

Le défi du temps en Trauma



Tobias Gauss

SAR Beaujon, HUPNVS, AP-HP

Clichy



Conflits intérêts

Laboratoire du Biomédicament, LFB

Online Training Module pour financer programme de simulation in situ

AVANTAGE
CENTRE HOSPITALIER
DE NÎMES



 traumabase.eu



TRAUMA ?



***ADAMS R
COWLEY***

***SHOCK
TRAUMA
BALTIMORE***

GOLDEN HOUR

IMPACT OF ON-SITE CARE, PREHOSPITAL TIME, AND LEVEL OF IN-HOSPITAL CARE ON SURVIVAL IN SEVERELY INJURED PATIENTS

John S. Sampalis, PhD,^{a,b} Andre Lavoie, PhD,^d J. I. Williams, PhD,^c David S. Mulder, MD,^a and Mathias Kalina, MD^d

N=360

T>60'

OR death = 3

Trauma Care Regionalization: A Process-Outcome Evaluation

Sampalis, John S. PhD; Denis, Ronald MD; Lavoie, Andre PhD; Frechette, Pierre MD; Boukas, Stella BA; Nikolis, Andreas MD; Benoit, Daniel MSc; Fleischer, David MD; Brown, Rea MD; Churchill-Smith, Micheal MD; Mulder, David MD



