



Advancing Transfusion and
Cellular Therapies Worldwide

ASSOCIATION BULLETIN #08-04

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To: AABB Members
From: J. Daniel Connor, MM, President
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Re: Strategies to Reduce Adverse Reactions and Injuries in Younger Donors

This Association Bulletin contains information for the membership on strategies that may mitigate the risk of injuries and adverse reactions in donors under 20 years of age. AABB is issuing this bulletin in anticipation of the renewal of high school and college blood drives. Blood collecting facilities may want to consider implementing some of these strategies in an effort to reduce the incidence of injuries and adverse reactions in this population of donors.

Association Bulletins, which are approved for distribution by the AABB Board of Directors, can include announcements of standards or requirements for accreditation, recommendations on emerging trends or best practices, and/or pertinent information. This bulletin does not contain specific recommendations, nor does it create a standard or accreditation requirement. It is based on reports from the AABB Younger Donors Adverse Reaction Working Group, which includes physicians, nurses, administrators, communications and legal experts, and representatives from AABB, America's Blood Centers, the American Red Cross, and Blood Centers of America. The working group reviewed and discussed available information and, on the basis of current practices, addressed three objectives: 1) reduce adverse reactions in young blood donors; 2) eliminate donor injuries related to adverse reactions; and 3) address donor education and consent issues related to young blood donors. The full texts of these reports, which are included as [appendix 1](#) and [appendix 2](#) to this bulletin, contain a number of strategies that may accomplish these objectives. Some of the suggested interventions are supported by studies and data, while others represent a common practice or, a practice that is expected, but not proven, to accomplish the stated objectives.

Background

Volunteer blood donations are the basis of the nation's blood supply. Donations are recruited from a healthy population that ranges in age from 16 (state law permitting) to 75 years or older. During the past several years, blood collection facilities have placed greater emphasis on donations from younger donors as donations from older donors are declining due to individual health issues and other eligibility barriers. Reports from blood collection facilities indicate that 10 to 20 percent of all whole blood collections in the

United States now come from blood donors who are less than 20 years old. In states where 16-year-olds are permitted to donate, the percentage of donations from this age group is even higher. The growth of this donation segment is related to the increase in blood drives at high schools. Blood donors of high school age generally embrace the opportunity to donate blood for a number of reasons; including their perception that donating is a “rite of passage,” their attraction to the medical/technological aspects of blood donation, and the fact that they can often be excused from class. They are also ideal donors because they have lower deferral rates and, by experiencing donation early in life, they are more likely to continue donating in the future.

As data from young donors and high school drives accumulate, it has become clear that the rate of adverse reactions is more frequent in this group of donors – as much as five times the adult rate in some studies. Although serious syncopal reactions that can lead to donor injury are rare, they are proportionately elevated in this group. Moreover, age appears to be inversely related to the risk of suffering an adverse reaction. Several recent studies document this phenomenon as well as various strategies to reduce adverse reactions. These published results have drawn greater attention to this issue among blood collection facilities. Recognizing this new information and understanding the importance of assuring donors a safe and satisfying donation experience, blood collection facilities have joined forces to address safety for young blood donors.

Donor Adverse Reactions

The vast majority of blood donations are uncomplicated, with no side effects or discomfort. However, a small number of donors experience bruising and/or bleeding at the venipuncture site, mild nausea, or changes in consciousness, including dizziness, pre-fainting, fainting or syncope leading to collapse or convulsions. The working group focused specifically on change of consciousness reactions, such as syncope, that can lead to donor injury if the donor falls. Several factors influence the risk of complications after blood donation: inherent donor characteristics and predisposition toward reactions, blood collection staff skill and experience, blood drive set-up and environmental site features, and donor education before and after donation.

The literature, published studies and blood collection facility experience document donor characteristics that correlate with higher syncopal complication rates after whole blood donation. These include young age, first-time donation status, low weight, low blood volume, female gender, and Caucasian ethnicity. Young age, total blood volume, and first-time donation status are known to be independent risk factors and leading determinants of syncopal reactions.

Given these predisposing factors, the working group reviewed many field practices and literature reports on measures to reduce reactions, including the following.

- **Predonation education.** Measures in this area greatly affect donor understanding of what to anticipate and how to deal with discomforts that might arise from donation. This area is addressed more specifically below under Donor Education.

