7^ Conferenza Nazionale dei Servizi Trasfusionali
Vicenza | 24-26 maggio 2023
SIMTI

Cos'è realmente il PBM?

Sergio D'Antico

S.C. Banca del Sangue e Immunoematologia

A.O.U. Città della Salute e della Scienza di Torino

Il sottoscritto, **Sergio D'Antico**, in qualità di Relatore
dichiara che

nell'esercizio della Sua funzione e per l'evento in oggetto, NON È in alcun modo portatore di interessi commerciali propri o di terzi; e che gli eventuali rapporti avuti negli ultimi due anni con soggetti portatori di interessi commerciali non sono tali da permettere a tali soggetti di influenzare le sue funzioni al fine di trarne vantaggio.

SIMTI
PRO

PBM: un cambio di mentalità?

“I concetti più difficili possono essere spiegati all'uomo più lento di comprendonio se non ne ha già un'idea; ma la cosa più semplice non può essere chiarita all'uomo più intelligente se è fermamente convinto di sapere già, senza ombra di dubbio, ciò di cui si parla.”

Leo Tolstoy

The following was the year before Karl Landsteiner discovered the ABO blood groups

INTERCOLONIAL MEDICAL CONGRESS OF AUSTRALASIA.

FIFTH SESSION.

BRISBANE, QUEENSLAND.

SEPTEMBER, 1899.

SECTION OF MIDWIFERY AND GYNÆCOLOGY.

THE SAVING OF BLOOD IN GYNÆCOLOGICAL OPERATIONS.

By Archibald Watson M.D. Paris, F.R.C.S. Eng.,
Professor of Anatomy and Physiology in the Adelaide University.

Mr. President,—

Dr. Byrne, the courteous secretary of your Section, has paid me the compliment of inviting me to make some remarks on the saving of blood in gynæcological operations within the pelvis, on the principle, I presume, that "spectators see most of the game." Often, however, I have only appeared on the scene after the game was quite over, and in my opinion this latter factor should make any comments from one outside of your ranks appear less trivial than they otherwise might.

… The trasfusion of blood may be a life-saving procedure under certain circumstances, it may be a necessary supportive measure under orthers, but it is too often undertaken when the doctor can think of nothing else to do after all other therapy has failed. …

The New England **1936**
Journal of Medicine

VOLUME 215 SEPTEMBER 3, 1936 NUMBER 10

The Massachusetts Medical Society

SECTION OF MEDICINE

Lower Section Room, Municipal Auditorium, Springfield,
Tuesday, June 9, 1936, 2 p. m.

PRESIDING:
Dr. William D. Smith, Boston, Chairman.
Dr. Laurence B. Ellis, Boston, Secretary.

CHAIRMAN SMITH: Will the meeting please come to order.

The first duty of the Section is the selection of the Chairman and the Secretary for the coming year, and, in accordance with the usual custom, the Chair will appoint as the Nominating Committee to suggest names Dr. Dwight O'Hara, Chairman, Dr. George R. Minot and Dr. Chester M. Jones. They will report later and abide the pleasure of the Section.

I do not see Dr. Hamilton here. Apparently she is delayed, so we will pass on to the second paper. To those of us who have had our moments of indecision whether to transfuse or not to transfuse in some of our medical problems, Dr. Bock's paper should be of interest. His subject is "The Use and Abuse of Blood Transfusions."

THE USE AND ABUSE OF BLOOD TRANSFUSIONS*

BY ALTON V. BOCK, M.D.†

THE mass of literature on the subject of blood transfusions accumulated during the past twenty-five years is so great and most of it so readily available that one shows lack of temerity at least to attempt a discussion of the subject before this audience. The transfusion of blood may be a life-saving procedure under certain circumstances, it may be a necessary supportive measure under others, but it is too often undertaken when the doctor can think of nothing else to do after all other therapy has failed. My objective today is to discuss briefly the common surgical and medical conditions for which transfusion of blood is indicated, in which we can expect good physiological results, and to point out those conditions in which it is little more than a gesture, done, as it were, to satisfy the urge to do something.

SURGICAL INDICATIONS

plish two things, restoration of diminished blood volume and elevation of low blood pressure. Blood volume may be reduced by gross hemorrhage or it may be reduced by blood lost in the periphery of the body, as suggested by Freeman,[1] or by extravasation of serum through damaged capillaries. If hemorrhage has occurred, transfusion of blood, together with such supportive measures as heat, is the immediate indication. No other therapy is so successful. In shock without much or any hemorrhage, 6 per cent gum acacia in normal saline may be just as effective as blood, and has the advantage of greater availability. Repeated transfusions of blood or infusions of acacia may be necessary but, are usually not, if no delay has occurred in the first instance. Acacia may be used as a supportive measure until transfusion can be arranged. Prolongation of the shock state results in tissue asphyxia, capillary dam-

The number of patients that are reported here indicates that this adverse effect may be occurring more frequently than is recognized generally. In 1978, Thien et al.[3] reported that three of 30 patients who were treated with prazosin developed incontinence but the paucity of reported cases since makes a 10% incidence most unlikely. Voluntary reports to an adverse drug reaction reporting scheme can not be used to calculate the incidence of adverse effects for the reporting is incomplete and, in Australia, the prescribing base is not known. However, prazosin was the 33rd most-commonly prescribed drug in the Australian Pharmaceutical Benefits scheme in 1984/1985; 1.165 million prescriptions were dispensed in a 12-month period. Some of the reports of incontinence may have been stimulated by publicity in Australia through the *Australian Adverse Drug Reactions Bulletin*,[7] but 16 of the reports had been received before its distribution.

Urinary incontinence is an infrequent adverse effect of drugs and, in a recent review, only neuroleptic agents and drugs that affected the alpha-adrenergic receptor (phentolamine, phenoxybenzamine, methyldopa, reserpine and prazosin) are mentioned.[1] In addition, recent reviews of urinary incontinence[8] have not mentioned drugs as a cause of incontinence even when the focus has been on patients who have suffered a stroke who presumably have a high prevalence of hypertension.[9]

On the basis of the Australian experience, caution is suggested in the use of prazosin in elderly women. Urinary incontinence that develops in a patient who is taking prazosin is an indication for dosage reduction or drug withdrawal and will usually result in a return to continence.

Acknowledgements

This report was made possible by voluntary reporting to ADRAC. Thanks are due to members of ADRAC for assistance in preparation of this report.

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(Received July 17; accepted September 6, 1987)

POINT OF VIEW

The paradigm shift in blood transfusion

James P. Isbister

Since the discovery of the ABO blood-group system in 1900 by Karl Landsteiner, the history of blood transfusion has been one of continual progress, albeit with fits and starts, particularly in times of war. The collection, preservation and fractionation of blood is now a sophisticated science which was accepted until recently by donors, medical practitioners and patients as one of the most essential, well run and safe forms of medical therapy.[1] Since the development of blood banks, the provision of blood and blood products in most countries of the world has been dominated by the centralist bodies, with the system revolving around the donor.

from the donor to the recipient.

It is important to remember that in the early days of blood transfusion the procedure revolved around the patient's needs, but the donor was involved intimately in the process; the clinician was responsible for both the donor and the recipient, and on many occasions the clinician performed the blood-compatibility testing also. We see in those early days of blood transfusion the ultimate physical link between the donor and the recipient, which was overseen

The number of patients that are reported here indicates that this adverse effect may be occurring more frequently than is recognized generally. In 1978, Thien et al.[3] reported that three of 30 patients who were treated with prazosin developed incontinence but the paucity of reported cases since makes a 10% incidence most unlikely. Voluntary reports to an adverse drug reaction reporting scheme can not be used to calculate the incidence of adverse effects for the reporting is incomplete and, in Australia, the prescribing base is not known. However, prazosin was the 33rd most-commonly prescribed drug in the Australian Pharmaceutical Benefits scheme in 1984/1985; 1.165 million prescriptions were dispensed in a 12-month period. Some of the reports of incontinence may have been stimulated by publicity in Australia through the *Australian Adverse Drug Reactions Bulletin*,[7] but 16 of the reports had been received before its distribution.

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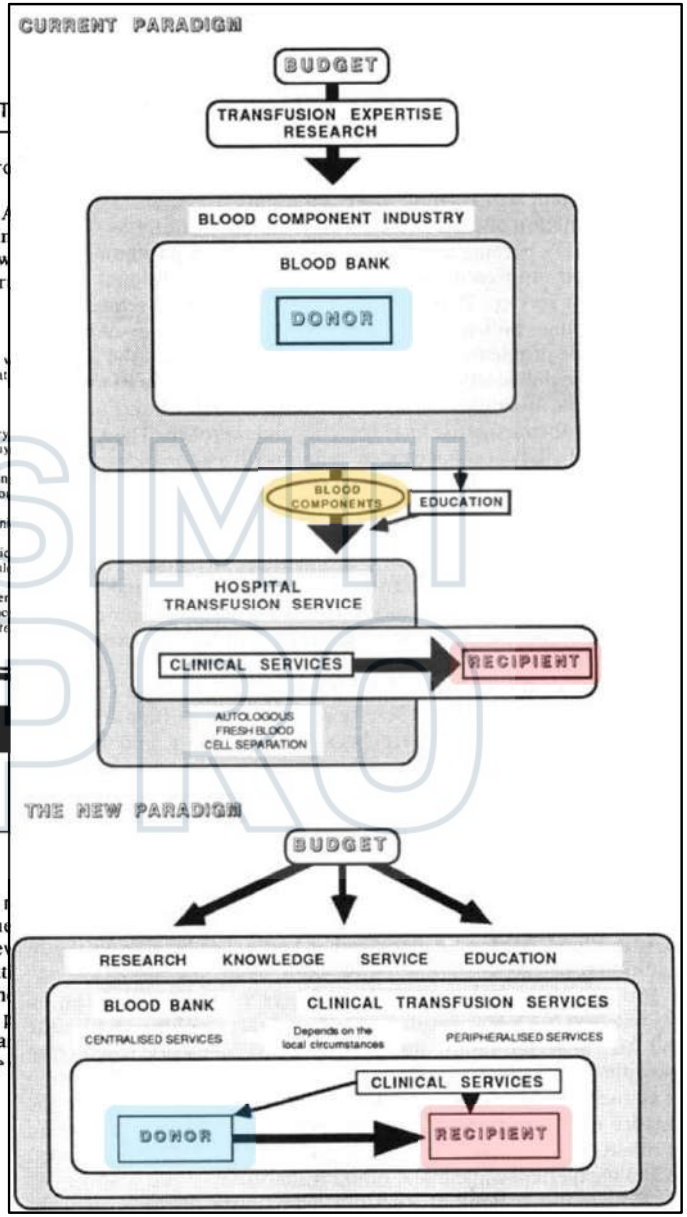


TRANSFUSION Volume 56, March2016

Patient blood management: the global view

Aryeh Shander,[1,2] James Isbister,[3] and Hans Gombotz[4]

change models

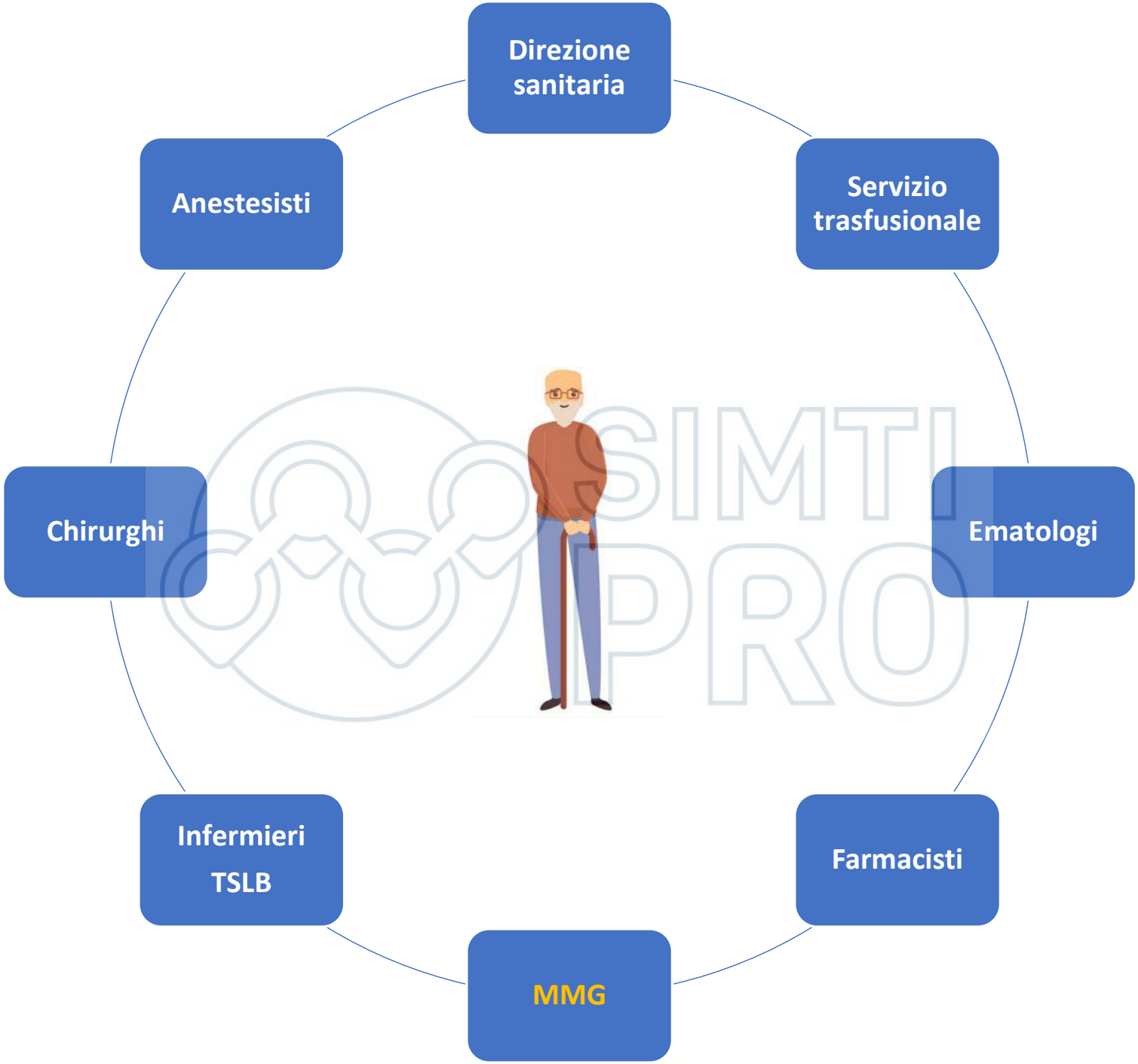
Lewin

Kotter

In the past, various change management models (especially for business and industry) have been created.[57-65] One early model of change, which was developed by the German-American psychologist Lewin,[66] served as a basic concept for Kotter's model.[61,67] Lewin described change as a three-stage process: he called the first stage "unfreezing," the second stage "change," and the third and final one "freezing." John Kotter's eight-step model,[68] on the other hand, integrates more important elements that are common in change management processes. It has already been successfully applied in many organizations in the industrial sector and, specifically, it aims to integrate the PBM concept in the Western Australia patient blood management program.[69] Thus, Kotter's model was chosen to be used to create the European PBM implementation guide.[61] His overarching concept will determine all the clinical and organizational measures to be adopted and adapted to the particular institutions.[60,61,70]

SIMTI
PRO

PBM: necessità / opportunità di interazione multidisciplinare?


