



Patient Blood Management in Clinical Practice: Time to Get into Action

Sponsored by CSL Behring

Chair: Elisavet Grouzi

Thursday 20th of April, 2023

1. THE FIRST STEP IN PATIENT BLOOD MANAGEMENT: CORRECTION OF ANEMIA

Elvira Bisbe

Patient blood management (PBM) is one of the six strategic goals of the WHO to ensure universal access to safe, effective quality blood products^{1,2}. This is a patient-centered, multidisciplinary, multimodal, evidence-based concept, aimed at preserving and properly using the patient's own blood as a vital resource. Currently, there is evidence that PBM programs do not only reduce the need for transfusion, complications, and mortality³.

Unlike the past treatment-centered approach, PBM focuses on the patient and the disease, that is, in anemia, aiming at improving the results.

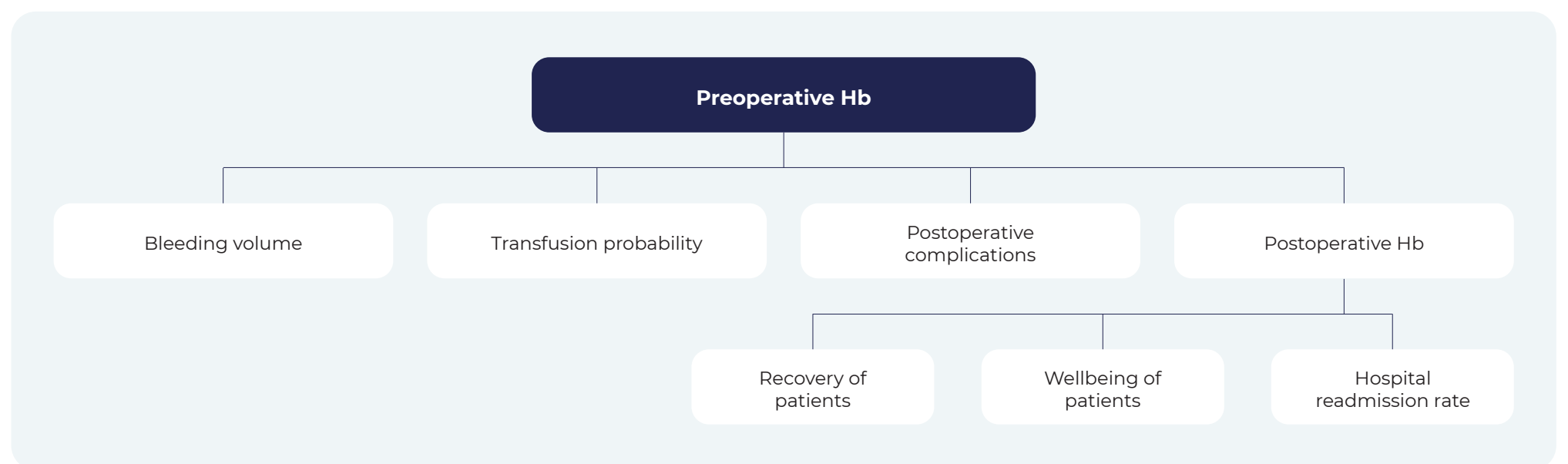
The last definition available of PBM refers to the multidisciplinary timely application of evidence-based medical and surgical concepts, with the following goals⁴:



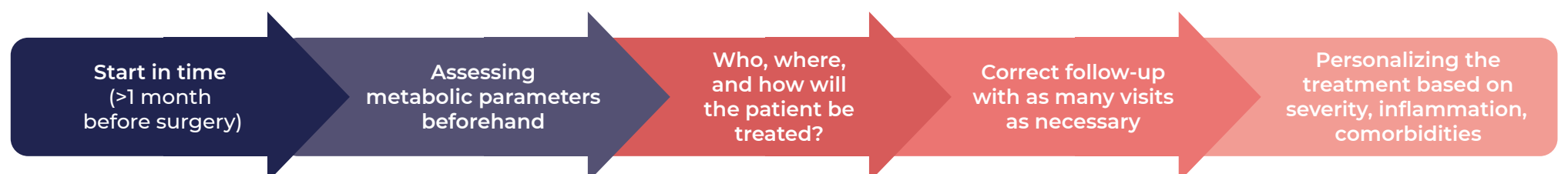
Therefore, one of three PBM pillars consists of optimizing the red blood cell mass of the patient⁵.

Managing anemia in PBM

The presentation of anemia is an independent risk factor to receive transfusions, with an increased morbidity and mortality⁶. The prevalence of preoperative anemia is high in patient undergoing major surgery¹, and it is an independent risk factor of morbidity and mortality⁷, even in mild cases⁸. Preoperative hemoglobin levels are related to various results⁹⁻¹³:



Anemia correction is the first step of PBM, which can result in an improvement of clinical results, and it involves the following steps:



Many institutions and scientific societies recommend not to perform elective surgeries in case of diagnosed rectifiable anemia.

