

Alberta Netcare eReferral
Evaluation Report (Nov. 2019)

Alberta Netcare eReferral Evaluation Report

Aug. 2018 to Oct. 2019



This report was prepared by the Alberta Health Services Access Improvement team.

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Abbreviations

Abbreviation	Name
Advisory Group	eReferral Evaluation Advisory Group
AH	Alberta Health – Ministry of Health, Government of Alberta
AHS	Alberta Health Services
AMA	Alberta Medical Association
ANP:	Alberta Netcare Portal (Alberta Netcare)
AR	Advice Request
ARECCI	Alberta Research Ethics Community Consensus Initiative
ATOP	Alberta Thoracic Oncology Program
Champlain BASE™	Building Access to Specialists through eConsultation
CKD	Chronic Kidney Disease
CR	Consult Request
DIMR	Data Integration, Measurement and Reporting
EHR	Electronic Health Record
EMR	Electronic Medical Record
eReferral	Alberta Netcare eReferral
FPR	Full Production Rollout
GI	Gastroenterology
HQCA	Health Quality Council of Alberta
IPM	Interventional Pulmonary Medicine
IT	Information Technology
LPR	Limited Production Rollout
MOA	Medical Office Assistant
PCAT	Pulmonary Central Access Triage
PCN	Primary Care Network
QuRE	Quality Referral Evolution initiative
RAAPID	Referral, Access, Advice, Placement, Information & Destination
RLS	Reporting and Learning System for Patient Safety
SHARPGI	Single Hub Access Referral Program for Gastroenterology
SCN	Strategic Clinical Network

Executive Summary

Alberta Netcare eReferral (eReferral) is Alberta Health Services' (AHS') first paperless referral management system that was launched in July 2014 in collaboration with physicians, clinicians and information technology (IT) experts. Its goal is to improve the referral and communication process with primary and specialty care to ultimately enhance patient access and safety.

Two types of requests are available within eReferral: **Consult Request** for patients who need an in-person consultation with a specialist, and **Advice Request** for non-urgent clinical advice answered by a specialist within five calendar days.

Since its inception, there has been an increasing eReferral utilization trend with the expansion from three (3) to 26 specialized health services and to different zones for existing specialties.

Between July 2014 and Sept. 2019, there were:

- 40,480 requests submitted by 3,429 referring providers either on their own or by support staff on their behalf
 - 463 providers submitted more than 20 requests
 - Three top referring providers submitted 1,333, 882 and 777 requests respectively
- 25,808 Consult Requests (64%) submitted to 12 specialized services/programs
- 14,672 Advice Requests (36%) submitted to 26 specialties
- 474 specialists who responded to Advice and/or Consult Requests at 72 facilities.

In response to needs identified in primary care, Advice Request was implemented for Adult Gastroenterology (Provincial) and Urology (Edmonton Zone) in late 2017, while Consult Request was implemented for Urology and Adult Gastroenterology (Colon Cancer Screening) in the Edmonton Zone in mid-2018.

This report provides a review of the progress made on the recommendations listed within the 2015 eReferral Evaluation Report, introduces the 2019-2022 eReferral Evaluation Framework and presents the findings of the Phase One evaluation. This report's results and recommendations can inform positive changes for further eReferral implementations, clinical practice and other clinical information systems.

Out of the 44 recommendations made in the 2015 Evaluation Report [1], 26 were completed, 15 have been partially implemented and three (3) were deferred due to

Alberta Netcare eReferral has received 40,480 requests since its launch in July 2014. 474 specialists responded to Advice and Consult Requests at 72 facilities for 155 reasons for referral.

broader systemic issues that require direction and resources from senior leadership across Alberta Health (AH), the Alberta Medical Association (AMA) and AHS.

A new evaluation framework (2019 - 2022) was developed to provide a holistic evaluation of the eReferral platform based on AHS' Organizational Goals (Quadruple Aim):

- Patient and family experience
- Patient and population health outcomes
- Experience and safety of our people
- Financial health and value for money.

The evaluation is conducted in a phased timeline: Phase One (2019), Phase Two (2020-2021) and Phase Three (2021-2022) using mixed methodologies to collect both quantitative and qualitative data. The methodologies include: surveys, semi-structured interviews, economic analysis, time motion studies with qualitative process analysis, and eReferral usage reporting.

As part of the Phase One evaluation, 23 semi-structured interviews and three sets of surveys (N=160) were conducted to study the level of awareness and satisfaction of Advice Request between primary care physicians and specialists, as well as eReferral user experience amongst referring providers, receiving providers and clinical support staff. The key findings were:

- The majority of primary care physicians surveyed (91%) were aware of Advice Request
- After using Advice Request, 68% of the primary care physicians indicated that they had more confidence in managing their patient's condition, or sending an appropriate consultation request
- The satisfaction rate with Advice Request was significantly higher amongst specialists (80%) than primary care physicians (45%). Further study is required to understand how to improve primary care satisfaction with Advice Request.
- About half of the survey respondents reported a "good" or "excellent" experience using Advice Request (58%) and/or Consult Request (40%)
- Interviewees and survey respondents suggested the following eReferral improvements: increased accessibility (e.g. spread to more specialized services), efficiency (e.g. more auto-populated fields), flexibility (e.g. improved ease with updating patient's condition after referral submission), user-friendliness (e.g. better integration with electronic medical records (EMR), and user support (e.g. more in-person training).

The Phase One evaluation concluded with 16 recommendations from participants:

- **System-Level (AH, AMA and AHS):** Enable patient notifications for referral statuses and appointments; upgrade the eReferral platform to a more user-friendly design; integrate eReferral into primary care's EMR systems; develop standards or medical education to reduce the number of unclear clinical questions or lack of pertinent information in requests.
- **Organizational-Level (AHS):** Increase available specialized services in the Central, North and South Zones to reduce patient travel costs and time for out-of-zone specialist appointments.
- **Department or Team-Level:**
 - *IT Operations team:* Enhance the ability for referring providers to edit the eReferral form after submission; increase the number of auto-populated fields from other Alberta Netcare data repositories; add more specialties and reasons for referral in each release cycle; enhance the Alberta Netcare training environment.
 - *Access Improvement team:* Increase users' awareness of provider notifications; promote and recruit more specialists and specialized services/programs with increased IT support; provide more in-person training for support staff and physicians; improve users' understanding of eReferral workflows to submit and track requests.
 - *Specialized Service/Program:* Reduce response time for Advice Request from five (5) calendar days to two (2) calendar days; maintain up-to-date statuses of Consult Request on eReferral; include consultation letter upon request completion.

Conclusion:

Broad implementation and promotion of electronic advice and referrals may have substantial positive impacts on patient health outcomes and health system budgets. Use of eReferral has the potential to advance timely access to specialty care, enhance care in the patient's medical home, decrease unnecessary higher-cost specialist appointments or procedures, and improve quality of communication with patients and providers. This can be done by improving communication processes as well as by empowering primary care providers to manage their patient's conditions in their medical home and avoid unnecessary referrals to specialists.

Full implementation and universal adoption of eReferral by providers requires adequate and stable financial and technological resources. Strong sponsorship and championship from AH and AHS Executive Leadership Team is fundamental to realize the full benefits of this service.

Introduction

Purpose

Alberta Netcare eReferral (eReferral) is a collaborative effort between physicians, clinicians and information technology (IT) experts to improve referral and consultation processes via standardized, technologically-facilitated communication methods. This report provides a comprehensive review of implementation progress on recommendations listed within the 2015 Alberta Netcare eReferral Evaluation Report, and shares the most recent evaluation results implemented within the 2019-2022 eReferral Evaluation Framework. The results and recommendations included can inform positive changes for future eReferral implementations, clinical practice and other clinical information systems.

Background

Rapid access to pertinent information is a crucial tool for physicians and other health professionals at the point of care [2]. This access is especially important in the referral and consultation process – a backbone of medical practice. However, substantial evidence suggests there is a communication breakdown in the referral process, where major issues include delayed communication, deficient referral letters, and poorly-coordinated, unclear responsibilities during the transfers of care [3-10].

eReferral currently provides a secure electronic platform for 23 specialties to offer Advice Requests that support patient care in the medical home, and for 12 specialized services to receive and manage high quality Consult Requests.

The first recommendation for Alberta Health (AH) and Alberta Health Services (AHS) from the 2013 Health Quality Council of Alberta's (HQCA) Continuity of Patient Care Report was to invest further in the provincial electronic health record (EHR) and electronic referral system [11]. This work would help standardize workflows for specialized health services and thus allow AH and AHS to provide more effective, safer patient care.

In July 2014 eReferral was launched within Alberta Netcare Portal (Alberta Netcare), an existing provincial EHR that healthcare providers can use to access and view patient health information from across the province. eReferral leverages existing information already in Alberta Netcare such as demographics, laboratory results and imaging reports into a standard advice or referral form that can be checked for completeness and tracked in real-time as its submitted, received, responded to, triaged and

scheduled. This strengthens quality control of advice or consultation requests, and improves communication processes.

The initial offering of eReferral was a Limited Production Rollout (LPR)^a focused on Consult Request, which allows providers to send electronic referral requests for patients who require an in-person specialist consultation. This was made available for use within three motivated subspecialty services provincially: both medical and radiation oncology focused on lung and breast cancers, and orthopaedic surgery focused on hip and knee joint replacements.

The first eReferral Evaluation Report issued in Dec. 2015 subsequently outlined the progress of this rollout and provided recommendations for the further expansion and maximization of the eReferral platform. Recommendations were strategized according to the Alberta Quality Matrix to:

- Improve specialized health services' **efficiency** by improving, standardizing and automating referral management processes
- Improve **accessibility** and reduce wait times for scheduled services
- Increase stakeholder **acceptability** by improving awareness of and clarity in a patient's path to specialty care
- Improve referral **appropriateness** through a standardized referral process and increased adoption of clinical best practices
- Assess platform **effectiveness** by identifying access improvement opportunities and developing key performance indicators
- Improve **safety** for patients by increasing transparency in the referral process

Additional funding was subsequently secured in late Dec. 2015 for a Full Production Rollout (FPR) of eReferral across the province to continue implementing Consult Request and start promoting Advice Request functionality. Two types of requests are currently available within eReferral:

- **Consult Request:** An electronic, non-urgent referral request for patients who need in-person consultations with specialists. Requests can be submitted by physicians, nurse practitioners or support staff (on the referring provider's behalf)
- **Advice Request:** A request for non-urgent clinical advice from a specialist that is received within five calendar days. It is a secured communication platform to promote better care and collaboration between healthcare providers. Requests can be submitted by physicians, nurse practitioners or support staff (on the referring provider's behalf)

^a eReferral Advice Request functionality was built as part of the business requirements in the LPR phase (2014-2016); however, it was not the focus in the LPR promotion.

Between 2016 and 2019, the Access Improvement team successfully expanded eReferral Consult Request availability to include 12 specialized services/programs. Further, to support appropriate and timely patient care in the patient's medical home, Advice Request was implemented for 26^b specialties.

eReferral Implementation Overview

Progress on Recommendations Made from the 2015 eReferral Evaluation Report

The 2015 eReferral Evaluation Report provided a total of 44^c recommendations to support the spread and scale of eReferral to other specialized services [1].

Between 2016 and 2019, the Access Improvement team successfully implemented 26 recommendations and made progress on another 15 recommendations. The remaining three (3) recommendations are related to broader systematic issues (such as community practitioner usage targets for Alberta Netcare) and need to be further explored and implemented with direction and more resources from AH's and AHS' senior leadership.

Goal 1: Improve specialized health services' **efficiency** by improving, standardizing and automating referral management processes

Status: Implemented ✓ | Partially Implemented ○ | To Be Implemented □

Recommendation	Status
Scope: Access Improvement team	
R1. Continue to support the spread of eReferral to referring providers as well as to receiving providers to ensure consistent data reporting across the hip and knee, lung and breast cancer participating sites.	✓ Engaged participating sites; conducted consistent data extractions and visualizations on the eReferral data dashboard.
R2. Continue to monitor eReferral status information to determine whether the current trends in referral errors, missed	○ Status and missing information is monitored; missed appointments and cancellations are difficult to track as clinic

^b The Access Improvement team implemented Advice Request for 26 specialties in total. In the first quarter of the 2019-20 fiscal year, Advice Request was disabled for three specialties (Oncology – Breast Cancer; Oncology – Lung Cancer; Paediatric Urology) due to operational reasons. Currently, 23 specialties are assessable via Advice Request.

^c The 2015 eReferral Evaluation Report had a numbering error and listed 46 recommendations but only 44 recommendations were provided. This section follows the same numbering order as the 2015 eReferral Evaluation Report for ease of comparison.

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Recommendation	Status
appointments and cancellations improves over time.	scheduling systems are not integrated with Alberta Netcare.
R5. Continue to deploy eReferral to more clinics and specialties.	✓ Increased from three (3) to 26 specialties.
R6. Assist in sustaining current users' adoption of eReferral and continue to elicit and respond to user feedback.	○ Limited enhancements have been made based on user feedback due to restricted IT resources.
R8. Consider process mapping current workflows and clinical systems before implementation – noting changes to workflow, highlighting benefits and discussing with users.	✓ Conducted current and future state workflow process mapping exercises with all specialty clinics before implementation.
R9. Future marketing strategies commenting on the efficiency advantages of eReferral should focus on the accessibility of information as it relates to service availability and wait times.	✓ Improved the eReferral Health Services Catalogue with accessible information related to service/provider availability and wait times.
Scope: Hip and Knee Clinics	
R7. eReferral efficiency and uptake could potentially be further improved by exploring the implementation of the ability to attach documents directly from EMRs into Alberta Netcare with the respective EMR vendors.	✓ Enhanced the eReferral form with an option to attach a referral letter and documents from EMRs; a similar referral form based on Quality Referral Evolution (QuRE) work was built into four commonly-used primary care EMRs: TELUS Health's Wolf, MedAccess, PS Suite, and QHR Accuro.
Scope: Organization-wide	
R3. AHS should continue supporting the development and adoption of provincial referral guidelines to standardize referral processes for patients and providers and streamline the process for future eReferral implementations. Even in the absence of automation, standardized referral processes reduce variability and simplify the referring process for patients and providers (i.e. one process for all providers within a specialty). Sending and receiving sites are equally important in the referral process and sites should support guidelines in daily practice (i.e. accept referrals that are complete, offer education on referral guidelines).	○ AHS has varied levels of support to develop and adopt provincial referral guidelines; increased from two (2) provincial referral guidelines to 14 provincial/zonal referral pathways (i.e. Adult and Paediatric Gastroenterology, Breast Health, Breast Cancer, Concurrent Disorders, Eating Disorders, Interventional Pulmonary Medicine, Lung Cancer, Nephrology, Pulmonary Medicine, Sleep Disorders, Tuberculosis Services, and Urology).
R4. AHS should continue to sustain eReferral and consider the benefits of	○ Full implementation of this recommendation would require additional

Recommendation	Status
spreading eReferral more broadly (benefits include error reduction, increased efficiency for both referring and receiving providers and transparency into the potential issues within the referral process for proactive resolution).	organizational support with clear direction on eReferral and other initiatives such as Connect Care, Specialist LINK and Connect MD.

