La terapia sostitutiva con emazie, leucociti o piastrine: gli errori da evitare

Dott. M. Marietta
Azienda Ospedaliero-Universitaria
Modena

Relazioni con soggetti portatori di interessi commerciali in campo sanitario

Ai sensi dell'art. 3.3 sul Conflitto di Interessi, pag. 17 del Regolamento Applicativo dell'Accordo Stato-Regione del 5 novembre 2009, dichiaro che negli ultimi due anni ho avuto i seguenti rapporti anche di finanziamento con soggetti portatori di interessi commerciali in campo sanitario:

- ✓ Partecipazione ad Advisory Board per le Ditte Novo-Nordisk, Kedrion, CSL
- ✓ Attività di consulenza per la Ditta Kedrion
- ✓ Relazioni a convegni organizzati dalle Ditte:
  - Sanofi
  - Bayer
  - CSL

Errore

L'allontanarsi dalla verità, dal giusto o dalla norma convenuta.

Quid est veritas?

bjh guideline

Guidelines on the management of anaemia and red cell transfusion in adult critically ill patients

British Journal of Haematology, 2013, **160**, 445–464

Andrew Retter,[1,2] Duncan Wyncoll,[1] Rupert Pearse,[3] Damien Carson,[4] Stuart McKechnie,[5] Simon Stanworth,[6] Shubha Allard,[7] Dafydd Thomas,[8] Tim Walsh[9] and British Committee for Standards in Haematology

Annals of Internal Medicine | CLINICAL GUIDELINE

Red Blood Cell Transfusion: A Clinical Practice Guideline From the AABB*

Ann Intern Med. 2012;157:49-58.

Jeffrey L. Carson, MD; Brenda J. Grossman, MD, MPH; Steven Kleinman, MD; Alan T. Tinmouth, MD; Marisa B. Marques, MD; Mark K. Fung, MD, PhD; John B. Holcomb, MD; Orieji Illoh, MD; Lewis J. Kaplan, MD; Louis M. Katz, MD; Sunil V. Rao, MD; John D. Roback, MD, PhD; Aryeh Shander, MD; Aaron A.R. Tobian, MD, PhD; Robert Weinstein, MD; Lisa Grace Swinton McLaughlin, MD; and Benjamin Djulbegovic, MD, PhD, for the Clinical Transfusion Medicine Committee of the AABB

RECOMMENDATION

Blood Transfus 2011;9:320-35

Recommendations for the transfusion management of patients in the peri-operative period. III. The post-operative period.

Giancarlo Maria Liumbruno[1], Francesco Bennardello[2], Angela Lattanzio[3], Pierluigi Piccoli[4], Gina Rossetti[5] for the Italian Society of Transfusion Medicine and Immunohaematology (SIMTI) Working Party

CRITERI PER TRASFONDERE SECONDO LE PIU' RECENTI LG Hb g/dL			
setting	BCSH, 2013 (GoR)	AABB, 2012 (GoR)	SIMTI, 2011 (GoR)
ICU	Hb <7 (1B)	Hb <7 (alta/forte)	
POSTOP	-	Hb< 8 o sintomi (alta/forte)	Hb <6 (1C+) Hb 6-8 e sintomi o fattori di rischio (1C+) Hb 8-10 e sintomi (2C) Hb>10 NO (1A)
ACS	Hb<8 (2C)	? (bassa/incerta)	
Angina instabile	Hb < 7 (2C)	-	
PAZ CV	-	Hb < 8 e/o sintomi (moderata/debole)	
SEPSI (inizio) SESPSI (avanzata)	Hb<9-10 + $\downarrow DO_2$ (2C) Hb< 7-9 (1B)	-	
STROKE	Hb<9 (2D)		

Recommendations for the transfusion of plasma and platelets

Giancarlo Liumbruno[1], Francesco Bennardello[2], Angela Lattanzio[3], Pierluigi Piccoli[4], Gina Rossetti[5] as Italian Society of Transfusion Medicine and Immunohaematology (SIMTI) Working Party

Blood Transfus 2009; 7: 132-150

Table I – Indications for the transfusion of plasma

Clinical condition	GoR
1. Correction of congenital or acquired deficiencies of clotting factors (for which there is not a specific concentrate), when the PT or aPTT ratio is >1.5:	
- Liver disease:	
- *active bleeding*	1C+
- *prevention of bleeding in the case of surgery or invasive procedures*	2C
- During treatment with vitamin K antagonists (if prothrombin complex, which is the first choice treatment, is not available):	1C+
- *in the presence of major or intracranial haemorrhage*	
- *in preparation for surgery than cannot be delayed*	
- Acute disseminated intravascular coagulation with active bleeding, in association with correction of the underlying cause	1C+
- Microvascular bleeding during massive transfusions (>1 blood volume), even before the results of PT and aPTT	1C+
- Deficiencies of single clotting factors, in the absence of specific concentrates (e.g. of FV), in the presence of active bleeding or to prevent bleeding during an invasive procedure	1C+
2. Apheretic treatment of thrombotic microangiopathies (thrombotic thrombocytopenic purpura, haemolytic-uraemic syndrome, HELLP syndrome), as a replacement fluid	1A
3. Reconstitution of whole blood for exchange transfusions	2C
4. Hereditary angioedema in the case that C1-esterase inhibitor is not available	2C+

Gli errori da evitare

- ✓Non so bene perché lo faccio, ma lo faccio perché bisogna farlo

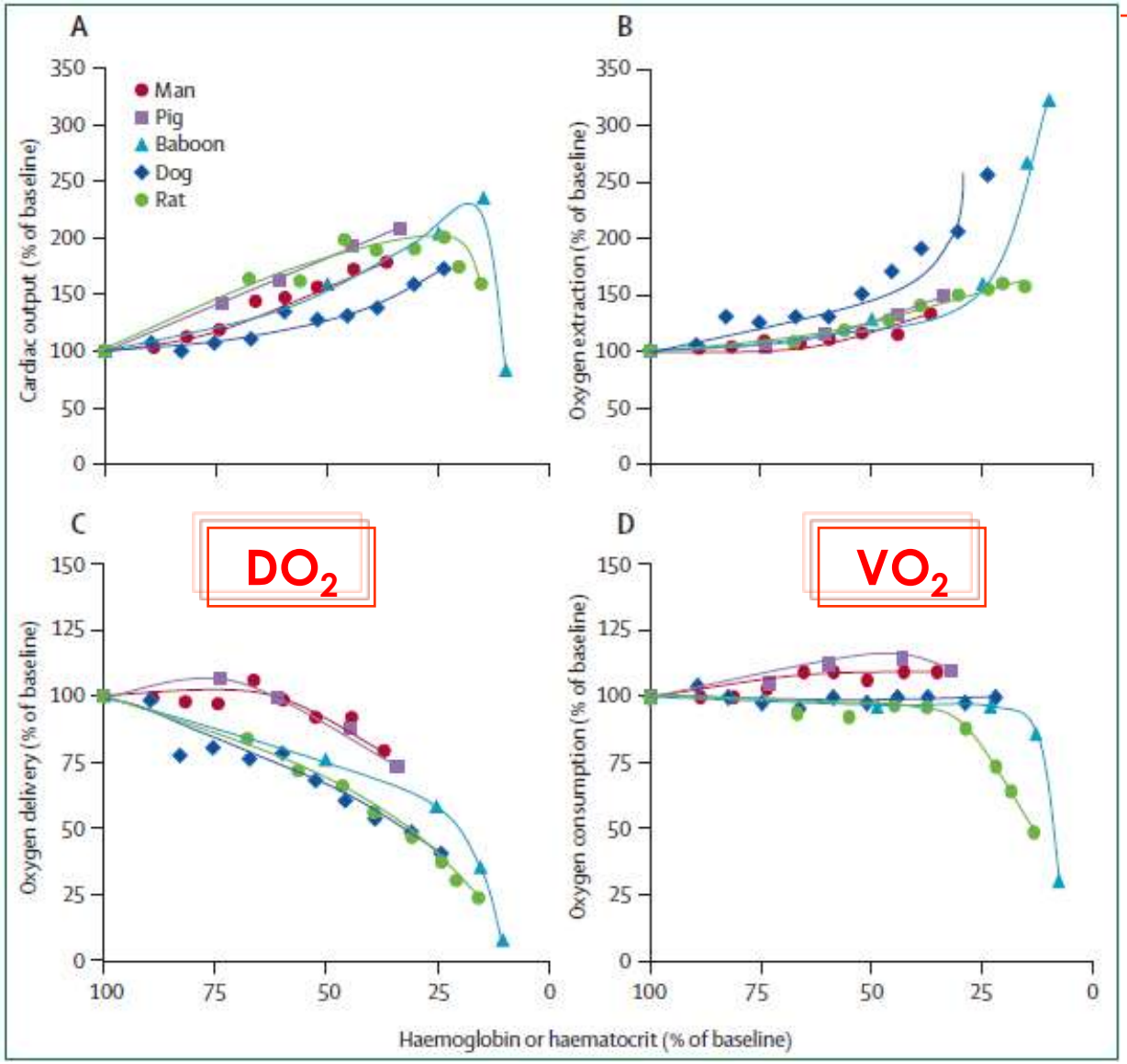
«Voglio dirti solo una parola, ragazzo. Solo una parola»
«Sì, signore». «Mi ascolti?». «Sì, signore».

