



## Technology

---

Volumetric infusion pumps (VIP) are medical devices capable of delivering continuous and very specific amounts of fluids at very slow to very fast rates. Infusion pumps are commonly used to control the flow of intravascular drugs, fluids, whole blood, and blood products to patients. Infusion pumps are used to provide fluids on a regular interval, or through patient control, in place of having a nurse repeatedly perform injections. The VIPs are designed to overcome issues that can occur with the size of fluid drops, making them more precise than a standard intravenous drip. Coupled with a high level of accuracy, VIPs provide a series of alarms which address issues from battery life to air bubbles in tubing. VIPs are used in hospitals to increase precision and efficiencies with patient care and drug administration.

## Issue

---

In Canadian hospitals, infusion pumps are critical to the safe and efficient delivery of care to patients. Currently, the users of infusion pumps – whether technicians or nurses – have no formal way of reporting errors with these devices. Any errors with VIPs are reported on a voluntary and informal basis, and the methods of reporting vary from region to region and hospital to hospital. At present, the full impact of the design quality of VIPs on users, with respect to reliability and usability, is not known. Another recognized knowledge gap is related to what brands and specific devices are used across Canada. Currently, more than 70 brands of large VIPs are licenced in Canada, yet the distribution of these devices across the country is not known.

## Methods

---

The Canadian Agency for Drugs and Technologies in Health (CADTH) conducted two national surveys to assess the inventory and usability of large VIPs by nurses, hospitals, and

regional health authorities (RHAs). To gain an understanding of the distribution of large VIPs across the country, a survey of inventory managers was conducted, with a focus on the models of large VIPs used and the mechanisms in place for reporting errors with the devices. In order to assess the usability of large VIPs by nurses, a second survey targeted the nurse population and collected information on their satisfaction with the devices and their error-reporting practices.

## Key Messages

- Nurses in Canada are generally satisfied with the safety and performance of the large VIPs they use.
- Nurses who use “smart pump” technology are more likely to be satisfied with all aspects of using a large VIP.
- Most hospitals surveyed had internal error reporting mechanisms for tracking issues with VIPs.

## Results

---

- A report outlining purchasing practices for large VIPs, as well as how nurses in Canada use large VIPs, what specific pumps nurses use, how satisfied nurses are with the devices they are using, and how frequently nurses report errors with the devices

For complete reports and intervention tools on this topic, please visit [www.cadth.ca](http://www.cadth.ca).

**DISCLAIMER:** The information in this Project in Brief is intended to help health care decision-makers, patients, health care professionals, health systems leaders, and policy-makers make well-informed decisions and thereby improve the quality of health care services. The information in this Project in Brief should not be used as a substitute for the application of clinical judgment in respect of the care of a particular patient or other professional judgment in any decision-making process nor is it intended to replace professional medical advice. While CADTH has taken care in the preparation of the Project in Brief to ensure that its contents are accurate, complete, and up-to-date, CADTH does not make any guarantee to that effect. CADTH is not responsible for any errors or omissions or injury, loss, or damage arising from or as a result of the use (or misuse) of any information contained in or implied by the information in this Project in Brief. CADTH takes sole responsibility for the final form and content of this Project in Brief. The statements, conclusions, and views expressed herein do not necessarily represent the view of Health Canada or any provincial or territorial government. Production of this Project in Brief is made possible through a financial contribution from Health Canada.