Goal 2: Improve accessibility and reduce wait times for scheduled services

Status: Implemented | Partially Implemented | To Be Implemented

Recommendation	Status
Scope: Access Improvement team	
R10. Address the potential for short-term increases in workload and provide support from the eReferral team to help mitigate this as much as possible.	<input checked="" type="checkbox"/> Provided pre- and post-implementation training and support services for each specialty.
R11. Clearly explain to users and potential users, and particularly to physicians, what the patient and clinical benefits of eReferral are and increase access to Alberta Netcare and AHS insite.	<input checked="" type="checkbox"/> Clear and ongoing communications with existing and potential users (e.g. emails, clinic visits and presentations); enhanced process to obtain Alberta Netcare access for users. A new Access Improvement page will be available on AHS insite (AHS' intranet) in Dec. 2019.
R13. To ensure smooth adoption of eReferral across the province, more work needs to be done with individual services and clinics to ensure that their business processes are standardized and consistent.	<input type="checkbox"/> Conducted current- and future-state workflow process mapping exercises with all specialty clinics before their implementations; QuRE referral templates and instructions have been created to support primary care workflows. Strategies are needed to increase eReferral exposure to support patients in their medical home.
R14. Research, plan and implement strategies to better engage physicians and their support staff to improve the eReferral platform, referral requirements and clinic work flow.	<input checked="" type="checkbox"/> Implemented strategies such as clinical design sessions, user feedback surveys, clinic visits and presentations at national conferences.
R15. Capture referral wait time information by accessing organizational analytics through Data Integration, Measurement and Reporting (DIMR). Doing so will provide a more concrete measure of accessibility to scheduled services across the province.	<input type="checkbox"/> Clinics have reported their wait times quarterly; there has been ongoing discussions with AHS' Path to Care team to strategize how to provide a more concrete measure of wait times based on Path to Care policies and analytics.

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Recommendation	Status
R16. Continue to work on the standardization and streamlining of referral processes.	✓ Implemented multiple strategies such as Community of Practices for access improvement and central intake, referral pathway development, and QuRE workshops to enhance high quality referral communication between physicians.
R19. To encourage consistency in referral processes and improve user experiences, eReferral should continue to work with referring and receiving users on standardized referral processes and developing and improving referral guidelines.	✓ Implemented multiple strategies to facilitate conversations between referring and receiving providers at groups such as Calgary Zone Specialist Access Community of Practice, Calgary Zone Health Systems Support Committee, Edmonton Zone Specialty Linkages (Gastroenterology and PCN Working Group & Urology and PCN Working Group), Alberta Referral Directory, and Connect Care. There are currently 14 referral pathways published.
R20. Efforts should be made to work with Primary Care Networks (PCNs), Departments of Family Medicine and AMA to develop a common communication strategy for developing and implementing referral guidelines.	✓ Developed close working relationships with PCNs, Departments of Family Medicine at the University of Calgary and the University of Alberta, and AMA for collaboration on common communication strategies.
R21. In order to keep patient priorities central to planning and development, eReferral team should continue to obtain patient feedback. Methods for obtaining feedback might include surveys, questionnaires, interviews, and informal feedback.	✓ Conducted patient focus groups and surveys; established a patient referral working group to develop patient referral resources and patient-friendly referral/consultation checklist for medical appointments; eReferral standard form clinical design also included patient advisors.
Scope: Hip and Knee Clinics	
R18. Continue to offer patients options for their care as there may be multiple reasons for their referral choices.	✓ When creating a request, individual providers, 'next available' providers and locations are available as options.

Recommendation	Status
Scope: Hip and Knee Clinics and Cancer Control	
R22. To improve patient knowledge regarding eReferral and referral guidelines, strategies to communicate to patients (such as providing patients with relevant medical and system information and resources while they wait for their appointment) should be explored.	<input type="checkbox"/> Needs to be explored further with senior leadership from Cancer Control and hip and knee groups.
Scope: Organization-wide	
R12. More consistent organizational support is required to train and prepare for eReferral to be spread to a larger sample of user groups. Without the spread of eReferral to more specialties, it is difficult for programs to use a system that does not align with other systems in the field.	<input type="radio"/> Full implementation of this recommendation would require additional organizational support with clear direction on eReferral and other initiatives such as Connect Care, Specialist LINK and Connect MD.
R17. eReferral needs to be expanded to other services in order to see demonstrated changes in referral wait times.	<input checked="" type="checkbox"/> Increased from three (3) to 26 specialties with expanded scope (e.g. clinical advice on transgender care concerns provided by specialized family physicians).

Goal 3: Increase stakeholder **acceptability by improving awareness of and clarity in a patient's path to specialty care**

Status: Implemented | Partially Implemented | To Be Implemented

Recommendation	Status
Scope: Access Improvement team	
R23. Maintain openness with stakeholders, help adopters take ownership of their use of eReferral, express a sense of urgency, recognize stakeholder needs, and be consistent with messaging.	<input checked="" type="checkbox"/> Clear and consistent messages with all existing and potential users is ongoing via emails, newsletters and online communications; continuing engagement occurs such as clinic visits and user surveys; multiple awareness strategies are ongoing such as involvement in Community of Practices and QuRE workshops to share best practice for sending high quality referral request and response.
R24. Continue to make time for personal face-to-face interaction with users in training and as support. Users reported the support of the team and personal interaction facilitated eReferral implementation.	<input checked="" type="checkbox"/> Regular clinic visits at both referring and receiving sites; regular training sessions as ongoing support for users; ongoing clinic support offered by Access Improvement team and Alberta Netcare eHealth Support Services team.

Recommendation	Status
R25. Continue to be open, accept user feedback and take steps to show users that their feedback will contribute to improvements in the eReferral system and process.	○ All user feedback for enhancements have been documented; however, limited IT resources and funding have prevented full implementation of this recommendation.
R26. Continue to utilize existing resources and a variety of education methods to expand reach of the catchment area.	✓ Provided weekly webinars ^d and in-person training sessions; shared booth with Alberta Netcare eHealth Support Services and AHS' Path to Care teams and distributed educational content at some conferences and physician education events.
R27. In order to maintain existing stakeholder relationships, the team should continue to be realistic and practical throughout the implementation process. This includes being upfront and honest about delays, conducting additional testing and training, and focusing on solutions.	✓ Clear and transparent messages are being distributed via clinic visits, engagement meetings and regular communication such as status reports or newsletters.
R29. Continue to capture feedback from referring and receiving sites and patients in order to understand their needs and to ensure eReferral is addressing them. Use this information to communicate back to stakeholders how best to improve transparency in the patient referral experience.	○ Recruitment of specialties has been prioritized based on the reported needs of primary care; documented all user feedback for enhancement but limited IT resources and funding have prevented full implementation of this recommendation.
Scope: Organization-wide	
R28. AHS should designate a leader to sponsor, support and champion eReferral.	○ AHS has a designated sponsor for eReferral; however, additional organizational support is required.

Goal 4: Improve referral appropriateness through a standardized referral process and increased adoption of clinical best practices

Status: Implemented ✓ | Partially Implemented ○ | To Be Implemented □

Recommendation	Status
Scope: Access Improvement team	
R30. Continue measuring inappropriate referrals focusing on sites with a fairly	✓ Implemented multiple strategies to facilitate conversations between referring

^d The weekly webinars were provided between July 2014 and July 2019 by Alberta Netcare eHealth Support Services. These are no longer available due to resource reallocation of the Alberta Netcare eHealth Support Services team.

Recommendation	Status
established user base. This will help eReferral analyze trends that are distinct from the variance caused by new users.	and receiving users to prevent inappropriate referrals (e.g. Advice Request, referral pathways, Community of Practices, Edmonton Zone Gastroenterology (GI)–PCN collaborative working group, and collaboration with Calgary Zone Specialist LINK).

Goal 5: Assess platform effectiveness by identifying access improvement opportunities and developing key performance indicators

Status: Implemented ✓ | Partially Implemented ○ | To Be Implemented □

Recommendation	Status
Scope: Access Improvement team	
R35. Expansion of eReferral to other service groups can be assisted by marketing eReferral not only to physicians, but also to all potential users.	✓ Engagement with physicians, nurse practitioners and support staff to promote that both physicians and nurse practitioners can submit eReferral requests on their own or their support staff can submit requests on their behalf. In 2019, more than 50% of submitting users are support staff.
R37. With the knowledge that the majority of eReferrals are submitted by non-physicians such as medical office assistants (MOAs), the referral requirements should be revised based on input from both referring and receiving users.	✓ Simplified referral requirements of the three LPR groups; engaged non-physicians (triage nurses and MOAs) in new referral pathway development; enabled option to attach EMR-generated letters to eReferral requests.
R38. A useful feature to implement in the eReferral system would be notifications (EMR or email) to users of any changes to a patient's referral status while the referral is on the eReferral platform.	✓ Launched provider notifications (i.e. option for immediate notification and/or daily summary of eReferral activity by email); implemented communication campaign with eReferral users to share how to set up and manage notifications.
R39. Continue to provide support (education, training, personal engagement) to user groups.	✓ Offered weekly webinars by Alberta Netcare eHealth Support Services team; conducted clinic visits and training sessions; attended conferences and physician education events to share educational materials.
R41. Efforts should be made by the Access Improvement team and their IT collaborators to align eReferral with current EMRs to eliminate rework experienced by users who	○ New standard referral template based on QuRE work has been built into four commonly-used primary care EMRs: TELUS Health's MedAccess, Wolf, and

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Recommendation	Status
must process referrals via multiple systems. Doing so may also address perceived workload burden among physicians.	PS Suite, and QHR Accuro; enabled the eReferral option to attach EMR-generated letters but users continue to request eReferral integration with their EMRs.
R44. Continue with Access Improvement team's strategy of open communication and personal face-to-face engagement with stakeholders to foster trusting and supportive relationships.	✓ Ongoing engagement such as clinic visits, clinical design sessions, one-on-one training sessions, Community of Practices, etc.
Scope: Access Improvement team and Alberta Netcare eHealth Support Services team	
R36. Alberta Netcare uptake should also be a priority for the Access Improvement team and the Alberta Netcare eHealth Support Services team. This could be addressed by setting Alberta Netcare access targets for each Zone until saturation and by reducing barriers to obtaining Alberta Netcare access for university staff and allied health practitioners. More Alberta Netcare users will mean more potential for using eReferral.	☐ Alberta Netcare uptake is currently at 74% of community clinics as of Apr. 30, 2019; this number increased by 4% from Sept. 2015 (70%). Barriers for university staff using Alberta Netcare have been removed, but usage target has not set for community users by AH.
R40. eReferral early adopters have the full support of the Alberta Netcare eHealth Support Services team but the training regimens between Alberta Netcare and eReferral are not aligned. Clear communication between training teams should be prioritized ensuring that all adopters are receiving consistent information.	○ Enhanced communication between training teams; however, the Alberta Netcare eHealth Support Services team has recently reduced resources to provide eReferral training and support.
R45. The Access Improvement team needs to streamline how they work with Alberta Netcare Operations and eHealth Support Services teams. This would improve communication between the Access Improvement team and their stakeholders, facilitate the smooth integration of system updates, and contribute to positive user experiences.	✓ Daily and weekly meetings with staff from different teams and management levels to streamline and improve communications.
Scope: Organization-wide	
R31. eReferral should be expanded to other groups in order to create a cohesive referral processing system that aligns referral processes in all specialty areas and fulfills expected benefits that eReferral can provide as reported by users and non-users.	○ Increased from three (3) to 26 specialties. Full implementation of this recommendation would require additional organizational support with clear direction on eReferral and other initiatives such as

Recommendation	Status
Dependency for eReferral expansion is consistent leadership support.	Connect Care, Specialist LINK and Connect MD.
R32. eReferral experiences low service volume at some early adopter sites such that it is difficult to determine its impact. Efforts should be made to expand eReferral to groups beyond early adopters	✓ Increased from three (3) to 26 specialties; over 40,400 Advice and Consult Requests have been submitted since July 2014.
R42. Stable funding and leadership support for the Access Improvement team would enable continued continuity, growth and support for the eReferral platform.	○ AHS has a designated sponsor for eReferral; however, full implementation of this recommendation would require additional organizational support with clear direction on eReferral and other initiatives such as Connect Care, Specialist LINK and Connect MD.
R43. Executive leadership should advocate for eReferral and its team members in times of high turnover to not inhibit project progression, which ultimately impacts users and dissuades potential users of eReferral.	○ Clear direction on the future of eReferral is required to support the full implementation of this recommendation.

Goal 6: Improve **safety** for patients by increasing transparency in the referral process

Status: Implemented ✓ | Partially Implemented ○ | To Be Implemented □

Recommendation	Status
Scope: Access Improvement team and Organization-wide	
R46. To understand the extent to which patient safety inquiries have changed since automation, eReferral should continue to promote Reporting and Learning System (RLS) reporting among users and potential users.	○ Started collaborative relationship with AHS Patient Relations team to understand concerns related to referrals and access; conducted patient focus groups and surveys to better understand perspectives on the consultation-referral process.

eReferral Implementation Timeline

After the 2015 eReferral evaluation, further funding was secured in Dec. 2016 for a FPR across the province.

To identify priority areas for full implementation, a survey was developed to understand the major issues surrounding referrals from primary to specialty care. The survey was distributed to primary care providers (i.e. physicians, nurses, referral coordinators, medical office assistants and clinic managers) from Sept. 25 to Dec. 29, 2017. A total of 142 responses were collected from 28 PCNs across all five AHS Zones. Respondents reported that they encountered challenges when referring patients to certain specialties, especially Orthopaedics, Psychiatry, Urology, Colorectal Surgery and Gastroenterology.

In response to the identified needs expressed from primary care, Advice Request was implemented for Adult GI provincially and Urology in the Edmonton Zone in late 2017. In addition, Consult Request was implemented for Adult GI^e and Urology in the Edmonton Zone in Summer 2018.

Advice Request was implemented for Adult GI and Urology in response to the needs expressed from Primary Care.

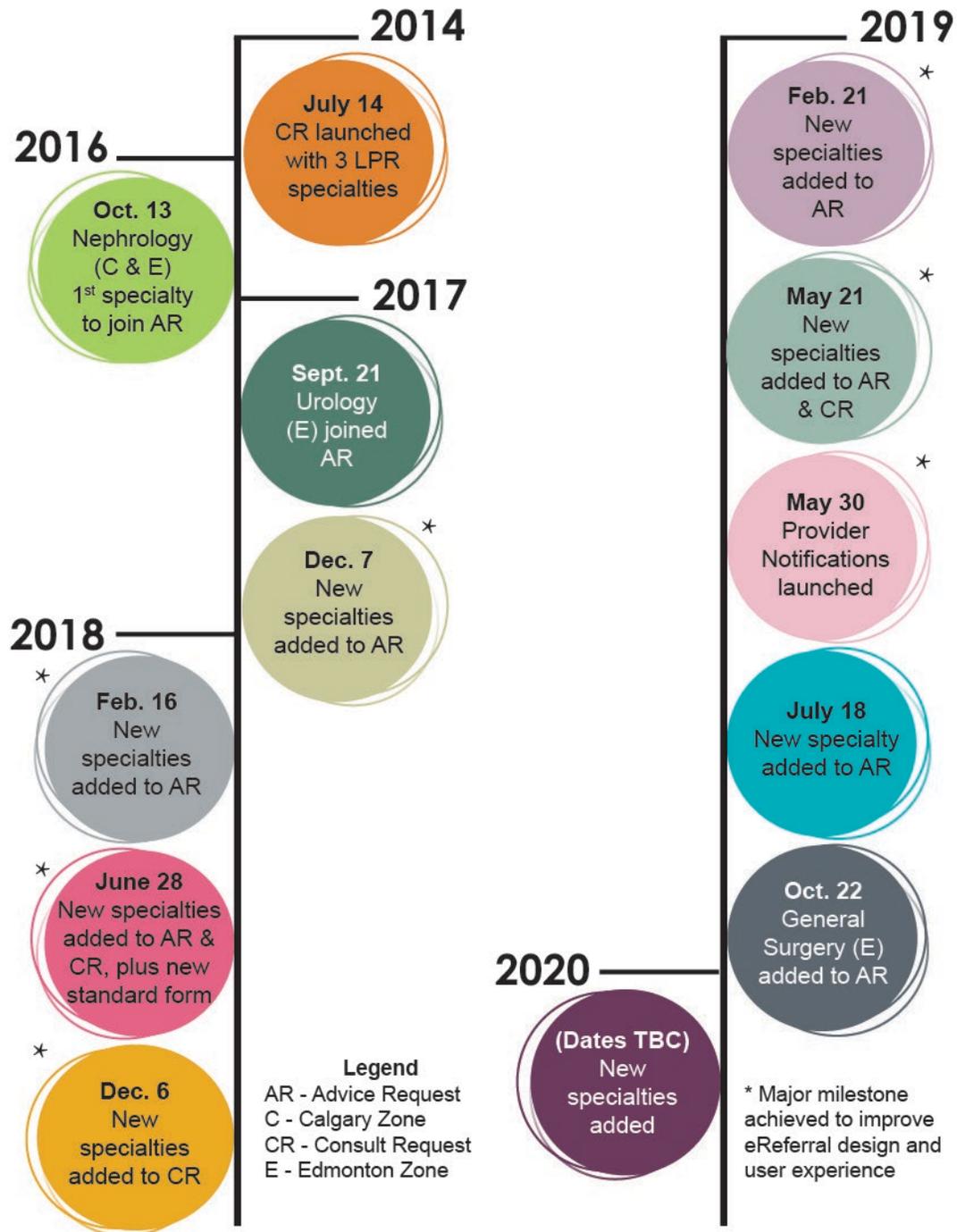
The Access Improvement team also recruited Orthopaedics and Child/Adolescent Psychiatry groups to promote Advice Request, and engaged with stakeholders of existing telephone advice services such as Alberta Mental Health Helpline (Provincial), Specialist LINK (Calgary Zone) and Connect MD (Edmonton Zone).

