

**Qualità ed appropriatezza
Better and Faster**



SAVE THE DATE

MILANO, ENTERPRISE HOTEL

**V CONGRESSO NAZIONALE
ORTHOPEA**

La trasfusione nel postoperatorio: quali trigger clinici e di monitoraggio

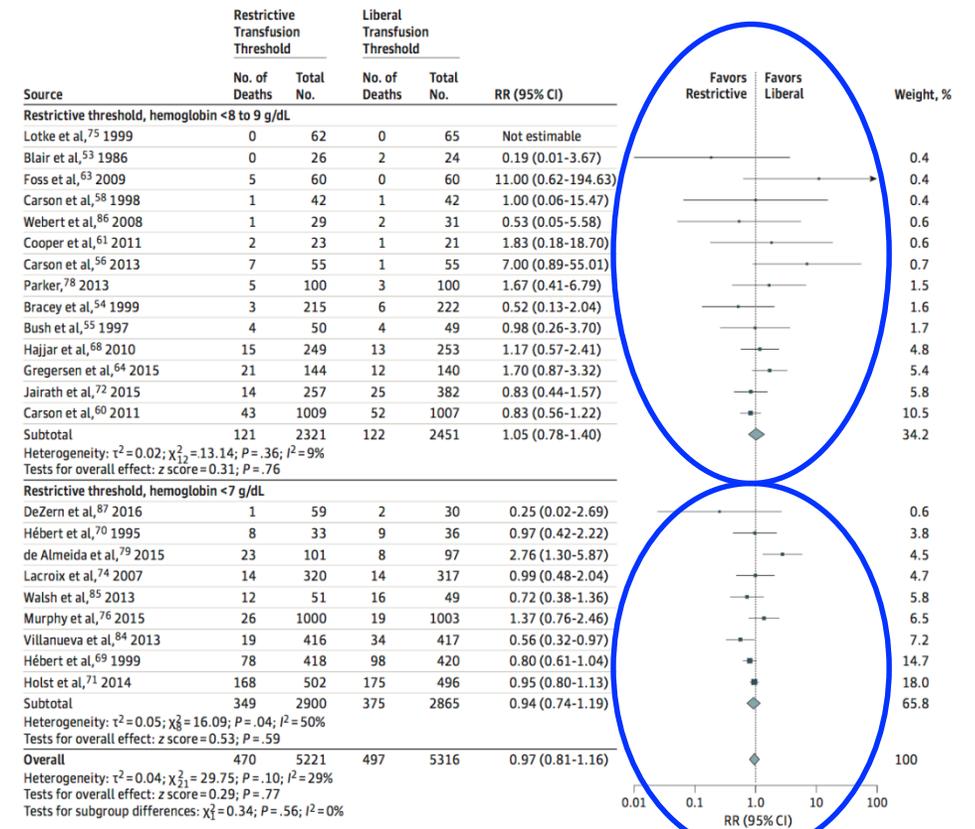
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Bergamo

Clinical Practice Guidelines From the AABB Red Blood Cell Transfusion Thresholds and Storage

Jeffrey L. Carson, MD; Gordon Guyatt, MD; Nancy M. Heddle, MSc; Brenda J. Grossman, MD, MPH; Claudia S. Cohn, MD, PhD; Mark K. Fung, MD, PhD; Terry Gernsheimer, MD; John B. Holcomb, MD; Lewis J. Kaplan, MD; Louis M. Katz, MD; Nikki Peterson, BA; Glenn Ramsey, MD; Sunil V. Rao, MD; John D. Roback, MD, PhD; Aryeh Shander, MD; Aaron A. R. Tobian, MD, PhD

Practice Guideline JAMA 2016 Nov 15;316(19):2025-2035.
doi: 10.1001/jama.2016.9185.

Figure 1. Comparison of 30-Day Mortality Using Restrictive vs Liberal Hemoglobin Transfusion Thresholds in Randomized Clinical Trials



The size of the data markers indicates the weight of the trial; RR, relative risk. Trials published after 2012 have been published since the prior AABB transfusion guidelines.