Direzione sanitaria
Servizio trasfusionale
Ematologi
Farmacisti
MMG
Infermieri TSLB
Chirurghi
Anestesisti

British Journal of Anaesthesia **109** (1): 55–68 (2012)
Advance Access publication 24 May 2012 · doi:10.1093/bja/aes139

BJA

Patient blood management in Europe

A. Shander[1*], H. Van Aken[2], M. J. Colomina[3], H. Gombotz[4], A. Hofmann[5], R. Krauspe[6], S. Lasocki[7], T. Richards[8], R. Slappendel[9] and D. R. Spahn[10]

Table 1 Estimates of preoperative anaemia prevalence and transfusion rates in orthopaedic surgery patients in selected European countries. ESA, erythropoiesis-stimulating agents; Hb, haemoglobin; THR, total hip replacement; TKR, total knee replacement

Country	Prevalence of preoperative anaemia	Frequency of transfusion use
Austria	16–18%	TKR=41.3% (varied from 12% to 87% between centres); THR=42.5% (varied from 16% to 85% between centres); <10% receive predonated autologous blood; patients with anaemia receive 2× amount of blood received by those without anaemia
France	Estimate: ~20% (no precise data)	Estimate: ~40% (despite ESA use)
Germany	Not known	Not known
Spain	In general, 18.3% (but almost one-third of patients have Hb levels of <13 g dl^{-1})[91]	Transfusion risk (varies among centres): Hb ≤10 g dl^{-1}: 93.2%; Hb=14 g dl^{-1}: 19.75%; Hb=13 g dl^{-1}: 40%
Switzerland	Estimates in selected centres: 16–21%	Estimates in selected centres: primary repair: 19–22%; repeat operations: 30–40%
The Netherlands	Estimate of anaemia (Hb levels of <13 g dl^{-1}): 15–20% for major orthopaedic surgery	TKR<2%; THR<5%
UK	<12 g dl^{-1} in 15% and <13 g dl^{-1} in 37% of patients (within 28 days of surgery)	57% of patients with a preoperative Hb level of <12 g dl^{-1}; 20% of patients with a preoperative Hb level of ≥12 g dl^{-1}

Blood Transfus 2015; **13**; 370-9

REVIEW

Pre-operative anaemia: prevalence, consequences and approaches to management

Manuel Muñoz[1], Susana Gómez-Ramírez[2], Arturo Campos[3], Joaquín Ruiz[3], Giancarlo M. Liumbruno[4]

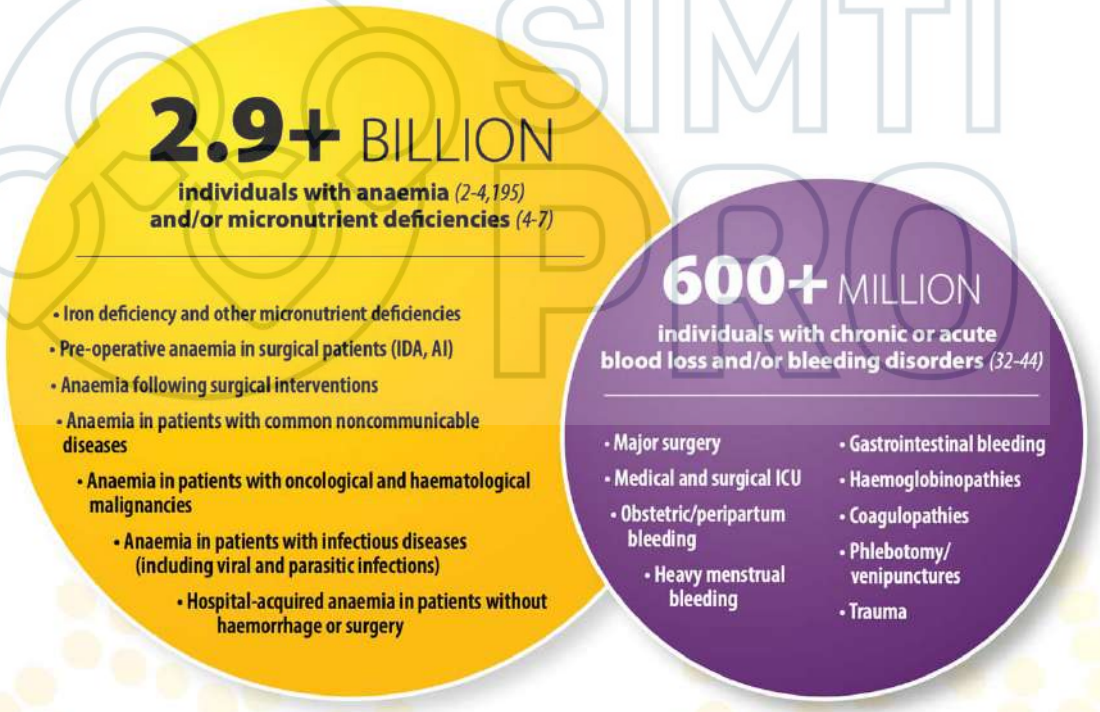
… In **18** large observational studies encompassing over **650,000** surgical patients, the mean prevalence of pre-operative anaemia was around **35%**, varying between 10.5% and 47.9%

World Health Organization

POLICY BRIEF 2021

"THE URGENT NEED TO IMPLEMENT PATIENT BLOOD MANAGEMENT"

Fig. 1. Global prevalence of anaemia, blood loss and bleeding disorders and their etiologies



Critchley HOD, Munro MG, Shakur-Still H, Roberts I.
Menstruation should not be overlooked in control of anaemia.
Lancet. 2021;397:26.

Mansour D, Hofmann A, Gemzell-Danielsson K.
A review of clinical guidelines on the management of iron deficiency and iron-deficiency anemia in women with heavy menstrual bleeding.
Adv Ther. 2021;38:201–225.

NO WOMAN NEED BECOME ANAEMIC

Most women are anaemic at some time in their lives, though it is not nearly so common as it used to be. Gone are the wan, romantic maidens of Queen Victoria's time.

THERE is no need now for any Australian to go without the essentials for normal blood formation, but many still do — some through ignorance, some because they prefer such things as alcohol, but most through carelessness.

The housewife often feeds her family, then settles down with a cup of tea and a slice of bread and jam, poor stuff for making good red blood!

Besides, anaemia is twice as common in women and adolescent girls as in men.

Anaemia really means a shortage in the red blood cells of the red pigment, haemoglobin, which carries oxygen all over the body. There may be insufficient red blood cells or insufficient red pigment in each.

The red cells are manufactured in the bone marrow from a variety of substances, some of which are made in other parts of the body, while others are taken in the diet.

Difficulties

There can be difficulties in manufacture, and absence of certain essentials can stop production.

Even if the manufacturing side is perfect, many things can happen to the cells; certain germs, drugs, and chemicals may destroy blood, and a common problem is blood loss from ulcers in the stomach or duodenum, from piles, and even heavy periods.

There are also times in our lives when there are greater demands on our blood, and it becomes extremely important that our bodies should be supplied with the right materials.

If I tell you something about these times and about the right materials, you will be better off than if I give you a long list of symptoms and say, "Go to the doctor if you get one."

After all, lots of very pale women have quite red lips, even without their lipstick, and are not anaemic at all.

And quite a lot of women who feel a bit tired and short of wind, and secretly imagine that they "have a heart," are suffering from anaemia that could be easily treated by attention to their diet.

You may be rather shocked to hear it, but liver injections are no good as a tonic.

Recent research work has established that liver and vitamin B_{12} injections, which were once considered to have a general tonic effect, really have none.

Patients who were given injections of water did just as well as those who had liver injections or B_{12}, provided they all got a diet containing the essentials and believed they were getting the tonic.

The periods in life that make special demands on blood supplies include those of most active growth—infancy and adolescence.

The baby grows very fast from birth to two years, and anaemia is common, particularly in premature babies, twins, and children who have had a lot of infections, even just colds.

Milk, with its low iron content, is often their main article of diet, so you must be alert to the results of infections and the need for the dietary extras.

At puberty bodies demand extra iron and calcium and proteins for growth, and there's actually a big increase in the quantity of their blood.

All girls from puberty onwards lose blood regularly with their monthly periods; not a great deal of blood, and nothing that a normal girl can't cope with.

However, the blood has to be replaced, and the girls who are overworking or careless with their diet, and harassed young mothers may not always get the essentials.

HELP FOR HOUSEWIVES by Clair Isbister,

Australian doctor and housewife. This is our third extract from her book, "What is Your Problem, Mother?"

Then there is pregnancy and lactation. Babies get all their body-building substances from their mothers.

During birth the mother loses more blood, and while she feeds the baby at the breast she passes sufficient iron into the milk to give her baby enough.

Artificially fed babies, on cow's milk for five months without extra food, often get anaemic because nature didn't arrange for a cow to add this extra iron to milk. Her calf goes out and chews grass at a very tender age.

It is estimated that the process of carrying, bearing, and feeding a child needs a third of the mother's iron and she has to supply it to the baby.

The baby of an anaemic mother is not anaemic at birth, because nature sees that it gets its requirements, but it soon becomes anaemic later on owing to a lack of reserves of iron.

What do we need for making blood? I've mentioned iron several times, but the research chemists have identified many other substances that the body itself cannot make but which are needed.

They include vitamin B_{12}, folic acid, unknown factors that occur in yeast and liver, certain fats, and metals such as iron, copper, and cobalt.

Don't think you should suck pennies, or have vitamin B_{12} injections. Most of these substances are needed in very small quantities and a good diet of meat, eggs, liver, cheese, and wholemeal cereals contains them all.

In certain illnesses, when food is not being properly absorbed from the bowel, folic acid or vitamins, for instance, may have to be added.

If the anaemia has already developed, single essential substances may have to be replaced in bigger quantities than the diet can supply.

But that is the doctor's job; just now I am talking about prevention.

Other substances are needed for the body to be able to use the essential materials.

You need vitamin C and the vitamin B group, and certain proteins.

To supply vitamin B, Vegemite, Marmite, and wholemeal bread are easy to get; oranges and tomatoes provide vitamin C.

Blood-making isn't just a matter of chemistry. Hormones are very important; thyroid, ovaries, pituitary, and adrenal glands all work together in harmony, and a discord can cause anaemia.

Many middle-aged women have a mild thyroid deficiency and the strange anaemia of Victorian times, which used to affect young girls so severely that they died, was partly due to iron deficiency, but also to some ovarian disturbance at puberty.

Not silly

It may sound silly, but it is true that happiness and emotional balance matter probably as much as balanced diet in preventing anaemia.

I must sound a funny doctor warning people against pills and potions, but I am talking about preserving health and preventing anaemia.

I prescribe iron pills for iron-deficiency anaemia, and injections for pernicious anaemia just the same as other doctors.

And I don't disapprove of those extra vitamins in hot milk at examination time or some extra iron and vitamins during pregnancy.

I'm pointing out that there are still many essential substances in the good food provided by nature that the scientists don't know about yet, so don't pin your faith on pills and tonics and refined foods.

July 23, 1958 PRICE 9d

THE AUSTRALIAN Women's Weekly

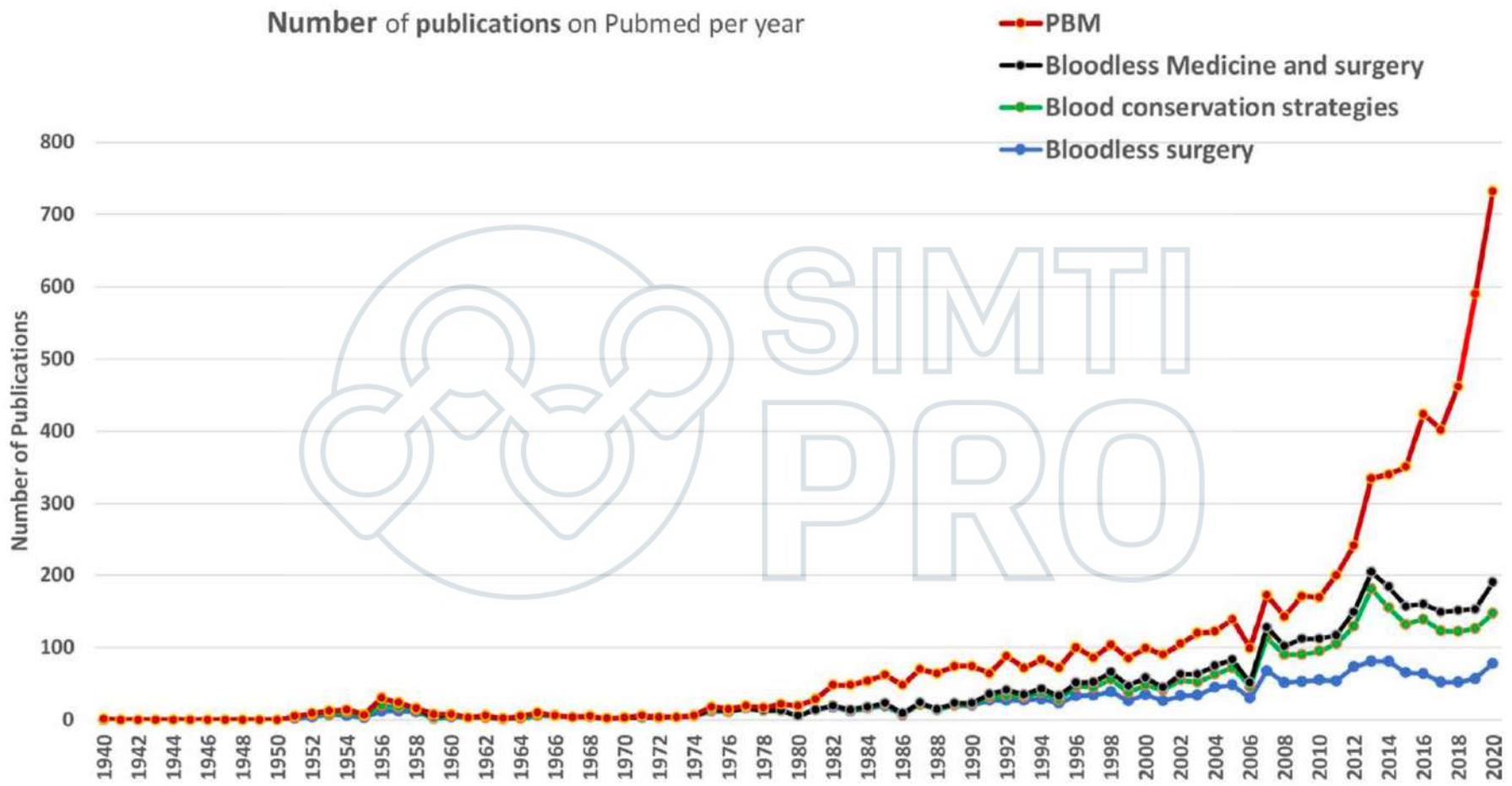
Target WHO per il 2025:
riduzione del 50% delle donne con anemia

Fig. 4. Stakeholders in multidisciplinary and multiprofessional PBM

SIMTI
PRO

PBM: evidence based medicine?

ANESTHESIA & ANALGESIA September 2022 • Volume 135 • Number 3



British Journal of Anaesthesia **109** (1): 55–68 (2012)
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BJA

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[1] Department of Anaesthesiology, Critical Care Medicine, Pain Management and Hyperbaric Medicine, Englewood Hospital and Medical Center, 350 Engle Street, Englewood, NJ, USA
[2] Department of Anaesthesiology and Intensive Care, University Hospital, Münster, Germany
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[4] Department of Anaesthesiology and Intensive Care, General Hospital, Linz, Austria
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[6] Department of Orthopaedics, University Hospital Düsseldorf, Heinrich-Heine-University Düsseldorf, Düsseldorf, Germany
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- Evidence of the clinical and economic disadvantages of RBC transfusion in treating perioperative anaemia has prompted recommendations for its restriction and a growing interest in approaches that rely on patients' own (rather than donor) blood.
- Patient blood management aims to minimize the need for transfusion.
- Early detection and treatment of anaemia and minimizing blood loss are key strategies.