Between 2016 and 2019, the Access Improvement team increased the number of specialties from three (3) to 26 groups, and recruited more specialists from other zones to participate in Advice Request and/or Consult Request. The eReferral platform now provides a secure electronic messaging for 23 specialties that offer Advice Request and 12 specialized services/programs that obtain high quality referrals via Consult Request. The latest eReferral release on Oct. 22, 2019, has now enabled General Surgery in the Edmonton Zone to provide Advice Request as well.

Figure 1 summarizes the eReferral implementation timeline from 2014-2020. A detailed eReferral implementation timeline with launch dates for each specialty is available in Appendix 1.

^e Currently, only one reason for referral (i.e. fecal immunochemical test (FIT) positive finding) is available for eReferral Consult Request to the Adult GI group in the Edmonton Zone.

Figure 1: eReferral Implementation Timeline (2014 – 2020)



Evaluation Strategies & Methods

To improve the delivery of eReferral services, comprehensive evaluation methods are essential to assess the strengths and areas for improvement to support informed decision making. In Nov. 2018, an eReferral Evaluation Advisory Group (Advisory Group) was established to guide the development and implementation of the eReferral evaluation. The Advisory Group includes primary care physicians, specialists, consultants from the AMA and policy analysts from AH to reflect system-wide perspectives on eReferral improvement.

Guiding Principles

The following principles guide all stages of the evaluation work from the discussion of objectives and quality indicators, through to design, implementation and reporting [12].

- 1. Systematic Inquiry:** The Advisory Group provides guidance on the core evaluation questions and methodologies. It ensures the evaluation design is useful for answering questions related to effectiveness and efficiency of eReferral from both providers' and the healthcare system administration's perspectives.
- 2. Competence:** Evaluation is conducted by experienced researchers in collaboration with the eReferral implementation team. This approach ensures that evaluation strategies work in the cultural context of the target audience (i.e. current and potential eReferral users). Tools and training are provided to team members involved in recruitment and/or data collection to ensure they complete the evaluation activities consistently and properly.
- 3. Integrity:** Ethical oversight reduces risks to participants and protects collected data. Evaluation methods were assessed using the Alberta Research Ethics Community Consensus Initiative (ARECCI) Guidelines for Quality Improvement and Evaluation Projects and the ARECCI Ethics Screening Tool. All activities are conducted with the highest ethical standards and all Access Improvement team members commit to communicating truthfully and openly with participants and relevant stakeholders.
- 4. Respect for People:** The evaluation methods, purposes, confidentiality, benefits and potential consequences are clearly explained, and written/verbal consent is obtained from participants prior to the start of a survey or an interview. All participants are advised that their participation is voluntary and will not impact their future opportunities to use eReferral or receive support services.

- 5. Common Good and Equity:** The evaluation framework and implementation plan are developed in recognition of the need to balance interests and perspectives from diverse stakeholders. The goal is to provide high-quality information that can be used by AH and AHS' senior leadership to make informed decisions on improving equitable access to healthcare services for all Albertans.

Evaluation Framework

A four-year evaluation framework was collaboratively developed by the Advisory Group and approved by the eReferral steering committee. The eReferral evaluation framework was developed to provide a holistic evaluation of the eReferral platform based on AHS' Organizational Goals (Quadruple Aim) for determining value of its projects:

- Patient and family experience
- Patient and population health outcomes
- Experience and safety of our people
- Financial health and value for money.

A mixed-method approach was designed to collect quantitative and qualitative data in a phased timeline between 2019 and 2022. Data collection methods include: surveys, semi-structured interviews, a time motion study, economic analysis, and data extraction from the eReferral platform and other ambulatory care databases.

Table 1: eReferral Evaluation Framework (2019-2022)

Goal 1: Improve Patient and Family Experience			
Input	Outcome	Indicator	Method & Frequency
<ul style="list-style-type: none"> • Advice Request (AR) • Patient Notification (Launch date: To be confirmed) 	<ul style="list-style-type: none"> • Patients are receptive to AR approach • Patients are aware of their referral status and next steps 	<ul style="list-style-type: none"> • % of patients who know their providers used AR to support their care • % of patients who are aware of questions asked by their family doctor and specialist's responses • % of patients who were notified about their referral status • % of patients who received clear directions on next steps • Patients' narratives on the level of acceptance for AR and notifications 	<ul style="list-style-type: none"> • Primary care physician AR survey (annually) • Patient referral survey (annually) • Patient interviews (once every two years)

Goal 2: Improve Patient and Population Health Outcomes			
Input	Outcome	Indicator	Method & Frequency
<ul style="list-style-type: none"> • Advice Request (AR) 	<ul style="list-style-type: none"> • Reduced wait times for getting non-urgent advice • Appropriate use of AR for patient's non-urgent conditions • Reduced number of unnecessary visits to the emergency department 	<ul style="list-style-type: none"> • % of avoided unnecessary referrals • Number of days/weeks waiting for non-urgent in-person consultation • % and number of ARs that were submitted for urgent conditions (Zero is the target) • % and number of visits to emergency department amongst patient panel of primary care physicians who used AR vs. patient panel of primary care physicians who do not 	<ul style="list-style-type: none"> • eReferral dashboard (quarterly) • Self-reported wait time by specialty (quarterly) • Primary care panel data from AH (single extract) • Emergency visit data from AHS Analytics (single extract)
Goal 3: Improve the Experience and Safety of Our People			
Input	Outcome	Indicator	Method & Frequency
<ul style="list-style-type: none"> • Advice Request (AR) • Consult Request (CR) 	<ul style="list-style-type: none"> • Providers have better experience in the referral and consultation processes • AR improves collaboration between primary and specialty care • AR increases physicians' competence to provide care in the community 	<ul style="list-style-type: none"> • Users' narratives on the value of using AR and/or CR and support received • % of users who had a positive experience and would recommend eReferral (AR and/or CR) to others • % of primary care physicians who are aware of AR • % of primary care satisfaction with AR to support care in the community • % of physicians who reported having more confidence and knowledge in managing patient's conditions after using AR • % of specialists' satisfaction with AR to provide recommendations and support primary care • % of specialists who perceived having more time to see urgent patient cases after providing recommendations to non-urgent cases via AR 	<ul style="list-style-type: none"> • Semi-structured interviews (annually) • Clinic visit survey (annually) • User experience survey (annually) • Primary care physician AR survey (annually) • Specialist AR survey (quarterly and annually)

Goal 4: Improve Financial Health and Value for Money			
Input	Outcome	Indicator	Method & Frequency
<ul style="list-style-type: none"> • Advice Request (AR) • Consult Request (CR) 	<ul style="list-style-type: none"> • Reduced health system costs after using AR • Reduced patients' travelling time and costs • Reduced referral management time which causes unnecessary delays in patient care 	<ul style="list-style-type: none"> • Average cost of offering AR compared to standard of care (e.g. in-person consult without AR) • % and number of avoided unnecessary referrals by specialty • Rural patients' travel time and costs to attend in-person consultation with specialist • Amount of time reduced on referral management in primary care clinics and specialty clinics that adopted eReferral 	<ul style="list-style-type: none"> • eReferral dashboard (single extract) • Billing codes and facility fee (single extract) • Time motion study and qualitative analysis (2019 – 2020) • Economic evaluation (2020 – 2021)

Evaluation Implementation Plan

A phased-approach is used to conduct all evaluation activities listed in the evaluation framework. The purpose is to study the trend of eReferral usage and user experience over time to determine the benefits of implementing eReferral, areas for eReferral improvement, and recommendations for other initiatives that focus on improving timely patient access to specialized services. Table 2 summarizes the key evaluation activities that will occur in the three phases and indicates the progress made in Phase One (2019).

Table 2: eReferral Evaluation Implementation Plan (2019-2022)

Status:  Completed |  On Track

Evaluation Activities	Phase One: 2019	Phase Two: 2020 - 2021	Phase Three: 2021 - 2022
eReferral data monitoring and dashboard enhancements with new data elements			
Quarterly wait time collection and feedback from specialties	 Data collection	 Analysis	
Association between emergency visit pattern and Advice Request usage	 Proposal	 Analysis	
Semi-structured interviews: Frequent users			
Semi-structured interviews: New and potential users			
Time motion study and qualitative analysis	 Referring clinics	 Receiving clinics	
Primary care physician Advice Request survey			

Evaluation Activities	Phase One: 2019	Phase Two: 2020 - 2021	Phase Three: 2021 - 2022
Specialist Advice Request survey	◆	★	★
eReferral user experience survey: Physicians and clinic staff	◆	★	★
Patient survey	★ (Nov. – Dec.)	★	★
Patient semi-structured interviews		★	
Economic evaluation <ul style="list-style-type: none"> Phase 1: Advice Request implementation cost Phase 2: Cost analysis of Advice Request and the standard of care Phase 3: Cost analysis of Advice Request and patient savings 	★ Phase 1	★ Phases 2 and 3	

This report focuses on Phase One of the evaluation and subsequent recommendations. The following sections provide further details of the completed activities: eReferral platform usage, Advice Request surveys for primary care physicians and specialists, eReferral survey for all users who submitted at least one request or registered to receive requests, and semi-structured interviews with frequent users.

eReferral Platform Usage

Overview

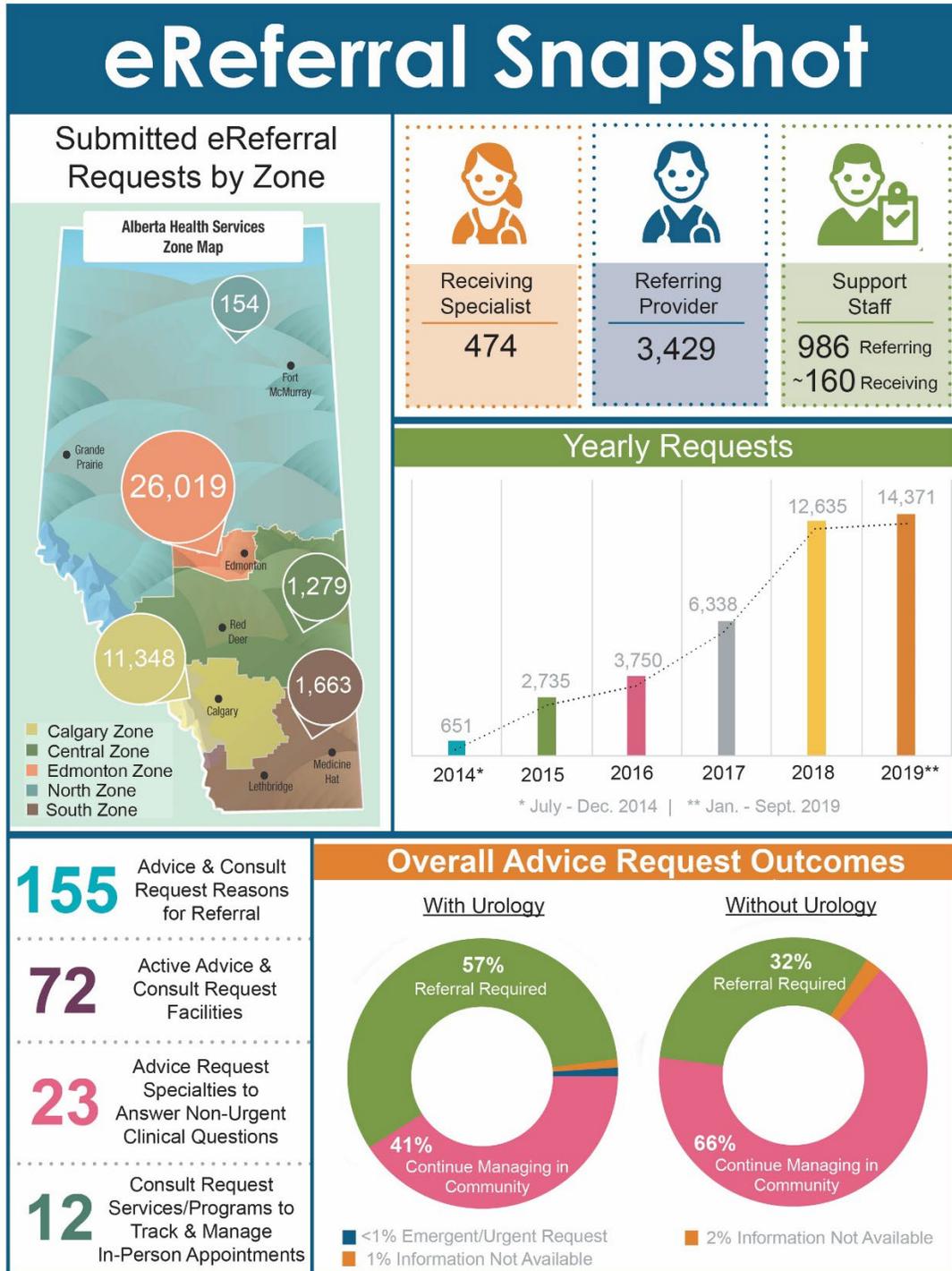
Currently, there are more than 470 specialists and 160 specialty clinic staff enabled with eReferral to answer Advice Requests and/or manage Consult Requests. In total, there are 155 reasons for referral available for referring providers to select the types of advice needed from a specialist or to clearly indicate the reason for referring a patient to see a specialist in-person.

Between July 2014 and Sept. 2019, 40,480 requests were submitted by 3,429 referring providers either on their own or by support staff on their behalf^f. Of 3,429 referring providers, 463 providers submitted more than 20 requests and there were three top referring providers submitted 1333, 882 and 777 requests respectively.

A yearly trend of eReferral requests, outcomes of Advice Requests and the number of referring providers, specialists, support staff, available facilities and services are summarized in Figure 2.

^f In the period from Dec. 2018 to Sept. 2019, the Calgary Zone Pulmonary Central Access Triage (PCAT) staff inputted 3,557 faxed referrals into eReferral on behalf of 1,480 referring providers.

