

Segítség.... vérzik a betegem....

Traumás koagulopátia



Dr. Tánczos Krisztián

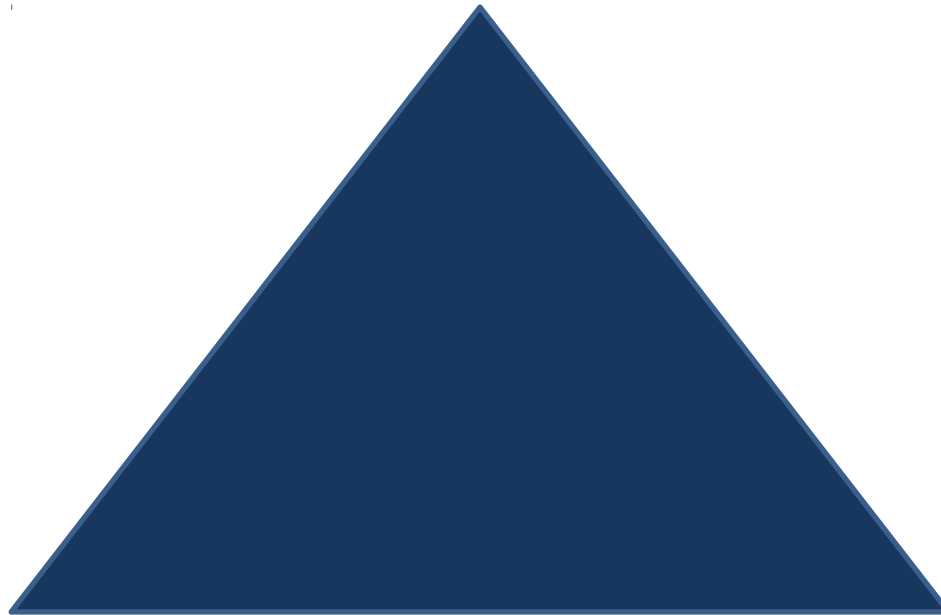
SZTE Aneszteziológiai és Intenzív Terápiás Intézet

Szeged, 2013. szeptember 20-21.

„Damage Control Resuscitation”

Holcomb JB et al J Trauma. 2007; 62(2):307-10

„Damage Control Surgery”

