





THROMBOELASTOGRAPHIE ET COAGULOPATHIE

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CONFLIT D'INTERET

- LFB (2018) : Rédaction Brochure
- TEM (2018) : Topo / Consulting

INTRODUCTION

- Coagulopathie Post Traumatique est fréquente :**
 - 20 – 30 % des Trauma
 - Rugeri et al. J Thromb Haemost 2007 ; Brohi et al. Curr opin Crit Care 2007*
- On se guide sur une « impression clinique »**
 - Notion de saignement important / FAST
 - Exactitude de « l'impression clinique » : **≈ 50 % ... ?**

VoxSanguinis

ORIGINAL PAPER

Prehospital parameters can help to predict coagulopathy and massive transfusion in trauma patients

J.-S. David^{1,2}, E.-J. Sogah^{1,2}, E. Chahar^{1,2}, G. Sime^{1,2}, E. Deschamps^{1,2}, P.-Y. Desgouttes^{1,2}, S. Puygallat^{1,2}, A. G. Serrano^{1,2}

	N	Threshold
Trauma-induced coagulopathy		
★ Shock index	444	≥0.90
GCS	477	<8
MGAP	476	<18
ROC Criteria	476	Present
★ Injury severity score	485	≥24
★ Noradrenaline	484	Present
★ Hbids (ml)	472	>1000

Y a t'il une coagulopathie ?

- Plaie Arme Blanche Parasternale
- Adm : PAS < 75 mmHg / Fc 100
- T+15 min : 1^{ère} AC puis 2^{ème}
- Posé en AC sur Table Opératoire
- Sternotomie de Sauvetage
- Plaie Tronc AP : Suture en quasi AC




Adm	02h33	03h40
TP	59	36
Fib	2	1,6
Hgb	125	94
Ac L	12	11
ROTEM	+	+
Fibrinogène	3	1,5
CGR	2	
TXA	1	1

Fresh Frozen Plasma Is Independently Associated With a Higher Risk of Multiple Organ Failure and Acute Respiratory Distress Syndrome

Gregory A. Watson, MD, Jason L. Sperry, MD, MPH, Matthew R. Rosengart, MD, MPH, Joseph P. Minei, MD, Brian G. Harbrecht, MD, Ernest E. Moore, MD, Joseph Cuschieri, MD, Ronald V. Maier, MD, Timothy R. Billiar, MD, and Andrew R. Peitzman, MD. The Inflammation and the Host Response to Injury Investigators

Mortality

Independent Hazard Ratios For FFP Transfusion (per unit)

Independent Hazard Ratios For Development of MOF

Independent Hazard Ratios For Development of ARDS

Each unit of FFP was independently associated with a 2.1% higher risk of MOF and a 2.5% higher risk of ARDS.

COMMENT FAIRE MIEUX ?

- BIOLOGIE DÉLOCALISÉE !**
 - Au lit du patient
 - Utilisation simple / fiable
 - Avec les biologistes ++++

- Détermination Rapide de l'INR
- Thromboélastométrie / Thrombéléstographie



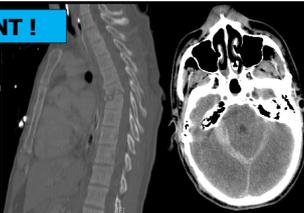
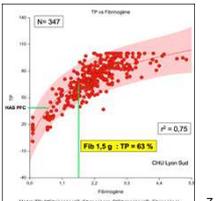


TQr/INR PAS SUFFISANT !

Grade A – 25 ans
 Acc Quad – GCS 3
 HSA Majeur – Oedème Cérébral
 Fr Dorsale x (D4 ++)

	Admission
HemoCue	144
INRc	1,2
A5 Extem	36
A5 FibTem	5
INR	1,31
Fibr	1,4
Hgb	142
PLT	310

Clotta 1,5 g

BIOLOGIE STANDARD

British Journal of Anaesthesia 116 (2): 217–24 (2016)
 Advance Access publication 8 September 2016 • doi:10.1093/bja/aew303

Usefulness of standard plasma coagulation tests in the management of perioperative coagulopathic bleeding: is there any evidence?
 T. Hoos¹, D. Fries¹, K. A. Tanaka¹, L. Asmis¹, N. S. Curry¹ and H. Schöchl¹*

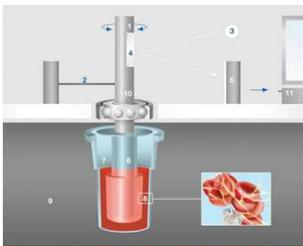
it seems questionable how long physicians are willing to continue using (late) results of SLTs as marker of coagulopathy or guidance for bleeding management. But as always, old and even bad habits die hard.

