

Canadian Blood Services: More than just blood

Five things to know about Canadian Blood Services that may be relevant to your patients.

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Canadian Blood Services is a critical part of Canada's health care system. As physicians, we often use blood products for our patients but rarely reflect on the breadth of activities that Canadian Blood Services oversees and the selfless volunteer donations made by Canadians.

20 years and counting

Canadian Blood Services recently celebrated 20 years in operation. The organization was formed on 28 September 1998 as an arm's-length organization to manage Canada's blood supply in response to the Krever inquiry into the blood system after thousands of people received infected blood products in the 1980s.^{1,2} During the past 20 years, the role of Canadian Blood Services has expanded from blood and blood

products to include both adult and cord blood stem cells, plasma sufficiency, and organ/tissue donation and transplantation.^{1,3} Canadian Blood Services highlighted 20 years of growth and maturity with a new logo and tagline (Canada's Lifeline) to better reflect this broader mandate as it continues to help patients in need.

Blood donations

Although more than half of Canadians are eligible to donate blood, only 1 in 25 does.^{4,5} Last year more than 410 000 donors visited clinics across the country, including British Columbia's five permanent collection sites and the numerous mobile clinics operated around the province. The minimum age to donate blood at Canadian Blood Services is 17,⁶ but there is no maximum age.^{6,7} Canada's oldest donor, a 95-year-old woman from Port Coquitlam, was celebrated last year.⁸

Iron deficiency is not uncommon among frequent blood donors, and Canadian Blood Services implemented changes in 2016 to reduce this risk. The interdonation interval for female whole blood donors was increased to 84 days from 56 days, and the minimum hemoglobin requirement for male whole blood donors was increased to 130 g/L from 125 g/L. Plans include selective ferritin testing for frequent donors who are at highest risk of developing iron deficiency.⁹

Stem cell donations and transplantation

Canadian Blood Services operates a stem cell program that provides hematopoietic stem cells for transplantation. Last year alone, Canadian Blood Services facilitated more than 400

unrelated transplants for Canadian patients through its adult stem cell registry and its cord blood bank.¹⁰

Did you know that for Canadian patients in need of a hematopoietic stem cell transplant the chance of finding an unrelated stem cell donor match is 80% to 90% for Caucasians, but falls to lower than 15% in non-Caucasians?¹¹ This reflects the lack of ethnic diversity in the stem cell registry [Figure 1], not only in Canada but worldwide. Unlike blood donation, allogeneic stem cell transplantation requires more stringent cell matching due to human leukocyte antigen (HLA) typing, which is determined by racial background and ethnicity. Efforts are being made to increase the biological diversity of the Canadian Blood Services stem cell registry by registering more potential adult donors to better reflect the current makeup of Canada's population.

Potential donors (healthy people between 17 and 35 years of age) can register online by completing a health questionnaire and be HLA-typed after providing a buccal swab to join the 400 000 Canadians already on the registry.¹²

The Canadian Blood Services cord blood bank was established in 2015, and one of its collection centres is at BC Women's Hospital in Vancouver. The other three collection centres are in Edmonton, Ottawa, and Brampton. Rather than being discarded as medical waste after the natural process of delivery, cord blood stem cells can be banked for an extended period. Cord blood stem cells are lifesaving for patients in need of stem cell transplant and, because of the less rigorous requirement for HLA matching due to the immaturity of the fetal blood stem cells, they provide some advantages over adult stem cell transplantations.¹³ The ethnic diversity of the cord blood bank is broader than that of the adult registry with more mixed-race units [Figure 2]. Currently there are more than 3000 cord blood units listed in the Canadian Blood Services bank and available for transplant, and 21 have been distributed and transplanted to date. Informed consent for cord blood donation must be obtained before the donor is in active labor, ideally as part of her prenatal care with her primary caregiver.¹⁴

Dr Wong is a family physician with a focus in elder care. As a Canadian Blood Services volunteer for the past 10 years, she organizes public awareness campaigns on how to "give life" by donating blood or cord blood, or by registering as a potential adult stem cell or organ/tissue donor. Her childhood experience of being a blood recipient and her husband's experience of not being able to find a suitable stem cell donor for his aplastic anemia, as well as learning about others' struggles, inspired her to give back. She is truly humbled by and grateful for the many volunteers who selflessly donate to Canadian Blood Services.

