

THROMBOELASTOGRAPHY IN CLINICAL PRACTICE: WHAT A DIFFERENCE A TEST MAKES...

OBSCYMRU – A QUALITY IMPROVEMENT STRATEGY TO TO REDUCE HARM FROM PPH

Dr Thomas Kitchen

on behalf of the OBSCymru Collaboration









What are you going to do...?

- A. Red syringe = Alteplase (Thrombolysis)
- B. I can't decide
- C. Green syringe = Fibrinogen (Coagulation product)

The question will open when you start your session and slideshow.

Votes: 0

 Closed

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What are you going to do...?

A. Red syringe = Alteplase (Thrombolysis)

We will set these example results to zero once you've started your session and your slide show.
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In the meantime, feel free to change the looks of your results (e.g. the colors).

B. I can't decide

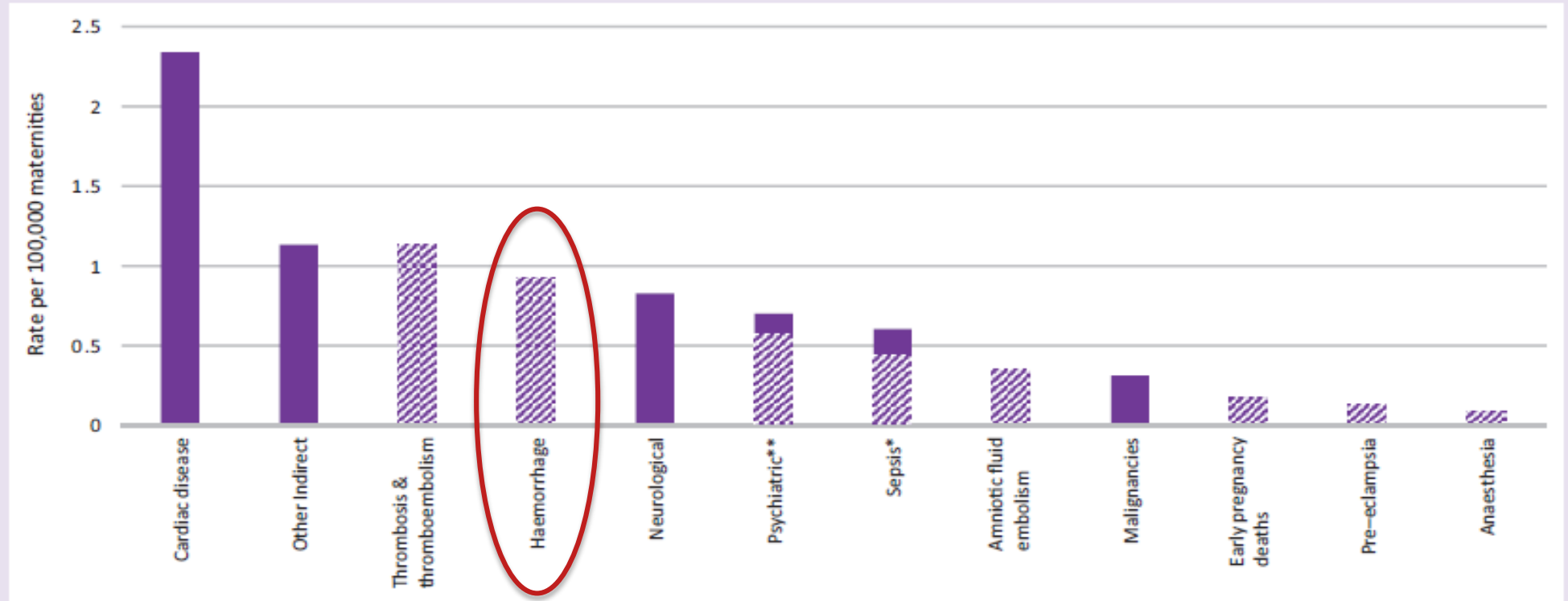
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C. Green syringe = Fibrinogen (Coagulation product) 0.0%

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Postpartum Haemorrhage rate increased from 0.5 to 0.8 / 100,000

Figure 2.3: Maternal mortality by cause 2013–15



Hatched bars show direct causes of death, solid bars indicate indirect causes of death;

*Rate for direct sepsis (genital tract sepsis and other pregnancy related infections) is shown in hatched and rate for indirect sepsis (influenza, pneumonia, others) in solid bar

**Rate for suicides (direct) is shown in hatched and rate for indirect psychiatric causes (drugs/alcohol) in solid bar

Source: MBRRACE-UK



Healthcare
Improvement
Scotland

'MOH remains the most frequent
cause of severe maternal morbidity,
being responsible for 80% of cases'