Based on the data of the present review, there is no high-quality evidence to support that the traditionally applied trigger levels of ≥ 1.5 -fold prolongation of aPTT/PT or INR are of great help to diagnose whether a patient suffers

TP = Concentration de facteurs ... Quid de l'agrégation plaquettaire ? Inflammation ?

TECHNIQUES VISCO-ELASTIQUES

- Sang Natif ou Citraté



- Inventé en 1948
- Ajout d'activateur
- ROTEM : 4 activateurs
 - INTEM : Ac Ellagic (TCA)
 - EXTEM : Fact Tissulaire (TP)
 - FIBTEM : CytoChal. D (FIB)
 - APTEM : Aprotinine (F.LYSE)
 - HEPTEM : INTEM + Héparinase
- TEG : 2 activateurs !
 - Kaolin (test classique)
 - rTEG (FT)
 - Fibrinogène Fonctionnel

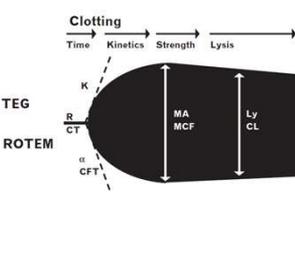
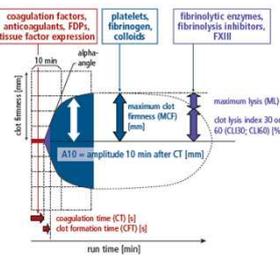
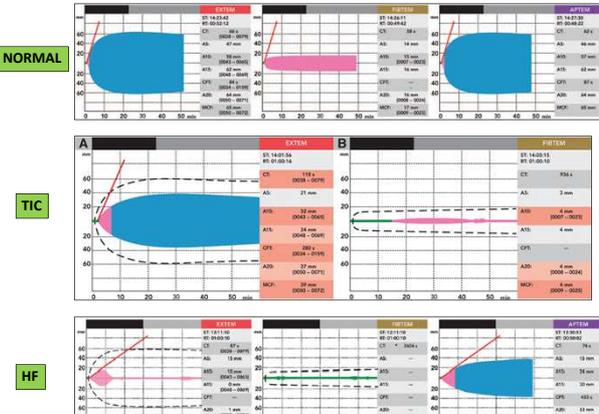


Thromboelastometry guided therapy of severe bleeding

Essener Runde algorithm

K. Lier¹, M. Vorweg², A. Hanke³, K. Görlinger⁴

¹Department of Anaesthesiology and Intensive Care Medicine, University Hospital Cologne, Germany; ²Administrative Department of Management, Cologne City Hospital, University of Witten/Herdecke, Cologne, Germany; ³Department of Anaesthesiology and Intensive Care Medicine, Hannover Medical School, Hannover, Germany; ⁴Tem International GmbH, Munich, Germany

ALGORITHME ROTEM CHOC HEMORRAGIQUE LYON SUD

Cibles Physiologiques : Temp > 36°C, pH > 7.2, Hgb > 70 g/L, Ca ionisé > 1 mmol/L

Etape 1 : Hyperfibrinolyse ?
 MCF EXTEM < 18 mm
 CT FIB > 500 s
 TAA : 1 g
 PFC : 20 mg/kg
 Clotfactant : 50 mg/kg

Etape 2 : Déficit isolé Fibrinogène ?
 AS FIBTEM - Clotfactant
 FIBTEM AS < 7 mm
 CT EXTEM < 106 s
 5-6 mm : 25 mg/kg
 4-5 mm : 50 mg/kg
 < 2 mm : 75 mg/kg

Etape 3 : Déficit Fibrinogène et Facteurs ?
 AS FIBTEM - Clotfactant + AS Fb
 FIBTEM AS < 7 mm
 CT EXTEM > 106 s
 CT EXTEM : 207-335 : PFC 50 mg/kg
 130-200 : PFC 20 mg/kg
 > 200 : PFC 50 mg/kg

