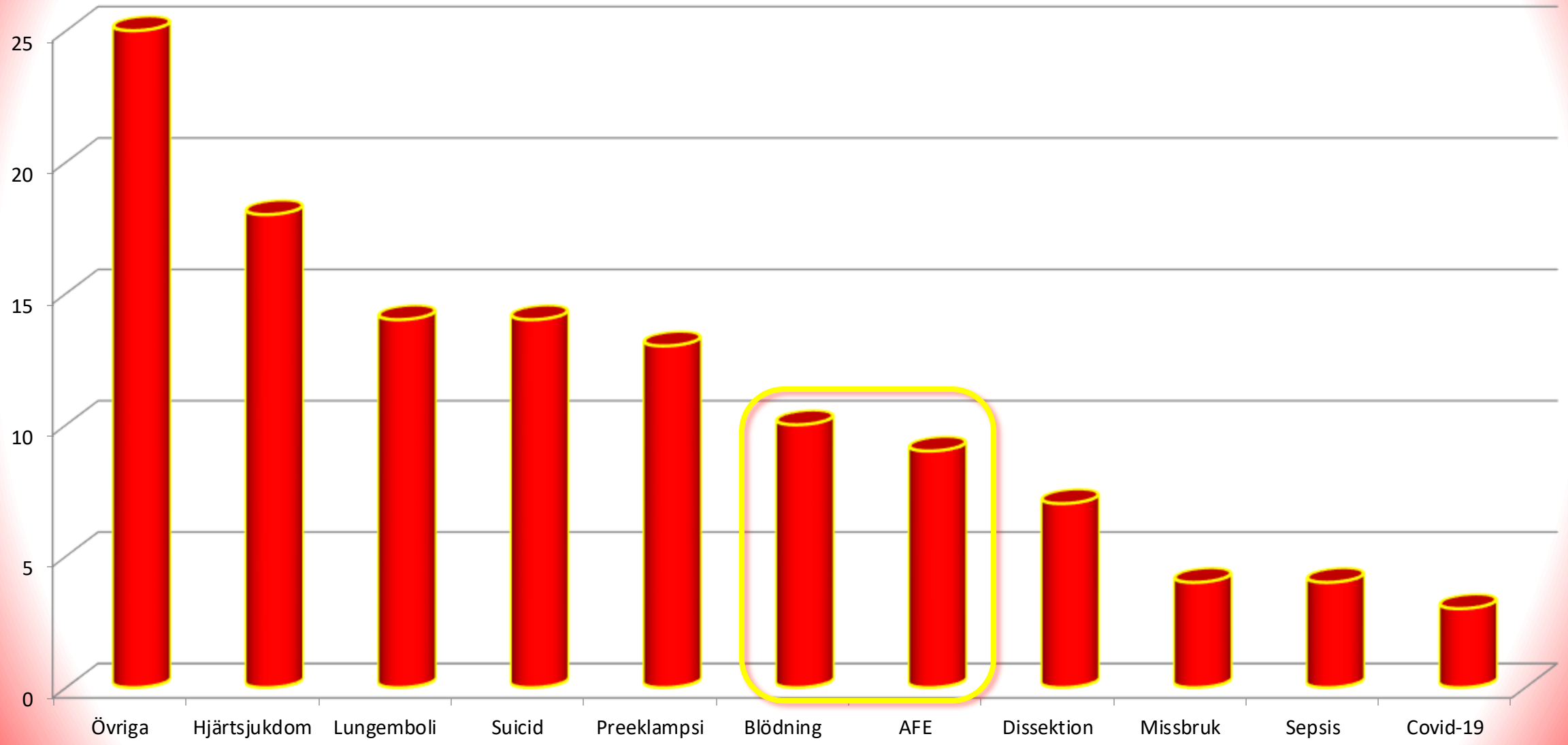
MRRACE-UK 2019-2021: 72%

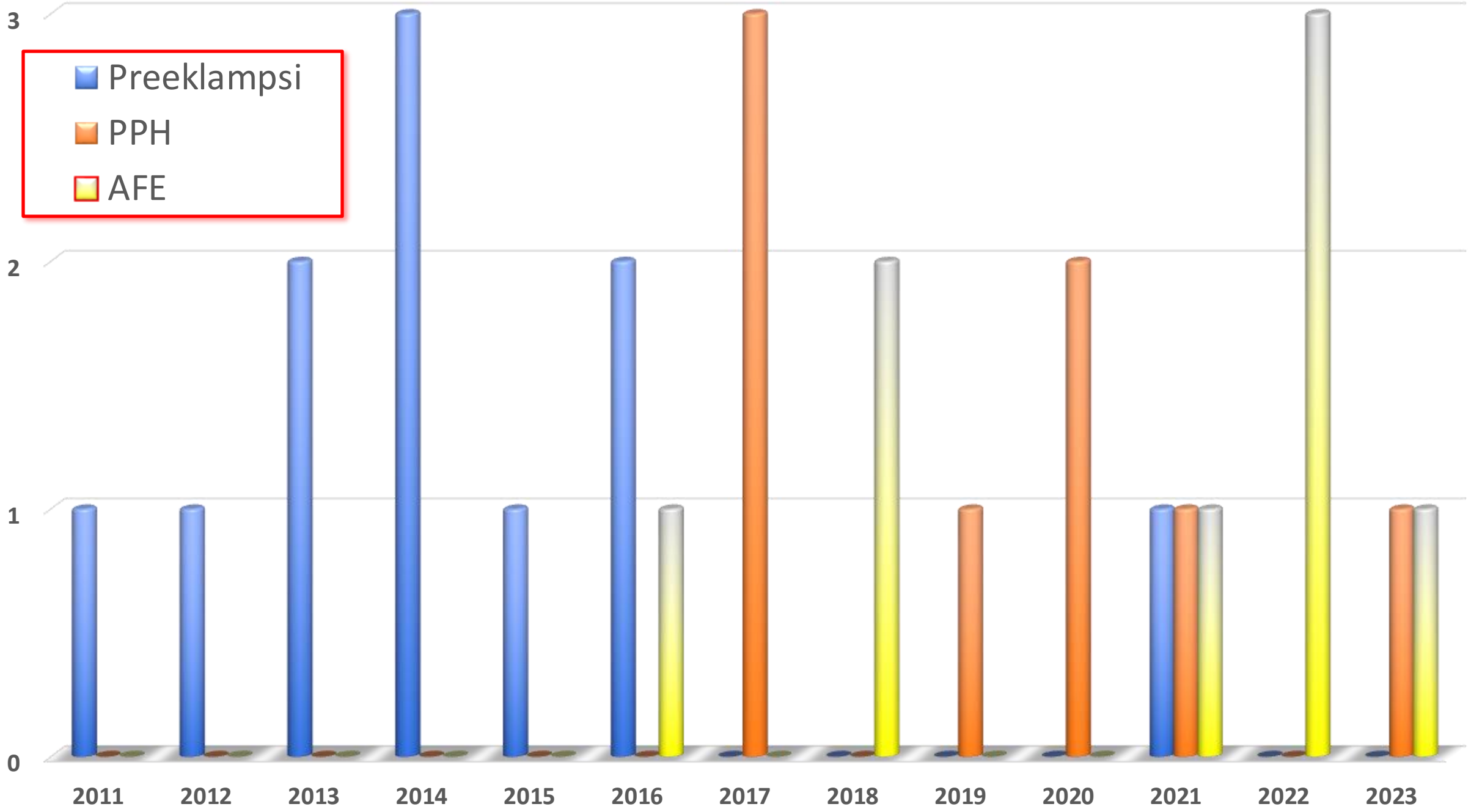


MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

Orsaker
1. Atoni
2. Placenta accreta
3. Ablatio
4. Förlossningsskador

Mödradödlighet Sverige 2007-2023




3
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Preeklampsi
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2011
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2013
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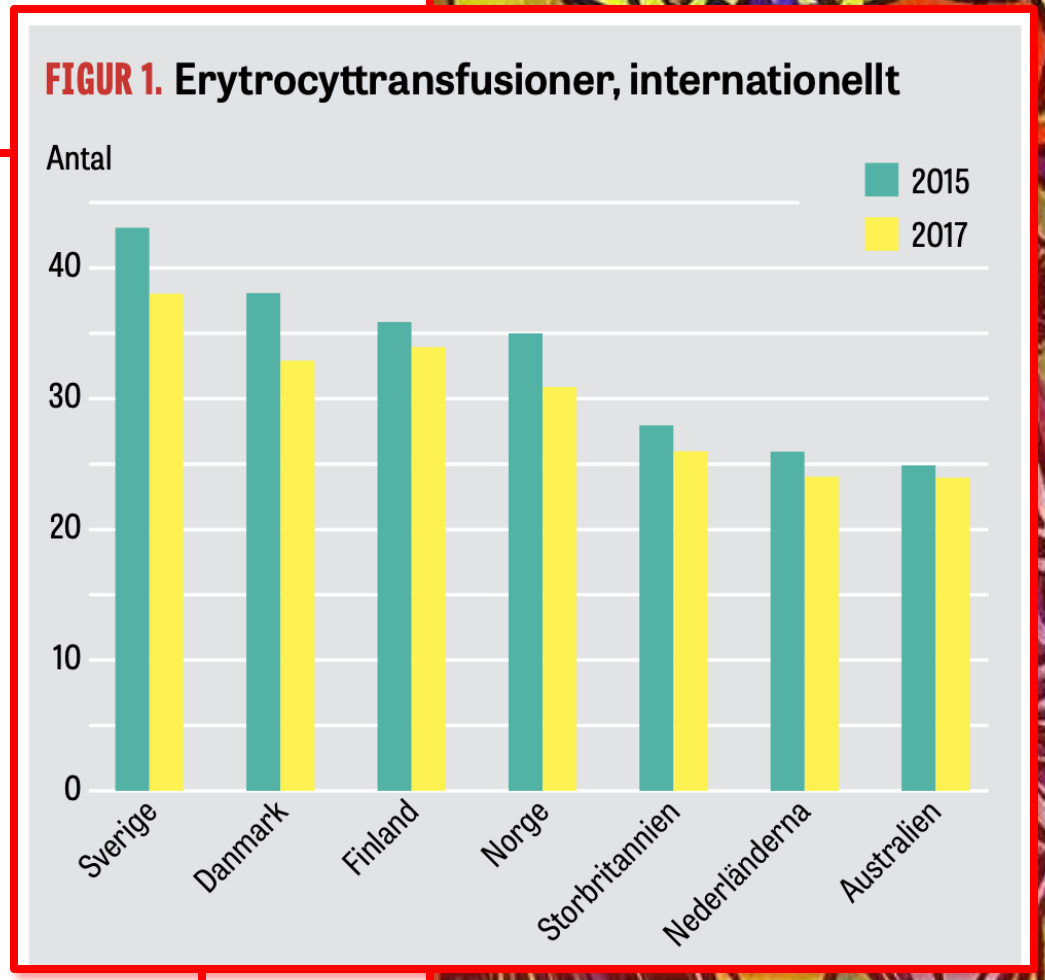
2016
2017
2018
2019
2020
2021
2022
2023

Stora blödningar

- Ökad mortalitet
- Ökad morbiditet
- Transfusionskomplikationer:
  - Infektioner
    - Virus
    - Bakteriell kontamination
    - Okända patogener
  - Immunologiska reaktioner
    - ABO inkompatibilitet
    - Hemolytisk transfusions reaktion
    - Anafylaxi
    - TRALI, transfusion related acute lung injury
- Stora kostnader



Stora skillnader sjukhus i Sverige
Fler transfusioner jmf andra länder

VoxSanguinis
The International Journal of Transfusion Medicine

Vox Sanguinis (2021) **116**, 821–830

ORIGINAL PAPER

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Vox Sanguinis published by John Wiley & Sons Ltd on behalf of International Society of Blood Transfusion
