MONITORAGE ET THÉRAPEUTIQUE DANS L'HÉMORRAGIE DU POST PARTUM

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Interne en anesthésie- réanimation DESAR 3

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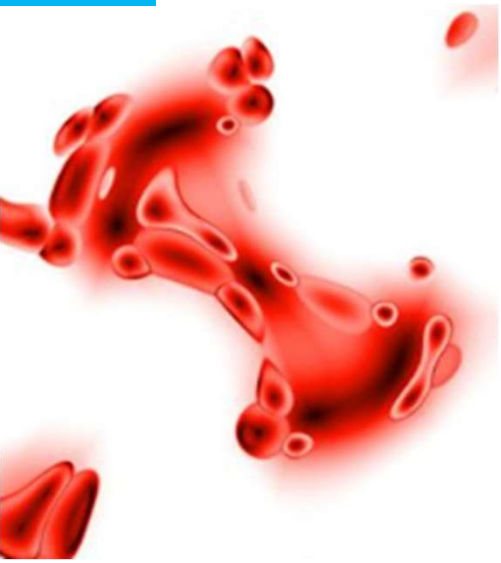
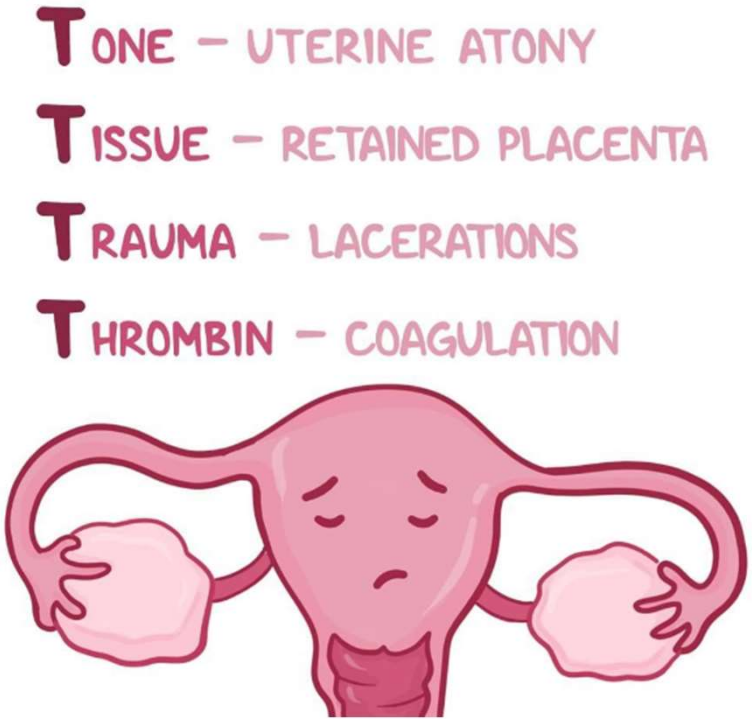
PLAN

A. L’hémorragie du post partum
B. Stratégie transfusionnelle
C. Monitorage de la coagulation
D. Application locale du ROTEM : l’étude ROFIPO
E. L’acide tranexamique
F. L’hypocalcémie
G. Conclusion





HEMORRAGIE DU POST PARTUM

HEMORRAGIE OBSTETRICALE

HÉMORRAGIE OBSTÉTRICALE :

8,4 % mortalité maternelle

3ÈME CAUSE DE MORTALITÉ MATERNELLE

- Hémorragie du post partum : saignements > 500mL au décours de l'accouchement

5-10% des accouchements

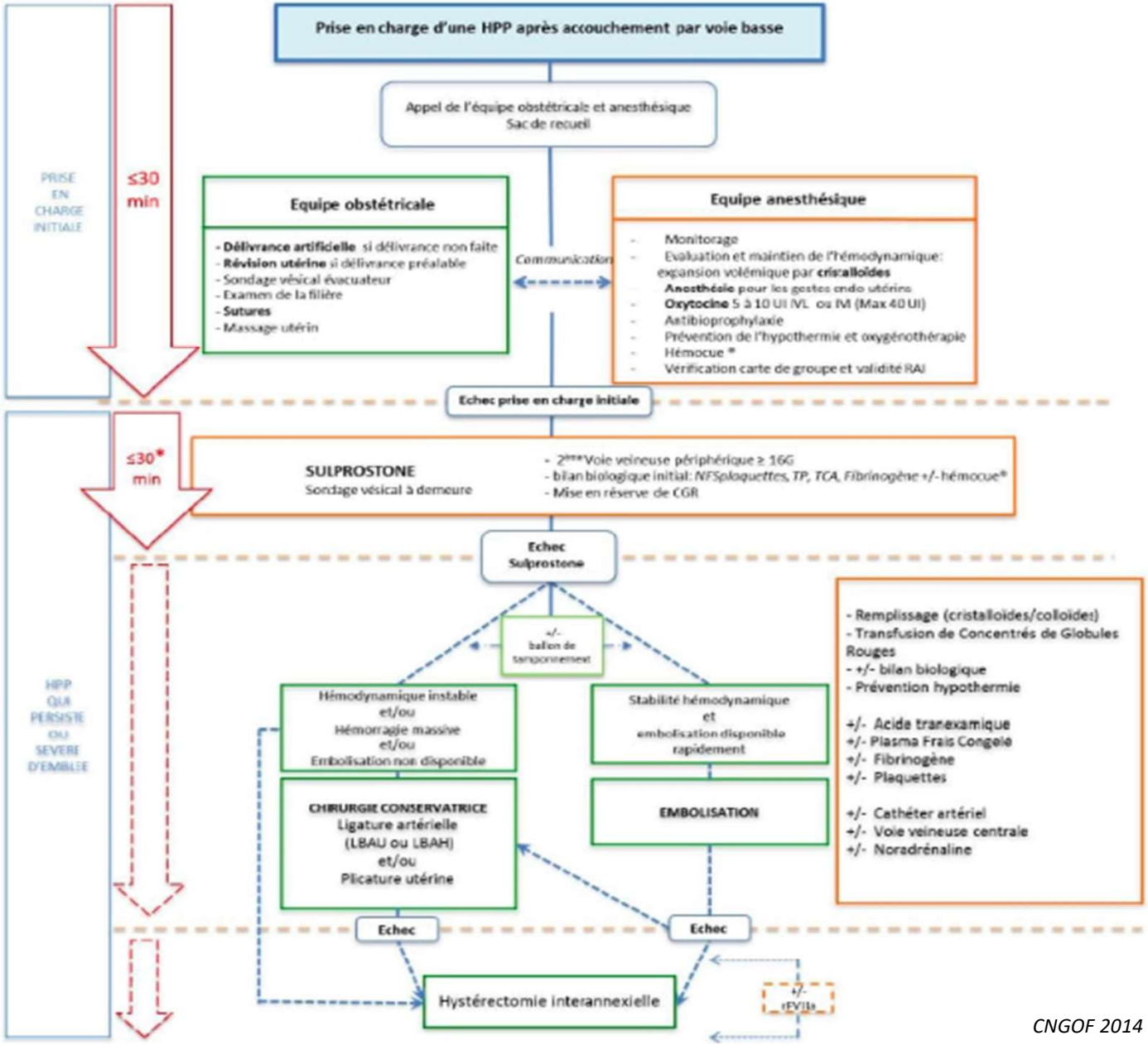
PRISE EN CHARGE MULTIDISCIPLINAIRE

- **Monitorage** clinique non invasif
- Gestion de la **coagulopathie**
- Restauration volémie
- **Traitement étiologique**

→ Instabilité : chirurgie conservatrice par ligature vasculaire et/ou plicature utérine

