



# Preoperative Autologous Blood Donation: Waning Indications in an Era of Improved Blood Safety



Ralph Vassallo<sup>a,\*</sup>, Mindy Goldman<sup>b</sup>, Marc Germain<sup>c</sup>, Miguel Lozano<sup>d</sup>, for the BEST Collaborative

<sup>a</sup> Blood Systems, Inc, Scottsdale, AZ

<sup>b</sup> Canadian Blood Services, Ottawa, ON, Canada

<sup>c</sup> Medical Affairs, Héma-Québec, Québec, QC, Canada

<sup>d</sup> Hemotherapy Section, Hospital Clinic de Barcelona, Barcelona, Spain

## ARTICLE INFO

Available online 6 May 2015

### Keywords:

Autologous blood transfusion  
Blood donors  
Patient blood management

## ABSTRACT

A downward trend in preoperative autologous donation (PAD) continues in Europe and the Americas, with many jurisdictions only funding medically necessary collections at present. This is the result of decreasing real and perceived residual risks of allogeneic transfusion-transmitted disease and the declining need for transfusion due to patient blood management, which have also led to escalating logistical and cost constraints for PAD programs. We outline collection trends in North America, Europe, and Latin America and review the benefits, risks, effectiveness, and safety of PAD. Important elements of informed consent follow from these points. Evidence-based medical criteria for PAD and autologous transfusion are discussed as are methods to optimize autologous collection timing to regenerate donated red cells. Recommendations for identification of patients whose risk-to-benefit ratio suggests substantial benefit compared with other autologous blood salvage and anemia management alternatives conclude the review.

© 2015 Elsevier Inc. All rights reserved.

## Contents

Preoperative Autologous Donation Trends . . . . .	269
Benefits and Risks of PAD . . . . .	269
Preoperative Autologous Donation Informed Consent . . . . .	271
Effectiveness of PAD . . . . .	271
Criteria and Procedure-Specific Guidelines for PAD . . . . .	272
Transfusion Triggers for Autologous Blood . . . . .	272
Timing of PAD . . . . .	273
Safety Concerns With PAD . . . . .	273
Preoperative Autologous Donation Cost-Effectiveness . . . . .	273
Summary and Recommendations . . . . .	274
Conflict of Interest . . . . .	274
Acknowledgments . . . . .	274
References . . . . .	274

Despite recent decreases in red blood cell (RBC) demand, demographic projections in highly developed countries predict that, by 2050, the population 60 years and older will have nearly doubled while the proportion of individuals 15 to 59 years old declines by almost 20% relative to the year 2000 [1]. This will result in a contracting donor population just as more elderly patients require transfusion-dependent

procedures. Therefore, efforts to assure the availability of blood remain relevant. There has also been increasing awareness of potential complications of transfusion, and many institutions have developed blood conservation strategies to optimize use of allogeneic blood transfusion alternatives in the perioperative setting. Autologous blood conservation techniques including perioperative autologous cell salvage (PACS), acute normovolemic hemodilution (ANH), and preoperative autologous donation (PAD) may be elements of these blood conservation programs.

Preoperative autologous donation enjoyed a great surge in popularity in the 1980s and early 1990s with the emergence of transfusion-

\* Corresponding author at: Ralph Vassallo, MD, FACP, EVP/Chief Medical & Scientific Officer, Blood Systems, Inc, 6210 E Oak St, Scottsdale, AZ 85257.

E-mail address: [rvassallo@bloodsystems.org](mailto:rvassallo@bloodsystems.org) (R. Vassallo).

transmitted HIV and hepatitis C. At the peak of public concern, as many as 8.5% of RBCs collected in the United States were obtained from autologous donors [2]. Since the mid 1990s, however, US autologous donation volumes have declined, precipitously so since 2001. Although autologous blood collection was never as prevalent in Canada or Europe as in the United States, these jurisdictions have also seen a substantial decline in use. The emergence of nontransfusion alternatives driven by patient blood management programs and demonstration of the safety of lower transfusion thresholds in a number of landmark randomized controlled trials (RCTs) has further eroded the indications for PAD [3–7]. We review PAD collection trends in the United States, Canada, and European and Latin American countries as well as the advantages, disadvantages, safety, and efficacy of PAD in an era of significantly improved blood safety.

### Preoperative Autologous Donation Trends

From the US 2011 National Blood Utilization and Collection Survey, Figure 1 illustrates the progressive decline in US collections [8]. In 2011, approximately 113 000 autologous whole blood (WB) units were collected (just <30% in hospitals) and approximately 4000 RBC units by single- or multiple-unit apheresis. The mean number of units collected per patient was 1.3. Nearly 45% of collected units were not transfused. Autologous units represented less than 0.75% of all RBCs collected in the United States in 2011. More recent North American blood providers' data are shown in Figure 2.

