Seeing What's Missing: The Untapped Role of Point-of-Care Ultrasound in Rural Indigenous Healthcare

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Abstract

Background. Access to diagnostic imaging remains a significant barrier for Indigenous and rural communities in Quebec, where patients often leave their home communities for basic cardiac or pulmonary assessments. Point-of-care ultrasound (PoCUS) is a portable, cost-effective tool that provides real-time physiological insights at the bedside, yet it remains underutilized in rural and Indigenous healthcare settings.

Methods. This commentary draws on anonymized clinical observations from the Innu community of Ekuanitshit and the regional hospital in Havre-Saint-Pierre, together with a narrative review of published Canadian literature, to examine the potential of PoCUS to improve diagnostic accuracy, continuity of care, and patient trust. PoCUS can complement physical examinations and radiographs, reduce unnecessary transfers, and support culturally safe care by visualizing physiology in real time.

Discussion. Despite proven feasibility across Canada, barriers persist, including limited training opportunities, scarce mentorship, and insufficient quality assurance frameworks. Nurses in Indigenous primary care clinics have expressed strong interest in ultrasound training, and existing Canadian models demonstrate potential pathways for integration. Sustainable adoption requires investment not only in devices but also in education and institutional commitment.

Conclusion. As a commentary grounded in regional clinical experiences rather than nationwide research, this article is not intended to offer broadly generalizable conclusions, but to share a practical example that may help motivate the adoption of a diagnostic tool supporting more equitable care. In settings where colonial legacies continue to shape healthcare experiences, PoCUS represents an opportunity to strengthen diagnostic transparency, clinical confidence, and health equity.

Keywords: point-of-care systems; ultrasonography; rural health services; Indigenous Peoples; health equity; primary health care

Clinical vignette

Richard (anonymized), an Innu man in his fifties, presented to the Ekuanitshit nursing clinic with chronic shortness of breath and progressive bilateral leg swelling. He was encountered during a rural clinical rotation in this 600-person Quebec coastal community. For two years, he had experienced symptoms consistent with cardiac insufficiency (a condition where the heart's pumping power is weakened or stiffened) but had never undergone a full cardiac workup, including an echocardiogram. Access to such diagnostics required transfer to Sept-Îles, the closest secondary care centre hours away by ambulance and far from his family and cultural comfort. His exam suggested fluid overload, and his story of declining functional capacity was concerning. A point-of-care ultrasound (PoCUS) could have helped confirm or refute heart failure by assessing cardiac pumping function and the presence of fluid in his lungs. Unfortunately, in Ekuanitshit, no ultrasound machine was available. In Havre-Saint-Pierre, the closest regional primary care center, ultrasound machines were available but rarely used in routine practice. Clinicians instead relied on vital signs, blood work, and chest radiographs—useful snapshots but incomplete for dynamic

physiology. For patients like Richard, PoCUS could have supplied the missing puzzle piece by directly visualizing cardiac function and fluid status, transforming inference into objective evidence and completing the clinical picture.

Contextualizing PoCUS in rural practice

PoCUS offers a portable, cost-effective, and high-yield tool for bedside diagnosis and triage. It has transformed emergency and critical care workflows worldwide [1]. Its strength lies in offering immediate, dynamic insights into physiology that can complete the physical exam and radiographs [2]. A quick bedside scan can clarify whether dyspnea is fluid versus bronchospasm, or whether leg swelling reflects heart failure. In rural and remote communities, PoCUS promises even greater value. Patients in Ekuanitshit and other remote Indigenous communities in Quebec must often be transferred by ambulance or plane for diagnostic procedures, resulting in avoidable delays, expenses, and disconnection from their community supports [3]. These delays sit within a measurable rural access gap: rural communities account for about 21% of Canada's population but only 9.4% of its physicians, leaving rural residents with roughly 1.0 physician per 1,000 people compared with more than 2.0 physicians per 1,000 people in larger urban centres [4]. Although this essay is grounded in Quebec, recent literature on PoCUS in austere environments suggests that the same problem of diagnostic distance is shared across remote and resource-constrained settings more broadly, making the discussion relevant beyond one province [5].