→ Stabilité : Embolisation

→ Echec : hystérectomie inter annexielle



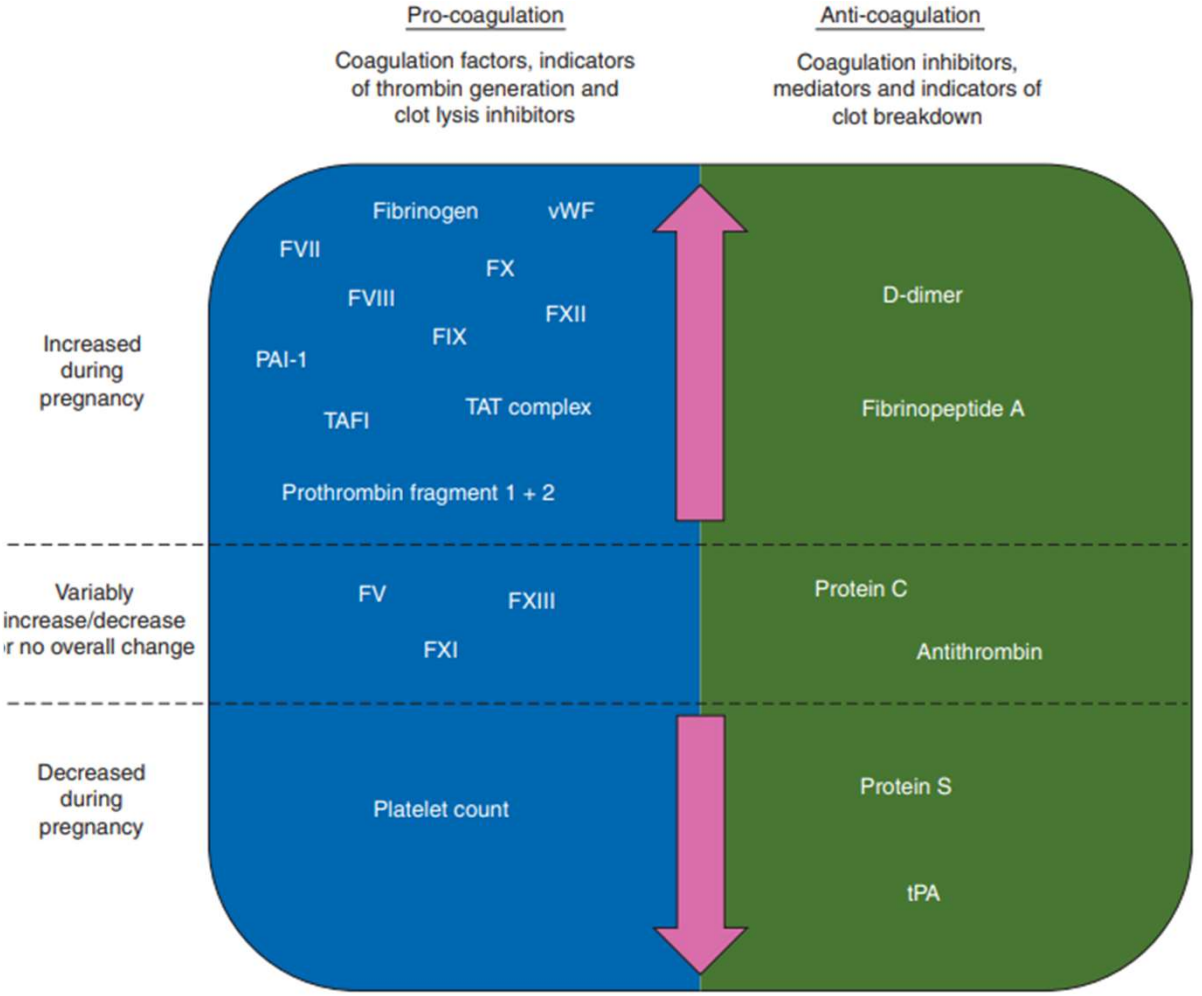
CNGOF 2014

HEMOSTASE ET GROSSESSE

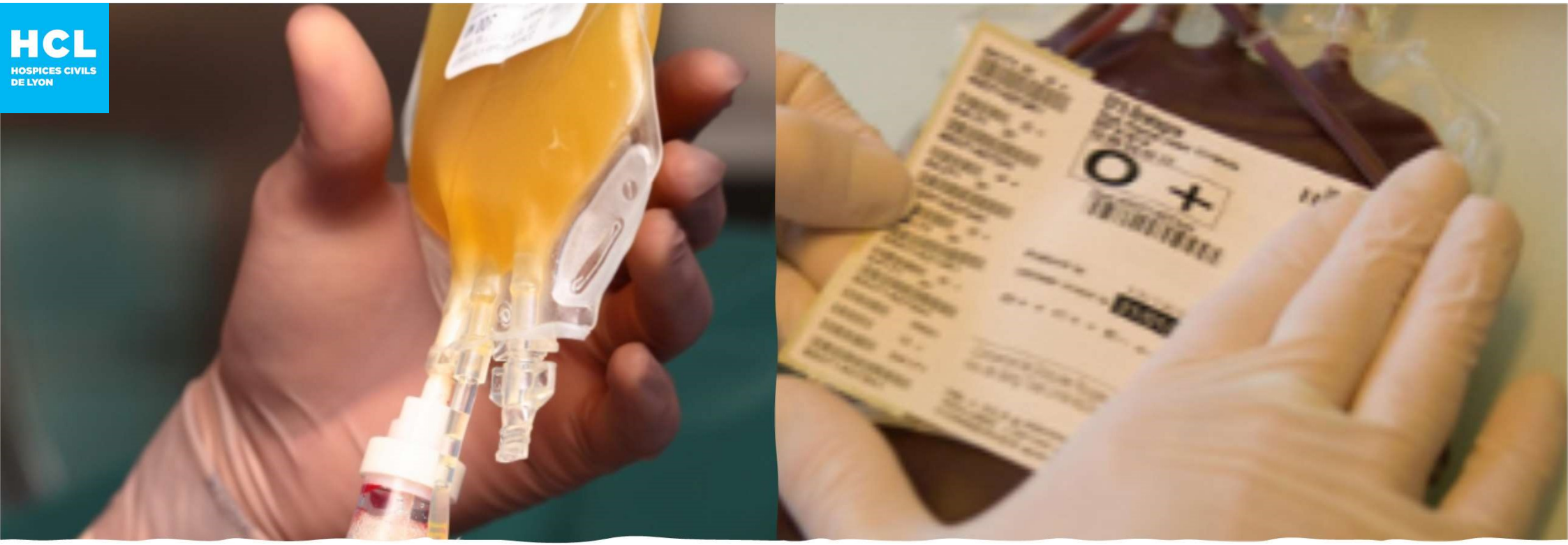
- Etat **prothrombotique** au cours de la grossesse
- Thrombopénie
- Anémie

ENJEU MAJEUR : Correction rapide de la coagulopathie en cas HPP

→ Retard de prise en charge : ↗ risque mortalité maternelle



British Journal of Anaesthesia 109 (6): 851–63 (2012) C. Solomon and coll.



STRATEGIE TRANSFUSIONNELLE

CONCENTRE DE GLOBULES ROUGES

Patient blood management in obstetrics: prevention and treatment of postpartum haemorrhage. A NATA consensus statement

HPP > 500 mL
HPP sévère > 1000 mL

STRATÉGIE RESTRICTIVE

- Seuil transfusionnel : **7 g/dl** chez patientes avec symptômes d'anémie
- Fer IV si Hg entre **6 et 9 g/dl**

HPP massive > 2500 mL

PROTOCOLE LOCAL DE TRANSFUSION MASSIVE

- Transfusion précoce de CGR et PFC

Blood Transfus 2019; 17: 112-36 DOI 10.2450/2019.0245-18

PLASMA FRAIS CONGELE

Patient blood management in obstetrics: prevention and treatment of postpartum haemorrhage. A NATA consensus statement

- HPP sévère non contrôlé sur données du ROTEM ou TP/TCA > 1,5 témoin
→Transfusion de PFC : 15-20ml/kg

- En dehors de résultats biologiques

→ Hémorragie non contrôlée après 4 CGR : ratio PFC/CGR 1:2
→Protocole de transfusion massive
→Hématome rétroplacentaire, embolie amniotique

Blood Transfus 2019; 17: 112-36 DOI 10.2450/2019.0245-18

PLAQUETTES

Patient blood management in obstetrics: prevention and treatment of postpartum haemorrhage. A NATA consensus statement

Hémorragie sévère non contrôlée

↓

Sur données biologiques ou ROTEM

- Seuil transfusionnel : **75 G/L (5-10ml/kg)**
  pour objectif > 50 G/L

/!\ Thrombopénie peu fréquente au cours HPP hormis contexte pré éclampsie, éclampsie, embolie amniotique, HRP

Blood Transfus 2019; 17: 112-36 DOI 10.2450/2019.0245-18

HCL
HOSPICES CIVILS
DE LYON

LES CONCENTRÉS DE FACTEURS DE LA COAGULATION

LE FIBRINOGENE, FACTEUR PREDICTIF D'UNE HPP SEVERE ?

