

SPRING MEETING OF THE SAOA 2025

“Update on pre-eclampsia and hypertensive disorders of pregnancy”

Obstetric coagulopathies

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NO CONFLICT OF INTEREST

Algorithme thérapeutique interdisciplinaire PPH: «PPH 2022»

Peripartal haemorrhage, diagnosis and therapy. Guideline of the DGGG, OEGGG and SGGG (S2k-Level, AWMF Registry No. 015/063, August 2022). <http://www.awmf.org/leitlinien/detail/II/015-063.html>
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	Saignement persistant	Perte de sang >1000 ml
Symptômes cliniques	APPELER le médecin obstétricien & INFO anesthésiologie • Circulation de la patiente stable • Saignement: – >500 ml après accouchement vaginal – >1000 ml après césarienne ATTENTION: les pertes de sang sont facilement sous-estimées! → Il faut mesurer et non pas estimer!!!	APPELER le médecin-chef en obstétrique & anesthésiologie Envisager un TRANSFERT dans un centre • Circulation de la patiente stable • Saignement important persistant
Obstétrique	• Mesurer la perte de sang • Exclure un hémorragie interne (par ex. rupture de l'utérus) • Poser 2 accès IV (si possible de gros calibre) • EDC / biologie d'urgence (formule sanguine, GDS, aPTT, Quick/INR et si disponible fibrinogène, FXIII, TVE), préparer des CE • Substitution volémique adaptée (cristalloïdes) • Pose d'une sonde urinaire • Examen interdisciplinaire rapide de la cause du saignement (4T): – Tonus : tonus utérin (atonie?) – Tissu : inspection du placenta (reste placentaire?) – Traumatisme : réglage speculum (canal génital?) – Thrombine : coagulation (paramètres de laboratoire?/TVE?) • Compression utérine - échographie	• PRÉVENIR l'équipe opératoire • Exclure une rupture utérine – Palpation / Échographie • En cas de suspicion de reste placentaire (après inspection ou échog.) – Palpation manuelle – Le cas échéant curetage (contrôle échog.) • Manœuvre de HAMILTON / envisager une compression de l'aorte • Le cas échéant tamponnement • Appeler du personnel en renfort!
Anesthésiologie/Coagulation	(si pas encore fait par le service d' obstétrique) • OXYTOCINE – 3-5 UI en perfusion courte – Le cas échéant, ensuite 10-40 UI dans 500-1000 ml en perfusion longue • ACIDE TRANEXAMIQUE – 1 g IV • Le cas échéant MISOPROSTOL (pour sécurité du traitement) – 800-1000 µg par voie rectale ou 600 µg par voie orale – <i>Off-label!</i>	• Préparation de 4 PFC / 4 CE / 1 CP (le cas échéant, les faire livrer en salle d'accouchement ou au bloc opératoire) • Si >25 UI d'oxytocine: passer à la SULPROSTONE (puis arrêter l'oxytocine; IV exclusivement; substitution rapide; surveillance de la circulation); posologie: 500 µg dans 500 ml en perfusion continue: diminuer!, c-à-d 3 min à 8,3 ml/min ou 500 ml/h (8,3 µg/min), puis 7 min à 1,7 ml/min ou 100 ml/h (1,7 µg/min), puis encore 0,2-0,4 ml/min ou 10-20 ml/h; max. 1500 µg/j • Administration d'O ₂ • Accès IV de gros calibre (≥14-16 G) • Administration adaptée de produits sanguins/de substitution volémique • Envisager système ATS & appareil de transfusion massive

← Identify and treat the cause →

← Control "circulation" "homeostasis" "coagulopathy" →

OBJECTIFS DU TRAITEMENT:

Arrêt de l'hémorragie | Stabilisation hémodynamique | Optimisation de la coagulation

Hémoglobine 7-9 g/dl (4,3-5,5 mmol/l), thrombocytes ≥70-100 Gpt/l, PAM ≥55-65 mmHg, pH ≥7,2, température ≥34 °C, calcium ≥0,9 mmol/l, UB >-6 mEq/l, lactate <4 mmol/l.

GDS: gaz du sang; **ATS**: autotransfusion sanguine (par ex. «Cell Saver®»);

TVE: tests viscoélastiques (par ex. ROTEM®, TEG®, ClotPro®, Quantra®)

