SCNergy, Summer 2022

Breast cancer is the #1 cancer in women. Knowing that 80% of breast cancers are diagnosed in early stages—even before a lesion (or "lump") can be felt—Alberta Health Services' <u>Evidence Decision</u> <u>Support Program (EDSP)</u> (sponsored by the <u>Surgery SCN</u>, the Calgary Department of Surgery and Edmonton Department of Surgery) has investigated a novel care pathway that uses magnetic surgical markers. This technology provides the opportunity to remove the discrete breast lump and detect potential spread—all with **one** device.

The benefits to patients are many: the technology involves no radiation exposure, less discomfort for the patient, and requires no external wire to be placed in the breast (Figure 1; Table 1). It also allows for more flexible scheduling of pre-operative procedures (i.e., no surgical delays waiting for wire placement), benefiting patients and care providers. The detection system also reduces the number of procedures patients typically require, freeing up resources to improve access for others.

The technology uses a magnetic marker (about the size of a grain of rice) to pinpoint the lump. The magnet can be placed up to 30 days before the surgical procedure and is removed with the lump at the time of surgery. Using the same device with a magnetic tracer, surgeons can also detect the optimal lymph node to biopsy at the time of surgery and examine for any spread of cancer.





(a) Current breast cancer surgical pathway (b) Novel magnetic detection system



Current Practice

For patients who have an abnormal breast lesion, the current surgical pathway is for a radiologist to localize the lesion the morning of surgery. At this time, a visible hook wire is inserted into the breast, then covered by a plastic cup, which is taped to the breast (Figure 1). The cup prevents dislodgement of the wire while the patient travels to the hospital for their scheduled operation. At the time of surgery, a radioactive tracer is injected into the patient to assess whether the cancer has spread to the patients' lymph nodes.

In 2018, there were 2,126 radioactive localizations performed in Alberta to examine for breast cancer spread and 919 wire localizations performed. Depending on where they live, some patients have to travel hours from one site to have the localization procedure and then to another facility for the surgery with a wire protruding from their breast.

COMPARISON OF BREAST LESION LOCALIZATION MARKERS		
Device	Wire Guided (hook-wire)	Magnetic Seed
Appearance	Marked in 1 cm increments	dunning
Size	3-15 cm	5 mm (grain of rice)
Device placementSame day of surgery	Yes	Yes
• Up to 30 days in advance	No	Yes
Requires radiology to place device	Yes	Yes
Device protrudes outside the breast	Yes	No
Device repositioned after insertion	Yes	No
Radiation exposure	Yes	Νο

Table 1

Evaluation Progressing: From Clinical Feasibility to Scale

Program Leads in all five AHS Zones agreed to undertake a Health Technology Evaluation Trial of the Sentimag® Localization Platform (with Magseed® and Magtrace® markers) in Alberta. This is a two-stage process. Stage 1 examined clinical feasibility at two high-volume surgical centres in Edmonton and Calgary. The trial involved 30 patients and demonstrated that the technology is surgically feasible.



We are now at Stage 2 and assessing the potential to scale this technology provincially. Starting in June 2022, we examined the use of this technology with 15 patients and general surgeons at the Grande Prairie Regional Hospital.

This trial has been a joint effort between surgeons, patients and radiologists province-wide. To date, this new technology has shown equivalent or better clinical outcomes as well as patient and clinician experiences when compared to existing approaches. One patient who had experienced both techniques said:



"I had to have a wire before for a benign mass on my other breast and this was better than that experience"

This Health Technology Evaluation Trial demonstrates how health innovations are piloted, evaluated and implemented based on evidence and trials conducted in Alberta. Input and active collaboration with partners across the health system are essential to the success of this work and we gratefully acknowledge the input of everyone who has contributed to date. Over the coming months, we will continue our efforts to create a new and improved pathway of care for breast cancer patients in Alberta.

To learn more about breast cancer screening in Alberta, mobile clinics and how to book an appointment, visit <u>https://screeningforlife.ca/breast</u>.