DOI: 10.1111/vox.13074

Patterns of red-cell transfusion use in obstetric practice in sweden 2003–2017: A nationwide study

Anne Brynolf,[1,2] Jingcheng Zhao,[1] Agneta Wikman,[3,4] Sara Öberg,[5,6] Anna Sandström[1,7] & Gustaf Edgren[1,8]
[1]*Department of Medicine, Solna, Clinical Epidemiology Division, Karolinska Institutet, Stockholm, Sweden*

Associationer mellan PPH
med PTSD och hjärtsjukdom

Primary postpartum haemorrhage and longer-term physical, psychological, and psychosocial health outcomes for women and their partners in high income countries: A mixed-methods systematic review

Su Mon Latt[1]*, Fiona Alderdice[1], Madeline Elkington[1], Mahkawnghta Awng Shar[2], Jennifer J. Kurinczuk[1], Rachel Rowe[1]

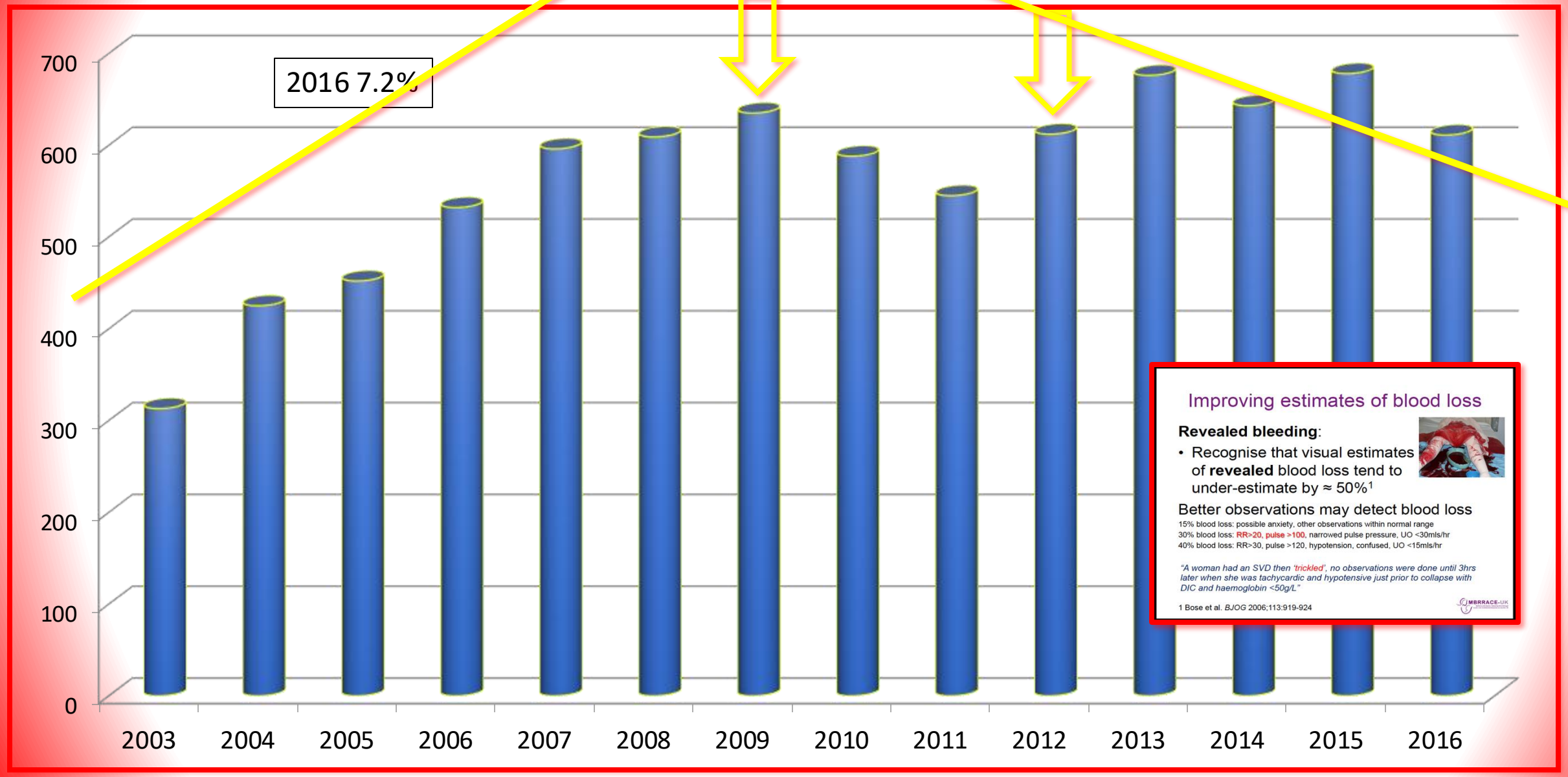
1 National Perinatal Epidemiology Unit, Nuffield Department of Population Health, University of Oxford, Oxford, United Kingdom, **2** Health and Nutrition Specialist, United Nations International Children Fund, Myanmar

* sumon.latt@dph.ox.ac.uk

PBM, Patient Blood Management

- Minska antalet transfusioner
- Minska mortalitet
- Minska morbiditet
- Minska transfusions komplik.
  - Allergiska
  - Hemolytiska
  - TACO
  - TRALI
- Minska blodsmitta
  - Bakteriella
  - Virala
- Minska framtida sjukdomar!
- Robustare samhälle