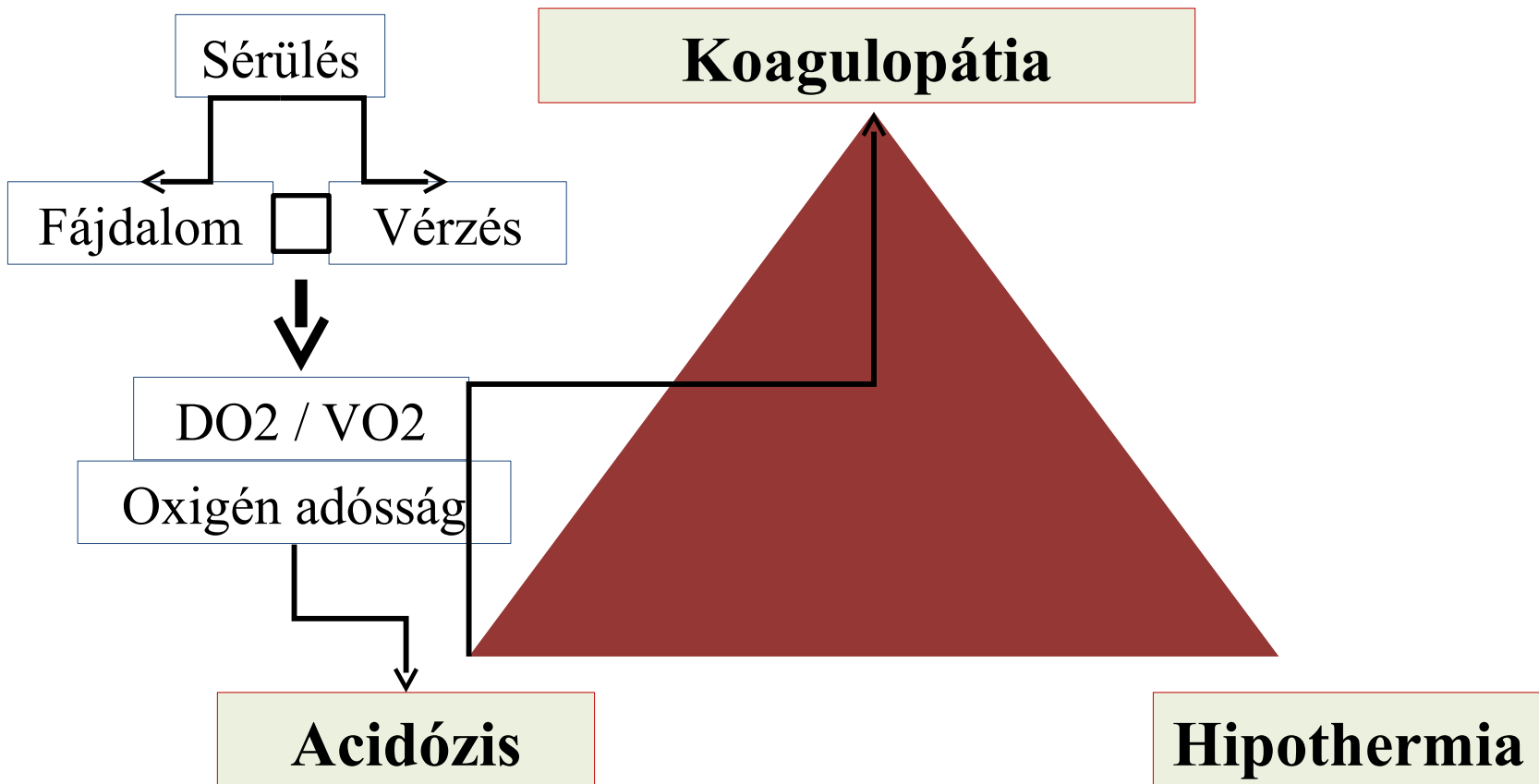


Koagulopátia
rendezése

Oxigén adósság
rendezése

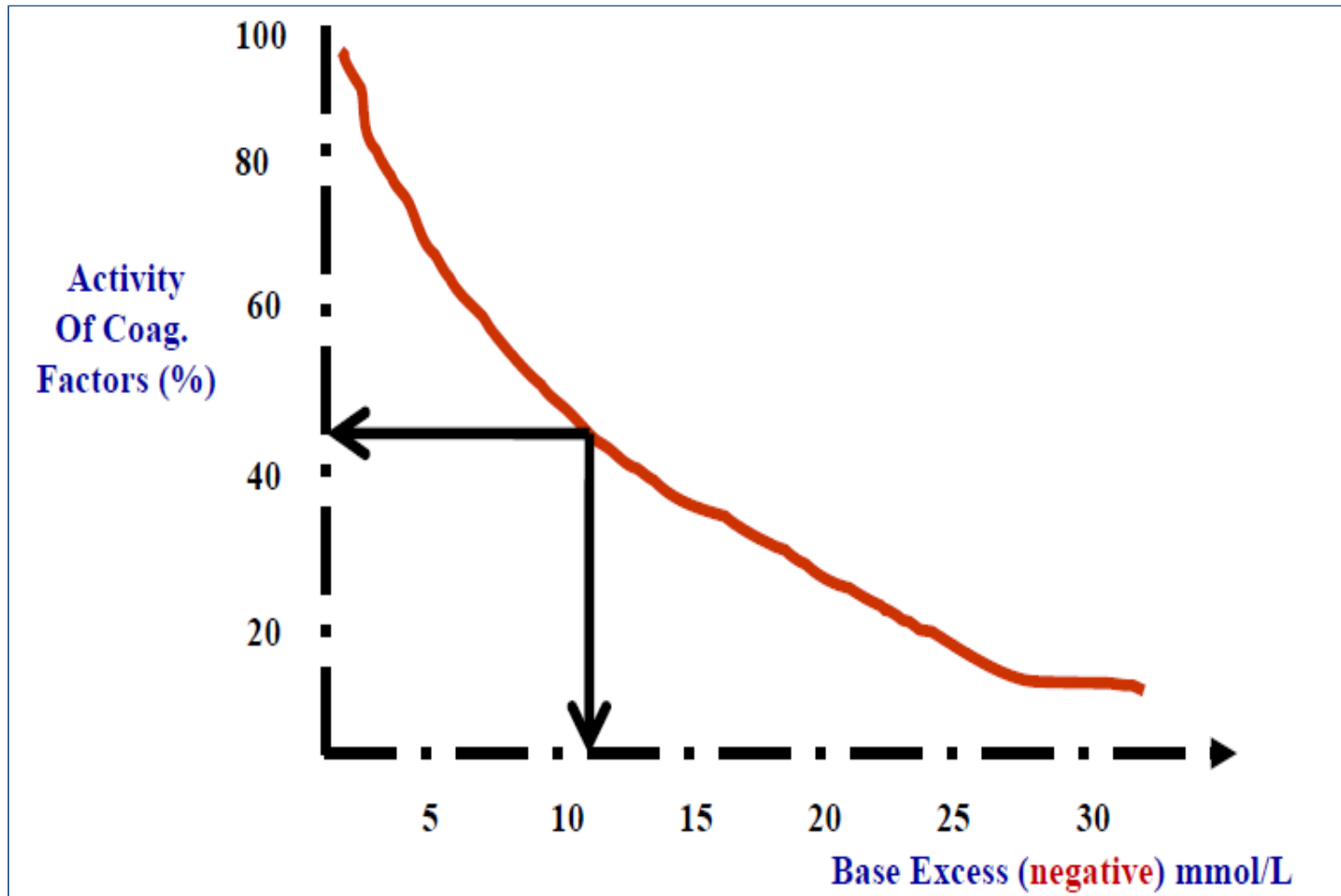
„Bloody lethal trias”

Shapiro MB et al J Trauma. 2000; 49(5):969-78



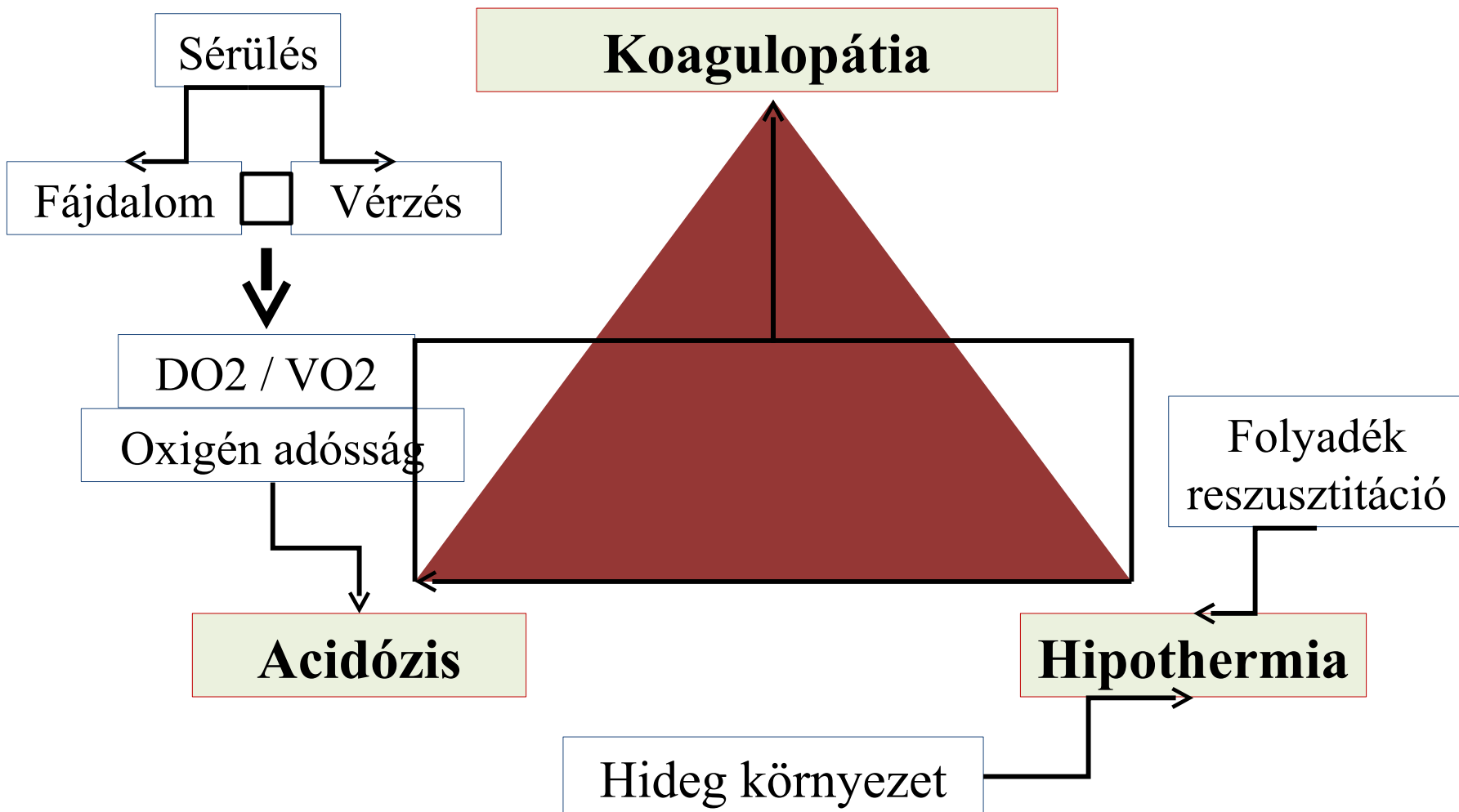
Acidózis

Meng ZH et al. J Trauma 2003; 55: 886



„Bloody lethal trias”

Shapiro MB et al J Trauma. 2000; 49(5):969-78



Hypothermia

Hypothermia & Coagulation

- Between 37 – 33 °C, haemostasis defects result from a **defect in platelets** adhesion and aggregation.

* Lier H et al. J Trauma 2008 ; 65: 951

- Each $\downarrow 1^{\circ}\text{C} \Rightarrow \downarrow 15\%$ in **Thromboxane** production.