JAMA. 2019;321(10):983-997

JAMA | Special Communication

Patient Blood Management Recommendations From the 2018 Frankfurt Consensus Conference

Markus M. Mueller, MD; Hans Van Remoortel, PhD; Patrick Meybohm, MD, PhD; Kari Aranko, MD, PhD; Cécile Aubron, MD, PhD; Reinhard Burger, PhD; Jeffrey L. Carson, MD, PhD; Klaus Cichutek, PhD; Emmy De Buck, PhD; Dana Devine, PhD; Dean Fergusson, PhD; Gilles Folléa, MD, PhD; Craig French, MB, BS; Kathrine P. Frey, MD; Richard Gammon, MD; Jerrold H. Levy, MD; Michael F. Murphy, MD, MBBS; Yves Ozier, MD; Katerina Pavenski, MD; Cynthia So-Osman, MD, PhD; Pierre Tiberghien, MD, PhD; Jimmy Volmink, DPhil; Jonathan H. Waters, MD; Erica M. Wood, MB, BS; Erhard Seifried, MD, PhD; for the ICC PBM Frankfurt 2018 Group

JAMA. 2019;321(10):983-997

JAMA | Special Communication

Patient Blood Management Recommendations From the 2018 Frankfurt Consensus Conference

1. Preoperative Anemia Detection and Management
2. Iron Supplementation
3. Erythropoiesis-Stimulating Agents
4. Short-Acting Erythropoietins and Iron Supplementation
5. Restrictive ABT threshold (Hb<7.0 g/dL)
6. Restrictive ABT threshold (Hb<7.5 g/dL) in cardiac surgery
7. Restrictive ABT threshold (Hb<8.0 g/dL) in HIP fracture & cardiovasc. dis.
8. Restrictive ABT threshold (Hb<7-8 g/dL) Acute Gastrointestinal Bleeding
9. PBM Programs Implementation
10. Decision Support Systems

Hamostaseologie 2023;43:16–21

Evidence-Based Medicine: Principles and Values as Illustrated by the Case of Patient Blood Management

Hans Van Remoortel[1,2] Emmy De Buck[1,2] Erhard Seifried[3,4] Philippe Vandekerckhove[2,5,6]

[1] Centre for Evidence-Based Practice, Belgian Red Cross, Mechelen, Belgium
[2] Department of Public Health and Primary Care, Leuven Institute for Healthcare Policy, KU Leuven, Leuven, Belgium
[3] German Red Cross Blood Service BaWüHe, Frankfurt, Germany
[4] Institute for Transfusion Medicine and Immunohematology, Goethe University, Frankfurt, Germany
[5] Division of Epidemiology and Biostatistics, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Stellenbosch Central, Stellenbosch, South Africa
[6] Belgian Red Cross, Mechelen, Belgium

Address for correspondence Hans Van Remoortel, MSc, PhD, Centre for Evidence-Based Practice (CEBaP), Belgian Red Cross, Motstraat 42, 2800 Mechelen, Belgium (e-mail: hans.vanremoortel@cebap.org).

Hamostaseologie 2023;43:16–21.

Hamostaseologie 2023;43:16–21

Evidence-Based Medicine: Principles and Values as Illustrated by the Case of Patient Blood Management

Hans Van Remoortel[1,2] Emmy De Buck[1,2] Erhard Seifried[3,4] Philippe Vandekerckhove[2,5,6]

without erythro-stimulating agents (ESAs). The best available scientific evidence today indicates that preoperative intravenous (IV) or oral iron monotherapy may not be effective to reduce RBC utilization (low-certainty evidence). Preoperative IV iron supplementation in addition to ESAs is probably effective to reduce RBC utilization (moderate-certainty evidence), whereas oral iron supplementation in addition to ESAs may be effective to reduce RBC utilization (low-certainty evidence). The adverse events of preoperative oral/IV iron and/or ESAs and their impact on patient-important outcomes (morbidity, mortality, quality of life) remain unclear (very low-certainty evidence). Since PBM is a patient-centered approach, emphasis on monitoring and evaluation of patient-important outcomes in future research is urgently needed. Finally, the cost-effectiveness of preoperative oral/IV iron monotherapy is unproven, whereas preoperative oral/IV iron in addition to ESAs is extremely cost-ineffective.

BMJ Open 2022;12:e054582

Open access Original research

BMJ Open

Reporting conflicts of interest in randomised trials of patient blood management interventions in patients requiring major surgery: a systematic review and meta-analysis

Marius Roman ,[1] Oluwatomini Fashina,[1] Sara Tomassini,[1] Riccardo G Abbasciano,[1] Florence Lai ,[1] Toby Richards,[2] Gavin Murphy[1]

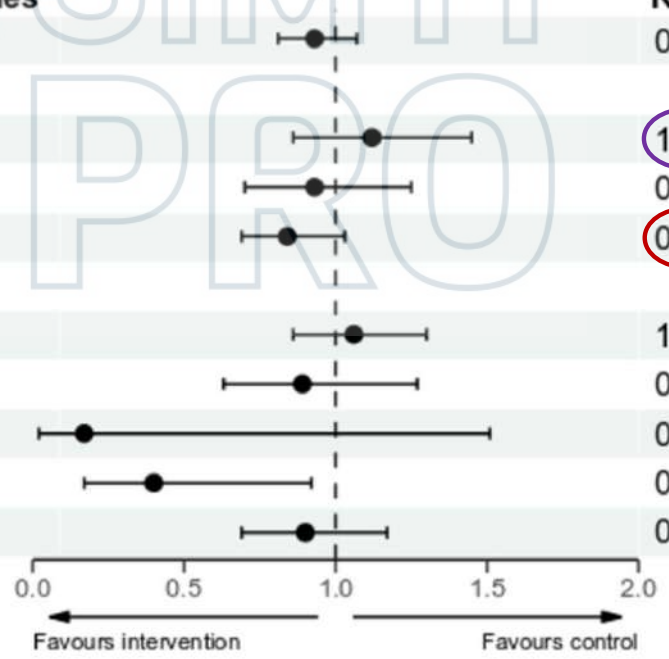
BMJ Open 2022;12:e054582

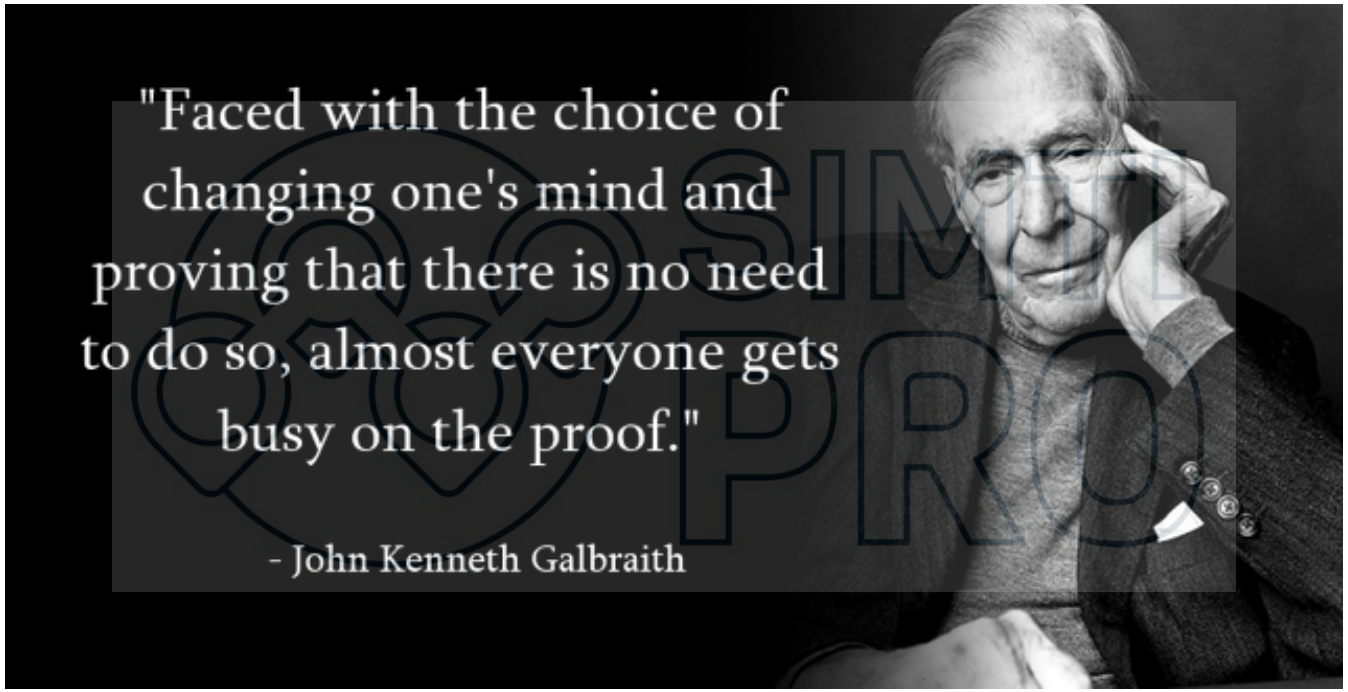
Open access Original research

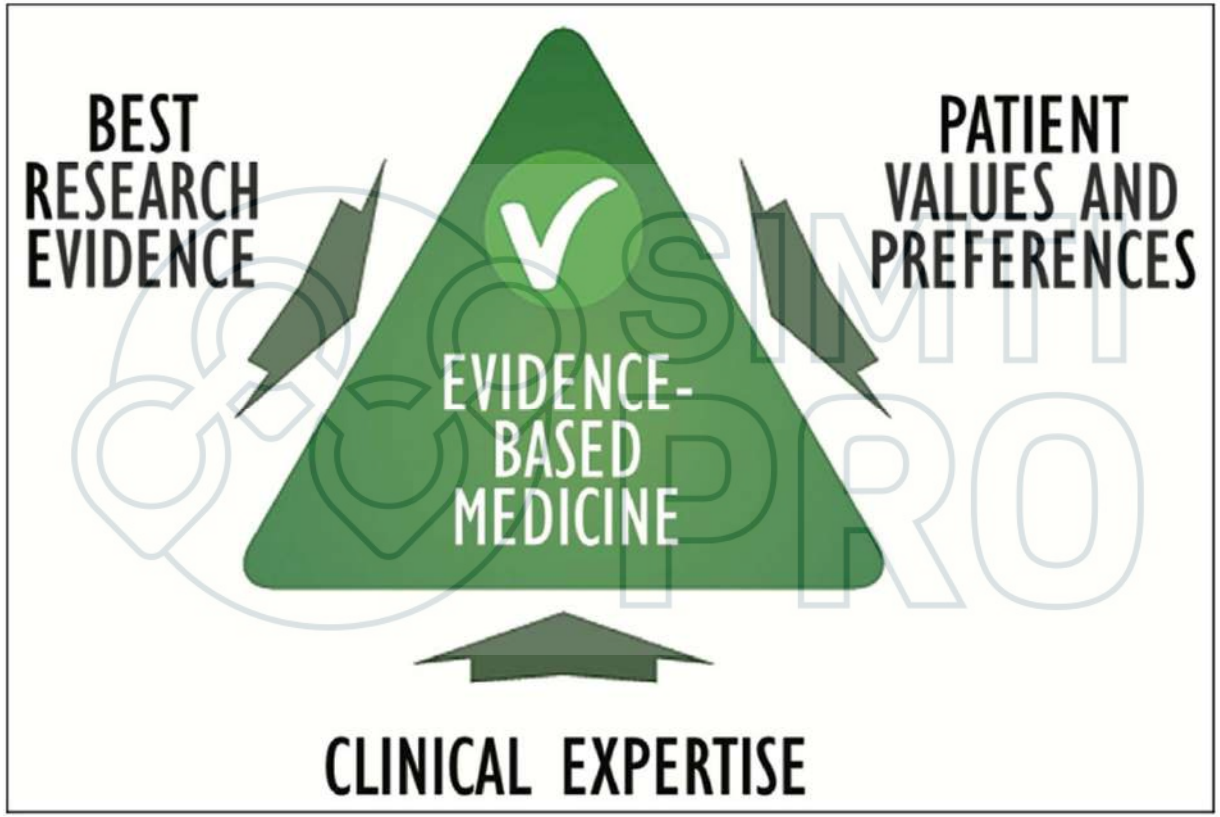
BMJ Open

Reporting conflicts of interest in randomised trials of patient blood management interventions in patients requiring major surgery: a systematic

Conflict of Interest	Number of studies	RR (95% CI)
All Patients	93	0.93 (0.81 to 1.07)
Author COI		
None	33	1.12 (0.86 to 1.45)
Unclear	50	0.93 (0.70 to 1.25)
Any	10	0.84 (0.69 to 1.03)
Type of Author COI		
Not Stated	77	1.06 (0.86 to 1.30)
Non profit	4	0.89 (0.63 to 1.27)
Blood Service	2	0.17 (0.02 to 1.51)
Professional advocacy	5	0.40 (0.17 to 0.92)
Industry	5	0.90 (0.69 to 1.17)




"Faced with the choice of changing one's mind and proving that there is no need to do so, almost everyone gets busy on the proof."
- John Kenneth Galbraith


BEST
RESEARCH
EVIDENCE
PATIENT
VALUES AND
PREFERENCES
EVIDENCE-
BASED
MEDICINE
CLINICAL EXPERTISE

SIMTI
PRO

PBM: miglioramento dell'outcome?

Errate convinzioni sulla terapia trasfusionale

- è tra le terapie più sicure
- è una terapia a basso costo
- ha un effetto immediato
- il paziente sta meglio

ANESTHESIA & ANALGESIA October 2016 • Volume 123 • Number 4
Shander et al.

”Using diabetes mellitus as an example, management is not focused on **insulin** as the sole therapy given in response to an abnormality in the single laboratory parameter of **blood glucose**. Rather, a diverse group of health care professionals counsel the patient on nutrition and dietary management, exercise, and weight control.”

“...blood transfusions have been historically practiced as an **isolated therapy**, often by a practitioner not primarily responsible for the long-term health of the patient, without appropriate evaluation or risk-benefit assessment. This lack of stewardship and focus on transfusion as a therapy has resulted in minimal insight regarding **its effect on clinical outcomes**.”

Connor *et al. BMC Cancer* (2023) 23:99
https://doi.org/10.1186/s12885-023-10579-x

BMC Cancer

RESEARCH Open Access

Pre-operative anemia and peri-operative transfusion are associated with poor oncologic outcomes in cancers of the esophagus: potential impact of patient blood management on cancer outcomes

Joseph P. Connor[1*], Eric Destrampe[1], Daniel Robbins[2], Aaron S. Hess[1,3], Daniel McCarthy[4] and James Maloney[4]

Connor et al. BMC Cancer (2023) 23:99
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BMC Cancer

RESEARCH Open Access

Pre-operative anemia and peri-operative transfusion are associated with poor oncologic outcomes in cancers of the esophagus: potential impact of patient blood management

Jose

Results - 348 cases were analyzed. 64% of patients were anemic pre-operatively and 22% were transfused. Transfusion and anemia were closely related to each other. Transfusion but not anemia was associated with a protracted LOS. Transfusion and anemia were both associated with reduced survival however only anemia was associated with decreased survival in multi-variable modeling.

Conclusions - Pre-operative anemia and transfusion are closely associated, however only anemia was found to compromise survival in our esophageal cancer cohort, supporting the need for more aggressive evaluation and treatment of anemia. Adherence to restrictive transfusion guidelines offers an opportunity to reduce transfusion rates which may also improve short-term outcomes.