«Fisiopatologia, Ben.»

Il Laureato – 1967

Red blood cell transfusion in clinical practice

Harvey G Klein, Donat R Spahn, Jeffrey L Carson



$DO_2 = CO \times CaO_2$

$CaO_2 =$
$(SaO_2 \times Hb \times costante)$
$+ PaO2$

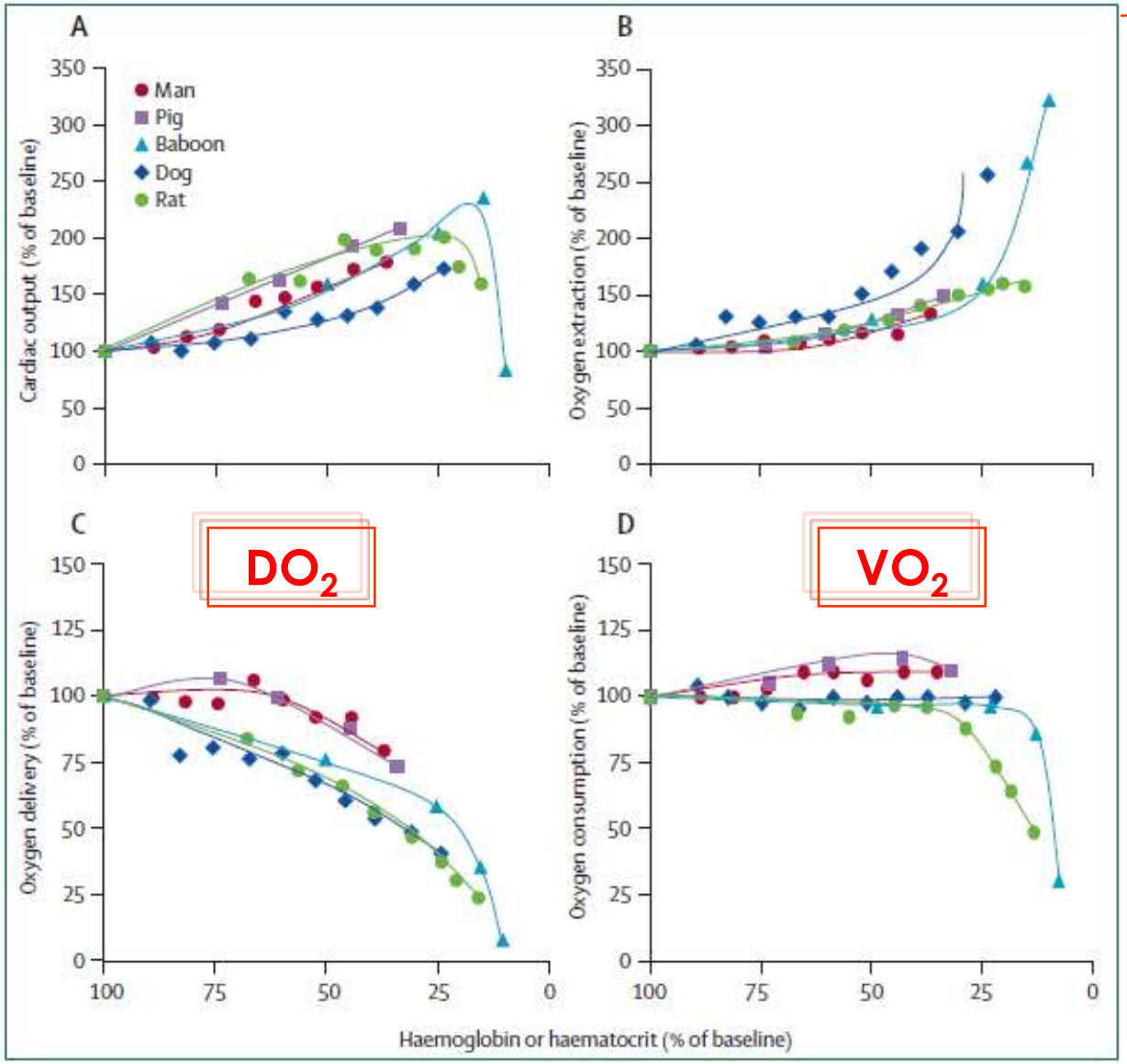
$VO_2/DO_2 = 30\%$

Finchè DO_2 non raggiunge il valore critico [DO_{2CRIT}]
VO2 non cala
e non c'è ischemia

Lancet 2007; 370: 415–26

Red blood cell transfusion in clinical practice

Harvey G Klein, Donat R Spahn, Jeffrey L Carson



Se trasfondiamo EC:

1. **↑ Hb**
2. **↑ DO_2**
3. **= VO_2**

?

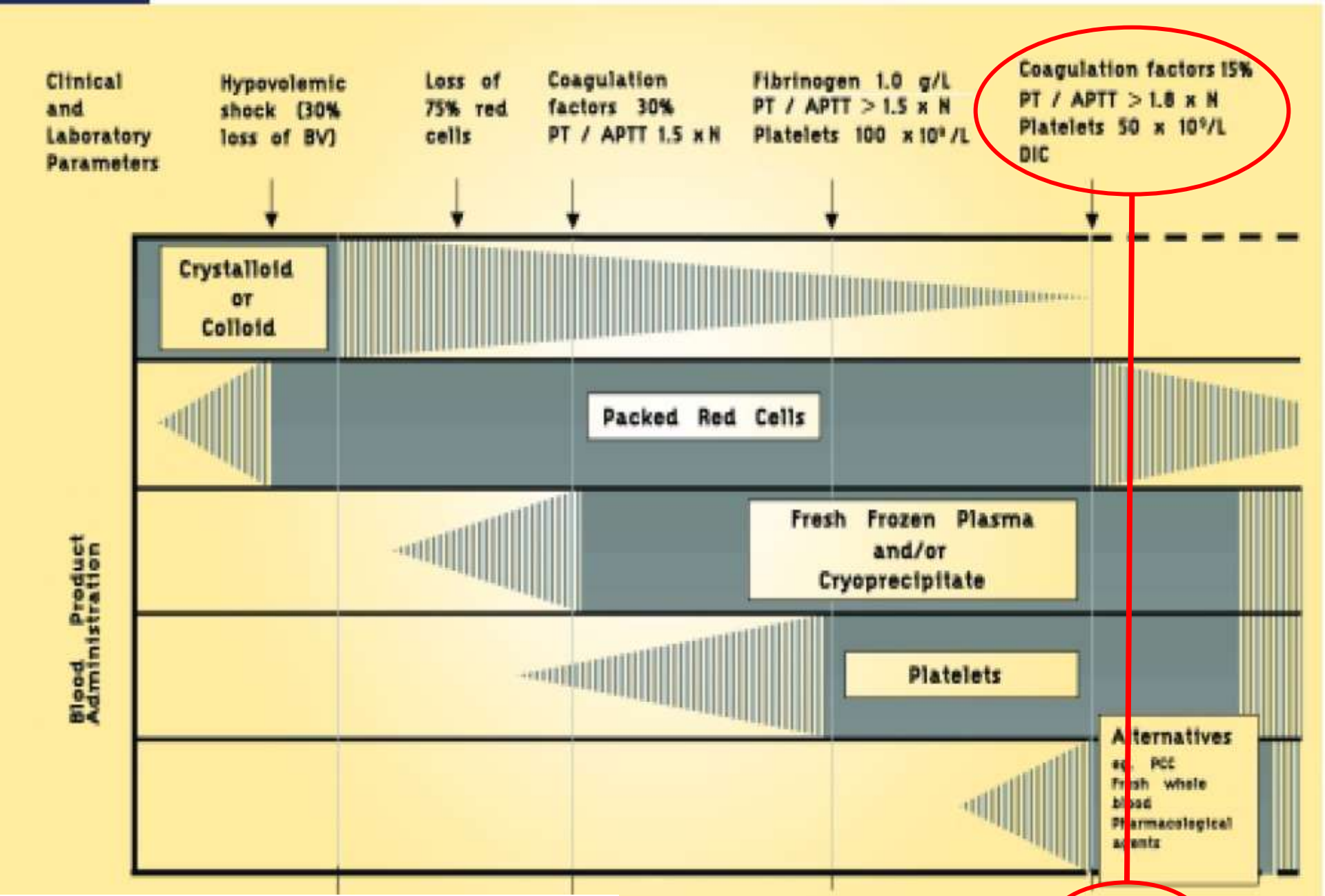
1. **Perchè EC sono poco efficienti nel portare O_2**
2. **Perchè il paziente è nella fase DO_2 - indipendente**

Lancet 2007; 370: 415–26

Gli errori da evitare

- ✓Non so bene perché lo faccio, ma lo faccio perché bisogna farlo

PLASMA FRESCO CONGELATO



Effective Hemostasis: What Can Be Done in Surgery and Trauma?