COAGULOPATHY RESEARCH

**The use of fibrinogen concentrate to correct
hypofibrinogenaemia rapidly during obstetric haemorrhage**

S.F. Bell, R. Rayment,* P.W. Collins* R.E. Collis

International Journal of Obstetric Anesthesia (2010) 19, 218–234

International Journal of Obstetric Anesthesia (2010) 19, 218–234

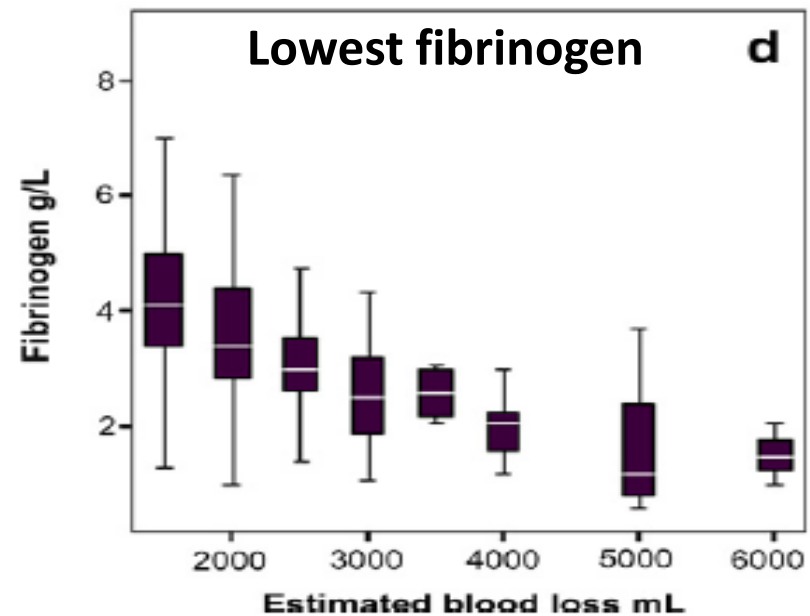
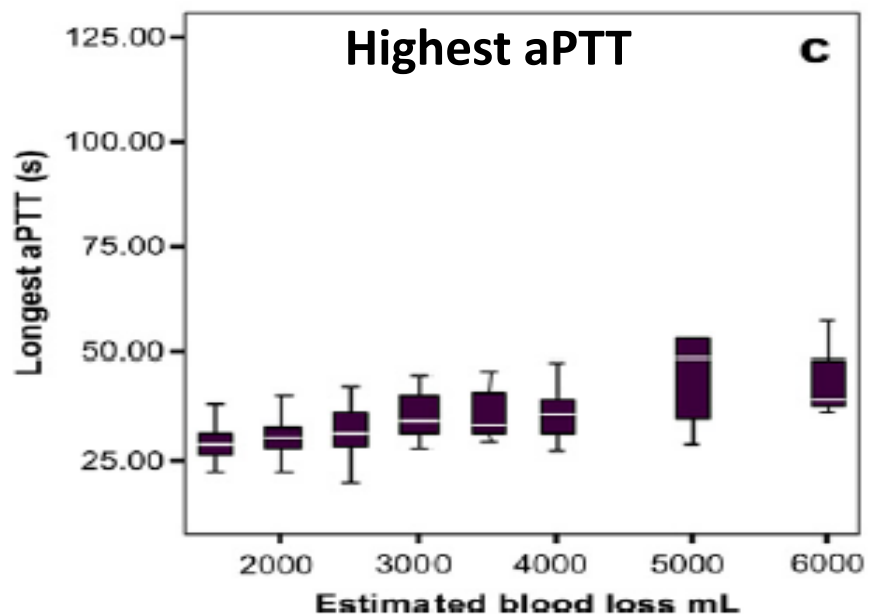
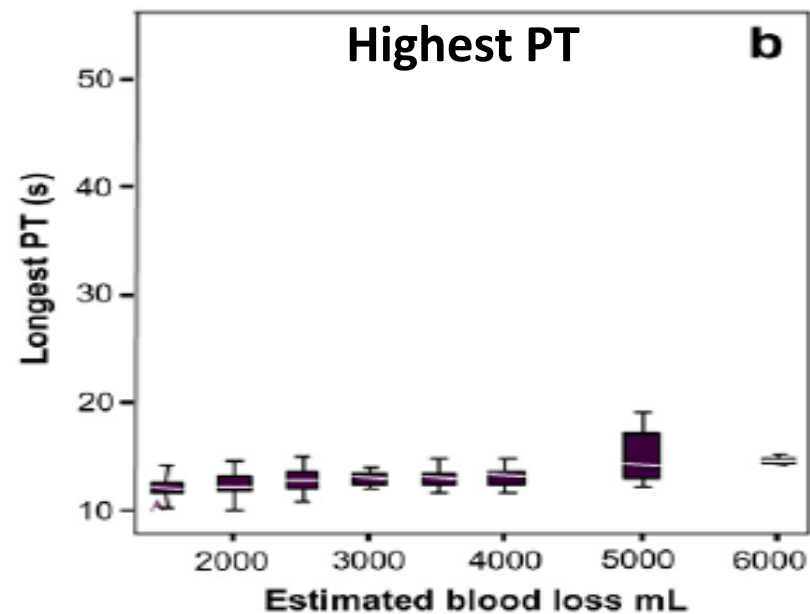
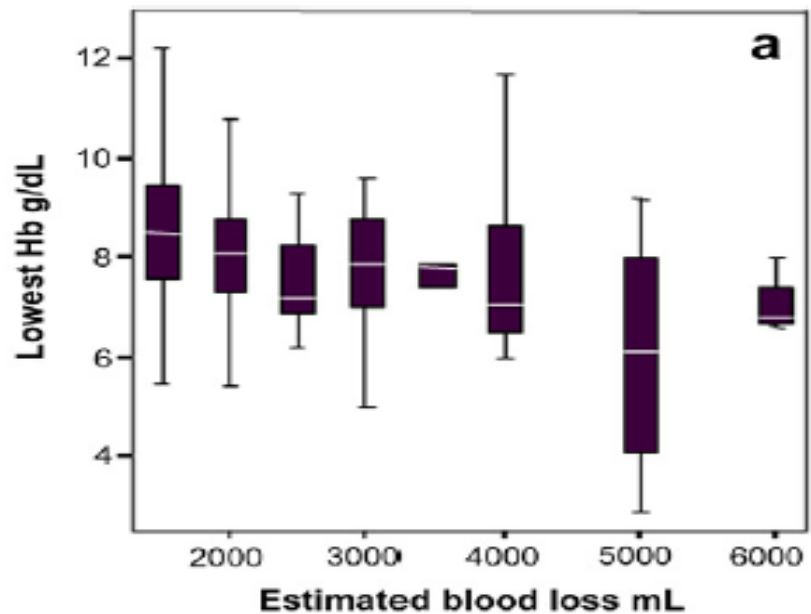
Standard haemostatic tests following major obstetric haemorrhage

L. de Lloyd,^a R. Bovington,^b A. Kaye,^c R.E. Collis,^a R. Rayment,^b J. Sanders,^c A. Rees,^c P.W. Collins^b *International Journal of Obstetric Anesthesia* (2011) **20**, 135–141

P.W. Collins, *International Journal of Obstetric Anesthesia* (2011) 20, 135–141

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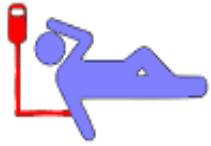


Fibrinogen - a predictive biomarker of progression of PPH

	n	Progression to severe PPH	Non progression to severe PPH
		Fibrinogen g/L	
Charbit: median (IQR)	129	3.3 (2.5–4.2)	4.4 (3.7–5.1)
Cortet: mean (SD)	738	3.4 (0.9)	4.2 (1.2)
de Lloyd Cardiff retrospective: mean (SD)	240	3.1 (1.0)	4.4 (1.1)
Cardiff prospective OBS1: mean (SD)	346	3 (1.4)	4.1 (1.2)

4 independent studies >1400 women

**Obstetric
Bleeding
Study**



1

Clinical study

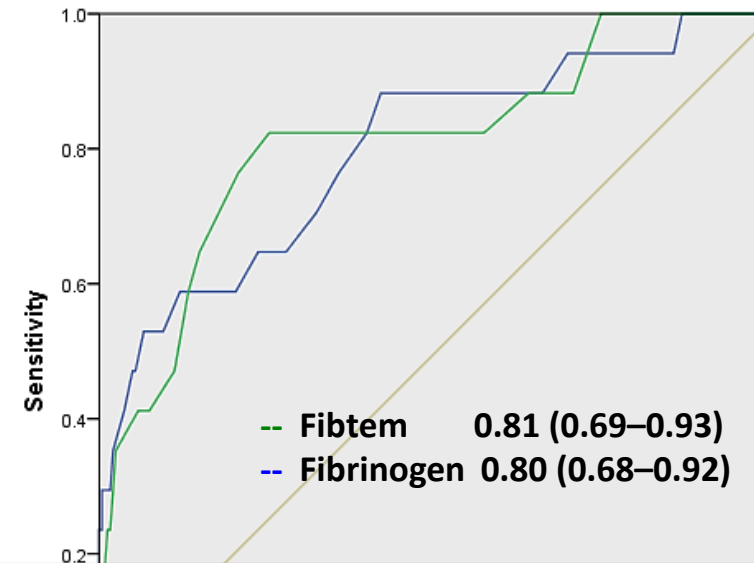
Fibrin-based clot formation as an early and rapid biomarker for progression of postpartum hemorrhage: a prospective study