Even in European countries still transfusing significant volumes of autologous blood, Figure 3 shows the significant downward trend in the percentage of autologous units collected since 2001. Stringent autologous collection guidelines are in place in Denmark, Finland, Ireland, the Netherlands, Norway, Poland, and Sweden, where less than 0.02% of donations were provided by autologous donors in 2008 [9]. Within Latin America, of the 13 countries reporting data to the Pan-American Health Organization, Cuba, El Salvador, Honduras, and Nicaragua drew 0.02% or less of RBCs from autologous donors in 2011 [10]. With the exception of Argentina and Brazil (whose fraction of autologous units in the blood supply has remained relatively stable around 2.5% and 1.4%, respectively), since 2007, there has also been a downward collection trend in most of the remaining countries (Fig 4).

### Benefits and Risks of PAD

Potential benefits of PAD are listed in Table 1. When PAD was first introduced, advocates focused on the elimination of allogeneic infectious disease transmission. Because of improvements in donor testing, risks of HIV, hepatitis C virus (HCV), and hepatitis B virus (HBV) transmissions

have decreased dramatically. In the United States, these are approximately 1 per 1 470 000 units for HIV, 1 per 1 150 000 for HCV, and 1 per 765 000 to 1 010 000 units for HBV [11,12]. Corresponding rates in Canada are reported as approximately 1 per 8 000 000 units for HIV, 1 per 6 700 000 for HCV, and 1 per 1 700 000 units for HBV [13]. However, in Southern Europe, HBV residual risk still remains high, estimated in Italy at 1 per 71 942 and, in Spain, 1 in 177 305 transfusions [14,15]. Patients may have an erroneous impression of these risks for a variety of reasons, including inaccurate transfusion consent forms, inadequate explanations from treating physicians or other health professionals involved in the PAD process, and commonly held misperceptions of transfusion risk in the general public. Without an accurate representation of risk, patients may perceive an inappropriately higher value for PAD [16].

Another cited benefit of PAD is related to supplementation of the allogeneic blood supply. This would benefit all patients due to wider availability of allogeneic blood. There are also benefits for the autologous donor in particular because his or her surgery is less likely to be delayed due to inadequate blood availability. However, as detailed in the PAD trends below, the number of allogeneic units actually saved by transfusion of autologous blood is very small, with negligible impact on overall blood availability. In an environment of overall decline in blood use, outside of holiday shortages, postponement of surgery is increasingly uncommon [8].

A third possible benefit of PAD is avoidance of transfusion-related immunomodulation (TRIM) effects associated with allogeneic transfusion. Particularly in retrospective studies, allogeneic transfusion has been associated with an increased risk of perioperative infection, cancer progression and relapse, and overall mortality. The existence and magnitude of this effect have been the subject of intense debate. Despite the conduct of a number of RCTs, no TRIM effect attributable to allogeneic white blood cells has been unequivocally demonstrable. It was concluded in a review of the many relevant studies that more widespread use of PAD could not be recommended for TRIM prevention [17]. Immune-mediated complications have, however, been reported with autologous transfusion, including febrile nonhemolytic transfusion reactions (FNHTRs), allergic reactions, and transfusion-related acute lung injury (TRALI) [18]. The risk of bacterial infection does not appear to be reduced in patients receiving autologous, as opposed to allogeneic transfusions [19].

In the late 1980s and 1990s, there was substantial media attention on the risks of transfusion-transmissible diseases. Inquiries into the management of the blood system took place in many jurisdictions. This fueled public concern about the safety of transfusion and encouraged patients to ask their physicians about autologous blood. Given the extremely low risk of transfusion-transmissible diseases at present, public confidence in the blood system has improved substantially.

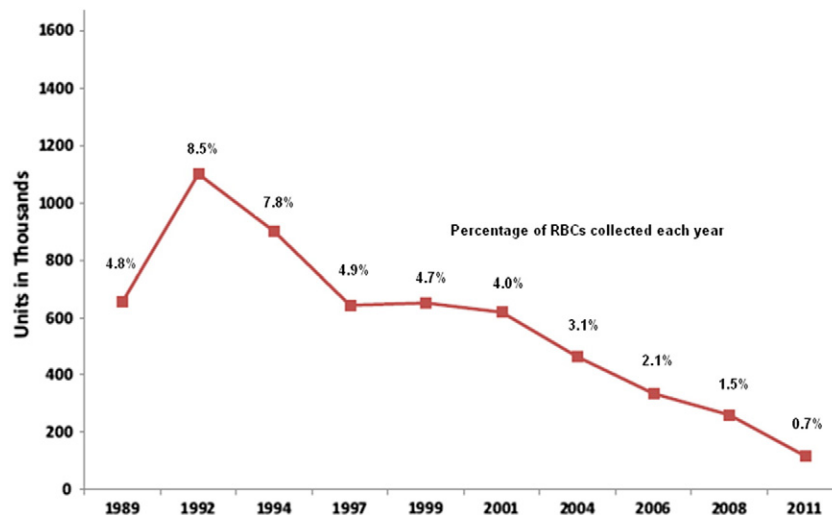


Fig 1. Historic US autologous collection volumes and fraction of collected RBCs.

Download English Version:

<https://daneshyari.com/en/article/3336491>

Download Persian Version:

<https://daneshyari.com/article/3336491>

[Daneshyari.com](https://daneshyari.com)