Connor *et al. BMC Cancer* (2023) 23:99
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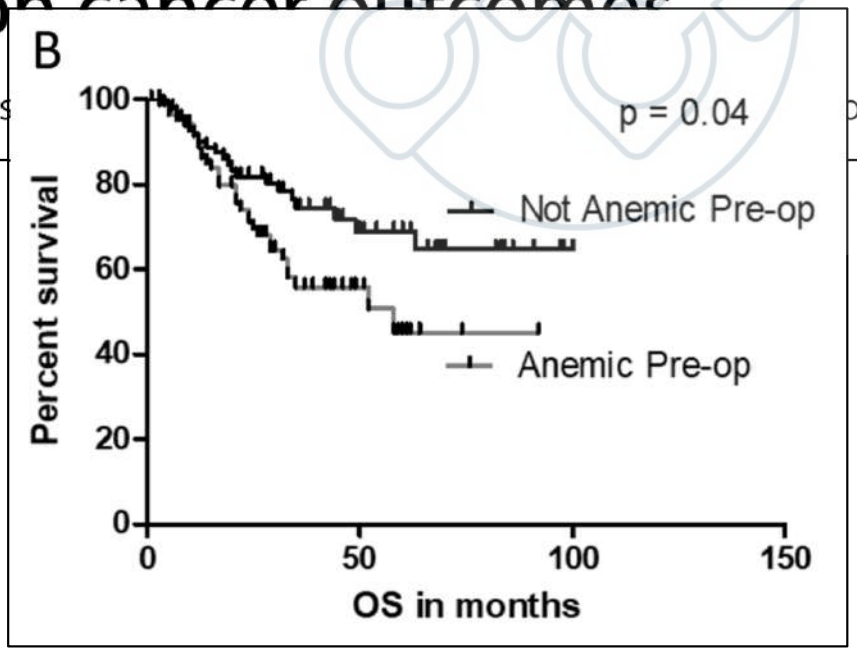
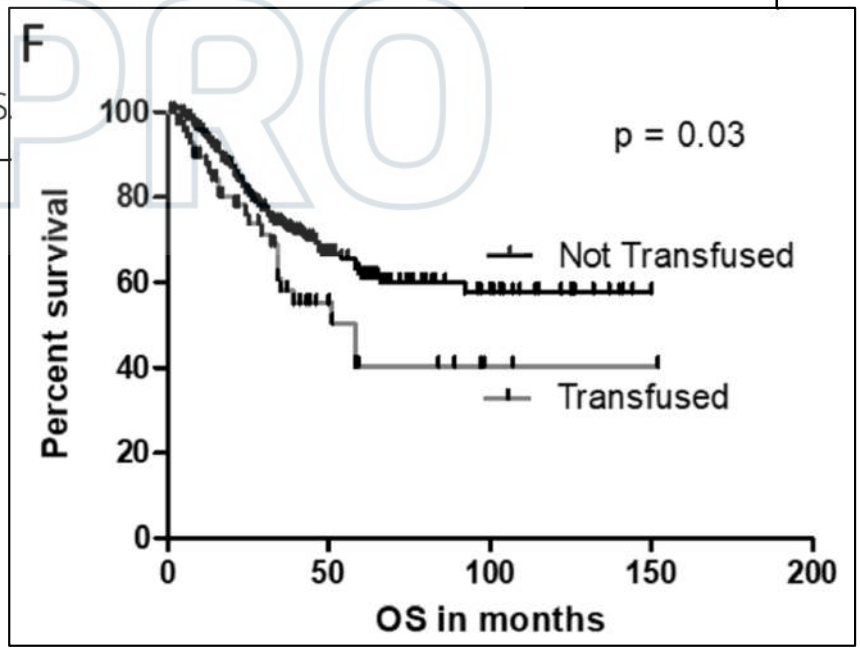
Jos… …on S…





Volume 57, June 2017 TRANSFUSION

ORIGINAL RESEARCH

Improved outcomes and reduced costs associated with a health-system–wide patient blood management program: a retrospective observational study in four major adult tertiary-care hospitals

Michael F. Leahy,[1,2,3] Axel Hofmann,[4,5,6] Simon Towler,[7] Kevin M. Trentino,[8] Sally A. Burrows,[1] Stuart G. Swain,[8] Jeffrey Hamdorf,[9,10] Trudi Gallagher,[11,12] Audrey Koay,[11] Gary C. Geelhoed,[11,13] and Shannon L. Farmer[9,14]

- Studio retrospettivo **605.046** pazienti
- applicazione PBM su vasta scala (2008-2014)

Volume 57, June 2017 TRANSFUSION

TABLE 2. Key hospital-wide patient outcomes

Outcome variable*	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
In-hospital mortality						
Unadjusted rate, %	2.03	2.10	1.85	1.76	1.77	1.65
Adjusted OR (95% CI)†	Ref	1.01 (0.94-1.08)	0.95 (0.89-1.02)	0.89 (0.83-0.95)	0.81 (0.76-0.87)	0.72 (0.67-0.77)
Hospital length of stay						
Unadjusted mean, days	5.91	5.95	5.72	5.51	5.46	5.26
Adjusted rate ratio (95% CI)†	Ref	1.05 (1.03-1.07)	1.01 (0.99-1.03)	0.96 (0.94-0.98)	0.92 (0.90-0.94)	0.85 (0.84-0.87)
28-Day readmissions						
Unadjusted rate, %	11.42	11.82	12.74	13.57	13.27	12.42
Adjusted OR (95% CI)†	Ref	1.03 (0.99-1.07)	1.14 (1.10-1.18)	1.21 (1.17-1.26)	1.16 (1.12-1.20)	1.06 (1.02-1.10)
Hospital-acquired infection‡						
Unadjusted rate, %	—	2.34	2.04	1.78	1.80	1.95
Adjusted OR (95% CI)†	—	Ref	0.92 (0.85-0.99)	0.80 (0.74-0.87)	0.77 (0.71-0.83)	0.79 (0.73-0.86)
Acute myocardial infarction-stroke‡						
Unadjusted rate, %	—	0.50	0.48	0.40	0.42	0.36
Adjusted OR (95% CI)†	—	Ref	1.02 (0.86-1.20)	0.84 (0.71-1.00)	0.85 (0.71-1.00)	0.69 (0.58-0.82)

* Shown are the unadjusted and adjusted patient outcomes by financial year over the period of the patient blood management program.
† Ratios and 95% confidence intervals are adjusted for hospital, age, sex, Diagnosis-Related Group (DRG) category, admission type, indigenous status, and comorbidities.
‡ Data were available for two of the four hospitals.
CI = confidence interval; OR = odds ratio; Ref = reference category.

JAAOS April 1, 2023, Vol 31, No 7

Transfusion Thresholds Can Be Safely Lowered in the Hip Fracture Patient: A Consecutive Series of 1,496 Patients

Sanjit R. Konda, MD
Rown Parola, MD
Cody R. Perskin, MD
Nina D. Fisher, MD
Abhishek Ganta, MD
Kenneth A. Egol, MD

ABSTRACT

Introduction: The purpose of this study is to identify optimal thresho
hemoglobin (Hgb) and hematocrit (Hct) laboratory values to transfus
hip fracture patients.

JAAOS April 1, 2023, Vol 31, No 7

Transfusion Thresholds Can Be Safely Lowered in the Hip Fracture Patient: A Consecutive Series of 1,496 Patients

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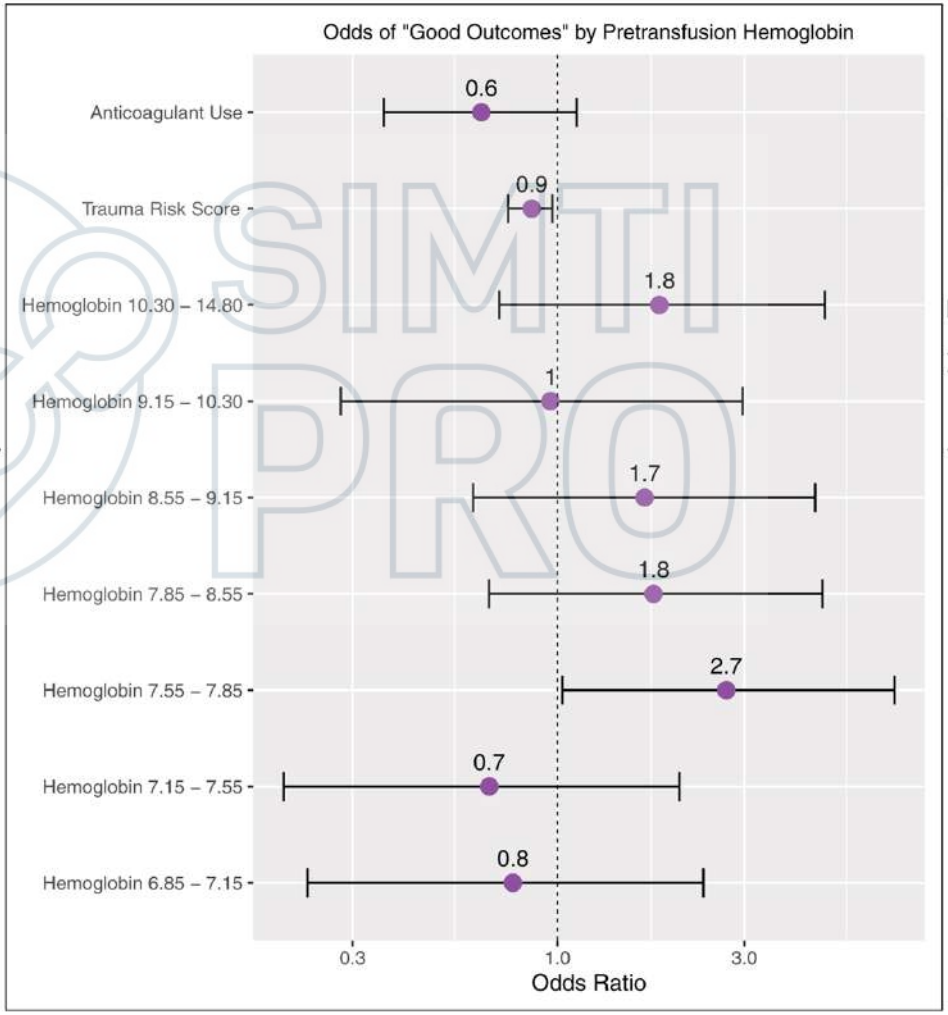


Volume 57, May 2017 TRANSFUSION

Single-unit transfusions and hemoglobin trigger: relative impact on red cell utilization

William W. Yang,[1] Rajiv N. Thakkar,[3] Eric A. Gehrie,[2] Weiyun Chen,[4] and Steven M. Frank[5]

Volume 57, May 2017 TRANSFUSION

Single-unit transfusions and hemoglobin trigger: relative impact on red cell utilization

William W. Yang, ... *teven M. Frank*[5]

RESULTS: Univariate analysis revealed that both the increase in single-unit transfusions (from 38.0% to 70.9%; $p < 0.0001$) and the decrease in RBC orders with an Hb trigger of at least 8 g/dL (from 45.7% to 25.0%; $p < 0.0001$) were associated with decreasing RBC utilization. Multivariate analysis showed that the increase in single-unit transfusions was an independent predictor of decreased RBC utilization, but the Hb triggers of both 7 and 8 g/dL were not. Overall, our PBM efforts decreased RBC utilization from 0.254 to 0.185 units/patient (27.2%) across all three hospitals ($p = 0.0009$).

CONCLUSIONS: A campaign promoting single-unit RBC transfusions had a greater impact on RBC utilization than did encouraging a restrictive transfusion trigger.

Blood Transfus 2019; 17: 191-5

REVIEW

Patient Blood Management: a revolutionary approach to transfusion medicine

Massimo Franchini[1,2], Giuseppe Marano[1], Eva Veropalumbo[1], Francesca Masiello[1], Ilaria Pati[1], Fabio Candura[1], Samantha Profili[1], Liviana Catalano[1], Vanessa Piccinini[1], Simonetta Pupella[1], Stefania Vaglio[1,3], Giancarlo M. Liumbruno[1]

[1]Italian National Blood Centre, National Institute of Health, Rome; [2]Department of Haematology and Transfusion Medicine, "Carlo Poma" Hospital, Mantua; [3]Department of Clinical and Molecular Medicine, "Sapienza" University of Rome, Rome, Italy

Patient Blood Management programmes are an extraordinary tool for the improvement of patients' clinical outcomes.

... national and international health authorities and medical societies should directly intervene by introducing regulatory measures and actions, issuing recommendations and providing resources to promote the effective implementation of PBM programmes.

TRANSFUSION Volume 56, March 2016

Patient blood management: the global view

Aryeh Shander,[1,2] James Isbister,[3] and Hans Gombotz[4]

a standard of care for all patients. As with any change,

threshols

there are still some clinicians and others with the traditional approach to blood transfusion and blood banking that persist in searching for the Hb threshold ("trigger" in the past) for transfusing RBCs, the so-called holy grail.

However, the patient-centered approach incorporates many other treatments with transfusion in its rightful

outcome

place. PBM does not focus on transfusion, but rather on identifying a medical condition that can be treated appropriately for the best clinical outcome. This approach has

been steadily rising in acceptance and implementation throughout the medical community.

standard

Moving forward, PBM should become an integral part of postgraduate training, and players, including the government, should develop demonstration projects to further validate the positive administrative and clinical outcomes associated with the approach. PBM will most

SIMTI
PRO

PBM: uno standard di cura?

Table. Historical Perspective of Events Related to Patient Blood Management

Year/Period	Event
Early 1960s	Blood conservation methodology pioneered by Denton Cooley
1970–90	Epidemics of hepatitis C and HIV
1990	Patient Self Determination Act increased awareness of the ability and need to increase communication between patients and caregivers
1995	Formation of The National Association for Bloodless Medicine and Surgery
Late 1990s	The Network for Advancement of Transfusion Alternative (NATA) conceived
1999	Transfusion Requirements in Critical Care (TRICC)[a] trial published
2000	Society for the Advancement of Blood Management (SABM) created
1988–2016	Numerous "Transfusion Guidelines" published

[a]TRICC trial: Ref. 1.

World Health Organization

World Health Assembly
Geneva, 17-21 May 2010
Resolution WHA63.12

"Availability, safety and quality of blood products"

… bearing in mind that patient blood management means that before surgery every reasonable measure should be taken to optimize the patient's own blood volume, to minimize the patient's blood loss and to harness and optimize the patient-specific physiological tolerance of anaemia following WHO's guide for optimal clinical use (three pillars of patient blood management);

… to provide guidance, training and support to Member States on safe and rational use of blood products and to support the introduction of transfusion alternatives including, where appropriate, autologous transfusion, safe transfusion practices and patient blood management;

World Health Organization

Global Forum for Blood Safety:
Patient Blood Management
14–15 March 2011, Dubai, United Arab Emirates

"Concept Paper "

… Patient blood management (PBM) is a patient-focused, evidence-based and systematic approach to optimize the management of patient and transfusion of blood products for quality and effective patient care.
It is designed to improve patient outcomes through the safe and rational use of blood and blood products and by minimizing unnecessary exposure to blood products.
Essential elements of patient blood management include: the prevention of conditions that might otherwise result in the need for transfusion (through health promotion and screening for early detection), appropriate diagnosis and optimal treatment, including the use of alternatives to transfusion, good surgical and anaesthetic techniques, the use of alternatives to blood transfusion and blood conservation.


6 DAL GOVERNO — Sanità — 13-19 maggio 2014

PATIENT BLOOD MANAGEMENT ITALY

CNS/ Un progetto condiviso con Simti, Siaarti e Anmdo sulla gestione globale dell'anemia

La governance del patient blood

Programma operativo in tre fasi - Guidelines teoriche entro fine giugno

I tre pilastri del Patient Blood Management (Pbm)

Pilastro 1 Ottimizzazione dell'eritropoiesi	Pilastro 2 Contenimento delle perdite ematiche	Pilastro 3 Ottimizzazione della tolleranza all'anemia
Periodo pre-operatorio		
Periodo intra-operatorio		
Periodo post-operatorio		

LA VOCE DEI DONATORI DI SANGUE

«Il Pbm consente la massima valorizzazione della supply chain trasfusionale»

IL PERCORSO DEL CNS

«Tre obiettivi europei da realizzare in 24 mesi»

Giuliano Grazzini, direttore Centro nazionale Sangue, Istituto superiore di Sanità

SIMTI – SIAARTI - ANMDO

Italia

Gli obiettivi del PBM

Il Patient Blood Management (PBM) è una strategia multidisciplinare e multimodale che mette al centro la salute e la sicurezza del paziente e migliora i risultati clinici basandosi sulla risorsa sangue dei pazienti stessi. Questo approccio riduce in modo significativo l'utilizzo dei prodotti del sangue, affrontando tutti i fattori di rischio trasfusionale modificabili ancor prima che sia necessario prendere in considerazione il ricorso alla terapia trasfusionale stessa.