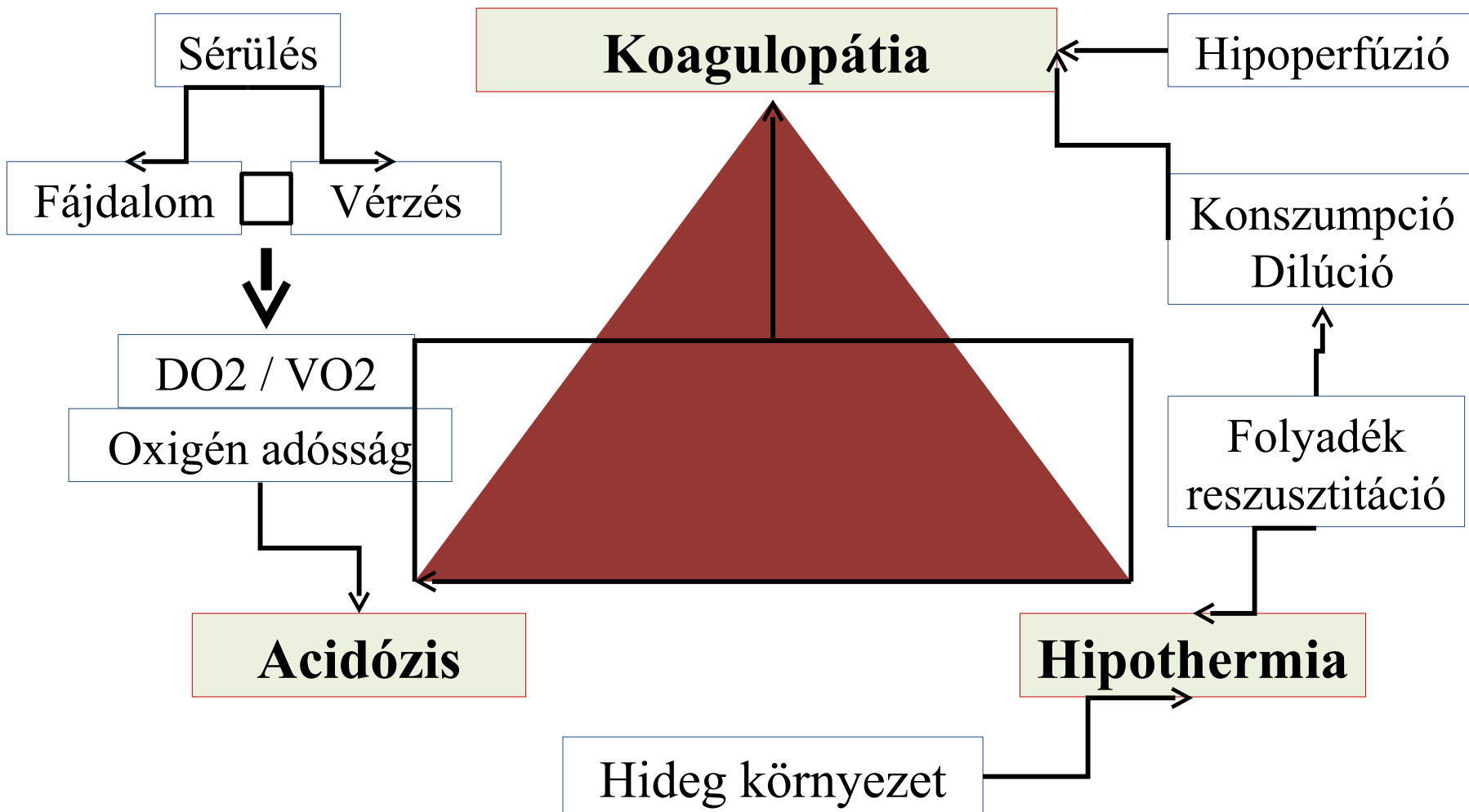
* Valeri CR et al. Crit Care Med 1995; 23: 698

- Below 33 °C, altered **enzymatic** activity is an additional factor.

* Wolberg AS et al. J Trauma. 2004; 56: 1221

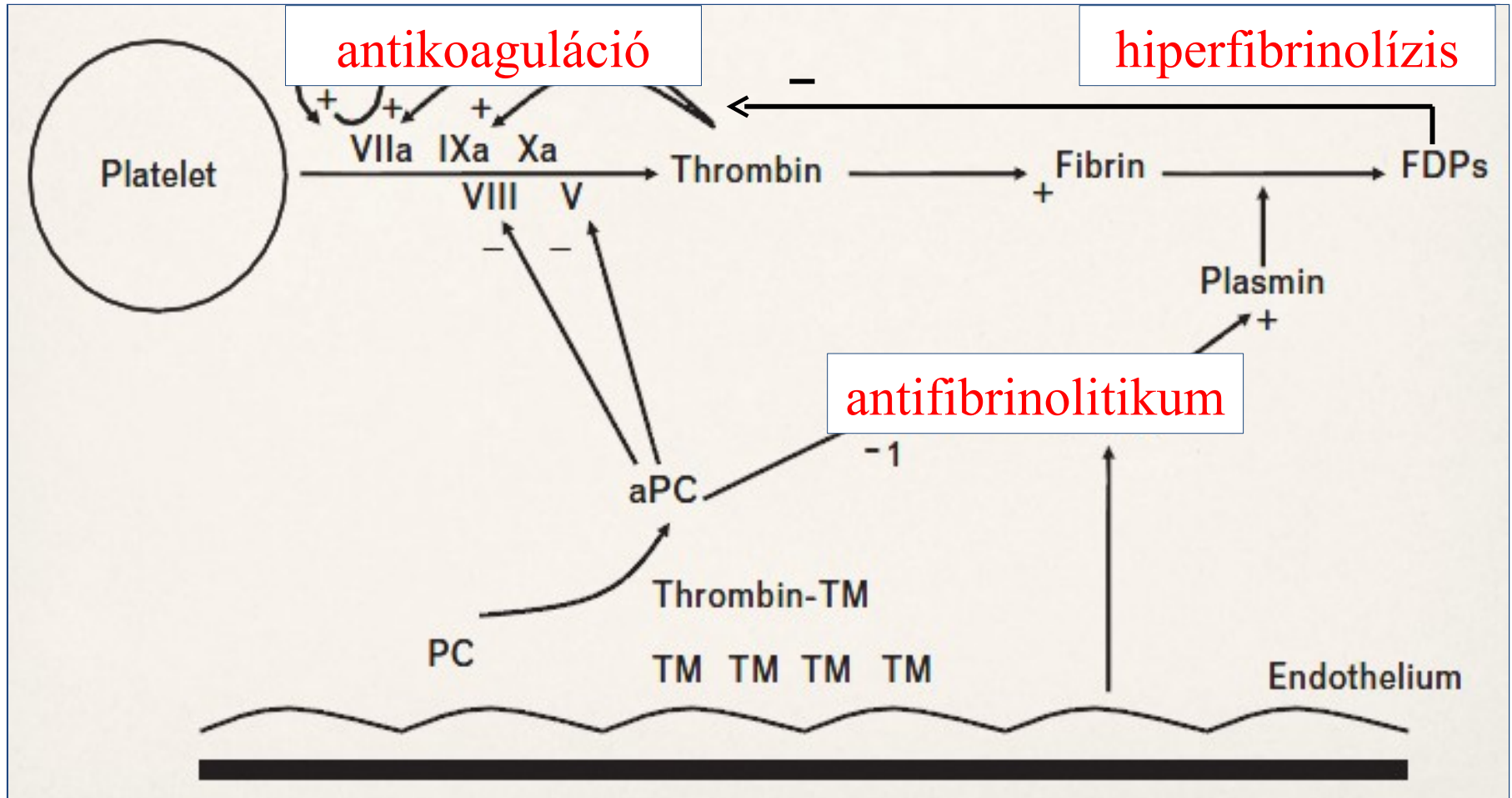
„Bloody lethal trias”