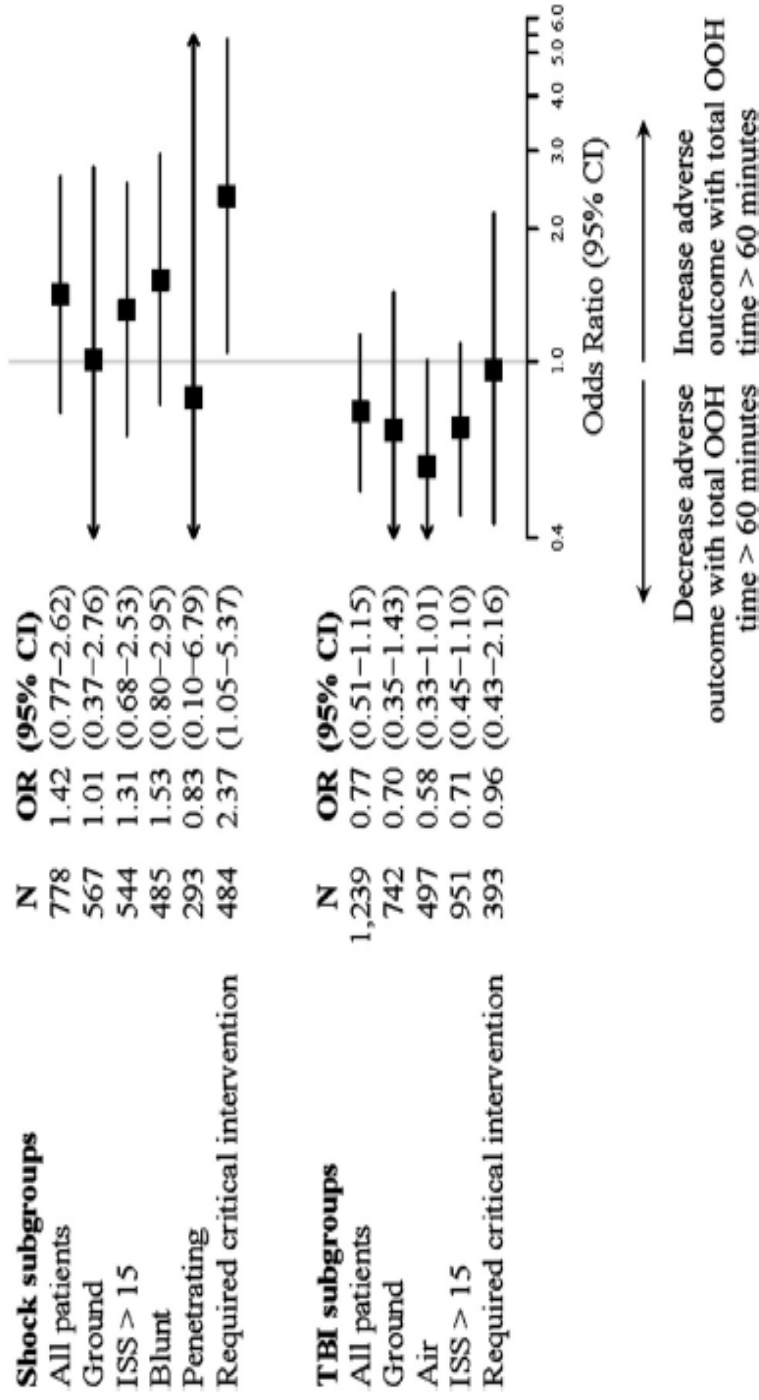
MERT

***Medical
Emergency
Response
Team***

Revisiting the “Golden Hour”: An Evaluation of Out-of-Hospital Time in Shock and Traumatic Brain Injury

Craig D. Newgard, MD, MPH*; Eric N. Meier, MS; Eileen M. Bulger, MD; Jason Buick, MSc, PCPf; Kellie Sheehan, BSN; Steve Lin, MD, MSc; Joseph P. Minei, MD; Roxy A. Barnes-Mackey, RN; Karen Brasel, MD, MPH; and the ROC Investigators

*Corresponding Author. E-mail: newgardc@ohsu.edu.



Not all prehospital time is equal: Influence of scene time on mortality

Joshua B. Brown, MD, MSc, Matthew R. Rosengart, MD, MPH, Raquel M. Forsythe, MD,
Benjamin R. Reynolds, MPAS, PA-C, Mark L. Gestring, MD, William M. Hallinan, RN, MS, EMTP,
Andrew B. Pelzman, MD, Timothy R. Billiar, MD, and Jason L. Sperry, MD, MPH, Pittsburgh, Pennsylvania

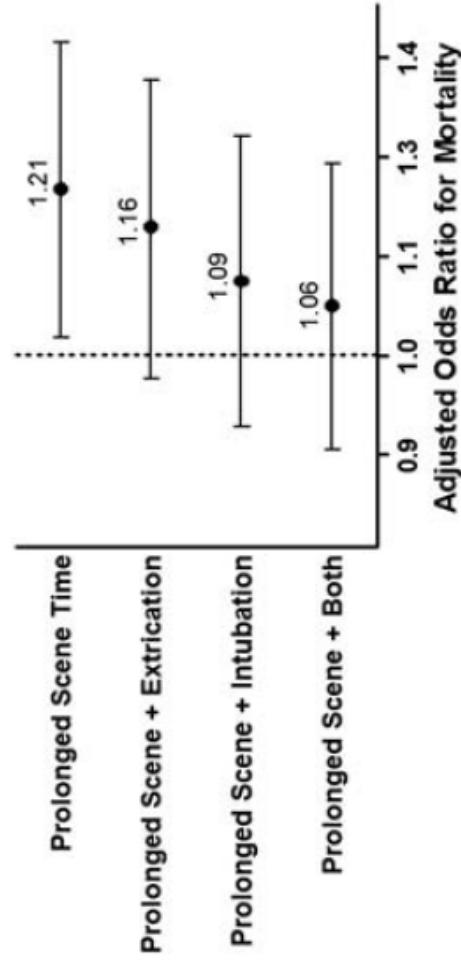


TABLE 2. Regression Results for Association Between Prolonged Scene Time and Mortality in PH Criteria Subgroups With a Significant Association