Etape 4 : Déficit Plaquette ?
 FIBTEM AS > 7 mm
 CT EXTEM < 23 mm
 AS EXTEM < 23 mm
 Concentrats Plaquette selon poids

Etape 5 : Anticoagulant ?
 CT EXTEM Allongé
 CCP selon Poids

Etape 6 : Cibles
 FIBTEM AS ≥ 7 mm – CT EXTEM < 106 s – AS EXTEM ≥ 23 mm

RÉPÉTER ROTEM APRÈS CHAQUE ADMINISTRATION PSL

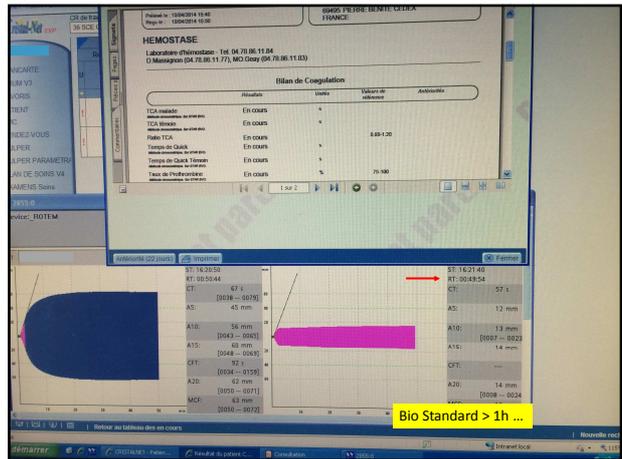
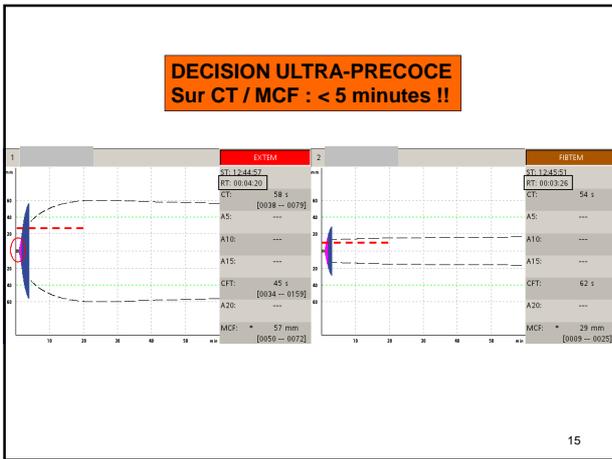
↓

**Lyon : Prélèvement au Déchocage puis Tube Citraté au Labo
 Tube Pneumatique (Pas de modification Amplitude !)**

↑

COLLABORATION +++ AVEC BIOLOGISTE

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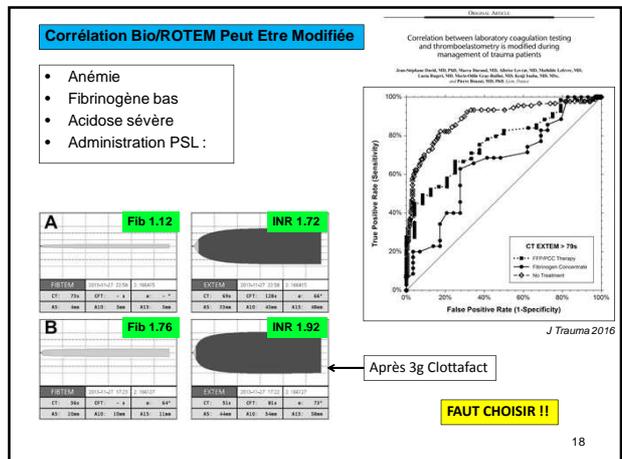
ADMISSION

Table 3. Correlations (r) between ROTEM® and standard coagulation

	Prothrombin time	Activated partial thromboplastin time	Fibrinogen	Platelets
EXTEM				
CT	0.53*	(-)	0.40*	(-)
CFT	0.62*	(-)	0.33*	(-)
CA ₁₅	0.66*	(-)	0.65*	0.56*
INTEM				
CT	(-)	0.47*	(-)	(-)
CFT	(-)	0.91*	(-)	0.32*
CA ₁₅	(-)	0.70*	0.66*	0.57*
FIBTEM				
CA ₁₀	(-)	(-)	0.88*	(-)