Shapiro MB et al J Trauma. 2000; 49(5):969-78



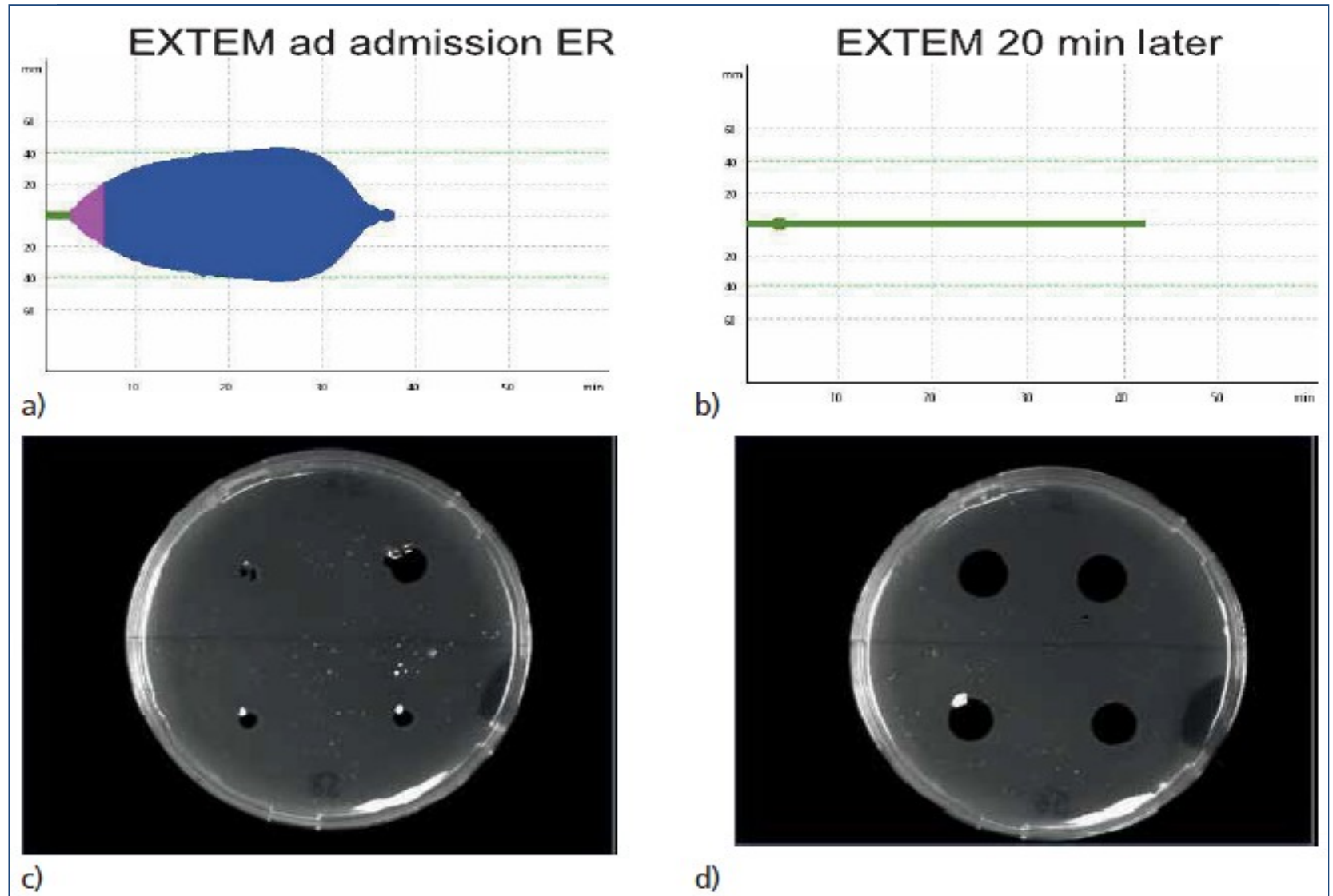
Hipoperfúzió

Schöchl H et al Hämostaseologie 2012; 32: 22–27 doi:10.5482/ha-1178



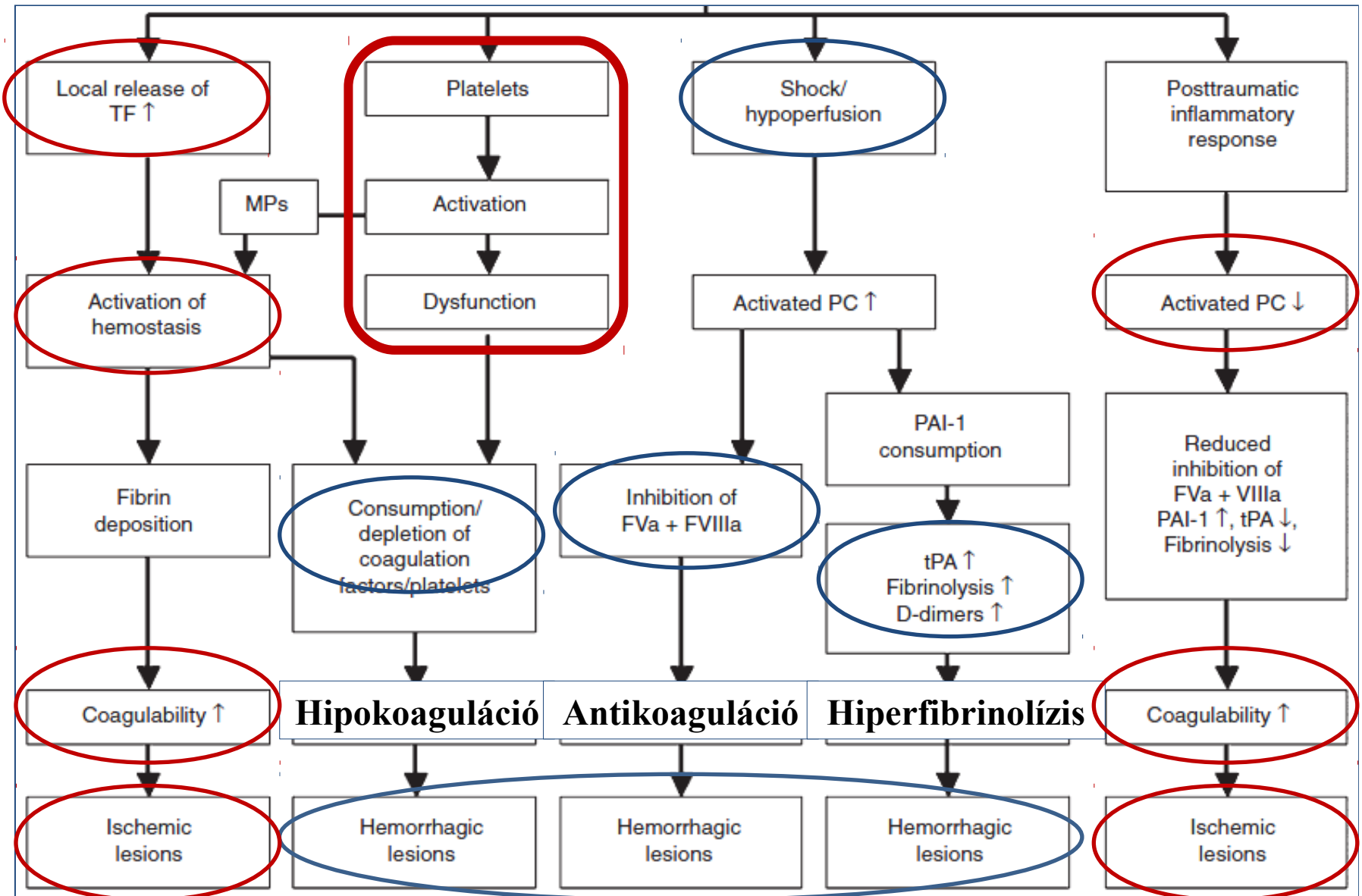
The CRASH-2 collaborators Lancet 2011; 9771:1096 - 1101

Hiperfibrinolízis



Traumatic Brain Injury

Maegele M Transfusion 2013;53:28S-37S.