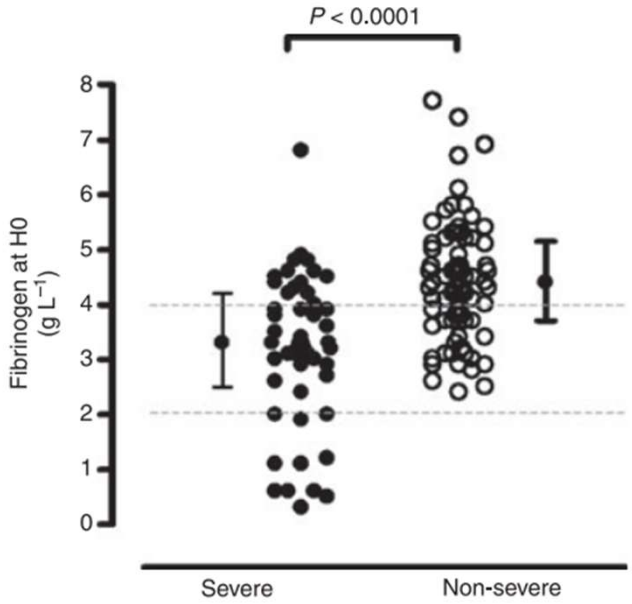


Fig. 2. Individual fibrinogen plasma concentrations at H0 in women with severe (●) or non-severe (○) postpartum hemorrhage. Mean ± SD values are reported for both groups.

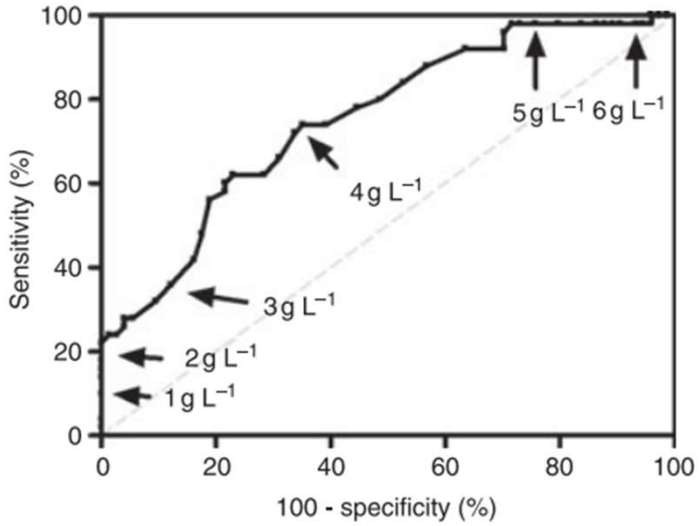


Fig. 3. ROC curve of fibrinogen plasma concentration at H0 for the diagnosis of severe postpartum hemorrhage.

Fibrinogène à H_0 : Facteur prédictif d'HPP sévère
VPP 100 % si < 2 g/l

Charbit B and coll.. J Thromb Haemost 2007; 5: 266–73

FIBRINOGENE ET SEVERITE HPP

RISQUE HPP SÉVÈRE

x 2 si fibrinogène entre 2 et 3 g/l

x 12 si fibrinogène < 2 g/l

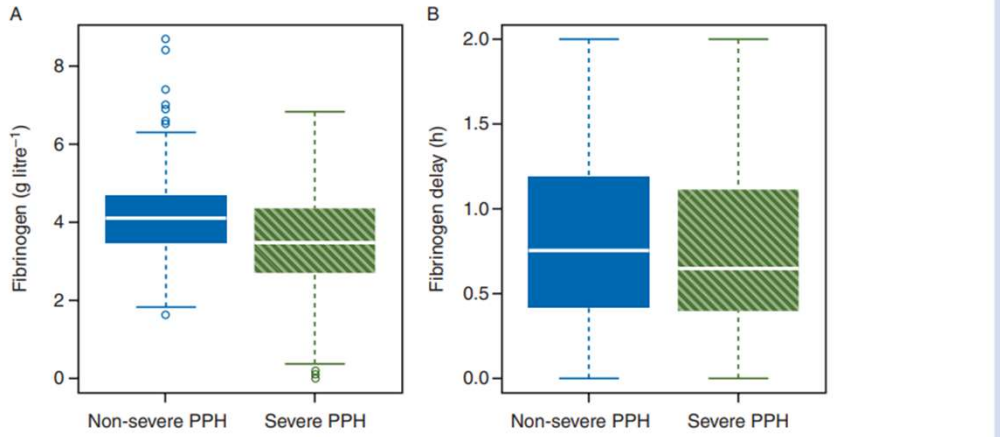


Fig 2 Distribution of (A) fibrinogen level and (B) time until blood samples were obtained (quartiles and medians) for non-severe PPH and severe PPH.

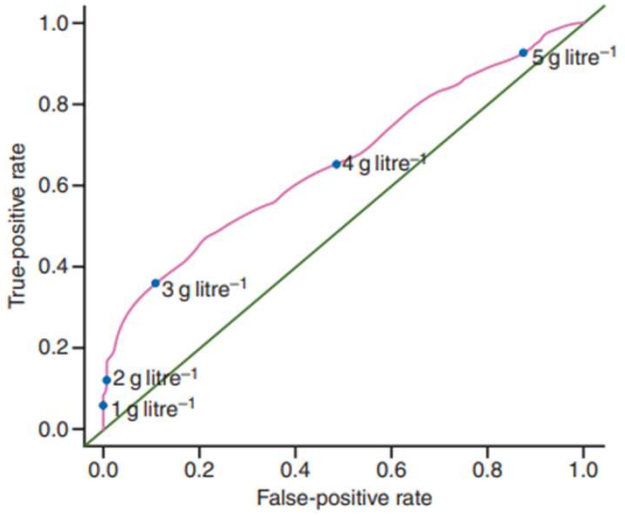


Fig 3 ROC curve of fibrinogen concentration at diagnosis for the prediction of severe PPH. Area under the curve=0.66, 95% CI=(0.64–0.68).

M. Cortet and coll British Journal of Anaesthesia 108 (6): 984–9 (2012) doi:10.1093/bja/aes096

CORRECTION DU FIBRINOGENE : QUEL DELAI ?

Pre-emptive treatment with fibrinogen concentrate for postpartum haemorrhage: randomized controlled trial†

A. J. Wikkelsø[1]*, H. M. Edwards[2], A. Afshari[3], J. Stensballe[4], J. Langhoff-Roos[5], C. Albrechtsen[3], K. Ekelund[3], G. Hanke[3], E. L. Secher[3], H. F. Sharif[5], L. M. Pedersen[6], A. Troelstrup[6], J. Lauenborg[7], A. U. Mitchell[1], L. Fuhrmann[1], J. Svare[2], M. G. Madsen[8], B. Bødker[9], A. M. Møller[1] and FIB-PPH trial group

British Journal of Anaesthesia 114 (4): 623–33 (2015) doi:10.1093/bja/aeu444

→ 249 patientes avec HPP > 500mL

→ Bras interventionnel : 2g fibrinogène

Absence de réduction significative de transfusion de CGR dans le bras fibrinogène

Pas d'administration préventive de fibrinogène si normofibrinogénémie

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

CORRECTION DU FIBRINOGENE : QUEL DELAI ?

Early and systematic administration of fibrinogen concentrate in postpartum haemorrhage following vaginal delivery: the FIDEL randomised controlled trial

Ducloy-Bouthors AS and coll. BJOG 2021;128:1814–1823

Etude randomisée, multicentrique, double aveugle

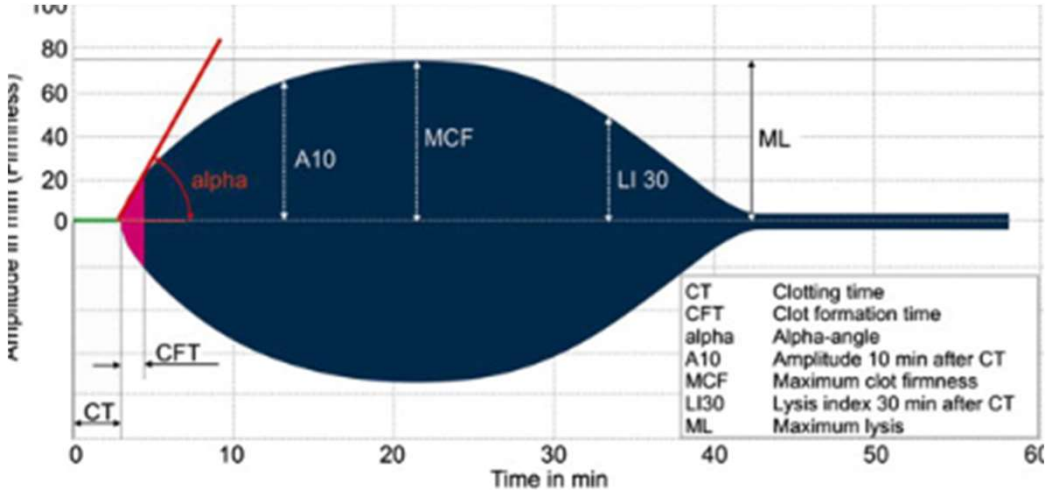
→ 427 patientes avec HPP nécessitant sulprostone