Peter W. Collins, Graeme Lilley, Daniel Bruynseels, David Burkett-St. Laurent, Rebecca Cannings-John, Elizabeth Precious, Vincent Hamlyn, Julia Sanders, Raza Alikhan, Rachel Rayment, Alexandra Rees, Abigail Kaye, Judith E. Hall, Shantini Paranjothy, Andrew Weeks, Rachel E. Collis

Blood 2014 124:1727-1736; doi:10.1182/blood-2014-04-567891



Progression to 4 U RBC transfusion



ROTEM FIBTEM A5 is as good as laboratory assessment of fibrinogen at predicting obstetric blood loss

OBSTETRICS

Viscoelastometric-guided early fibrinogen concentrate replacement during postpartum haemorrhage: OBS2, a double-blind randomized controlled trial

P. W. Collins^{1,*}, R. Cannings-John², D. Bruynseels³, S. Mallaiah⁴, J. Dick⁵, C. Elton⁶, A. D. Weeks⁷, J. Sanders⁸, N. Aawar², J. Townson², K. Hood², J. E. Hall⁹ and R. E. Collis³ on behalf the OBS2 study team[†]



- Coagulopathy in obstetrics is uncommon
- Inappropriate use of FFP may do harm
- Fibrinogen beneficial in certain groups
- ROTEM testing can be useful to determine when

Reduction in PPH associated morbidity had fallen more than could be attributed to the administration of fibrinogen concentrate alone



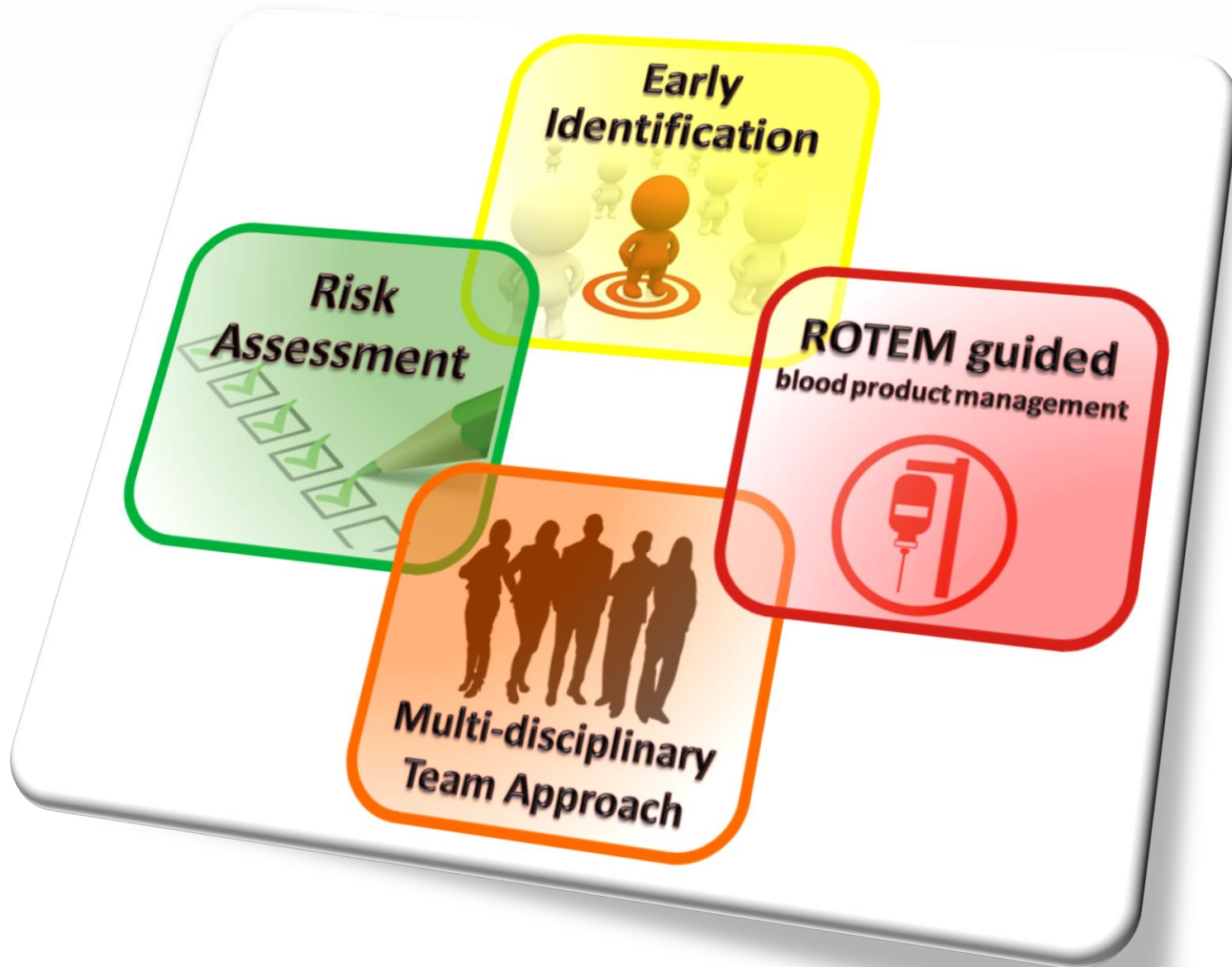
How might we reduce PPH morbidity?

- Universal PPH **Risk Assessment**
- **Measurement** of ALL blood loss
- **Early senior** midwife / Obs / Anaesth involvement
- **Prompt** uterotonics +/- surgical **intervention**
- POC **guided blood product usage**
- **Effective team-working**



OBSCYMRU
Obstetric Bleeding Strategy for Wales

**A NATIONAL
QUALITY IMPROVEMENT
COLLABORATION**





Project Aim

Reduce the maternal mortality^a and morbidity^b associated with postpartum haemorrhage in Wales

^a Target a reduction in mortality to less than UK national incidence (0.46/100,000 deliveries) across **all units** in Wales over 3 years

^b Aim to reduce the variation in outcome measures across **all units** in Wales over 3 years. Specifically:

- Hysterectomy rates
- Level 3 / ICU admissions
- Severe PPH $\geq 2.5L$ or \geq than 5 units RBC
- Reduction in FFP usage by 80%