	Perte de sang >1500 ml (~¼ du volume de sang)	Perte de sang >2000 ml
Symptômes	Personnel et expertise suffisants (médecin-chef obst. et médecin-chef anesth.) board hématologique / radiologique? • Circulation instable (indice de choc [FC/PAsys] >0,9) avec saignement persistant important (signaux d'alarme: UB <-6 mmol/l et lactate >4 mmol/l)	Suffisamment de personnel et d'expertise? Board hématologique? Embolisation disponible? • Choc hémorragique
Obstétrique	• ARRÊT DU SAIGNEMENT – Laparotomie / clampage vasculaire / compression – Suture de compression / ligature • TAMPONNEMENT – avec des hémostyptiques (Celox®, off-label!) / tamponnement par mèches • TAMPONNEMENT PAR BALLONNET intra-utérin – Introduction du ballonnet sous contrôle échographique (remplir suffisamment le ballonnet, poursuivre la sulprostone) – Tirer légèrement – Déblocage/retrait du ballonnet après 24 h	• Envisager de manière interdisciplinaire une HYSTERECTOMIE • SAIGNEMENT PERSISTANT ou RÉCIDIVANT (sous tamponnement par ballonnet ou après son retrait) – Le cas échéant nouveau tamponnement par ballonnet («bridging») – Packing – Occlusion aortique par ballonnet – Embolisation (radiologie) • APRÈS L'ARRÊT DU SAIGNEMENT – Stabilisation – Surveillance en soins intensifs – Retrait du ballonnet après 24 h (le cas échéant après transfert au centre)
Anesthésiologie/Coagulation	• Assurer l'approvisionnement en O ₂ , envisager intubation endotrachéale • Poser la cath. de Shaldon (si nécessaire échog.) / mesure de la pression artérielle • Installer et raccorder le ATS & l'appareil de transfusion massive • Le cas échéant, VASOPRESSEURS (par ex. NORADRÉNALINE, PHÉNYLÉPHRINE ou THÉODRÉNALIN / CAFEDRINE) • Début du traitement anticoagulant selon les conditions et dispositions de la clinique concernée COAGULATION (si diminution des paramètres correspondants): • Le cas échéant FIBRINOGENÈ 30-60 mg/kg PC; Objectif: ≥2-2,5 g/l (A5FIB >12 mm) et / ou • Le cas échéant FXIII 20 UI / kg PC; objectif: activité FXIII >60% • Le cas échéant, PPSB initial 25 UI / kg PC • Pour remplacer le volume de plasma PFC ≥30 ml/kg PC (CE: PFC: CP = 4:4:1) • Si nécessaire, répéter l' ACIDE TRANEXAMIQUE 1 g • Éventuellement (en cas de [suspicion de] thrombocytopathie acquise; seulement après coupe du cordon ombilical) DDAVP 0,3 µg/kg PC pendant 30 minutes	• Intubation trachéale • Poser un cath. Shaldon (le cas échéant échographie) / mesure tension artérielle • Préparer un système ATS si volume recueilli >1000 ml • «hybrid approach» si possible (initial. CE:PFC:CP = 4:4:1, puis ciblage le plus rapidement possible, en fonction des paramètres de coagulation / TVE) • «damage control» avec hypotension permissive COAGULATION • Le cas échéant envisager FACTEUR RECOMBINANT Villa initial. 60-90 µg/kg PC (bolus), seulement si >35,0 °C & fibrinogène >1,5 g/l & thrombocytes >50 Gpt/l; le cas échéant répétition de l'administration en cas de saignement persistant après 30 min.

PLAN

- **Predelivery coagulation tests and PPH**
- **Recent understandings in PPH associated coagulopathy**
- **Point-of-care viscoelastic hemostatic assays**

Fibrinogen and PPH

- Low fibrinogen level **early during PPH** is associated with progression to severe PPH

PPV = 100 % when fibrinogen < 2.0 g/l
NPP = 79% when fibrinogen > 4.0 g/l

Charbit B et al. J Thromb Haemost 2007

Charbit et al. J Thromb Haemost 2007

Collins et al. Blood 2014

Cortet et al. Br J Anaesth 2012

Gayat et al. Intensive Care Med 2011

- Whether fibrinogen level before labor predict severe PPH is controversial

NO: Karlsson et al. Br J Anaesth 2015

NO: Haslinger et al. J Thromb Haemost. 2020

NO: Kaufner et al. J Perinat Med. 2017

YES: Niepraschk-von Dollen et al. Arch Gyne Obst. 2016

Fibrinogen and PPH

- Retrospective studies support the use of Fibrinogen concentrate in PPH

Bell et al. IJOA 2010 / Fenger-Eriksen et al. BJA 2008

Glover et al. Anaesthesia 2010 / Bonnet et al. EJOGRB 2011

However :

- 3 RCTs showed that **pre-emptive** fibrinogen administration does not decrease PPH / bleeding

Wikkelsø et al. BJA 2015

Collins et al. BJA 2017

Ducloy-Bouthors et al. BJOG 2021

Prepartum VAHs and fibrinogen levels

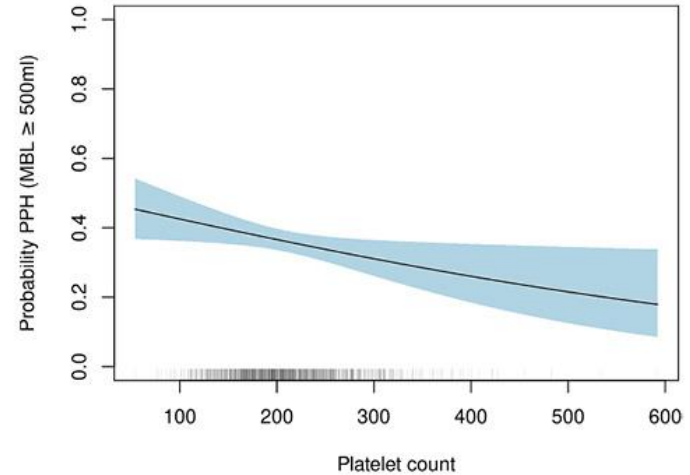
Prepartum ROTEM® parameters and Fibrinogen level were not associated with blood loss and did not predict PPH

N=217 healthy pregnant women

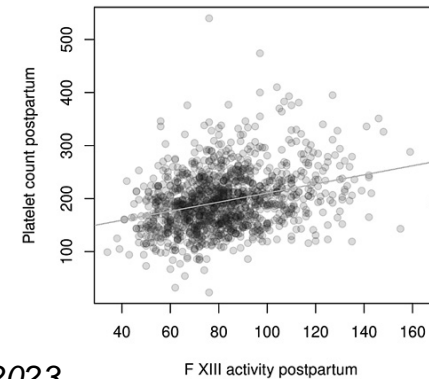


Impact of prepartum platelets count on PPH

Prepartum platelet counts are inversely correlated with postpartum blood loss



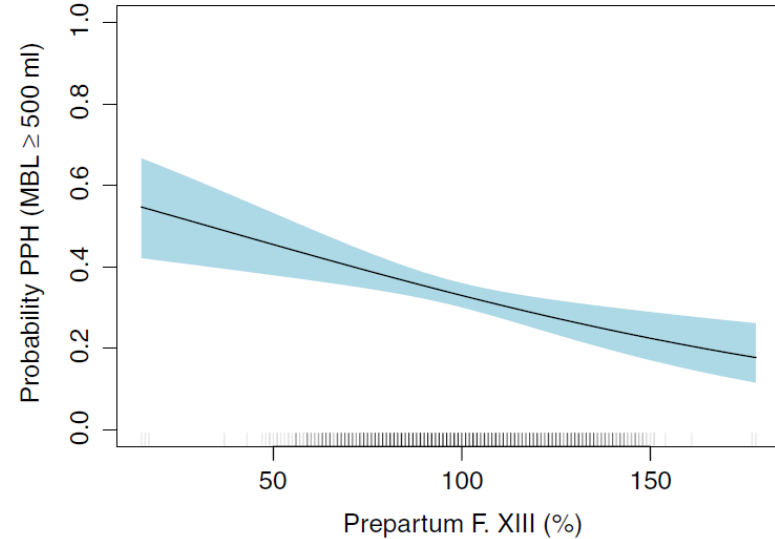
Platelet counts correlate with FXIII activity both pre- and postpartum