Jeffrey H. Lawson and Michael P. Murphy Semin Hematol 41(suppl 1):55-64. © 2004

Impaired thrombin generation and fibrin clot formation in patients with dilutional coagulopathy during major surgery

Saskia E. M. Schols[1]; Marcus D. Lancé[3]; Marion A. H. Feijge[1]; Jan Damoiseaux[4]; Marco A. Marcus[3]; Karly Hamulyák[2]; Hugo ten Cate[2]; Johan W. M. Heemskerk[1*]; Elisabeth C. M. van Pampus[2§*]

Thromb Haemost 2010; 103: ■■■

Variable	Study B + C (diluted) (n=84)	Study B after CPB(n=30)	Study C before FFP (n=54)	Study C after FFP (n=54)
Thrombin generation (R^2)	0.32***	0.10	0.44***	0.46***
fibrinogen (β)	ns	ns	−0.33*	ns
prothrombin (β)	ns	ns	0.68***	ns
factor X (β)	0.32*	+	ns	0.97***
factor XIII (β)	ns	ns	ns	ns
antithrombin (β)	ns	ns	ns	−0.45*
IgG (β)	0.33*	+	ns	ns
Fibrin clot formation (R^2)	0.60***	0.41***	0.74***	0.88***
fibrinogen (β)	0.78***	0.64***	0.58***	0.66***
factor X (β)	ns	ns	ns	0.21*
factor XIII (β)	ns	ns	0.38**	ns
antithrombin (β)	ns	ns	ns	ns
IgG (β)	+	+	ns	0.26**

For multiple regression analysis of all indicated parameters, associations are indicated as R^2 values. For individual parameters, values are standardized β coefficients. ns, not significant, +p<0.1 (borderline), *p<0.05, **p<0.01, ***p<0.001.

Gli errori da evitare

- ✓ Non so se serve, quindi ne faccio tanto

EMAZIE CONCENTRATE

Liberal or Restrictive Transfusion in High-Risk Patients after Hip Surgery

N Engl J Med 2011;365:2453-62.

Jeffrey L. Carson, M.D., Michael L. Terrin, M.D., M.P.H., Helaine Noveck, M.P.H., David W. Sanders, M.D.,

RANDOMIZZATO IN APERTO

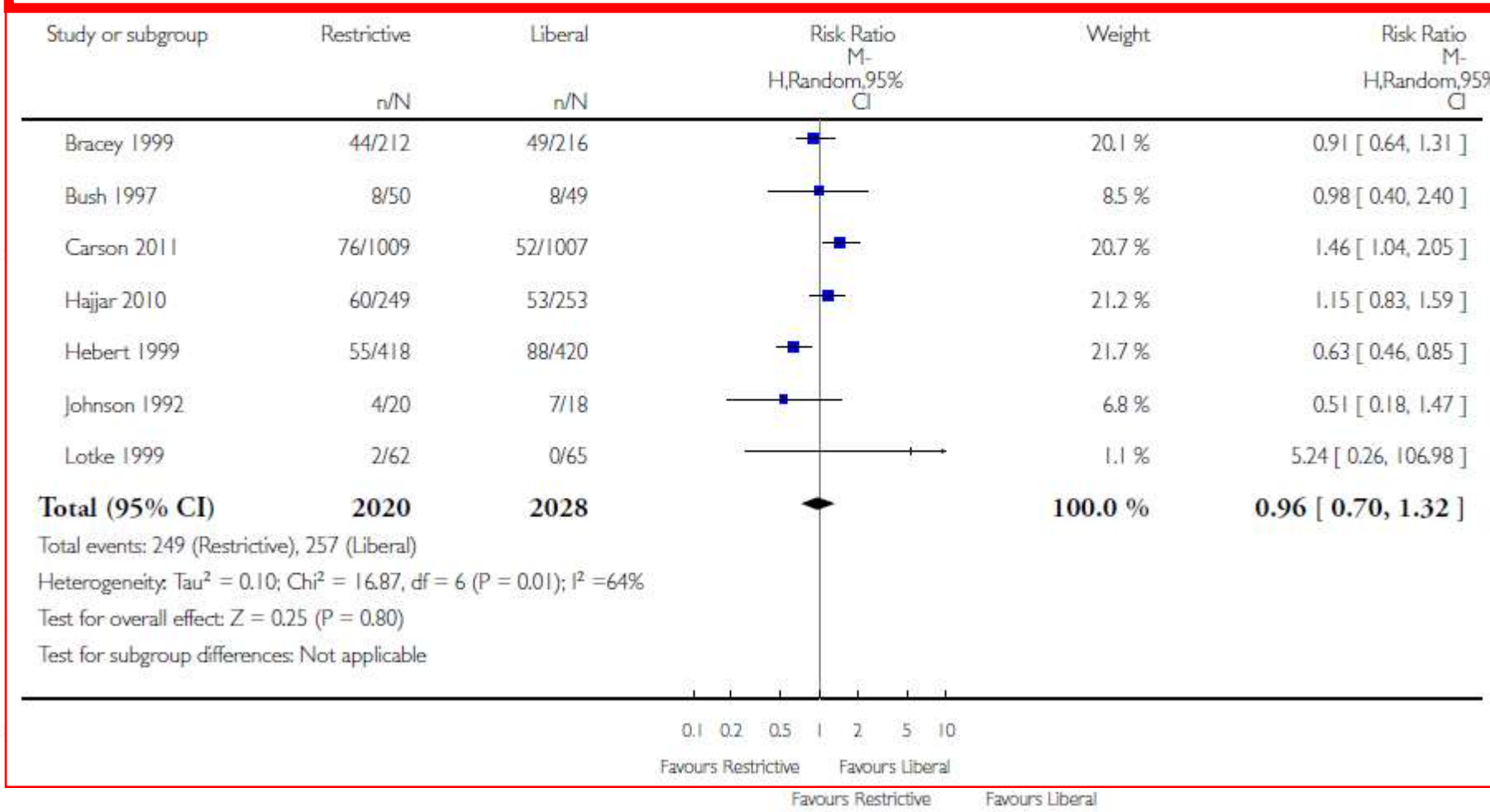
Table 3. Outcomes at 30 Days and 60 Days.*

Variable	30-Day Period			
	Hb< 10 g/dL Liberal Strategy (N=1007)	**Hb< 8 g/dL o sintomatici** Restrictive Strategy (N=1009)	Odds Ratio (99% CI)	Absolute Risk Difference (99% CI)
	no./total no. (%)			*percentage points*
Death or inability to walk independently	459/995 (46.1)	481/1000 (48.1)	0.92 (0.73 to 1.16)	−2.0 (−7.7 to 3.8)
Inability to walk independently	407/995 (40.9)	438/1000 (43.8)		
Death	52/995 (5.2)	43/1000 (4.3)	1.23 (0.71 to 2.12)	0.9 (−1.5 to 3.4)
Function and symptom scales				
Lower-extremity physical ADL‡	7.3±4.0	7.4±3.9		
Instrumental ADL§	3.9±0.5	3.9±0.4		
FACIT-Fatigue scale¶	38.7±7.7	38.6±7.6		

Transfusion thresholds and other strategies for guiding

Authors' conclusions

The existing evidence supports the use of restrictive transfusion triggers in most patients, including those with pre-existing cardiovascular disease. As there are no trials, the effects of restrictive transfusion triggers in high-risk groups, such as acute coronary syndrome, need to be tested in further large clinical trials. In countries with inadequate screening of donor blood, the data may constitute a stronger basis for avoiding transfusion with allogeneic red cells.



