CADTH Health Technology Review

# Individuals' Access to Medical Imaging Results via Patient Portals

# Table of Contents

# List of Tables

## Key Messages

- Patient portals allow users to access, manage, and share their health information online.
- Patient portals are available in 6 provinces: Alberta, British Columbia, Saskatchewan, Ontario, Prince Edward Island, and Quebec.
- Patient portals in Canada are implemented at the provincial, regional, or clinic level of the health care system, and vary in the health data and features that are shared with users.
- Medical imaging reports are shared on portals in Alberta, Ontario, Quebec, and Saskatchewan. In Saskatchewan and Alberta, reports are available immediately, whereas Quebec has a 30-day embargo period. Ontario has an intention to enable patient portals to share medical images from provincial diagnostic imaging repositories in the future.
- A tailored approach may be considered when timing the release of medical imaging results due to concerns related to patient anxiety, especially for individuals waiting for diagnostic results of potentially life-threatening or serious conditions.
- Radiologists can use lay language in their reports and provide users with reliable sources of information to increase understanding of complex results. They may develop or take advantage of existing patient-friendly templates for sharing results on portals.

## Context

Technology has transformed the way individuals access health services and information. This was especially apparent during the COVID-19 pandemic, when there was a shift to virtual care from in-person care.[1] As part of the transition to virtual care, health systems are beginning to implement patient portals.[1,2] Patient portals are intended to facilitate access to personal health information and may provide users with the opportunity to be stewards of their own data.[1,2] Patient portals allow individuals to access, manage, and share their health information through an online application in an environment that is intended to be safe and secure.[3] Patient portals are also seen as a means to support patient-centred care and data transparency.[4]

The type of health data and tools available to users can vary across patient portals.[5,6] Some examples of the information and tools that users may access include:

- medical imaging reports and laboratory results
- appointment bookings
- prescription refill requests
- vaccination records
- history of clinical visits.

A survey published in 2019, involving 2,005 adults in Canada, suggests that more than 70% are interested in using patient portals to access their health information.[7] The potential benefits of patient portals include better patient engagement, reinforcement of positive behaviours, and improvement in trust and

communication between individuals and their health care providers.[6,8-10] With access to their data, users may be empowered to participate in their own care and be proactive with their health.[8,11] Additionally, patient portals may help ease administrative burden by eliminating the need for individuals to contact staff for their information and upcoming appointments.[5,9,10]

Some clinicians worry about the potential for patient anxiety stemming from misinterpretation and confusion with complex medical results.[8] This is a particular concern for medical imaging exams because they require a radiologist's interpretation. It may be a challenge for individuals to comprehend radiology reports and discern clinically significant findings when results are shared on patient portals, particularly if radiologists have used clinical jargon and abbreviations.[12,13]

## Objective

This report provides a summary of patient portals across Canada, with a focus on individuals' access to their medical imaging results. The report also provides an overview of some considerations related to sharing medical imaging results when implementing patient portals.

## About This Document

This report summarizes information identified through a limited literature search using MEDLINE, Scopus, the Cochrane Database of Systematic Reviews, the International HTA Database, and the websites of Canadian and major international health technology agencies, as well as a focused grey literature search. This report may not provide an entirely comprehensive review of access to medical imaging results via patient portals, because the literature search used to inform the findings was limited to English-language documents published since January 1, 2018.

## Patient Portals Across Canada

Provincial and territorial authorities are responsible for governing how personal health information is collected, used, stored, and disclosed within their jurisdictions.[2,14] Hence, patient portals vary between jurisdictions in terms of the type of data and features that are made available to users. The federal government advocates for individuals to have access to their health data and provides provinces and territories with financial support and assistance through Canada Health Infoway to operate patient portals.[2] Patient portals are available in Alberta (MyHealth Records, MyAHS Connect),[15] British Columbia,[16-21] Ontario,[22] Prince Edward Island,[23] Quebec (Quebec Health Booklet),[24] and Saskatchewan (MySaskHealthRecord).[25] Nova Scotia discontinued its patient portal in 2020, reportedly due to low uptake from physicians and health care users.[26,27]

Patient portals may be implemented at the clinic, regional or health team, or provincial level. In Prince Edward Island, primary care clinics are beginning to implement patient portals and they can choose the

data and types of features to make available on the portal.[23] Ontario has set provincial service standards to guide health care organizations or regional health teams (e.g., the Atlas Alliance in Eastern Ontario) through the adoption of a patient portal (Refer to Table 1).[22] The suggested minimum data requirements for patient portals in Ontario follow the International Patient Summary by the Global Digital Health Partnership.[22] The International Patient Summary is "an electronic health record containing essential health information intended for use in unscheduled, cross-border care scenarios."[28] Alberta, Quebec, and Saskatchewan each operate their own patient portals for eligible residents. British Columbia offers a provincial level patient portal (i.e., Health Gateway), as well as other patient portals at the regional health authority level of the health care system. MyHealth Portal, HealthELife, and MyHealth are available for residents in the jurisdictions of Interior Health, Northern Health, and Island Health, respectively. Additionally, the BC Cancer patient portal is available to individuals with cancer.