Trauma : Tauber et al. BJA 2011, Hagemo JS et al. Crit Care 2015

Transfusion values	ROTEM® Cutoff values	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV % (95% CI)	AUC
Prothrombin time > 15	CA ₁₅ -EXTEM = 33 mm	87 (72-87)	100 (99-100)	100 (83-100)	99 (98-99)	0.98
APTT > 1.5 of control value	CFT-INTEM = 112 s	100 (84-100)	74 (73-74)	23 (19-23)	100 (98-100)	0.94
Fibrinogen < 1 g.g.L ⁻¹	CA ₁₀ -FIBTEM < 5 mm	91 (72-93)	85 (84-86)	55 (45-60)	99 (97-100)	0.96
Platelets < 50 × 10 ⁹ L ⁻¹	CA ₁₅ -INTEM = 46 mm	100 (71-100)	83 (82-83)	17 (12-17)	100 (98-100)	0.92



Point-of-Care Testing

A Prospective, Randomized Clinical Trial of Efficacy in Coagulopathic Cardiac Surgery Patients

Christin Friedrich-Wacker, Dr. med., Klaus Goring, Dr. med., J. DM Meringer, P.D., Dr. med., J. Eva Hennrich, Prof. Dr. med., Tobias Bergsch, Dr. med., J. Anton Metz, Prof. Dr. med., J. Lennertz in Corn, M.D., Prof. Dr. med., J. K. Zamboni, Prof. Dr. med., M.D., F.F.I.C.A.C.

Table 6. Cumulative Costs of Transfused Allogeneic Blood Products, Hemostatic Therapy (Including Coagulation Factor Concentrates), and Costs of Performed POC Analyses

	Conventional Group	POC Group
Allogeneic blood products	18,648	13,176
Packed erythrocytes (72 €/U)	13,530	4,665
FFP (0.162 €/g)	28,755	10,844
PC (231 €/U)	3,128	3,412
Other hemostatic therapy	35,882	27,727
Desmopressin (3.9 €/g)	10,844	6,726
Fibrinogen (233 €/g)	44,544	5,565
PCC (114 €/200 IU)	155,431	76,397
APVla (2.754 €/200 µg)		
Total blood products and hemostatic therapy	282,230	168,911
Expendable materials	4,095	2,427
POC Diagnostics	—	—
ROTEM®	—	—
Multiplate®	—	—
Cumulative [€]	155,431	82,918
Mean costs per patient [€]	3,109	1,658

ÉCONOMIE DE PSL ?

- Chirurgie Cardiovasculaire Complexe (Redux)
- 152 Patients
- Etude Prospective Randomisée
- ROTEM / Agrégométrie / Multiplate
- Critère 1^{ère} : Incidence Transfusion CGR

- Résultats :
 - CGR : 98 vs. 84%, p<0.05
 - PFC : 80 vs. 40%, p<0.05
 - Plaquette : 66 vs. 56%, p<0.05
 - Fibrinogène : 60 vs. 64%, NS
 - rFVIIa : 24 vs. 2%, p<0.05
 - Temps de Ventil : 827 vs. 316 min, p<0.05
 - ICU LOS : 24 vs. 21 jours, p<0.05

Original Article

ÉCONOMIE DE PSL ?

Change of transfusion and treatment paradigm in major trauma patients

Stahn A, Koenig T, G. A. Wenzel T, Saha T, M. Thiesing R, S. K. Spahn U

Table 2. Raw and adjusted differences in transfusion of allogeneic blood products and outcome between the two cohorts (2005–2007 and 2013–2014). Values are number (proportion), mean (SD) and odds ratio (95%CI).