A

Laboratory
parameters

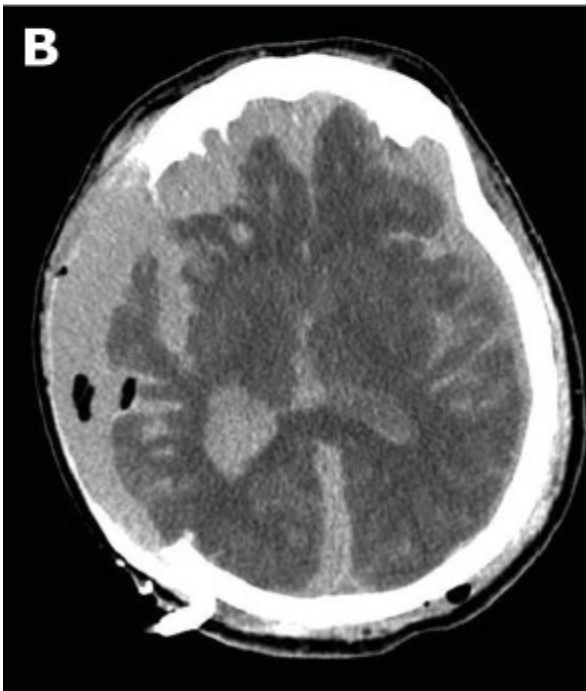
INR 1.4
PTT 38
Platelets 241

GCS : 4

TEG



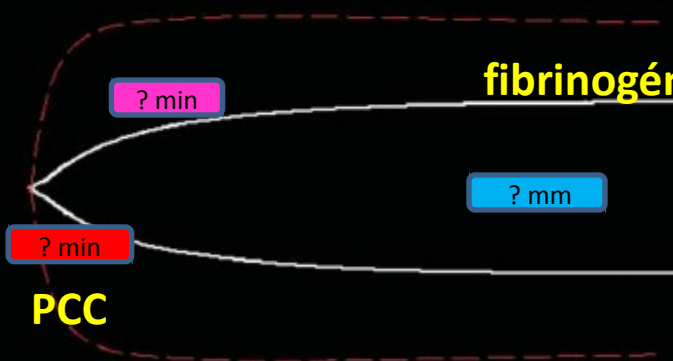
Trauma

B

Laboratory
parameters

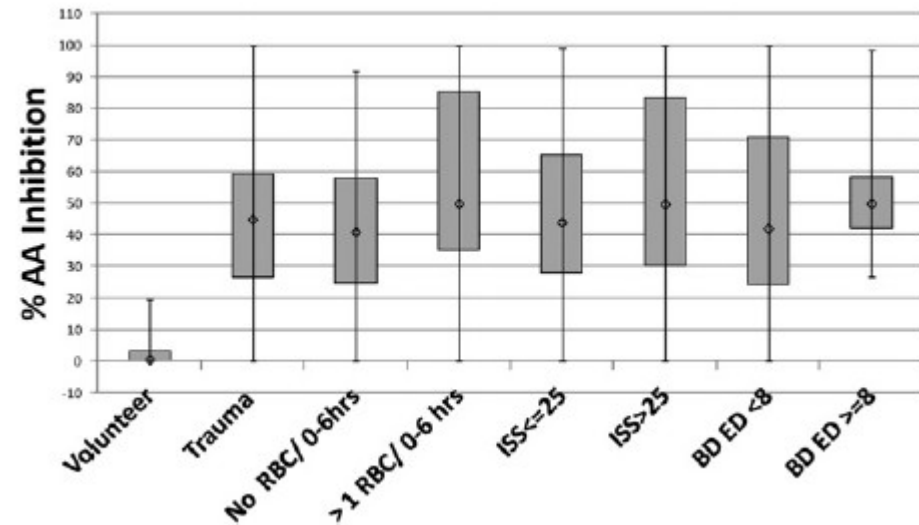
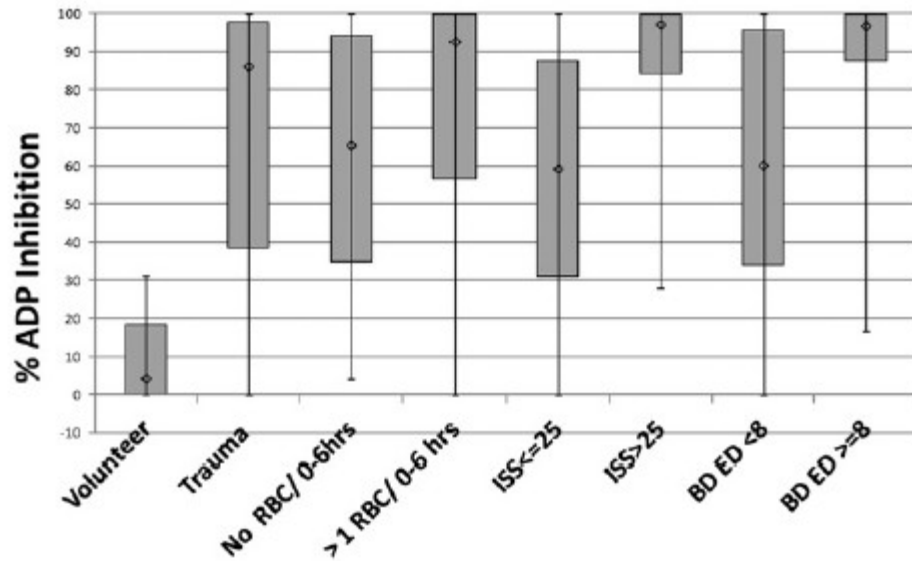
INR 1.8
PTT 46
Platelets 186

TEG



Lefogyott-Elfogyott:
szubsztrátumok ?