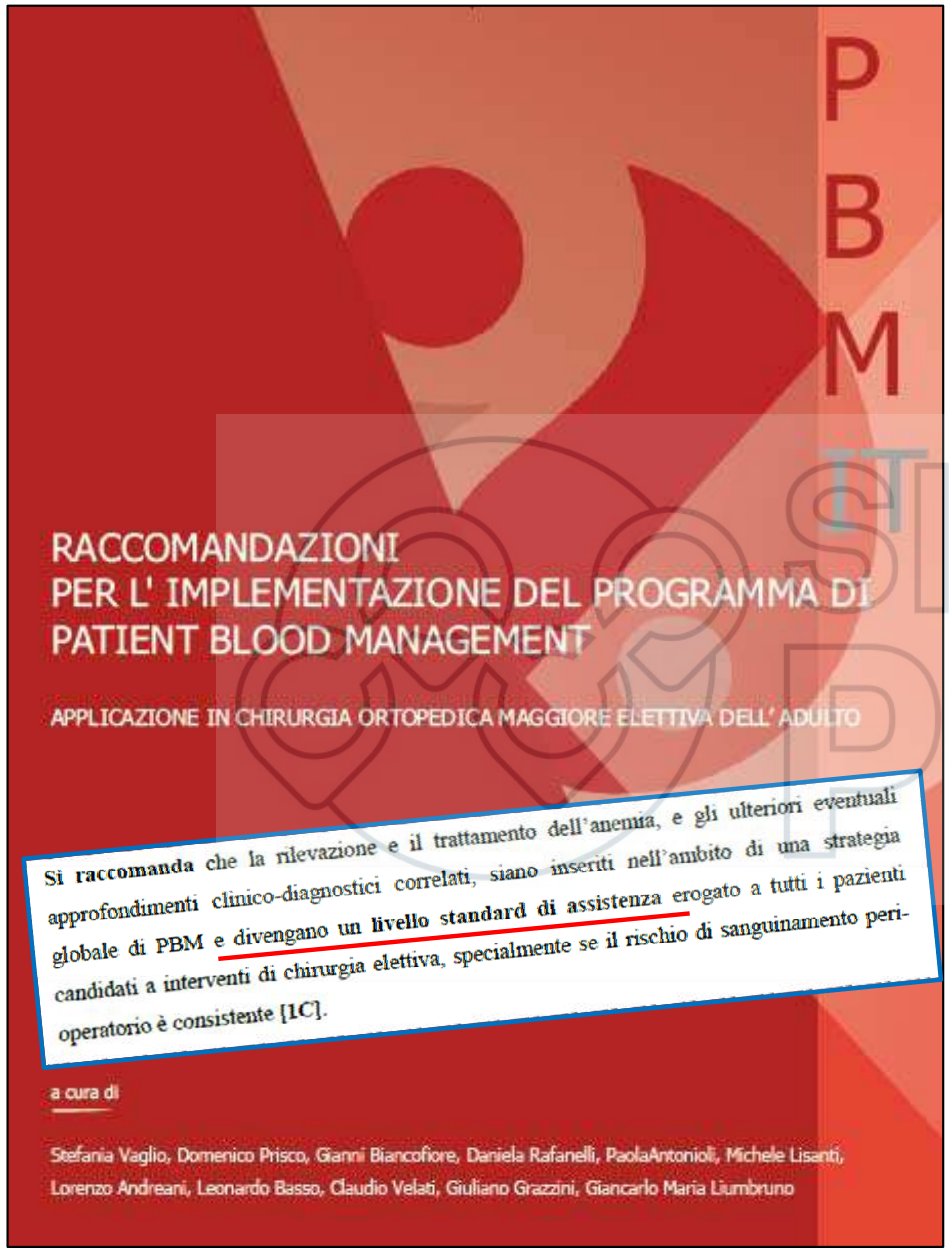
Gli obiettivi del PBM sono:

Miglioramento degli *outcome* clinici

Prevenzione della trasfusione evitabile

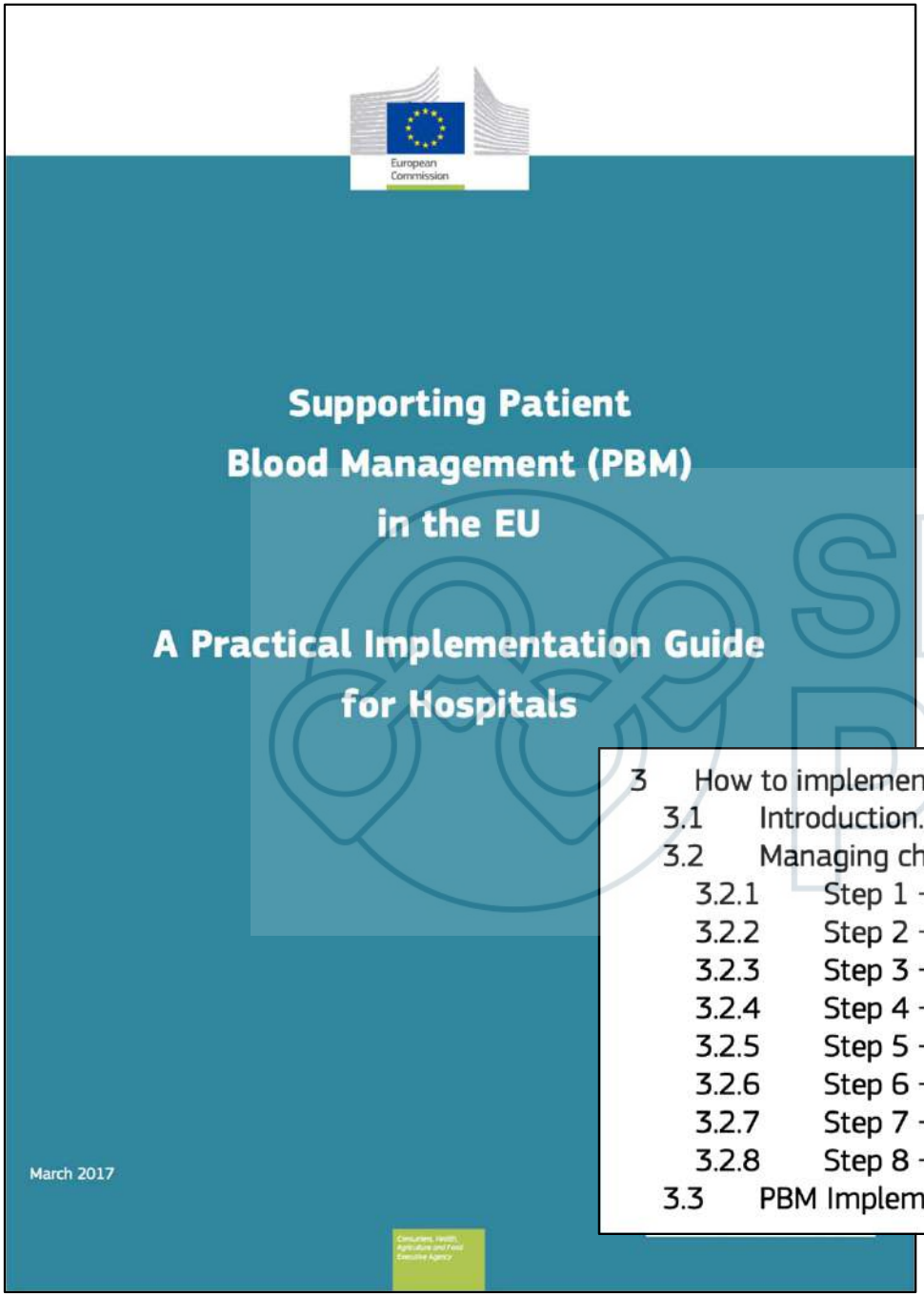
Riduzione dei costi di gestione

Italia

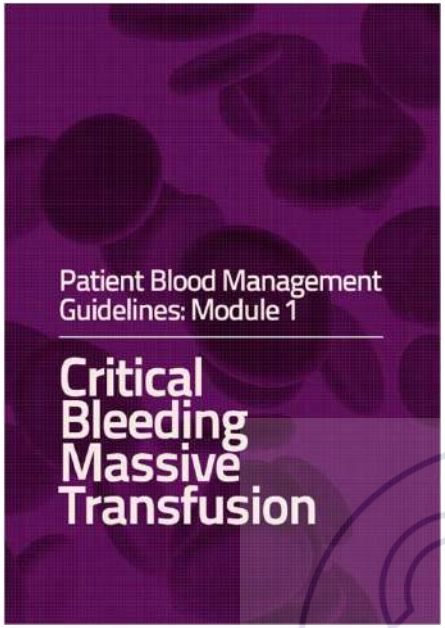

PBM
RACCOMANDAZIONI
PER L' IMPLEMENTAZIONE DEL PROGRAMMA DI
PATIENT BLOOD MANAGEMENT
APPLICAZIONE IN CHIRURGIA ORTOPEDICA MAGGIORE ELETTIVA DELL' ADULTO
Si raccomanda che la rilevazione e il trattamento dell'anemia, e gli ulteriori eventuali approfondimenti clinico-diagnostici correlati, siano inseriti nell'ambito di una strategia globale di PBM e divengano un livello standard di assistenza erogato a tutti i pazienti candidati a interventi di chirurgia elettiva, specialmente se il rischio di sanguinamento peri-operatorio è consistente [1C].
a cura di
Stefania Vaglio, Domenico Prisco, Gianni Biancofiore, Daniela Rafanelli, PaolaAntonioli, Michele Lisanti, Lorenzo Andreani, Leonardo Basso, Claudio Velati, Giuliano Grazzini, Giancarlo Maria Liumbruno

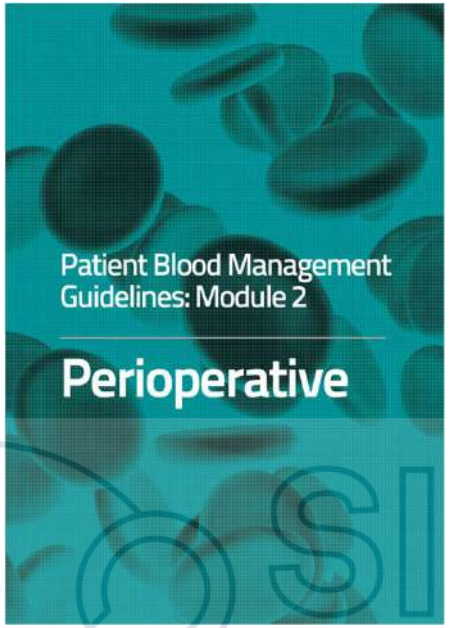
	Raccomandazioni da adottare nel periodo pre-operatorio, intra-operatorio e post-operatorio
1	I pazienti con coagulopatie e/o piastrinopatie congenite o acquisite, o anamnesi positiva per emorragia, o in trattamento con anticoagulanti e/o antiaggreganti piastrinici, sono gestiti in tutte le fasi in collaborazione c
2	In tutti i pazie autologhi), osp patologie cardi raccomandata l' di medicina tras
3	La soglia trasfu altre categorie d
4	Nei pazienti os eritrocitari (omo trasfusione deve
5	Nei pazienti cc intravascolare d un elevato risch considerazione trasfusionale e d un esperto di me
6	Le indicazioni a vigente.
7	Il volume e la f contenuti al fine
9	Si raccomanda che tutti i pazienti adulti candidati a interventi di chirurgia maggiore elettiva per i quali sia stato impostato un programma multidisciplinare di interventi coordinati che preveda l'adozione delle tecniche farmacologiche o non farmacologiche finalizzate a ottimizzare l'eritropoiesi, a contenere le perdite ematiche o a ottimizzare la tolleranza all'anemia, prima di rilasciare il consenso a uno o più dei suddetti trattamenti, ricevano un'informazione esaustiva sulla loro situazione clinica e sulle strategie di contenimento del fabbisogno trasfusionale omologo incluse nel programma di *patient blood management* locale, anche mediante l'uso di materiale illustrativo redatto *ad hoc* dalla struttura ospedaliera.
10	Il valore *targ* *range* di norm
11	L'anemia è d
12	Qualora medi diagnostici d nutrizionali (croniche.
13	Poiché il valo trasfusionale rilevate, sono
14	Successivame non sia effic programmato ferro per via e
15	Nei pazienti fattore stimol terapia marzia
16	Ove indicata che permettan
20	Si suggerisce di adottare protocolli di somministrazione dei fluidi intra-operatori basati sui princìpi della ottimizzazione emodinamica.
21	Nei pazienti adulti sottoposti ad interventi in cui si preveda una consistente perdita ematica e che non presentino fattori di rischio per ipercoagulabilità all'anamnesi preoperatoria, si suggerisce di considerare l'impiego di acido tranexamico.
22	Nei pazienti sottoposti ad interventi in cui si prevedano perdite ematiche di almeno 1000 mL o comunque ≥ al 20% della volemia, si raccomanda l'adozione di strategie multimodali che includano il ricorso integrato a tecniche di risparmio del sangue (recupero intra-operatorio, tecniche farmacologiche, chirurgiche e anestesiologiche).
23	Si raccomanda l'impiego di strumenti *point-of-care* (POC) per la misurazione non invasiva e in continuo dell'Hb e dell'ematocrito.
24	Si suggerisce l'impiego di strumenti POC per il monitoraggio globale dell'emostasi allo scopo di guidare la terapia sostitutiva dei fattori della coagulazione e di contenere il supporto trasfusionale con emocomponenti negli interventi di cardiochirurgia e in tutti gli interventi ad elevato potenziale emorragico o in presenza di sanguinamento.
25	In presenza di sanguinamento massivo in atto in corso di chirurgia maggiore elettiva e in associazione alla correzione della causa scatenante, in corso di trasfusione massiva, si suggerisce di trattare l'ipofibrinogenemia grave (< 1 g/L) e persistente nonostante la terapia con plasma fresco congelato, con concentrato di fibrinogeno* (o, se non disponibile, con crioprecipitato).

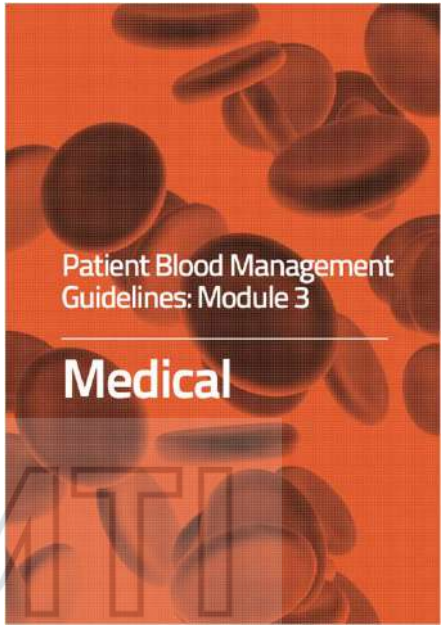
Europa

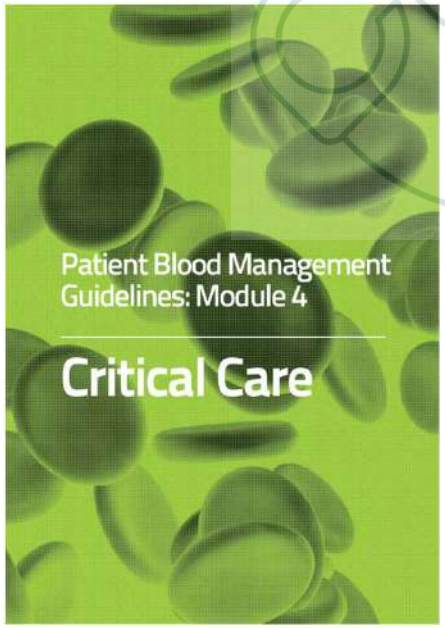


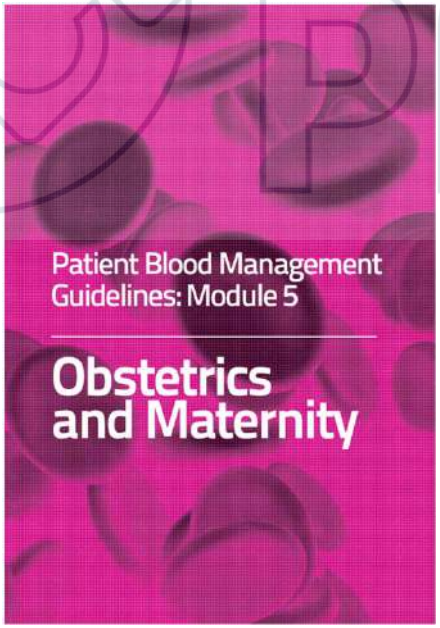
Australia

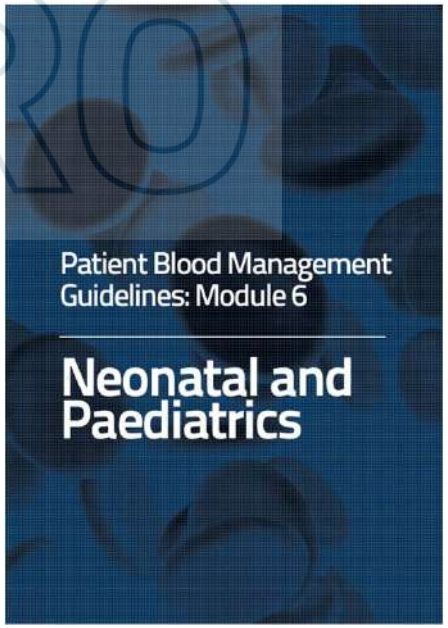

Patient Blood Management
Guidelines: Module 1
Critical
Bleeding
Massive
Transfusion


Patient Blood Management
Guidelines: Module 2
Perioperative


Patient Blood Management
Guidelines: Module 3
Medical


Patient Blood Management
Guidelines: Module 4
Critical Care


Patient Blood Management
Guidelines: Module 5
Obstetrics
and Maternity


Patient Blood Management
Guidelines: Module 6
Neonatal and
Paediatrics

Maggiori «consumatori»

Facco et al. - Blood Transfus 2021; 19: 384-95

- 66.7% for a medical indication
- 32.4% for a surgical indication

Bruun et al. - Vox Sanguinis 2016; 111: 391–398

- 61% for a medical indication
- 36% for a surgical indication

USA

THE JOINT COMMISSION PATIENT BLOOD MANAGEMENT PERFORMANCE MEASURES

TAC OCT. 2011

Transfusion consent (PBM-01)
Transfusion indication RBC (PBM-02)
Transfusion indication plasma (PBM-03)
Transfusion indication platelet (PBM-04)
Blood administration documentation (PBM-05)
Pre-operative anaemia screening (PBM-06)
Pre-operative blood type testing and antibody screening (PBM-07)

ANESTHESIA & ANALGESIA October 2016 • Volume 123 • Number 4

Patient Blood Management as Standard of Care

Aryeh Shander, MD,* Arthur W. Bracey, Jr, MD,† Lawrence T. Goodnough, MD,‡ Irwin Gross, MD,§ Nabil E. Hassan, MD,‖ Sherri Ozawa, RN,* and Marisa B. Marques, MD¶

PBM principles clearly recognize that to achieve improved patient outcomes, more than transfusion guidelines and transfusion avoidance are required. National and international organizations and policy makers are increasingly adopting and advocating PBM.