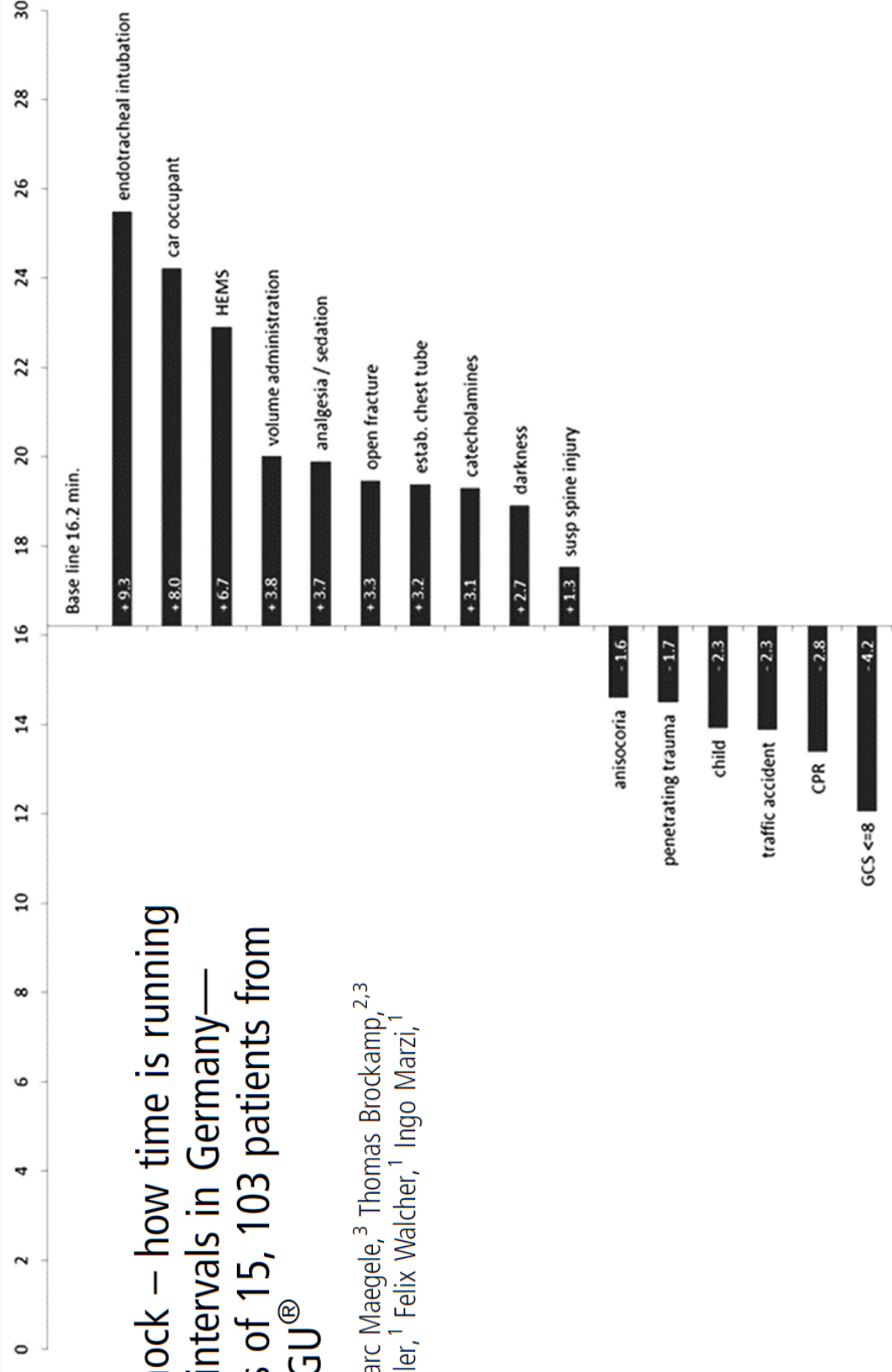
Criterion	AOR*	95% CI*	q value**
Risk adjustment model without extrication or PH intubation			
Hypotension (SBP < 90 mm Hg)	1.40	1.17–1.67	<0.01
PH GCS score ≤ 13	1.14	1.02–1.29	0.04
Penetrating injury	1.59	1.29–1.97	<0.01
Flail chest	1.34	1.15–1.56	<0.01
Pelvic fracture	1.23	1.03–1.54	0.04
Risk adjustment model adjusting for extrication and PH intubation			
Hypotension (SBP < 90 mm Hg)	1.25	1.04–1.50	0.04
Penetrating injury	1.38	1.13–1.69	0.01
Flail chest	1.21	1.04–1.40	0.03

*AOR and 95% CI, for association of mortality with prolonged scene time.