Expert Comment

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PBM is not an intervention as such, but it represents the foundations of best clinical practices, focusing on the root of the problem.

PBM is a diamond of healthcare policies, since it improves health, provides better care, cuts down costs, and results in social benefit.

The prevalence of preoperative anemia is very high (20-70%), it is the main risk factor of transfusion, it is an independent risk factor of morbidity and mortality, and its treatment can reduce transfusion and improve postoperative results. Even a mild anemia (Hcto 29-36%) entails a higher morbidity and mortality in surgical procedures other than cardiac surgery.

A meta-analysis by Fowler (BJ Surg 2015), with nearly one million surgical patients, 39% of which suffered anemia, was correlated to a 2.9-fold increase of perioperative mortality, 3.75 times more FRA, 1.93 times more infections, 1.28 times more neurological events in CCA and 5 times more risk of red blood cell transfusion. This is why many scientific societies recommend against performing elective surgeries in patients with diagnosed rectifiable anemia.

Correcting anemia TAKES TIME, as well as a structured approach. Preoperative analysis must be performed on the metabolism of iron, iron and/or erythropoietin should be administered, and patients should be followed to verify the preoperative Hb value.

However, this is not a standard therapy, equal for everyone, but it has to be personalized (PBM seeks a personalized therapeutic approach, based on the cause of the anemia, the surgical procedure, and the characteristics of the patient).

Not treating preoperative anemia means missing a great opportunity, since a great deal of Hb at the time of hospital discharge is associated to faster recoveries, as well as better evolution and outcomes.

Not only surgical patients are important. Prepartum anemia affects 20% of pregnant women, and it is connected to a higher risk of preterm delivery, higher maternal and fetal mortality, and higher rate of infections. NATA recommends correcting prepartum anemia in all pregnant women with an IA evidence-level, as well as an optimal implementation of the first PBM pillar, including optimization of red cell mass before delivery.

KEY MESSAGES:

- Anemia is an independent risk factor for transfusion and the increase of morbidity and mortality.
- Anemia has a high prevalence in major surgery procedures.
- The postoperative Hb level is also associated to postoperative outcomes.
- Prepartum anemia is connected to maternal-fetal adverse events.
- Correcting anemia is the first step of PBM to achieve the main goal of improving the evolution of patients.



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2. MANAGING COAGULOPATHY IN POSTPARTUM HEMORRHAGE

Fatima Khatoon

The most universal definition of postpartum hemorrhage is the loss of 1000 ml of blood or more¹⁴, whereas NATA contemplates the loss of 500 ml in 24 hours, in both cases regardless of the type of delivery¹⁵.