A National Approach

Obstetrics

Haematology

Midwifery & HCA's

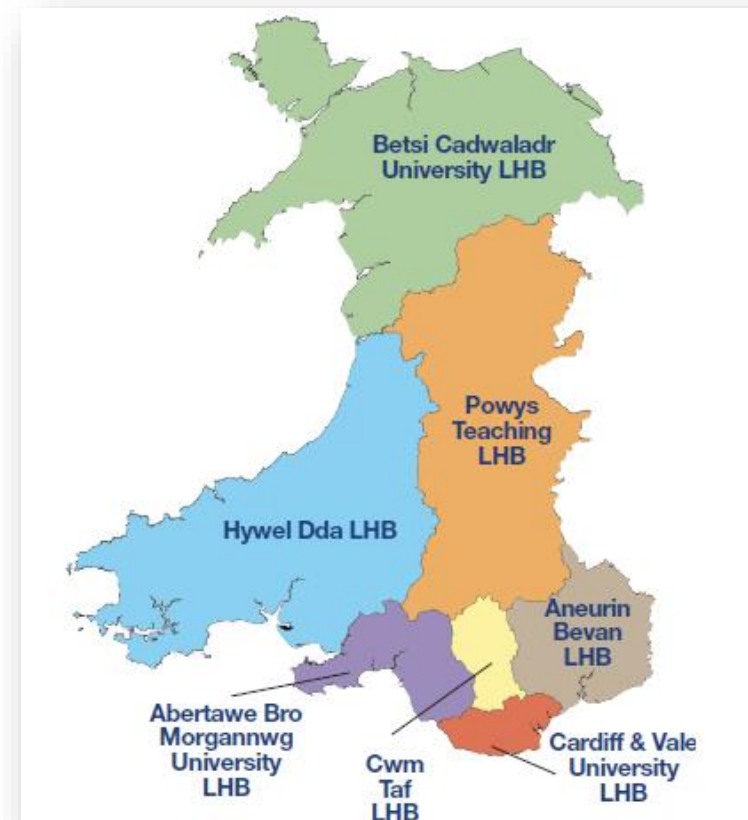
Anaesthetics / ODP's

Welsh Blood Service

Point-of-care teams

Laboratory staff

Transfusion Practitioners





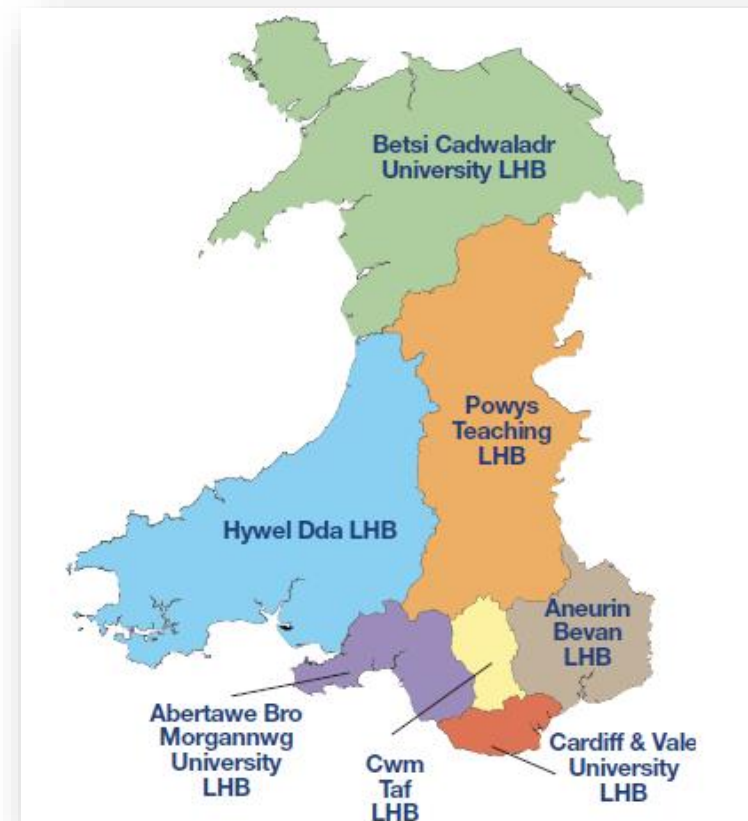
Come on people. We're a team.
Together we can do this!





A National Approach

**Maternal morbidity & mortality
a problem that can effect us all...**





Site Visits



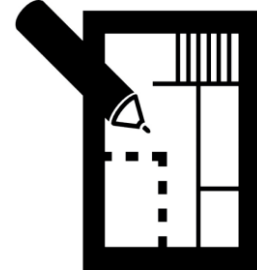
Communication



Team Dynamics



Data reliability & comparability



Geographical layout



Incident reporting

Education and Training Factors

Unit is engaged in some educational sessions however an overall MDT strategy/approach to skills & drills would benefit from further development. Anaesthetic led simulations are run every 3/12 to support anaesthetic trainees. Midwives engaged in 1-2 days per year as study days. Formal blood loss measurement training has been undertaken with the support of local OI methodology. **No ROTEM on-site – this will require specific training with regard to use of the machine and interpretation.**

Strengths

- Blood loss measurement training

Challenges

- Further development of MDT training/sims
- ROTEM training



**CHANGE
AHEAD**

How comfortable do you feel with making significant changes at work?

- A. Love change!!! - very comfortable
- B. Like it a little - comfortable
- C. Indifferent - neither comfortable or uncomfortable
- D. Makes me a little nervous - uncomfortable
- E. I simply won't even think about it - very uncomfortable

The question will open when you start your session and slideshow.