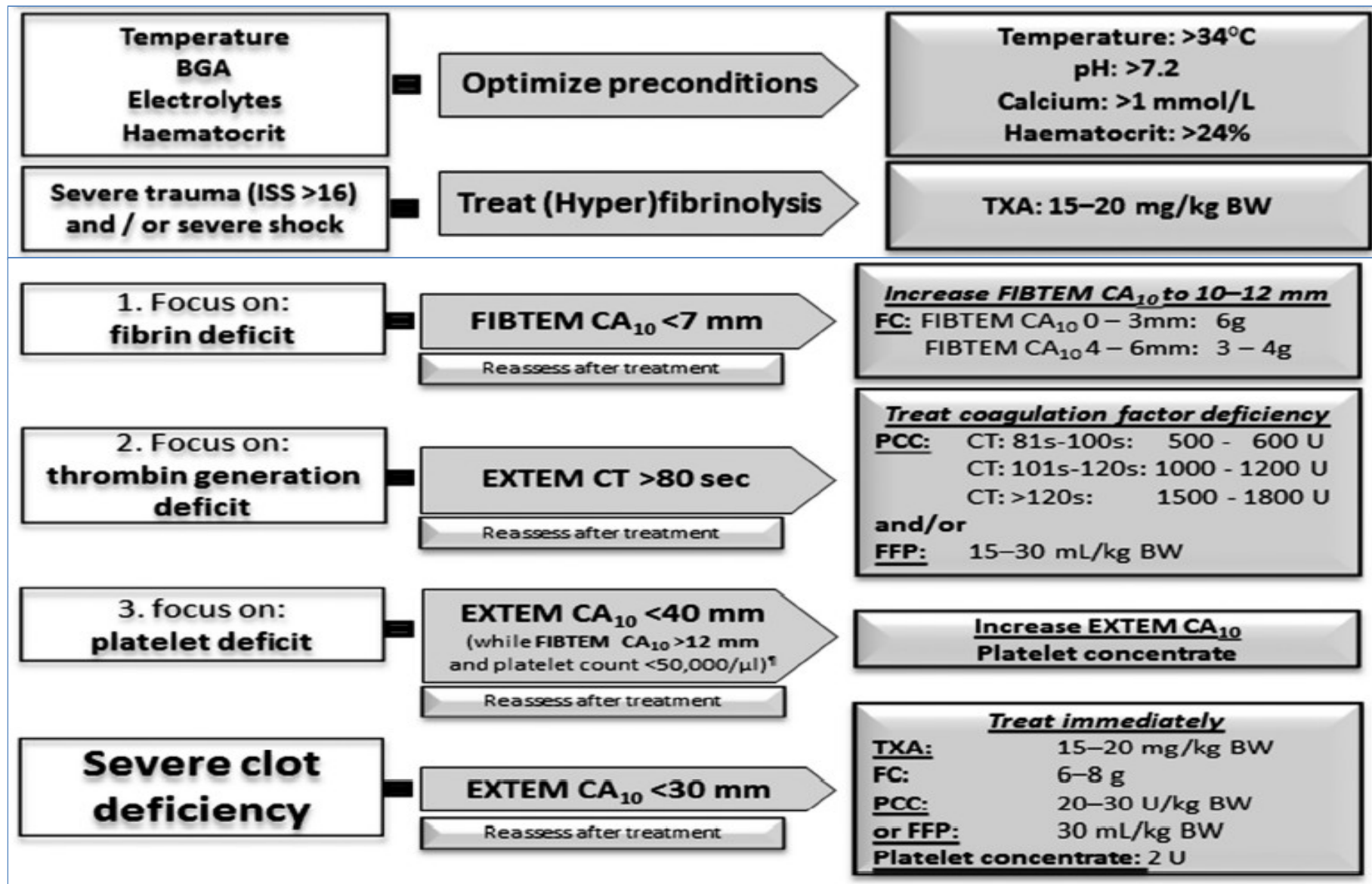
Early Platelet Dysfunction: An Unrecognized Role in the Acute Coagulopathy of Trauma



ADP gátlás 86.1% versus egészséges 4.2%
AA gátlás 45 % versus egészséges 0.5%

Algorithm for treating bleeding in patients with TIC

Schöchl H et al J Trauma Acute Care Surg. 2013; 74 (6):1587-1598



Segítség.... vérzik a betegem....

Posztpartum vérzés



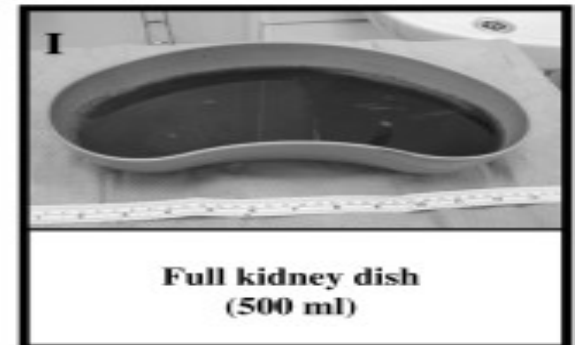
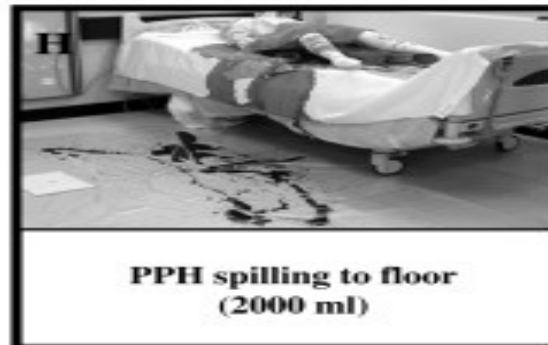
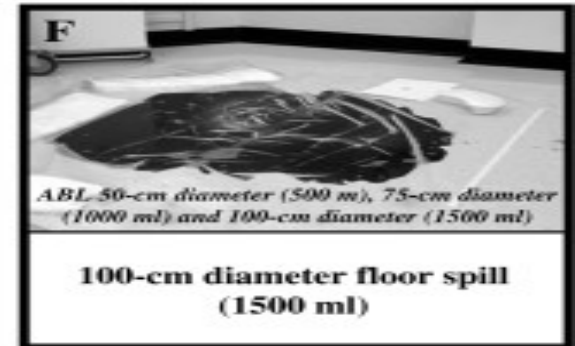
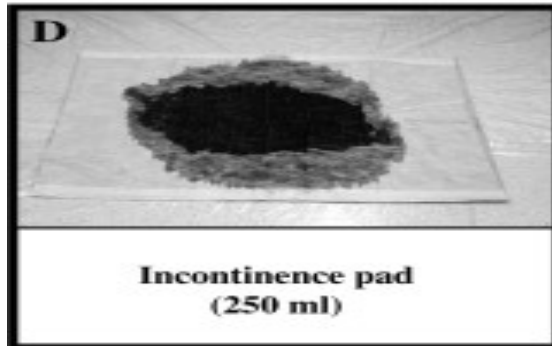
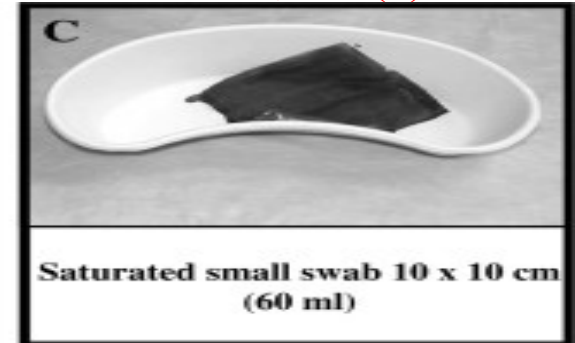
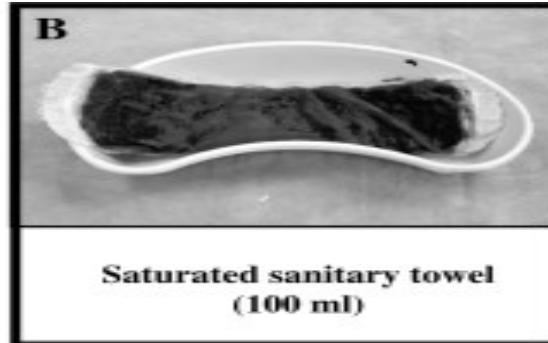
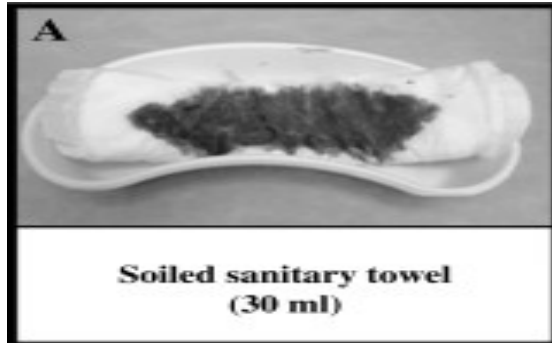
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Szeged, 2013. szeptember 20-21.