	2005–2007	2013–2014	Raw OR (95%CI)	p value	Adjusted OR (95%CI)	p value
Massive transfusion	40 (22%)	15 (9%)	0.27 (0.15–0.50)	< 0.001	0.16 (0.08–0.42)	< 0.001
FFP in first 24 h	128 (62%)	80 (51%)	0.28 (0.24–0.39)	< 0.001	0.23 (0.18–0.48)	< 0.001
RBC in first 24 h	170 (53%)	110 (67%)	0.43 (0.24–0.75)	< 0.001	0.27 (0.18–0.48)	< 0.001
FFP in first 24 h	99 (51%)	24 (15%)	0.18 (0.04–0.71)	< 0.001	0.13 (0.05–0.31)	< 0.001
FFP in first 24 h	119 (57%)	67 (41%)	0.48 (0.24–0.98)	< 0.001	0.28 (0.18–0.49)	< 0.001
FFP in first 24 h	35 (17%)	37 (23%)	0.62 (0.31–1.26)	0.42	0.73 (0.33–1.64)	0.38
FFP in first 24 h	35 (17%)	66 (41%)	0.84 (0.64–1.10)	0.16	0.62 (0.48–0.84)	0.002
Mortality (overall)	107 (53%)	88 (52%)	0.93 (0.69–1.26)	< 0.001	0.38 (0.22–0.65)	< 0.001
Mortality (in first 24 h)	35 (17%)	40 (25%)	0.53 (0.34–0.82)	< 0.001	0.28 (0.16–0.50)	< 0.001
Hospital stay, days	18.0 (8.2)	15.4 (7.4)	0.72	0.12	0.70 (0.62–0.79)	< 0.001
ICU LOS, days	10.2 (5.1)	7.1 (3.1)	0.67	< 0.001	0.67 (0.62–0.73)	< 0.001
Ventilator support, days	7.7 (9.2)	3.7 (6.2)	0.47	< 0.001	0.47 (0.38–0.58)	< 0.001

RESEARCH

REDUCTION PSL

BAISSE des COUTS

Open Access

Table 3. Impact of introduction of early coagulation support protocol on consumption of blood components*

	2011	2013	Missing	P-value
Patients with ROTEM® used at 1st FFP	130	96	—	0.169
RBC components transfused within 24 h				
FFP (U)	Median (IQR)	8.09 (6.7)	4.3 (4.8)	—
FFP (g)	Median (IQR)	5.6 (5)	4.1 (5.1)	—
FFP (L)	Median (IQR)	4.18 (3.5)	2.68 (4.7)	—
FFP (mL)	Median (IQR)	0 (0)	0 (0)	—
FFP (mL)	Median (IQR)	8.97 (9.47)	4.21 (4.61)	—
FFP (mL)	Median (IQR)	6 (8)	4 (8)	—
Outcome				
Dead within 24 h	n (%)	8 (8.17%)	3 (3.12%)	—
ROTEM® (mortality)	n (%)	26 (30.2%)	11 (11.2%)	—

Table 5. Estimated cost for blood, mood components, factor and point-of-care tests over the two periods (2011 versus 2013)

	2011	2013
FFP	419	194
FFP	1,87	470
FFP	611	538
Overall	433,818	419,220
Fibrinogen	4409 (1.7)	0
FFP	0	134 (9)
FFP	0	47,663
Overall	—	—
Subtotal	—	—

ARTICLE IN PRESS

Bundle of Care : DC / TXA / ROTEM

Effects of modification of trauma bleeding management: A before and after study

Stahn A, Wenzel T, Saha T, Thiesing R, Spahn U

Table 1. Laboratory analyses

	Period 1	Period 2	Unadjusted	Adjusted
FFP (U)	42 (13.4%)	64 (12.4%)	4.0 (4.4–3.4)	7.4 (5.1–11.7)
RBC (U)	33 (12.4%)	33 (12.4%)	3.3 (2.4–3.9)	3.3 (2.4–3.9)
FFP (g)	3.2 (1.1–7.1)	3.2 (1.1–7.1)	4.1 (2.4–6.8)	1.2 (1.2–1.4)
FFP (L)	16.9 (9.2–21)	16.9 (9.2–21)	1.1 (1.1–1.1)	1.1 (1.1–1.1)
FFP (mL)	16.9 (9.2–21)	16.9 (9.2–21)	1.1 (1.1–1.1)	1.1 (1.1–1.1)
FFP (mL)	110 (14.2%)	109 (19.6%)	1.1 (1.1–1.1)	1.1 (1.1–1.1)

Massive Transfusion

	OR	95% CI	AUC	P
Univariate analysis				
Period 1 (yes)	5.39	2.83–9.92	0.886	< 0.001
Injury severity score	1.06	1.04–1.08	0.712	< 0.001
Base deficit	0.88	0.84–0.92	0.712	< 0.001
Hemoglobin	0.96	0.97–0.99	0.862	< 0.001
SBP < 90 mmHg (yes)	3.27	1.94–5.51	0.816	< 0.001
PT _{max} > 1.2 (yes)	4.17	2.16–8.07	0.841	< 0.001