Figure 2: Overview of eReferral Services and Usage



I. Views of eReferral Platform

In every quarter between Dec. 2018 and Sept. 2019, there was a steady increase in the number of times that the eReferral platform was visited by healthcare professionals and administrators in the previous month. In Sept. 2019, the majority of users were administrators (48%), nurses (28%) and physicians (20%).

Figure 3: Number of Views by Month

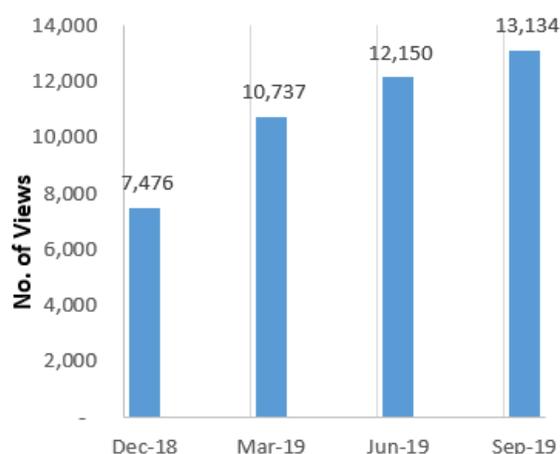
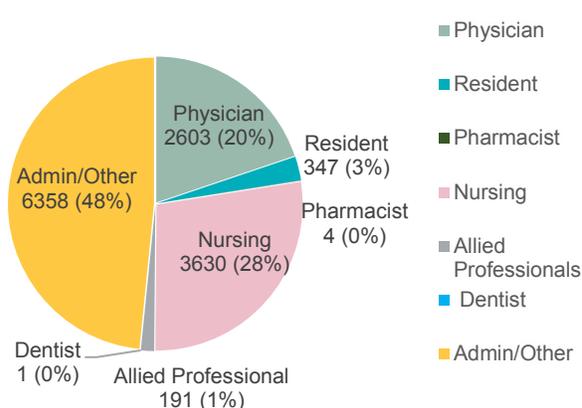


Figure 4: Views of eReferral by Roles in Sept. 2019



II. Total Number of Advice Requests and Consult Requests

As of Sept. 30, 2019, a total of 40,480 requests were submitted since July 2014. There were 25,808 Consult Requests (64%) submitted to 12 specialized services/programs and 14,672 Advice Requests (36%) submitted to 26 specialties⁹.

Figure 5 shows the number of Advice Requests sent to all specialties (excluding the Edmonton Zone Urology group) versus the number of Advice Requests sent to the Dianne & Irving Kipnes Urology Centre (formerly known as the Northern Alberta Urology Centre) only. The orange line displays a steady increase of Advice Requests from Oct. 2017 to Sept. 2019. The grey line illustrates the number of requests to Urology that substantially increased from 12 in Sept. 2017 to 1,153 in Nov. 2017 when it implemented Advice Request (on Sept. 21, 2017) and informed all referring providers to send their requests via eReferral. Because there was a large backlog of community referrals, primary care clinics in the Edmonton Zone submitted a large number of requests to Urology ranging from non-urgent clinical questions to requests for in-person

⁹ The Access Improvement team implemented Advice Request for 26 specialties in total. In the first quarter of the 2019-20 fiscal year, Advice Request was disabled for three specialties (Oncology – Breast Cancer; Oncology – Lung Cancer; Paediatric Urology) due to operational reasons. Currently, 23 specialties are assessable via Advice Request.

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consultations. After the initial surge due to the backlog of referrals, the number of requests dropped down to 620 - 720 per month between Dec. 2017 and June 2018 while Urology and the Access Improvement team worked closely to communicate about the appropriate use of Advice Request for non-urgent clinical questions only. After the implementation of Consult Request for Urology (on June 28, 2018), the number of Advice Requests to Urology slowly decreased (from 597 requests in July 2018 to 293 requests in Sept. 2019) with the increase of Consult Requests submitted every month.

Figure 5: Number of Advice Requests by Month (Oct. 2016 – Sept. 2019)

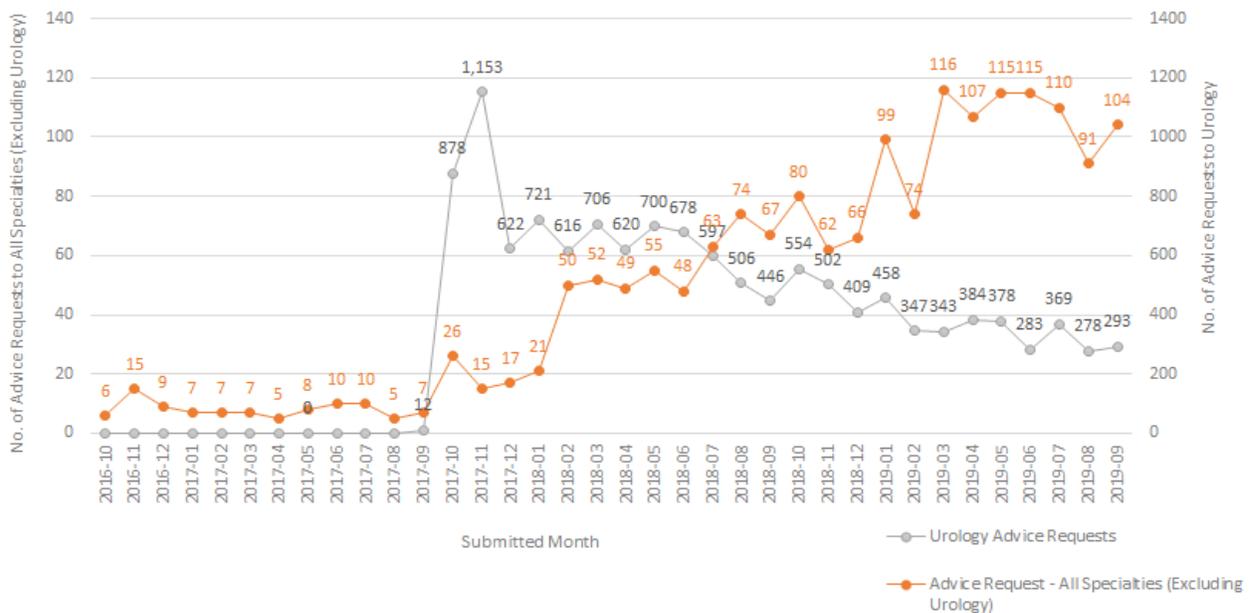


Figure 6: Number of Consult Requests by Month (July 2014 – Sept. 2019)

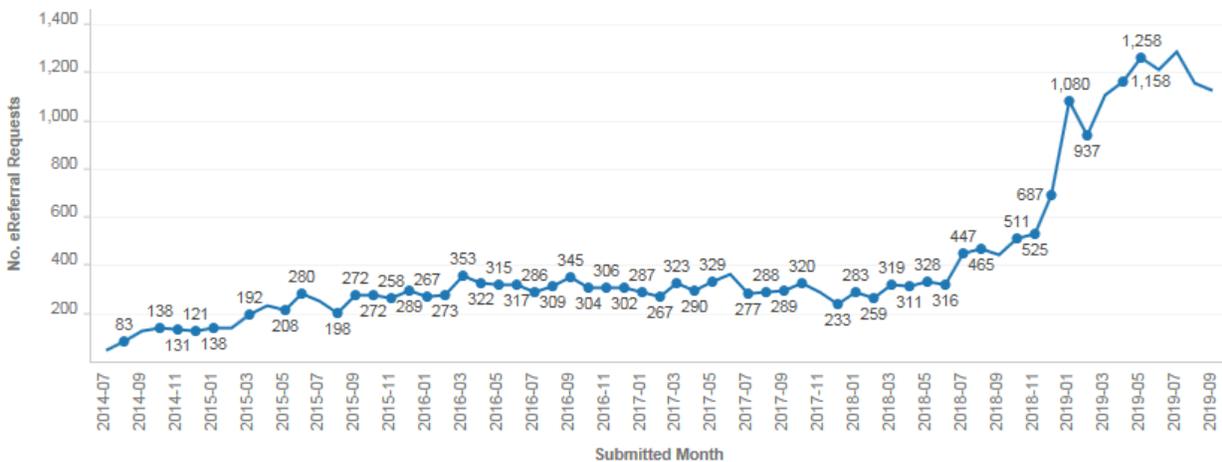
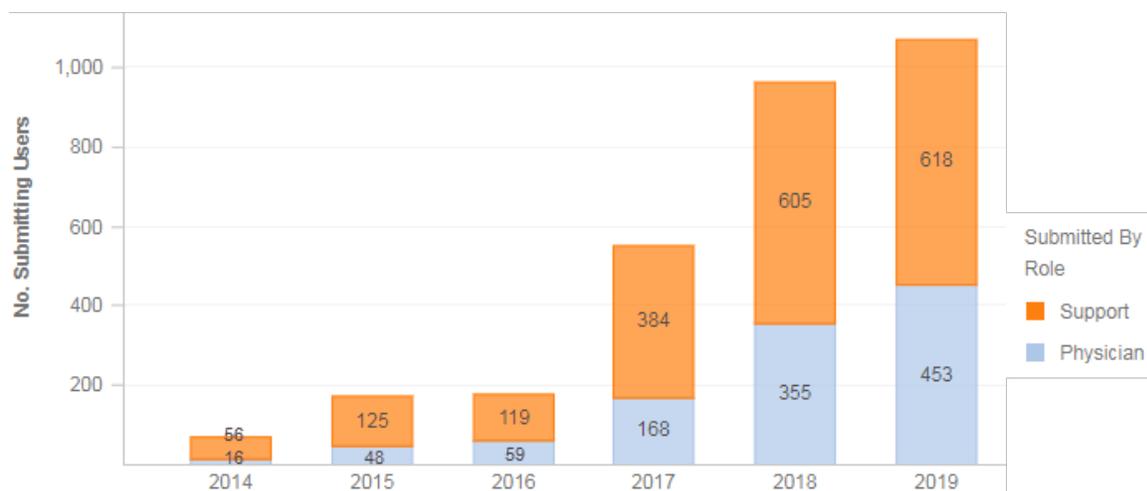


Figure 6 shows the number of Consult Requests increased from 447 in July 2018 to 1,080 in Jan. 2019. In addition to Urology, four other specialized services/programs started receiving Consult Requests in the second half of 2018, including: Single Hub Access Referral Program for Adult GI (SHARPGI) (Edmonton Zone), Breast Health Program (Calgary Zone), Alberta Kidney Care North (formerly known as Northern Alberta Renal Program) (Central, Edmonton & North Zones) and Pulmonary Medicine (Calgary Zone). The surge was also due to the new clinic workflow of the Pulmonary Central Access Triage (PCAT) in the Calgary Zone. In Dec. 2018, PCAT staff started entering all faxed referrals into eReferral and encouraging referring providers to track referral statuses on eReferral to promote closed-loop communication.

III. Total Number of Submitting Users and Referring Providers

eReferral is designed to provide a secure communication and shared referral management platform between physicians, surgeons, clinicians, medical office assistants, unit clerks and other clinic staff. Clinical support staff such as referral coordinators and clerks, can submit requests on behalf of physicians. From July 2014 to Sept. 2019, a total of 1,649 users submitted eReferral requests with 60% of the users being support staff.

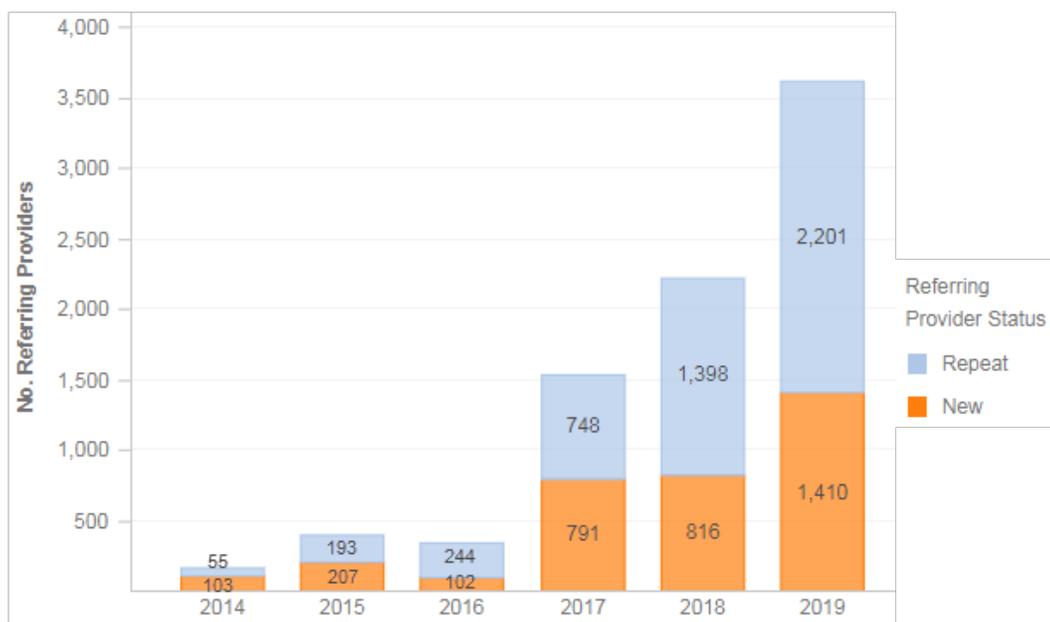
Figure 7: Number of Submitting Users by Year (July 2014 – Sept. 2019)



Referring providers are responsible for authorizing the initiation of Advice Request or Consult Request; however, they can delegate tasks such as submitting and tracking the request to their support staff, which is similar to other traditional methods. Since July 2014, a total of 2,225 referring providers have either submitted requests on their own or

asked their support staff to submit them on their behalf. Between Dec. 2018 and Sept. 2019, Calgary Zone PCAT staff inputted 3,557 requests received by fax into eReferral on behalf of 1,480 referring providers, and notified the referring providers by fax about the ability to track referral status on eReferral. In the past five years, the total number of referring providers increased every year with a rising trend of repeat users (i.e. referring providers who submitted more than one request).

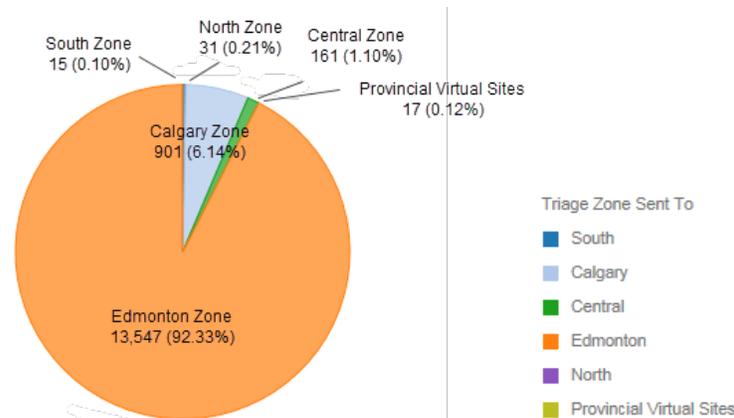
Figure 8: Number of New & Repeat Referring Providers by Year (July 2014 – Sept. 2019)



IV. Advice Requests & Consult Requests by AHS Zone

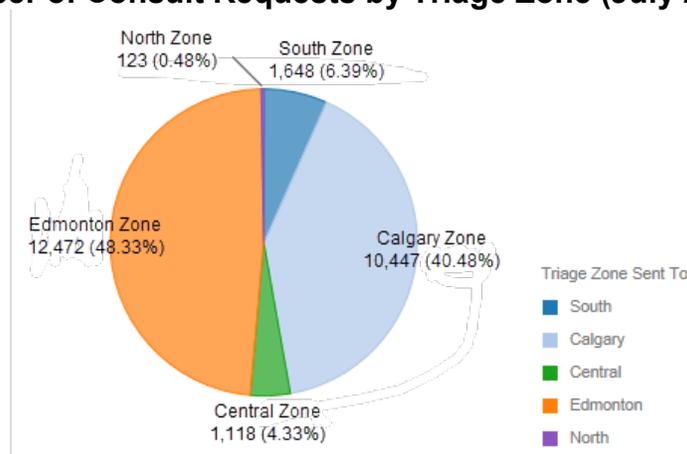
In the past five years, Edmonton Zone has received the highest number of requests (92% of Advice Requests and 49% of Consult Requests). As aforementioned, Urology in the Edmonton Zone informed all primary care clinics to send their requests via eReferral; thus, it significantly changed their referral practice from sending referrals via fax to submitting them through eReferral.

