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Enhancing Access to Diagnostic Imaging: A Proposal for a Pan-Canadian and Interoperable Teleradiology Network

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SUMMARY

Imaging Backlogs: Canada faces extensive wait times for X-rays, CT scans, and MRIs, with an associated high economic cost due to lost productivity. Aging equipment and regional disparities in radiologist distribution compound the issue, while the current "siloed" provincial approach to teleradiology limits its potential benefits.

Teleradiology as a Solution: A pan-Canadian, demand-driven, and interoperable teleradiology network can mitigate wait times by improving care efficiency and quality. Reevaluating the "portability" principle of the Canada Health Act can enable smoother cross-provincial billing, advancing digital coordination among provincial/territorial healthcare systems.

Regulatory Considerations: The implementation of a pan-Canadian teleradiology network necessitates revisions in health data interoperability, adapting to stronger privacy protections for shared health data, and standardizing regulations for radiologists practicing across jurisdictions.

Projected Implementation Costs: The projected costs are expected to be $5 to $10 million, sourced from federal funds and potential cost savings, with varied costs across provinces based on adoption rate, practitioner compensation models, billing agreements, and compliance with policies like the Diagnostic Services Policy to ensure appropriate funding and insurance coverage for scans.

PROBLEM OVERVIEW

Nationally, the median wait time for a CT scan is 5.4 weeks, while the median wait time for an MRI is 10.6 weeks. In provinces such as Nova Scotia and Prince Edward Island, the wait time for an MRI is as high as 20 weeks. While backlogs for medical imaging differ by province, they represent a symptom of a broader national issue.

Long wait times for diagnostic imaging can lead to delayed diagnoses and worsened medical conditions as specialists often do not see patients until their imaging results are available. Backlogs in imaging studies have knock-on effects, worsening wait times in other parts of the healthcare system by delaying surgeries and procedures. A report released by the Conference Board of Canada finds that wait times for MRIs and CT scans exceeding 30 days resulted in an aggregate economic cost of $3.54 billion in 2018. This figure encompasses the "loss of productivity" with 380,000 Canadians being unable to work due to their inability to access radiology services in a timely manner – causing an annual loss of $430 million in tax revenue.

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The challenge of radiology wait times is multifactorial. Demand for diagnostic imaging exams is anticipated to rise with an aging demographic, the number of new imaging machines procured is at an unprecedented 20-year low, and the distribution of radiologists across Canada is uneven. Newfoundland and Labrador has the highest number of radiologists per 100,000 people at 10.5 while Prince Edward Island has the lowest at 5.8. While boosting investments in imaging infrastructure and radiologists will provide a long-term solution, it cannot immediately address the high wait times being faced by Canadians today.

Teleradiology is a viable solution to the wait time crisis and can provide a more swift alternative for patients. Teleradiology exists in Canada, but not at a national scale. Central to teleradiology capability is the Picture Archiving and Communication System (PACS), a system for efficient medical image storage and transfer. A majority of Canada's radiology facilities already have PACS capability.

PACS and teleradiology are already in use to expand diagnostic imaging access and reduce wait times. Collaboration between a hospital in Iqaluit, Nunavut, and radiologists at The Ottawa Hospital is a salient example of teleradiology's benefits. Before the 2010 acquisition of Iqaluit's CT scanner, patients had to travel to Ottawa for scans, often incurring costs up to $25,000 and requiring two-week stays. This not only added financial strain but also resulted in long wait-times and considerable emotional distress. By introducing teleradiology services, patients in Iqaluit can now undergo local imaging, which is swiftly interpreted by Ottawa-based radiologists. This has led to greater cost-efficiencies, reduced wait periods, and alleviated the emotional and logistical burdens associated with prolonged travel.

Despite the existence of teleradiology networks, the absence of coordination on a pan-Canadian scale means many Canadians miss out on the advantages of this important digital health service. An approach that is solely provincial or territorial can lead to disparities in care access based on a patient's residence. Rather than overhauling the current system, the emphasis should be on harmonizing the established infrastructure to guarantee uniform access to diagnostic imaging.

