

## Background

In March of 2022 Thunder Bay Regional Health Sciences Centre (TBRHSC), a 375-bed hospital in Northwestern Ontario, carried out an organization wide implementation of over 600 NOVUM IQ large volume smart pumps. The success of the project was largely due to the assembly of a robust drug library. Significant time and resources were used, including collecting critical feedback from frontline clinicians. In order to measure the success of the smart pump implementation, post-implementation feedback from across all speciality areas was necessary to understand end-user experience of navigating the new smart pump. This analysis mainly concentrated on the robust drug library.

## Description

The drug library build was a pharmacy driven initiative that was vetted by clinical representatives from across all speciality areas in the hospital.

Clinical representatives included, but not limited to:

- TBRHSC Pharmacist;
- Baxter Healthcare Pharmacist;
- Physicians;
- Clinical Nurse Specialists (CNS) and;
- Frontline Clinicians

After implementation, encountering difficulties with the programming of the drug library was considered. Key processes were put into place to mitigate these difficulties such as, an online drug library adjustment form. This allows frontline clinicians to submit changes for a specific drug which, is then reviewed by a Pharmacist. With the launch of the form there still remained some challenges to fully capture the end-user experience and opportunities for improvement of the drug library.

## Action

To address the knowledge gap on end-user experience with the smart pump, specifically the drug library, real time feedback at the end-user level in actual clinical practice was determined to be the most appropriate method of collecting data, both objective and subjective.

## Evaluation

An online survey was developed which was made available to all frontline clinicians within three months of the smart pump implementation. A total of 232 respondents completed the survey (26% response rate). Active engagement with staff was a critical component, portable tablets were used targeting high traffic areas in the hospital and meeting with staff in their respective departments to ensure easy access to the survey.