Votes: 0

 Closed

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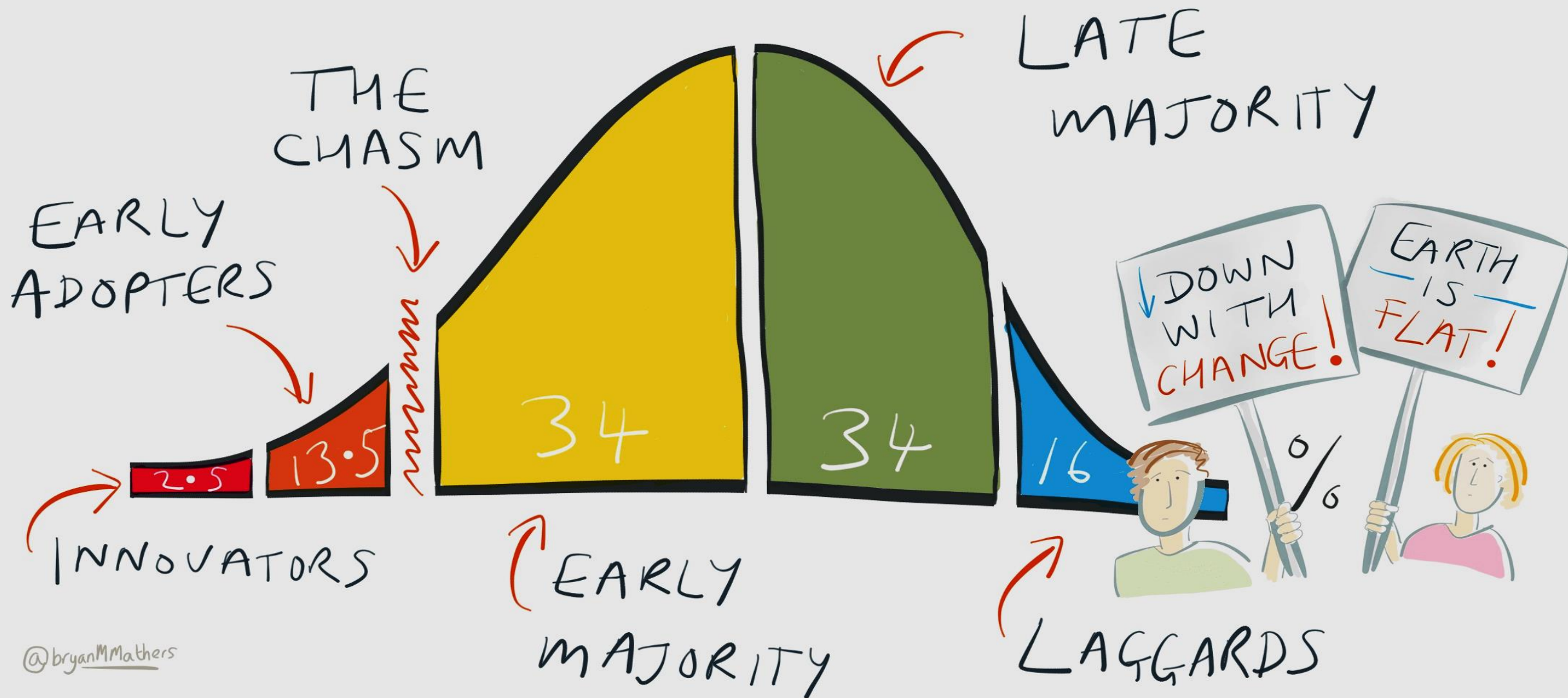
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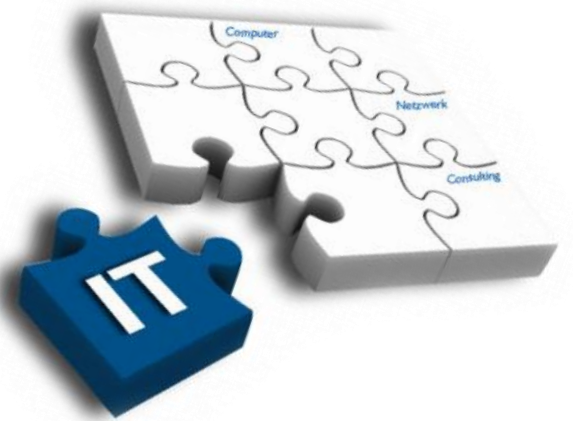
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DIFFUSION OF INNOVATION



@bryanMMathers



VALIDATED



TRAINING



Site Files

- Initial Site Validation Data
- How to run a ROTEM – a guide
- ROTEM Protocol
- Maintenance Guide
- Weekly QC Log & Fault Log
- Quarterly Maintenance Log & Fault Log
- Training Log
- Training Competency Assessments
- SOP - Operation and Maintenance
- MOU, Data Sharing Agreement & Forms of Indemnity

THE DATA...