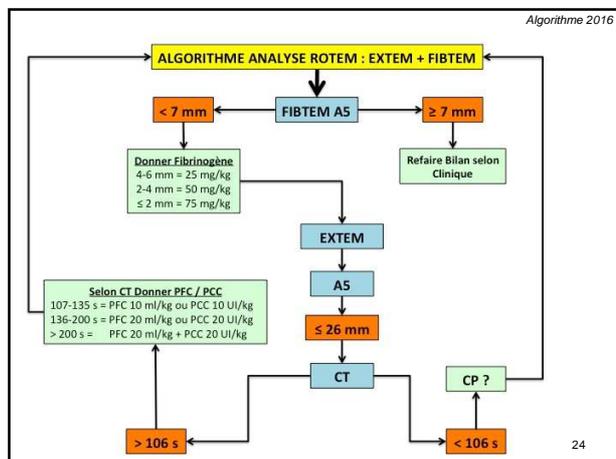
Death Day 28

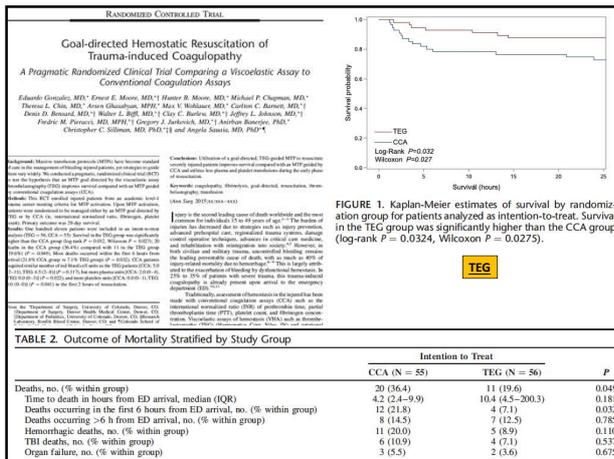
	OR	95% CI	AUC	P
Univariate analysis				
Period 1 (yes)	0.79	0.52–1.22	0.529	0.196
Age	1.02	1.00–1.05	0.874	0.004
ISS > 9	12.67	7.50–21.29	0.775	< 0.001
Injury severity score	1.10	1.07–1.12	0.806	< 0.001
Base deficit	0.85	0.82–0.89	0.741	< 0.001
SBP < 90 mmHg (yes)	2.63	1.65–4.18	0.624	< 0.001

Cost ?

3.4. Comparison of blood products and CFC Cost between groups

After matching, a significant decrease to the overall cost of blood products and CFC was observed in Period 2 (2370 ± 2126 vs. 3284 ± 3812 €, P: 0.036).





TEG / ROTEM : Littérature ?

- Rapide que Bio
- Réflecte mieux réalité Hémostase
- Réduction Utilisation des FSL
- Baisse Coûts lié à la transfusion
- Baisse LOS
- Amélioration Mortalité

Donc le ROTEM ça marche ! Mais ... ROTEM ? Concentrés de Facteurs ?

David JS et al. Crit Care 2011

Trauma Bleeding Management: The Concept of Goal-Directed Primary Care

Herbert Schöchl, MD¹* and Christoph J. Schellip, MD¹

Fixed ratio versus goal-directed therapy in trauma

Herbert Schöchl¹, Marc Magagnoli², and Wolfgang Holzlner³

Abstract

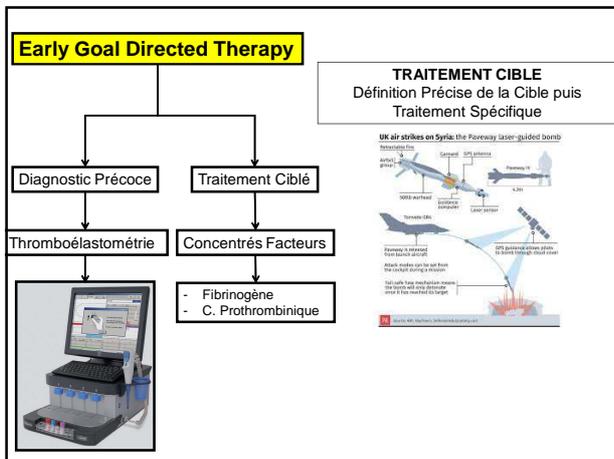
Background: The concept of damage control resuscitation (DCR) is associated with regional volume resuscitation, predominantly in the first 1-1.5 hours with blood cells, is associated with regional volume resuscitation, predominantly in the first 1-1.5 hours with blood cells, is associated with regional volume resuscitation, predominantly in the first 1-1.5 hours with blood cells...