## Medical Imaging Reports and Embargo Times

Medical imaging reports are available to users on patient portals in 4 provinces in Canada: Alberta, Ontario, Quebec, and Saskatchewan.[15,22,24,25,29] Radiology reports comprise the formal documentation and communication of the results of an imaging exam.[30,31]

### Alberta

Diagnostic imaging reports are accessible from Alberta's MyHealth Record and MyAHS Connect portals as soon as a radiologist has prepared the report. With no set delay for release on portals, individuals may view their diagnostic imaging report before their care provider has received them. Individuals are informed that ordering physicians may not see results until their next clinical day and that a consultation between care providers may be required to support the interpretation of results before they can have an informed discussion with their patients.[15,29]

### Ontario

Medical imaging reports are a requirement for patient portals in Ontario.[22] According to Ontario's patient portal service standards, organizations can delay or restrict clinical records for clinical or safety reasons, but expectations regarding the timing of availability of results on the platform should be communicated with users.[22] Ontario intends to enable the ability to share medical images, in addition to the radiologist's report, from Ontario's diagnostic imaging repositories in the future.[22]

### Quebec

Residents of Quebec are required to wait 30 days after an ordering physician receives their test results before access to results on Quebec Health Booklet is available to them.[32] The 30-day embargo in Quebec was requested to ensure adequate time for ordering physicians to arrange appointments with individuals who have abnormal findings.[32]

### Saskatchewan

Similar to Alberta, medical imaging reports can be viewed by users of Saskatchewan's MySaskHealthRecord as soon as a radiologist has prepared the report.[25,32]

## Other Features of Patient Portals

Information commonly made available on patient portals in Canada include: prescription summaries or histories, immunization records, clinical visit summaries, and diagnostic exam results, including laboratory and/or medical imaging reports (Refer to Table 1). The majority of patient portals in Canada allow users to add and/or edit personal health information.[15,16,22,23,25] However, depending on the nature of the information requiring revision, users may need to request changes.[15,22,25] Some portals allow for users to upload information from other devices or apps, such as Apple Health, Google Fit, and Fitbit.[15,25] Ontario and Alberta allow users to communicate to their health team through patient portals.[15,22] In Quebec, users can register in the Quebec Family Doctor Finder program on their patient portal.[24] Users can check the status of special authority requests in patient portals (e.g., coverage of a drug or medical device) in British Columbia.[15,16]

## Considerations

### Embargo Period

An embargo period — the time between when a radiologist's report is shared with a referring physician and when it is shared with a patient — allows referring physicians time to interpret results. While some physicians view immediate access to reports as a step toward patient-centred care, others are concerned that the availability of complex medical imaging results without medical interpretation can overwhelm users and cause anxiety.[6,8,33,34] There is some literature indicating that concerns over user anxiety when faced with unclear information is unfounded.[13,35] However, user preference on how and when medical imaging results are made available varies across studies. Some of the variations in these studies may be attributed to:[36,37]

- differences in study populations
- the length of the embargo periods under evaluation
- time differences between the exam and appointment to discuss findings with a physician.

For example, the results of a study of 418 individuals with cancer in the US show that they prefer to receive imaging results as soon as possible from their physician over the phone than from a patient portal.[37] The value of receiving their results online is only recognized when study participants had to wait longer for a phone call from their physician.[37] Another study, involving 4,592 participants recruited from a Dutch hospital, found that individuals would choose to wait the shortest amount of time for their radiology results online.[36] However, some participants met with their doctors to discuss the results the same day as their exam.[36]

It has been suggested that the optimal embargo time takes into consideration the clinical context of the user.[13,38] Results for a fracture may be released immediately, whereas complex oncological cases may be best suited for an embargo period or may be communicated to users by the physician before releasing results on a portal.[13,39,40] A tailored approach for the timing of the release of reports can be achieved in many ways, such as selecting certain physicians (e.g., oncologists) or allowing users to choose based on their preferences.[39]