Clinical Practice Guidelines From the AABB Red Blood Cell Transfusion Thresholds and Storage

Recommendations

First Recommendation

The AABB recommends a restrictive RBC transfusion threshold in which the transfusion is not indicated until the hemoglobin level is 7 g/dL for hospitalized adult patients who are hemodynamically stable, including critically ill patients, rather than a liberal threshold when the hemoglobin level is 10 g/dL (strong recommendation, moderate quality evidence). For patients undergoing orthopedic surgery or cardiac surgery and those with preexisting cardiovascular disease, the AABB recommends a restrictive RBC transfusion threshold (hemoglobin level of 8 g/dL; strong recommendation, moderate quality evidence). The restrictive hemoglobin transfusion threshold of 7 g/dL is likely comparable with 8 g/dL, but RCT evidence is not available for all patient categories. These recommendations apply to all but the following conditions for which the evidence is insufficient for any recommendation: acute coronary syndrome, severe thrombocytopenia (patients treated for hematological or oncological disorders who at risk of bleeding), and chronic transfusion-dependent anemia.

Transfusion Requirements in Surgical Oncology Patients

A Prospective, Randomized Controlled Trial

Juliano Pinheiro de Almeida, M.D., Jean-Louis Vincent, M.D., Ph.D.,

Critical Care (London, England), 01 Jan 2013, 17(Suppl 2):P364-P364

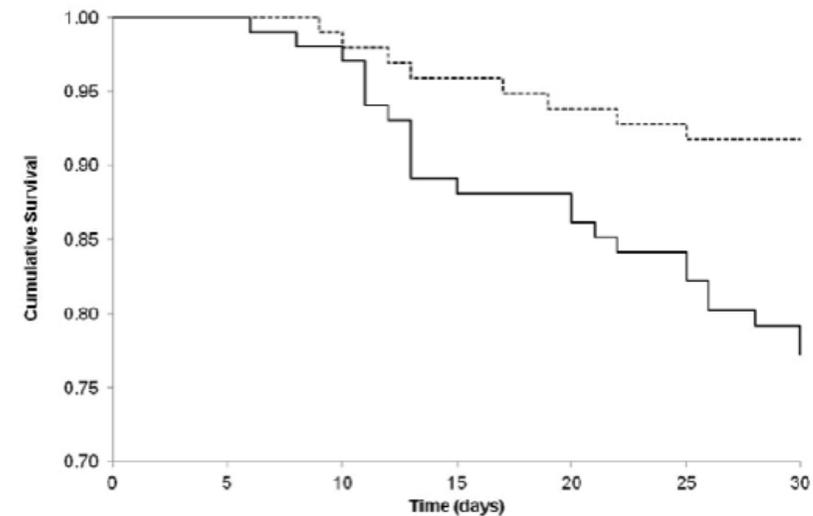


Fig. 2. Kaplan–Meier curves showing the probability of 30-day survival in patients randomized to a restrictive strategy of erythrocyte transfusion (transfusion when hemoglobin concentration <7 g/dl) and those randomized to a liberal strategy (transfusion when hemoglobin concentration <9 g/dl). The *P* value was calculated with the use of the log-rank test.

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Another possible explanation for the different finding is that patients with cancer receiving restrictive transfusions may be more susceptible to altered oxygen delivery and impaired tissue oxygenation during the postoperative period, leading to higher rates of complications and death. Jhanji *et al.*²² reported that patients having major abdominal surgery who had impaired microvascular flow after surgery experienced a higher rate of postoperative complications than did patients with normal microvascular flow (measured with sublingual capillaroscopy). Abnormalities in micro-

Should Transfusion Trigger Thresholds Differ for Critical Care Versus Perioperative Patients? A Meta-Analysis of Randomized Trials

Matthew A. Chong, MD¹; Rohin Krishnan, BSc¹; Davy Cheng, MD, FRCPC¹;
Janet Martin, PharmD, MSc(HTA)^{1,2}

Conclusions: The safety of restrictive transfusion strategies likely differs for critically ill patients versus perioperative patients. Further trials investigating transfusion strategies in the perioperative setting are necessary. (*Crit Care Med* 2018; 46:252–263)