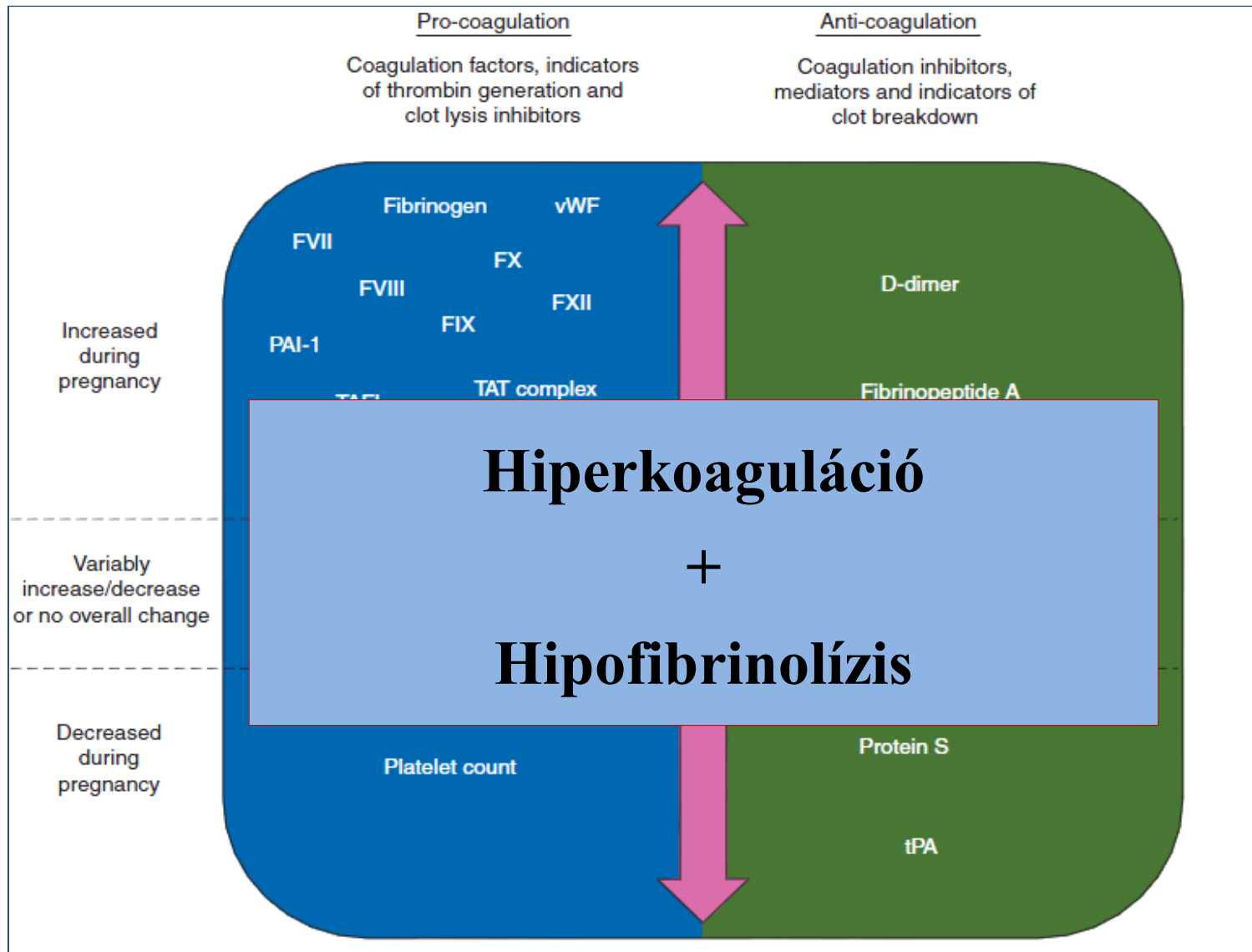
Posztpartum vérzés

Bose P et al BJOG 2006; 113(8): 919-924



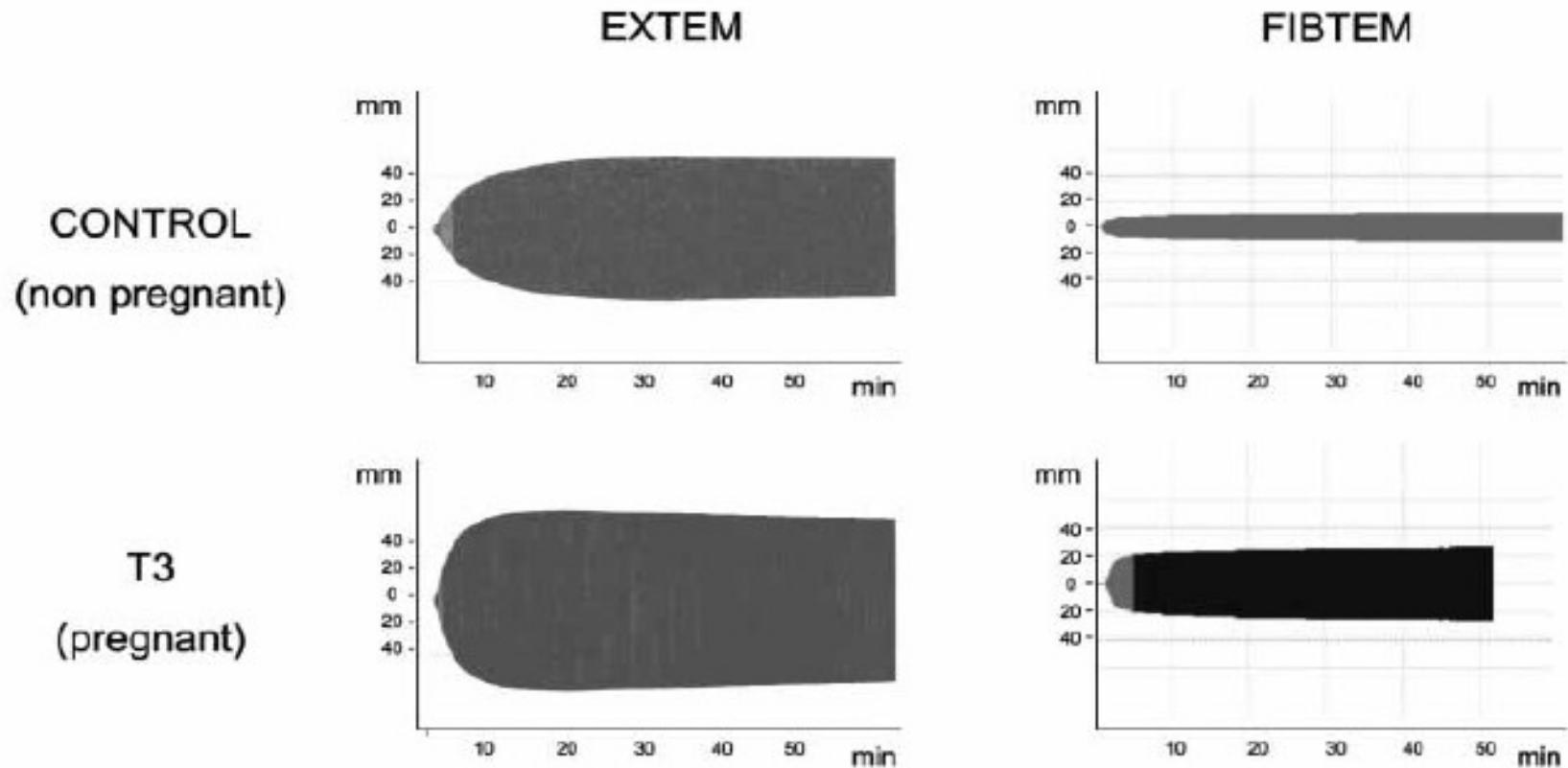
Fiziológiás változások!