Vaginala förlossningar med blödning >1000 ml, Sahlgrenska Universitetssjukhuset

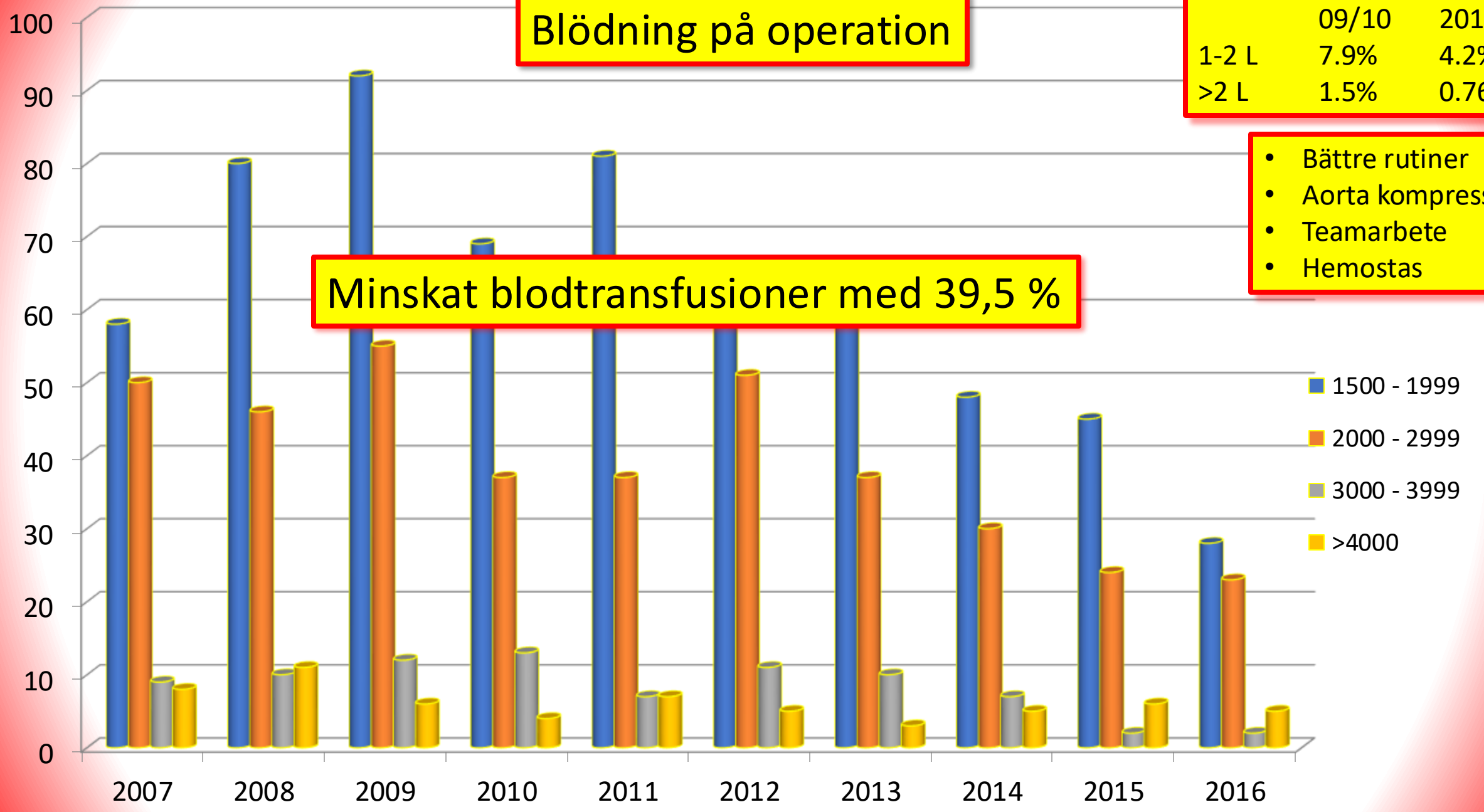


Blödning på operation

	09/10	2016
1-2 L	7.9%	4.2%
>2 L	1.5%	0.76%

- Bättre rutiner
- Aorta kompression
- Teamarbete
- Hemostas

Minskat blodtransfusioner med 39,5 %



Circulation during partus

Blood flow to uterus **700 ml /min**

Placenta, arterial bleeding

Atony, match wide arteries

5 minutes bleeding without contraction

3500 mL

Postpart

Expertgrupps

Råd för utfärda

Författare: Hann

Detta dokument
praxis inom det
förlaga vid framt
uppdateras fortl
kan inte i juridisk

1. Övergripande strategier

Att förebygga och behandla postpartumblödning (>1 000 ml) innefattar ett systematiskt arbete på individ- och systemnivå. Det krävs god beredskap på kliniken, rutiner för att upptäcka och förebygga blödningar, likväl som snabb och korrekt respons då blödning uppstår. För ett långsiktigt hållbart kvalitetsarbete är också uppföljning och lärande viktigt.

Beredskap

Varje klinik

- Uppdaterade klinikriktlinjer.
- Blödningsvagn med nödvändig medicinsk utrustning, läkemedel samt blödningsprotokoll.
- Tydliga larmrutiner och kommunikationsvägar (exv. operation, blodcentral, IVA).
- Återkommande teamträning.

Upptäcka och förebygga

Varje födande

- Preoptimering av Hb under graviditet, målvärde 100 – 110 g/L.
- Bedöm den gravidas risk för postpartumblödning.
- Väg all blödning kontinuerlig.
- Följ rekommendationer för handläggning av efterbördsskedet.

Respons

Varje blödning

- Följ rekommendationer för respons vid postpartumblödning.
- Stödinsatser till patienten, familjen och personal vid signifikanta stora blödningar.

Uppföljning och inlärning

Varje klinik

- Etablera en rutin för strukturerad uppföljning och lärande efter stora Postpartumblödningar.
- Följ resultat och målvärden för att utvärdera förbättringsåtgärder, förslagsvis i Graviditetsregistret.

Upptäcka och förebygga

Varje födande

- Preoptimering av Hb under graviditet, målvärde 100 – 110 g/L.
- Bedöm den gravidas risk för postpartumblödning.
- Väg all blödning kontinuerlig.
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Respons

Varje blödning

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Akut postpartumblödning

ÖVERVÄG ALLTID AORTAKOMPRESSION OCH UTERUSKOMPRESSION

Steg 1
Blödning >500 ml

- Tillkalla extra BM+USK samt läkare
- Försök lösa placenta med traktion av navelsträng
- Blödningsvagn+protokoll
- PVK+bastest
- Oxytocin totalt 16,6 µg im/iv (max 16,6µg)
- Tappa urinblåsan
- Identifiera orsak och påbörja åtgärder
  - ✓ Atoni, placenta, bristning eller koagulation?

Steg 2
Fortsatt blödning

Säkerställ att åtgärder på steg 1 är utförda

- Lös placenta
- Metylergometrin 0,2 mg iv/im
- Förstärkt oxytocindropp
- Extra PVK
- Tranexamsyra 1 g iv
- Prostinfenem 0,25 mg im
- Misoprostol 0,2mg 3 tabl subl

Steg 3
Blödning >1 000 ml
(eller kliniskt påverkad patient)

Säkerställ att åtgärder på steg 2 är utförda

- Kontroller enligt ONEWS2
- Syrgas 10 l/min
- Planläge, höjda ben
- Kroppsvarm Ringer-Acetat 1 l
- Tranexamsyra 1 g iv
- KAD

Steg 4
Blödning >1 500 ml

Time-out i teamet, utvärdera orsak och åtgärder

Överväg:

- Resursförstärkning (ex anestesiolog, bakjour)
- Fortsatt handläggning på operation
- Transfusion av blodprodukter
- Fibrinogen 2 – 4 g iv
- Följ blodprover: Hb, TPK, PK, APTt, S-Ca, Fibrinogen

Väg all blödning kontinuerligt

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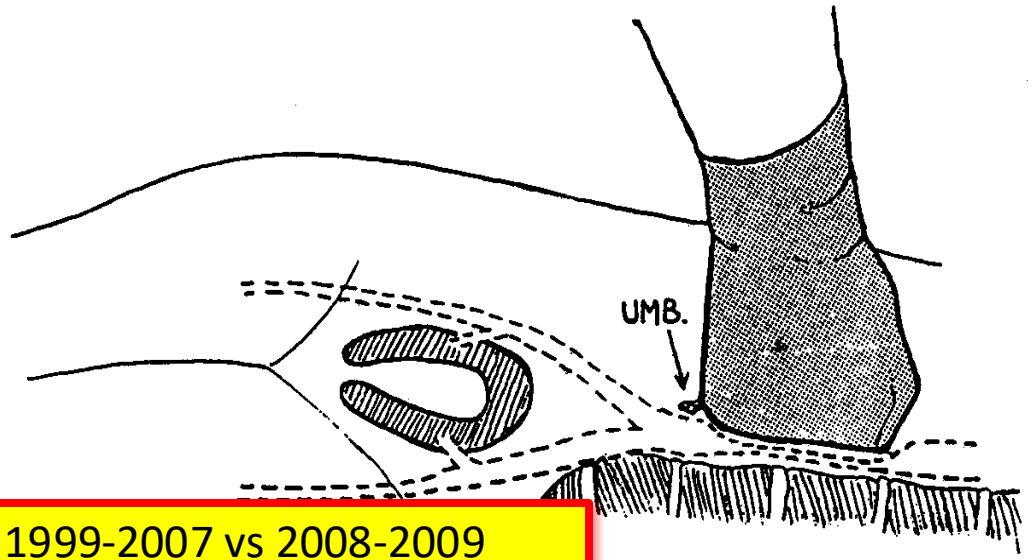
  - ✓ Atoni, placenta, bristning eller koagulation?