For Indigenous patients, these delays are more than logistical; they can deepen mistrust in health systems already shaped by colonial history. In local nursing clinics, patients may feel more comfortable sharing their concerns openly, confident they are understood in their local language and context. Once transferred to urban centers, their stories are often abbreviated or reframed, and key details can be lost or misinterpreted. Richard spoke freely about breathlessness and declining function in Ekuanitshit, yet in Havre-Saint-Pierre, uncomfortable and alone, he mentioned only longstanding leg pain from swelling, and the initial workup did not focus on a cardiac etiology. Local imaging with PoCUS could have bridged that gap, providing the urban team objective data from the local team to complement patient narratives and improve outcomes.

Despite its promise, PoCUS remains underutilized in Quebec's rural and Indigenous settings. Nurses in Ekuanitshit have neither access to machines nor PoCUS training, and in Havre-Saint-Pierre, ultrasound machines were available but seldom integrated into day-to-day clinical workflows. Concerns around overcrowding in the emergency room, limited training time, and lack of Canadian Point-of-Care Ultrasound Society (CPoCUS) Independent Practitioner (IP) certified personnel were often voiced. These gaps reflect a broader systemic issue: technology acquisition is not the same as meaningful integration. Without training, time, and institutional culture that supports its use, a probe risks becoming another dusty tool.

In practice, the absence of PoCUS was tangible. A young child struck by a car received a physical exam and radiographs, but a focused assessment with sonography in trauma (FAST) scan was not part of the assessment to rule out internal bleeding, despite the tool being rapid and non-invasive. A diabetic patient with foot ulcers worried about amputation. Without Doppler ultrasound or PoCUS to assess perfusion, her prognosis was based on inspection and palpable pulses alone. Neither case reflects negligence, but the structural limitations of practice in these environments. Clinicians did the best they could with the tools and training at hand.

Figure 1. Trauma room in the Ekuanitshit nursing clinic during a simulation. PoCUS could be incorporated into these spaces and provide real-time imaging to support clinical impressions. Photograph captured and provided by the authors.

Training pathways and the role of nurses

Nurses are increasingly vocal about the value of ultrasound at the bedside. In a survey of 193 nurses, 94.8% argued it should be part of nursing curricula [6]. Evidence from the emergency department confirms that this enthusiasm translates into competence: a prospective trial of nurse-performed PoCUS in septic patients showed 99% agreement with physician assessments and often influenced management [7]. Specifically relevant to Richard's case, a 2024 review of nursing-led teams concluded that nurses

trained to assess inferior vena cava (IVC) collapsibility and cardiac chambers successfully individualized fluid therapy and improved guideline compliance [8].

Barriers include absent curricula, scarce local mentors, and weak quality assurance structures [9], magnified in rural settings where nurses already manage broad responsibilities. Yet, the foundations for sustainable change already exist. In Quebec's nursing clinics, nurses already use Communications Médicales Désignées (CMD), a workflow through which clinical images, exam findings, and histories can be transmitted for virtual physician review. Extending this workflow to focused cardiac or lung PoCUS - with clear protocols and defined scope - would not create entirely new medico-legal burdens but rather strengthen an existing system. It would maximize in-community, culturally safe pre- and post-hospital care, while leaving diagnostic responsibility with physicians, now supported by richer data to guide decisions.

Canada's training infrastructure already has significant precedent to support this expansion. CanPoCUS courses are designed for doctors, nurse practitioners, and physician assistants, and feed into Canadian Point of Care Ultrasound Society (CPoCUS) certification pathways [10]. The BC Rural Ultrasound Fellowship offers a year-long mentorship and practice model that avoids the pitfalls of single-weekend workshops for rural realities [11]. Where on-site proctoring is difficult, distributed education can also fill the gap for both physicians and nurses willing to incorporate PoCUS in practice. Programs like Rural PoCUS Rounds, supported by the Rural Coordination Centre of British Columbia (RCCbc) and the University of British Columbia Continuing Professional Development (UBC CPD), already use virtual mentorship to sustain rural clinicians [12], which could be adapted for longitudinal training for Indigenous nursing stations in Quebec. A related two-year rural British Columbia study reported that rural PoCUS use was highest in emergency departments (87.2%), followed by ambulatory care clinics (54.7%) and inpatient settings (50.3%); RCCbc notes that use is expanding in rural communities with large Indigenous populations, with practitioners reporting improvements in clinical care [13]. The experience on Haida Gwaii, an archipelago about 55 km off British Columbia's northern Pacific coast, provides a more specific Indigenous-community comparison: rural PoCUS education was paired with remote care delivery in a geographically isolated community. In that report, PoCUS was embedded across the emergency department, inpatient ward, outpatient clinic, and outreach clinics, with all local providers using it, some scans performed "10–12 times a day" in clinic, and images uploaded into the electronic medical record so they could be reviewed by surgeons and distance-based specialists, helping reduce reliance on travel to Prince Rupert for radiology ultrasound, a trip described as approximately 10 hours one way by ferry and wait time. This illustrates a deployment model focused on local diagnostic capacity, remote support, and continuity of care rather than device placement alone [14].