Favours Restrictive Favours Liberal

Gli errori da evitare

- ✓ Non so se serve, quindi ne faccio tanto

PLASMA FRESCO CONGELATO

Efficacy of standard dose and 30 ml/kg fresh frozen plasma in correcting laboratory parameters of haemostasis in critically ill patients

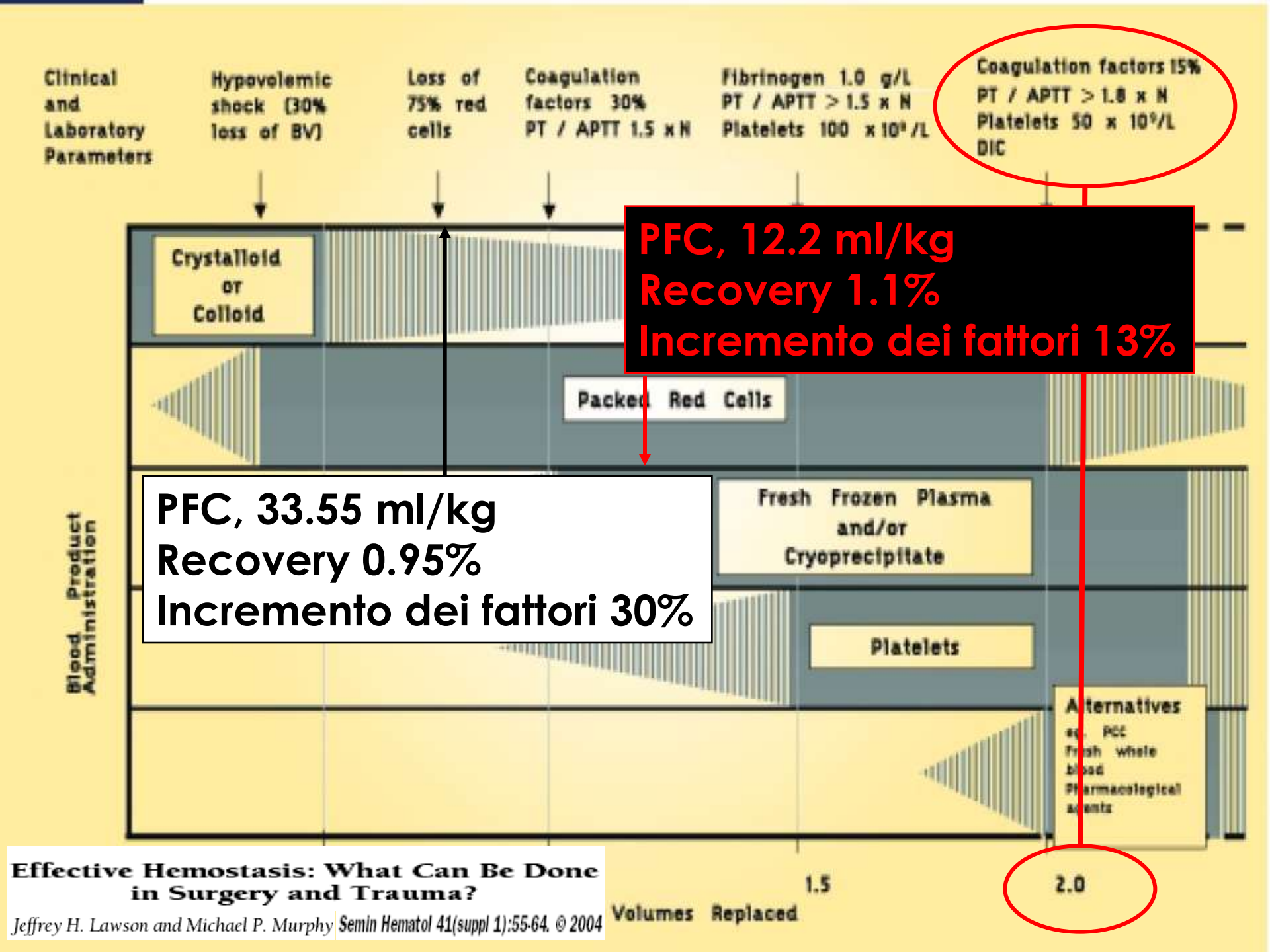
Pratima Chowdhury, *British Journal of Haematology*, **125**, 69–73

PFC medio 12.2 ml/kg
Recovery medio =1.1%
FVIII recovery = 0.82%
FIX recovery = 0.65%

PFC medio 33.5 ml/kg
Recovery medio = 0.95%
FVIII recovery = 0.50%
FIX recovery = 0.83%

Table II. PT, aPTT and coagulation factor levels before and after the infusion of FFP.

	Group 1			Group 2		
	Preinfusion	Postinfusion	Observed increment	Preinfusion	Postinfusion	Observed increment
PT (s)	22·8 (17–222)	19 (15–36)		24 (17–44)	16 (14–20)	
aPTT (s)	46·4 (30–223)	37 (30–158)		41 (28–198)	30** (24–45)	
FI (g/l)	2·7 (0·2–4·4)	3·4 (0·2–7·2)	0·4 (−1·5–2·9)	1·5 (0·4–4·5)	2·7 (1·7–4·1)	1·0 (−0·9–2·4)
FII (IU/dl)	36·5 (22–65)	56 (43–76)	16 (7–42)	35 (16–73)	83** (60–102)	41* (15–61)
FV (IU/dl)	36 (2–126)	58 (14–121)	10 (−4·7–37)	41 (10–99)	69 (39–119)	28* (−16–51)
FVII (IU/dl)	43 (6·6–99)	55 (17–114)	11 (4–32)	48 (16–91)	85** (54–127)	38* (−3–75)
FVIII (IU/dl)	146 (8–391)	159 (18–360)	10 (−49–46)	157 (58–535)	175 (120–313)	17 (−250–96)
FIX (IU/dl)	83 (29–165)	98 (41–167)	8 (−6–30)	73 (43–174)	114 (65–156)	28* (−35–53)
FX (IU/dl)	49 (28–133)	61 (50–94)	15 (−73–43)	53 (16–94)	88** (65–104)	37* (−5–65)
FXI (IU/dl)	38 (20–105)	48 (38–101)	9 (−4·3–32)	34 (15–58)	55** (41–80)	23* (6–37)
FXII (IU/dl)	39 (27–64)	57 (44–83)	30 (1–37)	30 (5–69)	73** (60–105)	44* (23–66)



Effective Hemostasis: What Can Be Done in Surgery and Trauma?

Jeffrey H. Lawson and Michael P. Murphy Semin Hematol 41(suppl 1):55-64. © 2004

The effect of plasma transfusion on morbidity and mortality: a systematic review and meta-analysis

TRANSFUSION 2010;50:1370-1383.

Mohammad Hassan Murad, James R. Stubbs, Manish J. Gandhi, Amy T. Wang, Anu Paul, Patricia J. Erwin, Victor M. Montori, and John D. Roback

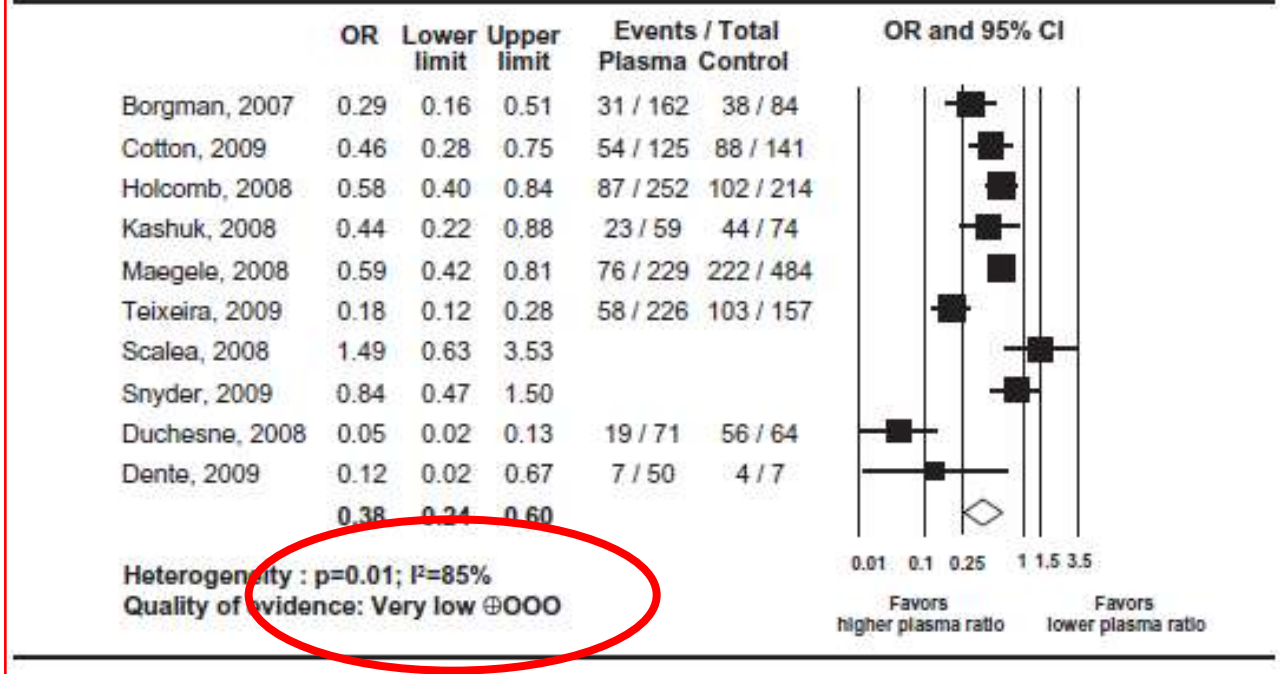


Fig. 2. Mortality in patients undergoing massive transfusion.