Impact of prepartum FXIII and PPH

Prepartum factor XIII activity correlates with postpartum blood loss

Cut-off	Prepartum blood parameter	Odds ratio	95% confidence interval	P
All	Hemoglobin	1.008	0.999-1.018	.07
	Fibrinogen	0.930	0.828-1.044	.22
	Factor II	1.007	1.001-1.013	.02
	Factor XIII	1.011	1.006-1.015	<.001

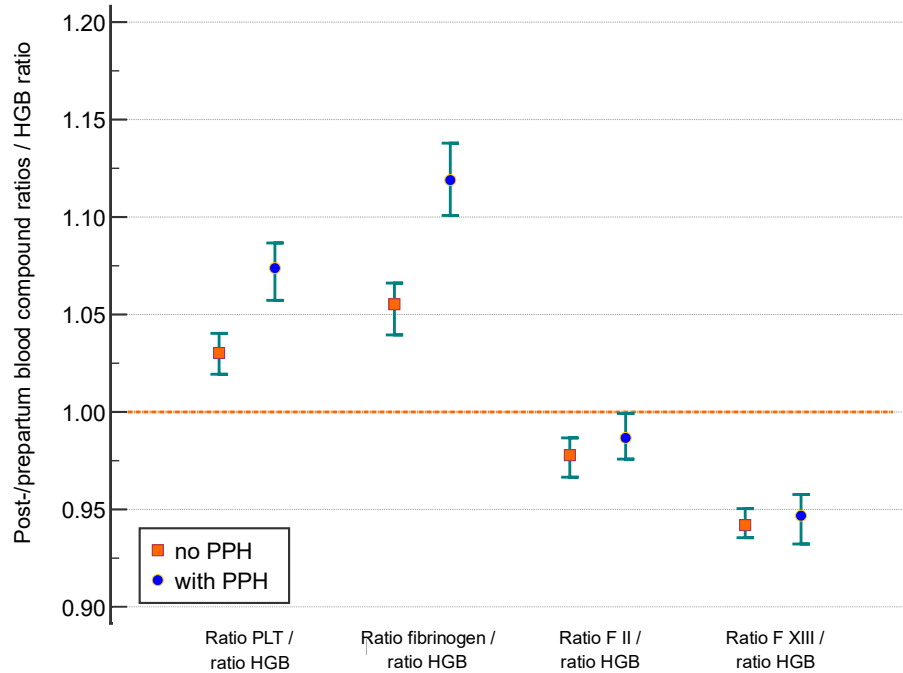


Haslinger et al. J Thromb Haemost. 2020
N=1300

Two other studies found similar results, no cut off value could be determined (overlap)

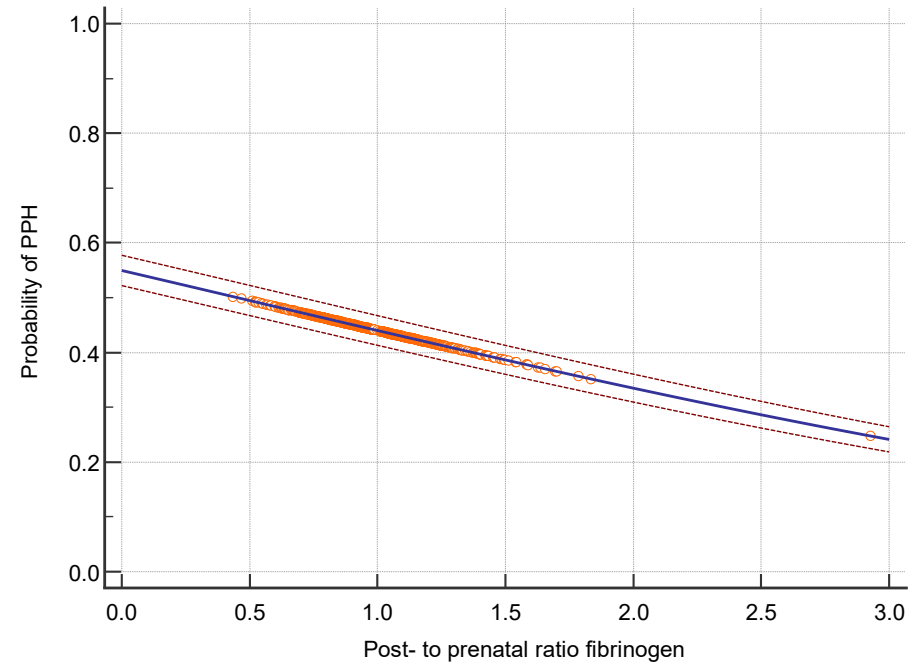
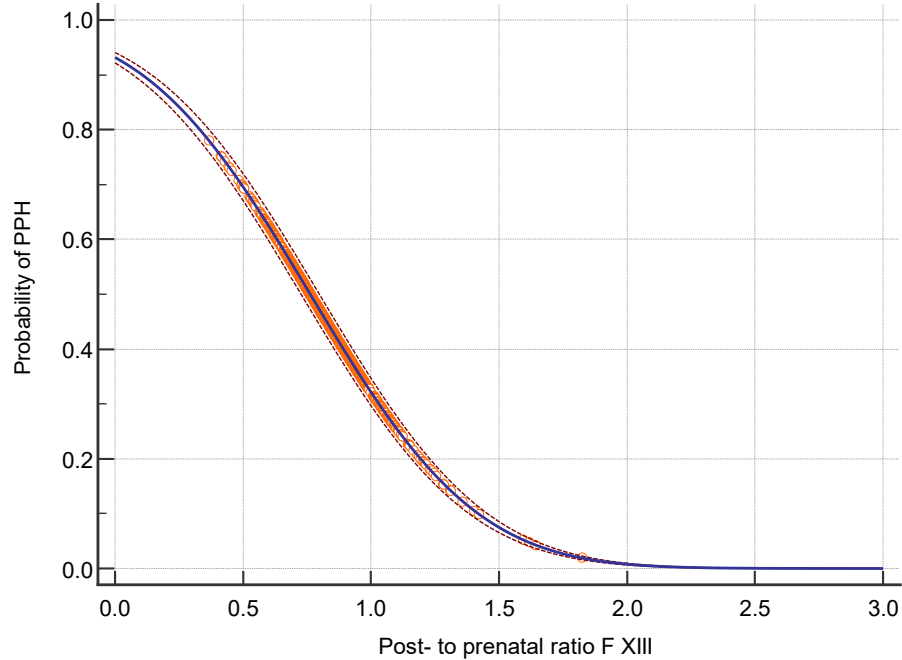
Karlsson et al. Int J Obstet Anesth. 2021
Bamberg et al. Arch Gynecol Obstet. 2019