Orsaker [illegible]tora postpartumblöd-ningar [illegible]innas)	Komplikation	%
Tonu[illegible]	Atoni Placentaavlossning	50-80
Trauma	[illegible]lossningsskador [illegible]	15-35
"Tissue"	Plac[illegible] Placenta pl[illegible] Placenta accreta Placentaavlossning	10
Trombin	Koagulationsrubbning Placentaavlossning	[illegible]

STOPPA BLÖDNINGEN

Initial behandling

- Aortakompression
- Alt bimanuell uterus kompression
- Tillkalla personal
- Sänk huvudända och syrgas 5-10 L/min
- Blodtryck och puls
- 2 grova nålar
- Hb, bastest, hemostasprover, blodgas
- Varma vätskor
  - Ringeracetat (försiktighet > 2000 ml)
  - Risk spädningskoagulopati
- KAD
- Håll patient varm
- Inj Tranexamsyra (Cyklokapron®) 1 g iv



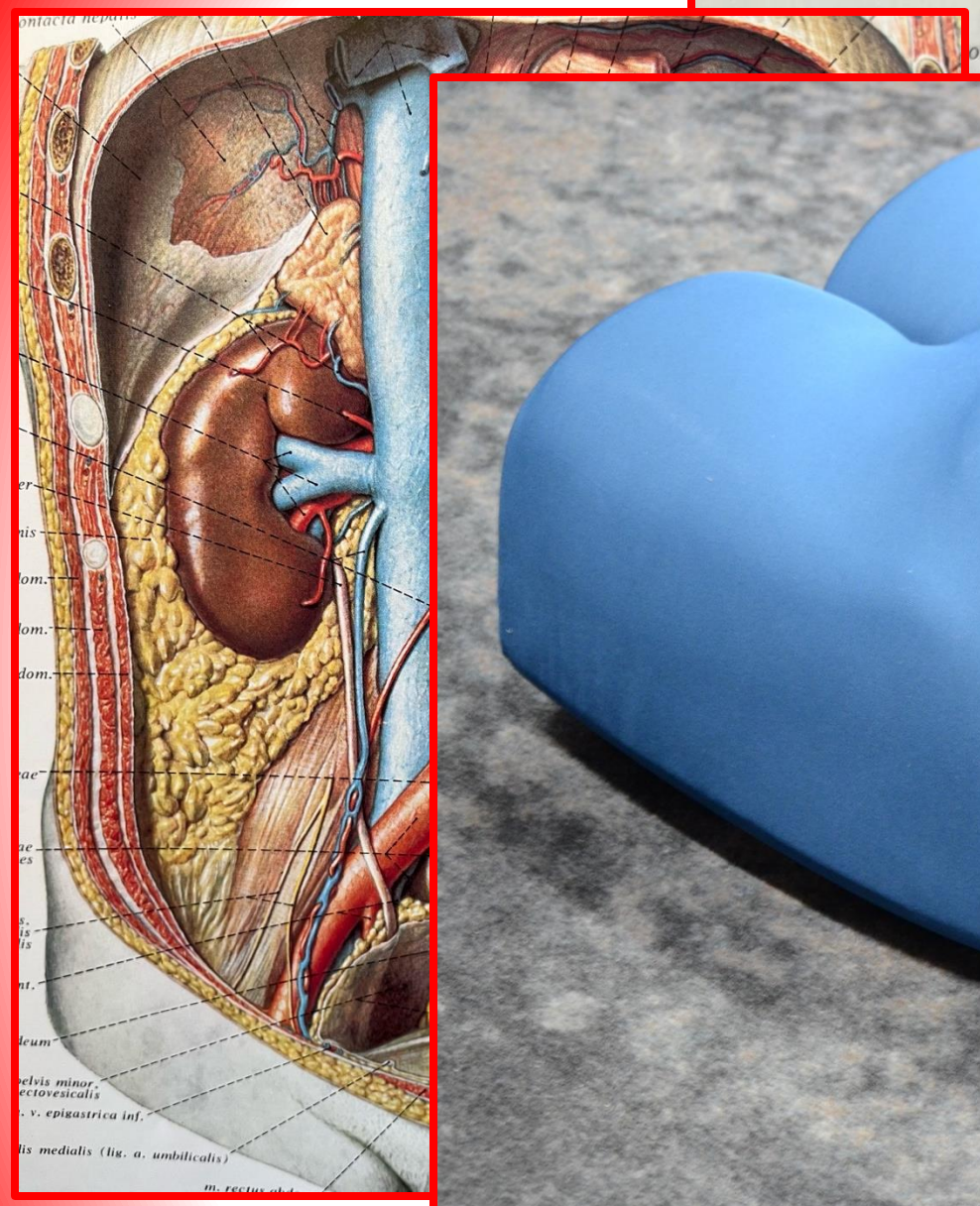
- PPH 1999-2007 vs 2008-2009
- PPH = hypovolemisk chock
- 2008 El-Minia aortic device
- 2009 External aortic compression
- Mortalitet 1-6 st/år vs 0
- PPH 4,6 % vs 0,9 %

The official Journal of Asia and Oceania Federation of Obstetrics and Gynaecology
Japan Society of Obstetrics and Gynecology
...naecol. Res. Vol. 37, No. 11: 1557–1563, November 2011

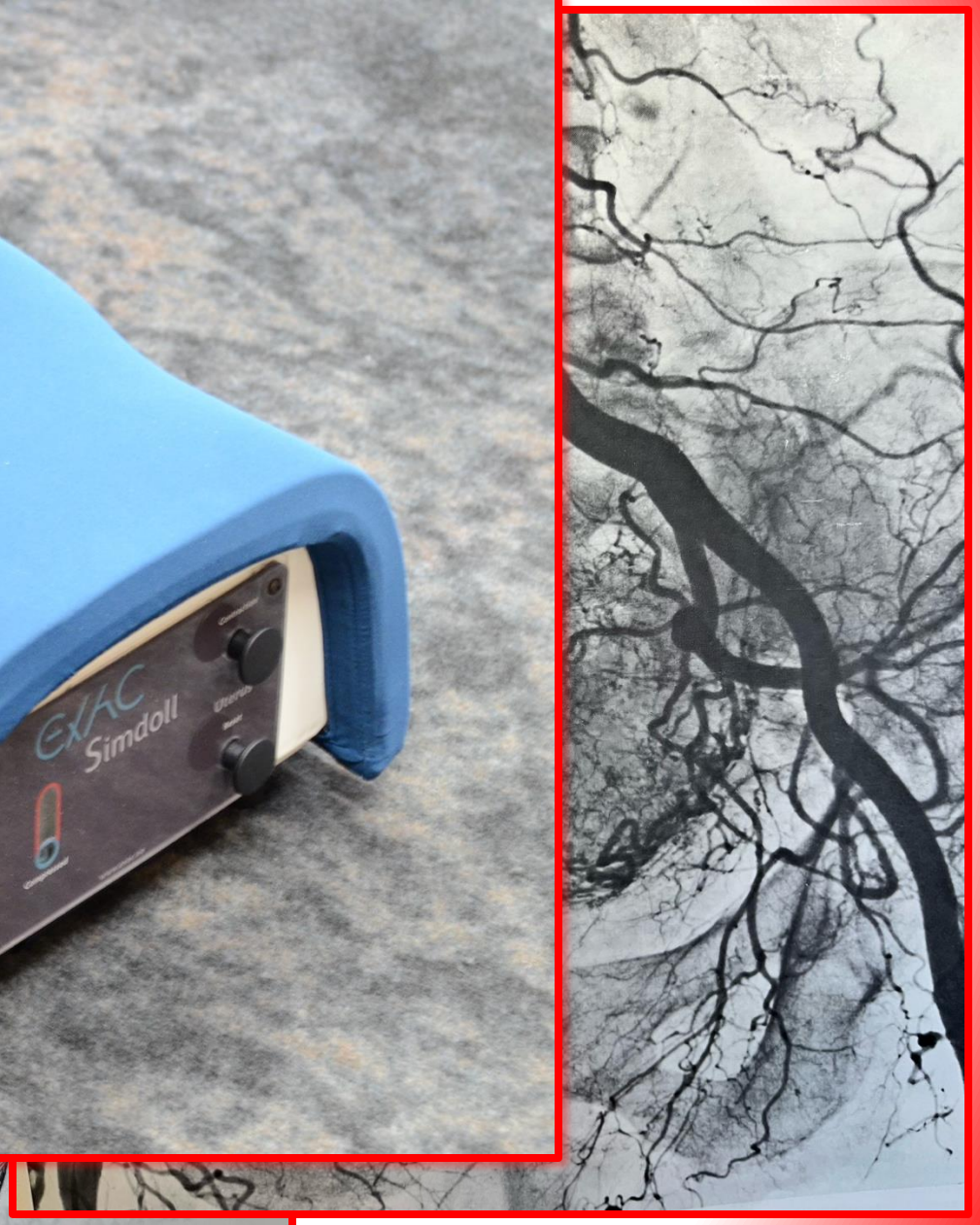
Experience managing postpartum hemorrhage at Minia University Maternity Hospital, Egypt: No mortality using external aortic compression