**False discovery rate-adjusted *p* values; can be interpreted similarly to standard *p* values with significance defined as $q \leq 0.05$.

The golden hour of shock – how time is running out: prehospital time intervals in Germany—a multivariate analysis of 15, 103 patients from the TraumaRegister DGU®

Hendrik Wyen,^{1,2} Rolf Lefering,² Marc Maegele,³ Thomas Brockamp,^{2,3} Arasch Wafaisade,³ Sebastian Wutzler,¹ Felix Walcher,¹ Ingo Marzi,¹ the TraumaRegister DGU



Scoop/Run

Stay/Play

Play/Run

.....



AVANTAGE
CLINIQUE



 traumabase.eu

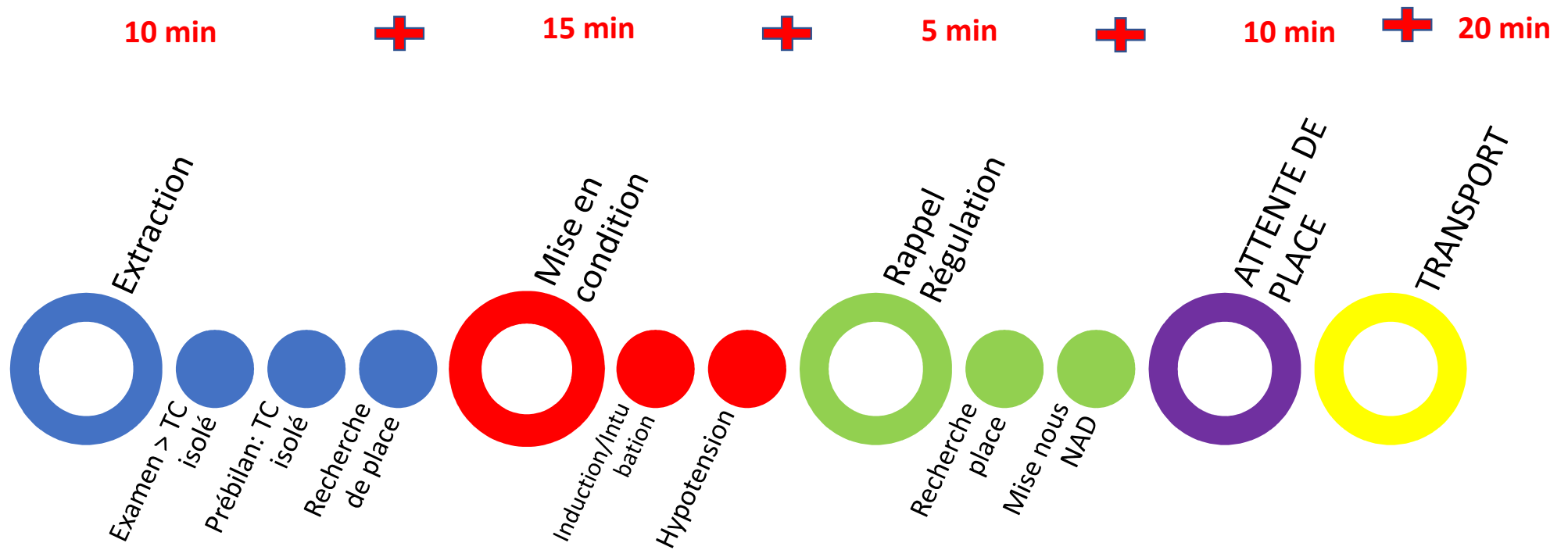
TRENAU Trauma system
Trauma registry

Österreich Nord-Alpen des Engadins
Southern French Alps Emergency Network



Le temps résulte de l'interaction
d'évènements.