JAMA | Special Communication

Clinical Practice Guidelines From the AABB

Red Blood Cell Transfusion Thresholds and Storage

Jeffrey L. Carson, MD; Gordon Guyatt, MD; Nancy M. Heddle, MSc; Brenda J. Grossman, MD, MPH; Claudia S. Cohn, MD, PhD; Mark K. Fung, MD, PhD; Terry Gernsheimer, MD; John B. Holcomb, MD; Lewis J. Kaplan, MD; Louis M. Katz, MD; Nikki Peterson, BA; Glenn Ramsey, MD; Sunil V. Rao, MD; John D. Roback, MD, PhD; Aryeh Shander, MD; Aaron A. R. Tobian, MD, PhD

LIMITAZIONI

L'uso delle trasfusioni di emoglobina può essere considerato un surrogato imperfetto del **delivery di ossigeno**

Postoperative Anemia and Exercise Tolerance After Cardiac Operations in Patients Without Transfusion: What Hemoglobin Level Is Acceptable?

Marco Ranucci, MD, Maria Teresa La Rovere, MD, Serenella Castelvechio, MD, Roberto Maestri, MS, Lorenzo Menicanti, MD, Alessandro Frigiola, MD, Andrea Maria D'Armini, MD, Claudio Goggi, MD, Roberto Tramarin, MD, and Oreste Febo, MD

(Ann Thorac Surg 2011;92:25–31)

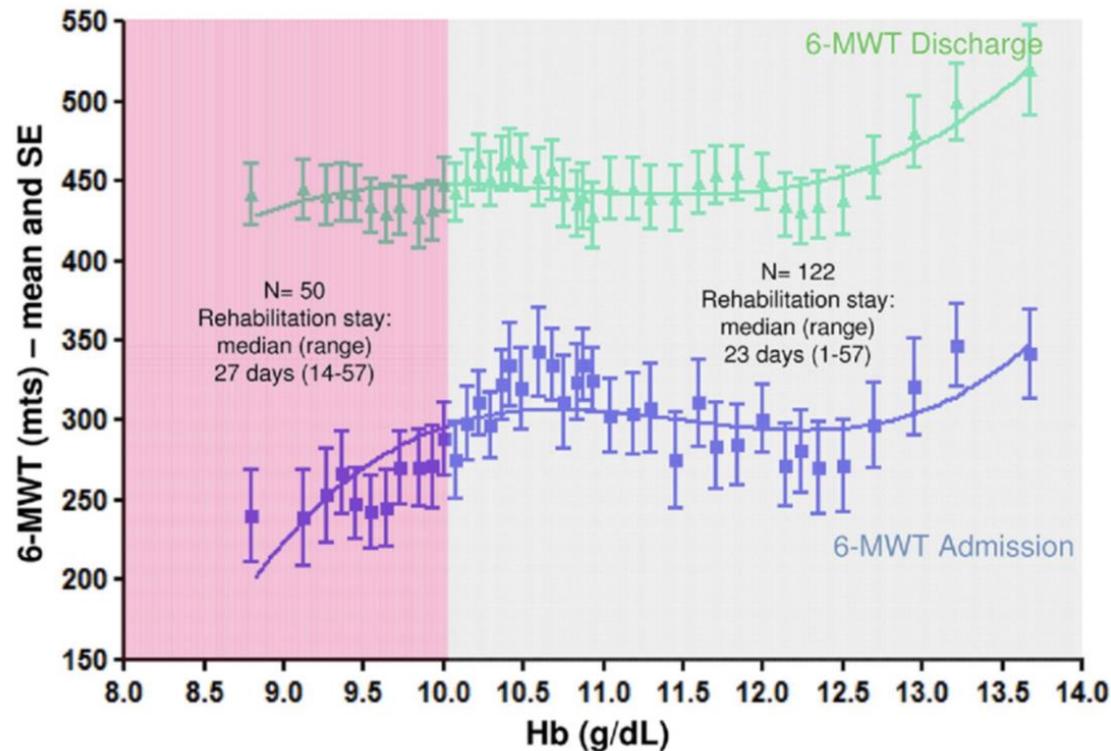


Fig 1. Exercise tolerance upon admission (blue line) and discharge (green line) from the rehabilitation hospital in patients without transfusions. The performance is dependent on the Hb value for values below 10 g/dL (pink area) and independent in patients with higher Hb values upon admission (gray area). (6-MWT = 6-minute walk test; Hb = hemoglobin; SE = standard error.)