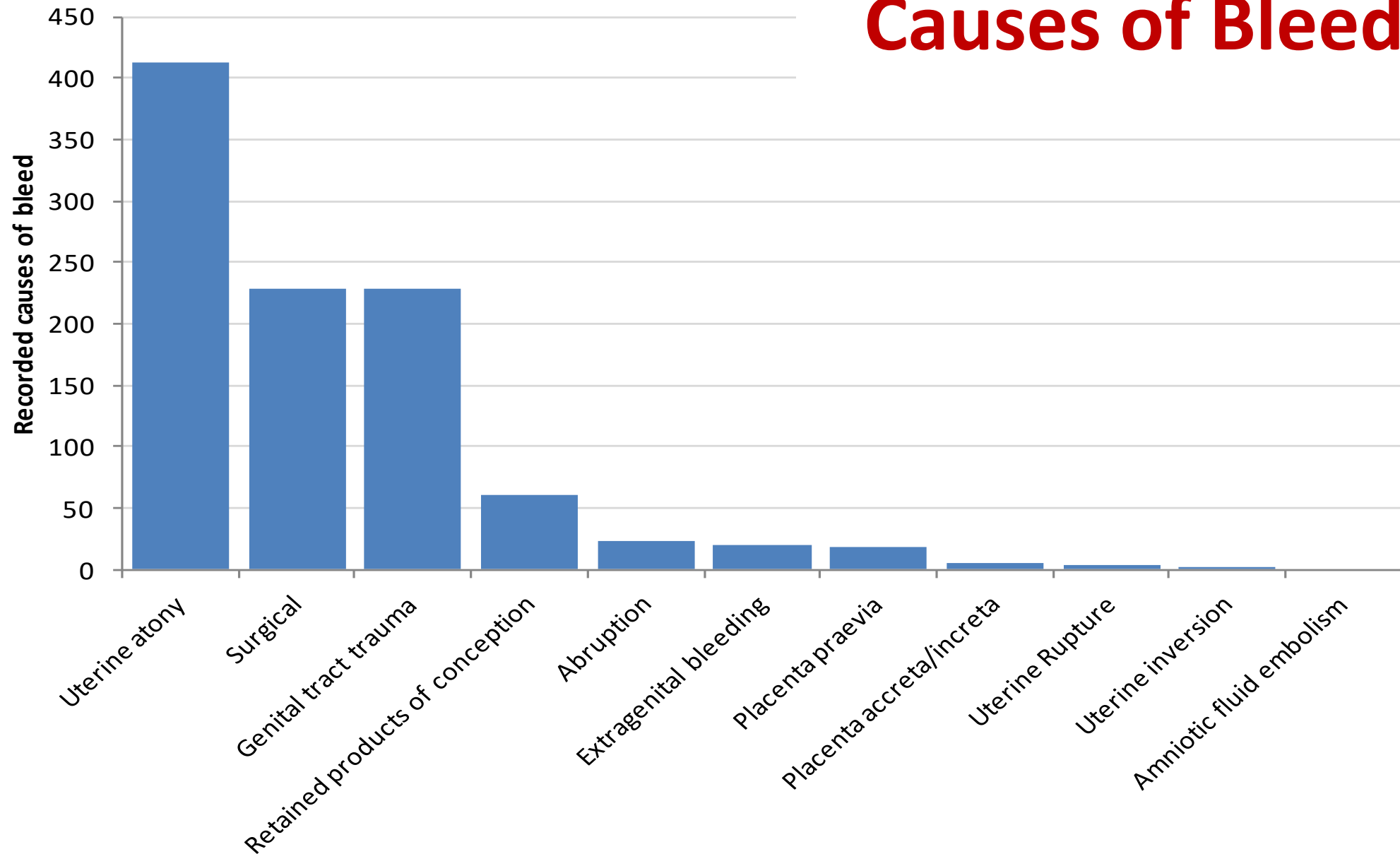


National Data Collection

Postpartum Haemorrhage Rates

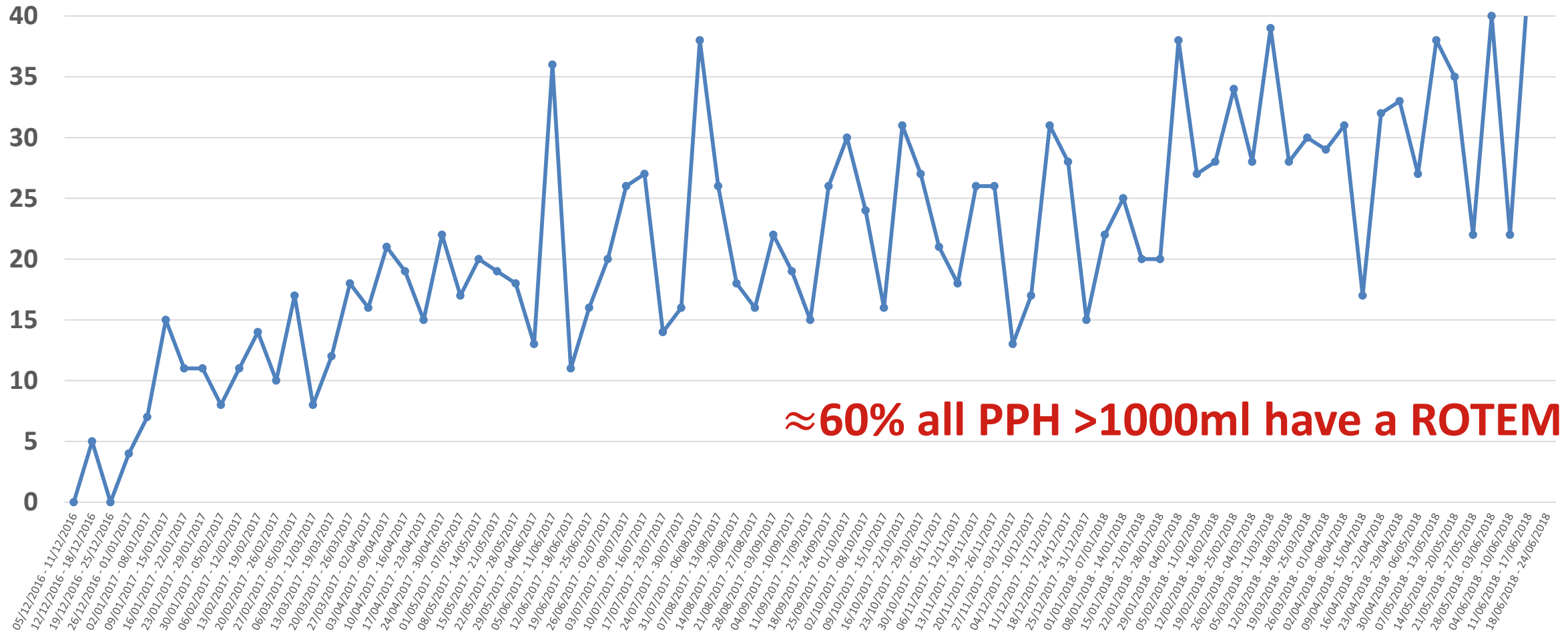
PPH	Apr-Jun 2017	Jul-Sep 2017	Oct-Dec 2018	Jan-Mar 2018
≥1000ml	9.7%	9.5%	8.9%	9.7%
≥ 2500ml	0.6%	0.6%	0.5%	0.6%