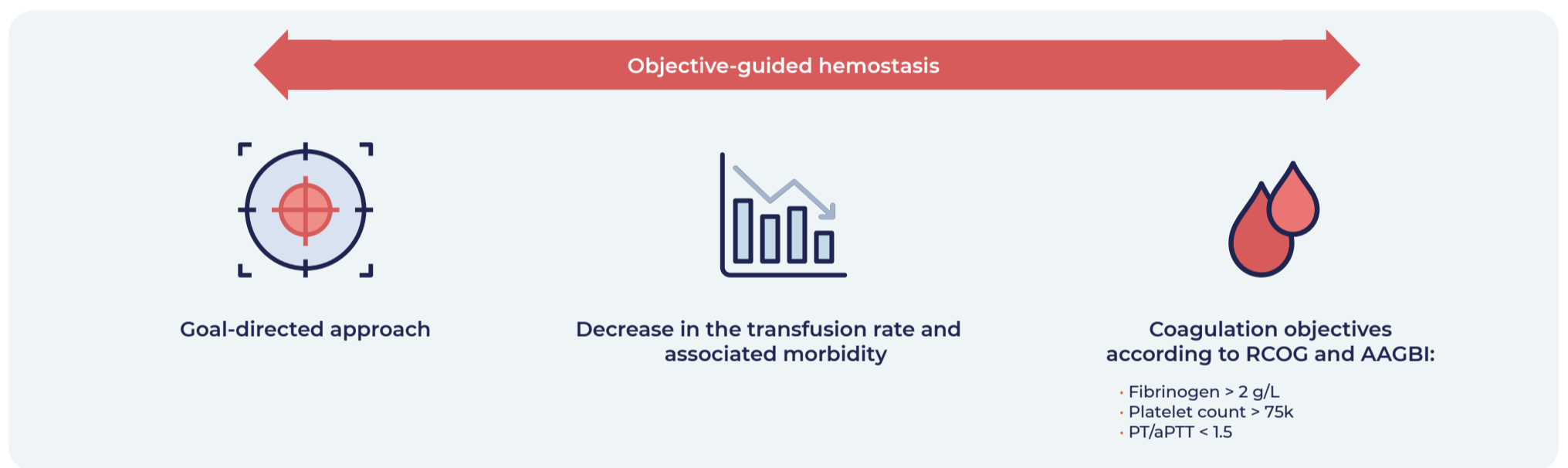
**Present in
1-6% of deliveries**

**Main cause of mortality in
developing countries**

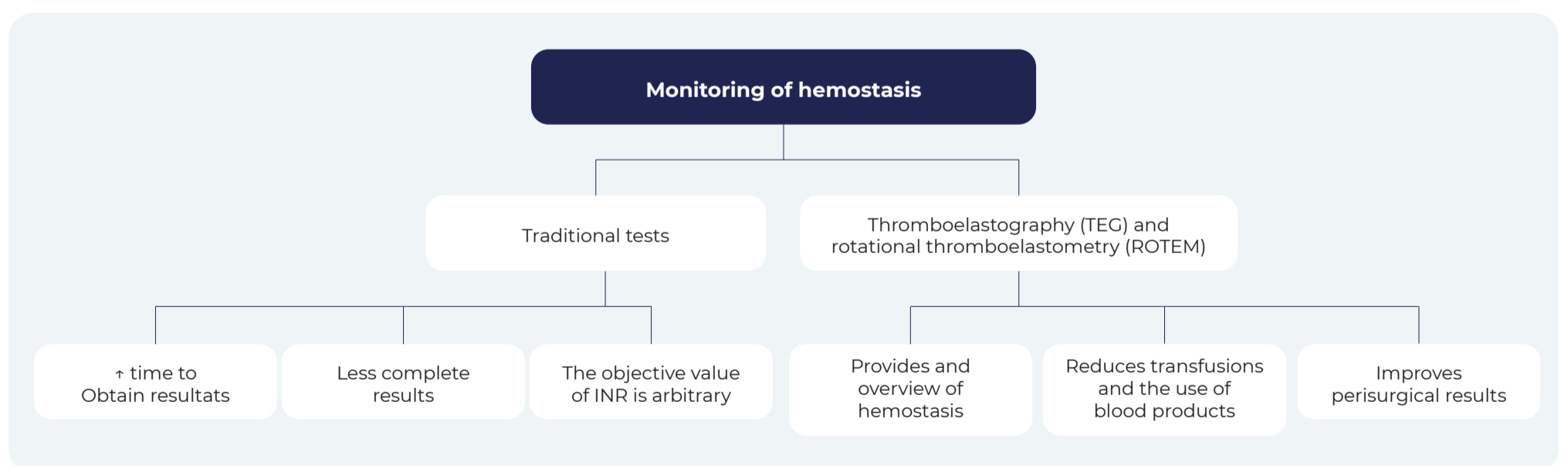
**< 25% of patients present
coagulopathy and require
coagulation factors**

In obstetrics, prepartum anemia is connected to worse outcomes, both for the mother and the newborn^{15,16}. Therefore, it is vital to correct anemia before delivery.

Objective-guided hemostasis consists of determining the deficient coagulation factor and the administration of only such factor.



With objective-guided hemostasis, unnecessary transfusions and associated morbidity, among others, can be reduced. Currently, the literature supports objective-guided hemostasis in obstetric patients, since it allows adapting the treatment to the type of coagulopathy. Not all women with postpartum hemorrhage present coagulopathy, and in order to make a diagnosis it is essential to understand the etiology of postpartum hemorrhage.



Postpartum hemorrhage over 1 500 ml only occurs in 2.7% of deliveries; using ROTEM, it has been estimated that, out of these women, barely 25% present signs of coagulopathy, and almost 50% of them do not require an intervention¹⁷.

Fibrinogen is the first coagulation factor that decreases in patients with postpartum hemorrhage, and often the only one. Its levels are an early severity predictor.

Management of hemostasis in obstetrics must be guided by objectives, and it should identify and correct, at first, the decrease in fibrinogen levels.

Expert Comment

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An important premise is that PPH is not exactly the same as post-trauma hemorrhage, and still, some therapy formulas applied to PPH are drawn from multiple trauma patient management guides.

A significant coagulopathy in PPH with bleeding > 1500 ml occurs in 25% of cases.

Hemostasis in PPH depends on the cause of the bleeding. The work by Peter Collins in 2014 shows that hemostasis after bleeding of 1-2 liters stays nearly always unchanged in cases of atony, whereas virtually all amniotic fluid embolisms present a coagulopathy.

Following a single formula would result in overtreatment of some cases and undertreatment of others.