## Table 1: Features and Data Available on Patient Portals Across Canada

| Data and features | Province, patient portal | | | | | |
|---|---|---|---|---|---|---|
| | Alberta, MyHealth, MyAHS Connect[a,15] | British Columbia, Health Gateway[b,16] | Ontario, NA[c,22] | Prince Edward Island[d,23] | Quebec, Health Booklet[24] | Saskatchewan, MySaskHealth-Record[25] |
| Available data | | | | | | |
| Medication history | Yes | Yes | Yes | No | Yes | Yes |
| Allergies and intolerances | Yes | No | Yes | No | No | Yes |
| Current and/or past conditions | Yes | No | Yes | No | No | Yes |
| Immunization record | Yes | Yes | Yes | No | No | Yes |
| Clinical visits | Yes | Yes | Yes | No | Yes | Yes |
| Medical devices used | Yes | No | Yes | No | No | No |
| Laboratory test results | Yes | Yes | Yes | No | Yes | Yes |
| **Medical imaging results** | Yes | No | Yes | No | Yes | Yes |
| Vital signs | Yes | No | Yes | No | No | Yes |
| Pregnancy | Yes | No | Yes | No | No | No |
| Social history | Yes | No | Yes | No | No | No |
| Functional status | Yes | No | Yes | No | No | No |
| Plan of care | Yes | No | Yes | No | No | No |
| Advance directives | Yes | No | Yes | No | No | No |
| Current and historical e-referrals | Yes | No | Yes | No | No | No |
| Log of who has accessed information | Yes | No | Yes | No | Yes | No |
| Status of special authority requests | Yes | Yes | No | No | No | No |
| Features | | | | | | |
| Upload health info from other devices | Yes | No | Yes | No | No | Yes |
| Set medication reminders | Yes | No | No | No | No | Yes |
| Request prescription renewals, see refills | Yes | No | Yes | No | No | Yes |
| Set appointment reminders | Yes | No | Yes | Yes | No | Yes |
| Schedule or manage appointment(s) | Yes | No | No | Yes | Yes | Yes |
| Add or edit personal information | Yes | Yes | Yes | Yes | No | Yes |

| Data and features | Province, patient portal | | | | | |
|---|---|---|---|---|---|---|
| | Alberta, MyHealth, MyAHS Connect[a,15] | British Columbia, Health Gateway[b,16] | Ontario, NA[c,22] | Prince Edward Island[d,23] | Quebec, Health Booklet[24] | Saskatchewan, MySaskHealth-Record[25] |
| Communicate with health professionals | Yes | No | Yes | No | No | No |
| Share information with others | Yes | No | No | No | No | Yes |
| Access education resources and materials | Yes | No | Yes | No | No | No |

NA = not applicable.

[a]These are different products with different functionality. Users would be required to subscribe to both portals to have access to all of the listed data and features.

[b]Based on Health Gateway only.

[c]Based on the patient portal provincial service standards by Ontario Health.[22]

[d]Features and data available to patients differ by clinic.

As artificial intelligence (AI) and clinical decision support tools become more mainstream in imaging departments, they may be used to detect which results should be immediately released or if an embargo period may be more appropriate.[39] Results of a survey of 31 academic radiology institutions revealed that the average embargo period before the release of radiology reports in the US is 4 days.[41] As mentioned previously, Saskatchewan and Alberta provide immediate access to medical imaging results on their provincial portals.[29,32]

## Radiology Reports With Exam Images

One of the main concerns with including medical images in patient portals is that it can result in confusion and misinterpretation, especially in complex clinical scenarios (e.g., oncology). A user is unlikely to be able to differentiate clinically significant abnormalities from those that can be ignored on images.[13,42] Nonetheless, many people may prefer to have access to images of their scans with their results,[13,43] feel that the increased transparency with their medical results outweighs the associated risks,[44] and appreciate the ability to share images for a second opinion.[13] An investigation of 299 individuals' experiences of viewing of medical images online revealed that a large proportion of them felt that the opportunity enabled them to:[43]

- better understand their medical condition
- feel more in control of their care
- feel encouraged to follow physician recommendations
- increase their trust in their doctor
- have reassurance about their care plan.

From the perspective of radiologists, some feel that individuals' access to images has no impact on their roles, while only a few reported either negative impacts (e.g., phone calls to discuss findings with users, user confusion, and stress) or positive impacts (e.g., direct communication, improved user understanding).[22,33] It is unclear if the patient portals reported in Table 1 of this document provide access to digital images with medical imaging results on portals. Regional portals, not included in Table 1, may also provide access to

medical images. Ontario has an intention to enable patient portals to share radiology images from provincial diagnostic imaging repositories in the future.[22]