Absence de différence significative sur la ↘ transfusion de CGR ou ↘ anémie post partum

Pas d'administration systématique de 3 g de fibrinogène sans monitorage biologique

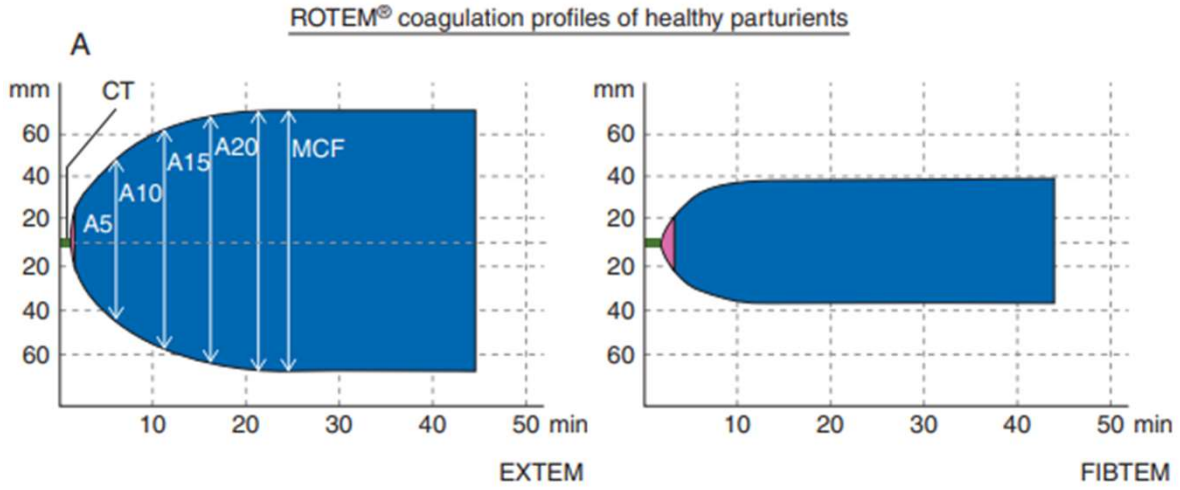
Table 2. Primary and secondary outcomes

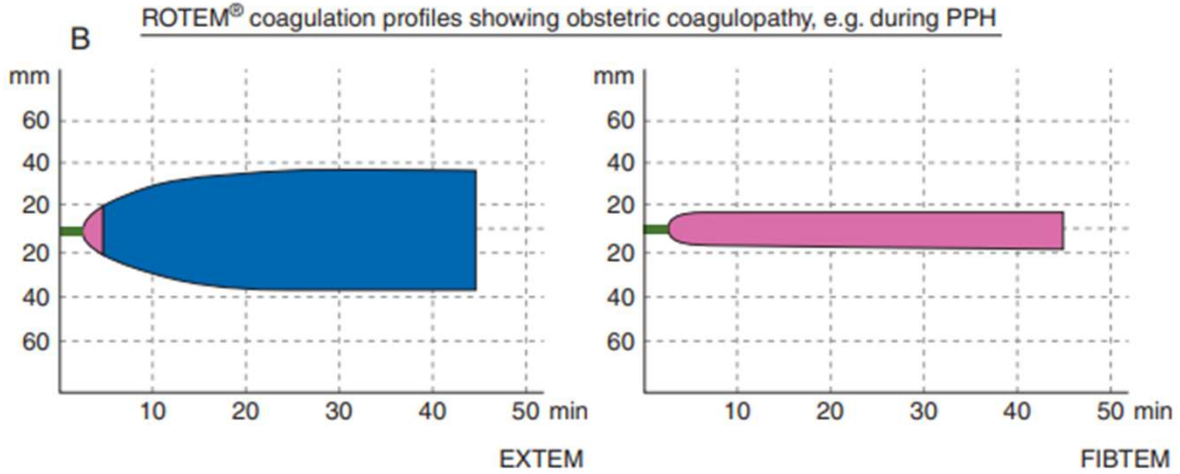
Outcome	Fibrinogen *n* = 220	Placebo *n* = 210	OR (95%CI)	*P*-value
Primary outcome				
Failure, *n* (%)	88 (40.0%)	89 (42.4%)	0.99 (0.66–1.47)	0.96*
Secondary outcomes				
RBC transfusion ≥2 Units from H0 to D2, *n* (%)	51 (23.4%)	52 (25.0%)	1.00 (0.63–1.60)	0.98*
RBC transfusion ≥4 Units from H0 to D2, *n* (%)	6 (2.7%)	5 (2.4%)		0.87**
Number of RBC units per transfused patient from H0 to D2, mean ± SD	2.7 ± 1.2	3.1 ± 2.5		0.99***
Hb loss ≥4 g/dl from reference level to D2, *n* (%)	42 (19.1%)	41 (19.5%)	1.02 (0.62;1.67)	0.95*
Hb loss ≥3 g/dl from reference level to D2, *n* (%)	102 (46.4%)	98 (46.9%)		0.91**
Hb loss ≥4 g/dl from H0 to D2, *n* (%)	16 (7.3%)	17 (8.3%)		0.69**
Hb level < 9 g/dl from reference level to D2, *n* (%)	112 (50.9%)	117 (56.0%)		0.29**
Total blood loss (from baseline to D2), mean ± SD, ml	1555 ± 849	1723 ± 1193		0.21***
Additional blood loss (from H0 to D2), mean ± SD, ml	304.7 ± 386.2	319.7 ± 417.1		0.33***
Intrauterine balloon, *n* (%)	63 (28.6%)	61 (29.0%)		0.93**
At least one rescue procedure, *n* (%)	65 (29.5%)	64 (30.5%)		0.83**
At least one invasive haemostatic procedure, *n* (%), including:	8 (3.6%)	10 (4.8%)		0.56**
Arterial embolisation	6 (2.7%)	10 (4.8%)		0.27**
Arterial ligation	0 (0%)	0 (0%)		—
Hysterectomy	0 (0%)	1 (0.5%)		0.49****
Intensive care or resuscitation, *n* (%)	62 (28.2%)	54 (25.7%)		0.56**
Length of stay in intensive care or resuscitation unit, mean ± SD, day	0.7 ± 0.6	0.7 ± 0.9		0.84***
SOFA score of patients admitted to intensive care or resuscitation unit, median [min; max]	0 [0;4]	0 [0;6]		0.32***
Death, *n* (%)	0 (0%)	0 (0%)		—



MONITORAGE DE LA COAGULOPATHIE

MONITORAGE DE LA COAGULOPATHIE





- Alternative au bilan d'hémostase standard
- Informations sur l'ensemble de la cinétique d'hémostase en quelques minutes

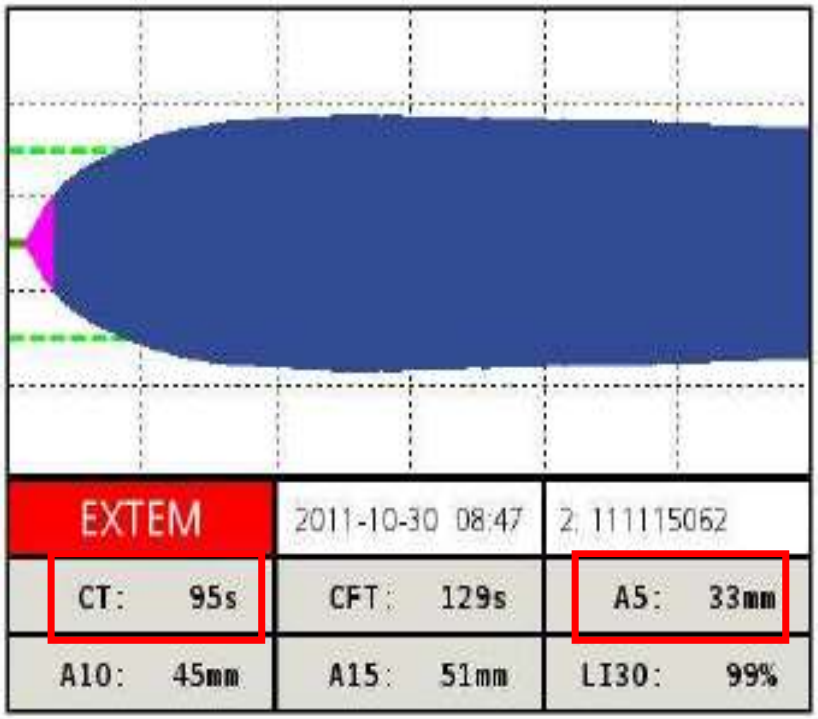
CT EXTEM : temps initiation de la coagulation