- **Blood drive environment and set-up.** Although few published data or information are available on best practices for drive set-up, the working group recognized the importance of adequate ventilation, electrical outlets, and physical space for managing adverse reactions. Specific actions discussed include:
 1. Procedures for site selection to ensure acceptable conditions that support operation and guidance on discontinuing operations if the conditions become unsuitable.
 2. Controlled donor flow and adequate staff or volunteer availability.
 3. Existence of a donation environment that can accommodate progressive recovery strategies.
 4. Donor escorts, especially from the chair/bed to the postdonation area (canteen).
 5. Predonation area for hydration and nutrition.
 6. Postdonation canteen/refreshment area.
 7. At the canteen site, adequate staff or volunteers who are trained in recognizing donation reactions.
 8. Separate areas for recovering donors who may feel anxious or sick.

Additional practices and information relating to the listed strategies are contained in the appended reports.
- **Staff supervision and phlebotomist skills.** Training and supervision of collection staff are critical to the success of all blood drives and the safety of the donor. For high school drives, in particular, providing extra or experienced staff may mitigate the rate and impact of donor reactions. Blood collection facilities should regularly review collections staffing, training, and performance regarding managing reactions.
- **Interventions.** Various field practices are currently in place to prevent donor reactions, specifically in young donors. Although they are evolving practices, the following practices should be considered and evaluated by blood collection facilities.
 1. Donor Size/Age Criteria. The current eligibility requirement of a minimum weight of 110 lb and a whole blood collection limit of 10.5 mL/kg are sufficient to protect most donors. These criteria are based on the assumption that they would prevent drawing more than 15 percent of a donor's blood volume. Some blood collection facilities are considering changing those criteria to require that eligible donors have an estimated blood volume greater than 3500 mL. Other practices include raising the minimum weight to 120 lb for young donors or collecting a smaller volume of blood from young donors.
 2. Distraction Strategies. Distraction techniques such as audiovisual entertainment have been reported to be effective at putting donors at ease during collection, based on reductions in self-reporting of reactions.
 3. Hydration. In a few studies, donors who received water (500 mL, 30 minutes before donation) reported significantly fewer reactions. Blood

collection facilities may want to provide donors less than 20 years of age with beverages and encourage them to consume 500 mL of fluid within 30 minutes before phlebotomy.

4. **Applied Muscle Tension (AMT).** AMT is the repeated, rhythmic contraction of the large muscles of the arms and legs and has been shown to reduce presyncopal reactions in young donors. This technique is also easy to learn and safe to use.
5. **Automated Collection Procedures.** Automated two-unit red cell collections have a favorable safety profile compared to whole blood collections in young and first-time donors. The lower risk of reactions may be attributed in part to the saline (volume) replacement. Expansion and further study of apheresis red cell donation programs in high schools and colleges is recommended.
6. **Postreaction Instructions.** Under current standards, blood collection facilities must have a process for treating donor adverse events and providing for emergency care as necessary (BB/TS Standard 5.3.2.1). It is advisable to include information for both donors and families. This issue is addressed in more detail below under Donor Education.

Donor Injuries Resulting from Reactions

As it is a rare occurrence, there is no published information on injuries resulting from blood donor reactions. Available data come from injury claims at large collection programs. Current estimates predict approximately one serious injury per 200,000 donations. Injuries can occur when a donor has a syncopal reaction and collapses to the floor, causing facial or other fractures and lacerations. Reducing these syncopal reactions should, in turn, reduce these types of injuries. Other environmental and operational practices, including the use of additional staff and training in the management of reactions in the recovery area, are evolving. Reinforcement of canteen observation and escort policies and donor education about reaction recognition are also recommended. Placing recovering high school donors on floor mats to prevent falls and injury is another practice being evaluated. An accurate assessment of the impact of these measures awaits further collection of information on injury rates.

Donor Education

Predonation information, consent for donation and understanding how to manage postdonation issues are critical to providing a satisfying donation experience and ensuring that the donor returns for future donation. Because younger donors have different backgrounds, expectations, and legal issues relating to their donation, donor education and consent have special significance. Blood drives at high schools involve additional considerations for education, legal responsibility, and parent/guardian involvement.