Carlo Rovelli



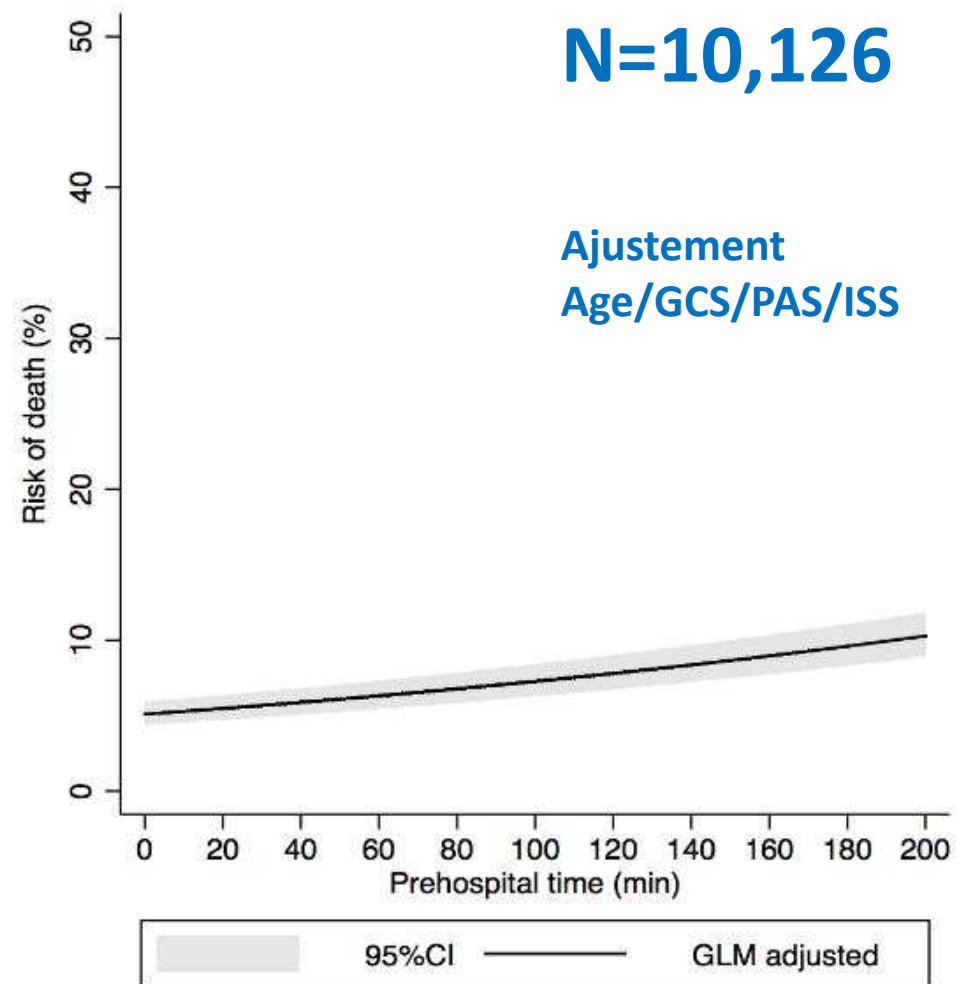
TEMPS PREHOSPITALIER TOTAL

INTERACTIONS COMPLEXES >>>>> TEMPS ↑↑↑



**Temps
Préhospitalier
Total = 63-73 minutes**

***Mortalité toute cause
confondue***



	GLMM	P Value
	OR (95% CI) ^a	
Univariate analysis		
Overall death	1.09 (1.07-1.11)	<0.001
Death due to head injury	1.09 (1.06-1.11)	<0.001
Death due to bleeding	1.04 (1.00-1.09)	0.043
Multivariable analysis		
Overall death	1.04 (1.01-1.07)	0.007
Death due to head injury	1.03 (1.00-1.07)	0.153
Death due to bleeding	1.00 (0.99-1.02)	0.239