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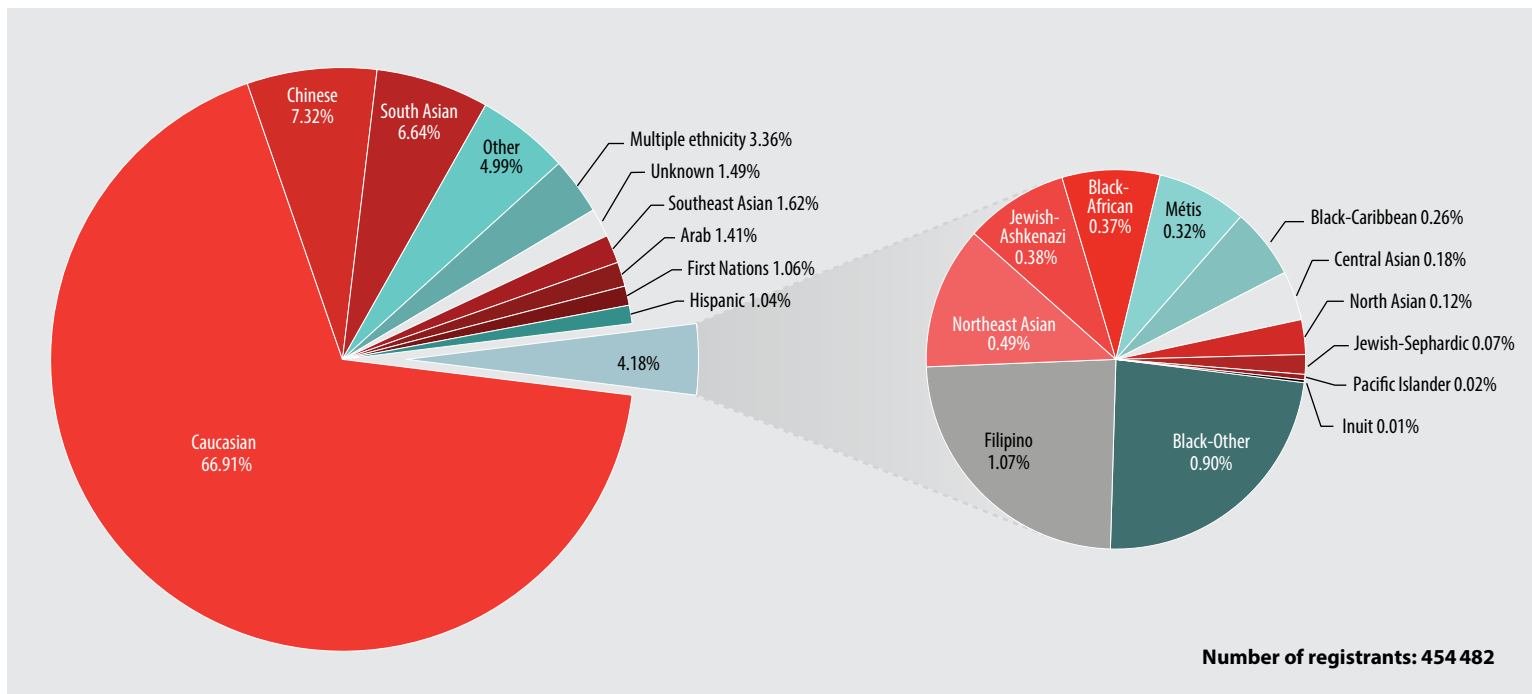


FIGURE 1. Ethnic composition of adult stem cell registry (provided by Canadian Blood Services, September 2019).

Organs and tissues: Donations and transplantation

Canadian Blood Services helps coordinate organ and tissue donation and transplantation in partnership with provincial organ donation organizations like BC Transplant. The Kidney Paired Donation (KPD) program, launched in 2009, is an example of interprovincial health systems working together to forge success beyond provincial borders and improve access to transplants for patients. The success of this program can be attributed to the selflessness of those who have stepped forward to be living organ donors. KPD is operated as part of the Canadian Transplant Registry, a national web-based computer program operated by Canadian Blood Services and used to link the national potential recipient wait list with actual organ donors.