TUTTI OSSERVAZIONALI IN PAZIENTI CON TRAUMA

The effect of plasma transfusion on morbidity and mortality: a systematic review and meta-analysis

TRANSFUSION 2010;50:1370-1383.

Mohammad Hassan Murad, James R. Stubbs, Manish J. Gandhi, Amy T. Wang, Anu Paul, Patricia J. Erwin, Victor M. Montori, and John D. Roback

RCT

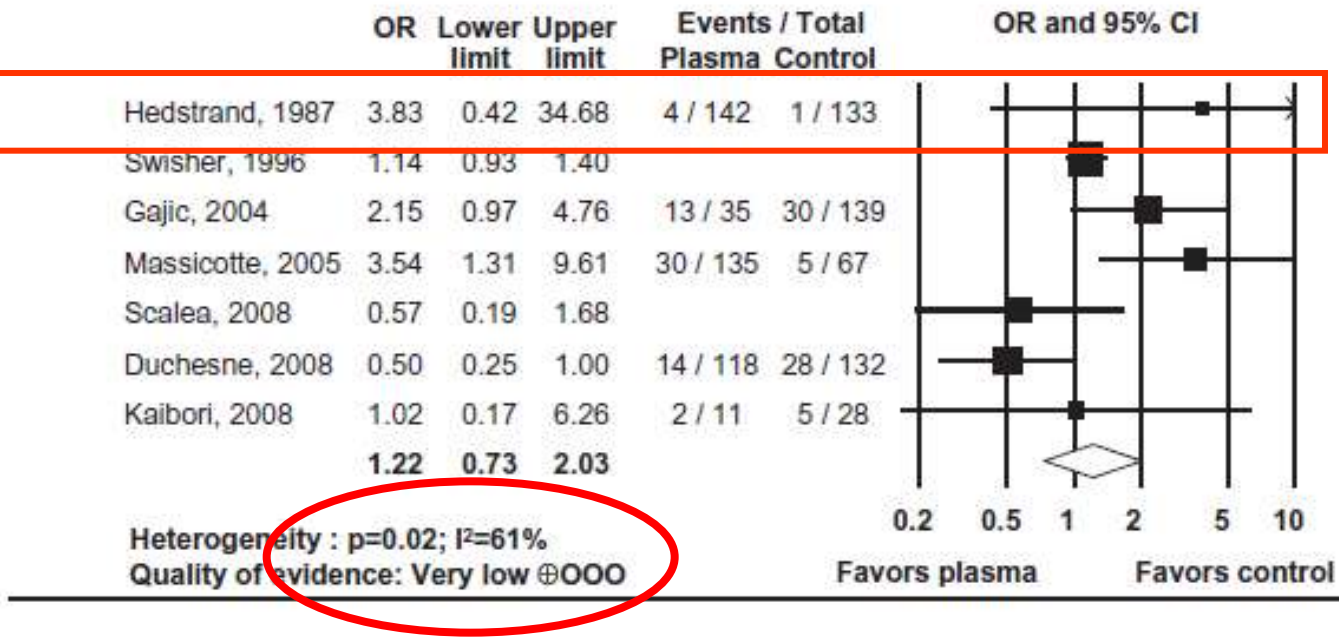


Fig. 3. Mortality in patients undergoing surgery without massive transfusion.

Gli errori da evitare

- ✓ Non so se serve, quindi ne faccio tanto perché tanto non fa male

EMAZIE CONCENTRATE

Arch Intern Med.
Published online December 24, 2012.

ORIGINAL INVESTIGATION

ONLINE FIRST | LESS IS MORE

Association of Blood Transfusion With Increased Mortality in Myocardial Infarction

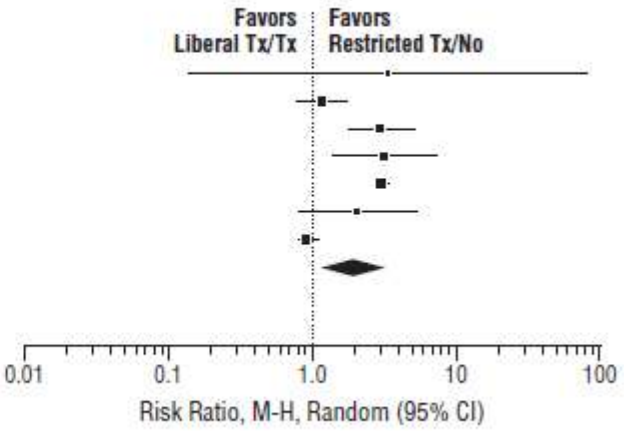
A Meta-analysis and Diversity-Adjusted Study Sequential Analysis

Saurav Chatterjee, MD; Jørn Wetterslev, MD, PhD; Abhishek Sharma, MD; Edgar Lichstein, MD; Debabrata Mukherjee, MD, MS

Source	Transfusion or Liberal Events	Transfusion or Liberal Total	No Transfusion or Restricted Events	No Transfusion or Restricted Total	Weight, %	Risk Ratio M-H, Random (95% CI)
Cooper et al,[31] 2011	1	21	0	24	3.5	3.41 (0.15-79.47)
Jani et al,[32] 2007	35	1033	102	3590	17.0	1.19 (0.82-1.74)
Jolicoeur et al,[33] 2009	16	204	128	4984	16.3	3.05 (1.85-5.04)
Nikolsky et al,[34] 2009	6	82	44	1975	14.0	3.28 (1.44-7.49)
Rao et al,[35] 2004	604	2401	1771	21711	18.0	3.08 (2.84-3.35)
Singla et al,[37] 2007	8	110	9	260	13.3	2.10 (0.83-5.30)
Yang et al,[39] 2005	242	12724	1447	72387	17.9	0.95 (0.83-1.09)
Total (95% CI)		**16575**		**104931**	**100.0**	**2.04 (1.06-3.93)**
Total events	912		3501			

Heterogeneity: $\tau = 0.62$; $\chi^2_9 = 246.84$ ($P < .001$), $I^2 = 98\%$

Test for overall effect: $z = 2.14$ ($P = .03$)



Rischio di infarto

Risk Ratio, M-H, Random (95% CI)

Transfusion Strategies for Acute Upper Gastrointestinal Bleeding

N Engl J Med 2013;368:11-21.

Càndid Villanueva, M.D., Alan Colomo, M.D., Alba Bosch, M.D., Mar Concepción, M.D.,

