

Making platelet transfusions safer through pathogen reduction



What was achieved?

In January 2022, Canadian Blood Services started providing some hospitals with platelet concentrates treated with a technology that inactivates pathogens.

Pathogen-reduced platelets provide an extra layer of safety for patients who receive platelet transfusions. These patients include people who have a low number of platelets or platelets that don't work properly, such as people with cancer who are undergoing chemotherapy.

Platelets treated with pathogen inactivation technology are considered pathogen-reduced because the process inactivates viruses, bacteria or parasites that remain despite other safety measures. Pathogen inactivation is especially important for platelets because they are stored at relatively warm temperatures, which increase the risk that bacteria will spread and contaminate the blood product. Pathogen inactivation also protects against emerging pathogens and pathogens for which tests are not available.

Pathogen-reduced platelets are Canadian Blood Services' first pathogen-reduced blood product. We now manufacture two types of pathogen-reduced platelets: pooled platelet psoralen-treated (PPPT) products made from whole blood donations, and apheresis platelet psoralen-treated (APPT) products made from platelet donations collected from a single donor through apheresis. Apheresis is a process through which a machine is used to collect one part of blood, like platelets, and return the remaining parts of blood to the donor.



How was this achieved?

Development research played a key role in putting in place a robust and consistent manufacturing process for pathogen-reduced platelets. The Canadian Blood Services team collaborated closely with Cerus Corporation, the company that developed the INTERCEPT pathogen inactivation system, to design the manufacturing process. The resulting process not only aligned with stringent quality benchmarks but was simple to use and required minimal manual intervention.

This development work laid the groundwork for validating the process and ultimately achieving Health Canada approval. Taken together, these combined efforts ensured that the new pathogen-reduced platelets met all quality and regulatory requirements.

A circular of information was developed and distributed to hospitals to provide detailed product information to clinicians on these new blood products (Canadian Blood Services, 2022a and 2022b). Our knowledge mobilization team, in collaboration with colleagues in medicine, hospital relations, and supply chain, developed educational resources to support health-care professionals. These resources included a new chapter in our Clinical Guide to Transfusion, a series of frequently asked questions (FAQs), presentation slides, narrated presentations and animations of the manufacturing process (Blais-Normandin et al., 2022). We also hosted live virtual town hall events for hospital staff so they can learn about our PPPT and APPT products and available resources. Health-care providers can find the information they need in our FAQs, which are updated based on questions received during the town halls.



What was the impact and outcome?

Pathogen-reduced platelets have now replaced non-pathogen-reduced platelet concentrates on the shelves of many hospitals served by Canadian Blood Services. The processes for manufacturing pathogen-reduced platelets (PPPT and APPT) are being gradually rolled out across all our manufacturing sites. As of September 2023, most of our distribution sites were providing PPPT products to hospitals, and we expect to provide PPPT products across the country by the end of 2023. We are in the early stages of manufacturing APPT products and expect to distribute these products nationally by mid-2024.

Pathogen inactivation also means bacterial testing for platelets is no longer needed. Removing this step means we can distribute pathogen-reduced platelets to hospitals about 24 hours earlier compared to untreated platelets.

Bibliographies

Blais-Normandin, I., Tordon, B., Anani, W., & Ning, S. (2022). Pathogen-reduced platelets. In A. Khandelwal & T. Abe (Eds.), *Clinical Guide to Transfusion*. Canadian Blood Services. professionaleducation.blood.ca

Canadian Blood Services. (2022a). Pathogen reduced platelet concentrates: Apheresis platelets psoralen treated ([Circular of information for the use of human blood](#)).

Canadian Blood Services. (2022b). Pathogen reduced platelet concentrates: Pooled platelets psoralen treated ([Circular of information for the use of human blood](#)).

Howell, A. (2021). 2PDO252-PRT Cerus INTERCEPT pathogen reduced pooled platelets in PAS. Technical report: Pathogen inactivation confirmation study. Canadian Blood Services.