Conclusion: The concept of damage control resuscitation (DCR) is associated with regional volume resuscitation, predominantly in the first 1-1.5 hours with blood cells, is associated with regional volume resuscitation, predominantly in the first 1-1.5 hours with blood cells...

STRATEGIE DE TRAITEMENT AU PFC

TRAITEMENT À L'AVEUGLE
« L'Abondance de la Mitraille compense l'Imprécision du Tir »
Michel Ney, Maréchal de France (1769-1815)

En Attendant la Biologie ...



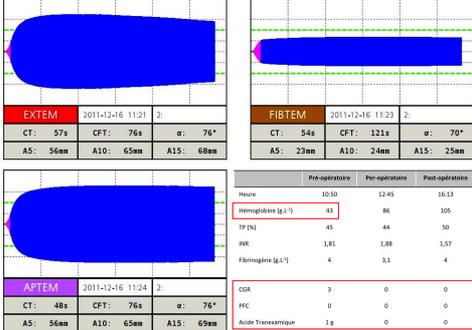
ET EN DEHORS DE LA TRAUMATO ?

NOUVEAU : LE ROBOT CHIRURGIEN

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ETAT DE CHOC POST OPERATOIRE

Bricker J12 PAS 75 mmHg, FC 110, Hgb 52 gr (HemoCue) **Que faites vous ?**



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HÉMORRAGIE DIGESTIVE

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Hémorragie Digestive Grave

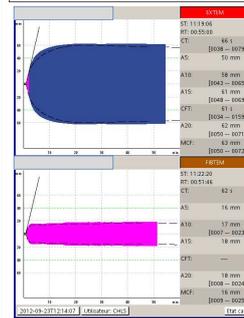
Pas de publication sur Hgie Digestive !
Transplantation hépatique : x publications ...
Roulet S et al. Liver Transplant 2015

Madame Paulette L, 57 ans, antiaïssée et accro au rhum ...
En métropole depuis 15 J ...
Adressée au déchocage pour Hémorragie Digestive grave
HemoCue à l'admission : 2,5 g/dL
INR (CoaguChek) : 3,7
Hémoglobine : 2,5 g/dL / Plaquette : 197 G/L
PAS 90 mmHg, FC 105 batt.min⁻¹

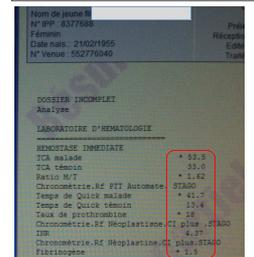
QUE FAITES VOUS ?

Hémorragie Digestive Grave

4 CGR (2 O neg et 2 iso groupes)
Exacyl 1 g
Je fait le RoTem !!



4 CGR (2 O neg et 2 iso groupes)
Exacyl 1 g
Si pas de RoTem : PFC ????



PSE Sandostatine
Erythro
Ligature VO sous AG
....

HÉMORRAGIE DU POST PARTUM

Hémorragie du Post Partum

- Un certain nombre de Publication
- Situation potentiellement à très haut risque !
- Contexte émotionnel ++
- Coagulopathie qui peut apparaître très vite (> 1500-2000 ml)
- Indispensable d'avoir un moyen de monitoring moderne
- Eviter Transfusion inutile / Consommation de Fibrinogène

BJA

BJA

OBSTETRICS

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

P. W. Collins¹*, R. Carrington-John¹, D. Bruynsewa¹, S. Mullaibai¹, J. Dick¹, C. Storey¹, A. D. Weeks¹, J. Sandford¹, S. Awan¹, J. Thompson¹, S. Hood¹, J. E. Hill¹ and R. E. Collins² on behalf of the OBS2 study team¹

BJA

Viscoelastometry guided fresh frozen plasma infusion for postpartum haemorrhage: OBS2, an observational study