RANDOMIZZATO IN APERTO

Hb <7 g/dL

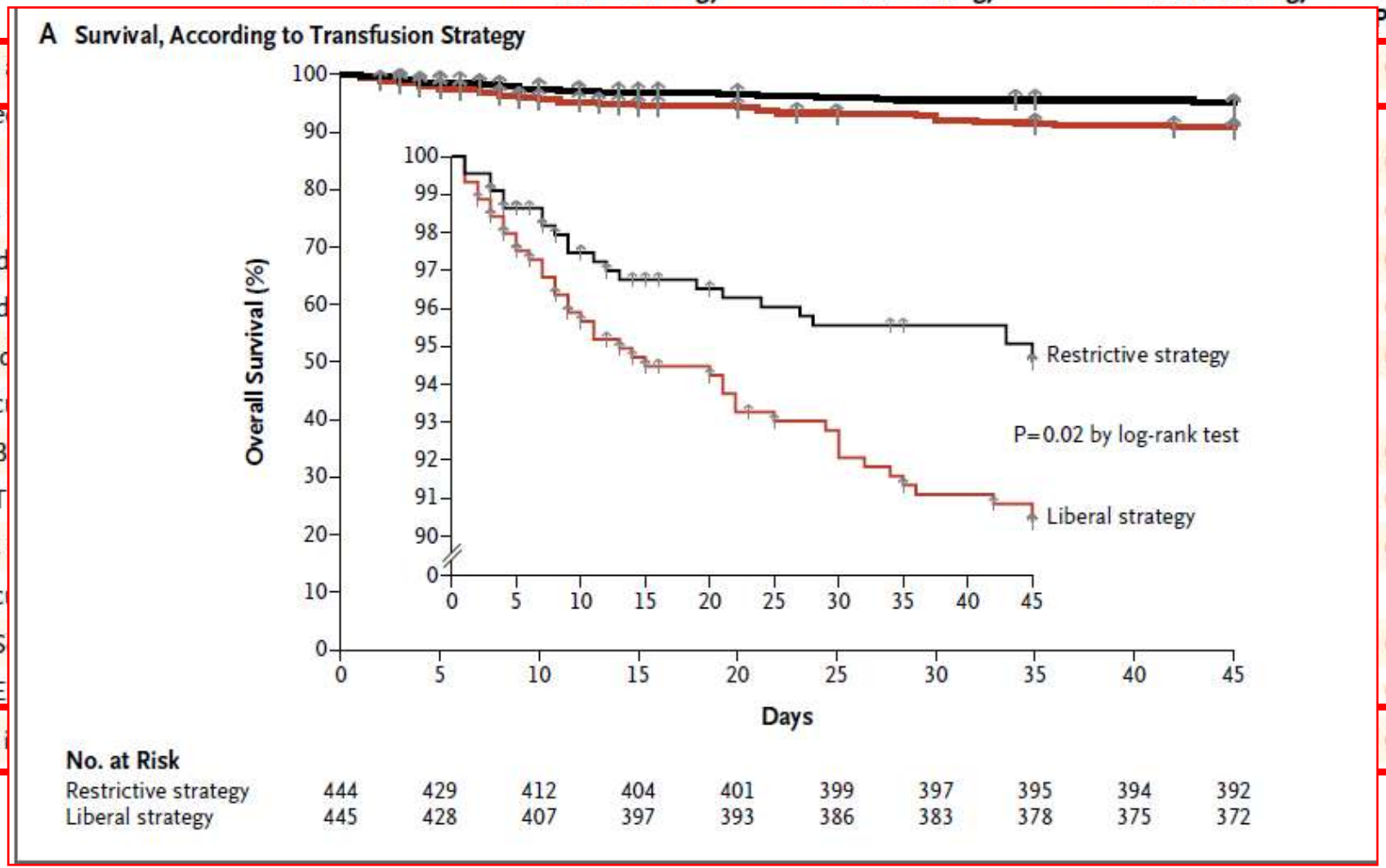
Restrictive Strategy

Hb <9 g/dL

Liberal Strategy

Hazard Ratio with Restrictive Strategy

Outcome	P Value
Death from	0.02
Further bleed	
Overall	0.01
Patients	0.02
Child	0.04
Child	0.33
Bleed	0.05
Resc	
B	0.03
T	0.04
Patients	0.09
Resc	
S	0.21
E	0.04
No. of days	0.01



Gli errori da evitare

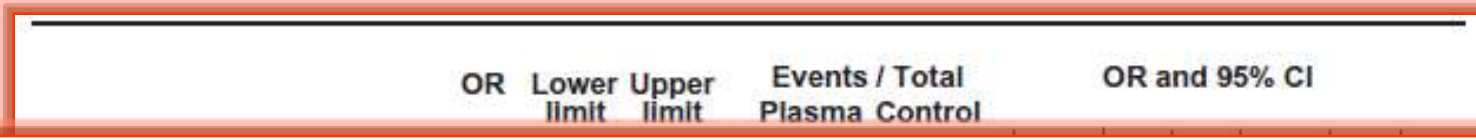
- ✓ Non so se serve, quindi ne faccio tanto perché tanto non fa male

PLASMA FRESCO CONGELATO

The effect of plasma transfusion on morbidity and mortality: a systematic review and meta-analysis

TRANSFUSION 2010;50:1370-1383.

Mohammad Hassan Murad, James R. Stubbs, Manish J. Gandhi, Amy T. Wang, Anu Paul, Patricia J. Erwin, Victor M. Montori, and John D. Roback



Overall, plasma transfusion was associated with a significantly increased risk of developing pulmonary complications (OR, 2.92; 95% CI, 1.99-4.29;p value for Q test = 0.14).

This effect was demonstrated in all five studies and was consistent among these studies.

Sensitivity analyses show that plasma significantly increased the risk of these complications even when

1) only studies of medical patients were considered (OR, 2.48; 95% CI, 1.29-4.75)

2) only studies of surgical patients were considered (OR, 3.00; 95% CI, 1.80-4.99)

3) only studies with clear definition of ALI were considered (OR, 2.58; 95% CI, 1.65-4.03).

Gli errori da evitare

Non ci sono evidenze che serva

↓

c'è evidenza che non serve

↓

non faccio niente

Vox Sanguinis (2005) 89, 92–96
© 2005 Blackwell Publishing
DOI: 10.1111/j.1423-0410.2005.00668.x

ORIGINAL PAPER

Transfusion practice in massively bleeding patients: time for a change?

P. I. Johansson, M. B. Hansen & H. Sørensen

Department of Clinical Immunology, University Hospital of Copenhagen, Copenhagen, Denmark

Materials and Methods Patients receiving > 10 units of red blood cells (RBC) within 24 h of admission and ≥ 30 blood components within 7 days of admission were reviewed.

Thirteen patients were inadequately transfused (IT), either not receiving PC transfusions or receiving ≥ 20 RBC units before FFP substitution commenced. Six of the patients received no substitutions of PC, despite bleeding requiring an estimated median blood component transfusion, of RBC and FFP, of 67 units (range: 33–116 units) – in seven patients ≥ 20 RBC units were transfused before substitution with FFP commenced (Table 3). Survival was lower (one out of 13)

	Transfusion therapy	
	Not adequate	
	PLT = 0 (n = 6)	> 20 SAG-M
Transfusion		
RBC	28·5 (18–79)	47 (27–78)
FFP	13·5 (4–37)	20 (3–54)
PC	0	4 (1–6)
Total	67 (33–116)	72 (31–133)
Platelet count (×10^9/l)	41	58
MVB (Y/N)		10
Survival (Y/N)	0/6	1/6

Survival rate: not adequately transfused 1/13 (7.7%)

Survival rate: adequately transfused 13/26 (50%) P=0.013

In sintesi…

Il prodotto giusto

Scandinavian Journal of Infectious Diseases, 2013; 45: 112–116

informa
healthcare

ORIGINAL ARTICLE

Clinical experience of granulocyte transfusion in the management of neutropenic patients with haematological malignancies and

A total of 30 patients with a median age of 46 y (range 3 – 82 y) who had received 1 or more GT were included.
The major indications for GT were persistent fever and clinical deterioration despite broad anti-infectious therapy, in combination with progressive pneumonia.
GTs were given for a median of 3 transfusions (range 1 – 14).
For 11 patients, the resolution of fever and all signs of infection could directly be related to GT, and 3 of these patients became long-term survivors. GT was well tolerated.
***Conclusions: A substantial proportion* of severely ill neutropenic patients appeared to benefit from GT. The results further underline the need for well designed,**
randomized, prospective trials to determine the efficacy of this intervention in patients with life-threatening infectious complications.

In sintesi…

Il prodotto giusto

↓

Al paziente giusto

Prophylactic platelet transfusion for prevention of bleeding in patients with haematological disorders after chemotherapy and stem cell transplantation (Review)

Cochrane Database of Systematic Reviews 2012, Issue 5. Art. No.: CD004269.

Estcourt L, Stanworth S, Doree C, Hopewell S, Murphy MF, Tinmouth A, Heddle N

1. There is no evidence, at the moment, to suggest a change from the current practice of using a platelet count of 10 x 109/L. However, the evidence for a platelet count threshold of 10 x 109/L being equivalent to 20 x 109/L is not as definitive as it would first appear and further research is required.
2. There is no evidence that platelet dose affects the incidence of WHO grade 4 bleeding.
3. Two large trials comparing a therapeutic versus prophylactic platelet transfusion strategy, that have not yet been published, should provide important new data on this comparison.

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MAY 9, 2013 VOL. 368 NO. 19

A No-Prophylaxis Platelet-Transfusion Strategy for Hematologic Cancers

The results of our study support the need for the continued use of prophylaxis with platelet transfusion and show the benefit of such prophylaxis for reducing bleeding, as compared with no prophylaxis. A significant number of patients had bleeding despite prophylaxis.

