

Infuzní a transfuzní strategie v intenzivní péči - něco nového?

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Disclosure



CSL Behring, Octapharma, Novo Nordisk, MSD, Phiser

Management of severe perioperative bleeding: guidelines from the European Society of Anaesthesiology

First update 2016

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The European guideline on management of major bleeding and coagulopathy following trauma: fourth edition

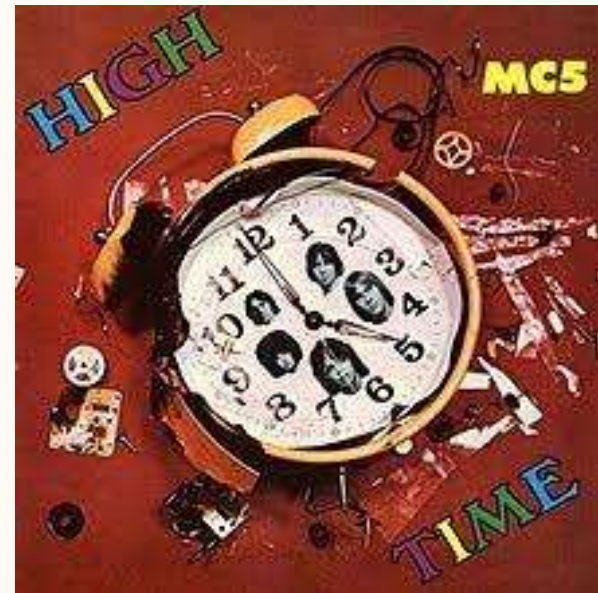
[Rolf Rossaint](#), [Bertil Bouillon](#), [Vladimir Cerny](#), [Timothy J. Coats](#), [Jacques Duranteau](#), [Enrique Fernández-Mondéjar](#), [Daniela Filipescu](#), [Beverley J. Hunt](#), [Radko Komadina](#), [Giuseppe Nardi](#), [Edmund A. M. Neugebauer](#), [Yves Ozier](#), [Louis Riddez](#), [Arthur Schultz](#), [Jean-Louis Vincent](#) and [Donat R. Spahn](#) ✉

Critical Care 2016 **20**:100

Guidelines z praktického hlediska



- *Time is high!!!*



ŽOK: krevní ztráta narůstající rychlostí 150ml/min.

→ **150 ml/min....exsanguinace za 30min**

Zatím jezdí pacient za krví,

.....



Guidelines z praktického hlediska

Strategii léčby musíme přizpůsobit i tomu, kde a s jak dostupným materiálem pacienty ošetřujeme.



*Pacient v sanitce....
....a cca 30 min na
urgentním příjmu*



ZZS



Turniket

Komunikace s dispečinkem

Nalož a jed'



ZZS



1. Okamžité podání: kyselina tranexamová

An analysis of tranexamic acid use in 20 211 trauma patients showed that it improves survival rates by approximately 10%.⁴⁸¹



ZZS a UP

Permisivní hypotenze

In cases of uncontrolled bleeding we suggest lower thresholds for cardiac pre-load and/or permissive hypotension may be considered. **2C**



ZZS a UP



Permisivní hypotenze, nicméně...

Udržení pre-loadu je klíčové

- objemové terapie krystaloidy,
- *Nestačí-li, pokračujeme koloidy: škrob, želatina, ale*

We suggest that the use of colloids be restricted due to the adverse effects on haemostasis. (Grade 2C)



Urgentní příjem



- Pacient přijíždí na UP
- Pokračuje objemová terapie: krystaloidy a koloidy
- **Pacient dále krvácí**

- Odběry pro určení krevní skupiny, nakřížení ery, bed-side, laboratoř





Emergency



Urgentní příjem



- **Pacient dále krvácí a zahajujeme resuscitaci koagulace**



Transfuzní přípravky,

krvní deriváty



Emergency

Urgentní příjem



- **Pacient dále krvácí**



**snaha o chirurgickou
kontrolu zdroje**



Urgentní příjem



- **Pacient dále krvácí**



ihned dostupné

Ery koncentrát

Prvních 30 min na UP: dostupné 0-

We recommend a target haemoglobin concentration of 7 to 9 g dl⁻¹ during active bleeding. **1C**

- ***Ery koncentrát Hb min 70g/l***

Prvních 30 min na UP: dostupné O-



We recommend a target haemoglobin concentration of 7 to 9 g dl⁻¹ during active bleeding. **1C**

Kleinman S, Stassinopoulos A. Risks associated with red blood cell transfusions: potential benefits from application of pathogen inactivation. *Transfusion* 2015; **55**:2983–3000.

Leukocyty jako buněčné elementy specifické pro imunitní systém jednotlivce jsou potenciálně kontaminující pro dalšího jedince

(Catalano Ch.,2007)

J Trauma. 2010 Aug;69(2):330-7.