## Patient–Centred Reporting

Standard radiology reports are written for clinicians who understand medical language and abbreviations.[12,13] The terms used by radiologists may not be well understood by individuals reading their radiology reports.[12,13] Unlike laboratory results (e.g., blood tests), radiology reports do not have normal ranges for individuals to reference. Individual access to results on portals requires consideration of their health literacy.[12] The use of lay language when results are intended to be shared on a patient portal can help increase an individual's understanding of their health information.[6,8,43,45] It has been suggested that separate, user-friendly summaries can be shared on portals.[43] It may also be helpful to direct users to reliable web sources, such as consumer health vocabularies for information through hyperlinks on reports.[13,39] Other recommendations to help mitigate confusion include providing results in the appropriate context (e.g., spine disc desiccation that is expected for the individual's age)[46] and working with local patient groups to develop simplified terminology for reports.[47]

Structured reporting templates that are disease-specific have been developed by some groups.[40] However, it is recognized that standardizing and simplifying radiology reports requires considerable effort, especially when considering different cultures and languages.[13] A patient-centred radiology report (PACERR) prototype for prostate MRI was developed by relevant experts in health, medical imaging, engineering, and research.[48] The development of the template was informed by interviews with experts and individuals undergoing prostate MRI.[48] Another tool developed to facilitate patient-friendly reporting in radiology is Patient-Oriented Radiology Reporter (PORTER).[49] PORTER is a lay-language glossary of frequently used terms applied to MRI exams of the knee.[49]

AI and natural language processing could potentially be used to improve an individual's understanding of electronic health record content in the future.[13] For example, dedicated text-processing tools can help simplify terms.[13]

## Individual Health Outcomes and Health System Outcomes

The literature on the impact of portals on health outcomes is limited and heterogeneous.[35,50] The studies differ in indications, health-related outcomes, and instruments used to evaluate impact. Existing studies focus on chronic diseases such as diabetes, hypertension, heart failure, and asthma,[5,6,35] and are considered to offer low-quality evidence due to the lack of a framework, conceptual foundation, evidence grading, and theories.[5,6]

Based on the results of the literature search for this report, studies that evaluate clinical utility outcomes relevant to medical imaging results on patient portals — such as time to diagnosis, time to treatment, or change in care plan — are lacking. Evidence around the impact of patient portals on health system costs and utilization is also limited and inconclusive.[50]

## Direct Communication

Currently, radiologists may have a limited role in communication and engagement with individuals.[13,51,58] Some clinicians claim that reliance on patient portals as the sole means to communicate with individuals may not be advisable, but it may be an opportunity for radiologists to be become more involved in an individual's care.[8,52] Potential benefits of direct communication between patients and radiologists may include the ability to better identify errors in records, establish trust, avoid confusion, improve adherence to management, and increase understanding.[13,47]

There are concerns over the possible impact on the workload and workflow of radiologists.[6] Reported experience of radiology departments in other jurisdictions with this functionality has found that this concern was unjustified.[13,33,43,53-55] More than half of radiologists surveyed in the US would prefer more interaction with individuals, and stated that interactions with patients had minor to no negative impact on their workflow.[13] Within the Canadian context, it may be important to consider these issues as they relate to pressures in the health care system around growing medical imaging waitlists and a human resource shortage in radiology.[56,57] Not all radiologists may have the time to communicate with patients as they would like to, due to heavy workloads. Radiologists may also need formal training to communicate with patients, given their minimal role in patient engagement.[13,58] Other considerations include the implications on workflow and lines of communication with other providers (e.g., referring physicians) and reimbursement for patient communication.[13,52]

## Security and Access

Cyber attacks on health care organizations have been occurring with greater frequency and severity in recent years.[59-61] Users may have concerns around the security of their health information on patient portals.[5] Maintaining privacy and data security while enabling online access to reports, especially when including exam images, can be a challenge for health care organizations.[62] Ensuring that patient portals have security features, such as encryption, user authentication, and the ability to audit who has accessed information, may help facilitate their use.[8,33] Guidance on how, when, and where to access data (e.g., appropriate locations such as in the individual's home) could be a discussion with users.[8]

Additionally, members of the health care team and administrative staff that can access these records should be flagged to the user.[8] Certain population groups, such as children and people with debilitating disease, may share access privileges with their caretakers. In Canada, people aged 14 and older can sign up for a patient portal in Alberta and Saskatchewan,[25] whereas Health Gateway in British Columbia allows those aged 12 years and older to do so.[15,16] It may be helpful to implement a process to review access preferences and establish procedures around access and proxy access in cases of user incapacity.[8,10]

## Interoperability

A qualitative study of 29 users of MyChart suggests that interoperability between record systems can improve user experience with online portals.[9] Users may be discouraged to view their information online if they need to access different portals for a full view of their health data.[9,63] Limited interoperability between

health systems in Canada could be a challenge when sharing radiology reports, especially when including images.[9,14,64]

## Health Equity Considerations

User trend analysis indicates that specific populations may use patient portals more than others, such as women, individuals with higher education attainment, and white people.[6,63,65,66] In terms of imaging modality type, MRI results are viewed more than CT and X-ray results.[65] Hence, it may not be optimal to rely solely on patient portals to communicate diagnostic imaging findings. Physician buy-in can also impact an individual's use of a patient portal. Training can help physicians gain comfortability with the interface and enable them to properly inform users on how portals can be utilized.[5,6]

An individual who lacks a reliable internet connection or is uncomfortable using technology may not effectively use patient portals.

