



# Balancing Act

Striving for Optimal Iron  
Management in Blood Donors





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**I**ron management in blood donors has become one of the most frequently discussed issues in the blood community in the past few years. The results of several studies indicate that iron depletion may be more common among blood donors compared with the general population. The potential for iron depletion may be particularly heightened in several subgroups of blood donors, including frequent donors, young donors and premenopausal women.

Further research on the extent of iron depletion associated with blood donation, as well as its potential health consequences, is still needed. However, some evidence indicates that prolonged iron deficiency may increase a person's risk for anemia; there is a relatively strong correlation between iron deficiency anemia (IDA) and pica. Other health issues that may be more common among people with IDA include fatigue, decreased exercise tolerance, cognitive dysfunction and, possibly, hearing loss. In pregnant women with IDA, various complications and adverse events – including perinatal mortality, preterm delivery, low birth weight and newborn neurodevelopmental abnormalities – may be more common.

The links among blood donation, iron deficiency, anemia and further health risks are still being assessed. Studies are ongoing to help better understand the extent to which IDA may be associated with adverse health consequences.

AABB has long considered iron management to be an important issue in the blood donation process. As more data on the link between blood donation and iron depletion have become available, AABB has updated its members on optimal iron management strategies. In March 2017, AABB released Association Bulletin #17-02,



titled “Updated Strategies to Limit or Prevent Iron Deficiency in Blood Donors.” This bulletin recommended actions to prevent or mitigate iron deficiency in blood donors following a donation. The recommendations include using comprehensive donor education materials, instituting one or more specific interventions for donors at an increased risk for iron depletion, and postimplimentation monitoring to evaluate these strategies.

### Iron Supplements

One of the potential interventions highlighted in Association Bulletin #17-02 was the use of iron supplements. Noting that evidence from various studies indicates that frequent donors may “require iron supplementation to prevent significant iron depletion that may have deleterious health consequences,” the bulletin recommended that blood collection facilities consider iron supplements to help prevent iron depletion in at-risk donors.

Evidence indicates that donors who take iron supplements to replace iron lost through donation are likely to recover iron stores faster than donors who do not take supplements. In addition, the majority of donors taking iron supplements are able to replace their lost iron within the current minimum interdonation period.

“Recent research shows that iron supplementation facilitates iron absorption following donation, such that both hemoglobin and iron stores are replenished more quickly than if no exogenous iron is taken,” said Bryan Spencer, PhD, research scientist at the American Red Cross, Scientific Affairs. “It may be that the optimal dose and duration vary across individuals, but it appears that a low-dose of iron for eight weeks is helpful for many donors.”

Ralph Vassallo, MD, chief medical and scientific officer at Blood Systems, Inc., and chair of the AABB Donor Health and Safety Committee, also cited available research to illustrate the potential benefits of iron supplements. “Blood donors are at risk for developing iron deficiency if lost iron is not replaced before the next donation,” he told *AABB News*. “Taking a multivitamin with iron or an iron supplement containing 19 mg of elemental iron daily for 60 days

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—BRYAN SPENCER, PhD

soon after donating whole blood – and perhaps after every four or five apheresis donations – has been shown in NHLBI-funded studies to replace the majority of lost iron when accompanied by a prudent diet.”

Vassallo added that proposals to provide iron supplementation to donors are mostly designed as precautionary strategies. “The adverse effects of non-to-mildly anemic iron deficiency in donors are still not fully known and iron replacement is largely precautionary to avoid pica, exercise intolerance and fatigue, as well as the more theoretical neurocognitive effects of iron depletion,” he said.

### Questions Remain

Despite data indicating the potential benefits of iron supplements, concerns remain. For example, iron supplements can interfere with the body’s ability to absorb some medications, rendering them detrimental for some donors. Other potential risks are not yet fully understood and require further research, which remains ongoing.

Some experts stress that a better understanding of the health risks associated with iron deficiency is needed before the clinical utility of strategies to mitigate its effects can be characterized. “While there is evidence that donors, under the closely monitored conditions of trials, will absorb iron if their stores are low, the evidence that reduced storage iron is associated with debility in these donors is incomplete,” Merlyn Sayers, MBBCh, PhD, president and CEO of Carter BloodCare, told *AABB News*. “Given that we have known for decades about reduced iron stores in donors, there has been ample opportunity for studies to reveal that such stores are associated with debility, which would deserve our remedial interventions. Such studies have not been forthcoming.”

Louis Katz, MD, chief medical officer at America’s Blood Centers, agreed that more data are needed to help guide decisions on iron management strategies. “Real-world evidence of the impact of various iron management strategies is critical,” he said. “The impact that must be measured is not just on iron stores in donors, but on the effect on the blood



supply. The actual clinical import of donor iron depletion needs high-quality data. These are very difficult studies to do, but if we claim to practice evidence-based transfusion medicine, they need to be completed.”