CHALLENGES

Radiology, by its nature, is an expensive yet critical component of the healthcare system that is increasingly in demand. Creating a pan-Canadian network presents the following challenges in diagnostic imaging:

- **Cost of Supply:** Radiology, inherently an expensive service, poses a financial challenge for healthcare providers. The costs associated with procuring advanced imaging technology and hiring specialized professionals may hinder the implementation of a pan-Canadian network, particularly in regions with budget constraints.

- **Interoperability:** Provincial/territorial healthcare systems operate in silos, preventing them from effectively accessing, exchanging, and integrating data across different platforms and boundaries. This lack of interoperability creates obstacles to smooth communication and data sharing, impeding the establishment of a comprehensive, cohesive teleradiology network.

- **Jurisdictional Buy-in:** Every province/territory needs to actively participate in a pan-Canadian teleradiology network, commit to data sharing, and adhere to common standards of practice. Securing broad political consensus and collaborative spirit may prove difficult given the distinctiveness of the individual health systems of each province/territory.

Overcoming existing silos and the absence of national healthcare infrastructure, with the following recommendation, transforms the potential of teleradiology as a promising solution to resolve diagnostic imaging wait times.

RECOMMENDATION

Modernizing Canada's teleradiology landscape begins with updating the understanding of the "portability" principle of the Canada Health Act (CHA) to reflect the digital age and promote an integrated, nationwide healthcare system. Achieving a coordinated pan-Canadian network will require the federal government to play a pivotal role in both financing such advancements and facilitating collaboration among provinces for standardized data exchange. To navigate regulatory complexities, provinces/territories must work collectively on data interoperability, privacy measures, and radiologist regulations, ensuring the successful realization of a pan-Canadian teleradiology network that elevates patient care across all regions.

Canada Health Act: A Renewed Understanding of the Principle of Portability

In the context of the CHA, "portability" ensures continuous health coverage for residents transiting or relocating between provinces and territories. Historically grounded in geographic terms, this principle warrants adaptation to embrace today's digital healthcare landscape. Notwithstanding provincial authority over health matters, the CHA offers a framework to facilitate a pan-Canadian teleradiology initiative by modernizing the interpretation of portability.

Consider an Ontario patient's MRI scan is read and interpreted by a New Brunswick specialist using a pan-Canadian teleradiology network. Under an evolved interpretation of the CHA's portability clause, the New Brunswick entity would be authorized to directly invoice the Ontario Health Insurance Plan (OHIP). Existing inter-provincial billing agreements may require adjustments to accommodate the specific nature of teleradiology. A mechanism similar to the Reciprocal Medical Billing Agreement could serve as a model, enabling a New Brunswick-based provider to directly bill the OHIP for radiology services. This process streamlines billing procedures, ensuring health care providers receive agreed-upon compensation.

To meet today's digital healthcare demands, a contemporary interpretation of the CHA's portability terms is essential. The focus should shift towards supporting health service exchanges across jurisdictions more easily without necessitating the physical mobility of patients. Reinterpreting the CHA can modernize the principle of portability for the digital era, allowing provinces/territories to tap into teleradiology services nationwide, bolstering service delivery, and promoting collaboration among provincial/territorial health systems that can better match supply with demand.

Federal Government's Dual Role in Facilitating Teleradiology in Canada

Given the increasing demand for radiology and the advancing technology that outpaces the current system's capabilities, the federal government's involvement is critical. These interventions materialize through two strategic roles: fiscal allocation and facilitation of cross-provincial collaborations.