# Limitations

This report provides some insight into the use of patient portals to view medical imaging results. Patient portals were designed to facilitate individual access to all of their health information. This report may omit other potential considerations associated with sharing other types of health-related information (e.g., laboratory results) and the use of other features that may be offered in a portal (e.g., prescription refills). Considerations discussed in this report may not be generalizable to other patient portal capabilities.

Features of portals in Canada detailed in this report were based on information listed on their respective websites. Hence, features available on patient portals but not disclosed on public websites may not be captured. Additionally, the information may not reflect the full spectrum of features available across multiple patient portals in 1 jurisdiction (i.e., British Columbia, Ontario, or Prince Edward Island).

# Conclusion

Patient portals in Canada are implemented at the provincial, regional, or clinic level of the health care system. Six provinces have patient portals: Alberta, British Columbia, Saskatchewan, Ontario, Prince Edward Island, and Quebec. These patient portals differ in features and data-sharing capabilities. Saskatchewan and Alberta share medical imaging reports on patient portals immediately after radiologists pass on imaging reports to referring physicians, whereas Quebec has set a 30-day embargo period before individuals can access medical imaging results. Ontario also provides medical imaging results on portals, and has an intention to enable the sharing of images in the future.

Concerns over user anxiety and confusion when faced with results without physician interpretation may depend on the severity of the individual's condition. A tailored approach for timing the release of medical imaging results has been suggested to satisfy varying preferences of users. However, the literature is heterogeneous and limited, especially in the context of providing access to medical imaging results. Users

may benefit from patient-centred reporting and guidance to reliable sources of information. Physicians are encouraged to use lay language and avoid abbreviations, in addition to discussing the data security and access protocols with users.

Direct communication with individuals through portals may be an opportunity for radiologists' role in the health care continuum to be further recognized and valued. As AI becomes more common in health systems, it may be used to optimize processes around sharing radiology results and increase a user's understanding of their imaging results.

# References

1. Lo B, Charow R, Laberge S, Bakas V, Williams L, Wiljer D. Why are Patient Portals Important in the Age of COVID-19? Reflecting on Patient and Team Experiences From a Toronto Hospital Network. *J Patient Exp.* 2022;9:23743735221112216. [PubMed](#)

2. G7 Research Group. G7 patient access to health records. 2021; [http://www.g7.utoronto.ca/healthmins/2021-patient-access.html#g7-commitment-on-digital-health](http://www.g7.utoronto.ca/healthmins/2021-patient-access.html#g7-commitment-on-digital-health). Accessed 2023 Mar 13.

3. Connecting for health: a public-private collaborative. New York (NY): Markle Foundation; 2003: [https://markle.org/app/uploads/2022/03/final_phwg_report1.pdf](https://markle.org/app/uploads/2022/03/final_phwg_report1.pdf). Accessed 2023 Apr 19.

4. Meyer H. Patient portals: a valuable tool for improving patient engagement. *Providertech* 2021; [https://www.providertech.com/patient-portals-tool-for-improving-patient-engagement/](https://www.providertech.com/patient-portals-tool-for-improving-patient-engagement/). Accessed 2023 Apr 24.

5. Carini E, Villani L, Pezzullo AM, et al. The Impact of Digital Patient Portals on Health Outcomes, System Efficiency, and Patient Attitudes: Updated Systematic Literature Review. *J Med Internet Res.* 2021;23(9):e26189. [PubMed](#)

6. Antonio MG, Petrovskaya O, Lau F. The State of Evidence in Patient Portals: Umbrella Review. *J Med Internet Res.* 2020;22(11):e23851. [PubMed](#)

7. The future of connected health care: reporting Canadians' perspective on the health care system. American Medical Association, Canadian Medical Association, Ipsos; 2019: [https://www.cma.ca/sites/default/files/pdf/Media-Releases/The-Future-of-Connected-Healthcare-e.pdf](https://www.cma.ca/sites/default/files/pdf/Media-Releases/The-Future-of-Connected-Healthcare-e.pdf). Accessed 2023 Apr 4.

