



## Special article

# Consensus of the Brazilian association of hematology, hemotherapy and cellular therapy on patient blood management

## Definition of Patient Blood Management

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## ARTICLE INFO

## Article history:

Received 6 February 2024

Accepted 18 February 2024

Available online 8 March 2024

## Keywords:

Patient-centered approach

Empowerment

Patient blood management

Blood transfusion

## ABSTRACT

Managing the patient's blood and hematopoietic system is like managing any of the other organs and organ systems during patient care. Specialists control the heart, kidneys, endocrine system, etc. and the patient's blood requires similar clinical treatment. The hematopoietic system and its circulatory products are fundamental for the healthy functioning of the human body. In simple terms, Patient Blood Management (PBM) is an organized, patient-centered approach in which the entire healthcare team coordinates efforts to improve outcomes by managing and preserving the patient's own blood. By reducing dependence on blood transfusions, PBM seeks to improve clinical outcomes, reduce the risks and costs associated with transfusions, and improve the safety and quality of patient care. Essentially, the concept of PBM is about the holistic management and preservation of the patient's own blood in the medical and surgical context.

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<https://doi.org/10.1016/j.htct.2024.02.003>

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## Definition

It is well known that the term Patient Blood Management (PBM) was originally proposed in 2005 by James Isbister at a board meeting of the Medical Society for Blood Management and first appeared in the literature in 2008.<sup>1</sup> However, long before that there was a concept of Patient Blood Management (PBM); we can say that it began to be structured by the renowned heart surgeon Dr. Denton Cooley. Dr. Cooley, who is recognized as “the father of bloodless surgery,” pioneered open-heart surgery without blood transfusion at the Texas Heart Institute in the early 1960s. At that time, these surgeries regularly consumed dozens of units of blood to fill the circuit of the heart-lung machine and during the procedure itself.<sup>2</sup>

Patients who refused blood transfusions and requested a “bloodless” approach came to Cooley for surgery. He felt that these patients needed to be cared for like any other, and so he developed a different approach, ‘another way’ to manage their treatment. This involved three basic steps that would later be described as the three pillars of PBM.<sup>3</sup> This was indeed the beginning of a new approach to surgical patient care. Rather than simply relying on the transfusion of blood from other people, this approach focused on preserving and managing the patient’s own blood.<sup>2,4</sup>

PBM is currently defined as a “patient-centered, systematic and evidence-based approach to improve patient outcomes by managing and preserving a patient’s own blood, while at the same time promoting patient safety and empowerment.”<sup>1</sup>

PBM involves the timely, multidisciplinary application of evidence-based medical and surgical concepts with the aim of: 1) screening patients in respect to the diagnosis and adequate treatment of anemia; 2) minimizing surgical, procedural and iatrogenic blood loss and managing bleeding linked to coagulopathies; and 3) increasing tolerance of the patient’s anemia while appropriate treatment is initiated. This definition also emphasizes the critical role of informed patient choice.

The goal of PBM is not limited to reducing blood transfusions as such. Rather than transfusions being the standard based on a specific hemoglobin concentration, PBM focuses on the importance of the patient’s own blood as a unique, valuable, natural resource that must be conserved and managed appropriately. Hence, a reduction in the number of transfusions is a natural consequence of the direct implementation of PBM. Adherence to the principles of rational blood use, that is, transfusions indicated at the smallest dose necessary to maintain a certain laboratory hemoglobin value, helps to minimize transfusion. However, such programs, designed to reduce transfusions, have a narrow focus compared to the broader clinical approach of PBM.

Once the concept and importance of PBM are understood, it is necessary to find an effective way to implement the approach in hospitals and medical services, including outpatient services. All sectors of healthcare must be aligned with the proposals and objectives of PBM. This topic will be addressed in a subsequent article of this Consensus entitled The Implementation of Patient Blood Management.

## Recommendation

For the implementation of PBM to be successful, a multidisciplinary approach is required, involving professionals from different areas, including doctors, surgeons, anesthesiologists, hematologists, as well as other professionals. Education and awareness of PBM guidelines are essential to ensure their adoption and effectiveness.

## Conclusion

PBM takes an individualized, multidisciplinary approach to managing a patient’s blood through the assessment and development of a management plan to optimize the patient’s own blood (identify and correct conditions such as anemia and iron deficiency), minimize blood loss (such as surgical techniques that reduce blood loss) and optimize tolerance to anemia.

This approach should be the standard of care applied by all clinicians for patients facing a medical or surgical intervention with a high risk of significant blood loss. The best and safest blood for patients is their own circulating blood.

## Conflicts of interest

The author declares no conflicts of interest.

## Supplementary materials

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.htct.2024.02.003](https://doi.org/10.1016/j.htct.2024.02.003).

## REFERENCES

1. Shander A, Hardy JF, Ozawa S, Farmer SL, Hofmann A, Frank SM, et al. A global definition of patient blood management. *Anesth Analg*. 2022;135(3):476–88.

2. Isbister JP. The three-pillar matrix of patient blood management - an overview. *Best Pract Res Clin Anaesthesiol.* 2013;27(1):69–84.
3. Cooley DA. Conservation of blood during cardiovascular surgery. *Am J Surg.* 1995;170:53S–9S.
4. Farmer SL, Isbister JP, Gross I, Estioko MR, Shander A. Patient choice and the drive for change. In: Farmer SL, Gross I, Shander A, eds. *Blood works: an owner's guide: what every person needs to know before they are a patient*, Westport: City Point Press; 2022:42–73.