P. W. Collins¹*, R. Carrington-John¹, D. Bruynsewa¹, S. Mullaibai¹, J. Dick¹, C. Storey¹, A. D. Weeks¹, J. Sandford¹, S. Awan¹, J. Thompson¹, R. Hood¹, J. Hill¹, K. Heering², R. Graumet¹ and R. Collins² on behalf of the OBS2 study team¹

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Four Stage Approach

Stage 0	Stage 1	Stage 2	Stage 3
<p>All women on Admission</p> <p>Record Most recent Hb & Plt Complete PPH Risk Assessment</p> <p>Act Plan to measure & record all blood loss and postpartum haemorrhage risk in hospital If women at increased risk Review patient early for symptoms Consider early transfer to specialist delivery</p> <p>Treat Once bleeding stopped ensure PPH post-assess checklist complete</p>	<p>+500ml blood loss</p> <p>Mobilise Help Notify obstetric on-call</p> <p>Act Measure & record blood loss, ensure blood loss measured in ml Ensure patient on 40ml/hr, ensure volume of any given Consider giving oxytocin</p> <p>Treat Once and record obstetrician Consider: - Empty bladder - Uterine massage - Placental check retained - Placental check complete - Manual compression</p> <p>Think of other possible cause Tonic, Thromb, Thrombol</p> <p>Once bleeding stopped ensure PPH post-assess checklist complete</p>	<p>1000ml blood loss OR clinical concern</p> <p>Mobilise Help Alerting on the bed-side: Lead 2 Midwife Obstetrician Anaesthetist</p> <p>Act Measure & record blood loss Monitor patient on 40ml/hr Consider 2nd IV access & fluid bolus</p> <p>Take bloods: Send for FIBTEM, ROTEM, coagulation screen Send point of care blood results Repeat point of care blood results Monitor patient on 40ml/hr & 40ml/hr</p> <p>Treat Once and record further obstetrician Obstetrician Anaesthetist Emergency bloodless team Monitor and ensure genital tract Check volume of vaginal interventions Ensure adequate blood and coagulation Give Transfuse, 200ml if the 1st</p> <p>If bleeding on-going transfer about to operating theatre</p> <p>Once bleeding stopped ensure PPH post-assess checklist complete</p>	<p>> 1500ml blood loss OR on-going clinical concern</p> <p>Mobilise Help Transfused blood present Obstetric in Charge, Obstetrician, Theatre Nurse, Anaesthetist Transfer to theatre Activate MDR protocol Inform Obstetric consultant Inform Anaesthetic consultant</p> <p>Act Measure measured blood loss Continue to report measured blood loss Monitor patient - continue receiving Continue to give fluids Follow MDR and ROTEM protocols Review blood counts Consider discussion with haematologist</p> <p>Treat Haemostatic Review obstetrician Give Transfuse, 400ml if not done so Consider additional surgical techniques Consider use of uterine Transfer to HDU/ICU care once bleeding stopped</p> <p>Once bleeding stopped ensure PPH post-assess checklist complete Management plan written in notes</p>

https://www.youtube.com/watch?v=m1_Ze_16yz0

Hémorragie du Post Partum

16 Octobre – Maternité Lyon Sud
Obèse – Toxémie gravidique
Césarienne – X parités utérus cicatriciel
Saignement +++ 30-60 min après en SSP1
Hémoglobine : 7,5 g/dL – Nalador / Exacyl → ROTEM !

	13h30	14:32
Hgb	74	67
Plaq	93	94
TP	36	75
TQr	1,82	1,16
Fibrinogène	1,5	3,2

+ Ballon de Bakri → Stop Saignement
Annulation Embolisation

Hémorragie du Post Partum

ROTEM Protocol

(For use in postpartum haemorrhage)

NB ROTEM does not reliably detect effects of warfarin, heparin, or oral direct thrombin inhibitors. Consider to use point of care laboratory if you're transfused blood.

Collins PW et al. Int J Obst Anesthesia 2019

CONCLUSION

- Très difficile de diagnostiquer coagulopathie / Clinique
- Biologie déportée
- Taux de facteur (Bio Standard) pas suffisant
- Techniques visco-élastique
- Economie PSL / Baisse des couts / Baisse TM
- Amélioration pronostic
- Avec les Biologistes +++

IL EST TEMPS D'EVOLUER !