SARS in Canada: Lessons learned for the blood operator

As the world struggles with another coronavirus pandemic, it is instructive to examine the impact of severe acute respiratory syndrome (SARS) in Canada as we consider how the blood operators should prepare for the impact of COVID-19. Canada's first encounter with SARS began in mid-February 2003 when a 73-year-old woman returned to Toronto from a trip to Hong Kong where she had contact with an infected physician, who himself had been exposed when caring for patients in Guangdong province, China. Within 2 days of her return, she experienced a high fever and breathing difficulties and visited her doctor. She died at home 5 days later with her illness unrecognised as SARS. Her 44-year-old son then became ill; required hospitalisation; and, suspected of having tuberculosis, was put in hospital quarantine. Unfortunately, he spent >18 hours in the hospital emergency department exposing other patients, staff and visitors to his coronavirus. This incident seeded the first wave of SARS in Toronto, with a second wave in late May also related to hospital-spread infection. Ultimately, Canada had 438 probable or confirmed cases of SARS with 44 deaths; 43 deaths and 375 cases occurred in Toronto.^{1,2}

So, what was happening to the blood supply? The outbreak disproportionately affected health-care workers who comprised nearly 40% of cases. A small number of Canadian Blood Services staff also held part-time jobs in hospitals and found themselves self-quarantined at home after SARS appeared in their hospital workplace. Several steps were taken to protect staff: (a) each collection centre posted a notice outside requesting that people who may have been exposed to SARS not to enter and also posted the SARS questions that donors would be asked; (b) antibacterial hand-washing stations were set up throughout the blood collection centres; and (c) drivers who delivered blood to quarantined hospitals were met by hospital staff outside of the building. In addition, Canadian Blood Services maintained constant communication with public health officials to access up-to-date information on the outbreak. These practices proved effective; no staff member developed SARS from working in our blood collection centres. There was concern that donors would also be fearful of donating blood, but that did not materialise. The various steps taken to mitigate risk to the blood supply are summarised in Table 1.

TABLE 1 Measures taken in Canada to mitigate risk of acquiring SARS from blood

Risk mitigation action	Date of implementation
By asking	
In the last 3 years, have you been outside Canada or the US?	Long-standing question in the record of donation
In the last 14 days, have you	
• Visited a facility such as a hospital that is under quarantine for Severe Acute Respiratory Syndrome (SARS)	10 April 2003
• Been advised to place yourself under voluntary quarantine	10 April 2003
• Cared for, lived with or had direct contact with the bodily fluids of a person with SARS or suspected SARS	8 May 2003
By deferring:	
Persons who have travelled to an affected area for 14 days from the date they have left the affected area.	10 April 2003
Persons who have visited an affected facility or been asked to place themselves under quarantine for 14 days after the last visit.	10 April 2003
Case or suspected case for 28 days after symptom resolution and cessation of treatment.	26 May 2003
Contact for 14 days after last exposure to case or suspected case.	26 May 2003
By telling donors to report:	
SARS illness or treatment that occurs within 14 days after donation.	26 May 2003
By retrieving and/or quarantining:	
Products using the above time frames for donors who report:	
• SARS or suspected SARS	26 May 2003
• Possible exposure to SARS	26 May 2003
• Travel/visit to an affected area or facility	10 April 2003

TABLE 2 Considerations for the SARS outbreak in Canada

What was known before in preparations for pandemic virus infection?	<ul style="list-style-type: none"> • Very little was in place in Canada to be prepared for a viral pandemic. In general, decisions were made as the situation evolved.
What were key events for donation during epidemic in Canada	<ul style="list-style-type: none"> • Ensuring donors were aware of SARS deferrals. • Preventing at-risk donors from entering blood collection events. • Encouraging donors in parts of the country that did not have community-acquired SARS.
What was learned from the SARS epidemic for future planning?	<ul style="list-style-type: none"> • Stay in close contact with public health authorities to have current information. • Use internal "command and control" processes to minimise impact on staff and blood supply. Regular communication with staff is critical. • Plan for the worst but recognise that you will probably get a more benign outcome.

Loss of blood centre staff was partially offset by the fact that SARS-affected Toronto area hospitals suspended non-essential hospital services, thereby reducing the demand for blood products. However, at the time, it was possible that increased blood demand would occur to support extracorporeal membrane oxygenation (ECMO).

During the SARS outbreak, Toronto RBC orders were down 15.5% compared to the same period in the prior year. We collected ~400 units less than planned due to donor event cancellations. Overall, the SARS outbreak had a relatively low system-wide effect, certainly much less than was feared.

A product-recall process was established for SARS risk information received post-donation. If the donor reported a history of SARS

disease or suspected SARS disease or treatment for SARS disease within 180 days before the donation or 21 days after the donation or SARS exposure or possible SARS exposure within the 21 days before the donation, then any in-date components intended for transfusion or plasma units for fractionation were retrieved and destroyed.

Numerous lessons were learned in the SARS outbreak of 2003 (Table 2). It was clear that Canada, and particularly the province of Ontario, was not ready for SARS, and management of the outbreak quickly highlighted issues with information flow and chain of command among local, provincial and federal authorities. The aftermath of SARS brought a serious improvement effort before Canada faced its next epidemic. A new federal agency, the Public Health Agency of Canada, was established in 2004, and many organisations, including Canadian Blood Services, carefully considered pandemic plans, which are reassessed on a regular basis. At Canadian Blood Services, this has evolved into a part of our overarching business continuity plan.

CONFLICT OF INTEREST

The author has no competing interests.

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