Objective-guided hemostasis can be directed by standard lab tests, but the time between shipping the sample and obtaining the results is too long. These conventional tests do not give us a clear idea of the strength of the clot, and some parameters, such as INR, are not well correlated to the bleeding rate.

Therapy directed by viscoelastic tests (VET) is reliable, provides an overview of the hemostatic capacity of the patient, is adequately correlated with the severity of blood losses, saves transfusions of blood products, improves the evolution of patients, and is cost-effective.

The 2019 NATA consensus for PBM in obstetric hemorrhage is focused on maintaining Hb, correcting hemostasis, and reducing blood losses. NATA's therapeutic strategy recommends starting with tranexamic acid and repeating in case of persistent bleeding, using blood salvage devices, properly monitoring, target fibrinogen above 2 g/liter (or functional fibrinogen above 12 mm in ROTEM or 14 mm in TEG).

Surgical control of bleeding is fundamental and no hemostatic correction will be useful if the source of the bleeding is not surgically corrected.

In summary:

- Standard transfusion ratios lead to unnecessary transfusions and a dilution of fibrinogen levels
- Literature supports the use of objective-guided hemostasis
- Fibrinogen levels during PPH are an early predictor of hemorrhage severity
- Only 25% of women with postpartum bleeding suffer from an associated coagulopathy.
- The etiology of PPH is essential to diagnose the coagulopathy.
- VET-guided therapy is relevant, reliable, cost-effective, and improves perioperative results.



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2. MAKING PATIENT BLOOD MANAGEMENT THE STANDARD OF CARE: WHERE TO BEGIN?

Diana Castro Paupério

The implementation of PBM is an emergency worldwide, but how can it become the standard of care? The steps to implement and institutionalize PBM (PBM-TIPS implemented in Portugal) are summarized below.

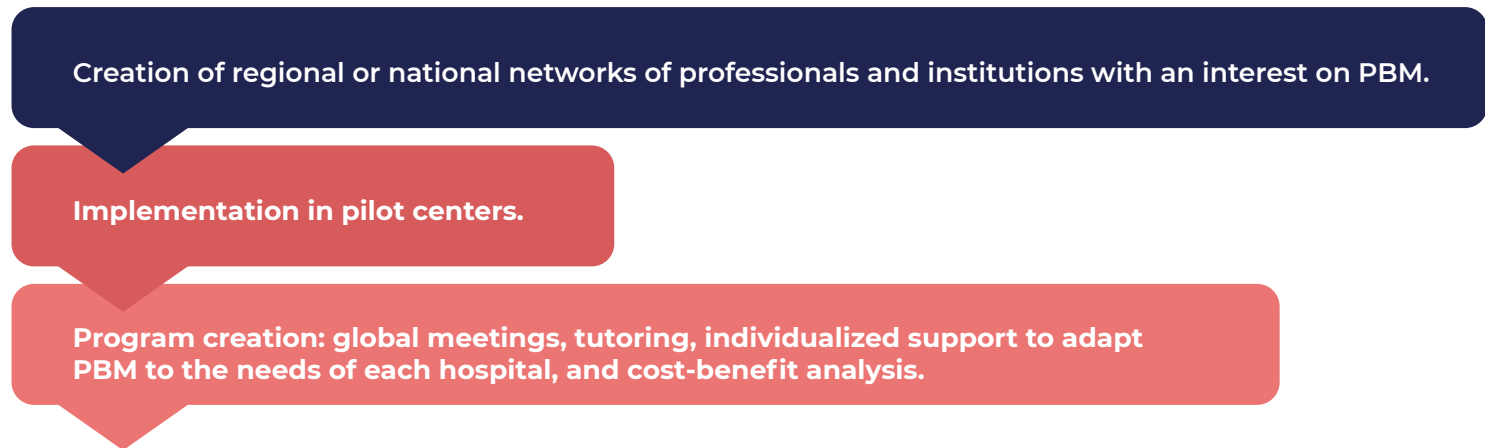
1 THE EMERGENCE OF THE NEED



2 COMUNICATION



3 CREATION OF THE INFLUENTIAL SUPPORT GROUP



4 OPPORTUNITY ANALYSIS



5 CHALLENGE ANALYSIS



Expert Comment



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Patient Blood Management is a bespoke solution that follows a set of global rules and should be adapted to each particular context.

Doctor Castro explains the journey followed to reach the implementation and dissemination of PBM programs in her country. She underlines the need for support from political authorities, the creation of a medical network between hospitals of various levels and primary care centers involved in PBM.

She also stresses the importance educating future doctors at universities, as well as training residents.

PBM is not implemented in the infrastructure of our hospitals, and it is not part of our service portfolio—it is a pro bono activity.

In summary, the implementation of PBM is based on education, dissemination, a multidisciplinary approach, and patient empowerment.

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