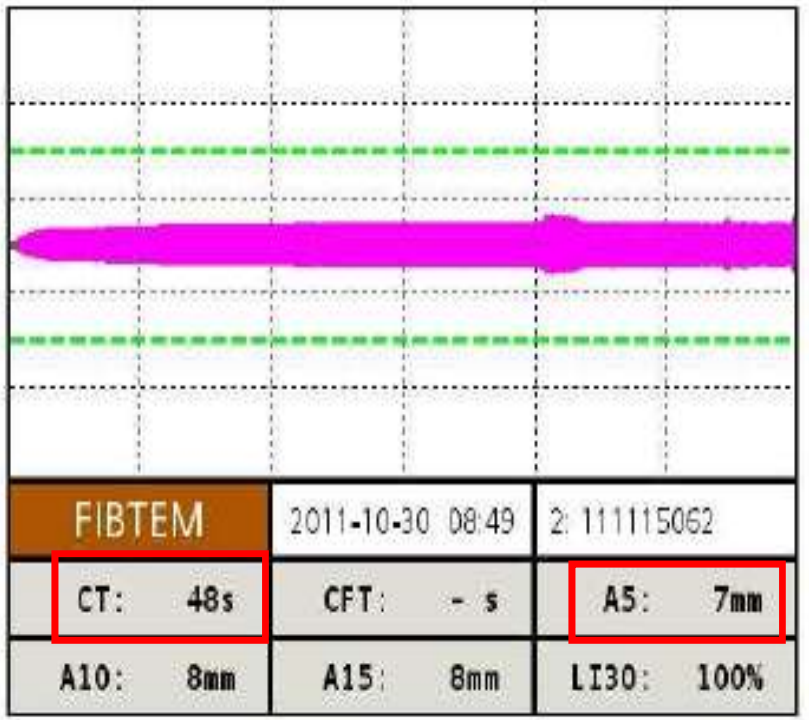
A5 EXTEM : qualité du caillot

A5 FIBTEM : déficit en fibrinogène

Haemostatic monitoring during postpartum haemorrhage and implications for management C. Solomon, R. E. Collis and P. W. Collins British Journal of Anaesthesia 109 (6): 851–63 (2012) doi:10.1093/bja/aes361

APPLICATION DU ROTEM





CT EXTEM ↗ : déficit global en facteurs de la coagulation →PFC
EXTEM A5 ↘ + FIBTEM A5 normal → Thrombopénie
EXTEM A5 normal + FIBTEM A5 ↘ → Hypofibrinogénémie

ROTEM ET TAUX DE FIBRINOGENE

Bedside assessment of fibrinogen level in postpartum haemorrhage by thrombelastometry

Huissoud C and coll. BJOG 2009;116:1097–1102

Table 2. Correlation (*r*) between FIBTEM and fibrinogen level

FIBTEM	Controls	Haemorrhage
	Fibrinogen	Fibrinogen
CA_5	0.83*	0.86*
CA_{15}	0.83*	0.84*
MCF	0.86*	0.85*
CT	−0.1	−0.36*

Values are Spearman's rank correlation coefficient (*r*), *$P < 0.0001$. $CA_{5 \text{ or } 15}$, amplitude of the clot at 5 and 15 minutes; CT, clotting time; MCF, maximum clot firmness.

Table 3. Cut-off values for CA_5-FIBTEM in postpartum haemorrhage

Fibrinogen levels (g/l)	FIBTEM cut-off values (mm)	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV % (95% CI)	*AUC*
Fibrinogen < 2	$CA_5 = 6$	100 (100–100)	87 (77–96)	50 (36–64)	100 (100–100)	0.97
Fibrinogen < 1.5	$CA_5 = 5$	100 (100–100)	85 (76–95)	30 (17–43)	100 (100–100)	0.96
Fibrinogen < 1	$CA_5 = 4$	100 (100–100)	86 (76–96)	13 (3–22)	100 (100–100)	0.96
Fibrinogen < 2	$CA_{15} = 8$	100 (100–100)	84 (75–94)	46 (32–60)	100 (100–100)	0.96
Fibrinogen < 1.5	$CA_{15} = 6$	100 (100–100)	88 (78–97)	33 (20–46)	100 (100–100)	0.97
Fibrinogen < 1	$CA_{15} = 5$	100 (100–100)	88 (79–97)	14 (5–24)	100 (100–100)	0.97

AUC, area under curve; CI, confidence interval; NPV, negative predictive value; PPV, positive predictive value.

Bonne corrélation entre les données du FIBTEM et le taux de fibrinogène

→ Détection précoce hypofibrinogénémie

→ Supplémentation sur les valeurs FIBTEM A5

QUELLE VALEUR RETENIR DU A5 FIBTEM ?

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

P. W. Collins[1,*], R. Cannings-John[2], D. Bruynseels[3], S. Mallaiah[4], J. Dick[5], C. Elton[6], A. D. Weeks[7], J. Sanders[8], N. Aawar[2], J. Townson[2], K. Hood[2], J. E. Hall[9] and R. E. Collis[3] on behalf the OBS2 study team[†]

British Journal of Anaesthesia, 119 (3): 411–21 (2017) doi: 10.1093/bja/aex181

Recommendation 36. We recommend against pre-emptive fibrinogen supplementation (**1B**). Instead, fibrinogen levels should be monitored early in severe ongoing PPH in order to consider cryoprecipitate or fibrinogen concentrate substitution at a plasma level <2 g/L or FIBTEM A5 <12 mm (**1C**).

52 HPP 1000-1500mL avec FIBTEM A5 ≤ 15mm

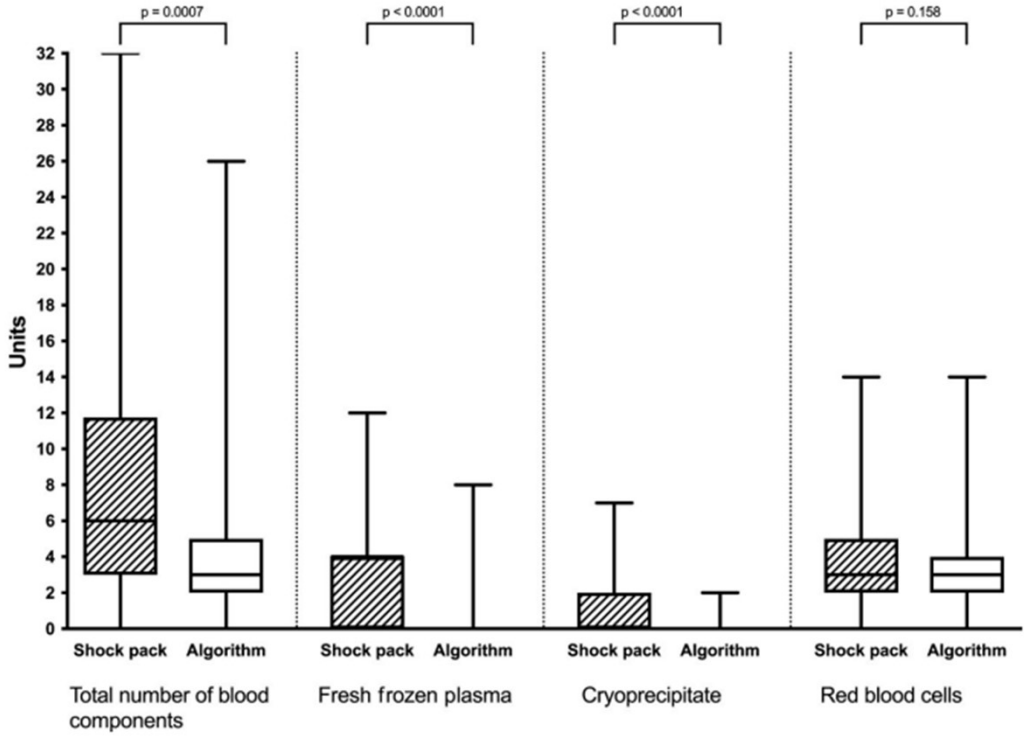
→ IRR 0,72 en terme de transfusion de produits sanguins (p = 0,45)

→ Administration fibrinogène si **A5 FIBTEM ≤ 12mm ou fibrinogène < 2g/L**

ALGORITHME DE PRISE EN CHARGE BASE SUR LES DONNEES DU ROTEM

Four years' experience of a ROTEM®-guided algorithm for treatment of coagulopathy in obstetric haemorrhage*