### Blood Centers’ Response

In the absence of more definitive data, leaders of many blood centers are questioning how to respond. Experts vary in their recommendations. A plethora of medical, ethical, legal, regulatory and public health issues should be taken into consideration when determining appropriate policies regarding iron supplementation for blood donors. In addition, iron supplements raise practice-of-medicine questions in many jurisdictions and legal counsel familiar with applicable state law should be consulted.

“Centers interested in replacing donated iron have logistical, regulatory and legal obstacles to overcome, but with appropriate messaging, partnerships and planning, providing pills or vouchers may be possible, particularly when operating within one or only a few states whose regulations regarding the practice of medicine are well-researched,” said Vassallo.

Beyond the issue of providing iron supplements for blood donors, questions about determining which donors should receive such an intervention need to be answered. Should iron supplements be provided to all donors? To donors at a higher risk for iron depletion? To donors who request them? To donors most likely to take them? These questions are currently the subject of ongoing research.

“The industry appears to have reached consensus that frequent donors should be taking supplemental iron,” said Spencer. “This includes male donors who donate three units of red cells in a 12-month period and female donors with two – or three, if post-menopausal – units in 12 months. Also, regular plateletpheresis donors can meet this threshold of equivalent red cell loss at approximately 15 donations for males and 10 for females in a 12-month period.”

Some experts suggest that determining strategies regarding iron supplements for blood donors should be based on a replacement paradigm instead of a risk paradigm. “A risk paradigm would recommend iron supplementation to groups of donors known to be at higher risk for iron depletion, which would include frequent donors as well as pre-menopausal female donors and younger donors,” Spencer said. “A replacement paradigm would simply try to maintain each donor’s iron balance in equilibrium by replacing the iron lost in a donation with a brief course of iron following donation, unless otherwise contraindicated.”

### Additional Considerations

Even if other issues regarding iron supplements are resolved, questions remain about whether or not blood donors will, in fact, take them. Several recent studies have examined donors’ adherence to iron supplement regimens; the results have been mixed.

“Studies suggest that not everyone who is counseled to take iron does so, but facilitating access to iron does improve the number of people who take replacement iron,” Vassallo said. “Also, people who are informed of the status of their iron stores through ferritin testing are more likely to follow recommendations that improve their iron status.”

Joseph E. Kiss, MD, medical director of Hemapheresis and Blood Services at the Institute for Transfusion Medicine/Blood Systems, Inc. and professor of medicine at the University of Pittsburgh, agreed that current research has shown it is challenging to encourage donors to take iron supplements. “Studies in the United States and other countries indicate that general guidance recommending iron supplements, even to targeted donor populations, is unlikely to be effective,” he said.

However, Kiss noted that implementing other interventions in tandem with iron supplementation may be more beneficial. “Approaches that may be more likely to be successful in promoting iron supplementation include measuring ferritin coupled with providing written feedback to the donor on his or her ferritin level, along with clear advice on

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of donors said they would be “likely  
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blood center in the future.





Again, there is limited research analyzing effective education strategies. “Enhanced education about iron management aimed at blood donors has not been rigorously evaluated,” said Spencer. “It may be that stronger and more consistent messaging moves the needle, but we don’t have sufficient data at the moment.”

There is consensus in the blood community that research providing more definitive data regarding iron depletion and the benefits of iron supplements is needed. Several ongoing studies are currently evaluating various aspects of this issue and publication of additional research is forthcoming. For example, new data from the CHILL study is expected to be published later this year. ■

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obtaining low dose iron tablets. In addition, providing iron supplements directly to donors by mail may be beneficial,” he said.

Kiss cited data from the STRIDE study, in which 57% of donors who were mailed a letter about their iron status reported taking iron. Similarly, 58% of donors who were mailed iron tablets reported taking the supplements “frequently.” More than 70% of donors said they would be “likely to take supplements” if they were recommended or provided by the blood center in the future. “However, it should be emphasized that willingness to take iron pills in a formal research study may not be the same as in everyday blood center operations,” Kiss noted.

### Educating Donors

Several experts agreed that awareness about iron management is lacking among blood donors. Increased education efforts regarding iron management aimed at the general public – or blood donors, in particular – could be an important step in mitigating iron deficiency.

“Task one, to my mind, is to get donors at the start of their donation careers to understand the impact that blood donation has on iron balance and to convince them that maintaining iron balance by replacing what is lost during donation will allow us to maintain a robust blood supply,” said Katz.

But the development of optimal education interventions to help increase public awareness about iron balance remains in its early stages.