



Advancing Wound Care And Lower Limb Preservation In Northwestern Ontario Through Dedicated People, Pathways And Technology

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Abstract: Northwestern Ontario is home to 88 Indigenous communities, many remote and isolated. Lower extremity amputation rates are high in the region, and even higher among Indigenous populations. The Central Wound Intake system was developed over the past few years in consultation with a clinical working group with representatives from across Northwestern Ontario (Canada). The system attempts to address key components such as points of entry, triage and the development and communication of a wound care plan, with an ultimate goal of reducing amputation rates.

Key words: *lower extremity amputation, Northwestern Ontario, Indigenous communities, technology.*

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Could you find Pikangikum in your phone's GPS? It appears onscreen with the airport, the northern store, the school and the nursing station clearly marked. As you scroll in, smaller stores, the Ontario Provincial Police (OPP) station, hotels and roads appear. You might try to plan a route from Pikangikum to Meno Ya Win Health Centre in Sioux Lookout, the closest medical centre with an Emergency Department and surgical capability. Your GPS will tell you to "try again". If you persist, your technology may offer you a flight option: two and a half hour flights, available every few days.

Northwestern Ontario is home to 88 Indigenous communities, of which 24 are "fly-in", having only air travel as their year-round transportation. Winter roads and summer barges are seasonal, and all are subject to limitations of weather, infrastructure and competing transport priorities.

Rates of lower extremity amputation in Northwestern Ontario are high and amputation rates are higher among Indigenous populations. Estimates range from three to seven times higher than in Southern Ontario, with multiple factors being implicated. There is a high incidence of related comorbidities (diabetes, smoking, atherosclerotic disease). There are geographic, financial and logistic barriers for patients to access advanced wound care equipment and expertise. Prior to 2015, there was no vascular surgery service within Northwestern Ontario.

Organization

As Canadian health-care systems cultivate wound care and limb preservation strategies, a 'hub and spoke' model often evolves to ensure that wound care necessities are available without organizational or geographic restriction along the spokes, while high-cost, resource intensive modalities (revascularization, surgical debridement, advanced wound care practices) are concentrated at one or two service hubs. Such a model relies on strong connections between each spoke and hub.

In Northwestern Ontario, wound care specialists in the 'hub' communities (Sioux Lookout and Thunder Bay) began a dialogue early on with

the surgeons in the newly developed division of Vascular Surgery at Thunder Bay Regional Health Sciences Centre (TBRHSC). We envisioned a robust network that would support individuals with wounds in their home communities and cultures; that would deliver easy, consistent access to wound care expertise and that would render subspecialty care whenever needed. The geographic constraints are real so, as health-care clinicians and planners, we began to employ flexible, redundant, network planning with synchronous and asynchronous advanced technology to bridge these gaps.

The Central Wound Intake system was developed over the past few years in consultation with a clinical working group with representatives from across Northwestern Ontario, using referral management software. Key components of the Central Wound Intake (CWI) are:

1. Multiple points of entry including individual self-referrals, primary care, nursing, emergency department referrals and specialty sites such as dialysis units – essentially, any care setting
2. Triage of each referral by an Advanced Practice Specialist (APS), who enlists resources to support wound healing and prevent recurrence (treatment of infection, diabetes care, offloading, vascular assessment, foot care resources, footwear etc.)
3. Communication of a Wound Care Plan back to the referring provider and primary care team with coordination of acute care including surgery, home and community care, private sector resources (such as custom offloading and footwear, etc.) and rehabilitation services.

The Rapid Access to Vascular Evaluation (RAVE) facilitates assessment of anyone with lower extremity wounds by the Vascular Surgery team within a few days of referral. RAVE works closely with the CWI system to ensure that the potential for revascularization is assessed early in the wound healing process.

Technology

We are also developing an ecosystem of technology-enabled health care. *Swift* is an asynchronous wound management application that has particular value in the northern communities where images, referrals and care plans may need to be generated and accessed by a wide variety of providers with suboptimal connectivity. It is currently available in six communities.

TeleVu is a real-time image acquisition and sharing system that enables remote medical assistance for nurses at the isolated nursing stations who use high-resolution 'smart glasses' to assess the wound, visible in real time to the Advanced Practice Specialists and physicians who support them with the *TeleVu* app. It is currently available in three communities with plans to expand this year.

Future State

In our region, we have dealt for many years with obstacles of geographic distance, patient and cultural expectations, gaps in health human resources (from nursing to primary care to specialty services), organizational impediments with a patchwork of financial support for equipment and services and communication challenges at every level. We believe that dedicated people, pathways, and technology will advance wound care and lower limb preservation in Northwestern Ontario. ■

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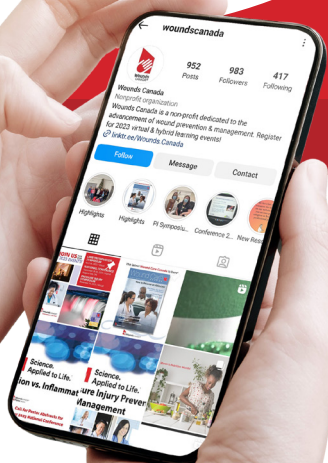
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