## Results

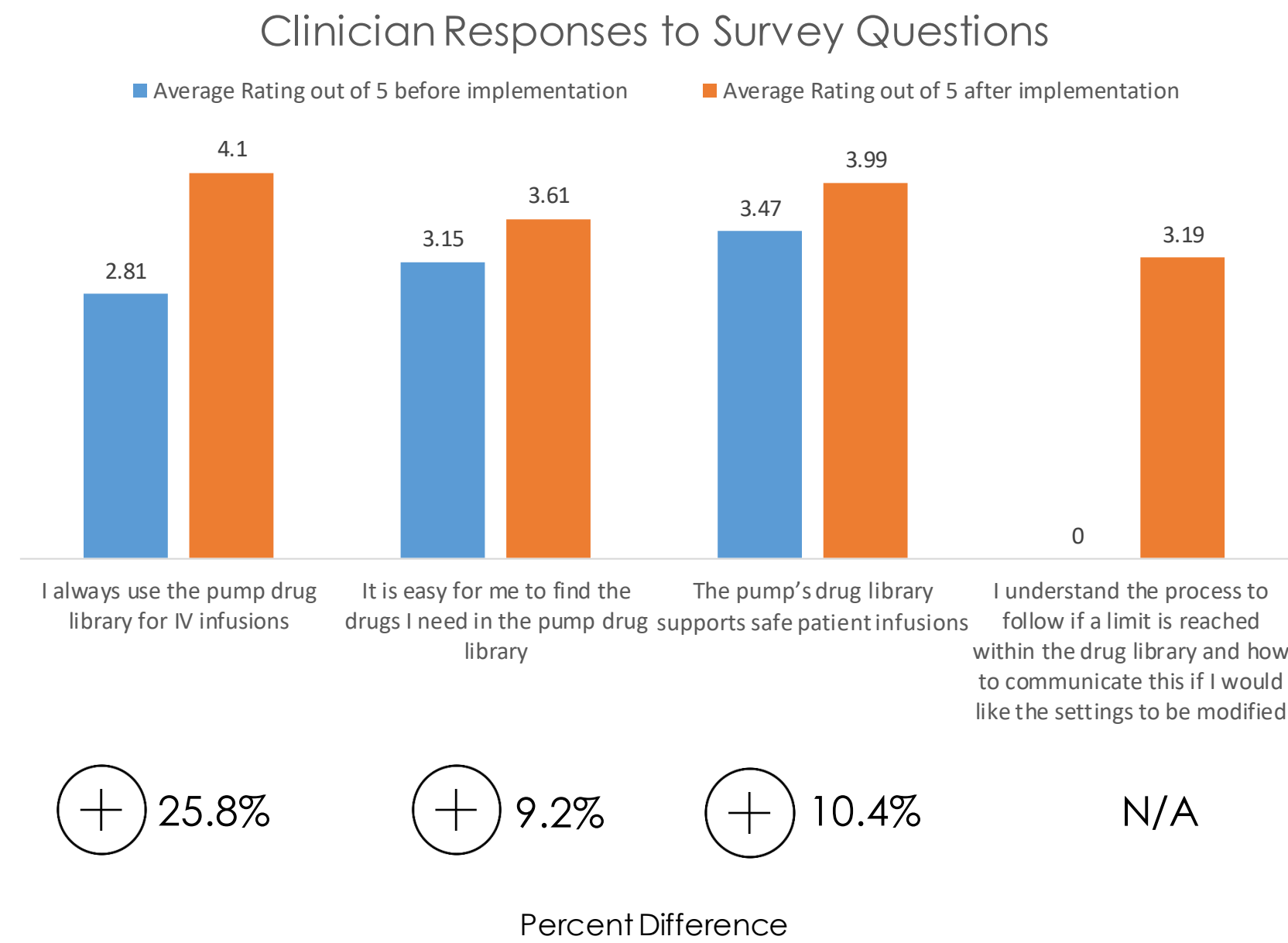
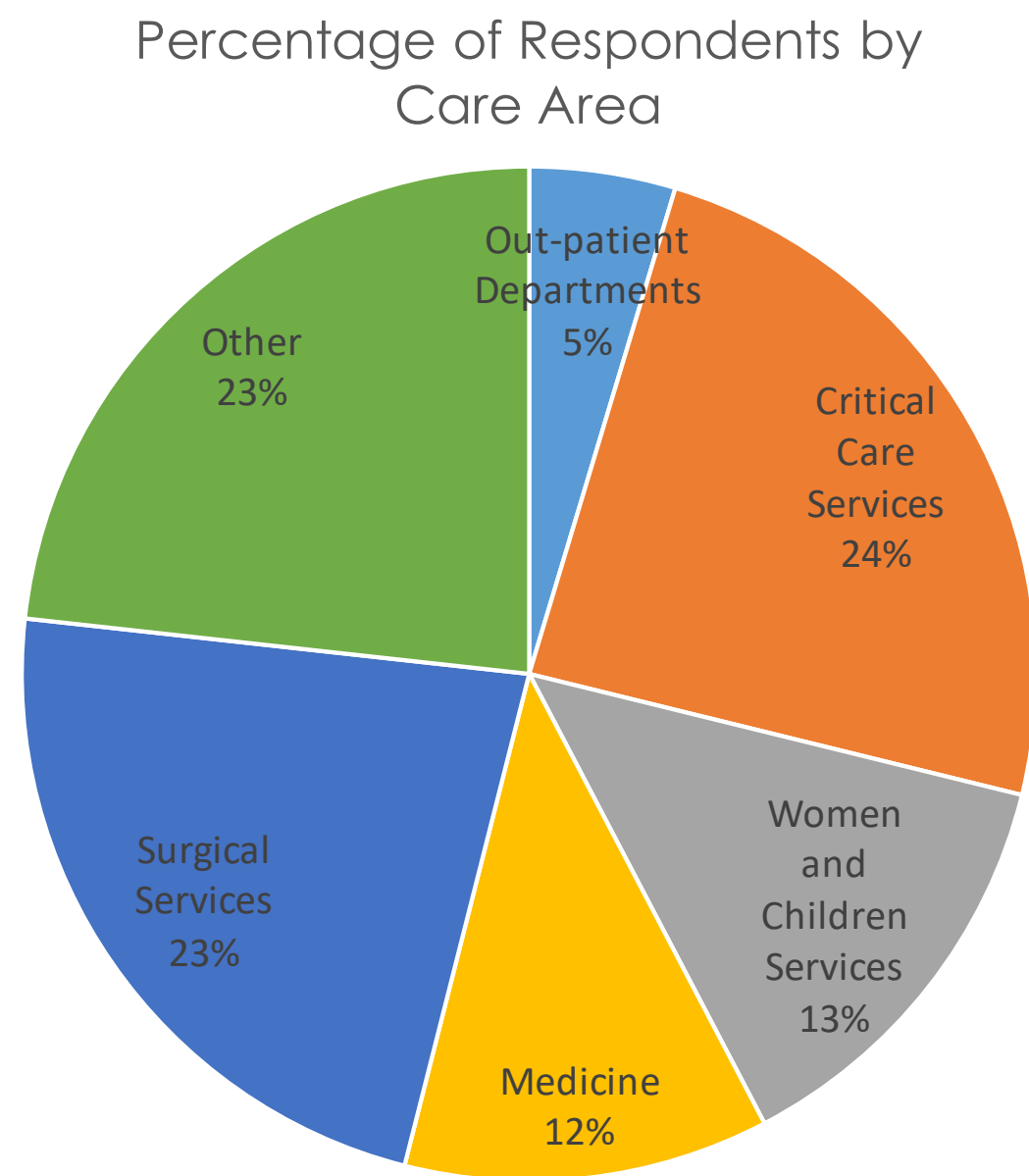