8. Canadian Medical Protective Association. Patient portals - considerations for safety and medico-legal risk. 2021; [https://www.cmpa-acpm.ca/en/advice-publications/browse-articles/2021/patient-portals-considerations-for-safety-and-medico-legal-risk](https://www.cmpa-acpm.ca/en/advice-publications/browse-articles/2021/patient-portals-considerations-for-safety-and-medico-legal-risk). Accessed 2023 Mar 16.

9. Sieck CJ, Hefner JL, McAlearney AS. Improving the patient experience through patient portals: Insights from experienced portal users. *Patient Experience Journal.* 2018;5(3):47-54.

10. Mehta S, Jamieson, T., and Ackery A.D. . Helping clinicians and patients navigate electronic patient portals: ethical and legal principles. *Can Med Assoc J.* 2019. [PubMed](#)

11. Ryan BL, Brown JB, Terry A, Cejic S, Stewart M, Thind A. Implementing and Using a Patient Portal: A qualitative exploration of patient and provider perspectives on engaging patients. *J Innov Health Inform.* 2016;23(2):848. [PubMed](#)

12. Mityul MI, Gilcrease-Garcia B, Searleman A, Demertzis JL, Gunn AJ. Interpretive Differences Between Patients and Radiologists Regarding the Diagnostic Confidence Associated With Commonly Used Phrases in the Radiology Report. *AJR Am J Roentgenol.* 2018;210(1):123-126. [PubMed](#)

13. Becker CD, Kotter E. Communicating with patients in the age of online portals—challenges and opportunities on the horizon for radiologists. *Insights Imaging.* 2022;13(1). [PubMed](#)

14. Connecting the health system. Toronto (ON): Canada Health Infoway: [https://www.infoway-inforoute.ca/en/component/edocman/6413-connecting-the-health-system-connected-care-a-healthier-canada/view-document](https://www.infoway-inforoute.ca/en/component/edocman/6413-connecting-the-health-system-connected-care-a-healthier-canada/view-document). Accessed 2023 Mar 31.

15. Government of Alberta. Welcome to MyHealth Records. [https://myhealth.alberta.ca/myhealthrecords](https://myhealth.alberta.ca/myhealthrecords). Accessed 2023 Mar 13.

16. Government of BC. Access you health information online. [https://www.healthgateway.gov.bc.ca/](https://www.healthgateway.gov.bc.ca/). Accessed 2023 Mar 13.

17. BC Cancer. BC Cancer is inviting patients to participate in a survey to help understand online preferences. 2022; [http://www.bccancer.bc.ca/about/news-stories/stories/inviting-patients-to-participate-in-a-survey-to-help-understand-online-preferences](http://www.bccancer.bc.ca/about/news-stories/stories/inviting-patients-to-participate-in-a-survey-to-help-understand-online-preferences). Accessed 2023 Mar 14.

18. Interior Health. MyHealthPortal. [https://www.interiorhealth.ca/health-and-wellness/accessing-care-through-technology/myhealthportal](https://www.interiorhealth.ca/health-and-wellness/accessing-care-through-technology/myhealthportal). Accessed 2023 Mar 13.

19. Island Health. MyHealth. [https://www.islandhealth.ca/our-services/virtual-care-services/myhealth](https://www.islandhealth.ca/our-services/virtual-care-services/myhealth). Accessed 2023 Mar 13.

20. Northern Health. HealthElife. [https://www.northernhealth.ca/services/digital-health/healthelife](https://www.northernhealth.ca/services/digital-health/healthelife). Accessed 2023 Mar 13.

21. Fraser Health. MyHealth. https://www.fraserhealth.ca/employees/employee-resources/your-health-matters/myhealth#.ZCsQnHbMI2w. Accessed 2023 Mar 13.

22. Patient portal (PP) provincial service standard. Toronto (ON): Ontario Health; 2021: https://www.ontariohealth.ca/sites/ontariohealth/files/2021-09/PatientPortal-PP-ProvincialServiceStandards.pdf. Accessed 2023 Mar 13.

23. Government of Prince Edward Island. Electronic medical record - for patients. 2022; https://www.princeedwardisland.ca/en/information/health-and-wellness/electronic-medical-record-for-patients. Accessed 2023 Mar 13.

24. Government of Quebec. Quebec Health Booklet. 2021; https://www.quebec.ca/en/health/your-health-information/quebec-health-booklet. Accessed 2023 Mar 13.

25. eHealth Saskatchewan. Take your health in your hands. https://www.ehealthsask.ca/MySaskHealthRecord/MySaskHealthRecord/Pages/About.aspx. Accessed 2023 Mar 13.

