

MaRS EXCITE Case Example: Continuous Glucose Monitor Sensor

Clinical Condition: Type 1 Diabetes

- Type 1 diabetes (T1D) is a chronic and potentially life-threatening illness caused by the body's inability to produce insulin, resulting in very low or very high blood sugar levels.
- Tightly managing blood sugar levels is important in preventing short- and long-term complications from diabetes, such as nerve and organ damage, vision loss, limb amputation, etc.
- Extremely low blood sugar levels (hypoglycaemia) can result in life-threatening consequences or death.

Technology Solution: Continuous Glucose Monitor (CGM) Sensor



In the Medtronic Sensor Augmented Pump+CGM (SAP+CGM) system, an insulin pump and CGM sensor are paired via a transmitter to allow the continuous monitoring of blood sugar levels (288 times per day). This reduces the variability between high and low blood sugar levels supporting blood glucose levels in the target range. If blood sugar drops below a pre-determined threshold, the pump automatically suspends insulin delivery to protect the patient against hypoglycaemia — this feature is known as Suspend on Low.

The Province of Ontario currently funds the cost of insulin pumps, but not the cost of CGM sensors. In February 2018, Health Quality Ontario (through the Ontario Health Technology Advisory Committee) recommended publicly funding CGM for T1D.

Process: Robust Evaluation

Objective

Given the demonstrated clinical benefits of CGM and the global uptake of these devices, EXCITE, in collaboration with the Ottawa Hospital Research Institute and the HUB at St. Michael's Hospital in Toronto, has generated evidence to understand the barriers to system adoption and diffusion and to support decision-making around funding of CGM sensors in Ontario.

Methods

1) A systematic review

Conducted to better understand the clinical benefits and risks of the MiniMed insulin pump and CGM system with Suspend on Low in patients with T1D.

2) A multi-stakeholder group qualitative study

Conducted to gain an improved understanding of the role of CGM in T1D and of current reimbursement practices for this device.

3) A budget impact analysis

Conducted to look at the incremental costs to the Ontario health system of adding CGM sensors to activate the Suspend on Low feature of the SAP+CGM over a five-year time period.

4) Implementation Planning

A multi-stakeholder collaborative exercise identifying potential market access pathways for CGM in Ontario.

Key Results

- CGM helps improve patient control of blood glucose, leading to improved safety, health outcomes and overall quality of life.
- Establishing criteria of those most likely to benefit from this technology is seen as a clinically reasonable, economically feasible and equitable approach to a ramped-up reimbursement strategy.
- Incremental costs to the Ontario Ministry of Health for CGM sensor technology among existing T1D SAP+CGM pump users were estimated to be \$9 million in the first year and \$15 million in the fifth year.

Outcomes

Evaluation of contextual evidence, as well as key insights from EXCITE's implementation working group activities, informed a final report outlining adoption and implementation considerations, with the ultimate goal of expediting uptake of the CGM sensor in Ontario. The EXCITE Management Board recommended the CGM sensor technology, as a class, be considered by the Ontario Ministry of Health for adoption into the Ontario health system beginning with a targeted subpopulation leading to gradual inclusion of all.