	Total	Oro-tracheal intubation N (%)	Resuscitation fluid >1000 ml N (%)	Vasopressor use N (%)	Osmotherapy N (%)
0-29 min	514	49 (10)	71 (14)	24 (5)	11 (2)
30-59 min	3,535	488 (14)	578 (16)	203 (6)	131 (4)
60-89 min	3,459	794 (23)	806 (23)	328 (10)	210 (6)
90-119 min	1,624	555 (34)	550 (34)	242 (15)	123 (8)
120-179min	870	391 (45)	365 (42)	153 (18)	76 (9)
180 + min	124	67 (54)	68 (54)	32 (26)	18 (14)
Total	10,126	2,321 (23)	2,438 (24)	982 (10)	569 (6)
		<0.001	<0.001	<0.001	<0.001

A
C
T
I
O
N
S

T
E
M
P
S

Ratio: Intervention-Temps

Prioriser les interventions essentielles

dans un temps dédié et limité

Bénéfice-risque entre le temps investi

et le bénéfice attendu de l'intervention



A
Cibler besoins immédiats

Actions « simples/rapides »

***Airway
Décompression
TXA***

....

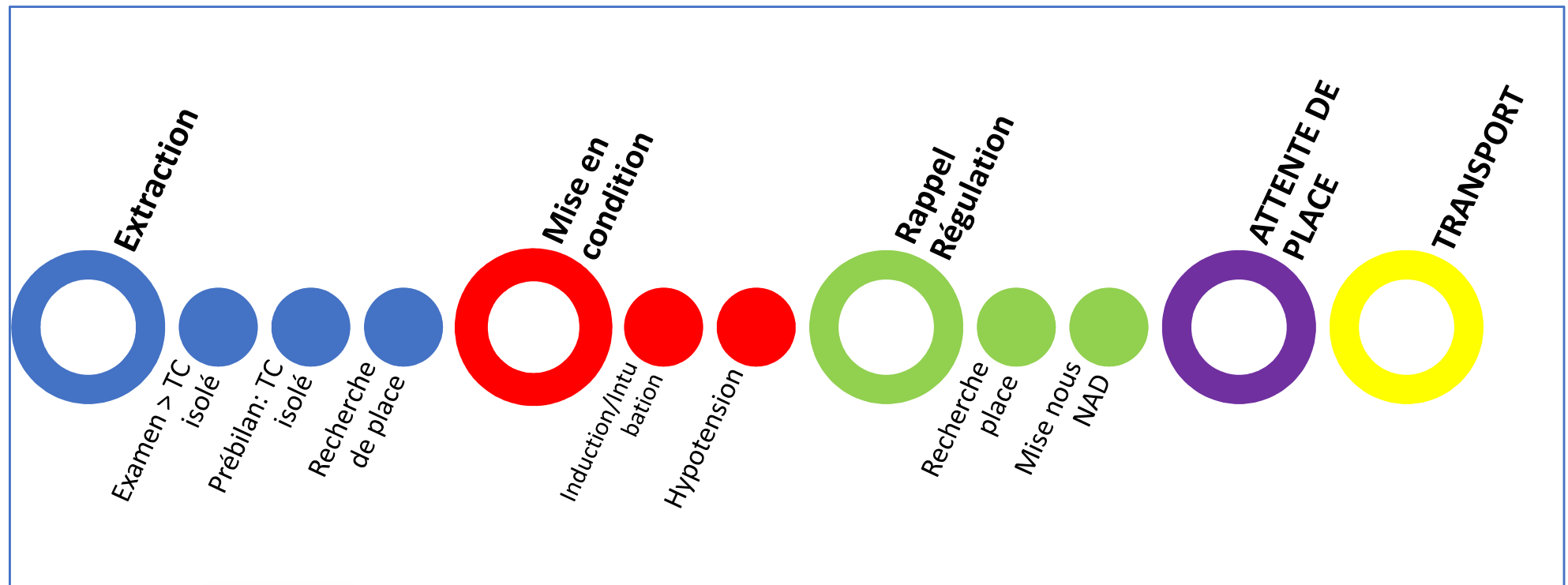
B
Identifier besoins complexes

Actions complexes

Peser bénéfice/risque



= objectif thérapeutique
individualisé



Time to Death by Cause of Death

	<1 hr	2 hr	3 hr	4 hr	4–8 hr	8–12 hr
Head Injury, n (%)	119/265 (45)	20/62 (32)	20/38 (53)	13/26 (50)	38/58 (66)	30/37 (81)
Hemorrhage, n (%)	131/265 (50)	38/62 (61)	19/38 (50)	14/26 (54)	24/58 (41)	7/37 (19)
DF + sepsis, n (%)	0/265 (0)	0/62 (0)	0/38 (0)	0/26 (0)	0/58 (0)	0/37 (0)
Resp Fail, n (%)	4/265 (2)	0/62 (0)	0/38 (0)	0/26 (0)	1/58 (2)	0/37 (0)
Shock, n (%)	7/265 (3)	2/62 (3)	4/38 (11)	0/26 (0)	4/58 (7)	0/37 (0)
Comorbid, n (%)	0/265 (0)	2/62 (3)	0/38 (0)	0/26 (0)	0/58 (0)	1/37 (3)
Other, n (%)	2/265 (1)	0/62 (0)	1/38 (3)	1/26 (4)	0/58 (0)	0/37 (0)
Unknown, n (%)	36/265 (14)	4/62 (6)	0/38 (0)	0/26 (0)	0/58 (0)	0/37 (0)
PE, n (%)	0/265 (0)	0/62 (0)	0/38 (0)	0/26 (0)	0/58 (0)	0/37 (0)

Cumulative percentage is greater than 100% due to patients with multiple causes of death.

<1 hr

Head Injury, n (%) 119/265 (45)