H. McNamara,[1] C. Kenyon,[2] R. Smith,[3] S. Mallaiah[1] and P. Barclay[4]



1/07/2012 : instauration algorithme basé sur les données du ROTEM pour HPP ≥ 1500mL

→ ↘ volume et du nombre d'unité de produits sanguins transfusés
→ ↘ TACO

Traitement personnalisé pour limiter transfusion de produits sanguins non nécessaires

Anaesthesia 2019, 74, 984–991 doi:10.1111/anae.14628

Reduction in massive postpartum haemorrhage and red blood cell transfusion during a national quality improvement project, Obstetric Bleeding Strategy for Wales, OBS Cymru: an observational study

Bell et al. BMC Pregnancy and Childbirth (2021) 21:377 https://doi.org/10.1186/s12884-021-03853-y

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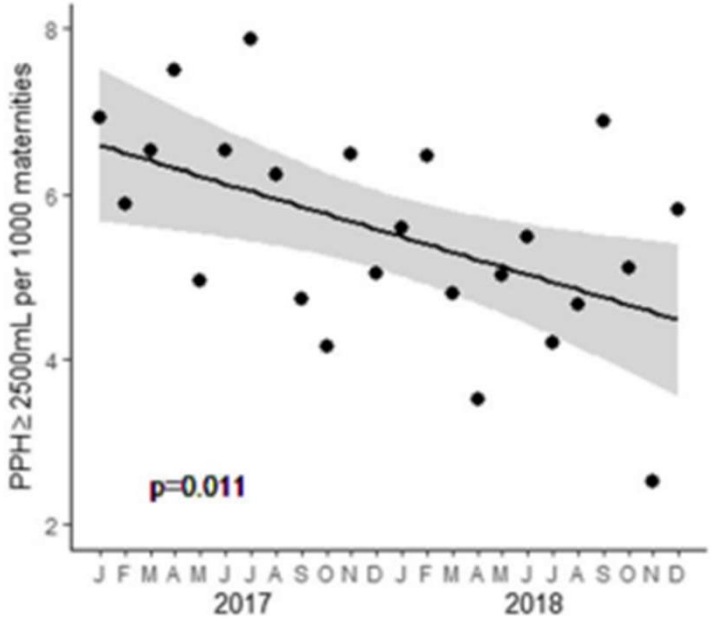


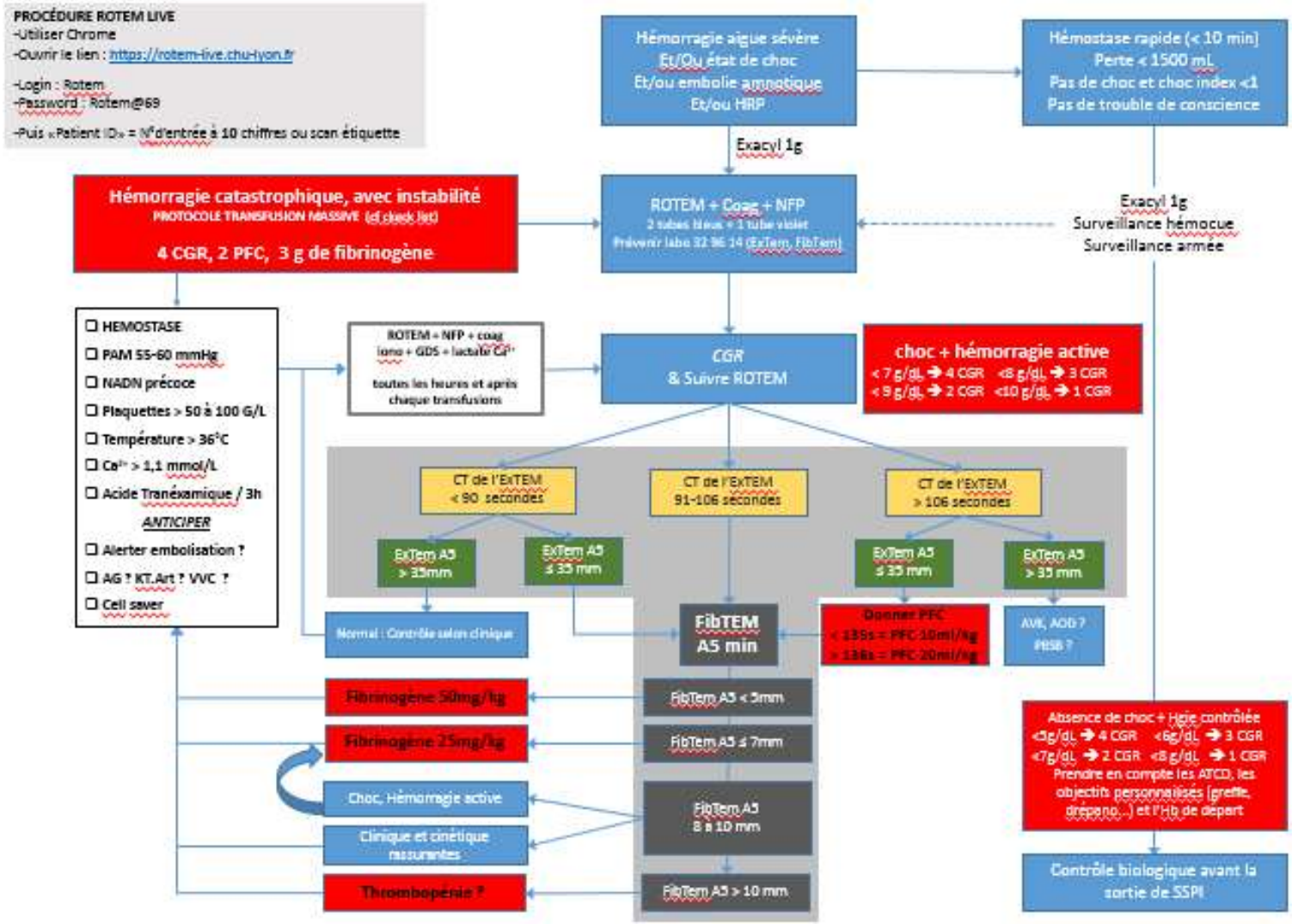
Table 3 Transfusion and haematological results for postpartum haemorrhage

	Jan-Jun 2017	Jul-Dec 2017	Jan-Jun 2018	Jul-Dec 2018
Transfusion of red blood cells and blood components				
Number of women transfused red blood cells: n (/1000 maternities)	350 (23.0)	270 (16.9)	278 (18.8)	268 (17.7)
Total number of units of red blood cells transfused: n (/1000 maternities)	823 (54.1)	656 (41.0)	636 (43.1)	609 (40.2)
Number of women transfused ≥5 units red blood cells: n (/1000 maternities)	16 (1.1)	14 (0.9)	14 (1.0)	11 (0.7)
Number of women transfused FFP: n (/1000 maternities)	26 (1.7)	20 (1.3)	21 (1.4)	15 (1.0)
Total number of units of FFP transfused: n (/1000 maternities)	87 (5.7)	78 (4.9)	74 (5.0)	37 (2.4)
Number of women transfused fibrinogen: n (/1000 maternities)	22 (1.5)	19 (1.2)	17 (1.2)	30 (2.0)
Total number of grams of fibrinogen transfused: n (/1000 maternities)	94 (6.2)	103 (6.4)	89 (6.0)	137 (9.0)
Number of women transfused cryoprecipitate: n (/1000 maternities)	6 (0.4)	3 (0.2)	2 (0.1)	5 (0.3)
Total number of units of cryoprecipitate transfused: n (/1000 maternities)	14 (0.9)	8 (0.5)	4 (0.3)	9 (0.6)
Number of women transfused platelets: n (/1000 maternities)	12 (0.79)	8 (0.50)	6 (0.41)	7 (0.46)
Total number of units of platelets transfused: n (/1000 maternities)	20 (1.3)	13 (0.8)	10 (0.7)	9 (0.6)