Emoglobina e trasfusione



MORTALITA'

INFEZIONI

**RICOVERO
PROLUNGATO**

**INSUFFICIENZA
RENALE**

TRALI

ISCHEMIA

$$\dot{V}O_2 = \dot{Q} * (CaO_2 - C\bar{v}O_2)$$

Rapporto DO_2/VO_2 Ottimizzare il Delivery



$$DO_2 = CaO_2 \times CO$$

$$DO_2 = ((1.34 \times SaO_2 \times [Hb]) + paO_2 \times 0,003) \times FC \times SV$$

APPROPRIATEZZA

L'intervento necessario solo se
l'**ossigenazione ai tessuti**
non è sufficiente rispetto alle loro esigenze

L'altro piatto della bilancia:

La riduzione del consumo di O₂

British Journal of Anaesthesia **114** (2): 261–8 (2015)
Advance Access publication 29 October 2014 · doi:10.1093/bja/aeu365

BJA

CRITICAL CARE

Metabolic monitoring in the intensive care unit: a comparison of the Medgraphics Ultima, Deltatrac II, and Douglas bag collection methods

C. Black^{1,2*}, M. P. W. Grocott^{3,4} and M. Singer¹

RESEARCH

Open Access

The Shock Index revisited – a fast guide to transfusion requirement? A retrospective analysis on 21,853 patients derived from the TraumaRegister DGU[®]

Manuel Mutschler^{1,2*}, Ulrike Nienaber³, Matthias Münzberg⁴, Christoph Wölfel⁴, Herbert Schoechl^{5,6}, Thomas Paffrath¹, Bertil Bouillon¹, Marc Maegele¹ and The TraumaRegister DGU^{®7}

Can J Anesth/J Can Anesth (2012) 59:348–356
DOI 10.1007/s12630-011-9663-7



REPORTS OF ORIGINAL INVESTIGATIONS

Plasma methemoglobin as a potential biomarker of anemic stress in humans

La méthémoglobine plasmatique: un marqueur potentiel du stress anémique chez l'humain

Gregory M. T. Hare, MD, PhD · Alexander Mu, MD · Alexander Romaschin, MD ·
Albert K.-Y. Tsui, PhD · Nadine Shehata, MD · W. Scott Beattie, MD, PhD ·
C. David Mazer, MD



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**Annales
françaises
d'ANESTHÉSIE
ET DE RÉANIMATION**

Annales Françaises d'Anesthésie et de Réanimation 28 (2009) 522–530

Article original

Apport de la saturation veineuse centrale en oxygène dans la décision transfusionnelle postopératoire

Contribution of central venous oxygen saturation in postoperative blood transfusion decision

S. Adamczyk, E. Robin, O. Barreau, M. Fleyfel, B. Tavernier, G. Lebuffe, B. Vallet*

Fédération d'anesthésie-réanimation, CHU de Lille, rue Polonovski, 59037 Lille, France

Reçu le 7 septembre 2008 ; accepté le 25 mars 2009

Disponible sur Internet le 20 mai 2009

Confronto in 60 pazienti chirurgici ad alto rischio per verificare l'attendibilità del valore di ScVO₂ nella decisione di trasfondere un paziente, confrontandola con i criteri delle linee guida francesi per la trasfusione di sangue

Apport de la saturation veineuse centrale en oxygène dans la décision transfusionnelle postopératoire