Drop in coagulation factors relative to drop in Hb



- Drop in fibrinogen and TC is lower than Hb drop (relative "increase")
- Drop in FII and FXIII is greater than drop in Hb (relative "decrease")
- $p < 0.0001$ between all factors (ANOVA)

Peripartum ratio of FXIII and Fib and risk of PPH



Autor's interpretation

WHAT'S NEW

- FXIII drops the most after birth (FXIII >> FII > TC > fibrinogen)
- Fibrinogen hardly drops at all; there is even a relative "increase" in relation to the drop in Hb
- FXIII drop (and also the difference to other factors) is all the greater the greater the blood loss

CONCLUSION

FXIII is currently the most promising coagulation therapeutic approach for an intervention trial (SWIFT Study)

PLAN

- Predelivery coagulation tests and PPH
- **Recent understandings in PPH associated coagulopathy**
- Point-of-care viscoelastic hemostatic assays

Fibrinogen during PPH

- Fibrinogen level falls to critically low levels earlier than other coagulation factors
- Levels < 2 g/l predict progression to massive PPH
- Fibrinolysis increases in the postpartum and peaks around 3 h PP

*Ducloy-Bouthors et al. BJA 2016 / Wikkelsø et al. BJA 2015 / Bell et al. IJOA 2021
Bell et al. IJOA 2022 / De Lloyd et al. IJOA 2011*



**After \approx 1500 ml blood loss
what % of patients have a
Clauss Fibrinogen $<$ 2 g/l ?**



**After ≈ 2500 ml blood loss
what % of patients have a
Clauss Fibrinogen < 2 g/l ?**

Fibrinogen during PPH

After \approx 1500 ml blood loss **between 2 to 5 %** of patients have a Clauss Fibrinogen < 2 g/l

After \approx 2500 ml blood loss \approx **17%** of patients have a Clauss Fibrinogen < 2 g/l

Some women however will develop severe peripartum coagulopathies !

*Ducloy-Bouthors et al. BJA 2016 / Wikkelsø et al. BJA 2015 / Bell et al. IJOA 2021
Bell et al. IJOA 2022 / De Lloyd et al. IJOA 2011*



What is the proportion of parturients who will develop severe obstetric peripartum coagulopathies?

Acute obstetric coagulopathy during postpartum hemorrhage is caused by hyperfibrinolysis and dysfibrinogenemia: an observational cohort study

11'279 parturients

518 (4,6%) recruited with :

- PPH \geq 1000ml or placenta abruptio or AFE or concealed bleeding

Median blood loss was 1500 ml (200–8500 ml)

148 patients had multiple routine and extended coagulation tests and Point-of-care VHAs (Rotem[®] sigma)

Routine tests at study entry (\approx 1200 ml blood loss)

	Nonpregnant healthy control	Pregnant term healthy controls N = 37	All PPH N = 518
Measured blood loss at first sample (mL) Median (IQR), range	NA	None	1200 (1000-1400) 70-3000
Hb at first sample (g/L) Median (IQR), range	115-165	121 (116-126) 104-136	109 (100-119) 67-150
Clauss fibrinogen g/L Median (IQR), range N (%) \leq 2 g/L	2-4 ¹	5.0 (4.4-5.6) 3.5-7.9 0/37 (0%)	4.4 (3.7-5.2) 0.4-10.1 11/449 (2.4)
PT (sec) Median (IQR), range N (%) above NR	9-13 ¹	10.4 (9.9-10.6) 9.1-11.5	10.8 (10.4-11.3) 8.6-20.1 6/449 (1.3)
aPTT (sec) Median (IQR), range N (%) above NR	28-38.5 ¹	25.1 (23.4-26.0) 20-29.8	24.1 (22-25.9) 20-46.1 1/449 (0.2)
Platelet count ($\times 10^9/L$) Median (IQR), range N (%) below NR	150-400 ¹	230 (181-279) 101-419 4/36 (11.1)	200 (163-237) 19-438 78/470 (16.6)

Reduced levels of coagulation factors, sufficient to prolong PT/APTT, are uncommon in women with PPH of approximately 1200 ml

Laboratory normal and reference ranges (NR)¹. AFE, amniotic fluid embolism; ND, data not available; NA, not applicable; RPOC, retained products of conception; and includes retained placenta or membranes. Blood loss in the placental abruption group is lower because cases were recruited at the time of diagnosis rather than at 1000 mL, and it is likely that some bleeding was concealed.