Financially, the federal government bears a paramount responsibility in endorsing initiatives that elevate both access and quality of diagnostic imaging. The Canada Health Infoway Fund, a federal establishment, earmarks funds for provinces/territories tailored to pan-Canadian virtual care priorities, encompassing teleradiology. In 2020, this fund dedicated $50 million towards a concerted effort to proliferate virtual care across jurisdictions. Moreover, the 2023 Health Transfer Agreements incorporate explicit funding provisions for diagnostic services, harmonizing with the overarching Diagnostic Services Policy.

With respect to the Canada Health Transfers (CHTs), provincial and territorial governments are asked to commit to improving how health information is collected, shared, used, and reported to Canadians. This commitment is significant for the success of a pan-Canadian teleradiology network, as it relies heavily on the sharing of patient imaging data between provinces/territories. The policy initiatives of the federal government encourages provinces/ territories to adopt common data standards for interoperability, fostering efficient, secure, and private data exchange among jurisdictions. By extension, these common data standards should be applied to radiology imaging data and transfer, enabling jurisdictions with limited radiology resources to tap into the expertise and supply available in other provinces/ territories. This provision is particularly relevant given the current issues with differing health record platforms, which may not seamlessly communicate with each other.

On the convening side, the federal government can leverage its ability to foster cooperation among the provinces/territories. Drawing upon successful models of provincial/territorial cooperation, like the pan-Canadian Pharmaceutical Alliance and the Reciprocal Medical Billing Agreement, Ottawa can facilitate the creation of an opt-in model of pan-Canadian teleradiology. This approach ensures flexibility for each province/territory to join the network based on their specific needs and radiology demands.

Moreover, the federal government's convening power can drive the development of common standards and policies related to health data. This would include collaboration with provincial/territorial governments, patient advocacy groups, private teleradiology providers, hospital networks, medical associations, and the Canadian Radiology Association, among others. Such an approach not only ensures the robustness of the proposed system but also promotes transparency and manageability in driving forward public health outcomes.

By fulfilling a dual role of financing and convening, the federal government can contribute to the successful implementation of a pan-Canadian, demand-driven, and interoperable teleradiology network. Such an initiative can enhance the efficiency and quality of patient care, while paving the way for more digital innovations in the Canadian healthcare system.

POTENTIAL REGULATORY CHANGES

Interoperability of health data systems to facilitate teleradiology services

Currently, healthcare data is stored in primary health care electronic medical records (EMRs) which are digital versions of patient charts, stored mainly in a provider's office or the hospital. This information is rarely shared outside these facilities. Patient portals are not available in most provinces/territories; furthermore, EMR systems are often incomplete and do not allow for inter-provincial or -territorial borders.

Canada has an opportunity to create a harmonized framework to facilitate the sharing of health data across provinces/territories. The United States, Australia, and the United Kingdom have implemented legislation or infrastructure in place which enable the compiling of patient information in a centralized repository.

Within Canada, provinces like Ontario have made moves to improve interoperability of health records, including for diagnostic imaging. The Diagnostic Imaging Common Service Standard focuses on building regional diagnostic imaging repositories to provide secure access to patient digital imaging records anywhere and at any time. The common standard is working towards creating consistent data exchange formats and improving report and image retrieval. Provinces/territories can collaborate to adopt this model or collaborate to create a similar model for a country-wide diagnostic imaging system.

Privacy protections for sharing health data

The sharing of patient information over an electronic platform gives rise to potential privacy considerations. Health data is protected by federal and provincial legislation. The *Personal Information Protection and Electronic Documents Act* (PIPEDA) is a federal law focused on the protection of electronic documents. Where provincial legislation, as it relates to health data, is deemed substantially similar to PIPEDA – such as in Ontario, New Brunswick, Newfoundland and Labrador, and Nova Scotia – the provinces use their laws to govern the protection of personal information. For other provinces/territories, which do have their own health laws, PIPEDA may still be applicable. Bill C-27, the proposed *Digital Charter Implementation Act*, aims to replace PIPEDA and is likely to strengthen the governance of health information. Provinces/territories, in concert with federal legislation, provide a strong regulatory framework for protecting health data. To ensure patient information is shared securely, provinces/territories should work together to align the creation of a platform in accordance with existing and new laws. This policy should feature resources and support for privacy that enable functions like conducting privacy impact assessments or creating a Chief Privacy Officer and corresponding team to oversee digital privacy concerns.