Primary end point				
WHO grade 2, 3, or 4 bleeding — no. (%)	151 (50)	128 (43)	8.4 (1.7 to 15.2)†‡	0.06§
Secondary end points				
Highest grade of bleeding — no. (%)				
None or 1	149 (50)	170 (57)		
2	145 (48)	127 (43)		
3	4 (1)	1 (<1)		
4	2 (1)	0		
No. of days from randomization to first episode of grade 2, 3, or 4 bleeding	17.2±12.8	19.5±12.6	1.30 (1.04 to 1.64)¶	0.02‖
Grade 3 or 4 bleeding — no. (%)	6 (2)	1 (<1)	6.05 (0.73 to 279.72)**	0.13‖
No. of days with grade 2, 3, or 4 bleeding††	1.7±2.9	1.2±2.0	1.52 (1.14 to 2.03)‡‡	0.004‖

Therapeutic platelet transfusion versus routine prophylactic transfusion in patients with haematological malignancies: an open-label, multicentre, randomised study

Lancet 2012; 380: 1309–16

The therapeutic strategy could become a new standard of care after autologous stem-cell transplantation; however, prophylactic platelet transfusion should remain the standard for patients with acute myeloid leukaemia.

Both fatal bleeds occurred in parallel with protocol violations (eg, fungal infection in one patient and new headache at 11 10^9 per L platelets in the other). This finding emphasises that transfusion decision should be based on the individual clinical situation of a patient, rather than on transfusion trigger.

Primary endpoint

Grade 2 or higher	65 (19%; 14–23)	127 (42%; 36–48)	<0·0001
Grade 3	3 (1%; 0–2)	7 (2%; 0–4)	0·21
Grade 4	4 (1%; 0–2)	14 (5%; 2–7)	0·0159
Red blood cell transfusions per patient	2·85 (2·58–3·12)	3·14 (2·81–3·46)	0·18
Days with thrombocytopenia (<20×10^9/L)	9·48 (5·81)	10·17 (6·51)	0·38

Platelet Transfusion Threshold in Patients With Upper Gastrointestinal Bleeding

A Systematic Review

(*J Clin Gastroenterol* 2012;46:482–486)

Anoush Razzaghi, MD and Alan N. Barkun, MD, MSc†‡*

Conclusions: There exist a paucity of data to recommend optimal therapeutic platelet count targets in patients with active GI bleeding. Based principally on expert opinion recommendations, we propose a count of 50×10^9/L. Some professional associations have suggested in very specific clinical settings (postcardiopulmonary bypass surgery or central nervous system trauma) a higher value of up to 100×10^9/L. Properly designed randomized trials are required to more precisely address this important clinical question.

BMJ open accessible medical research

A meta-analysis to determine the effect on survival of platelet transfusions in patients with either spontaneous or traumatic antiplatelet medication-associated intracranial haemorrhage

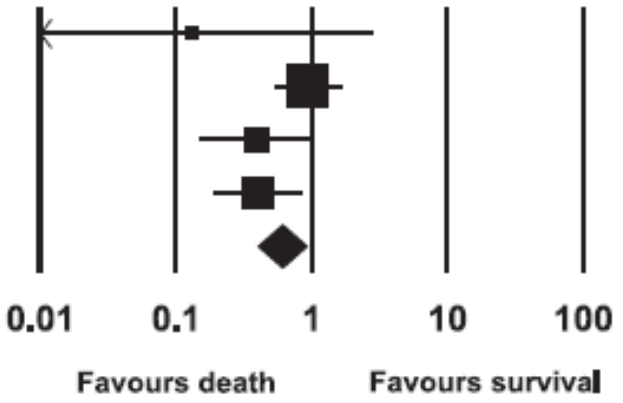
John S Batchelor, Alan Grayson

BMJ Open 2012;**2**:e000588.

Study name	OR	Lower limit	Upper limit	Z Value	p Value
Washington *et al*[10]	0.132	0.006	2.813	−1.298	0.194
Downey *et al*[11]	0.945	0.531	1.680	−0.193	0.847
Ivascu *et al*[14]	0.395	0.148	1.060	−1.844	0.065
Fortuna *et al*[15]	0.408	0.194	0.859	−2.359	0.018
	0.609	0.404	0.917	−2.376	0.018

Statistics for each study

OR and 95% CI



Post-traumatica

Critical Care

CRITICAL CARE

This Provisional PDF corresponds to the article as it appeared upon acceptance. Copyedited and fully formatted PDF and full text (HTML) versions will be made available soon.

Management of bleeding and coagulopathy following major trauma: an updated European guideline

Critical Care 2013, **17**:R76 doi:10.1186/cc12685

Recommendation 28

We recommend that platelets be administered to maintain a platelet count above 50 × 10^9/l. (Grade 1C)

We suggest maintenance of a platelet count above 100 × 10^9/l in patients with ongoing bleeding and/or TBI. (Grade 2C)

We suggest an initial dose of 4-8 single platelet units or one aphaeresis pack. (Grade 2C)

Relationship of Erythrocyte Transfusion with Short- and Long-term Mortality in a Population-based Surgical Cohort

Anesthesiology 2012; 117:1175-83

Keyvan Karkouti, M.D., M.Sc.,* Thérèse A. Stukel, Ph.D.,† W. Scott Beattie, M.D., Ph.D.,‡ Susie Elsaadany, Ph.D.,§ Ping Li, Ph.D.,‖ Rachel Berger, A.R.T.-I.H. (C.S.M.L.S.),# Duminda N. Wijeysundera, M.D., Ph.D.**

Table 1. (Continued)

	Transfused Patients (n = 37,015)	Nontransfused Patients (n = 125,175)
Outcomes		
30-day mortality	279 (0.75%)	276 (0.22%)
1-yr mortality	1,065 (2.88%)	1,392 (1.11%)

Data are numbers (percentages) unless otherwise indicated.

Table 1. Characteristics of Patients Who Did or Did Not Receive Erythrocyte Transfusions

	Transfused Patients (n = 37,015)	Nontransfused Patients (n = 125,175)
Predicted 30-day mortality*	187 (0.51%)	368 (0.29%)

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Table 2. Characteristics across Quartiles of Hospital-specific Erythrocyte Transfusion Rate

	Quartile of Hospital-specific Erythrocyte Transfusion Rate			
	Quartile 1 (15 Hospitals; 39,859 Patients)	Quartile 2 (15 Hospitals; 41,678 Patients)	Quartile 3 (16 Hospital; 39,033 Patients)	Quartile 4 (20 Hospitals; 41,620 Patients)
Erythrocyte transfusions				
Number	5,069 (12.7%)	7,289 (17.5%)	9,247 (23.7%)	15,410 (37.0%)

Table 3. Adjusted Association of Hospital-specific Erythrocyte Transfusion Rate Quartile with 30-day and 1-yr Mortality

Hospital-specific Transfusion Quartile	30-day Mortality	1-yr Mortality
Quartile 1 (lowest)	Reference	Reference
Quartile 2	HR 1.06 (95% CI, 0.83–1.35; $P = 0.66$)	HR 1.05 (95% CI, 0.91–1.22; $P = 0.50$)
Quartile 3	HR 1.07 (95% CI, 0.81–1.40; $P = 0.65$)	HR 0.99 (95% CI, 0.87 –1.13; $P = 0.88$)
Quartile 4 (highest)	HR 1.11 (95% CI, 0.82–1.50; $P = 0.50$)	HR 1.02 (95% CI, 0.82–1.26; $P = 0.88$)

HR = hazard ratio.

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.D.,‡

What We Already Know about This Topic

- Although an association between erythrocyte transfusion and increased perioperative mortality is usually observed, unmeasured confounding may have unduly influenced this association

What This Article Tells Us That Is New

- In a large administrative database (162,190 patients in 66 hospitals), the impact of erythrocyte transfusion on mortality differed substantially when comparing outcomes at hospitals with differing transfusion rates, as opposed to comparing patients who were or were not transfused, raising question about the true relationship between transfusion and mortality

Thus, the hospital-level results are only applicable in the aggregate and should not be used for deciding whether an individual patient should or should not receive a transfusion.