26. Henderson J. After $8.5 million was spent on developing MyHealthNs, the vendor of the online portal for health records is calling it quits. *Halifax Examiner* 2019; https://www.halifaxexaminer.ca/government/province-house/after-8-5-million-was-spent-on-developing-myhealthns-the-vendor-of-the-online-portal-for-health-records-is-calling-it-quits/. Accessed 2023 Mar 13.

27. Government of Nova Scotia. MyHealthNS services winding up. 2020; https://novascotia.ca/news/release/?id=20200214005. Accessed 2023 Mar 13.

28. The international patient summary. 2023; https://international-patient-summary.net/. Accessed 2023 Mar 13.

29. Diagnostic imaging reports online via MyPersonalRecords. Edmonton (AB): Government of Alberta; 2023: https://myhealth.alberta.ca/help/KnowledgeBase/Documents/MHR-Diagnostic-Imaging-For-Providers.pdf. Accessed 2023 Apr 04.

30. Wilcox JR. The written radiology report. *Appl Radiol.* 2006.

31. CAR Standard for Communication of Diagnostic Imaging Findings. Ottawa (ON): Canadian Association of Radiologists; 2010: https://car.ca/wp-content/uploads/Communication-of-Diagnostic-Imaging-Findings.pdf. Accessed 2023 Apr 17.

32. Basky G. Some provinces still delay access to health records via patient portals. *CMAJ.* 2019;191(48):E1341. PubMed

33. Choi HH, Kotsenas AL, Chen JV, Bronsky C, Roth CJ, Kohli MD. Multi-institutional Experience with Patient Image Access Through Electronic Health Record Patient Portals. *J Digit Imaging.* 2022;35(2):320-326. PubMed

34. Mezrich JL, Jin G, Lye C, Yousman L, Forman HP. Patient Electronic Access to Final Radiology Reports: What Is the Current Standard of Practice, and Is an Embargo Period Appropriate? *Radiology.* 2021;300(1):187-189. PubMed

35. Ammenwerth E, Hoerbst A, Lannig S, Mueller G, Siebert U, Schnell-Inderst P. Effects of Adult Patient Portals on Patient Empowerment and Health-Related Outcomes: A Systematic Review. *Stud Health Technol Inform.* 2019;264:1106-1110. PubMed

36. Hulter P, Langendoen W, Pluut B, et al. Patients' choices regarding online access to laboratory, radiology and pathology test results on a hospital patient portal. *PLoS ONE [Electronic Resource].* 2023;18(2):e0280768. PubMed

37. Woolen SA, Kazerooni EA, Steenburg SD, et al. Optimizing Electronic Release of Imaging Results through an Online Patient Portal. *Radiology.* 2019;290(1):136-143. PubMed

38. Gagnon L. Patient portals are double edged swords for radiology. *AuntMinnie.com* 2014; https://www.auntminnie.com/index.aspx?sec=ser&sub=def&pag=dis&ItemID=107229. Accessed 2023 Mar 16.

39. Arenson RL. Building a Better Online Portal for Patients to Obtain Radiologic Results. *Radiology.* 2019;290(1):144-145. PubMed

40. Perlis N, Finelli A, Lovas M, et al. Exploring the value of using patient-oriented MRI reports in clinical practice - a pilot study. *Support Care Cancer.* 2022;30(8):6857-6876. PubMed

41. Holder J, Tocino I, Facchini D, et al. Current state of radiology report release in electronic patient portals. *Clin Imaging.* 2021;74:22-26. PubMed

42. Waite S, Grigorian, A., et al. . Analysis of perceptual expertise in radiology - current knowledge and a new perspective. *Front Hum Neurosci.* 2019.

43. Norris EC, Halaska C, Sachs PB, Lin CT, Sanfilippo K, Honce JM. Understanding Patient Experiences, Opinions, and Actions Taken After Viewing Their Own Radiology Images Online: Web-Based Survey. *JMIR Formative Research.* 2022;6(4). PubMed

44. Halaska C, Sachs P, Sanfilippo K, Lin CT. Patient Attitudes About Viewing Their Radiology Images Online: Preintervention Survey. *J Med Internet Res.* 2019;21(7):e12595. PubMed

45. Alarifi M, Patrick T, Jabour A, Wu M, Luo J. Understanding patient needs and gaps in radiology reports through online discussion forum analysis. *Insights Imaging.* 2021;12(1). PubMed

46. Lourenco AP, Baird GL. Optimizing Radiology Reports for Patients and Referring Physicians: Mitigating the Curse of Knowledge. *Acad Radiol.* 2020;27(3):436-439. PubMed