Table 1. Clinician Comments Grouped by Topic\*\*  
\*\*Most reported topics

Drug Library-related	Change Management/ Training-related	Pump Design-related
<ul style="list-style-type: none"> <li>• Revision of limits (including hard and soft limits)</li> <li>• Adjusting air in line detection threshold</li> <li>• Drug nomenclature modifications for easier/ more intuitive search</li> <li>• Adding missing drugs or drug concentrations</li> </ul>	<ul style="list-style-type: none"> <li>• Programming steps</li> <li>• Adjustment of alarm volumes</li> <li>• Management of alerts and alarms</li> <li>• Pump cleaning after use</li> </ul>	<ul style="list-style-type: none"> <li>• Interest in touch screen functionality</li> <li>• More extensive memory of recently used drugs on the pump</li> <li>• Interest in "standby" functionality</li> </ul>

## Implications

The data collected will be leveraged to implement strategies at the pharmacy and clinical levels within the hospital to optimize the clinicians' experience and enhance patient safety. Pump design-related input will be examined by the pump manufacturer to support its efforts in improving the technology.

## Recommendations

Baxter Healthcare	<ul style="list-style-type: none"> <li>• Consider the creation of a history feature for last infused drug, fluid and associated rate</li> <li>• Future iterations of the pump, consider touchscreen</li> <li>• Increase speed to programming functions when turning on, to reduce infusion delays</li> </ul>
TBRHSC	<ul style="list-style-type: none"> <li>• Increase communication around use of drug library adjustment form. Help to decrease the use of basic mode</li> </ul>
Education/ Training	<ul style="list-style-type: none"> <li>• Encourage the use of the e-learning modules, especially new frontline clinicians</li> <li>• Increase education/ training during nursing orientation</li> </ul>

## Conclusion

In summary, the smart pump implementation at the TBRHSC was a success. Certainly we were presented with some challenges, specifically around change management but, with active and early engagement many of them were mitigated. Gaining insight 3 months post- implementation was crucial for our organization to identify gaps in end-user experience. The data indicated a positive shift in adopting the use of the drug library but, continued work is needed to ensure that frontline clinicians avoid the use of basic mode and utilize the drug library adjustment form when needed.

## Acknowledgments

Made possible through the support of an educational grant from Baxter Healthcare.