Mohamed H. Soltan[1] and Refaat R. Sadek[2]

Departments of [1]Obstetrics and Gynecology and [2]Community Medicine, Faculty of Medicine, Minia University, El-Minia, Egypt


v. epigastrica inf.
lis medialis (lig. a. umbilicalis)

EXAC
Simdoll



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Fortsatt blödning

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- Fortsatt handläggning på operation
- Transfusion av blodprodukter
- Fibrinogen 2 – 4 g iv
- Följ blodprover: Hb, TPK, PK, APTt, S-Ca, Fibrinogen

Obstetriska åtgärder

STOPPA BLÖDNINGEN

- Kontroll placenta
- Exploration uterus
- Kontroll cervix och vagina
- Ballongtamponad
- Kompressionssutur, B-Lynch
- Hysterektomi

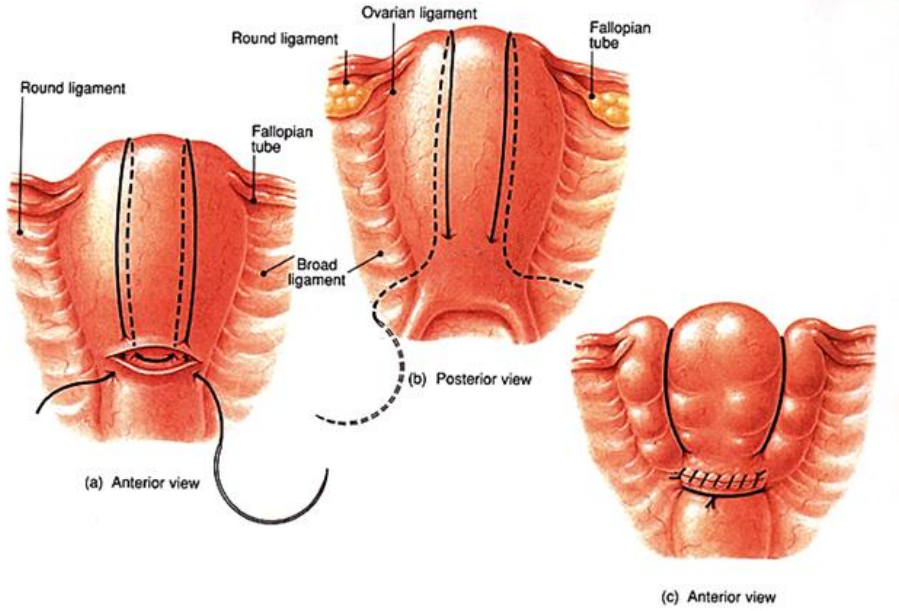
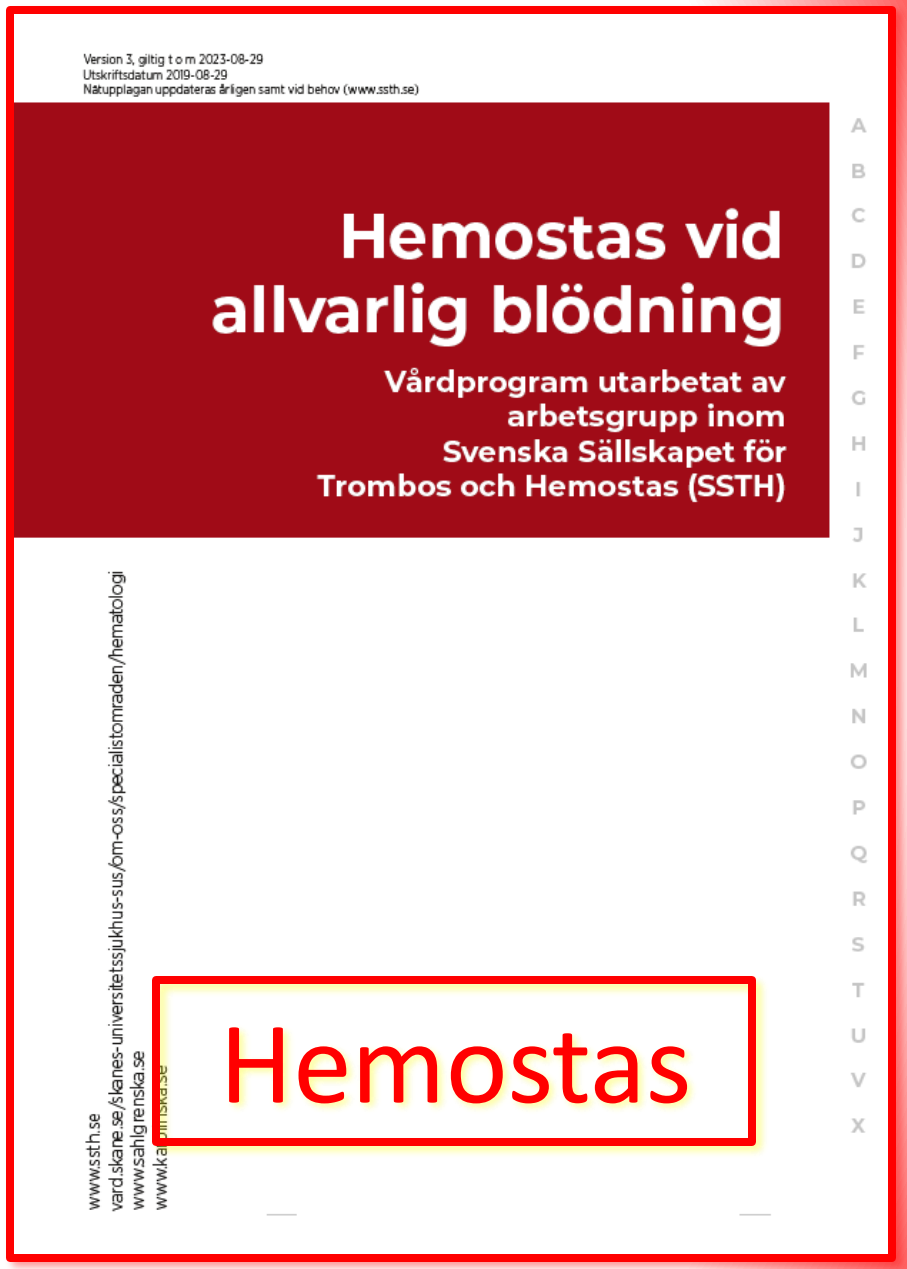


Fig. 1. Parts (a) and (b) demonstrate the anterior and posterior views of the uterus showing the application of the B-Lynch Brace suture. Part (c) shows the anatomical appearance after competent application. (Illustrations by Mr Philip Wilson FMAA, AIMI, based on the authors' video record of the operation.)