Predonation anxiety is associated with increased rates of reactions. Addressing common donor fears and suggesting useful coping techniques allays donor anxiety and improves

attitudes toward self-efficacy (the belief that one has the capability to manage a situation) and future intention for blood donation. Predonation educational materials should be considered part of the consent process, in that information pertinent to the donation process, possible reactions, and interventions is imparted before the decision to donate. These materials will have greater impact if they are designed for the high school population, using age-appropriate language and graphics. They also may be presented in other adolescent-friendly formats, such as videos. Elements to be considered for inclusion in such materials include:

- A general statement that most donors have uneventful donations and most reactions, when they occur, are minor.
- A statement identifying which donors may be at increased risk for a reaction and why (for example, young, first-time, female, or low-weight donors may be especially at risk).
- A brief description of the donation process to inform first-time donors about the process and to alleviate anxiety about the unknown.
- Descriptions of possible techniques to prevent reactions and enhance coping skills, and a brief explanation of the possible benefits of adhering to these techniques.
- Statements describing blood collection facility policies on parent/guardian consent and confidentiality regarding test results, if applicable.

Blood collection facilities may want to consider targeting educational initiatives on adverse reaction prevention strategies, coping strategies to reduce reactions, responses to the management of delayed or prolonged donor reactions, and continuity of care after release from the donation site to the following groups:

- Chairpersons, drive sponsors, and high school officials.
- Training, recruitment and collection staff.
- High school students and their parents.
- School nurses.

Ideally, this information should be delivered close to the day of donation.

Postreaction Education and Care. Collection facilities must have a process for treating donor adverse events and providing for emergency care as necessary (BB/TS Standard 5.3.2.1). Measures to improve communication with parents/guardians or school nurses should improve the management of delayed reactions after leaving the site, and collection facilities may want to consider the following measures:

- Communication with parents/guardians if a donor experiences loss of consciousness or other reaction or injury, in accordance with state laws.
- Continuation of care for young donors who have had a reaction at the site or at home.

Consent and Confidentiality for Young Blood Donors

Informed consent practices for blood donation that successfully incorporate the principles of autonomy, veracity, beneficence, and non-maleficence have not been uniformly adopted. Consent to donate is not a simple signature on a form, but a broader process that involves education of the donor and, in some cases, the donor's parents/guardians. Moreover, consent for the collection of blood from 16- and 17-year-old minors, presents certain dilemmas and challenges. For example, state laws that allow 17-year-olds to consent to donate blood are generally silent on the minor's right to consent to subsequent medical treatment for an adverse reaction. States that allow 16-year-olds to donate often require parent/guardian permission/consent and, therefore, do not imply any emancipated status. Even though these states may recognize that minors have the decisional skills necessary to make informed health-care decisions, parents/guardians still have legal responsibility for their minor children.

Policies on notification of blood donors of test results must be carefully reviewed against state statutes relating to minors. In addition, minors are generally prohibited from participating in research without parent/guardian permission, although blood collection facilities may perform certain required or elective tests under research protocols that have been approved by an institutional review board.

Again, in providing adolescent donors (and parents/guardians) with information regarding the donation process and possible consequences (reactions), collection facilities are meeting an essential requirement of consent. Blood collection facilities may want to:

- Consult state statutes regarding age and consent requirements.
- Become familiar with the literature specific to adolescent/minor informed consent and assent.
- Provide information to both donors and parents/guardians as part of the consent process. Some facilities provide a parent/guardian consent form that functions as both informational brochure and consent documentation.
- Incorporate information specific to increased rates of reactions among certain groups such as young and/or first-time donors into the consent process.
- Incorporate statements regarding release of information to parents regarding medical care for reaction and/or positive test results, as applicable.

Summary and Conclusions

While most donations are uneventful, even a minor complication reduces the likelihood of a return donation. Serious injury following blood donation occurs infrequently among all donor age groups, but adolescent donors are disproportionately affected compared to older adults. Virtually all dimensions of the blood donation experience have some impact on the risk of complications. The working group has performed a comprehensive review of current views and practices involving adverse donation reactions in young donors. AABB believes that blood collection facilities may find this information useful in addressing the unique challenges presented by young donors and high school blood drives. Although zero risk may not be attainable even in adults, the rate of complications in minors calls for ongoing attention to a sustained operational effort that is continually focused on donation safety. AABB encourages blood collection facilities to continue to

monitor and report the effectiveness of interventions on blood donor reaction rates and injuries resulting from reactions. AABB's effort to establish a national hemovigilance program in the United States could provide not only a uniform reporting structure for adverse events after blood donation, but also the mechanism to monitor the effectiveness of efforts to prevent the rare but more medically serious donation-related complications.