Figure 9: Number of Advice Requests by Triage Zone (July 2014 – Sept. 2019)



Note: Provincial virtual sites were set up for specialties that receive Advice Requests virtually from across the province without a physical facility.

Figure 10: Number of Consult Requests by Triage Zone (July 2014 – Sept. 2019)

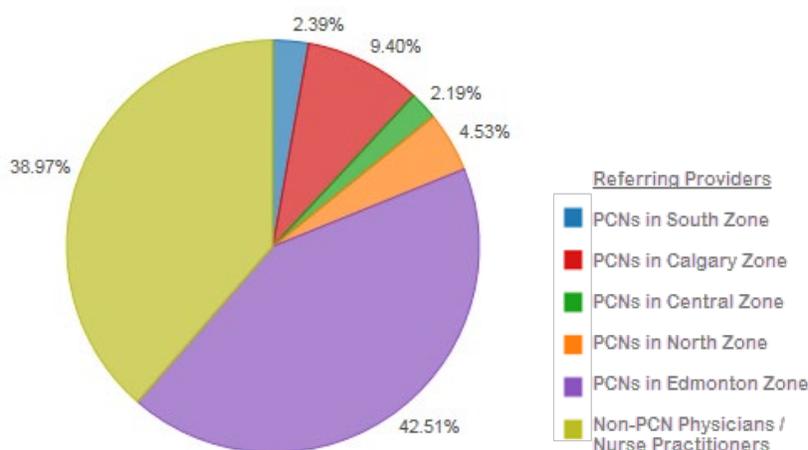


V. PCN Physicians Using eReferral

eReferral has been actively promoted to 41 PCNs across the province. Physicians and support staff from 40 PCNs have used eReferral and submitted 24,704 requests (13,260 Advice Requests and 11,444 Consult Requests) with the exception of Rocky Mountain House PCN^h in the Central Zone. A total of 2,107 requests were submitted by Calgary Zone PCAT staff on behalf of PCN physicians. Figure 11 shows 61% of requests originated from PCN physicians while 39% were from non-PCN physicians and nurse practitioners. Amongst the non-PCN physicians, 69% are specialists while 31% are hospitalists and primary care physicians who do not register with a PCN.

^h The first request from Rocky Mountain House PCN was received in Oct. 2019.

Figure 11: Percentage of eReferral Requests (July 2014 – Sept. 2019) by PCN Physicians and Non-PCN Physicians (N = 40,480)



Based on the AH's PCN physician registration record in Sept. 2019, there are 4,011 physicians registered as physicians with one of the 41 PCNs. In total, 2,443 PCN physicians (61% of all PCN physicians) have used eReferral or support staff have submitted requests on their behalf, making up approximately 71% of all referring providers who submitted eReferral requests. The remaining 29% of referring providers are nurse practitioners and non-PCN physicians who are specialists, hospitalists or primary care physicians who do not register with a PCN.

Table 3: Number & Percentage of PCN Physicians Using eReferral by Zone (July 2014 – Sept. 2019)

AHS Zone	No. of PCN Physicians	No. of PCN Physicians Using eReferral ⁽ⁱ⁾		% of PCN Physicians Using eReferral	
		All	(Excluding requests submitted by PCAT) ⁽ⁱⁱ⁾	All	(Excluding PCAT)
Calgary Zone	1,808	958	(309)	53%	(17%)
Central Zone	403	172	(144)	43%	(36%)
Edmonton Zone	1,213	1,050	(1050)	87%	(87%)
North Zone	337	181	(178)	54%	(53%)
South Zone	250	82	(63)	33%	(25%)
TOTAL	4,011	2,443	(1,744)	61%	(43%)

(i) eReferral requests can be submitted by physicians, nurse practitioners or by clinical support staff on behalf of physicians.

(ii) Between Dec. 2018 and Sept. 2019, Calgary Zone PCAT staff inputted 3,557 faxed referrals into eReferral on behalf of 1,480 referring providers. If the number submitted by PCAT staff is excluded, the number and percentage of PCN physicians using eReferral is 1,744 and 43% respectively.

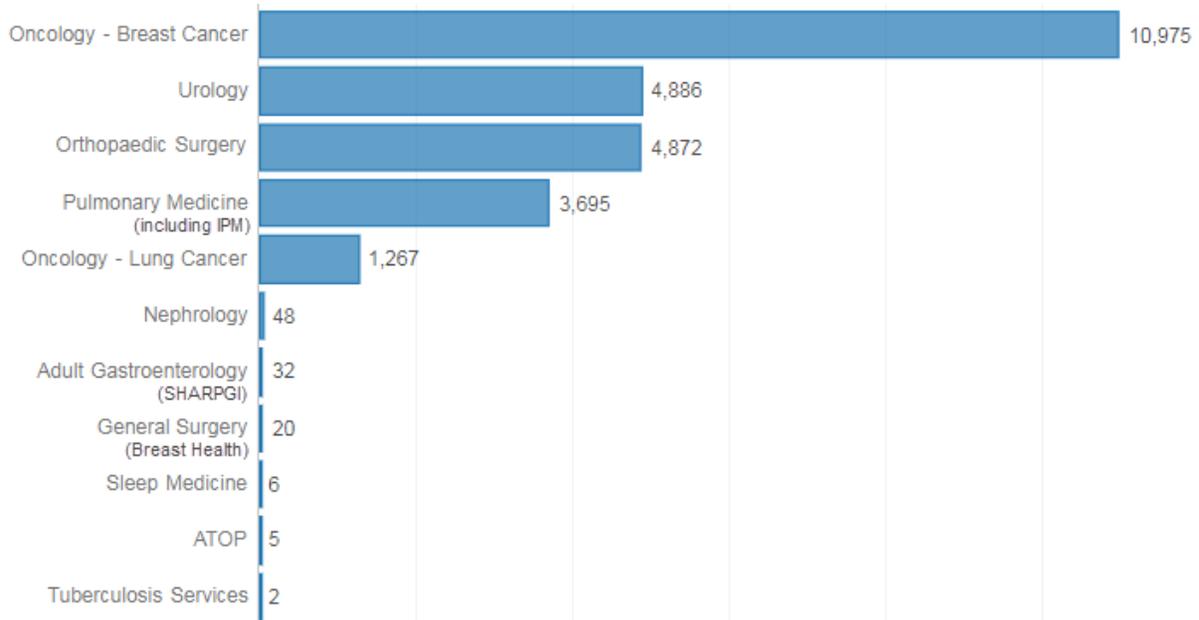
Consult Requests (July 2014 – Sept. 2019)

A total of 25,808 Consult Requests were submitted between July 2014 and Sept. 2019. The following 12 specialized services/programs have adopted eReferral for requests for in-person appointments with a specialist:

- Adult Gastroenterology – Single Hub Access Referral Program for GI (SHARPGI) – Edmonton Zone
- Alberta Thoracic Oncology Program (ATOP) – Calgary Zone
- General Surgery – Breast Health Program – Calgary Zone
- Nephrology – Alberta Kidney Care North – Central, Edmonton & North Zones
- Oncology – Breast Cancer – All Zones
- Oncology – Lung Cancer – All Zones
- Orthopedic Surgery (Hip and Knee Joint Replacement) – All Zones
(*Note: Central Zone was deactivated in May 2019*)
- Pulmonary Medicine – Calgary Zone
- Pulmonary Medicine – Interventional Pulmonary Medicine (IPM) – Calgary Zone
- Sleep Medicine – Calgary Zone
- Tuberculosis Services – Calgary Zone
- Urology – Edmonton Zone

Five out of 12 specialized services/programs received more than 1,000 requests. These high receiving groups include the original LPR specialties (Oncology – Breast Cancer, Oncology – Lung Cancer & Orthopaedic Surgery – Hip & Knee Joint Replacement), Urology and Pulmonary Medicine. The Oncology groups received high numbers of Consult Requests due to targeted recruitment and training for high referring surgeons and support staff to Alberta cancer centers. The orthopaedic surgery groups had their acuity assessment tool built into the eReferral referral form which helped referring providers and their support staff to assess the appropriateness and urgency of an in-person consultation. As aforementioned, the Edmonton Zone Urology group mandated referring providers to submit their requests via eReferral and Calgary Zone PCAT required their triage staff to input all faxed referrals into eReferral; hence, they also had a high number of requests in the first year of implementation. In contrast, the other specialized services/programs did not mandate a single submission method or single referral tracking system, and the number of requests remained low despite sending regular and consistent communication materials to referring providers.

Figure 12: Total Number of Consult Requests by Specialized Services/Programs (July 2014 – Sept. 2019)

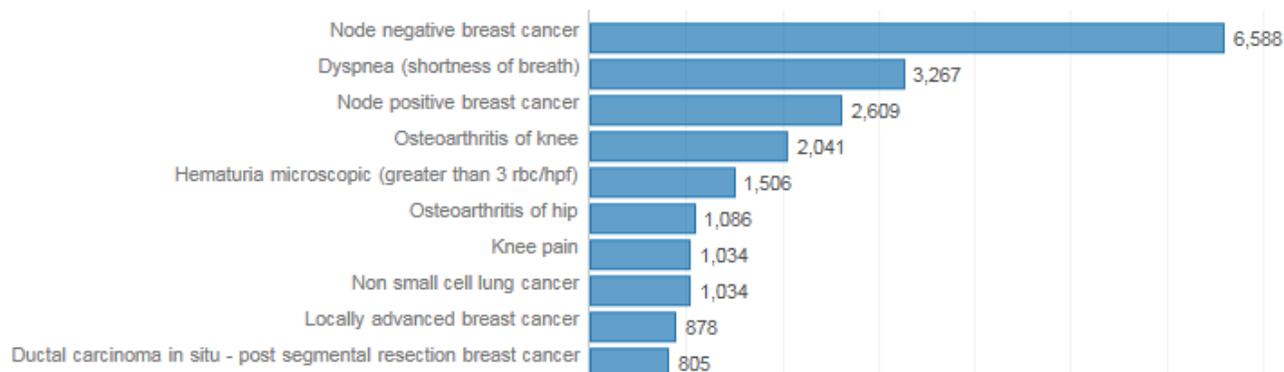


I. Reason for Referral

The most common eReferral reason for referral is node negative breast cancer (over 6,500 Consult Requests have been submitted since July 2014). In early 2019, the Central Alberta Cancer Centre and Clinical Breast Health Program won the AHS SPIRIT Award due to their commitment to using an automated referral management system (i.e. eReferral) to manage and track breast oncology referrals.

The second most common reason for referral is dyspnea (shortness of breath) which has been used as a default reason for referral for faxed referrals sent to Pulmonary Medicine in the Calgary Zone when there was no clear reason for referral indicated on the faxed referral. The Access Improvement team has been working closely with Pulmonary Medicine and other specialized services/programs to promote eReferral and ask primary care physicians to submit their referral via eReferral instead of via traditional methods (e.g. fax, mail, etc.).

Figure 13: Total Number of Consult Requests by Top 10 Reasons for Referral (July 2014 – Sept. 2019)

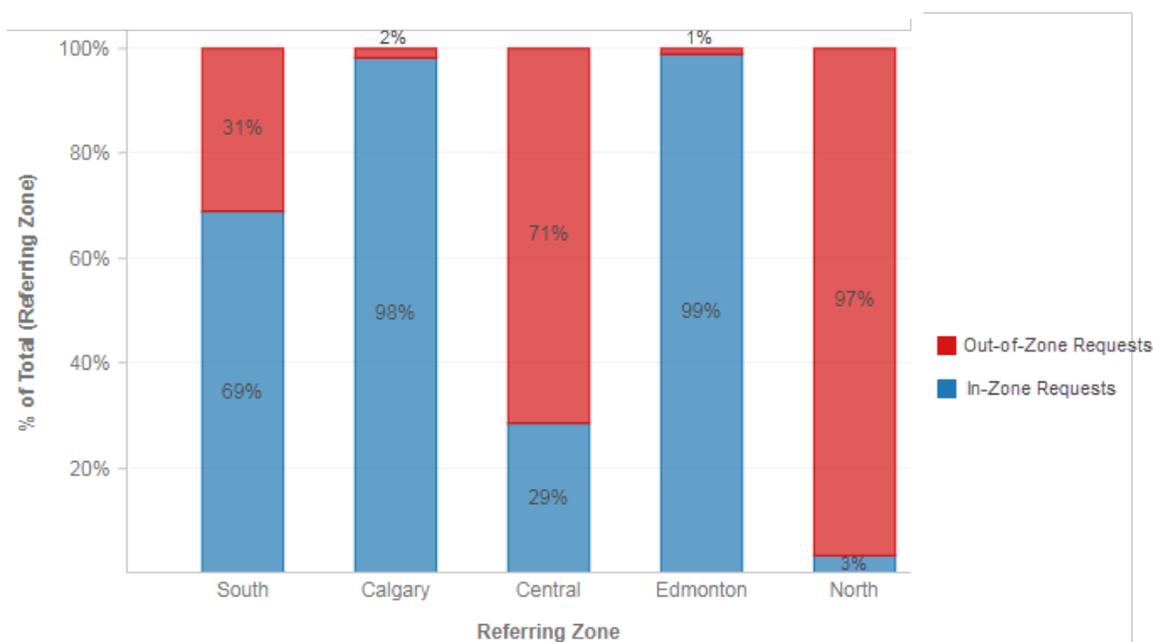


II. In-Zone and Out-of-Zone Requests

eReferral allows referring providers to see approximate wait times of specialized services and specialist appointments. This promotes options for patients to select the service or provider based on their preferred provider, location or available time. As patients need to travel and physically attend the appointment, it is important to study the pattern of in-zone referrals (i.e. referring zone is the same as the triage zone) and out-of-zone referrals (i.e. referring zone differs from the triage zone).

As shown in Figure 14, 97% of requests for patients living in the North Zone were out-of-zone referrals while only 1-2% of requests for patients living in Calgary and Edmonton Zones were out-of-zone referrals. This indicates that a disproportionate number of patients living in the North Zone had to travel to another zone for an appointment with a specialist. In the Central Zone, 71% of requests were out-of-zone referrals and patients travelled to either the Edmonton or Calgary Zone depending on the distance from their place of residence.