47. Slanetz PJ, Krishnaraj A, Lee CI, Lourenco AP. Patient Portals and Radiology: Overcoming Hurdles. *J Am Coll Radiol.* 2019;16(10):1488-1490. PubMed

48. Perlis N, Finelli A, Lovas M, et al. Creating patient-centered radiology reports to empower patients undergoing prostate magnetic resonance imaging. *Can Urol Assoc J.* 2021;15(4):108-113. PubMed

49. Oh SC, Cook TS, Kahn CE, Jr. PORTER: a Prototype System for Patient-Oriented Radiology Reporting. *J Digit Imaging.* 2016;29(4):450-454. PubMed

50. Mechanisms for accessing local services. Québec City (QC): INESSS; 2019: https://www.inesss.qc.ca/fileadmin/doc/INESSS/Rapports/ServicesSociaux/INESSS_Mechanisms_accessing_local_services_EnglishSummary.pdf. Accessed 2023 Mar 27.

51. Manchon P. Patient communication in Radiology learning from COVID-19 experience. *HealthManagement* 2020; https://healthmanagement.org/c/enterprise/issuearticle/patient-communication-in-radiology-learning-from-covid-19-experience. Accessed 2023 Apr 19.

52. Liao GJ, Lee CI. Viewing the Value of Radiology Through Patient Web Portals. *Acad Radiol.* 2018;25(6):792-793. PubMed

53. Cross NM, Wildenberg J, Liao G, et al. The voice of the radiologist: Enabling patients to speak directly to radiologists. *Clin Imaging.* 2020;61:84-89. PubMed

54. McBee MP, Perry LA, Bick J, Towbin AJ. Online Patient Portal System to Allow Patients to Directly Communicate With Radiologists. *J Am Coll Radiol.* 2019;16(7):999-1002. PubMed

55. Fang J, Boos J, Cohen MP, et al. Radiologists' Experience With Patient Interactions in the Era of Open Access of Patients to Radiology Reports. *J Am Coll Radiol.* 2018;15(11):1573-1579. PubMed

56. Cao DJ, Hurrell C, Patlas MN. Current Status of Burnout in Canadian Radiology. *Can Assoc Radiol J.* 2023;74(1):37-43. PubMed

57. Canadian radiologists sound the alarm on long wait times for CT scans, MRIs. *CityNews* 2022; https://ottawa.citynews.ca/local-news/canadian-radiologists-sound-the-alarm-on-long-wait-times-for-ct-scans-mris-6133149/. Accessed 2023 Apr 04.

58. Rockall AG, Justich C, Helbich T, Vilgrain V. Patient communication in radiology: Moving up the agenda. *Eur J Radiol.* 2022;155:110464. PubMed

59. Cloutier P-E, Shipley D. Canada's health-care cybersecurity is in critical condition. *Ottawa Citizen* 2021; https://ottawacitizen.com/opinion/cloutier-and-shipley-canadas-health-care-cybersecurity-is-in-critical-condition. Accessed 2023 Mar 30.

60. Amanat H. Cyberattacks increased 20 per cent in Canada last year: IT security company. *CTV News* 2023; https://www.ctvnews.ca/sci-tech/cyberattacks-increased-20-per-cent-in-canada-last-year-it-security-company-1.6224097. Accessed 2023 Mar 30.

61. Gilmore R. Ransomware demands double amid COVID-19, with healthcare industry a key target: report. *Global News* 2021; https://globalnews.ca/news/7699883/coronavirus-cyber-security-ransomware-hack-canada/. Accessed 2023 Mar 30.

62. Mendelson DS, Carr C, Davis BD. The RSNA ImageShare - Enabling Secure, Transparent, and Easy Image Exchange. *J Digit Imaging.* 2022;35(4):739-742. PubMed

63. Oest SER, Hightower M, Krasowski MD. Activation and Utilization of an Electronic Health Record Patient Portal at an Academic Medical Center—Impact of Patient Demographics and Geographic Location. *Academic Pathology.* 2018;5:1-9. PubMed

64. Gorfinkel I, Lexchin J. Enabling Patient Portals to Access Primary Care Medical Records: Maximizing Collaboration in Care between Patients and Providers. *Healthc Policy.* 2019;14(4):21-27. PubMed

65. Foster B, Krasowski MD. The Use of an Electronic Health Record Patient Portal to Access Diagnostic Test Results by Emergency Patients at an Academic Medical Center: Retrospective Study. *J Med Internet Res.* 2019;21(6):e13791. PubMed

66. Dendere R, Slade C, Burton-Jones A, Sullivan C, Staib A, Janda M. Patient Portals Facilitating Engagement With Inpatient Electronic Medical Records: A Systematic Review. *J Med Internet Res.* 2019;21(4):e12779. [PubMed](#)