Causes of Bleeding





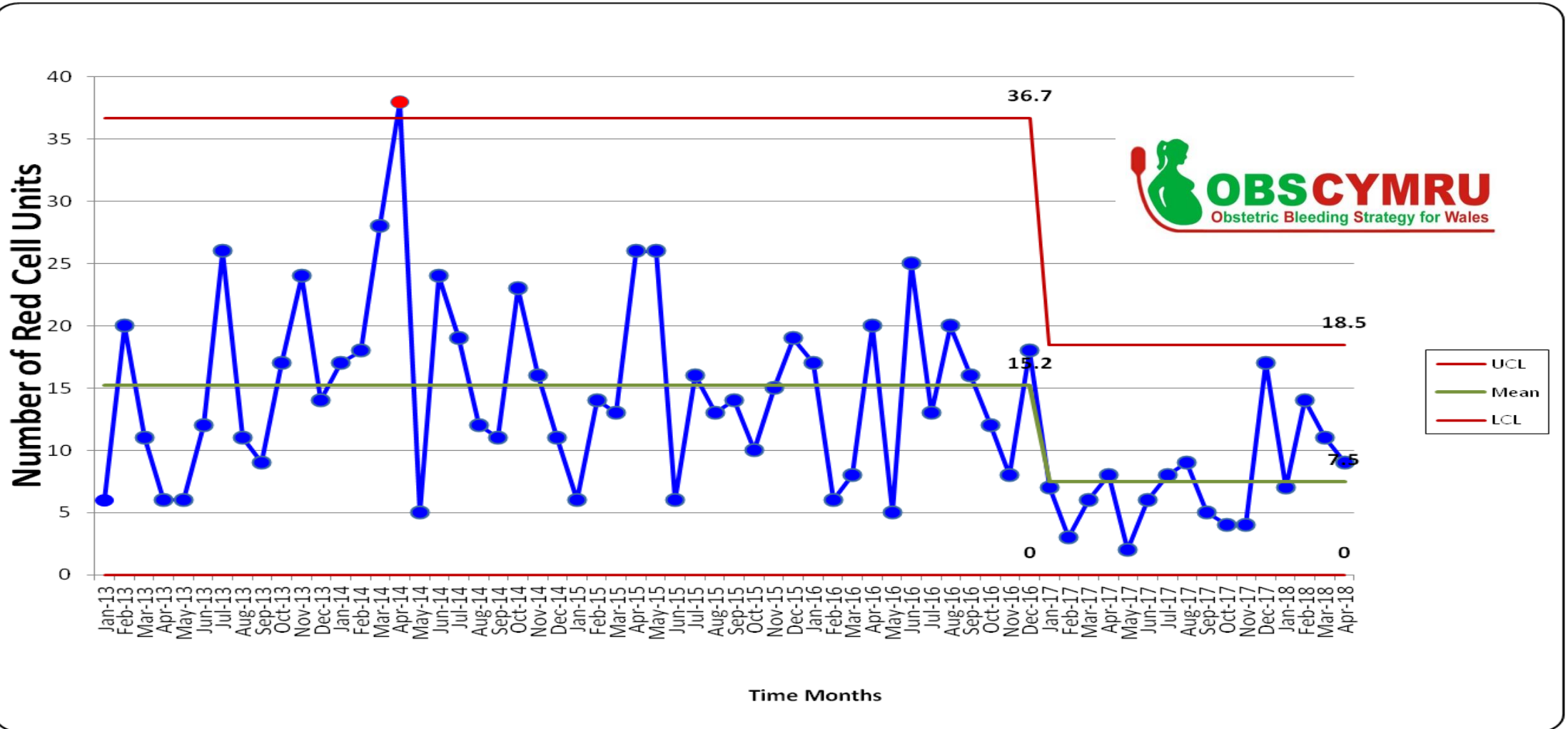
Use of ROTEM – All Wales



≈ 60% all PPH >1000ml have a ROTEM

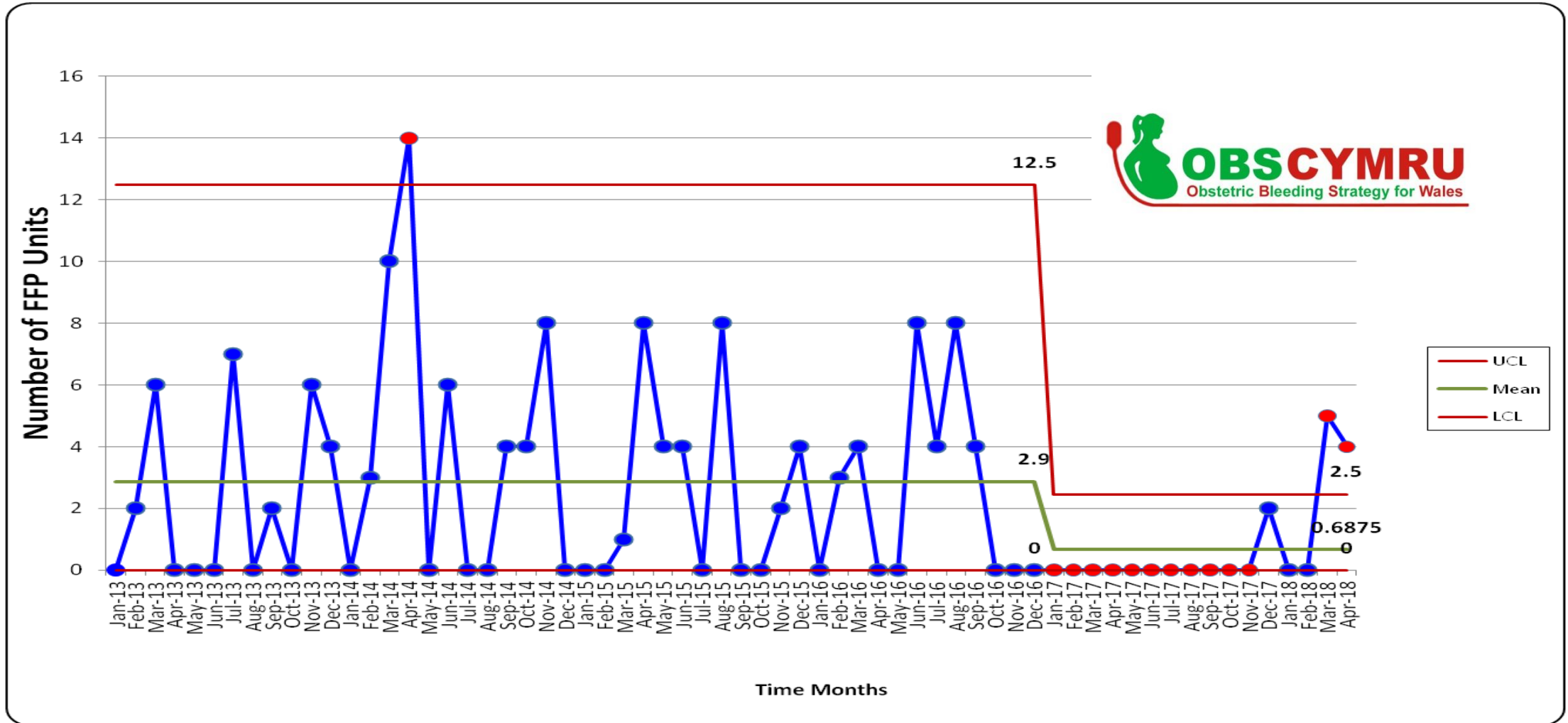


Red Cell Use in Early Adopter Site



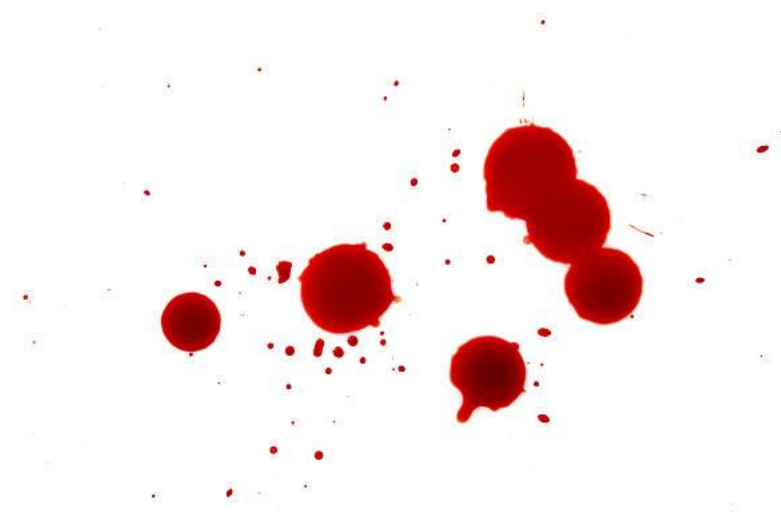


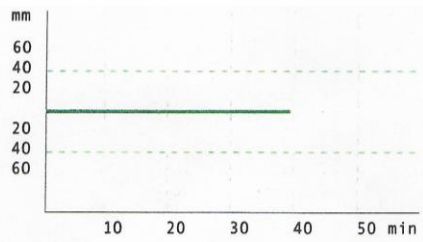
FFP Use in Early Adopter Site



THE REAL DIFFERENCE...

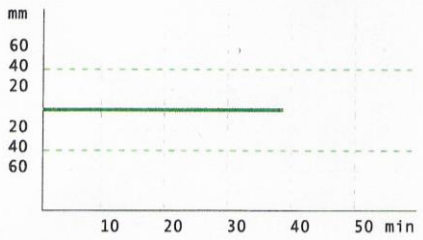
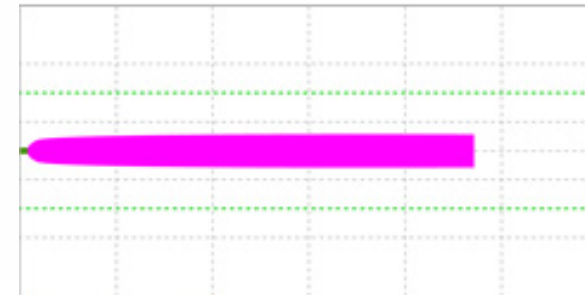






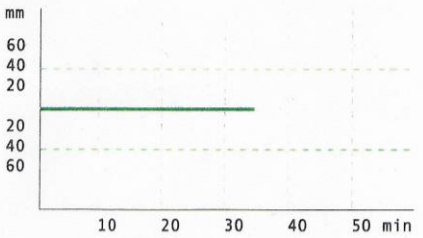
FIBTEM C [default]