Hemorrhage, n (%) 131/265 (50)

Published online first as:

J Trauma. 2016; 80(1): 5–12. doi:10.1016/j.injury.2016.10.037.

Trends in 1029 Trauma Deaths at a Level 1 Trauma Center

Blessing T. Oyeniyi, BS¹, Erin E. Fox, PhD¹, Michelle Scerbo, M.D.¹, Jeffrey S. Tomasek, M.D.¹, Charles E. Wade, PhD¹, and John B. Holcomb, M.D.¹



INTERACTIONS COMPLEXES >>>>> TEMPS ↑↑↑??



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

JULY 26, 2018

VOL. 378 NO. 4

Prehospital Plasma during Air Medical Transport in Trauma Patients at Risk for Hemorrhagic Shock

Plasma-first resuscitation to treat haemorrhagic shock during emergency ground transportation in an urban area: a randomised trial



Hunter B Moore, Ernest E Moore, Michael P Chapman, Kevin McVane, Gary Bryskiewicz, Robert Blechar, Theresa Chin, Clay Cothren Burlew, Fredric Pieracci, F Bernadette West, Courtney D Fleming, Arsen Ghasabyan, James Chandler, Christopher C Silliman, Anirban Banerjee, Angela Savaia

Summary

Background Plasma is integral to haemostatic resuscitation after injury, but the timing of administration remains controversial. Anticipating approval of lyophilised plasma by the US Food and Drug Administration, the US Department of Defense funded trials of prehospital plasma resuscitation. We investigated use of prehospital plasma during rapid ground rescue of patients with haemorrhagic shock before arrival at an urban level 1 trauma centre.

Lancet 2018; 392: 283-91

Published Online

July 19, 2018

[http://dx.doi.org/10.1016/S0140-6736\(18\)31553-8](http://dx.doi.org/10.1016/S0140-6736(18)31553-8)

See Comment page 255

INTERACTIONS COMPLEXES >>>>> TEMPS ↑↑↑??

CONCLUSION

Le temps objectif thérapeutique individualisé



Quelles sont les actions à prioriser?
deux niveaux A et B

Comment répondre au défi mortalité grave < 1h?