Figure 14: Percentage of In-Zone & Out-of-Zone Consult Requests by Referring Zone (July 2014 – Sept. 2019)



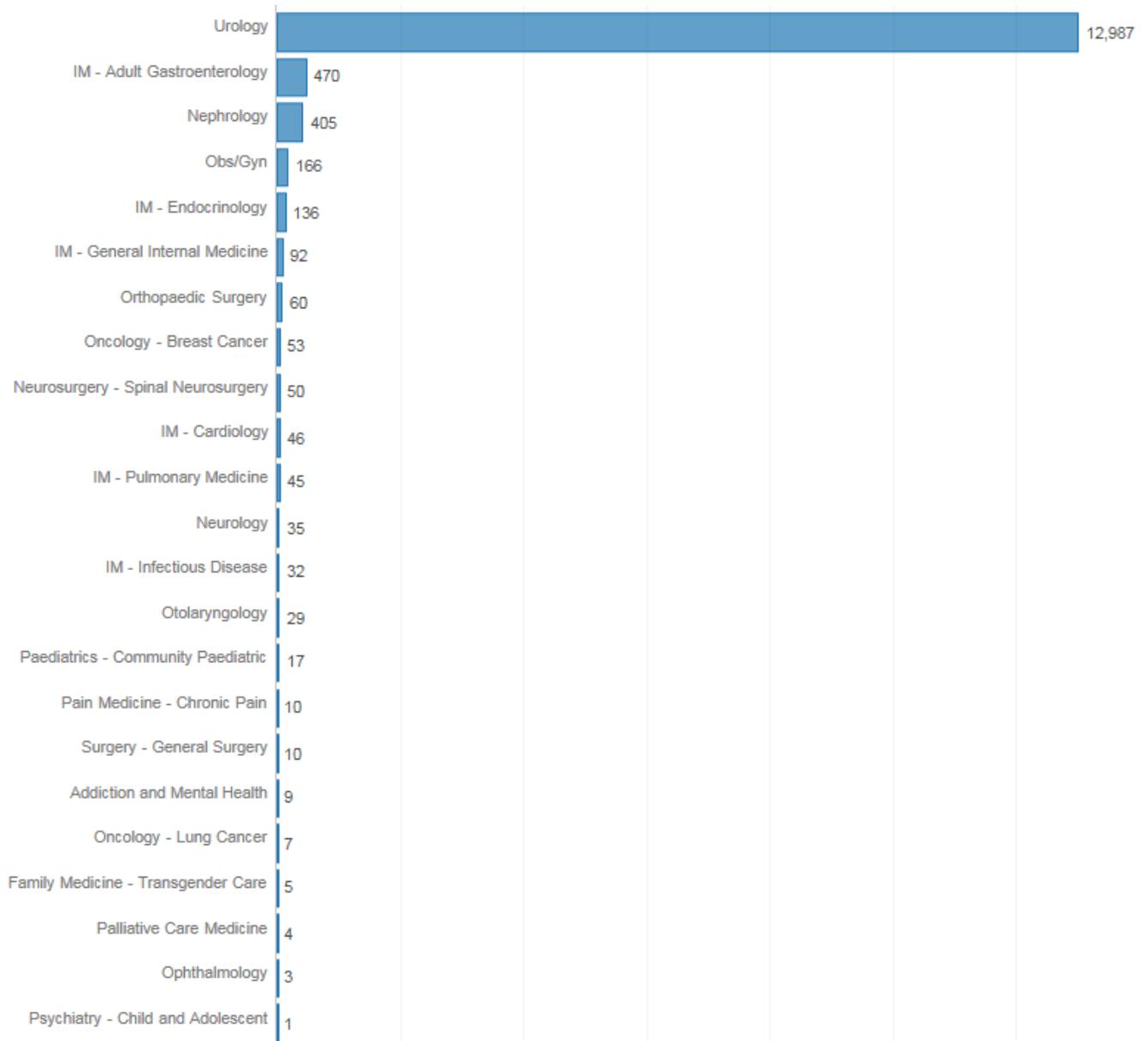
Advice Requests (Oct. 2016 – Sept. 2019)

Learning from the Champlain BASE™ (Building Access to Specialists through eConsultation) eConsult service in Ontario [13], the Access Improvement team started promoting eReferral Advice Request as a secure online platform that connects primary care providers and specialists to improve access to specialty care and offer more coordinated careⁱ. As a pilot study, Nephrology (Edmonton and Calgary Zones) enabled Advice Request and promoted this service along with primary care workshops for Chronic Kidney Disease (CKD) management. Currently, there are 23 specialties offering Advice Request services that support primary care providers to manage 43 issues (i.e. reasons for referral on eReferral). A complete list of specialties and reasons for referral is available in Appendix 2.

In the last three years, a total of 14,625 requests were submitted to 23 specialties. Of these 23, five specialties: (i) Urology, (ii) Internal Medicine – Adult Gastroenterology, (iii) Nephrology, (iv) Obstetrics and Gynecology, and (v) Internal Medicine – Endocrinology, received the highest number of requests.

ⁱ eReferral Advice Request functionality was built as part of the business requirements in the LPR phase (2014-2016); however, it was not the focus in the LPR promotion.

Figure 15: Number of Advice Requests by Specialty (Oct. 2016 – Sept. 2019)



I. Outcomes of Advice Requests

Receiving providers indicated the event outcome after reviewing and responding to each Advice Request. The outcomes were grouped into four main categories:

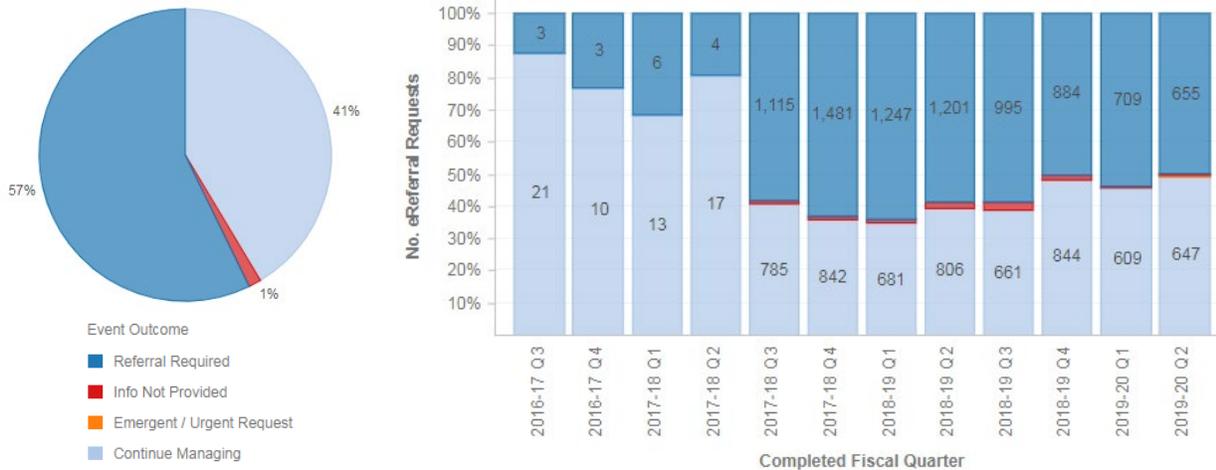
- Referral Required: The specialist recommended sending the patient to see a specialist (i.e. an in-person consultation)
- Info Not Provided: The specialist did not have enough information from the referring provider to provide advice
- Emergent / Urgent Request: The specialist believed the patient's condition was emergent or urgent. The specialist contacted the referring provider by phone immediately and closed the request for non-urgent advice
- Continue Managing: The specialist believed the patient's condition did not require an in-person consultation with a specialist and provided recommendations for the referring provider to provide appropriate care in the community

As of Sept. 30, 2019, there were 14,456 completed Advice Requests and 41% of those requests could continue to be managed by the referring providers in the community. This prevents unnecessary referrals and avoids needless wait times for patients to see a specialist. It also allows the referring provider to utilize the specialist's advice for appropriate care in the patient's medical home.

Figure 16 shows the overall percentage of event outcomes and the quarterly trend. From Oct. 2016 to Sept. 2017, a majority of the requests (68 - 87%) did not need a referral (i.e. continuing managing). In Fall 2017, there was a large influx of Advice Requests (from 19 requests in Sept. 2017 to 1,168 in Nov. 2017) and the percentage of "continue managing" dropped to 41%. This sudden change was due to the launch of Advice Request to Urology in the Edmonton Zone in late Sept. 2017 and the request from the urology clinics that all referring providers sent their requests via eReferral. As a result, primary care clinics in the Edmonton Zone submitted a large number of referral requests for in-person consultations using Advice Request. The percentage of "continue managing" gradually increased when primary care clinics started to submit referral requests as Consult Requests (which was implemented in June 2018). In the last quarter (July to Sept. 2019), the percentage of "continue managing" was 49% across all specialties.

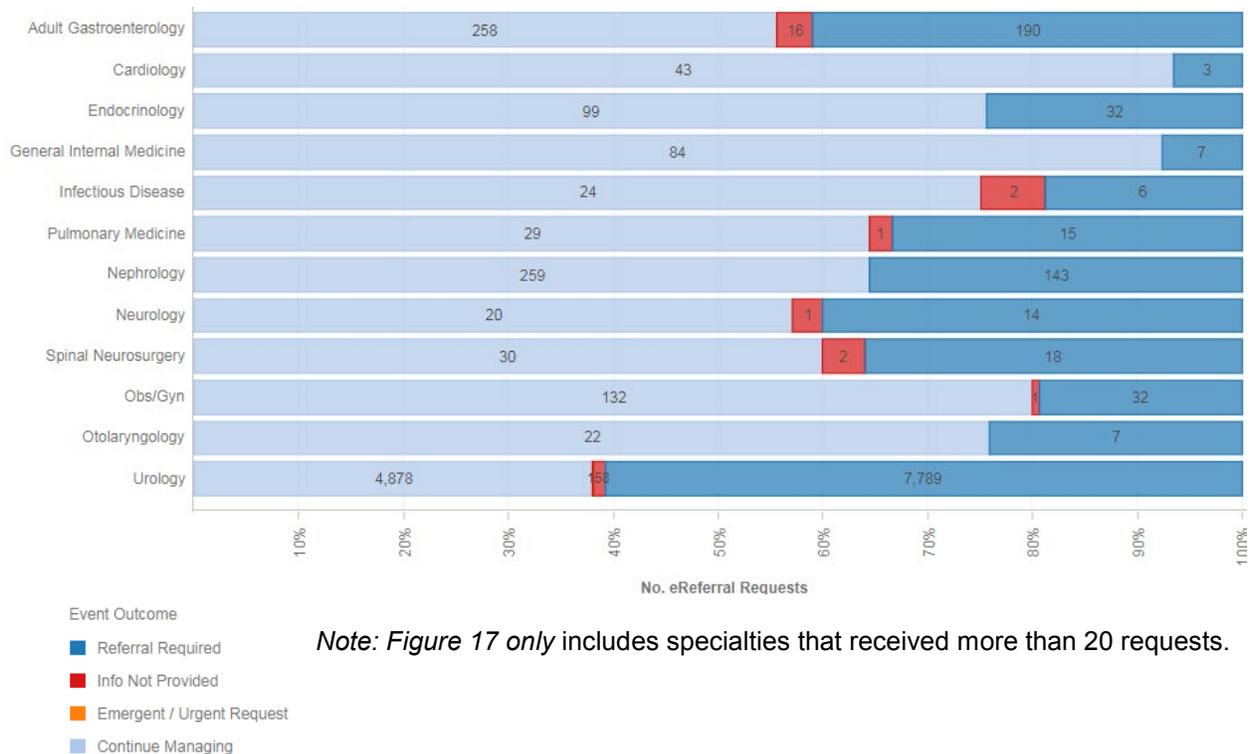
Figure 17 shows the percentage of "continue managing" varied by specialty, ranging from 38% for Urology to 93% for Cardiology. Further studies are required to understand what caused the event outcome variation across the specialties and what intervention could be implemented to support appropriate use of non-urgent advice or referral requests.

Figure 16: Percentage of Advice Requests by Event Outcome & Fiscal Quarter (Oct. 2016 – Sept. 2019)



Note: There were 7 emergent/urgent requests (0.04%) sent to Urology in the second quarter of the 2019-20 fiscal year; thus the orange line was almost invisible in Figure 16.

Figure 17: Number and Percentage of Advice Requests by Event Outcome & Specialty (Oct. 2016 – Sept. 2019)



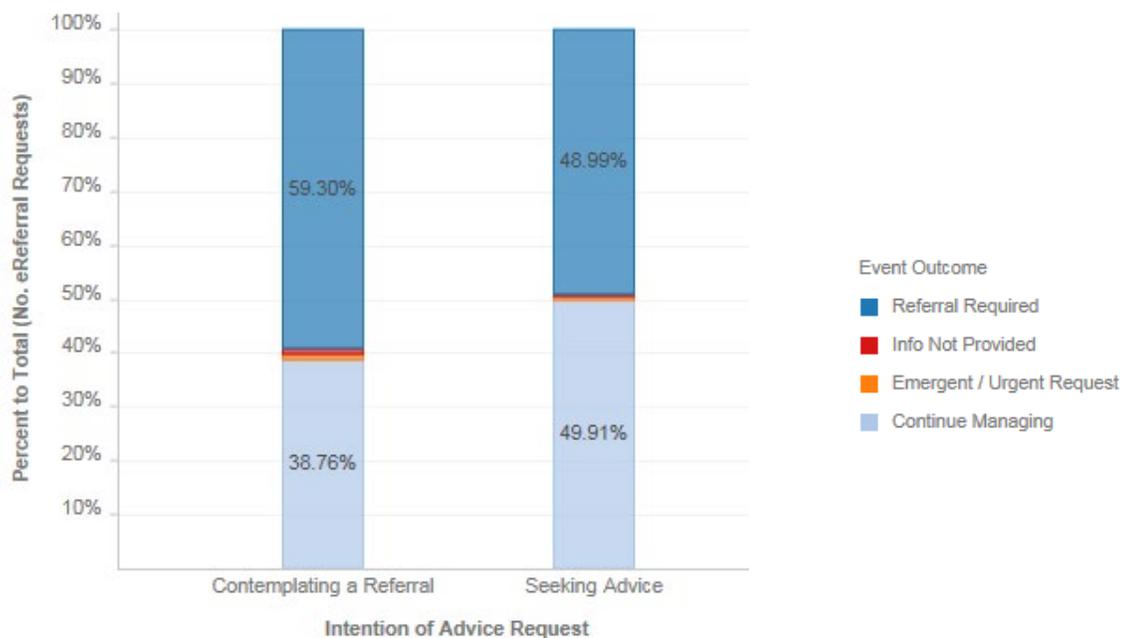
Note: Figure 17 only includes specialties that received more than 20 requests.

II. Intention of Advice Requests

A new question asking about the intention of submitting an Advice Request was added to the Advice Request standard form on July 18, 2019. This helps build momentum towards the national standardized reporting metric to accurately report the number of avoided referrals which can be derived based on two criteria: (i) a request that the referring provider was contemplating to send a referral but wanted to seek advice from a specialist first; (ii) the request outcome was “continue managing”.

From July 18 to Sept. 30, 2019, there were 803 completed Advice Requests, and the majority of them (68%) were submitted to seek advice only (i.e. the referring provider was not contemplating sending a referral for the patient to see a specialist). Figure 18 shows the proportion of outcomes between the requests with different intentions. For requests that referring providers were contemplating sending a referral, 39% did not require a referral and could continue to be managed by the referring provider. In contrast, 50% of requests did not require a referral when referring providers intended to seek advice only. These numbers show avoided referrals for in-person consultations and indicate knowledge gaps that need greater practice support to identify conditions that require a referral.