RT: 00:38:40		ST: 201	
CT	: * 2499	s [46 - 84]	
CFT	:	s	
α	:	°	
A5	:	mm [5 - 20]	
A10	:	mm [6 - 21]	
A20	:	mm [6 - 21]	
A30	:	mm [6 - 21]	
MCF	:	mm [6 - 21]	
LI30	:	% [91 - 100]	



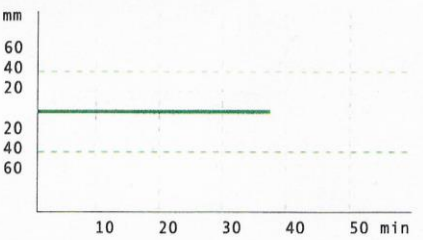
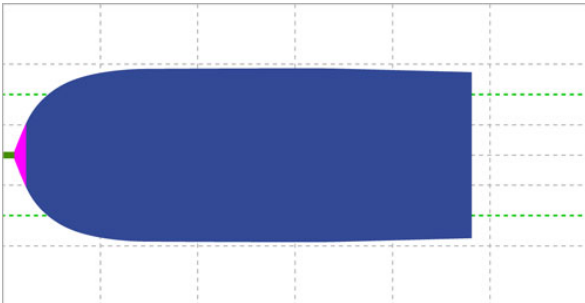
EXTEM C [default]

RT: 00:38:00		ST: 201	
CT	: * 2820	s [50 - 80]	
CFT	:	s [46 - 149]	
α	:	° [63 - 83]	
A5	:	mm [32 - 52]	
A10	:	mm [43 - 63]	
A20	:	mm [52 - 70]	
A30	:	mm [54 - 72]	
MCF	:	mm [55 - 72]	
LI30	:	% [99 - 100]	



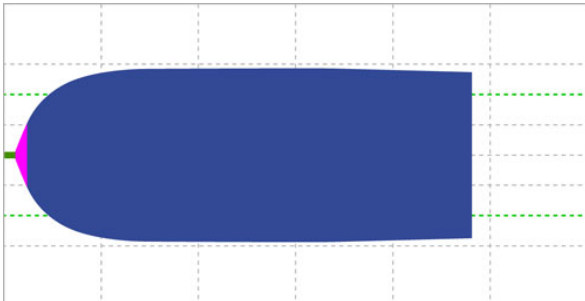
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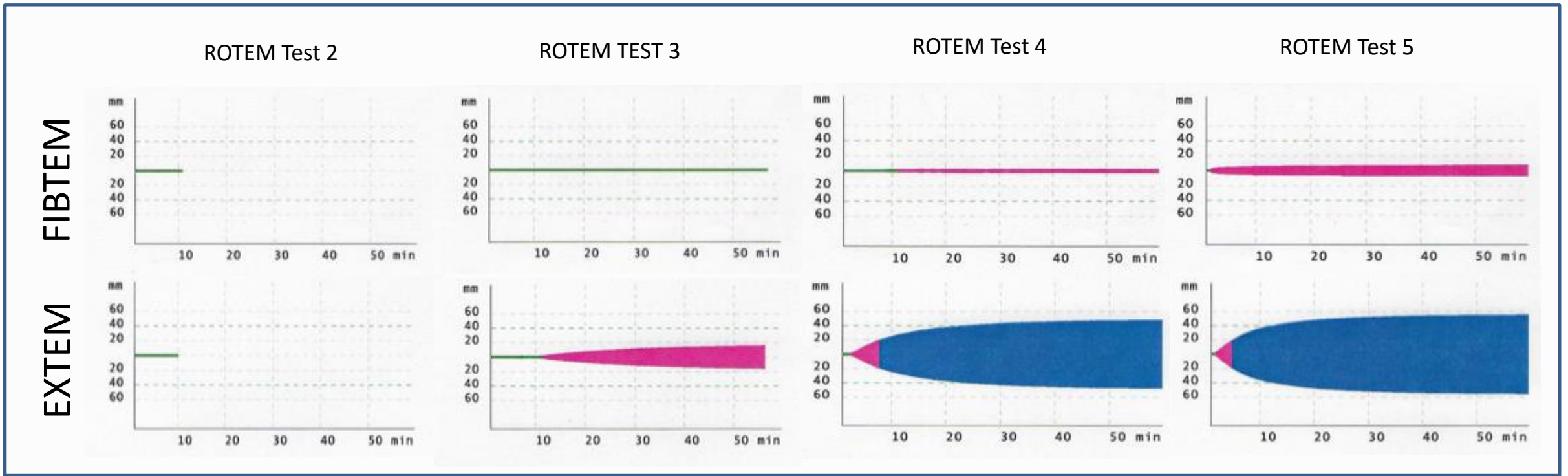
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CFT	:	s [62 - 130]	
α	:	° [66 - 77]	
A5	:	mm [33 - 52]	
A10	:	mm [43 - 62]	
A20	:	mm [50 - 68]	
A30	:	mm [51 - 69]	
MCF	:	mm [51 - 69]	
LI30	:	% [98 - 100]	



APTEM C [default]

RT: 00:36:52		ST: 2017	
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CFT	:	s [62 - 184]	
α	:	° [60 - 80]	
A5	:	mm [28 - 50]	
A10	:	mm [39 - 61]	
A20	:	mm [48 - 68]	
A30	:	mm [51 - 71]	
MCF	:	mm [52 - 71]	
LI30	:	% [99 - 100]	





6 units of packed red cells
 1 pool of platelets
 12 units FFP
 14g of fibrinogen con^c

67 minutes of CPR
 Admitted to ICU

**Total measured blood loss
 = 3683ml**

For more details see IJOA Case report
 DOI: <https://doi.org/10.1016/j.ijoa.2018.09.001>

Better Together.



Thank you to all of the OBSCymru Champions

Nevill Hall Hospital

Abergavenny

Emma Mills
Mike Byrne
Graeme Lilley
Anurag Pinto
Jane Bruton
Wendy Jones
Sarah Lewis
Sarah Beuchel

Royal Gwent Hospital

Newport

Emma Mills
Cerys Richards
Sajitha Parveen
Marcus Silcocks
Jessica Anderson
Sarah Beuchel
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University Hospital of Wales

Cardiff

Donna James
Steve Morris
Marion Beard
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Richard Hurton
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Royal Glamorgan Hospital

Llantrisant

Kelly Godwin
Neeta Tailor
Huw Davies
Alfi Ahmed
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Vikram Sinha
Dr Swammy
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Dermot Nicolson
Fiona Benjamin
Madu Dey
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Singleton Hospital

Swansea

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Susan Williams
Martin Garry
Nigel Jenkins
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Dawn Apsee
Hannah Saitch

Glangwili General Hospital

Carmarthen

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Saran Nicholas

Bronglais General Hospital

Aberystwyth

Su Roberts
Sunil Kumar
Angela Hamon
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Saran Nicholas

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Wrexham

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Lally Desoysa

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