Mål under pågående stor blödning:

- Hb > 90 g/l
- TPK > (50)100 x 10^9/l
- PK < 1,5
- APTT normal
- Fibrinogen > 2,0-2,5 g/l
- Temp > 36,5 ° C
- pH > 7,2
- Jonicerat Ca >1,0
- **Patient nära analysinstrument**
- **Upprepa provtagning!**



1. Tone
   - Postpartum blödning pga atoni
2. Trauma
   - Postpartum blödning pga cervix laceration
3. Tissue
   - Postpartum blödning pga placentarester
4. Trombin
   - DIC pga sepsis

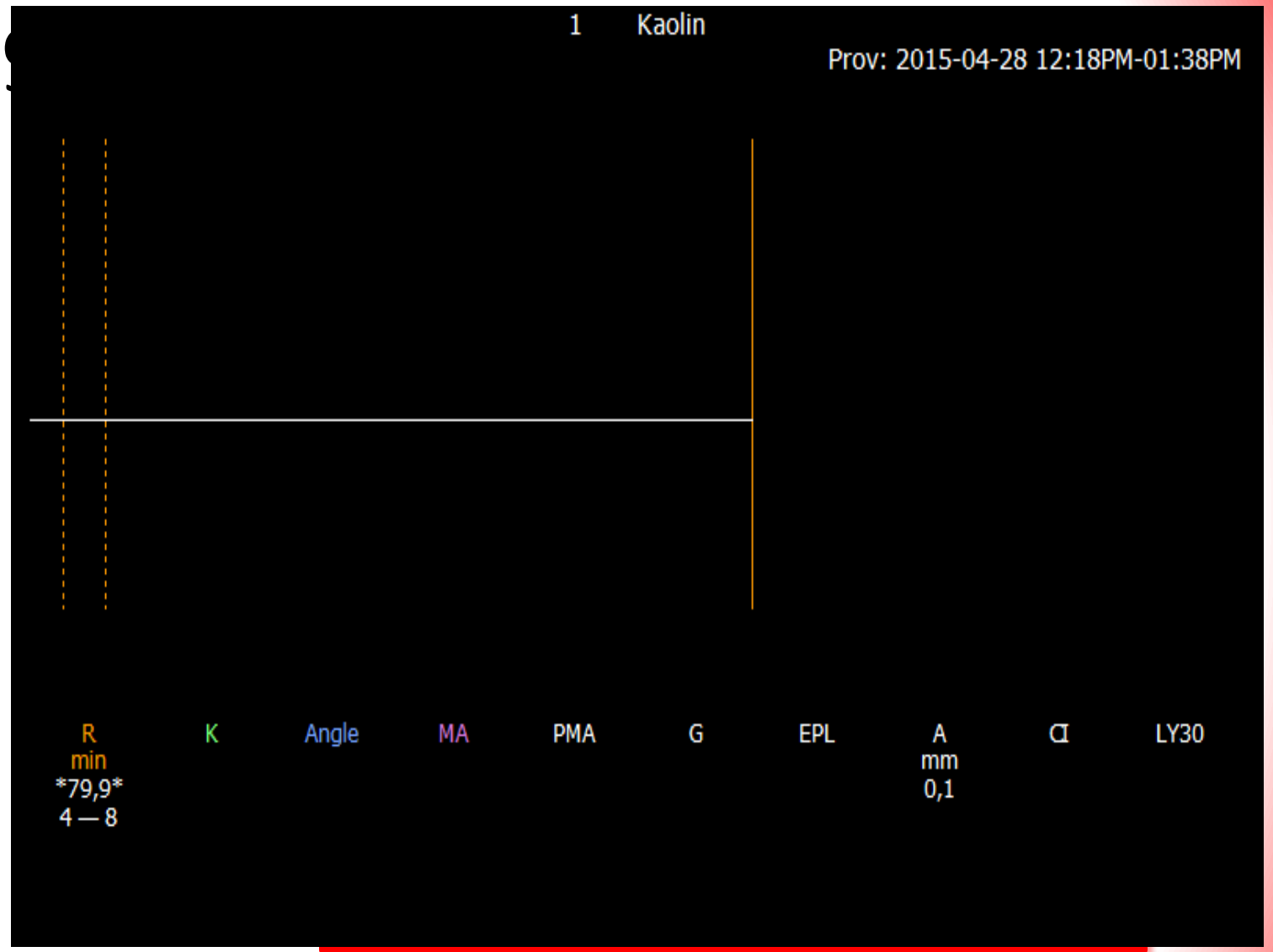
Manuell exploration pga PPH
Frisk kvinna, aortakompression

En liten stund ser

- Intubations narkos
  - Alfentanil, tiopental och su
  - Får en cirkulatorisk chock
- Oxytocin, metylergometrin
  misoprostol, försök till ball
- Sivande blödning från ytlig
- Ytterligare 1000 ml blödnin
- Mörjiga hinnor utbyte

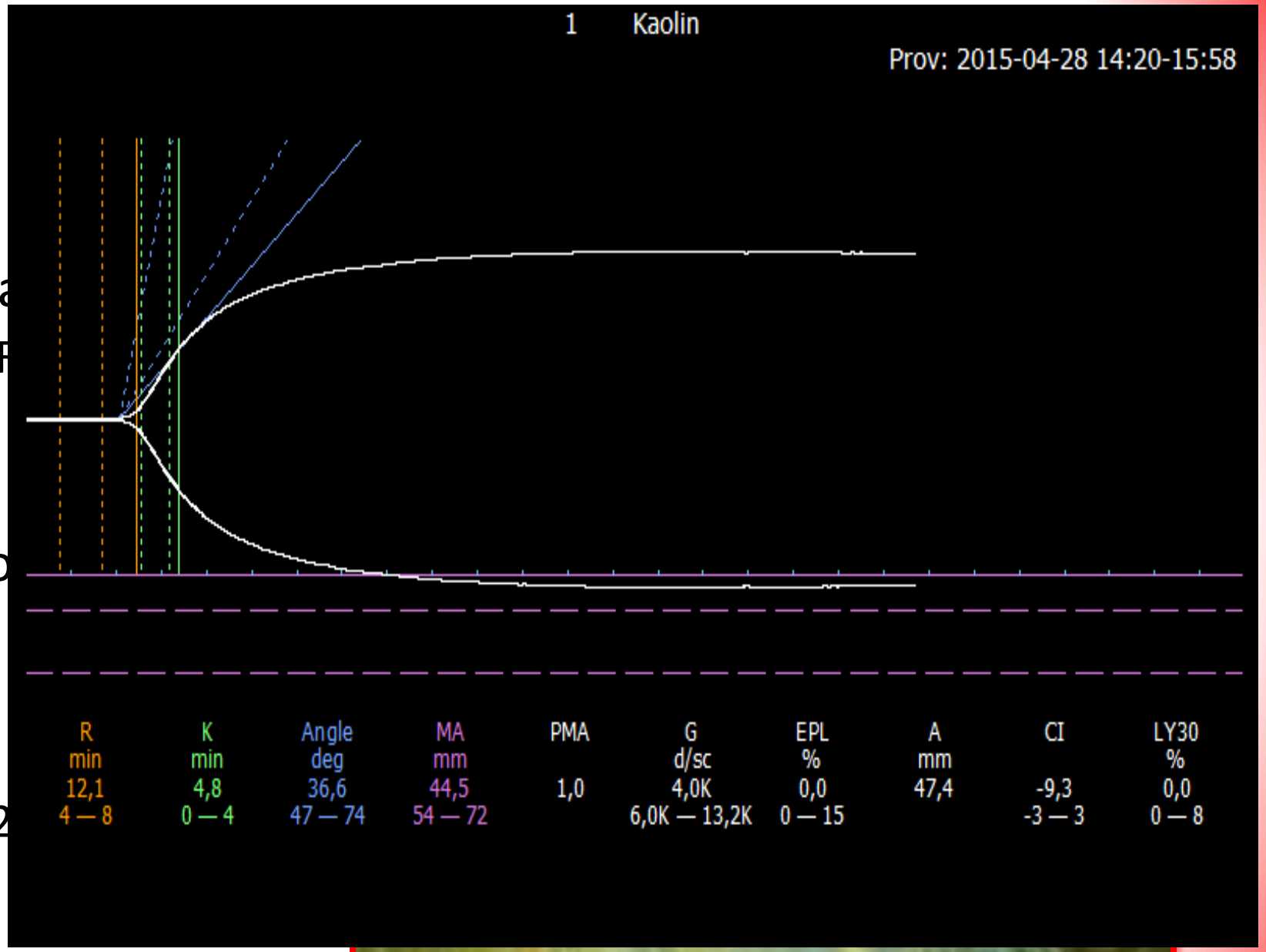
Kvinna född 197

- Anamnes
  - Frisk
- Aktuell graviditet
  - 3-gravida 1-para
  - Partus
    - Söndag kl 05.06
  - Hem
    - Måndag kl 14.05



Prover tisdag

- Kl 10.30 på antenata
  - Hb 117, TPK 123, CR
  - PK 1.0, APTT 96
  - Fibrinogen 1.4
- Kl 11.21 på operatio
  - Hb 107, TPK 70
  - PK 1.1, APTT 148
  - Fibrinogen 1.0
  - AT 0.52, D-dimer >2