Figure 18: Percentage of Advice Requests by Event Outcome & Intention of Request (July 2019 – Sept. 2019)



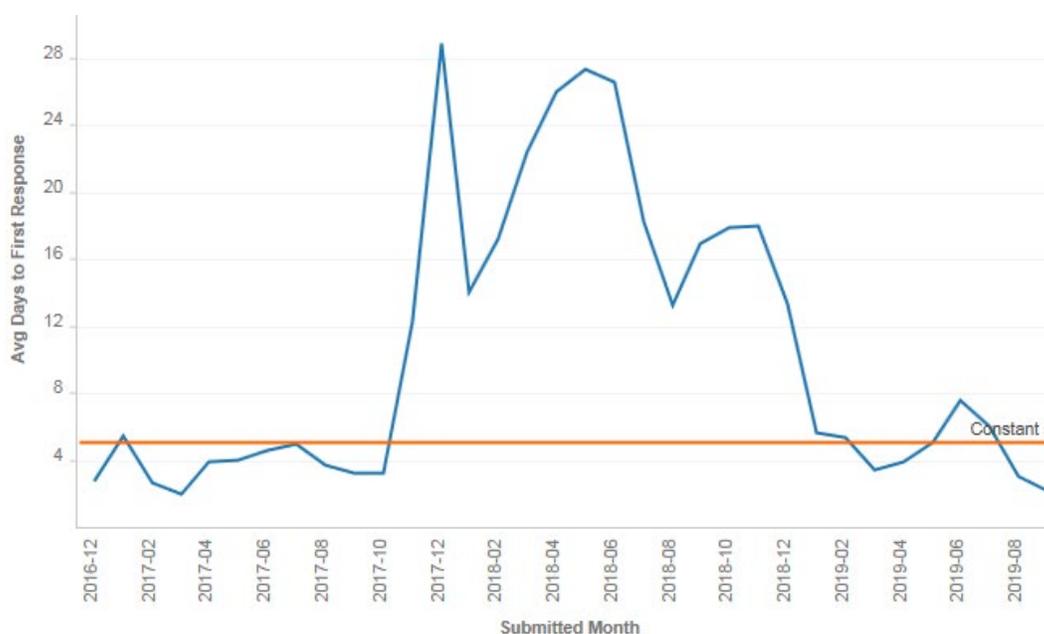
III. Response Time of Advice Requests

The target response time for Advice Request is five (5) calendar days^j. In the past three years (Oct. 2016 – Sept. 2019), 54% of requests met this target across all specialties and the average number of days to first response for all specialties was 14 days.

The low percentage of requests that met the five-day target was influenced by the large number of requests submitted to Edmonton Zone Urology in Fall 2017. Urology was not able to respond to thousands of requests within five calendar days when they first launched the Advice Request service. After improving communications with primary care providers and allocating more resources to answer Advice Requests, Urology has improved their response time drastically since Feb. 2019. In Sept. 2019, Urology received 300 Advice Requests; 98% met the five-day target and the average number of days to first response was two (2) days.

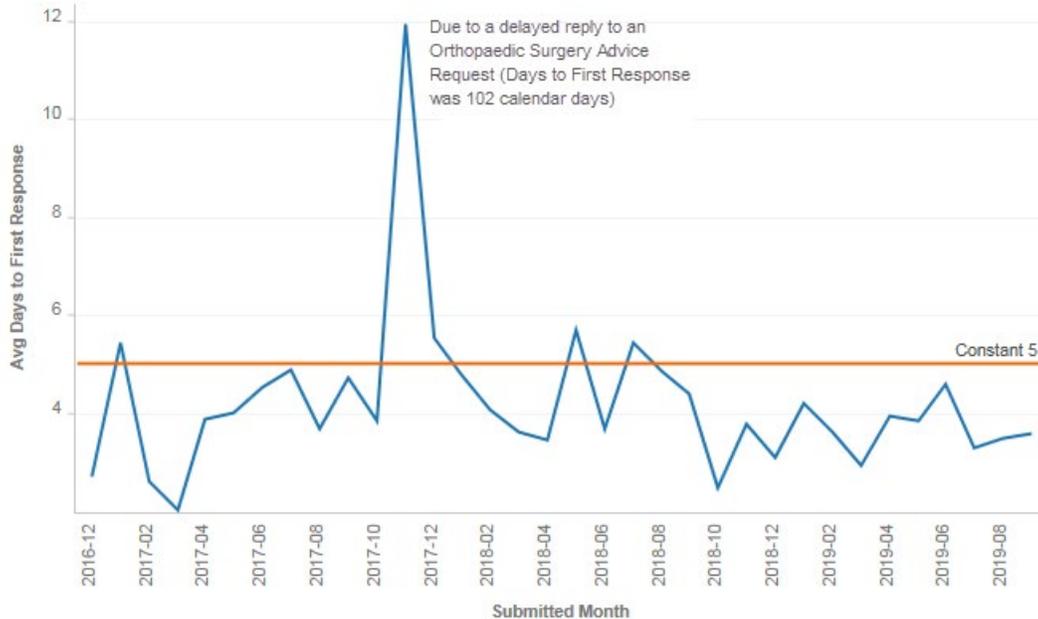
Out of the 23 specialties that received Advice Requests, 17 specialties met the five-day target. If Urology is excluded, the average number of days to first response is four (4) days, with 77% of requests meeting the five-day target.

Figure 19: Average Days to First Response by Month (All Specialties)



^j The target response time for eReferral Advice Request is five (5) calendar days in comparison with the one-week target of the Champlain BASE™ eConsult model.

Figure 20: Average Days to First Response by Month (Excluding Urology)



User Experience: Surveys & Interviews

According to the Phase One of the evaluation implementation plan, a mixed-method approach was used to collect quantitative and qualitative data to understand user experience and identify the strengths and weaknesses of current eReferral services. Three sets of online surveys and 23 semi-structured interviews were conducted between 2018 and 2019.

eReferral Surveys

Method:

In 2019, three online surveys were conducted to measure users' experience with Advice Request and Consult Request. These surveys were designed using the AHS-approved SelectSurvey.NET software and distributed by email and electronic newsletter. All responses were anonymous and confidentially-stored in the online survey with limited access to three researchers only. To ensure anonymity, there was no attempt to link survey respondents with any previous eReferral usage records. Table 4 summarizes the evaluation indicator, target audience, data collection period, survey design and number of completed responses of these surveys.

Table 4: Summary of Survey Methods

Survey Name	Evaluation Indicator	Target Audience	Data Collection Period	Survey Design	Number of Completed Responses
Advice Request survey for specialists	Degree of satisfaction with using Advice Request	All specialists who responded to Advice Request	Quarterly collection: 2018-19 Q4 & 2019-20 Q1	One choice question; 5-point Likert-type scale question	30
Advice Request survey for primary care physicians	Level of awareness & satisfaction of Advice Request	All primary care physicians in Alberta	Feb. 15, 2019 to Oct. 15, 2019	Three choice question; 5-point Likert-type scale question; open-ended question	67
eReferral user experience survey	Overall experience with eReferral's effectiveness, efficiency, flexibility & user-friendliness	All users who submitted at least one request or are registered to receive requests. Users included referring providers, clerks, referral coordinators, triage staff and receiving providers	Aug. 1, 2019 to Oct. 20, 2019	5-point Likert-type scale question; open-ended question	63

Results:

Question 1: What is the level of awareness of primary care physicians regarding the Advice Request service in Alberta? After using Advice Request, how confident do physicians feel in continuing to manage care for their patients?

Analysis:

Descriptive statistics were used to describe the percentage of participants who have heard about Advice Request and their level of confidence in managing care after using Advice Request. A chi-square test was conducted to examine if the level of awareness was associated with employment status (e.g. full-time or part-time position) or years of experience in primary care practice.

Findings:

From Feb. to Oct. 2019, there were 72 respondents to the Advice Request survey for primary care physicians and the completion rate was 93% (i.e. 67 primary care physicians completed the whole survey). The majority of respondents (51%) were from the Calgary Zone while the remaining respondents were from the Edmonton Zone (36%), Central Zone (9%), North Zone (3%) and South Zone (3%)^k. Their clinical experience varied from newly-practicing in primary care (0-5 years) to more than 25 years; however, the majority of them had practiced for 6-10 years (24%) or over 25 years (28%). More than half of the respondents (58%) worked full-time.

Table 5: Primary Care Physicians' Level of Awareness About Advice Request

Number of Response (N=67)		
	Yes	No
Heard about Advice Request?	61 (91.0%)	6 (9.0%)

Table 6: Primary Care Physicians' Experience with Advice Request

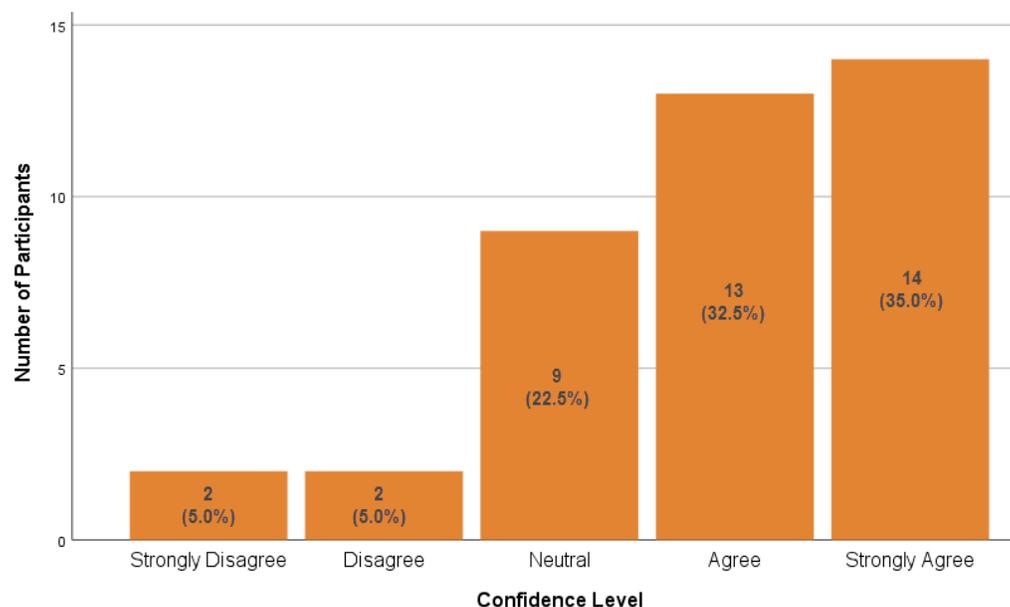
Number of Response (N=61)		
	Yes	No
Comfortable knowing when to use Advice Request versus Consult Request?	47 (77.0%)	14 (23.0%)
Used Advice Request?	40 (65.6%)	21 (34.4%)

As shown in Table 5, a total of 61 respondents (91%) had heard about Advice Request. Among these 61 respondents, Table 6 indicates 47 of them (77%) were comfortable knowing when to use Advice Request (i.e. seek specialist's advice on non-urgent clinical questions) instead of sending a Consult Request (i.e. referral for an in-person appointment with a specialist). There was no association between the level of awareness about Advice Request and the years of experience practicing in primary care or employment status.

Forty respondents (66%) had used Advice Request prior to completing this survey. After using Advice Request, a majority of respondents (68%) indicated that they had more confidence in managing their patient's condition in the community, or sending an appropriate referral request (Figure 21).

^k Some respondents practiced in more than one AHS Zone and thus the sum of percentage does not equal 100%.

Figure 21: Physicians' Confidence Level After Using Advice Request



Question 2: Does the degree of satisfaction with Advice Request differ between referring providers (primary care physicians) and receiving providers?

Analysis:

To compare the degree of satisfaction between referring providers (primary care physicians) and receiving providers (specialists), the collected responses from two surveys (Advice Request survey for specialists and Advice Request survey for primary care physicians) were extracted for data analysis. The chi-square test was used to determine if there was a significant difference between the specialists' degree of satisfaction with Advice Request and the primary care physicians' degree of satisfaction.

Findings:

Responses from 40 primary care physicians and 30 specialists who used Advice Request were included in the analysis. The respondents practiced in the North Zone (4%), Edmonton Zone (40%), Central Zone (4%) and Calgary Zone (57%)¹. No response was received from physicians practicing in the South Zone. A majority of the respondents (60%) were "satisfied" or "very satisfied" with the Advice Request service.

¹ Some respondents practiced in more than one Zone and thus the sum of percentage does not equal 100%.

Figure 22: Degree of Satisfaction with Advice Request by Role

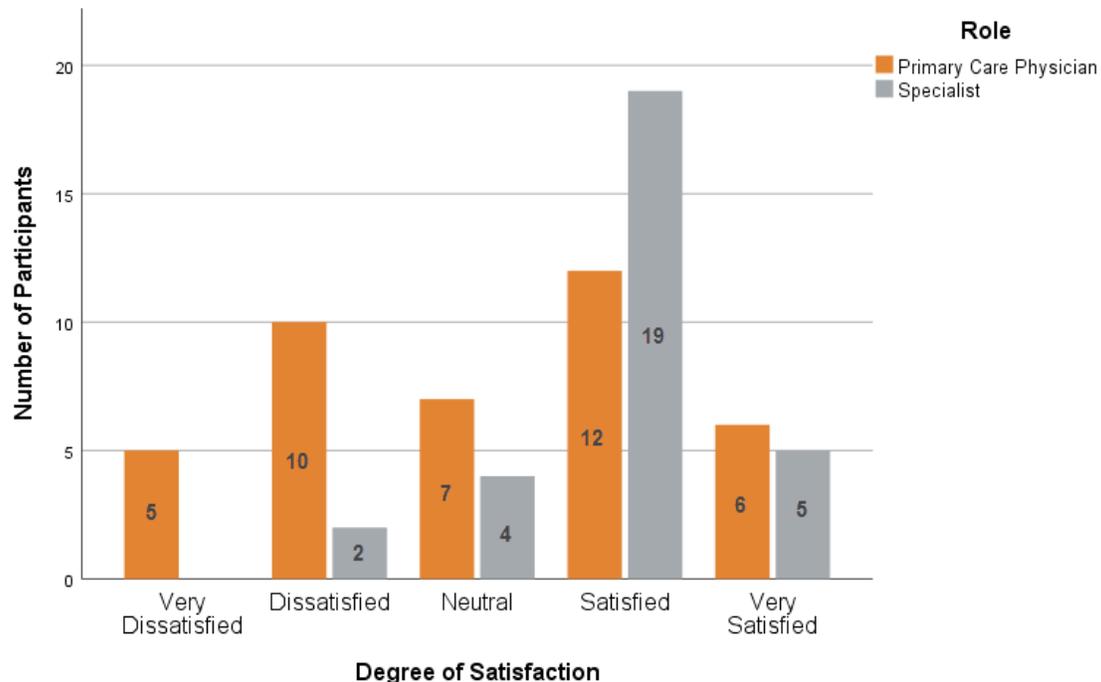


Figure 22 shows 18 out of 40 primary care physicians (45%) reported “satisfied” or “very satisfied” with Advice Request, while 24 out of 30 specialists (80%) rated “satisfied” or “very satisfied” with Advice Request. The chi-square test (Likelihood Ratio = 13.834 with $p = 0.008^m$) shows that the degree of satisfaction with Advice Request was significantly different between specialists and primary care physicians (Cramer’s $V = 0.408$, a moderate effect sizeⁿ). A statistical difference on the “satisfied” category between primary care physicians and specialists was found after performing the post-hoc test^o. This indicates that the specialists were more satisfied with Advice Request than the primary care physicians.

^m The p value (0.05) is used as the cut-off for significance.

ⁿ Cramer’s V is an effect size measurement for the chi-square test of independence. It measures how strongly two categorical variables are associated. The Cramer’s V between 0.3 and 0.6 is considered as a moderate effect size, indicating that two variables are moderately associated.

^o Post-hoc analysis was used after a statistically significant chi-square test – Bonferroni Procedure was conducted here.

Question 3: What is the overall user experience with Advice Request and Consult Request? Are there any other factors impacting the user experience?