Routine tests at study entry (\approx 1200 ml blood loss)

	Nonpregnant healthy control	Pregnant term healthy controls N = 37	All PPH N = 518	Placental abruption N = 31	Atony N = 71	Surgical or Trauma N = 334	RPOC N = 54	Placenta accretia or praevia N = 26	AFE N = 1	Coagulopathy unknown cause N = 1
Measured blood loss at first sample (mL)	NA	None	1200 (1000-1400)	600 (400-1100)	1300 (1085-1500)	1200 (1013-1460)	1100 (1000-1300)	1000 (950-1290)	2000	ND
Median (IQR), range			70-3000	70-1300	350-2200	100-3000		300-2320		
Hb at first sample (g/L)	115-165	121 (116-126)	109 (100-119)	108 (100.5-128)	113 (101.5-122.5)	109 (99-118)	114 (105-124)	102.5 (94-109)	135	115
Median (IQR), range		104-136	67-150	67-150	72-150	70-149	86-141	67-119		
Clauss fibrinogen g/L	2-4 ¹	5.0 (4.4-5.6)	4.4 (3.7-5.2)	3.7 (2.7-4.5)	4.6 (3.7-5.7)	4.5 (3.8-5.3)	4.8 (4.1-5.1)	3.8 (3.6-4.6)	1.7 -	1.4 -
Median (IQR), range										
N (%) \leq 2 g/L		3.5-7.9 0/37 (0%)	0.4-10.1 11/449 (2.4)	1.3-6.0 6/27 (22.2)	2.3/7.3 0/60	1.8-8.3 2/292 (0.7)	1.8-10.1 1/44 (2.3)	2.5-6.1 0/25 (0)	- 1/1 (100)	- 1/1 (100)
PT (sec)	9-13 ¹	10.4 (9.9-10.6)	10.8 (10.4-11.3)	10.6 (10.2-11.4)	10.8 (10.5-11.3)	10.8 (10.4-11.3)	10.9 (10.5-11.3)	10.7 (10.4-11.3)	11.8	20.1
Median (IQR), range										
N (%) above NR		9.1-11.5	8.6-20.1 6/449 (1.3)	9.5-13.4 1/27 (3.7)						
aPTT (sec)	28-38.5 ¹	25.1 (23.4-26.0)	24.1 (22-25.9)	24.4 (22.7-26.1)						
Median (IQR), range										
N (%) above NR		20-29.8	20-46.1 1/449 (0.2)	20-29.8 0/27 (0)						
Platelet count ($\times 10^9/L$)	150-400 ¹	230 (181-279)	200 (163-237)	197 (173-202)						
Median (IQR), range										
N (%) below NR		101-419 4/36 (11.1)	19-438 78/470 (16.6)	19-371 3/27 (11.1)	53-414 10/66 (15.1)	53-438 53/302 (17.5)	116-399 5/49 (10.2)	63-303 7/24 (29.2)	- 0/1 (0)	- 0/1 (0)

...except for fibrinogen in the context of placental abruption and AFE !

Laboratory normal and reference ranges (NR)¹. AFE, amniotic fluid embolism; ND, data not available; NA, not applicable; RPOC, retained products of conception; and includes retained placenta or membranes. Blood loss in the placental abruption group is lower because cases were recruited at the time of diagnosis rather than at 1000 mL, and it is likely that some bleeding was concealed.

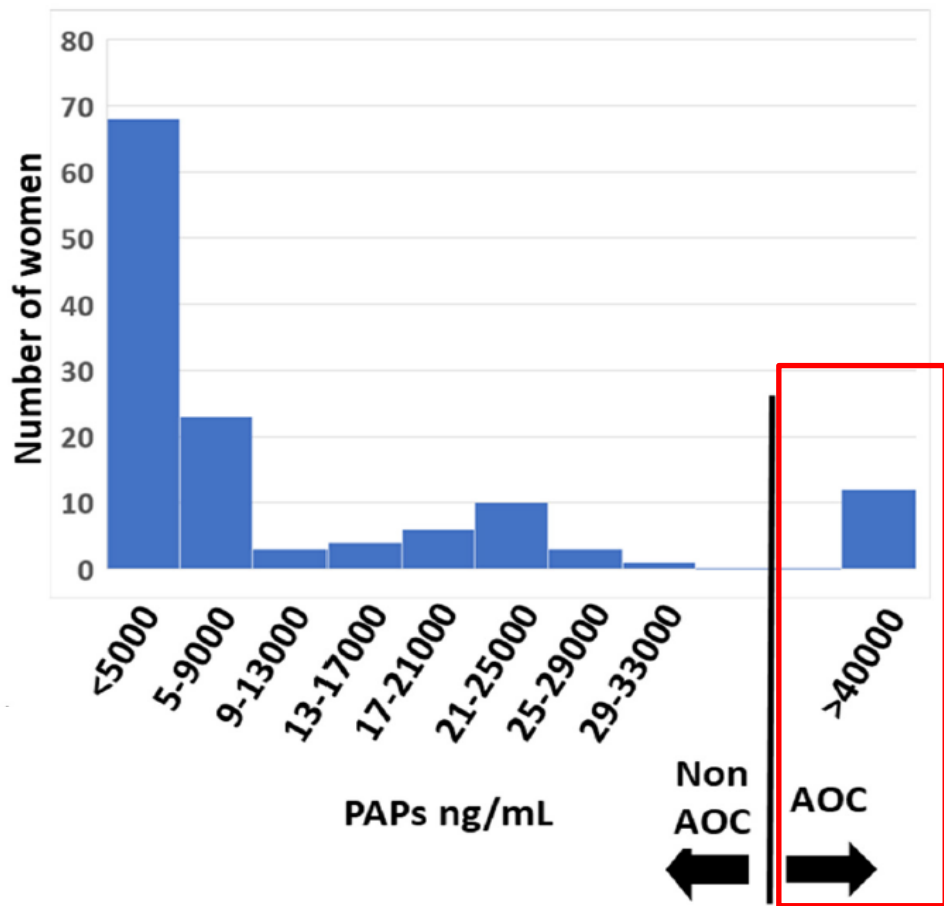
130 women with :

PPH > 2000 ml blood loss or abruption, or AFE, or receipt of blood products

Compared with healthy term pregnant controls these women had :

- **Higher PAPs (p < .0001)**
(Plasmin- α 2-antiplasmin complex, a marker of the activity of the fibrinolytic system and a marker of net activation of fibrinolysis)
- **Higher D-dimers (p < .0001)**

=> consistent with activation of fibrinolysis during PPH



A post hoc review of PAP distributions identified a distinct subgroup of **12 women** who were significant outliers with **PAPs > 40 000 ng/ml** corresponding to **massive fibrinolysis**

This group was defined as having **acute obstetric coagulopathy (AOC)**.