Solomon C et al BJA 2012; 109 (6): 851–63



Viszkoelasztikus tesztek (TEG, ROTEM)

Huissoud C et al Thromb Haemost 2009; 101:755-761 851–63



Posztpartum vérzés okai

Solomon C et al BJA 2012; 109 (6): 851–63

TONE

Abnormal uterine contractility

Uterine atony, overdistension and muscle fatigue

risk factors include prolonged labour, multiple gestation, oxytocin augmentation, polyhydramnios

Inflammation due to infection

e.g. chorioamnionitis

TISSUE

Placental complications

Placenta accreta, increta, percreta

retained placental products, risk factors include multiple gestation

Placenta praevia

placental blockage of cervix

Placental abruption

Posztpartum vérzés okai

Solomon C et al BJA 2012; 109 (6): 851–63

TRAUMA

Physical injury

Laceration of cervix, vagina or perineum

causes include malpresentation and instrumental delivery

Injury during Caesarean section

Uterine rupture

Previous trauma

Grand multiparity

Previous vertical uterine incision

THROMBIN

Congenital coagulation disorders

e.g. haemophilia, vWD

Acquired coagulopathy

e.g. DIC, hyperfibrinolysis, pharmacologic anticoagulation

The major coagulopathy independently associated with PPH is low FIBRINOGEN levels

Terhességi koagulopátia

Huissoud C et al BJOG 2009; 116:1097-1102

Table 1. Results of standard laboratory tests and FIBTEM results

	Controls (n = 54)	Haemorrhages (n = 51)	P value*
Hb (g/l)	120 (112–127) [89–139]	91 (82–102) [38–119]	<0.0001
Platelets (G/l)	193 (164–236) [85–322]	145 (117–188) [42–231]	<0.0001
Fibrinogen (g/l)	5.1 (4.4–6) [2.6–8.9]	3.4 (2.5–3.9) [0.5–5.9]	<0.0001
CT (s)	51 (46–64) [32–104]	57 (48–76) [23–596]	0.05
CA ₅ (mm)	16 (15–19) [10–37]	12 (8–15) [3–19]	<0.0001
CA ₁₅ (mm)	19 (17–22) [12–47]	14 (9–18) [3–43]	<0.0001
MCF (mm)	19 (17–23) [13–68]	15 (9–19) [3–55]	<0.0001

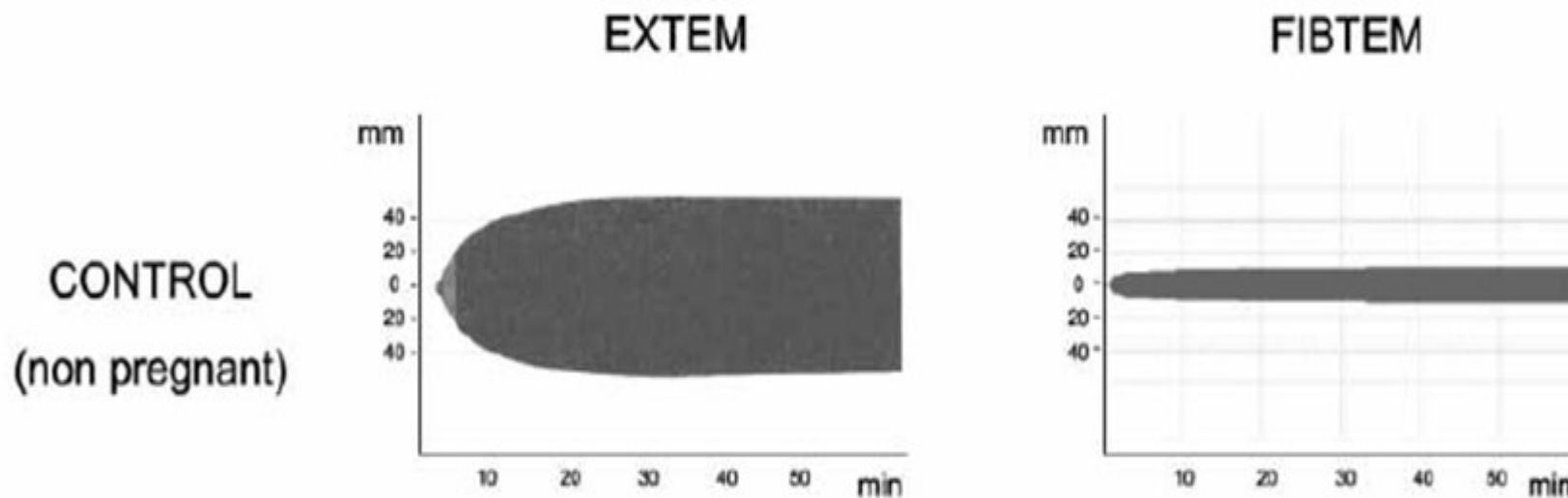
Values are median, (interquartile) and [range].

*Comparison between controls and haemorrhages using Mann–Withney U-test (two-tailed probability).

CA₅ or 15, amplitude of the clot at 5 and 15 minutes; CT, clotting time; Hb, haemoglobin; MCF, maximum clot firmness.

Összefoglalás

Solomon C et al BJA 2012; 109 (6): 851–63



Posztpartum koagulopátia

Wikkelsøe *et al. Trials* 2012, **13**:110
<http://www.trialsjournal.com/content/13/1/110>



STUDY PROTOCOL

Open Access

The FIB-PPH trial: fibrinogen concentrate as initial treatment for postpartum haemorrhage: study protocol for a randomised controlled trial

Anne Juul Wikkelsøe^{1*}, Arash Afshari^{2,3}, Jakob Stensballe⁴, Jens Langhoff-Roos⁵, Charlotte Albrechtsen², Kim Ekelund², Gabriele Hanke², Heidi Fosgrau Sharif⁵, Anja U Mitchell¹, Jens Svare⁶, Ane Troelstrup⁷, Lars Møller Pedersen⁷, Jeannet Lauenborg⁸, Mette Gøttge Madsen⁹, Birgit Bødker¹⁰ and Ann M Møller¹

Ducloy-Bouthors *et al. Critical Care* 2011, **15**:R117
<http://ccforum.com/content/15/2/R117>



RESEARCH

Open Access

High-dose tranexamic acid reduces blood loss in postpartum haemorrhage

Anne-Sophie Ducloy-Bouthors^{1*}, Brigitte Jude^{2,3}, Alain Duhamel^{4,5}, Françoise Broisin⁶, Cyril Huissoud⁷, Hawa Keita-Meyer^{8,9}, Laurent Mandelbrot^{9,10}, Nadia Tillouche¹¹, Sylvie Fontaine¹¹, Françoise Le Goueff¹², Sandrine Depret-Mosser¹³, Benoit Vallet^{1,14}, for The EXADELI Study Group¹⁵ and Sophie Susen^{2,3}