Working with partners across the organ and tissue donation and transplantation community, Canadian Blood Services also develops leading practices, supports professional education and public awareness activities, and collaborates on new ways to share data on the performance of the donation and transplantation system in Canada.¹

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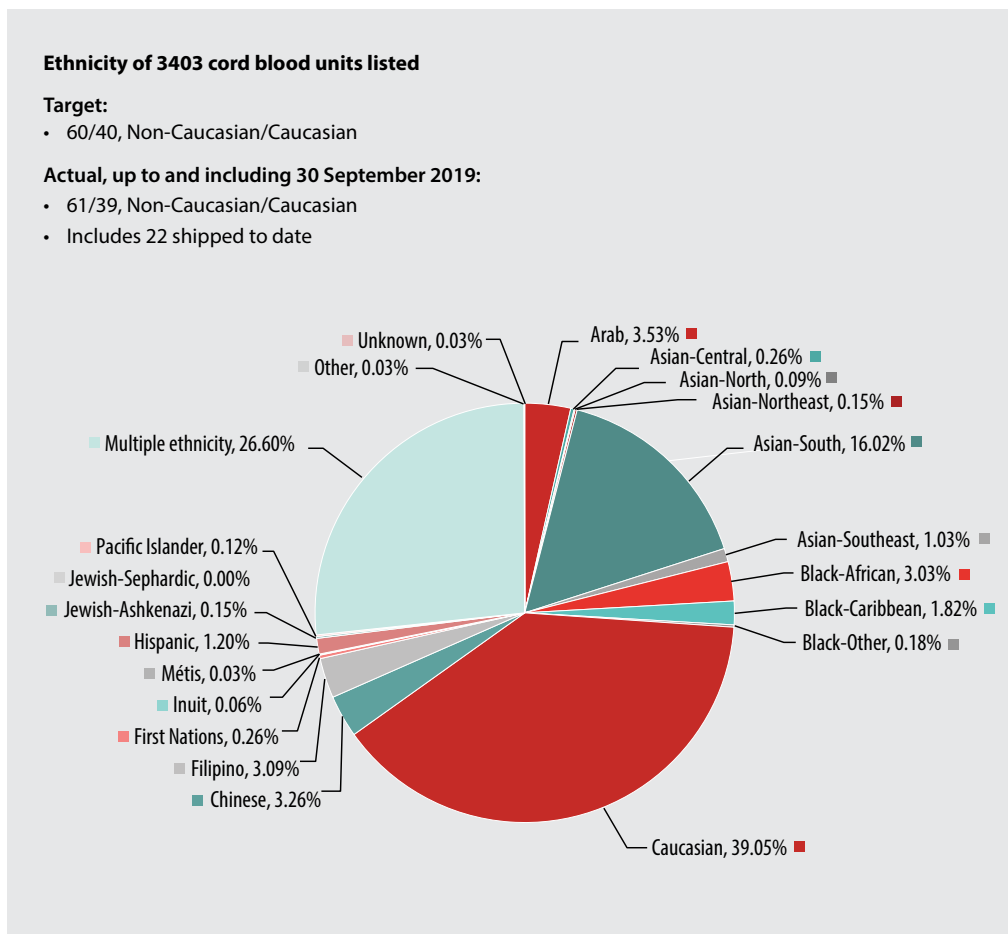


FIGURE 2. Ethnic composition of cord blood bank (provided by Canadian Blood Services, September 2019).

Plasma

Canadian Blood Services operates a national formulary for plasma protein products, including immune globulins, clotting factor concentrates, and albumin to name a few. Canadian Blood Services is embarking on a project to significantly increase the amount of plasma that can be collected from unpaid donors. This plasma can be directed to the production of plasma protein products such as immune globulins to improve plasma sufficiency in Canada. In August 2019, Canadian Blood Services announced plans to open a proof-of-concept source plasma collection site in Kelowna.¹⁵

Conclusion

Canadian Blood Services plays a vital role in the health care system, and physicians should be aware of its origins and its expanded scope encompassing blood and blood products, stem cells (adult and cord blood), organs, and tissue. Because the criteria for blood donation, such as ferritin levels, deferral periods, and eligibility, can change, the most up-to-date information should be obtained from www.blood.ca. Iron levels should be monitored in regular whole blood donors. As stem cell transplants are dependent on HLA matching, increasing the ethnic diversity of the stem cell registry is paramount. In this regard, primary care physicians should encourage public cord blood donation as part of prenatal care, especially in underrepresented groups.

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Since volunteer donations are critical to its continued operations, physicians should also consider their role in educating the public about Canadian Blood Services. Not only do existing patients need its services daily, some day physicians and their families and friends could be those patients as well. ■

Competing interests

None declared.

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