Funding and access: overcoming resource limitations

Canada has already piloted funding and infrastructure models that can be adapted for Quebec. The Digital Technology Supercluster's Intelligent Network for PoCUS deployed over 80 handhelds in remote and Indigenous communities with an AI-enabled mentorship backbone, suggesting that device deployment is most likely to improve access when paired with coaching and remote support rather than hardware alone [15]. At the provincial level, RCCbc's Rural PoCUS Strategy coupled device distribution (more than 50 probes) with education and quality assurance, while UBC CPD's Handheld Loan Program accelerated adoption by letting rural clinicians try handhelds before purchase [12,16]. In 2024, Rural PoCUS Rounds registered 968 providers, and 41 providers from 24 rural communities accessed POCUS coaching through UBC CAMP, showing that mentorship infrastructure can extend beyond individual pilot sites [12]. Taken together with the rural BC survey and Haida Gwaii experience, these examples suggest that the strongest current outcomes are feasibility, local capacity-building, remote mentorship, and improved access to bedside imaging, while stronger controlled evidence on downstream clinical outcomes remains limited [12-15].

Workforce grants have also underwritten training at scale. The SRPC-Service Canada partnership reimbursed 342 rural clinicians for advanced skills (over 32% in Indigenous communities), including PoCUS - establishing a federal precedent that could be mirrored for nurse-led programs in Quebec [17]. Alberta's RhPAP offers team-based Rural Education Fund support and the REAL program for individual upskilling (including NPs), a template for group courses hosted in-community [17].

PoCUS is also not a substitute for formal imaging, and its expansion should not be framed as risk-free. A recent Canadian medico-legal analysis underscores that training, documentation, scope clarity, and quality assurance matter; implementation without governance can create new problems even when the technology itself is promising [18]. Still, funding alone is insufficient without institutional commitment to integration.

Cultural alignment, trust, and policy implications

In Indigenous communities, where colonial legacies have sown deep distrust in healthcare systems, diagnostic transparency matters. PoCUS creates moments of shared understanding. Showing a patient their heart beating or lungs inflating can strengthen the clinician-patient relationship. It fosters collaborative encounters and shows patients the effort to understand them fully.

If Quebec and Canada aim to improve rural and Indigenous health equity, PoCUS should be part of the plan. That means not just buying devices but investing in training for both physicians and nurses, supporting mentorship networks, and normalizing its use. In practical terms, this work could be advanced through coordination between the Quebec Ministère de la Santé et des Services sociaux, Indigenous Services Canada's First Nations and Inuit Health Branch, rural training partners such as CanPoCUS and the Society of Rural Physicians of Canada, and community-led nursing clinic leadership [10,17,19,20]. In these contexts, PoCUS should be considered an important tool that can support equity-oriented care. The technology represents a relatively inexpensive investment compared to the costs of recurrent transfers.

Return to the case

After repeated, unsuccessful transfers to the hospital for Richard, a PoCUS device from Montreal - acquired after completion of CPoCUS IP certification - was eventually brought to the clinic. With it, scanning suggested severe left-sided eccentric hypertrophy, less than 15% contractility, and right ventricular hypotrophy. These findings were compelling enough to prompt a rare visiting physician to order a formal echocardiogram - the first Richard had received after two years of worsening symptoms. He was ultimately diagnosed with heart failure in Sept-Îles.

What patients like Richard need is not only access to tertiary care, but communities equipped with the right tools and training. While this commentary is rooted in one Quebec case, the broader global health question is how remote communities can access timely diagnostics without leaving care entirely dependent on distant centers. The ability to visualize physiology in real time, share those findings remotely, and communicate conditions to patients by showing them can transform care. Sometimes, equity in medicine begins with something as simple as being able to see what's there.

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AI Statement

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