PBM is becoming, and must be considered, the standard of care or at least recognized as best practice. It avoids and mitigates risks by addressing clinical issues that may lead to transfusion long before transfusion is even considered.

Volume 57, June 2017 TRANSFUSION

EDITORIAL

Patient Blood Management: the new standard

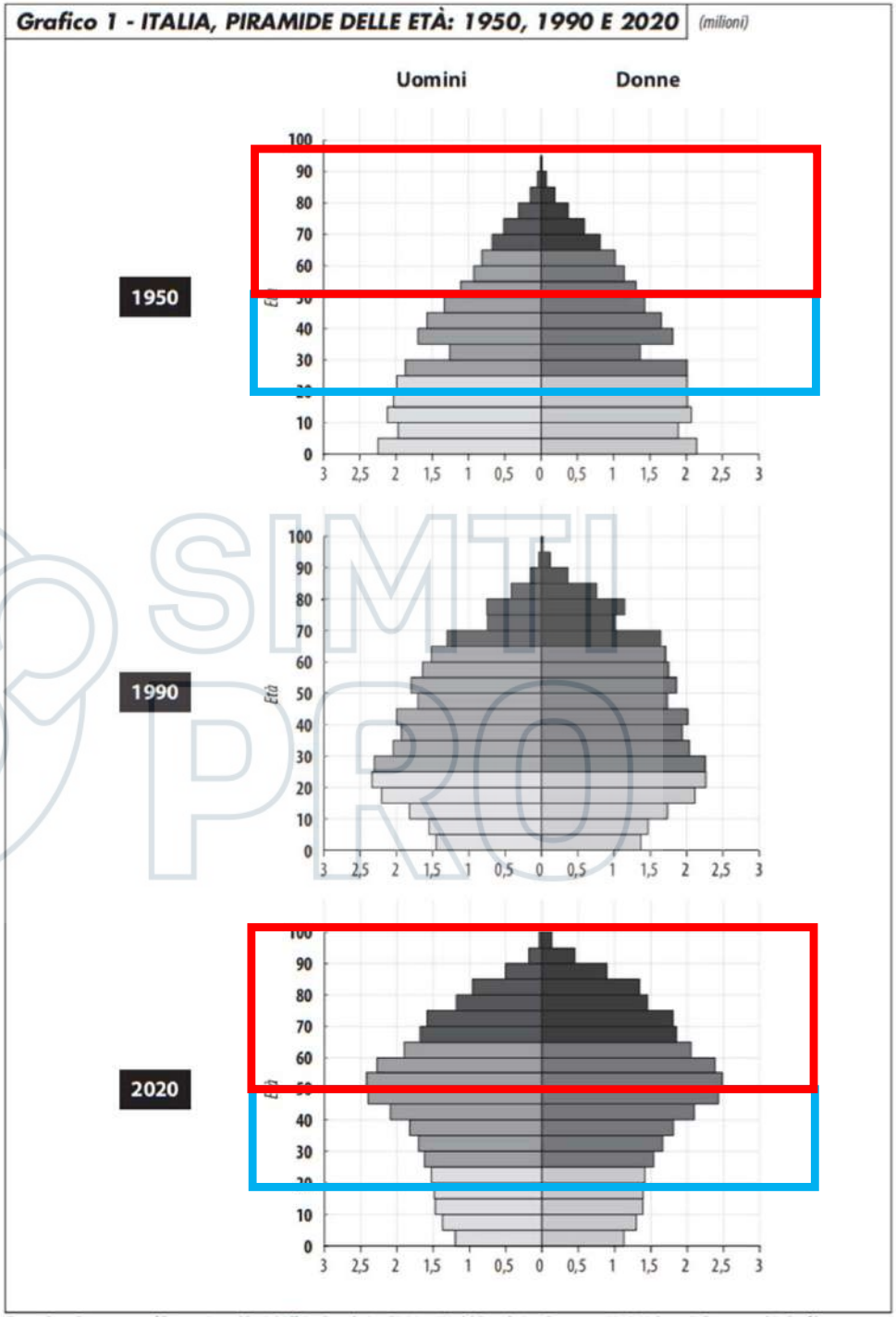
Donat R. Spahn, MD, FRCA
e-mail: donat.spahn@usz.ch
Institute of Anesthesiology
University and University Hospital of Zurich
Zurich, Switzerland

… The take home message is: PBM is safe and efficacious in improving patient outcome, in reducing the need for allogeneic blood product transfusion, and in lowering costs.

SIMTI
PRO

PBM: strumento di risparmio di sangue?

Trend demografico in Italia



Fonte: Onu, Department of Economic and Social Affairs, Population Division; World Population Prospects 2019, Volume II: Demographic Profiles

Rischi della terapia trasfusionale

- trasfusione al paziente sbagliato
- reazione emolitica acuta AB0 incompatibile
- reazione emolitica ritardata
- reazione allergica severa
- insufficienza respiratoria acuta (TRALI, TACO)
- sepsi
- infezioni
- immunomodulazione
- aumento morbilità / mortalità (fattore di rischio indipendente)

Anesthesiology 2008; 109:951–3

Patient Blood Management

The Pragmatic Solution for the Problems with Blood Transfusions

ALLOGENEIC erythrocyte transfusions are associated with increased mortality,[1] major adverse cardiac and noncardiac outcome,[2] and low output failure in cardiac surgery. Transfusion of allogeneic erythrocyte transfusions has also been found to be an independent factor increasing mortality in trauma, including traumatic brain injury,[3] burns,[4] liver transplantation, intensive care medicine,[5] and the treatment of acute coronary syndrome.[6] In addition, allogeneic erythrocyte, fresh frozen plasma, and platelet transfusions result in a several-fold increase in postoperative and nosocomial infections.[6,7] Further-

rocytes stored for more than 9 days having a significantly more pronounced deleterious effect.

The reason for cancer progression after blood transfusion is unclear, and the article by Atzil *et al.* did not precisely elucidate the mechanisms involved. The perioperative period is characterized by numerous processes that can induce abrupt elevation of risk factors for the outbreak of preexisting micrometastases and the seeding of new metastases. Here, deterioration of erythrocytes as a result of storage is demonstrated as a major cause for the cancer-promoting effect. Atzil *et al.* mainly discuss

Donat R. Spahn, M.D., F.R.C.A.,* Holger Moch, M.D.,† Axel Hofmann, M.E.,‡ James P. Isbister, M.B., F.R.A.C.P.§

*Institute of Anesthesiology, University Hospital Zürich, Zürich, Switzerland. donat.spahn@usz.ch. †Institute of Surgical Pathology, Department of Pathology, University Hospital Zurich, Zurich, Switzerland. ‡Medical Society for Blood Management, Laxenburg, Austria. §Department of Haematology, University of Sydney, Royal North Shore Hospital of Sydney, St. Leonards, New South Wales, Australia.

Current Opinion in Anaesthesiology 2008, 21:657–663

EDITORIAL COMMENT

Our own blood is still the best thing to have in our veins

Tim Frenzel, Hugo Van Aken and Martin Westphal

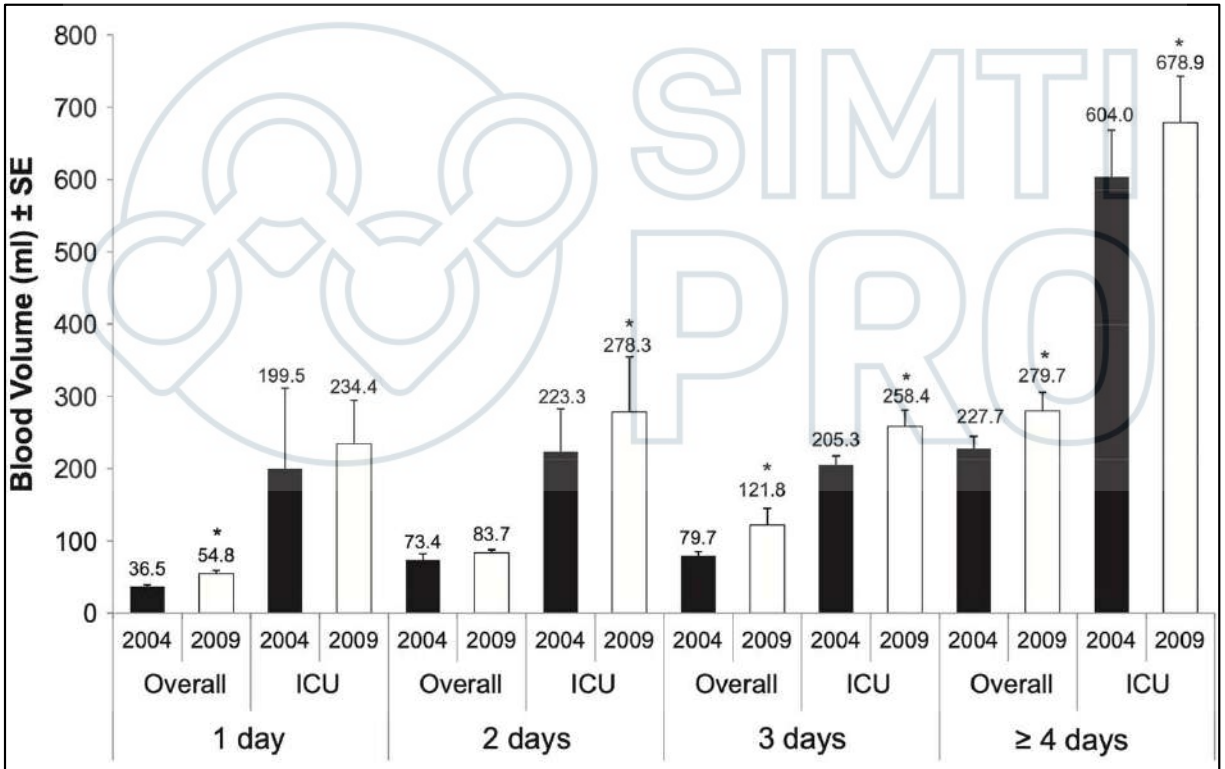
Taking into account the current evidence on this topic, it appears that **our own blood** is still the best thing to have in our veins.

Injury, Int. J. Care Injured 43 (2012) 78–83

The increasing burden of phlebotomy in the development of anaemia and need for blood transfusion amongst trauma patients

Bernardino C. Branco [a], Kenji Inaba [a,*], Reece Doughty [a], Jennifer Brooks [a], Galinos Barmparas [a], Ira Shulman [b], Janice Nelson [b], Demetrios Demetriades [a]

[a] Division of Trauma and Surgical Critical Care, University of Southern California, Los Angeles, CA, United States
[b] Department of Pathology, University of Southern California, Los Angeles, CA, United States



SE, standard error. The *p*-values were derived from Student`s *t* test; * *p*-values are significantly different ($p<0.05$).

Fig. 3. Volumes of blood drawn according to hospital length of stay.

SIMTI
PRO

PBM: strumento di risparmio economico?

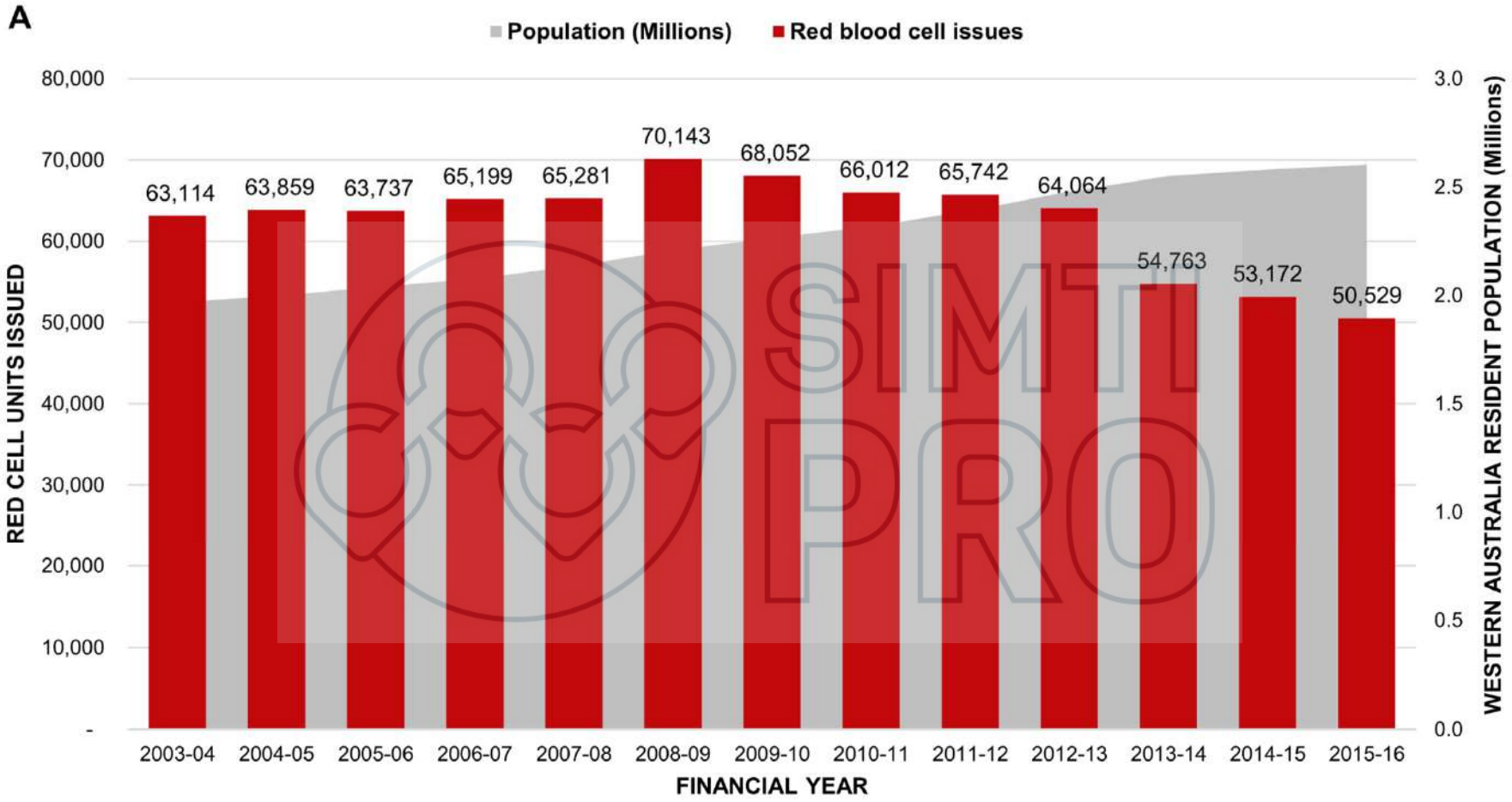
Volume 57, June 2017 TRANSFUSION

ORIGINAL RESEARCH

Improved outcomes and reduced costs associated with a health-system–wide patient blood management program: a retrospective observational study in four major adult tertiary-care hospitals