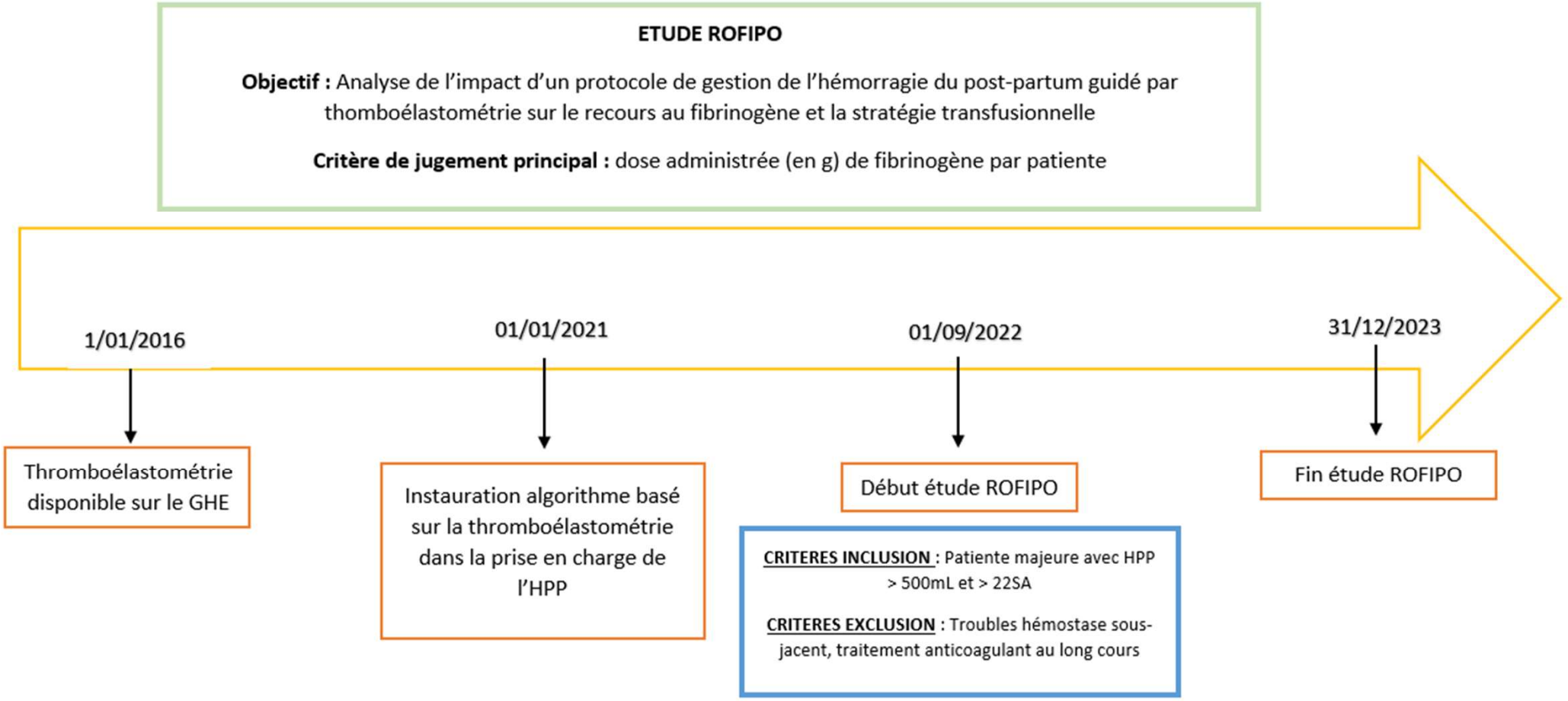
Diminution HPP ≥ 2500mL suite à l'instauration de l'ensemble des mesures

- ↘ transfusion de CGR et PFC
- ↗ perfusion de fibrinogène et ↗ nombre d'examens de thromboélastométrie

PROTOCOLE LOCAL DE GESTION HPP



ETUDE ROFIPO



ETUDE ROFIPO : RESULTATS PRELIMINAIRES

	2016-2018	2019-2018	2021	p
Nombre de patientes ayant reçu du fibrinogène	140/1214 (11,5%)	92/901 (10.2%)	25/591 (4.2%)	<0.0001 *
Critères de jugements secondaires				
Pertes sanguines moyenne (mL)	800 (600-1020)	800 (600-1100)	800 (600-1100)	0,72
Nombre de patientes ayant présentées une hémorragie du post partum > 1500 mL	91/1220 (7,5%)	79/904 (8,7%)	53/595 (9%)	0.44
Nombre de patientes ayant bénéficiées d'un examen de thromboélastométrie	4/1220 (0,3%)	13/904 (1,4%)	49/595 (8,2%)	<0.0001 **
Nombre de patientes ayant bénéficiées d'acide tranexamique	739/1220 (60,6%)	739/904 (81,7 %)	507/595 (85,2 %)	<0.0001****
Nombre de patientes ayant bénéficiées d'une transfusion de CGR	161/1220 (13,2%)	133/904 (14,7%)	63/595 (10,6%)	0.07
Nombre de patientes ayant bénéficiées d'une transfusion de PFC	38/1220 (3,1%)	22/904 (2,4%)	10/595 (1,7%)	0.18
Nombre de patientes ayant bénéficiées d'une transfusion plaquettaire	16/1220 (1,3%)	10/904 (1,1%)	3/595 (0,5%)	0.29

↘ du nombre de patiente ayant reçu du fibrinogène par facteur 3

FACTEUR rVIIa

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

International Anesthesia Research Society DOI: 10.1213/ANE.0b013e3181c039e6

110 patientes ayant bénéficiées rFVIIa dans le cadre HPP
→ Réponse 76%
→ Absence de décès d'origine thromboembolique

Use of recombinant activated factor VII in severe post-partum haemorrhage: Data from the Italian Registry
A multicentric observational retrospective study

Giovanni Barillari [a,*], Maria Grazia Frigo [b], Maddalena Casarotto [c], Antonio Farnia [d], Barbara Massè [e], Roberto Wetzl [f], Andrea Bianchin [g], Andras Rabi [h], Paolo Malacarne [i], Samantha Pasca [a], Enrico Bigotto [a] and The Italian rFVIIa-PPH Study Group

Thrombosis Research 124 (2009) e41–e47 doi:10.1016/j.thromres.2009.08.018

35 patientes ayant bénéficiées rFVIIa dans le cadre HPP
→ Diminution de plus de 90% de RBC chez 51% des patientes
→ Absence de décès d'origine thromboembolique

HPP réfractaire au traitement standard/prévention hystérectomie : 60 µg/kg rFVIIa après correction de la fibrinogénémie et de la thrombopénie

COMPLEXE PROTHROMBOTIQUE HUMAIN

- Concentré de facteurs II, VII, IX, X et de protéines S et C

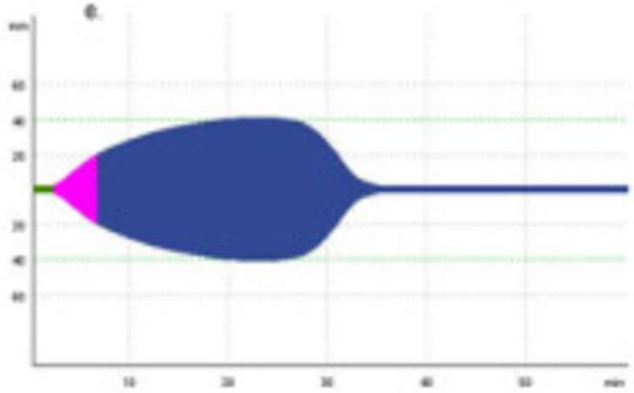
Recommendation 37. We recommend against using prothrombin complex concentrates in PPH because of safety concerns and a lack of evidence to support their efficacy (**1C**).

Blood Transfus 2019; 17: 112-36 DOI 10.2450/2019.0245-18

ACIDE TRANEXAMIQUE

Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomised, double-blind, placebo-controlled trial

Lancet 2017; 389: 2105–16 DOI: 10.1016/S0140-6736(17)30638-4



	Tranexamic acid group (n=10 036)	Placebo group (n=9985)	RR (95% CI)	p value (two-sided)
Bleeding	155 (1·5%)	191 (1·9 %)	0·81 (0·65–1·00)	0·045
Pulmonary embolism	10 (0·1%)	11 (0·1)	0·90 (0·38–2·13)	0·82
Organ failure	25 (0·3%)	18 (0·2%)	1·38 (0·75–2·53)	0·29
Sepsis	15 (0·2%)	8 (0·1%)	1·87 (0·79–4·40)	0·15
Eclampsia	2 (0·02%)	8 (0·1%)	0·25 (0·05–1·17)	0·057
Other	20 (0·2%)	20 (0·2%)	0·99 (0·54–1·85)	0·99
Any cause of death	227 (2·3%)	256 (2·6%)	0·88 (0·74–1·05)	0·16

Data are n (%), unless otherwise indicated. RR=risk ratio.