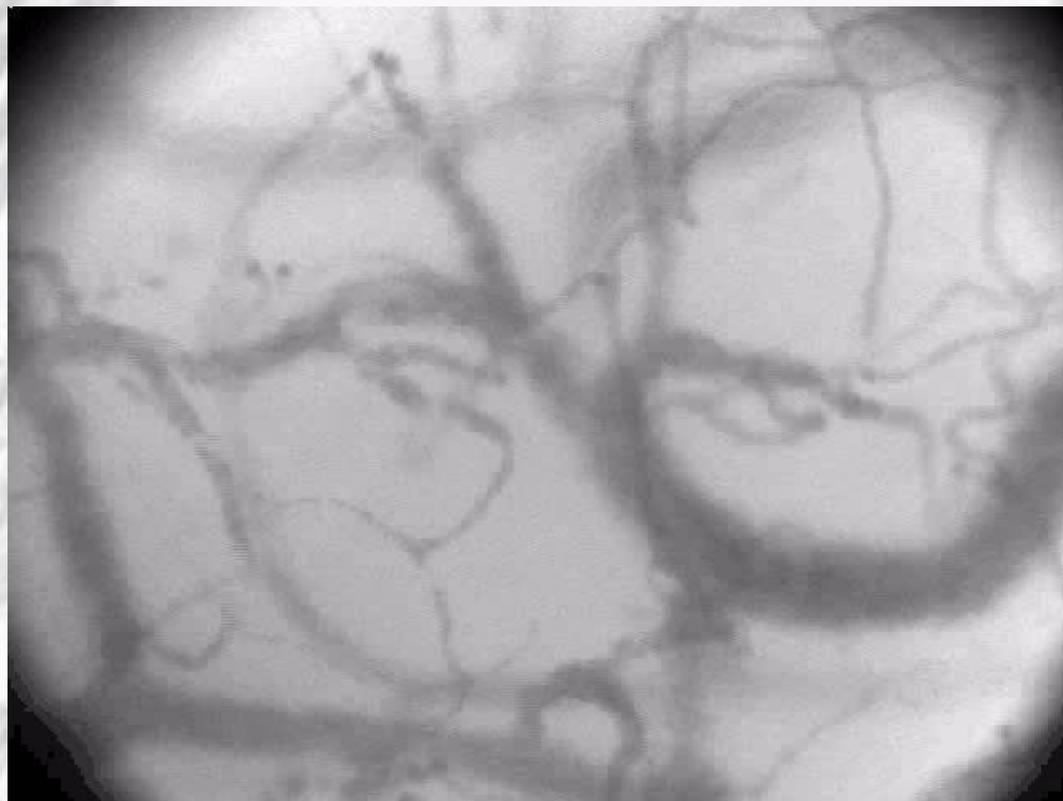
Contribution of central venous oxygen saturation in postoperative blood transfusion decision

S. Adamczyk, E. Robin, O. Barreau, M. Fleyfel, B. Tavernier, G. Lebuffe, B. Vallet *

- In questo studio i pazienti sono stati divisi retrospettivamente in due gruppi in base ai valori di ScVO₂ (< o >70%) precedenti alla trasfusione
- L' ScVO₂ si è dimostrato essere significativamente aumentato solo nei pazienti con livelli pretrasfusione inferiori al 70%
- 13 pazienti con SvcO₂<70% sono stati trasfusi non in accordo con le linee guida e tutti hanno beneficiato della trasfusione
- Il 54.5% dei pazienti trasfusi secondo le linee guida avevano ScVO₂ ≥ 70% e sono stati trasfusi in eccesso