Michael F. Leahy,[1,2,3] Axel Hofmann,[4,5,6] Simon Towler,[7] Kevin M. Trentino,[8] Sally A. Burrows,[1] Stuart G. Swain,[8] Jeffrey Hamdorf,[9,10] Trudi Gallagher,[11,12] Audrey Koay,[11] Gary C. Geelhoed,[11,13] and Shannon L. Farmer[9,14]

- Studio retrospettivo **605.046** pazienti
- applicazione PBM su vasta scala in Western Australia (2008-2014)


A
Population (Millions)
Red blood cell issues
RED CELL UNITS ISSUED
WESTERN AUSTRALIA RESIDENT POPULATION (Millions)
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
3.0
2.5
2.0
1.5
1.0
0.5
0.0
63,114
63,859
63,737
65,199
65,281
70,143
68,052
66,012
65,742
64,064
54,763
53,172
50,529
2003-04
2004-05
2005-06
2006-07
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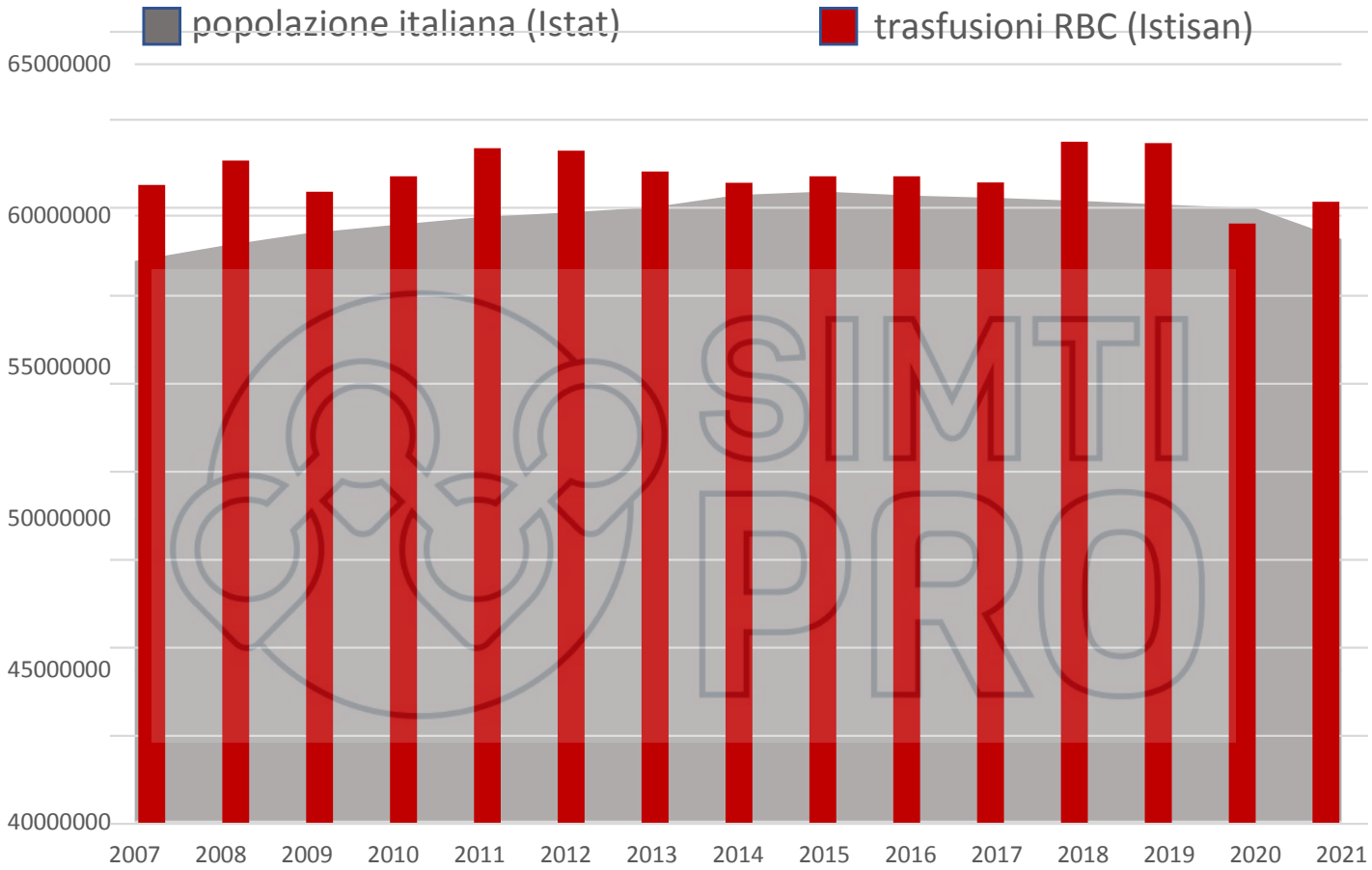
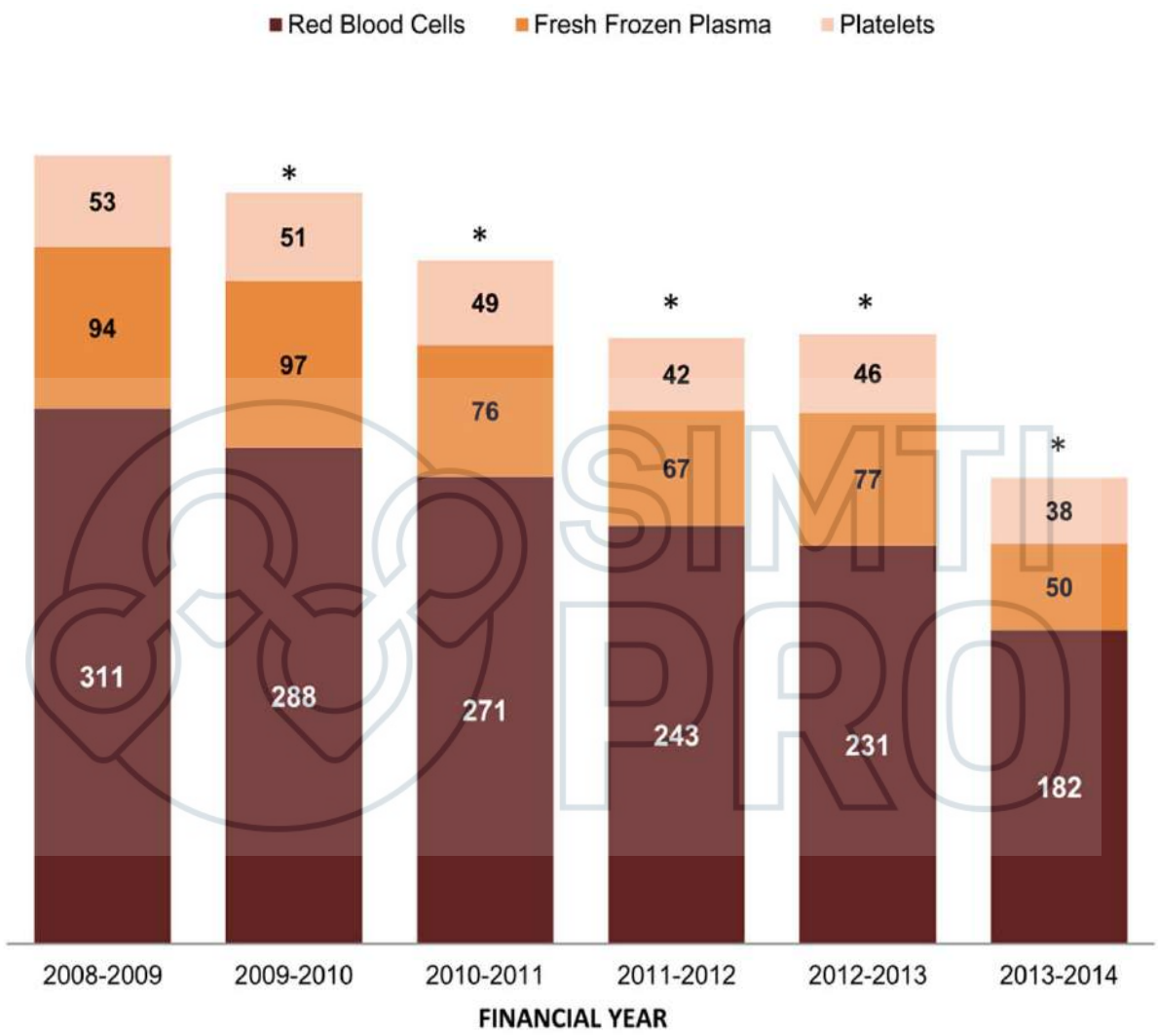
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
FINANCIAL YEAR


popolazione italiana (Istat)
trasfusioni RBC (Istisan)
65000000
60000000
55000000
50000000
45000000
40000000
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021



** p-value < 0.05, indicating the mean units transfused per 1000 discharges decreased significantly when compared to the reference year (2008-2009).*

Volume 57, June 2017 TRANSFUSION

ORIGINAL RESEARCH

Improved outcomes and reduced costs associated with a health-system–wide patient blood management program: a retrospective observational study in four major adult tertiary-care hospitals

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PRODUCT COST SAVINGS

Over the six-year study period blood product cost savings were:

$18.5M

ACTIVITY BASED COST SAVINGS

...however with the hospital costs of administering a transfusion added, the gross savings are estimated to be between:

$80M–$100M

Blood Transfus 2019; 17: 16-26

A model-based cost-effectiveness analysis of Patient Blood Management

Adina Kleinerüschkamp[1], Patrick Meybohm[1], Niels Straub[2], Kai Zacharowski[1], Suma Choorapoikayil[1]

[1]*Department of Anaesthesiology, Intensive Care Medicine and Pain Therapy, University Hospital Frankfurt, Frankfurt;* [2]*Institute of Market Research, Statistics and Prognosis, Munich, Germany*

PBM-related costs of therapy exceeded costs of the control arm by **€ 150** per patient. However, total costs, including hospitalisation, were higher in the control-arm for both non-cardiac (**€ 2,885.11**) and cardiac surgery patients (**€ 1,760.69**)

Current Opinion in Anaesthesiology - April 2023, Volume 36 (2), p 228–233

Is a Patient Blood Management programme economically reasonable?

Lotta Hof[a], Suma Choorapoikayil[a], Patrick Meybohm[b] and Kai Zacharowski[a]

cost saving

patient's value

costs vary widely

KEY POINTS

- Intravenous iron supplementation in iron deficient anaemic patients, use of antifibrinolytic agents for the treatment of bleeding, use of cell salvage and an evidence-based transfusion strategy are associated with cost savings.
- The performance of healthcare cannot be described by the sum of the overall costs, but has to take into account the value for the patients.
- It is challenging to evaluate the costs and performance of comprehensive PBM programmes, because it is a multimodal and multidisciplinary concept.
- Analyses of single measures are rarely comparable, because healthcare costs vary widely between countries and healthcare systems.

SIMTI
PRO

PBM: obbligo di legge?

Supplemento ordinario alla "Gazzetta Ufficiale„ n. 300 del 28 dicembre 2015 - Serie generale

Spediz. abb. post. - art. 1, comma 1
Legge 27-02-2004, n. 46 - Filiale di Roma

GAZZETTA UFFICIALE

DELLA REPUBBLICA ITALIANA

PARTE PRIMA **Roma - Lunedì, 28 dicembre 2015** SI PUBBLICA TUTTI I GIORNI NON FESTIVI

DIREZIONE E REDAZIONE PRESSO IL MINISTERO DELLA GIUSTIZIA - UFFICIO PUBBLICAZIONE LEGGI E DECRETI - VIA ARENULA, 70 - 00186 ROMA
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N. 69

MINISTERO DELLA SALUTE

DECRETO 2 novembre 2015.

Disposizioni relative ai requisiti di qualità e sicurezza del sangue e degli emocomponenti.

Supplemento ordinario alla "Gazzetta Ufficiale,, n. 300 del 28 dicembre 2015 - Serie generale

Spediz. abb. post. - art. 1, comma 1
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06-85081 - LIBRERIA DELLO STATO

N. 69

Art. 25.

Sicurezza della trasfusione

5. Al fine della prevenzione della trasfusione evitabile, sono definiti e implementati, sul territorio nazionale, specifici programmi (Patient Blood Management), con particolare riferimento alla preparazione del paziente a trattamenti chirurgici programmati, sulla base di linee guida da emanare a cura del Centro nazionale sangue entro sei mesi dall'entrata in vigore del presente decreto.

DECRETO 2 novembre 2015.

Disposizioni relative ai requisiti di qualità e sicurezza del sangue e degli emocomponenti.

	Raccomandazioni da adottare nel periodo pre-operatorio, intra-operatorio e post-operatorio
1	I pazienti con coagulopatie e/o piastrinopatie congenite o acquisite, o anamnesi positiva per emorragia, o in trattamento con anticoagulanti e/o antiaggreganti piastrinici, sono gestiti in tutte le fasi in collaborazione c
2	In tutti i pazie autologhi), osp patologie cardi raccomandata l' di medicina tras
3	La soglia trasfu altre categorie d
4	Nei pazienti os eritrocitari (omo trasfusione deve
5	Nei pazienti cc intravascolare d un elevato risch considerazione trasfusionale e d un esperto di me
6	Le indicazioni a vigente.
7	Il volume e la f contenuti al fine
9	Si raccomanda che tutti i pazienti adulti candidati a interventi di chirurgia maggiore elettiva per i quali sia stato impostato un programma multidisciplinare di interventi coordinati che preveda l'adozione delle tecniche farmacologiche o non farmacologiche finalizzate a ottimizzare l'eritropoiesi, a contenere le perdite ematiche o a ottimizzare la tolleranza all'anemia, prima di rilasciare il consenso a uno o più dei suddetti trattamenti, ricevano un'informazione esaustiva sulla loro situazione clinica e sulle strategie di contenimento del fabbisogno trasfusionale omologo incluse nel programma di *patient blood management* locale, anche mediante l'uso di materiale illustrativo redatto *ad hoc* dalla struttura ospedaliera.
10	Il valore *targ* *range* di norm
11	L'anemia è d
12	Qualora medi diagnostici d nutrizionali (croniche.
13	Poiché il valo trasfusionale rilevate, sono
14	Successivame non sia effic programmato ferro per via e
15	Nei pazienti fattore stimol terapia marzia
16	Ove indicata che permettan
20	Si suggerisce di adottare protocolli di somministrazione dei fluidi intra-operatori basati sui princìpi della ottimizzazione emodinamica.
21	Nei pazienti adulti sottoposti ad interventi in cui si preveda una consistente perdita ematica e che non presentino fattori di rischio per ipercoagulabilità all'anamnesi preoperatoria, si suggerisce di considerare l'impiego di acido tranexamico.
22	Nei pazienti sottoposti ad interventi in cui si prevedano perdite ematiche di almeno 1000 mL o comunque ≥ al 20% della volemia, si raccomanda l'adozione di strategie multimodali che includano il ricorso integrato a tecniche di risparmio del sangue (recupero intra-operatorio, tecniche farmacologiche, chirurgiche e anestesiologiche).
23	Si raccomanda l'impiego di strumenti *point-of-care* (POC) per la misurazione non invasiva e in continuo dell'Hb e dell'ematocrito.
24	Si suggerisce l'impiego di strumenti POC per il monitoraggio globale dell'emostasi allo scopo di guidare la terapia sostitutiva dei fattori della coagulazione e di contenere il supporto trasfusionale con emocomponenti negli interventi di cardiochirurgia e in tutti gli interventi ad elevato potenziale emorragico o in presenza di sanguinamento.
25	In presenza di sanguinamento massivo in atto in corso di chirurgia maggiore elettiva e in associazione alla correzione della causa scatenante, in corso di trasfusione massiva, si suggerisce di trattare l'ipofibrinogenemia grave (< 1 g/L) e persistente nonostante la terapia con plasma fresco congelato, con concentrato di fibrinogeno* (o, se non disponibile, con crioprecipitato).