Sepsis med DIC och PPH
Grupp A Streptokocker

- Söndag — Partus
- Måndag — Hem
- Tisdag — PPH
- Två veckor — IVA
  - En vecka respirator
  - Multiorgansvikt
- 5 ½ vecka — Hem

DIC

OBSTETRICS

American Journal of Obstetrics & Gynecology 2015

Disseminated intravascular coagulation in pregnancy: insights in pathophysiology, diagnosis and management

Offer Erez, MD; Salvatore Andrea Mastrolia, MD; Jecko Thachil, MD

Uncontrolled peripartum bleeding, resulting in disseminated intravascular coagulation (DIC), is one of the leading causes for maternal mortality worldwide.[1] This is in spite of an

Disseminated intravascular coagulation (DIC) is a life-threatening situation that can arise from a variety of obstetrical and nonobstetrical causes. Obstetrical DIC has been associated with a series of pregnancy complications including the following: (1) acute peripartum hemorrhage (uterine atony, cervical and vaginal lacerations, and uterine); (2) placental abruption; (3) preeclampsia/eclampsia/hemolysis, elevated liver es, and low platelet count syndrome; (4) retained stillbirth; (5) septic abortion and erine infection; (6) amniotic fluid embolism; and (7) acute fatty liver of pregnancy. diagnosis and understanding of the underlying mechanisms of disease leading to mplication in essential for a favorable outcom and treatment modalities along with bedside y assist the clinician in the diagnosis and m treatment are essential for the successful m

ords: acute fatty liver of pregnancy, endothe zymes, and low platelet count (HELLP) syndr

- Acute peripartum hemorrhage
- Placental abruption
- Preeclampsia/eclampsia/HELLP syndrome
- Retained stillbirth
- Septic abortion and intrauterine infection
- Amniotic fluid embolism
- Acute fatty liver of pregnancy

- Omedelbar behandling
- Behandla orsak
- Ge samtidigt:
  - Tranexamsyra
  - Blod/Plasma/Tromb
  - Fibrinogen
- Upprepa provtagning

Viktigt för fungerande hemostas:

Syra-bas

Calcium

Temperatur

Review Article

The Journal of TRAUMA® Injury, Infection, and Critical Care

Preconditions of Hemostasis in Trauma: A Review. The Influence of Acidosis, Hypocalcemia, Anemia, and Hypothermia on Functional Hemostasis in Trauma

Heiko Lier, MD, Henning Krep, MD, PhD, Stefan Schroeder, MD, PhD, and Frank Stuber, MD, PhD

Background: Beside the often homeostasis cussed topics of consumption and dil erfusion. coagulopathy, additional perioperative rdiovascular pairments of coagulation are caused by a evel for ion- sis, hypocalcemia, anemia, hypothermia, ould be held combinations.

Methods: Reviewing current literature, cutoff values of these parameters become obvious at which therapy should commence.

Results: A notable impairment of hemostasis arises at a pH ≤7.1. Similar ef- sed by a BE of −12.5 or less. e of severe bleeding, buffering siologic pH values is recom- ecially with massive transfu- r RBCCs displaying exhausted red blood cell buffer systems. It completes ≥0.9 mmol/L.

From the hemostatic point of view, the optimal Hct is higher than the one required for oxygenation. Even without a "classical" transfusion trigger, the therapy of acute, persistent bleeding should aim at reaching an Hct ≥30%.

A core temperature of ≤34°C causes a decisive impairment of hemostasis. A controlled hypotensive fluid resuscitation should aim at reaching a mean arterial pressure of ≥65 mm Hg (possibly higher for cerebral trauma). Prevention and later aggressive therapy of hypothermia by exclusive infusion of warmed fluids and the use of warming devices are prerequisites for the cure of traumatic coagulopathy.

Combined appearance of single preconditions cause additive impairments of the coagulation system.

Conclusions: The prevention and timely correction, especially of the combination acidosis plus hypothermia, is crucial for the treatment of hemorrhagic coagulopathy.

Key Words: Blood coagulation, Coagulopathy, Acidosis, Hypocalcemia, Anemia, Hypothermia.

J Trauma. 2008;65:951–960.

International Journal of Obstetric Anesthesia (2009) **18**, 111–117
0959-289X/$ - see front matter © 2008 Elsevier Ltd. All rights reserved.
doi:10.1016/j.ijoa.2008.07.010

ORIGINAL ARTICLE

ELSEVIER
www.obstetanesthesia.com

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

M. King, I. Wrench, A. Galimberti, R. Spray
Departments of Anaesthesia and Obstetrics, Royal Hallamshire Hospital, Sheffield, UK

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 w
fusion rate of 22% (10 ca
ian volume (range) of bl
a heterologous transfusi
that cell salvage was in
Conclusion: We have su
largest series of patients
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FOCUSED REVIEW

CME

Cell Salvage in Obstetrics

Haley Goucher, MD, Cynthia A. Wong, MD, Samir K. Patel, MD, and Paloma Toledo, MD, MPH

erative cell salvage is a strategy to decrease the need for allogeneic blood transfusion. nally, cell salvage has been avoided in the obstetric population because of the perceived mniotic fluid embolism or induction of maternal alloimmunization. With advances in cell technology, the risks of cell salvage in the obstetric population parallel those in the population. Levels of fetal squamous cells in salvaged blood are comparable to those rnal venous blood at the time of placental separation. No definite cases of amniotic bolism have been reported and appear unlikely with modern equipment. Cell salvage effective in patients with predictably high rates of transfusion, such as parturients with al placentation. (Anesth Analg 2015;121:465–8)

Blodåtervinning
- Säker och kan övervägas
- Inga fostervattenembolier
- Leukocytfilter ska brukas

Cellsaver bör övervägas:
- Placenta accreta
- Svårigheter med X-test
- Patienter som nekar blod

ELSEVIER

Techniques in Vascular and Interventional Radiology

Postpartum Hemorrhage

Janice Newsome, Jonathan G. Martin, Zachary Bercu, Jay Shah, Haris Shekhani, and Gail Peters