Table 2: **Effect of tranexamic acid on maternal death**

Inclusion de 20 060 patientes ayant présentées une HPP

- Diminution de la **mortalité de cause hémorragique** dans le bras acide tranexamique
- Importance administration **dans les 3 heures** suivant le début de l'HPP

CORRECTION HYPOCALCEMIE

Association between ionised calcium and severity of postpartum haemorrhage: a retrospective cohort study

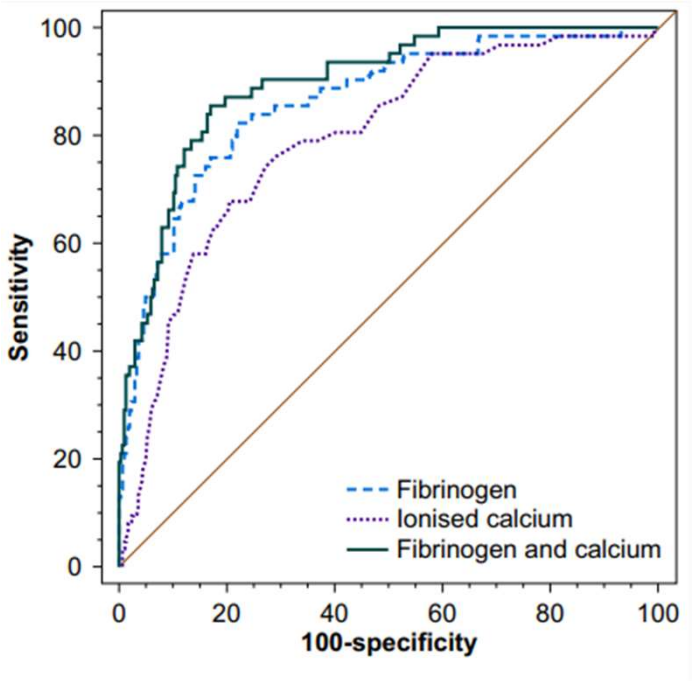
Danny Epstein[1,*], Neta Solomon[2,3], Alexander Korytny[4,5], Erez Marcusohn[6], Yaacov Freund[5], Ron Avrahami[7], Ami Neuberger[1,5,8], Aeyal Raz[5,9] and Asaf Miller[10]

British Journal of Anaesthesia, 126 (5): 1022e1028 (2021)

Calcémie ionisée : facteur prédictif évolution vers HPP sévère

Calcémie ionisée > 1,16 mmol/L : VPN 90,9%

	OR (95% CI)	P-value
Age, yr	0.99 (0.86–1.13)	0.90
Parity, *n*	0.94 (0.53–1.67)	0.83
Vacuum extraction, *n*	0.35 (0.02–7.19)	0.50
Haemoglobin, g dl^{-1}	0.88 (0.55–1.4)	0.60
pH†	0.31 (0.09–1.06)	0.06
Lactate, mmol L^{-1}	0.64 (0.37–1.09)	0.10
Fibrinogen,† mg dl^{-1}	1.14 (1.05–1.24)	**0.002**
PTT, s	1.01 (0.9–1.13)	0.87
Ionised calcium,† mmol L^{-1}	1.97 (1.25–3.1)	**0.003**



TAKE HOME MESSAGE

PRISE EN CHARGE MULTIDISCPLINAIRE

PERTES SANGUINES > 500mL

> 1000mL

> 2500mL

Tachycardie – Pâleur – PAS < 100mmHg

Choc hémorragique

ATONIE UTERINE : Massage utérin — Ballon de Bakri — Ligature des artères utérines — Embolisation — Hystérectomie

UTEROTONIQUES : 1° OXYTOCINE 2° SULPROSTONE

RUPTURE UTERINE / PLAIE DES VOIES GENITALES / RETENTION UTERINE

Stabilité hémodynamique : ALR

Instabilité hémodynamique : AG

CONTROLE DU SAIGNEMENT : TRAITEMENT ETIOLOGIQUE

REMPLISSAGE VASCULAIRE +/- SUPPORT EN AMINES

1 g ACIDE TRANEXAMIQUE

Monitorage de la coagulopathie : NFS / Bilan de coagulation / ROTEM

TRANSFUSION CGR si Hg < 7g/dl

TRANSFUSION PLAQUETTE si < 75G/L

PROTOCOLE TRANSFUSION MASSIVE (> 4CGR PFC 1 :2)

CORRECTION HYPOFIBRINOGENEMIE si < 2g/L ou FIBTEM A5 < 12mm

LUTTE CONTRE HYPOTHERMIE / ACIDOSE METABOLIQUE / COAGULOPATHIE / HYPOCALCEMIE

MERCI POUR VOTRE ATTENTION

HCL
HOSPICES CIVILS
DE LYON

PRE-ASSESSMENT

Monitor & treat anemia. Blood type/crossmatch.
Active management of the third stage of labor.
High-risk patient → Multidisciplinary approach.

Quick Reference Guide for the Management of Postpartum Hemorrhage

nata
Network for the Advancement of Patient Blood Management, Hemostasis and Thrombosis

Call for help early!
- ✓ Obstetrician/midwife, etc.
- ✓ Anesthetist/nurse, etc.
- ✓ Surgeon/operating room/ICU

Initial assessment
- ✓ Administer oxygen 2L/min
- ✓ Warming & monitoring
- ✓ Establish venous access x2
- ✓ Provide analgesia
- ✓ Insert urinary catheter
- ✓ Estimate blood loss
- ✓ Verify blood type/crossmatch
- ✓ Verify blood availability
- ✓ Repeated hemoglobin levels
- ✓ Analyze clotting (LAB/POC)
- ✓ Inform patient & family

Transfer
- ✓ At any time, transfer to a higher level hospital if needed or consider ICU admission

Temporary measures
- ✓ Uterotonic drugs
- ✓ Bimanual compression or intrauterine balloon
- ✓ External aortic compression
- ✓ Non-pneumatic anti-shock garment

Clinical symptoms	Heart rate >100 bpm Pallor	Systolic BP <100 mmHg Ongoing bleeding	Dizziness Massive bleeding	Coma Massive bleeding
Bleeding volume	>1000 mL	>1500 mL	>2500 mL	>4000 mL

Bleeding control – treat the cause!

Uterine atony

Treat atony	Local measures to control bleeding			Rescue surgery
	Non-surgical	Surgical	Embolization	Hysterectomy
Uterine massage	*Bi-manual compression* *Balloon tamponade*	*Arterial ligation* *Surgical compression*		*Abdominal packing*

Uterotonic drugs

First line — **Oxytocin bolus** 5-10 IU IV/IM → **Oxytocin infusion** 40 IU/500 mL crystalloid; 125 mL/h

Second line — **Ergometrin** 0.2 mg IM; **Syntometrin** 1 mL IM (500 µg ergometrin and 5 IU oxytocin)
Prostaglandins: Misoprostol 800 µg sublingual; **Sulprostone**: 500 µg/1h IV; **Carboprost** (0.25 mg/15 min IM, up to 8 doses)

Placental retention	Early manual removal or smooth curettage
Genital track injury	Tear suture, hematoma evacuation
Uterine rupture	Surgical suture → rescue hysterectomy
Uterine inversion	Immediate manual replacement → laparotomy rescue hysterectomy

Provide regional anesthesia in cases of hemodynamic stability.Prefer general anesthesia in cases of prolonged surgical procedures or hemodynamic instability. Avoid anesthetics (relax the uterus)

Control of coagulopathy – circulation - homeostasis

	Circulation	Hemodynamics	Response to therapy
Monitor	*BP, HR, non-invasive SpO_2*	*A-line etc.*	*Central line ($ScvO_2$), CO monitoring if available, etc.*
Treat	*Crystalloids 1000 mL*	*Crystalloids 2000 mL*	*Crystalloids 2000 mL*
Vasopressors (If needed)	Phenylephrine (HR>100 bpm) Norepinephrine (HR>100 bpm) Ephedrine (HR>100 bpm)	Norepinephrine	Norepinephrine or epinephrine
Monitor → Treat	**Hypocalcemia**	**Lactate – Acidosis**	**Hypothermia**

Initiate — **Tranexamic acid** 1 g IV — **Repeat** 1 g IV if ongoing bleeding
Intraoperative cell salvage (if available)

Monitor → Treat — **Hemoglobin (Hb)** (repeatedly) **& clotting** (repeat if needed)

Transfusions — **RBC** if Hb <7 g/dL — **Massive PPH?** → Activate massive transfusion protocol (MTP) → **Early transfusion of RBC and plasma**

Fibrinogen substitution if — **Fibrinogen concentration <2 g/dL (or ROTEM FIBTEM A5 <12 mm or TEG FF MA <14 mm)**
Fibrinogen concentrate 2-4 g or cryoprecipitate 5-10 mL/kg (upon availability)