It was present in $\approx 1/1000$ parturients

At the time of the highest PAPs : blood loss, lactate level, and shock index were similar between non-AOC and AOC

	Nonpregnant healthy controls (laboratory normal range or reference ranges)	Nonbleeding term pregnancy controls N = 37	Nonacute obstetric coagulopathy group Median (IQR) Range N = 118	Acute obstetric coagulopathy group Median (IQR) Range N = 12	P Non-AOC vs AOC
Blood loss when samples taken (mL) Median (IQR), range	NA	0	1500 (1125-2000) 875-5700	1350 (1085-2300) 595-5500	.9
Shock index when samples taken Median (IQR), range	NA	NA	0.85 (0.73-1.0) 0.4-1.75	0.81 (0.60-0.91) 0.51-0.94	.35
Lactate when samples take (mmol/L) Median (IQR), range	0.5-1.6	ND	2.3 (1.9-2.8) 1.1-7.5	2.1 (1.5-2.7) 0.9-3.5	.14

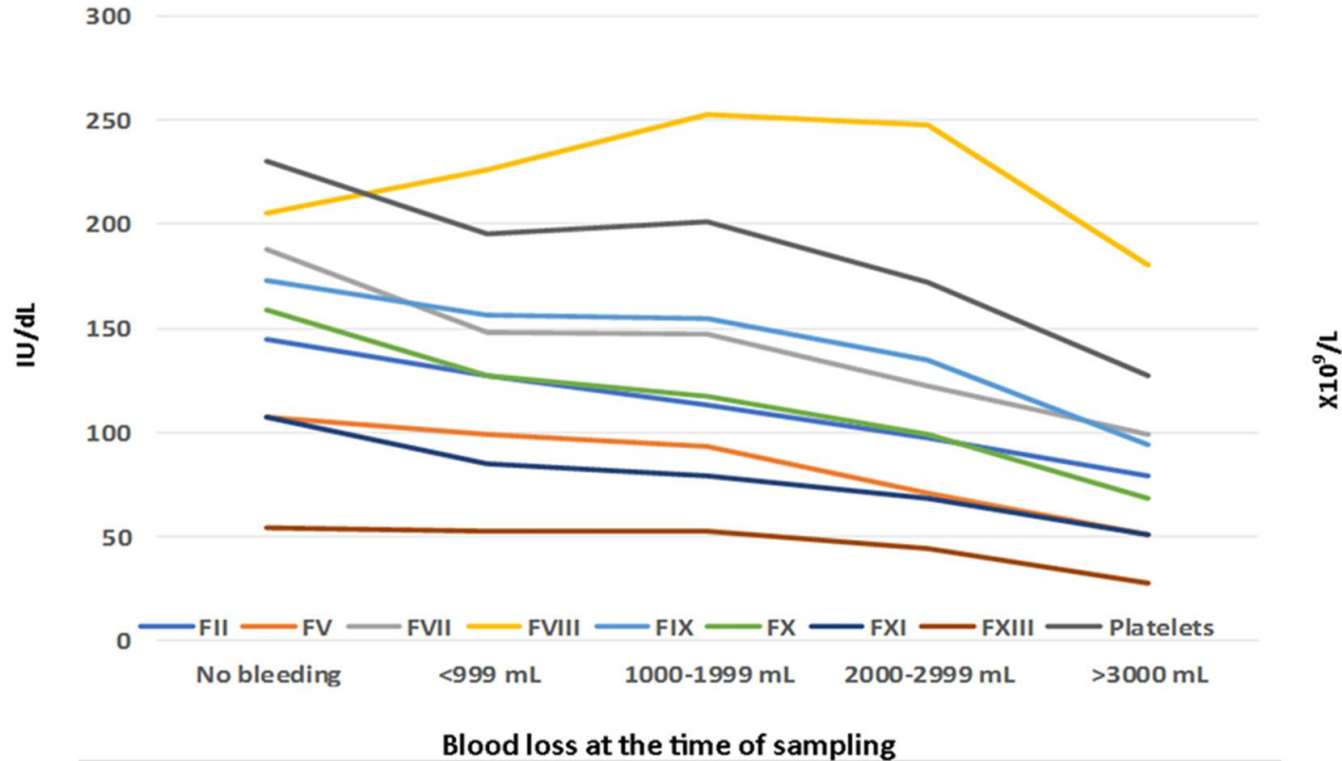
Women with AOC

- Had reduced Fibrinogen (Clauss and antigen), Fibtex A5, and Clauss/antigen ratio
- Had reduced FV, FVIII, and FXIII
- Other procoagulant factors were preserved
- Thrombin generation was normal or increased
- Had a small decrease in platelet count
- These changes suggest a specific rather than generalized consumption of coagulation factors

Clinical characteristics of women with AOC

- Placental abruption in 5/12 cases
- AFE (one case in the cohort)
- Markedly increased incidence of **intrauterine and neonatal deaths**
- Preeclampsia, smoking and lower gestational age were more common in AOC
- There was no association with clinical suspicion of sepsis
- AOC was associated with admission to ICU, ↑ RBC transfusion and fibrinogen concentrate.