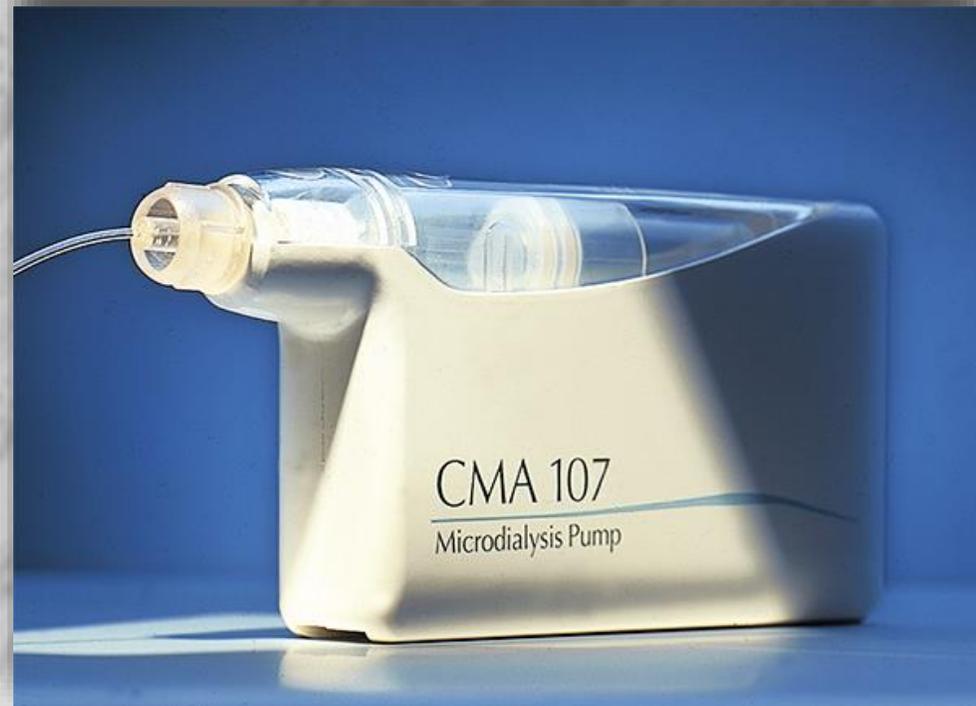


microcircolo



Acknowledgement: Dr Andreas Meier-Hellmann, Helios Klinik, Erfurt, Germany

Microdialisi: rapporto Lattato/Piruvato



Incremental value of noncerebral somatic tissue oxygenation monitoring for patients undergoing surgery

Mu, Dong-Liang^a; Wang, Dong-Xin^a; Meng, Lingzhong^b

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Current Opinion in Anaesthesiology: [February 2019 - Volume 32 - Issue 1 - p 50-56](#)

doi: 10.1097/ACO.0000000000000672



Carta 1: National Early Warning Score (NEWS)

PARAMETRI FISIOLGICI	3	2	1	0	1	2	3
Frequenza del respiro	≤8		9 - 11	12 - 20		21 - 24	≥25
Saturazione d'ossigeno	≤91	92 - 93	94 - 95	≥96			
Ossigeno supplementare		Sì		No			
Temperatura corporea	≤35,0		35,1 - 36,0	36,1 - 38,0	38,1 - 39,0	≥39,1	
Pressione sistolica	≤90	91 - 100	101 - 110	111 - 219			≥220
Frequenza cardiaca	≤40		41 - 50	51 - 90	91 - 110	111 - 130	≥131
Stato di coscienza				Vigile			Richiamo verbale, dolore provocato, coma

PATIENT BLOOD MANAGEMENT

Original article

Postoperative patient blood management: transfusion appropriateness in cancer patients

Lucia Merolle¹, Chiara Marraccini¹, Erminia Di Bartolomeo¹, Maria T. Montella²,
Thelma A. Pertinhez^{1,3}, Roberto Baricchi¹, Alessandro Bonini¹

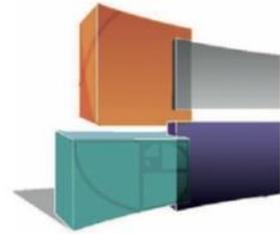
Blood Transfus 2020; 18: 359-65 DOI 10.2450/2020.0048-20

1. a preliminary audit on 200 cancer patients (Audit 1, from January to May 2014) aimed at evaluating RBC transfusion appropriateness after major cancer surgery before PBM implementation;
2. a PBM training programme (seminars and training sessions) was organised to ensure SIPO personnel (both physicians and nurses) followed Italian Society of Transfusion Medicine and Immunohaematology (SIMTI) recommendations. An intermediate audit (Audit 2, from January to July 2015) was conducted on 200 cancer patients after the training programme to verify its impact on RBC transfusion appropriateness;
3. introduction of Points Of Care (POCs) for the continuous non-invasive monitoring of haemoglobin (Hb) levels (Radical-7 Pulse CO-Oximeter device, Masimo Corp., Irvine, CA, USA) in the SIPO ward. POCs were intentionally used in support of and not in place of the routine analyses. A final audit (Audit 3, from May 2016 to October 2017) was conducted on 200 cancer patients monitored with POCs.

Results - RBC transfusion appropriateness in the postoperative period of cancer patients rose from 38% to 75% after seminars, and reached 79% after the introduction of POC. The mean number of RBC units each patient received remained unchanged after training sessions (1.8 units/patient) while the introduction of POCs saw a simultaneous decrease in the number of prescribed units (1.3 units/patient).