Réduire la complexité?
alors qu'actions de plus en plus complexe (sang, REBOA)

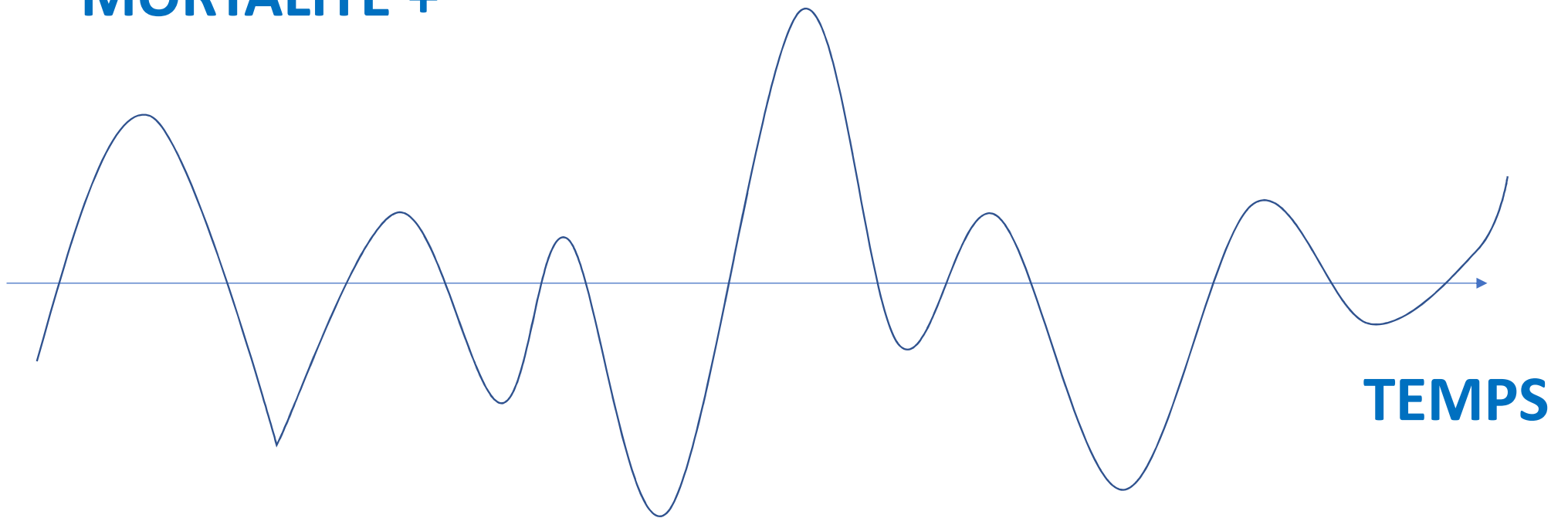
Simplifier le « process » (régulation/casser silos)

Merci pour votre Attention

tgauss@protonmail.com



MORTALITE +



TEMPS

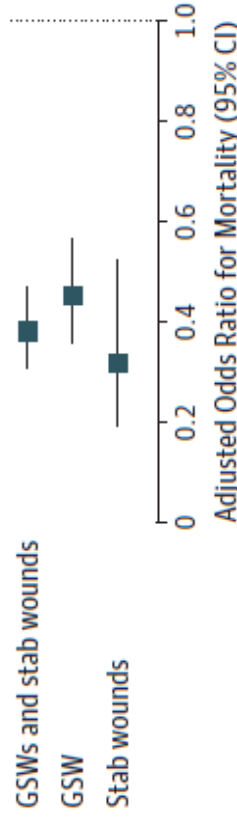
MORTALITE -

Association of Prehospital Mode of Transport With Mortality in Penetrating Trauma

A Trauma System–Level Assessment of Private Vehicle Transportation vs Ground Emergency Medical Services

Michael W. Wandling, MD, MS; Avery B. Nathens, MD, PhD; Michael B. Shapiro, MD; Elliott R. Haut, MD, PhD

Figure 2. Risk-Adjusted Odds Ratios For Mortality For Private Vehicle Transport When Compared With Ground Emergency Medical Services Transport



GSW indicates gunshot wound.