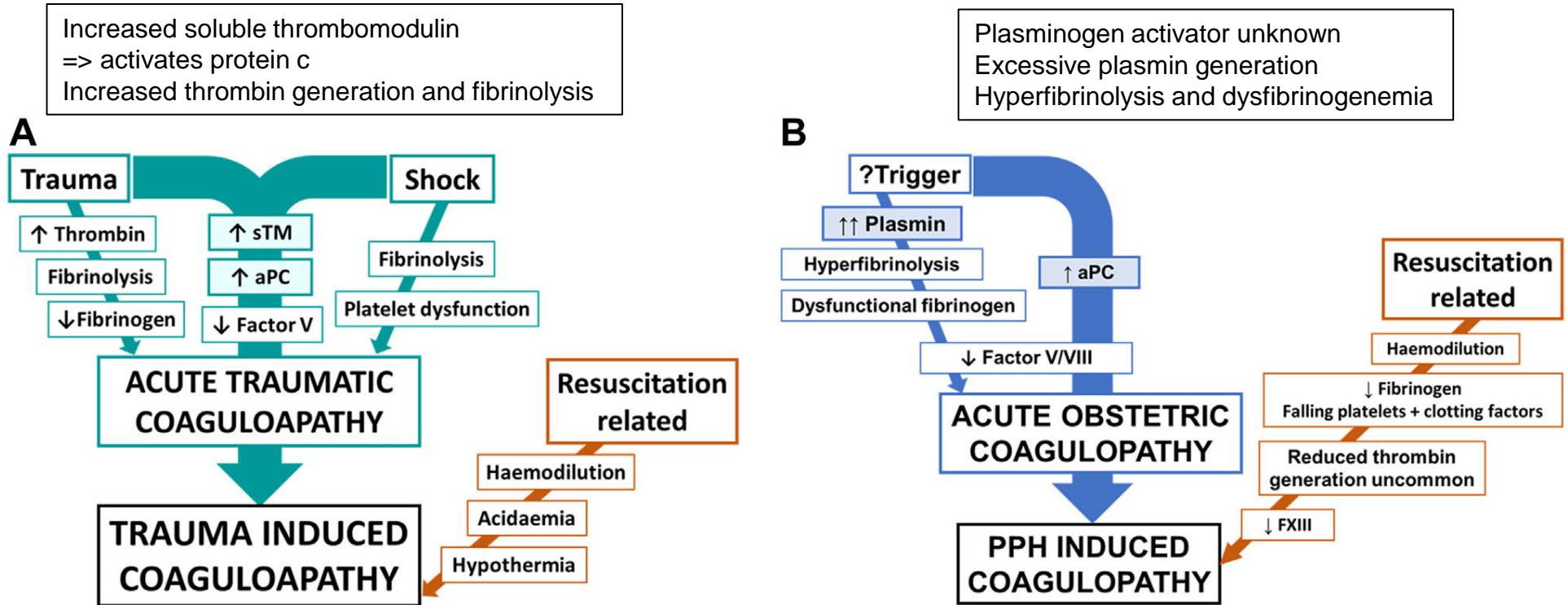
In non-AOC cases: linear fall in coagulation factors (except FVIII)



Suggests depletion / consumption of coagulation factors due to bleeding and clot formation and dilution due to fluid resuscitation

Trauma-induced coagulopathy vs AOC

Proposed mechanisms



Coagulopathy of PPH broadly falls into three categories

1. **Late dilutional coagulopathy** associated with significant blood loss (> 3000ml), hypofibrinogenaemia develops before prolongation of the aPTT/PT and thrombocytopenia
2. **Early hypo-dysfibrinogenemia (AOC)** with “normal” aPTT/PT values predominantly caused by placental abruption, can progress to catastrophic bleeding and severe coagulation failure
3. **Very rare cases of more generalized systemic coagulation failure** with early presentation of hypofibrinogenaemia, widespread clotting abnormalities and low platelets caused by amniotic fluid embolus (AFE) or PPH complicated by severe sepsis

PLAN

- Predelivery coagulation tests and PPH
- Recent understandings in PPH associated coagulopathy
- **Point-of-care viscoelastic hemostatic assays**



Do you routinely use point-of-care viscoelastic hemostatic assays (VHAs) to guide hemostatic management during PPH ?

FIBTEM amplitude correlates well with fibrinogen levels

Fibtem A5 \leq 5 mm and Fibtem A15 \leq 6 mm :
Detect fibrinogen level $<$ 1.5 g/l in PPH

Sensitivity (100% for both parameters)
Specificity (85 and 88% respectively)

Huissou et al BJOG. 2009 Jul;116(8):1097-102

FIBTEM A5 correlates with PPH progression

Fibtem A5 $<$ 15mm was usually associated with progression of PPH
Fibtem A5 $>$ 22mm was not associated with progression of PPH

Collins et al. Blood 2014; 124: 1727–36

VHAs provide timely data to guide PPH management

FIBTEM A5 ≤ 11 mm to detect fibrinogen levels ≤ 2 g/L :

Sensitivity = 0.76

Specificity = 0.96

NPV = 98%

Intervention points for platelet and FFP transfusion based on ROTEM Sigma parameters could not be established.

Laboratory results should continue to be used to guide platelet and FFP transfusion.



VHAs provide timely data to guide PPH management

CFF amplitude by $10 \leq 17$ mm to detect fibrinogen levels ≤ 2 g/L :

Sensitivity = 0.74

Specificity = 0.97

NPV = 98%

A value to identify transfusion thresholds for PT/aPTT and platelets was not established, and laboratory results should continue to be used.



The OBS2 Studies: observational and RCT

British Journal of Anaesthesia, 119 (3): 422–34 (2017)

PPH \approx 1000 ml + Fibtem A5 > 15 mm (N=605)

Conclusions of the observational study:

- Restricted use of plasma based on ROTEM results (FibtemA5 > 15 mm) was feasible
- No women developed clinically significant haemostatic impairment

British Journal of Anaesthesia, 119 (3): 411–21 (2017)

PPH \approx 1000 ml + Fibtem A5 > 15 mm (N=55)

Results and conclusions of the RCT:

- Infusion of fibrinogen when Fibtem A5 \leq 15mm did not improve outcomes in PPH !
- If Fibtem A5 \leq 12mm at randomization : \downarrow blood products and \downarrow bleeding in Fibrinogen group !