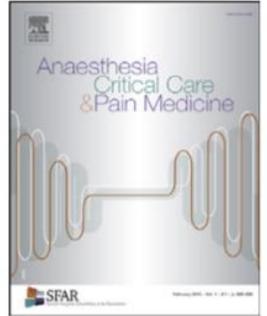


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Société Française d'Anesthésie et de Réanimation



Editorial

Postoperative transfusion thresholds: To wait or to anticipate? This is the question



1

First, based on the study by Irisson et al. [10], we can estimate a linear decrease in Hb concentration during the first three postoperative days. It seems

Annales Françaises d'Anesthésie et de
Réanimation

Volume 32, Issue 3, March 2013, Pages 170-174

Article original

Cinétique du saignement en
chirurgie orthopédique
majeure : implications pour la
prise en charge périopératoire
Perioperative management
based on kinetics of bleeding
during total primary
arthroplasty

E. Irisson ^a  ... L. Bellamy ^d

2

There is an incompressible time required for routing tubes, performing laboratory exams, validating results and posting (about 4 h). The

3

It seems surprising that 32% of patients with postoperative Hb levels < 8 g/dL didn't have any intraoperative or postoperative care unit Hb value lab tests, even following potentially haemorrhagic surgeries.

The concept of a transfusion trigger is questionable and should not be applied in isolation, but rather in the context of bleeding kinetics (i.e. a non-static model). As concerns orthopaedic surgery, postoperative bleeding is at least as important as intraoperative bleeding [11]. A patient who leaves the recovery room with an Hb level at 9 g/dL will necessarily be anaemic on day 1.

In conclusion, transfusion thresholds are useful as simple warning signals and the implementation of an individualized patient management program based on bleeding kinetics, patient status and comorbidities and the type of surgery is now mandatory. From a general point of view, severe postoperative anaemia is a marker for the efforts we all need to make in order to improve postoperative patient care.

Caso clinico 1

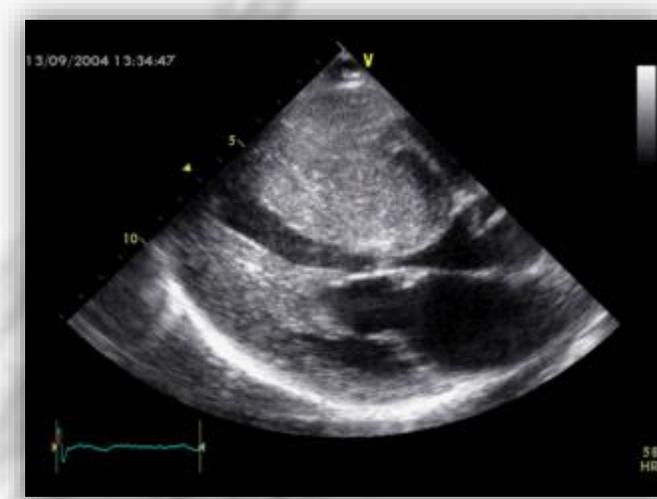
Ragazzo di 17 anni, non comorbidità

- Trauma maggiore della strada
- Hb partenza 14.1
- Hb postintervento 9,5
- **Controllo di Hb a 72 h: 7.5**

?



Caso clinico 2



Paziente di 65 aa, ospedalizzato per infezione delle vie urinarie

- Cardiopatia ipertrofica
- Quadro clinico: ipoteso, lattati in progressivo aumento
- Controllo di Hb : 7.5



Caso clinico 3



Paziente di 70 aa, entrato dall'ospedale dal PS per anemizzazione in corso di ematemesi

- Storia di gastropatia erosiva
- Quadro clinico: normoteso, lattati silenti, buona pressione
- **Controllo di Hb : 7.5**



Caso clinico 4



Paziente di 65 aa, ricoverato da 30 gg in Terapia intensiva, s/p polmonite COVID

- Allettamento, nutrizione enterale, tracheostomia con ventilazione assistita
- Quadro clinico: normoteso, lattati silenti, SvcO₂ 75%
- **Controllo di Hb : 7.5**