Regulation of radiologists

Healthcare practitioners are governed by the province/territory within which they work. Jurisdiction of interprovincial use of telehealth for clinical visits in Canada is still not defined. There are many strategies provinces/territories can take to mitigate this challenge. For example, a mutual recognition agreement – which "allows two or more regulatory bodies to recognize the licensure policies and practices of a physician's home jurisdiction so that a separate license is not required" – or a special purpose license – which "allow physicians who are actively licensed in another jurisdiction to practice medicine under specified

terms and limited scopes of practice"– can be developed for this network. Currently, the Federation of Medical Regulatory Authorities of Canada has a Working Group on Virtual Care and has developed a Framework on Telemedicine in 2019. FMRAC is currently working on the development of interjurisdictional licensure for the practice of telehealth. These efforts provide a foundation upon which diagnostic care standards and licensure can be developed and a forum for collaboration between provinces.

PROJECTED IMPLEMENTATION COSTS

Overall cost and funding sources

The projected cost for implementation, maintenance, and operationalization ranges from $5 million to $10 million, drawn from the implementation of e-consult services. Implementation funding can be accessed through the $200 billion the federal government committed towards strengthening the universal public health care system. A key priority for accessing these funds is focused on providing timely access to care and modernizing health systems. Funding for coordinated electronic information sharing can be drawn from the Canada Health Infoway Fund, as mentioned previously. A final source of funding for maintenance includes the cost-savings from implementing a teleradiology network. Evidence from the U.S., where teleradiology is far more abundant, suggests that implementation costs for teleradiology are nominally low – at $3,000 per hospital – with savings upwards of $300,000 per year.

Considerations for costing

The costs for this teleradiology program will depend on the scale of adoption within a given province/territory. To understand immediate costs to healthcare facilities, provinces/territories will need to map their capacity to supply practitioners and machines, and the demand for scans from patients.

Currently, benchmarks for wait time data for MRI and CT scans are not established. This information will be required to pinpoint specific areas that require the most support, guiding the allocation of resources accordingly. Teleradiology costs are not uniform and will vary depending on where the scan is performed and its purpose. Once these costs have been established, a projected cost of investment and deployment can be estimated.

For provinces/territories, practitioner remuneration will also need to be negotiated. For example, e-consults vary in compensation based on a jurisdiction's fee structure, fee codes, and salaried arrangements. Furthemore, in provinces such as British Columbia, Ontario, and Manitoba, where consultations from out-of-province physicians are not covered by provincial insurance, billing these provinces directly is not permissible. Remuneration structures will be necessary to accommodate teleradiology consults.

Provinces/territories will likely need to assess how to provide health insurance for scans read out-of-province. Provinces/territories cover medically necessary scans within provincial health insurance. CHT agreements can continue covering these scans and can even be withheld if provinces charge for medically necessary imaging services. A total of

$76.5 million was deducted from provinces and territories from failing to follow the [Diagnostic Services Policy](#) (DSP), which aims to eliminate charging patients for medically necessary diagnostic scans. Jurisdictions will need to understand how the DSP would apply in this teleradiology network.

MOVING FORWARD

Teleradiology has the potential to increase timely access to diagnostic imaging for Canadian patients while saving provincial/territorial health systems from the costs of long wait times. With precedent for jurisdictions collaborating on shared health goals and new advancements in digital health technology, the federal government has an opportunity to work with the provinces/territories to build on existing infrastructure to create a sustainable pan-Canadian teleradiology network – with the flexibility to adjust to the fluctuating demand for radiology services across regions. Such a network can meaningfully address the shared goal of reducing diagnostic imaging wait times for all Canadians.

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