Interventional radiologists are often called for emergent control of abnormal uterine bleeding. Bleeding, even heavy bleeding as a result of uterine fibroids is not a common emergent procedure; instead, pregnancy and pregnancy related conditions, trauma and malignancy associated with bleeding can be the source of many interventional radiology on call events or procedures. Postpartum hemorrhage (PPH) is the most common cause, and is defined as blood loss of 500 mL after vaginal delivery or 1000 mL after cesarean section. Several authors have suggested a simpler definition of any amount of blood loss that creates hemodynamic instability in the mother. Regardless, PPH can be a life-threatening emergency and is a leading cause of maternal mortality requiring prompt action. Primary PPH is bleeding within the first 24 hour of delivery and secondary PPH is hemorrhage that occurs more than 24 hour after delivery. In addition to death, other serious morbidity resulting from postpartum bleeding includes shock, adult respiratory distress syndrome, coagulopathy, and loss of fertility due to hysterectomy. Transcatheter uterine artery embolization was first introduced as a treatment for PPH in 1979. It is a nonsurgical, minimally invasive, extremely safe and effective treatment for controlling excessive bleeding of the female reproductive track usually after conservative measures have failed, yet somewhat underused. Referring providers have limited awareness of the procedure. In hospitals where interventional radiologists have the experience and technical expertise to perform pelvic arteriography and embolization, this therapeutic option can play a pivotal role in the management of emergent obstetric hemorrhage.
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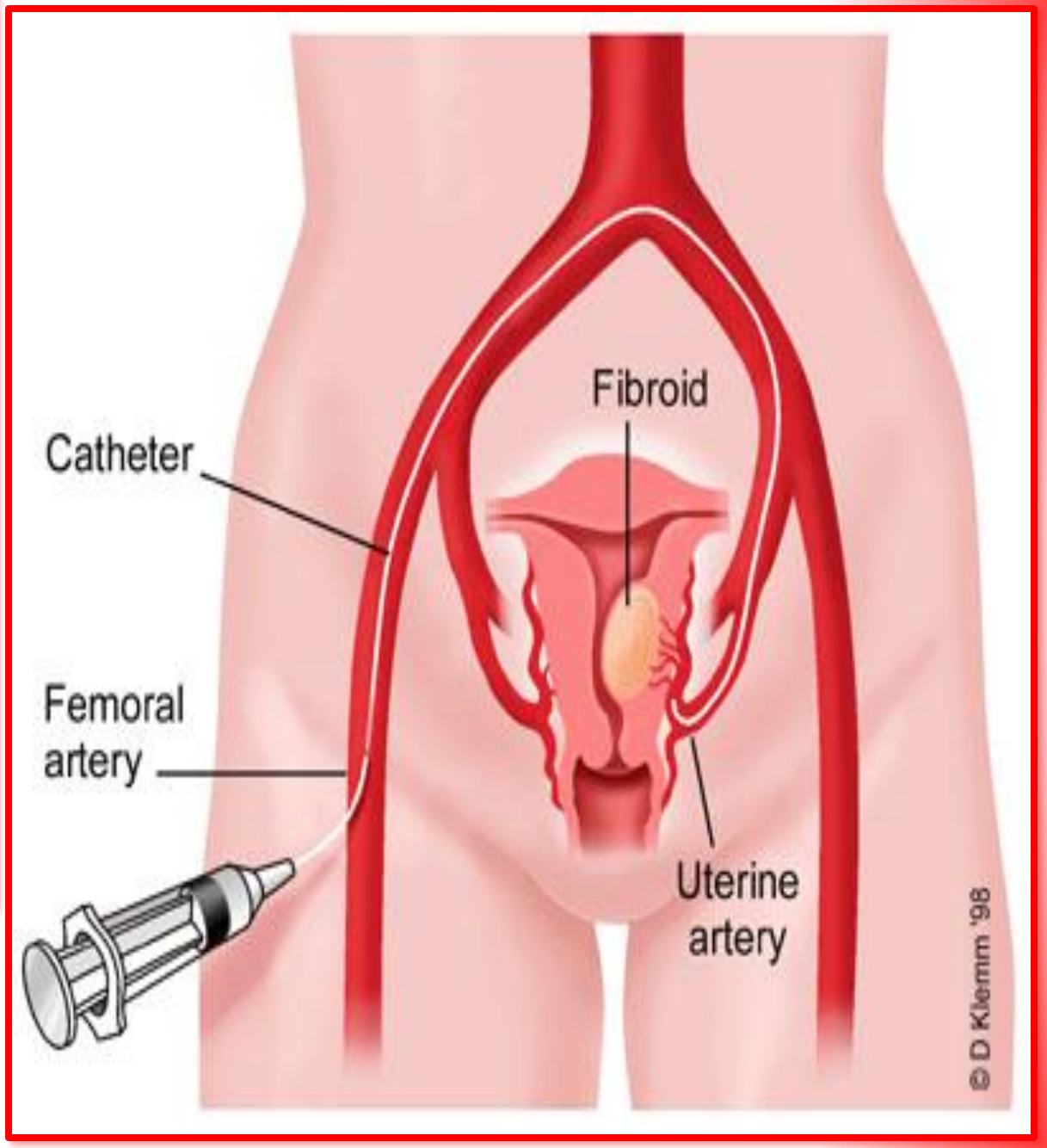
KEYWORDS embolization, postpartum bleed, obstetric hemorrhage, uterine artery embolization



Interventionell radiologi
- Kan vara värdefullt
- Kan brukas profylaktiskt
- Finns komplikationer

Invasiv plancenta

SCANDINAVIAN JOURNAL OF UROLOGY, 2017
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RESEARCH ARTICLE

Striking decrease in blood loss with a urologist-assisted standardized multidisciplinary approach in the management of abnormally invasive placenta

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ABSTRACT

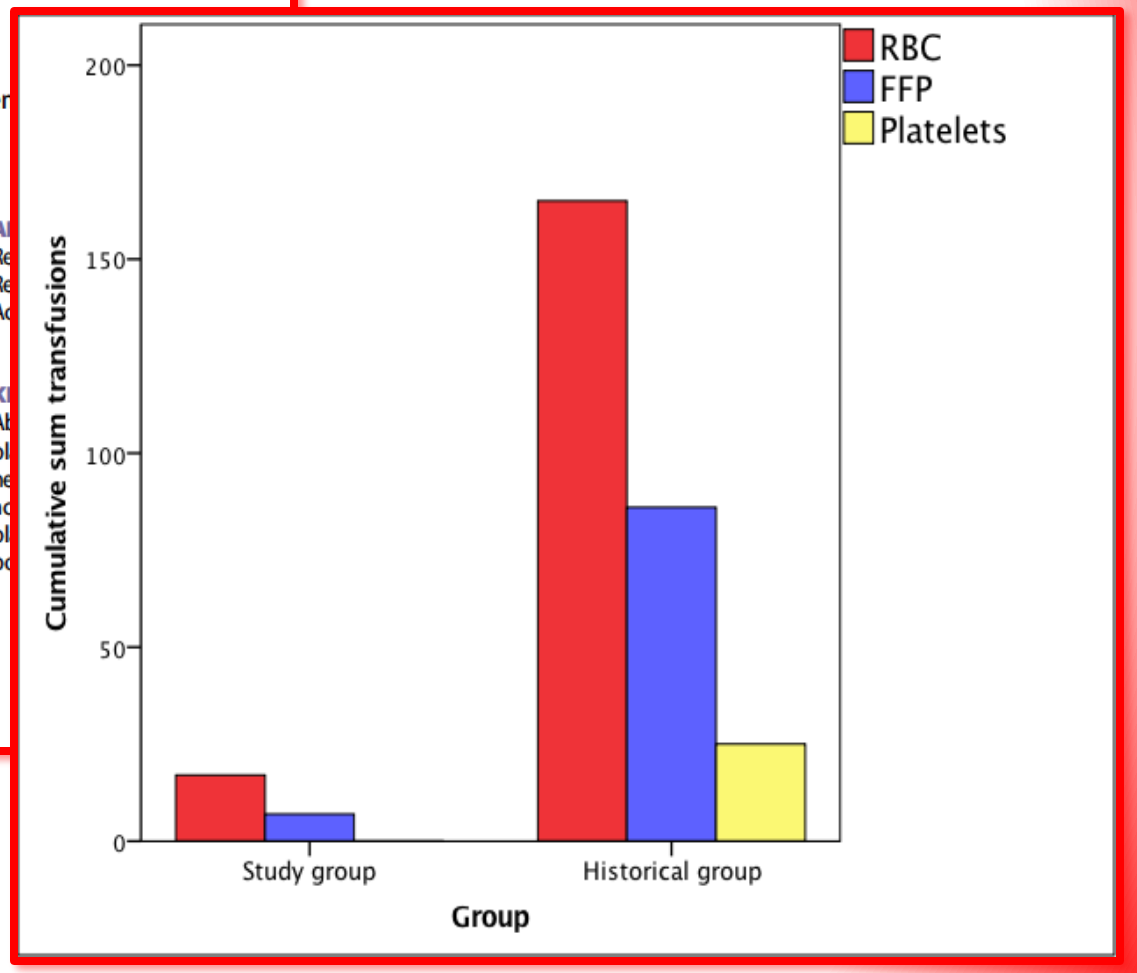
Objective: The aim of this study was to investigate the outcome of a standardized multidisciplinary approach using a modified surgical technique in the management of abnormally invasive placenta (AIP), with special reference to blood loss and the need for transfusion.

Materials and methods: Data were collected retrospectively in women managed with a recently adopted multidisciplinary strategy using a modified surgical approach, involving a urologist (study group: 10 patients). Women managed before the introduction of this standardized management served as a control group (nine patients). Comparisons were made between the study group and the control group. The main outcome measures were blood loss and the need for transfusion in the two groups.

Results: Standardized multidisciplinary management, involving a modified surgical technique performed by a urologist, decreased blood loss in the study group compared with the control group [median 1400 ml (range 400–3000 ml) vs median 8000 ml (2300–40000 ml); $p < .001$]. It also decreased postoperative complications and the need for transfusion of blood products.

Conclusions: Standardized multidisciplinary management of patients with AIP, using a modified surgical technique, reduces the risks of massive obstetric hemorrhage, the need for massive transfusion and the risk of postoperative complications. Involving an experienced urologist appears to be of paramount importance in the management of AIP.

- Sjukhus med ingen interventionell radiologi
- Standardiserat multidisciplinärt omhändertagande



Blödning (median och intervall)

- Studiegrupp 1400 ml (400-3000)
- Kontroll grupp 8000 ml (2300-40.000)

Akut artumblödning

Aortakompression

Tranexamsyra

Hemostas

STOPPA PÅGÅENDE BLÖDNINGEN

TEG/ROTEM

Blod/Plasma/Trombocyter 4/4/1

FIBRINOGEN

Upprepa provtag

Kommunikation och samarbete

Säkerställ att åtgärder på steg 2 är utförda

- Kontroller enligt ONEWS2
- Syrgas 10 l/min
- anläge, höjda ben
- Kroppsvarm Ringer-Acetat 1 l
- Tranexamsyra 1 g iv
- KAD