Vox Sanguinis (2011)

ORIGINAL PAPER

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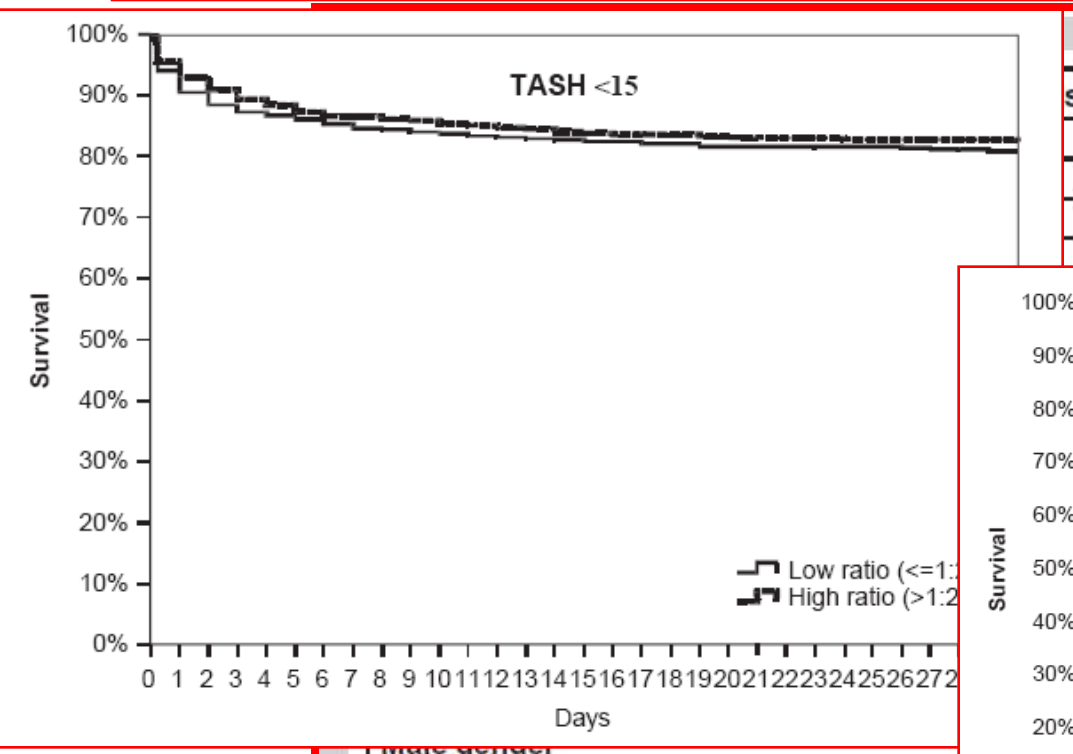
DOI: 10.1111/j.1423-0410.2011.01466.x

The effect of FFP:RBC ratio on morbidity and mortality in trauma patients based on transfusion prediction score

M. A. Borgman,[1] P. C. Spinella,[2] J. B. Holcomb,[3] L. H. Blackbourne,[4] C. E. Wade,[3] R. Lefering,[5,6,7] B. Bouillon[5,7] & M. Maegele[5,6,7]

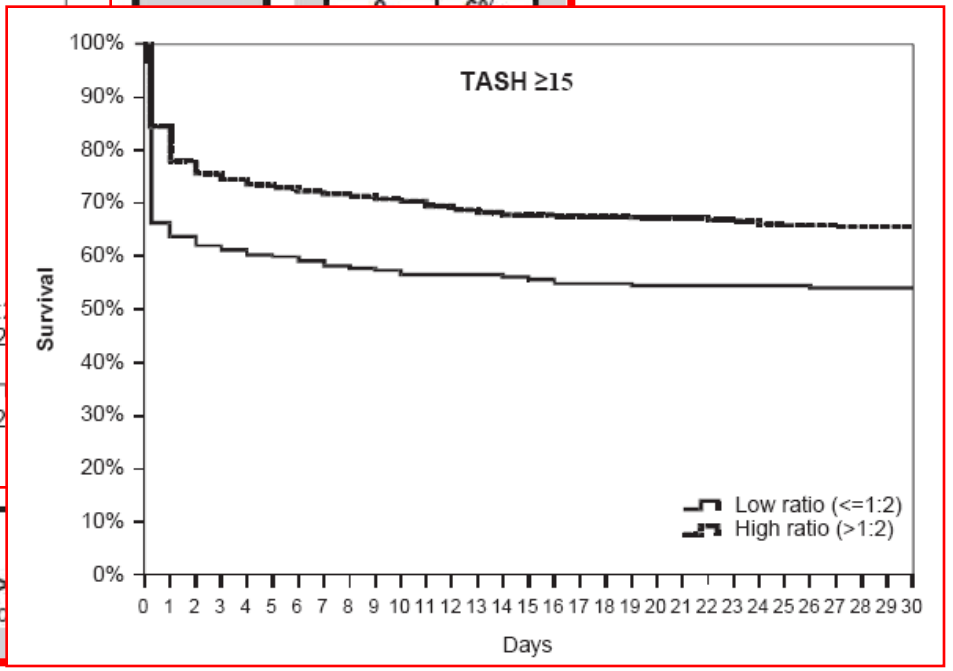


s Score

Probability for massive transfusion (MT)

TASH	P
1–8	< 5%

TASH >
(sum of score pc



In sintesi…

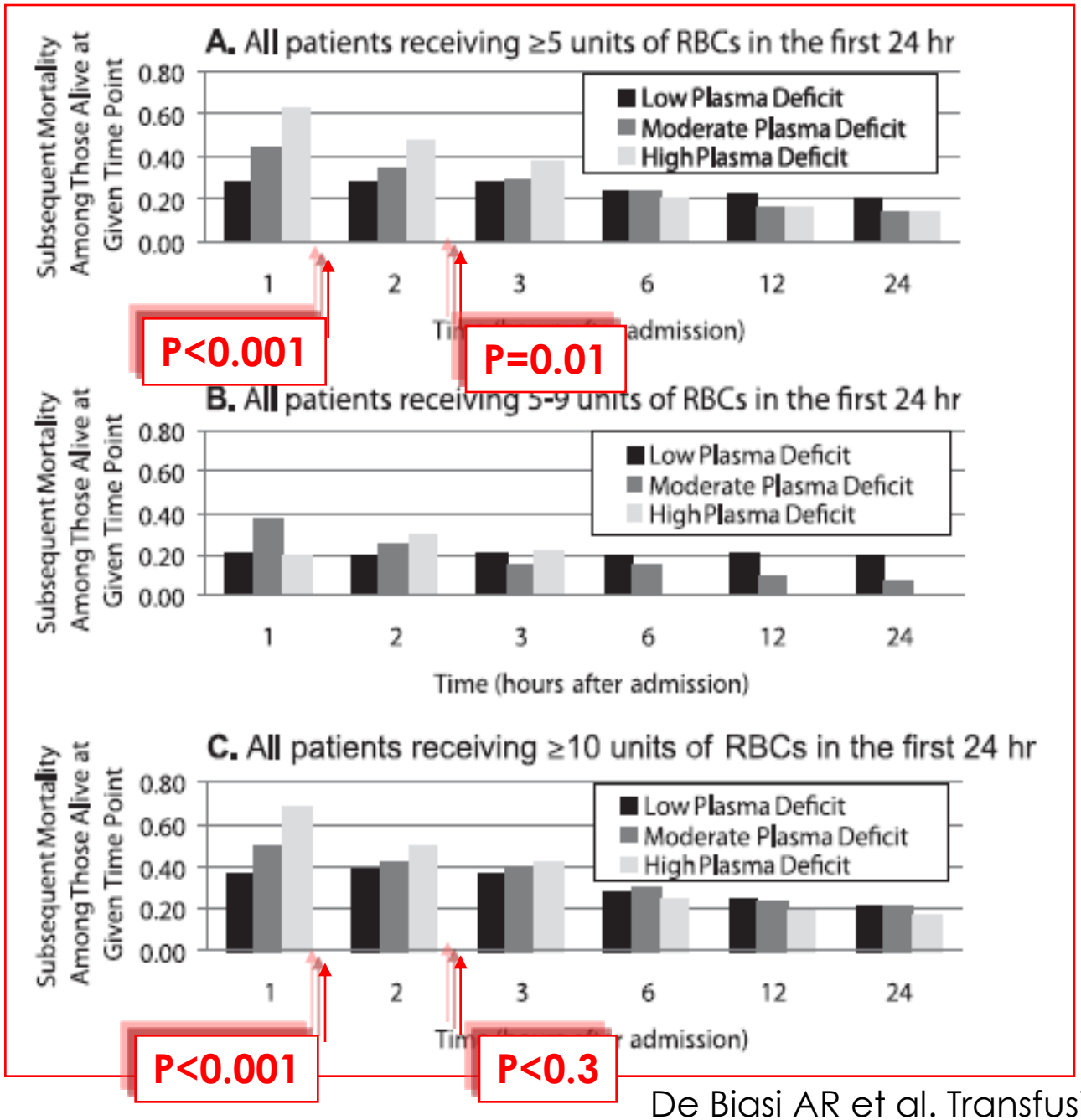
Il prodotto giusto

↓

Al paziente giusto

↓

Al momento giusto



De Biasi AR et al. Transfusion 2011

L'errore più grande....

Nessuno ha mai commesso un errore più grande di colui che non ha fatto niente perché poteva fare troppo poco.

Edmund Burke 1729-1797