SIMTI
PRO

PBM: definizione (in continua evoluzione...)

ANESTHESIA & ANALGESIA September 2022 • Volume 135 • Number 3

A Global Definition of Patient Blood Management

Aryeh Shander, MD,*† Jean-Francois Hardy, MD,‡§ Sherri Ozawa, RN,†‖ Shannon L. Farmer, DHSc,¶#**†† Axel Hofmann, Dr.rer.medic,¶**‡‡ Steven M. Frank, MD,§§ Daryl J. Kor, MD,‖‖¶¶ David Faraoni, MD,§## and John Freedman, MD,***††† Collaborators

"Patient blood management is a patient-centered, systematic, evidence-based approach to improve patient outcomes by managing and preserving a patient's own blood, while promoting patient safety and empowerment."

- **IFPBM** - International Foundation for Patient Blood Management
- **NATA** - Network for the Advancement of PBM, Haemostasis and Thrombosis
- **SABM** - Society for the Advancement of Patient Blood Management
- **WAPBM** - Western Australia Patient Blood Management
- **ONTraC** - Ontario Nurse Transfusion Coordinators

World Health Organization

Global Forum for Blood Safety:
Patient Blood Management
14–15 March 2011, Dubai, United Arab Emirates

"Concept Paper "

… Patient blood management (PBM) is a patient-focused, evidence-based and systematic approach to optimize the management of patient and transfusion of blood products for quality and effective patient care.

It is designed to improve patient outcomes through the safe and rational use of blood and blood products and by minimizing unnecessary exposure to blood products.

Essential elements of patient blood management include: the prevention of conditions that might otherwise result in the need for transfusion (through health promotion and screening for early detection), appropriate diagnosis and optimal treatment, including the use of alternatives to transfusion, good surgical and anaesthetic techniques, the use of alternatives to blood transfusion and blood conservation.

ANESTHESIA & ANALGESIA September 2022 • Volume 135 • Number 3

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SIMTI
PRO

PBM e Servizi Trasfusionali

PERIODO	PILASTRO 1 Ottimizzazione dell'eritropoiesi	PILASTRO 2 Contenimento delle perdite ematiche	PILASTRO 3 Ottimizzazione della tolleranza all'anemia
Pre-operatorio	• Rilevare l'anemia. • Identificare e trattare la patologia di base che causa l'anemia. • Rivalutare il paziente, se necessario. • Trattare le carenze marziali e le anemie sideropeniche, le anemie delle malattie croniche e le carenze funzionali di ferro (la cosiddetta "*iron-restricted erythropoiesis*"). • Trattare le carenze di altri ematinici.	• Identificare e gestire il rischio emorragico. • Contenimento del sanguinamento iatrogeno. • Attenta pianificazione e preparazione della procedura. • Predeposito, in casi molto selezionati.	• Valutare/ottimizzare la riserva fisiologica del paziente e i fattori di rischio. • Confrontare la perdita di sangue stimata con quella tollerabile dal singolo paziente. • Realizzare programmi di *blood management* individualizzati che includano le tecniche di risparmio del sangue adeguate al singolo caso. • Adozione di soglie trasfusionali restrittive.
Intra-operatorio	• Adeguata programmazione dell'intervento chirurgico dopo l'ottimizzazione dell'eritropoiesi.	• Emostasi meticolosa e tecniche chirurgiche. • Tecniche chirurgiche di risparmio del sangue. • Tecniche anestesiologiche di risparmio del sangue. • Tecniche di autotrasfusione. • Tecniche farmacologiche e agenti emostatici. • Diagnostica *point of care*.	• Ottimizzare la gittata cardiaca, • Ottimizzare la ventilazione e l'ossigenazione. • Adozione di soglie trasfusionali restrittive.
Post-operatorio	• Stimolare l'eritropoiesi, se necessario. • Rilevare le interazioni farmacologiche che possono favorire e accentuare l'anemia post-operatoria.	• Attento monitoraggio del paziente e gestione del sanguinamento post-operatorio. • Riscaldamento rapido/mantenimento della normotermia (almeno che non esista una specifica indicazione per l'ipotermia). • Tecniche di autotrasfusione, se appropriate. • Contenimento del sanguinamento iatrogeno. • Gestione dell'emostasi e dell'anticoagulazione. • Profilassi delle emorragie del tratto gastro-intestinale superiore. • Profilassi/trattamento delle infezioni.	• Ottimizzare la tolleranza all'anemia. • Massimizzare l'apporto di ossigeno. • Minimizzare il consumo di ossigeno. • Adozione di soglie trasfusionali restrittive.

Servizio trasfusionale

- Garantire l'appropriatezza e la reale necessità della trasfusione **al di là** della sicurezza/ qualità/ compatibilità del prodotto (obiettivo l'outcome)

- Contribuire ai percorsi di PBM della propria Struttura Sanitaria per la messa in atto delle misure raccomandate per la prevenzione e il trattamento delle anemie

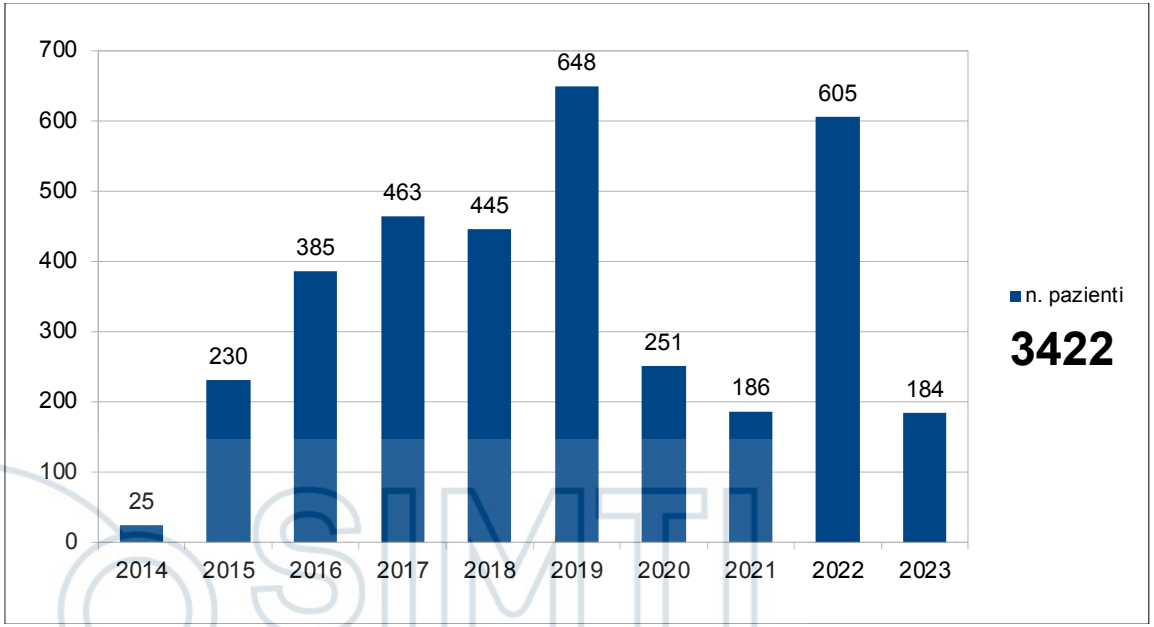
- Promuovere cultura e formazione sul corretto utilizzo della risorsa sangue

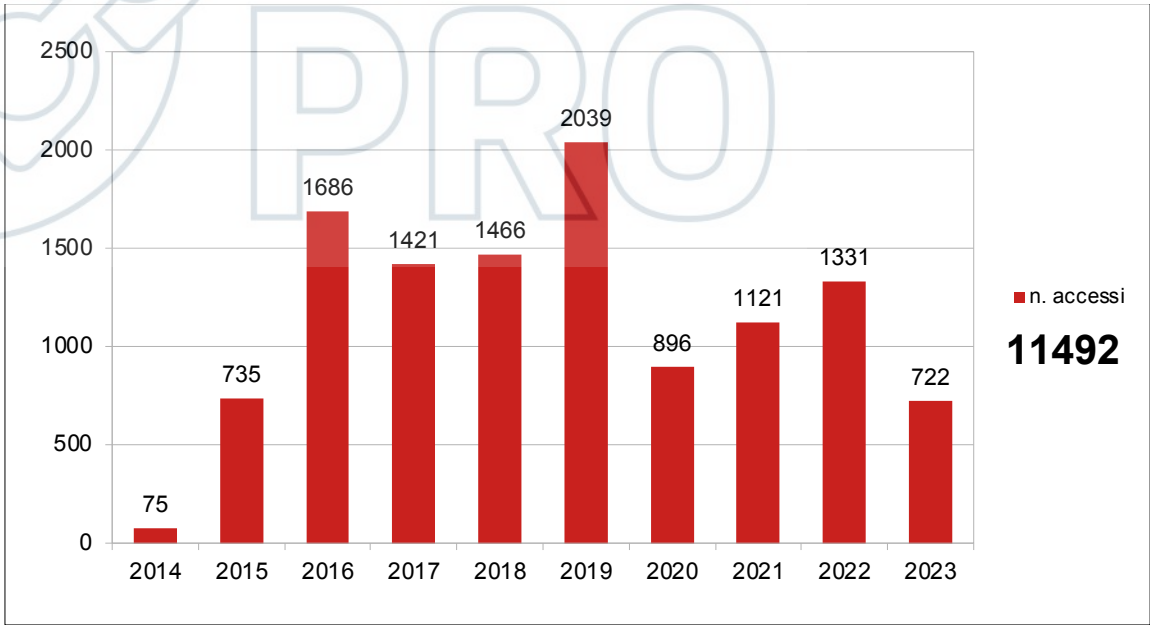
SIMTI
PRO

PBM: attività presso la Città della Salute e della Scienza di Torino

Anemia clinic pre-ricovero

dal **2014** ad oggi





Corsi di formazione aziendali

2013 - FORMAZIONE DEL PERSONALE PER LA GESTIONE DELL'AMBULATORIO PATIENT BLOOD MANAGEMENT

2013 - PROGETTO ED IMPLEMENTAZIONE DI UN AMBULATORIO MULTIDISCIPLINARE PER L'OTTIMIZZAZIONE EMATOPOIETICA IN PAZIENTI IN ATTESA DI INTERVENTO IN ELEZIONE

2015 - PATIENT BLOOD MANAGEMENT: L'EVOLUZIONE DELLA TRASFUSIONE DI SANGUE

2017 / **2019** - I TEST VISCOELASTICI DELLA COAGULAZIONE (TEG E ROTEM): A CHI, COME, QUANDO E PERCHÈ?

2018 / **2019** - IL SANGUE: SICUREZZA, PATIENT BLOOD MANAGEMENT E DISSENSO

2022 / **2023** – PREVENZIONE DELLA REAZIONE TRASFUSIONALE DA INCOMPATIBILITA' AB0: NORME, PROCEDURE, GESTIONE DEL PROCESSO

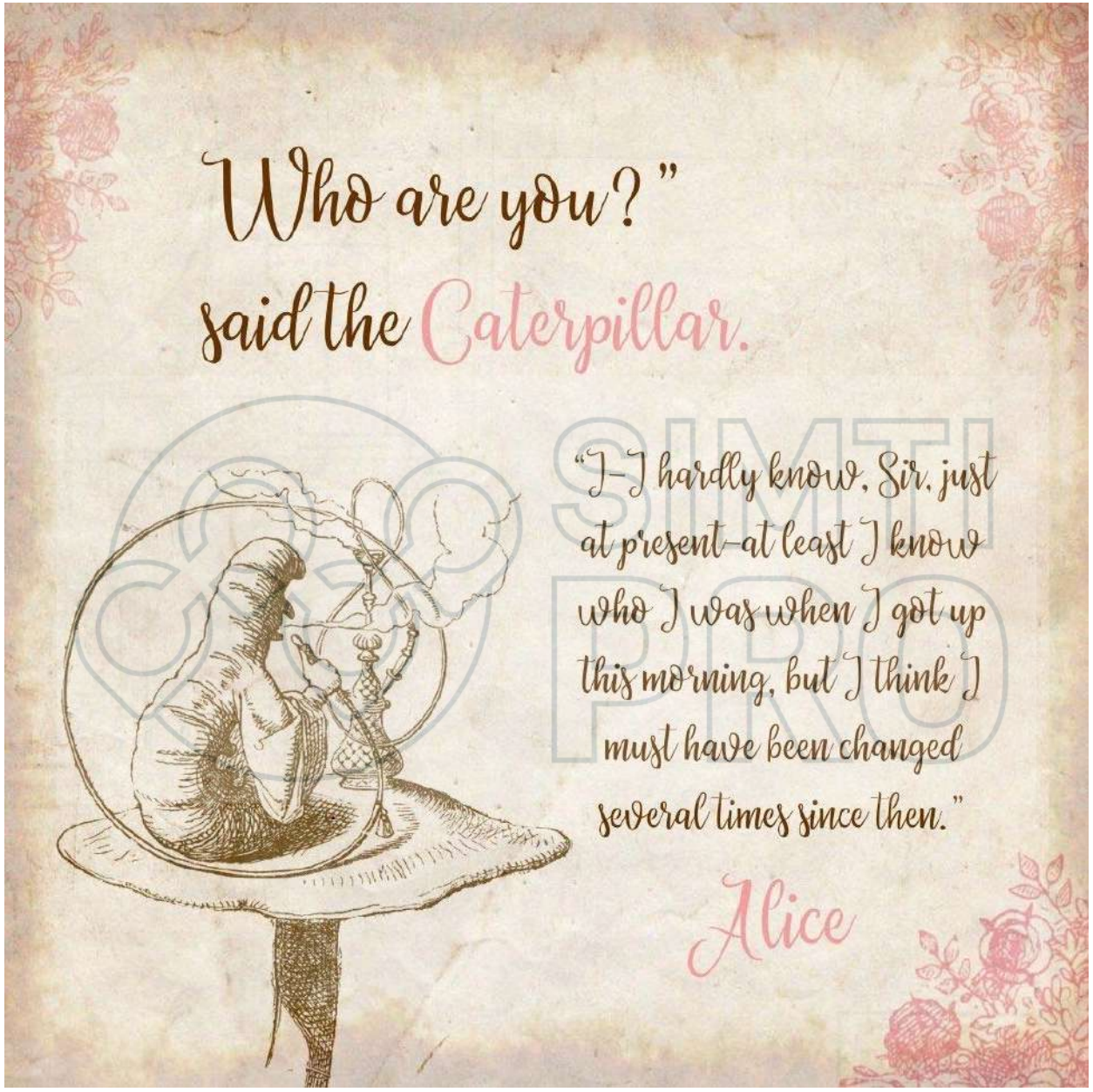
2022 / **2023** - GESTIONE DELLA RISORSA SANGUE "IL PATIENT BLOOD MANAGEMENT" PBM

Protocollo condiviso di gestione ospedaliera del paziente post-chirurgico in ambito di Patient Blood Management

- **giorno -1** Hb, saturazione transferrina, ferritina
- **intervento ch.** tecniche di risparmio di sangue, recupero i.o., acido tranexamico, normotermia, POC,
- **decorso** soglie restrittive, 1 unità se emodinamicamente stabili, solo prelievi per esami necessari (provette da 3 ml anzichè da 7 ml)
- **giorno +2 / +3** calcolo del ferro necessario per la risoluzione dell'anemia (Hb 13 g/dl – Hb attuale)
- **giorno +3 / +4** infusione Fe i.v. della dose calcolata
- **giorno +30** Hb, saturazione transferrina, ferritina

SIMTI
PRO

Cos’è realmente il PBM?


Who are you?"
said the Caterpillar.
"I-I hardly know, Sir, just at present-at least I know who I was when I got up this morning, but I think I must have been changed several times since then."
Alice