Prestorage leukoreduction ameliorates the effects of aging on banked blood.

Phelan HA, Gonzalez RP, Patel HD, Caudill JB, Traylor RK, Yancey LR, Sperry JL, Friese RS, Nakonezny PA.

Eca po 30min: Výsledky Bed-side, laborator

Plasma transfusion alone is not sufficient to correct hypofibrinogenaemia. **C**

Eca po 30min: Výsledky Bed-side, laboratoř

Fibrinogen concentration of less than 1.5 to 2 g l⁻¹ is considered as hypofibrinogenaemia in acquired coagulopathy and is associated with increased bleeding risk. **C**

We recommend treatment of hypofibrinogenaemia in bleeding patients. **1C**

- Koncentrát fibrinogenu s cílem nad 2g/l
- V praxi minimálně 4g iv
- PCC a trombo dle TEG a ROTEM



We recommend treatment of hypofibrinogenaemia in bleeding patients. **1C**

We suggest an initial fibrinogen concentrate dose of 25 to 50 mg kg⁻¹. **2C**

Rahe-Meyer N, Pichlmaier M, Haverich A, *et al*. Bleeding management with fibrinogen concentrate targeting a high-normal plasma fibrinogen level: a pilot study. *Br J Anaesth* 2009; **102**:785–792.

[Injury](#). 2013 Feb;44(2):209-16. doi: 10.1016/j.injury.2012.08.047. Epub 2012 Sep 20.

The exclusive use of coagulation factor concentrates enables reversal of coagulopathy and decreases transfusion rates in patients with major blunt trauma.

[Innerhofer P](#)¹, [Westermann I](#), [Tauber H](#), [Breitkopf R](#), [Fries D](#), [Kastenberger T](#), [El Attal R](#), [Strasak A](#), [Mittermayr M](#).

[Blood Transfus](#). 2017 Jul; 15(4): 318–324.

PMCID: PMC5490726

Prepublished online 2017 Mar 31. doi: [10.2450/2017.0094-17](#)

The use of fibrinogen concentrate for the management of trauma-related bleeding: a systematic review and meta-analysis

[Carlo Mengoli](#)¹, [Massimo Franchini](#)^{1,2}, [Giuseppe Marano](#)¹, [Simonetta Pupella](#)¹, [Stefania Vaglio](#)^{1,3}, [Marco Marietta](#)⁴ and [Giancarlo M. Liumbruno](#)¹

Recommendation 24

In the initial management of patients with expected massive haemorrhage, we recommend one of the two following strategies:

- Plasma (FFP or pathogen-inactivated plasma) in a plasma–RBC ratio of at least 1:2 as needed. (Grade 1B)**
- Fibrinogen concentrate and RBC according to Hb level. (Grade 1C)**

Prvních 30 min na UP: Plazma???

- V současné době odklon, ale v případě hromadných neštěstí, souběh několika pacientů, nedostupnost fibrinogenu.....



Prvních 30 min na UP: dostupná plazma

We recommend pathogen inactivation for fresh frozen plasma (FFP) and platelets. **1C**

- FFP od jednoho dárce
x
- Směsná farmaceuticky
ošetřená



Low Incidence of Hyperfibrinolysis and Thromboembolism in 195 Primary Liver Transplantations Transfused with Solvent/Detergent-Treated Plasma

Håkon Haugaa, MD, PhD^{*,†‡}, Eli Taraldsrud, MD[‡], Hans Christian Nyrrerød, MD^{*}, Tor Inge Tønnessen, MD, PhD^{*,†}, Aksel Foss, MD, PhD^{†§} and Bjarte G. Solheim, MD, PhD^{†‡}

SD-plasma is a safe plasma product for liver transplant recipients, and the incidences of hyperfibrinolysis and thromboembolic events are not significantly different from those seen in centers using FFP.



A single-center prospective study on the safety of plasma exchange procedures using a double-viral-inactivated and prion-reduced solvent/detergent fresh-frozen plasma as the replacement fluid in the treatment of thrombotic microangiopathy

Chiara Vendramin,¹ Siobhan McGuckin,¹ Ferras Alwan,¹ John-Paul Westwood,¹ Mari Thomas,² and Marie Scully²

CONCLUSION: Our data have demonstrated that the incidence of complications during PEX is low and using OctaplasLG is comparable to the low incidence of reactions. No cases of anaphylaxis, transfusion-related acute lung injury, or fatal plasma reactions were seen. There was no evidence of viral transmission or seroconversion after treatment.

Take home message



ZZS: kyselina tranexamová, krystaloidy...

..... + koloidy

TURNIKET

UP: ery Hb 70g/l

Fibrinogen nad 2g/l

pokud plazma, tak protivirově ošetřená

KONTROLA ZDROJE

Zatím jezdí pacient za krví,

***Bude časem jezdit krev za pacientem
(fibrinogen, umělý Hb) ????***

.....

Děkuji za pozornost