International recommendations for point-of-care viscoelastic hemostatic assays in PPH

Table 3
Comparison of published guidelines

	Fibrinogen replacement with concentrate or cryoprecipitate		Coagulation factor replacement with fresh frozen plasma		Platelet infusion	
	Clauss Fibrinogen	VHA	PT/aPTT	VHA	FBC platelet	VHA
Network for Advanced Transfusion alternatives [5]	Maintain >2 g/L	Treat if Fibtem A5 <12 mm or FF MA <14 mm	Treat if >1.5 times normal	Treat if CT or r above the normal range	Infuse if <75 × 10 ⁹ /L	VHA-based care supported, but no triggers given
British Society of Haematology [9]	Not addressed	Treat if Fibtem A5 <12 mm	Not addressed	Not addressed	Not addressed	Not addressed
Royal College of Obstetrics and Gynaecology [4]	Maintain >2 g/L	Agree local algorithm	Give 15 ml/kg FFP if above normal range	Agree local algorithm	Infuse if <75 × 10 ⁹ /L	Not addressed
International Society of Thrombosis and Haemostasis [3]	Maintain >2 g/L	Treat if Fibtem A5 <12 mm	Give 15 ml/kg FFP if above normal range	Not addressed	Infuse if <75 × 10 ⁹ /L	Not addressed

International recommendations for point-of-care viscoelastic hemostatic assays in PPH



Fibrinogen replacement with concentrate or cryoprecipitate

Clauss
Fibrinogen

VHA

Coagulation factor replacement with fresh frozen plasma

PT/aPTT

VHA

Platelet infusion

FBC platelet

VHA

Peripartum
hemorrhage,
diagnostics and
treatment
Update of the S2k
guidelines AWMF
015/063

International recommendations for point-of-care viscoelastic hemostatic assays in PPH



Fibrinogen replacement with concentrate or cryoprecipitate

Coagulation factor replacement with fresh frozen plasma

Platelet infusion

Clauss Fibrinogen VHA

PT/aPTT VHA

FBC platelet VHA

Peripartum hemorrhage, diagnostics and treatment
Update of the S2k guidelines AWMF 015/063

Maintain > 2 - 2,5 g/l

Treat if Fibtcm A5 < 12 mm

If abnormal Give ≥ 30 mL/kg

Not addressed

Infuse if < 70 G/l

Not addressed

International recommendations for point-of-care viscoelastic hemostatic assays in PPH



Fibrinogen replacement with concentrate or cryoprecipitate

Clauss
Fibrinogen

VHA

Coagulation factor replacement with fresh frozen plasma

PT/aPTT

VHA

Platelet infusion

FBC platelet

VHA

Peripartum hemorrhage, diagnostics and treatment
Update of the S2k guidelines AWMF 015/063

Haemostatic treatment of PPH starts early after diagnosis and combines tranexamic acid, an initially ratio-driven transfusion with RBC:plasma:PC = 4:4:1 and finally a goal-directed substitution with coagulation factor concentrates for proven deficiency.

Early monitoring of coagulation either by standard parameters or viscoelastic methods facilitates goal-directed haemostatic treatment.

Problems with the ratio-driven transfusion (4:4:1)

Empirical fixed ratio treatment of PPH is unlikely to improve coagulation in most women with PPH

It will lead to :

- 1) large numbers receiving unnecessary blood products
- 2) undertreatment of women with established coagulopathy (AOC)

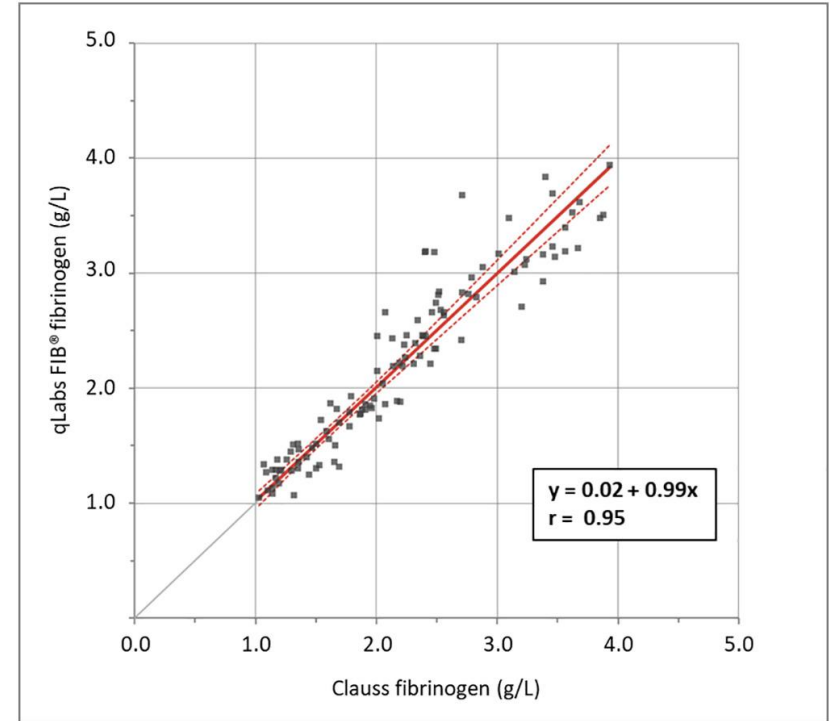
Correction of PPH-related coagulopathy should rely on the administration of antifibrinolytic agents and replacement of fibrinogen

=> Conclusions: the guidelines should change !

An even simpler and faster POCT to assess fibrinogen level



Measures fibrinogen levels
within 1 to 10 min



Take home messages

- Not all obstetric coagulopathies are the same
- In most episodes of PPH (up to 2.5-3 L blood loss) hemostatic parameters are maintained
- Dilutional coagulopathy is increasingly likely if bleeding continues
- Acute obstetric coagulopathy (AOC) is a distinct, rare but severe coagulopathy
- It is important to discriminate between consumption/dilution and AOC
- Hemostatic resuscitation should be adapted to the coagulopathy
- Regardless of PPH origin early TXA should be administered, and fibrinogen replaced
- POCT and laboratory test guided hemostatic resuscitation is key

Questions ?