Analysis:

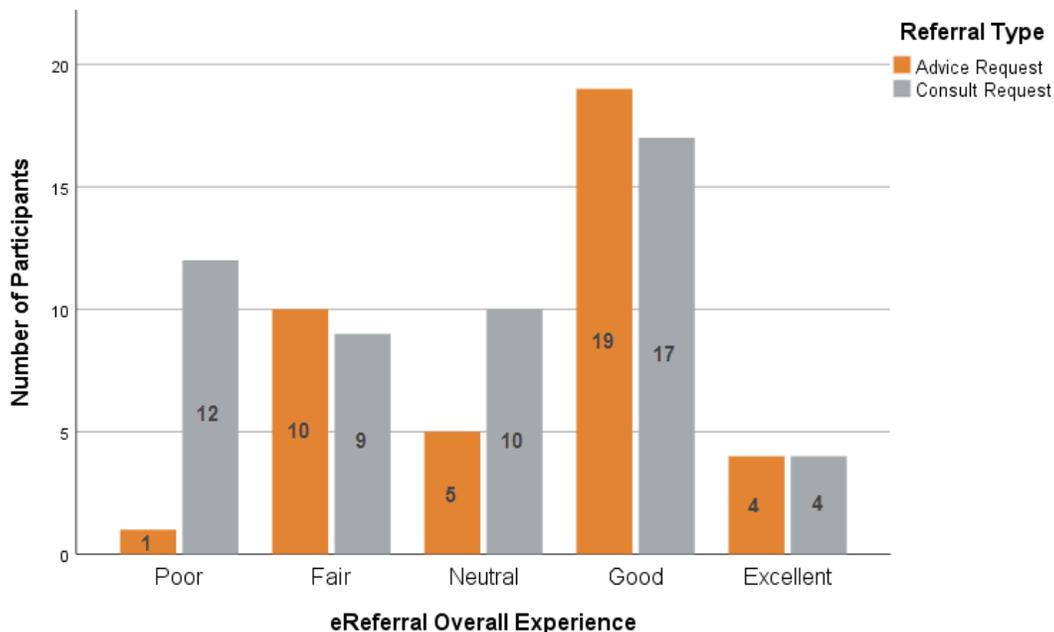
Descriptive analysis was used to explore the distribution of user experience with Advice Request and Consult Request. The chi-square test was conducted to test if any factors (i.e. when the users started using the services; role; employment status; age) affected the user experience with each individual service (i.e. Advice Request and Consult Request).

Findings:

There were 87 respondents in the eReferral user experience survey and the completion rate was 71% (62 respondents completed the whole survey, 24 did not complete all questions and one (1) did not provide consent). Only responses from respondents who completed all the questions were included in the analysis. The 62 respondents included nine (9) Advice Request users, 22 Consult Request users and 31 users of both services.

For Advice Request, a majority of the users (58%) reported a “good” or “excellent” experience while 28% reported a “poor” or “fair” experience. For Consult Request, nearly 40% of users had a “good” or “excellent” experience and 40% had a “poor” or “fair” experience.

Figure 23: eReferral Overall Experience Reported by Advice Request & Consult Request Users



Amongst the Advice Request users, their overall experience was not statistically associated with their age, role (i.e. physician, nurse practitioner, clinician, referral coordinator, triage nurse, clinic/unit manager or MOA), type of facility (i.e. AHS or community-based private facility), employment status (i.e. full-time or part-time), or which year they started using Advice Request. In contrast, the overall experience of Consult Request users was significantly associated with the year when they started using the service. The post-hoc test demonstrated that the earlier a user had started using Consult Request, the more likely they were to give a higher rating of their overall user experience. There was no association between their overall experience with Consult Request and their age, role, type of facility or employment status.

Question 4: What are the users' perceptions about Advice Request's and Consult Request's effectiveness, efficiency, flexibility and user-friendliness?

Analysis:

Four aspects were selected to evaluate the eReferral platform: (i) Effectiveness (e.g. successfully getting specialist's advice for non-urgent questions, confidently submitting a referral for an in-person appointment, following standardized requirements and consistent process, etc.); (ii) Efficiency (e.g. easily sending and receiving requests, real-time tracking of referral status, etc.); (iii) Flexibility (e.g. submitting and managing requests anytime as eReferral is available 24/7 on Alberta Netcare, sharing referral management between team members, etc.); (iv) User-friendliness (e.g. the interface is easy to learn or use, leveraging existing information from Alberta Netcare to populate the request form, etc.). Preliminary descriptive analysis was used to explore these four aspects.

Findings:

Advice Request: There were 40 respondents who had used Advice Request. The majority (63%) indicated that the eReferral platform was "effective" or "very effective" to get advice for non-urgent clinical questions; 58% reported it was "efficient" or "very efficient" to send requests and receive responses; 65% rated the flexibility as "good" or "excellent" for accessing the service 24/7 on Alberta Netcare; 43% rated the platform as "easy" or "very easy" to use while 38% rated it as "difficult" or "very difficult" to use (Table 7).

Consult Request: There were 53 respondents who had used Consult Request. Only 38% indicated that the eReferral platform was "effective" or "very effective" to submit requests or follow the standardized requirements, while 32% provided a neutral response; 36% reported it was "efficient" or "very efficient" to submit requests and track status while 38% reported it as "inefficient" or "very inefficient"; 57% rated the flexibility as "good" or "excellent" for accessing the service 24/7 on Alberta Netcare; 27% rated

the platform as “easy” or “very easy” to use while 47% rated it as “difficult” or “very difficult” to use (Table 7).

Overall, there was a higher percentage of respondents who perceived Advice Request as more effective, efficient and flexible in comparison to the users’ perception about Consult Request. Approximately 43% of users did not rate the platform as user-friendly.

Table 7: User Rating of eReferral’s Effectiveness, Efficiency, Flexibility & User-Friendliness

	Advice Request (N = 40)	Consult Request (N = 53)
Effectiveness		
• Very ineffective	1 (2.5%)	6 (11.3%)
• Ineffective	5 (12.5%)	10 (18.9%)
• Neutral	9 (22.5%)	17 (32.1%)
• Effective	18 (45.0%)	14 (26.4%)
• Very effective	7 (17.5%)	6 (11.3%)
Efficiency		
• Very inefficient	0 (0%)	9 (17.0%)
• Inefficient	6 (15.0%)	11 (20.8%)
• Neutral	11 (27.5%)	14 (26.4%)
• Efficient	19 (47.5%)	16 (30.2%)
• Very efficient	4 (10.0%)	3 (5.7%)
Flexibility		
• Poor	2 (5.0%)	7 (13.2%)
• Fair	0 (0%)	4 (7.5%)
• Neutral	12 (30.0%)	12 (22.6%)
• Good	14 (35.0%)	18 (34.0%)
• Excellent	12 (30.0%)	12 (22.6%)
User-Friendliness		
• Very difficult	6 (15.0%)	11 (20.8%)
• Difficult	9 (22.5%)	14 (26.4%)
• Neutral	8 (20.0%)	14 (26.4%)
• Easy	14 (35.0%)	11 (20.8%)
• Very easy	3 (7.5%)	3 (5.7%)

Discussion and Recommendations:

The Advice Request survey for primary care physicians was distributed multiple times through a wide variety of communication channels, which included: the AMA's electronic newsletters (MD Scope and Primary Care News), PCN's electronic newsletters, AHS' Medical Staff Newsletters, and emails to the Alberta Association of Clinic Managers and PCN Executive Directors asking for distribution to primary care physicians. Despite the response rate being low, 91% of participants have heard about eReferral Advice Request. There were 23% of respondents who reported not comfortable with using Advice Request because of limited training or information provided. For respondents (34%) who heard about Advice Request but had not used it before, the common responses were time constraints to log onto Alberta Netcare and submit questions between appointments, or limited knowledge about the eReferral. These responses suggest more training and information needs to be provided to primary care physicians to drive adoption.

More than half of the respondents (58%) reported having a good experience using Advice Request. However, the specialists expressed a significantly higher degree of satisfaction compared with primary care physicians.

58% of respondents reported having a good experience using Advice Request.

Suggestions and recommendations provided by respondents of all three surveys are summarized as the following:

- The platform design was not user friendly. It was not easy to add information such as a letter from a patient's chart or other documents;
- Training was very limited in the beginning, but the webinars were helpful for learning how to navigate the system;
- Including a patient's or specialist's name in the notification email (e.g. provider notifications) which confirms that a referral has been completed;
- Reducing the response time for Advice Request;
- Identifying new strategies to promote eReferral Advice Request as it would be an efficient way to provide support to the primary care team;
- Integrating laboratory reports from Alberta Netcare into eReferral would be useful instead of linking each report one-by-one;
- Providing more up-to-date status updates for Consult Requests on eReferral;
- Including consultation letters on Alberta Netcare after the specialist appointment when the referral is completed;
- Adding more specialties;
- Integrating eReferral with referring providers' EMR systems.

Limitations:

The response rate to the surveys was low despite several channels and mechanisms of communication. The voluntary nature of survey sampling may lead to either over- or under-representation and may interfere with the representativeness of the sample. However, the results do provide insights to set directions on areas for improvement, which are summarized in the recommendations section.

Interviews: eReferral Frequent Users

The purpose of conducting semi-structured interviews was to collect feedback from eReferral frequent users about their experiences with eReferral Consult Request and/or Advice Request. The findings provided an overview of how eReferral is currently being used in clinics that adopted eReferral into their workflow and informs future changes that can benefit all eReferral users.

Method:

Between Aug. 2018 and May 2019, a total of 23 semi-structured interviews were conducted: 17 referring clinics and six (6) receiving clinics located in Calgary, Edmonton, Leduc and Canmore. Interviewees were physicians and support staff from 13 primary care and 10 specialty care clinics. The interviewees were recruited based on the number of eReferral requests they had submitted or received from Aug. 2017 to Feb. 2019. The conversations focused on three areas:

- What do you like the most about eReferral?
- What are the top three eReferral improvements you want to see in the future?
- What other specialties would you like to have on eReferral?

Results:

The majority of the interviewees were satisfied with using Consult Request.

"Once it's in process, it's awesome. All you need to do is to go in, click and hit the submit button." – Interviewee A

"There is no fax involved and eReferral is more efficient." – Interviewee B

"It's super handy and efficient. No photocopy and no busy signal from (the) fax machine." – Interviewee C

"Very organized and easy to keep track of referrals. No lost referrals." – Interviewee D

Only one interviewee had experience using Advice Request and the physician commented it was much faster to create and submit an Advice Request – which took about 5-10 minutes – than calling for advice.

The main themes are summarized in the table below for two aspects: (i) benefits of using eReferral and (ii) suggestions for improving eReferral.

Table 8: Main Themes from Semi-Structured Interviews with Frequent Users

Benefits of Using eReferral	
Increased efficiency and patient safety	<ul style="list-style-type: none"> • Confirmation that referral is confidentially and successfully submitted, which decreases the chance of referrals getting missed and reduces follow-up time to confirm if the specialty clinic has received the referral. • A more efficient process than faxing referrals as everything is in one place (such as diagnostic test results) with the ability to attach other documents externally from EMRs. • Increased patient privacy by avoiding any paperwork flowing around clinics.
Improved overall referral quality	<ul style="list-style-type: none"> • Referral pathways help communicate clear referral requirements to physicians. • Increased confidence in submitting complete referral as the platform has the ability to check for completeness and stop users from submitting a referral if the mandatory fields are incomplete.
Enhanced transparency	<ul style="list-style-type: none"> • Ability to check referral status online; users do not need to call specialty clinics. • Increased transparency with approximate wait times.
User-friendliness and ease of access	<ul style="list-style-type: none"> • Integrated into Alberta Netcare that allows users to log on, click and submit referrals electronically.
Suggestions for Improvement	
Accessibility	<ul style="list-style-type: none"> • Adding more specialties, reasons for referral, physicians and surgeons. The most suggested specialties included: Dermatology, Gastroenterology and Urology. • Sending notifications for referral status and appointments to providers and patients. • Including actual information provided by the referring physician in the notification email. • Reducing the response time for Advice Request to 24 - 48 hours instead of five calendar days. • Providing an option to dictate to complete eReferral forms.
Efficiency	<ul style="list-style-type: none"> • Increasing the number of auto-populated fields. • Changing eReferral forms to be more concise.

Flexibility	<ul style="list-style-type: none"> • Enhancing the ability to edit the referral form. If the patient's condition changes and becomes urgent, they cannot be seen earlier unless a new referral is faxed as urgent. • Providing options to delete or edit an Advice Request after submission when an issue is resolved or the question has already been answered. • Adding functionality for the receiving side to add a note on Alberta Netcare for down times such as Christmas break when wait times are longer.
User-friendliness	<ul style="list-style-type: none"> • Creating a more user-friendly platform, particularly for referral coordinators. • Resolving technical issues such as issues with saving reports, long loading time for documents and getting different types of errors at the receiving end. • Integrating eReferral into EMRs.
User support	<ul style="list-style-type: none"> • Increasing awareness of staff members that they can submit referrals on behalf of physicians. • Providing one-on-one training initially instead of offering a webinar. • Enhancing the Alberta Netcare training environment with regular clean-up to remove previously created referrals and a different naming convention to indicate elements (such as available laboratory results) connected to the test patient.

Discussion and Recommendations:

Overall participants were satisfied with using eReferral. The main benefits include: improved quality and transparency of referrals, increased clinic efficiency and enhanced patient safety. While some participants commented that eReferral is user-friendly, others suggested resolving technical issues such as long document loading time, and integrating eReferral into their EMR systems to dictate and transcribe referral letters. Other suggestions include: adding more specialties, reducing Advice Request's response time from five (5) calendar days to 24 - 48 hours, and offering more in-person training sessions for physicians and support staff.

Limitations:

Phase One of the interviews only included frequent users and their views did not represent all eReferral users. While invitations were sent to both physicians and support staff, most physicians were unavailable to answer all questions during the clinic visits. Phase Two of the interviews will focus on recruiting new and potential users to share their perspectives and experience using eReferral.

Engagement Progress: Primary Care & Specialty Clinics

The Access Improvement team embraces the principle that “*eReferral is developed by clinicians for clinicians.*” The success of eReferral depends on ongoing communication and sufficient support for current and potential users who play a key role in the referral and consultation process to support timely and appropriate care for patients.

Visiting primary care and specialty clinics to understand their clinic workflow and perspectives about adopting new processes has always been a priority. In alignment with recommendations listed in the 2015 *eReferral Evaluation Report*, the in-person conversations with primary care physicians, specialists, referral coordinators, triage clinicians and clerks allowed the Access Improvement team to determine a clinic’s level of readiness for new processes. Furthermore, the conversations helped identify ways in which clinics can be supported based on their current needs to access to specialized services.

There were 71 engagement sessions and 302 training sessions with more than 600 new and potential users from primary and specialty care in 2019.

Engagement Sessions:

From Jan. to Oct. 2019, there were 71 engagement sessions (either clinic visits or online meetings) with more than 320 new and potential users from primary and specialty care across Alberta. Two clinical design sessions were organized to seek advice from 43 eReferral users on new functionalities that were implemented in 2019. The participants’ input on the enhancements for the eReferral standard forms (Advice Request and Consult Request) and the eReferral dashboard and worklists (such as new search functions) were implemented in July 2019.

Training Sessions:

The Access Improvement team collaborated with the Alberta Netcare eHealth Support Services team to provide both in-person and webinar training sessions. In 2019, 302 training sessions were conducted to support physicians and clinic staff to use eReferral. To meet the need of face-to-face training, 96 in-person sessions were arranged to support more than 280 physicians and clinic staff.

Other Communication Strategies:

Besides engagement and training sessions, eReferral was actively promoted at 18 conferences and 11 educational events between Aug. 2018 and Nov. 2019 to reach out to physicians, nurses and staff from PCNs, specialized services/programs and other AHS teams.

eReferral users also mentioned receiving emails is the most effective form of communication. Prior to each eReferral release, communication plans were in place to share clear and consistent messages with physicians and support staff.

Multiple strategies were executed to facilitate conversations and collaboration between referring and receiving providers. For example:

- Building Communities of Practices to share ideas and lessons learned to improve access at both system and clinic levels;
- Collaborating with RAAPID (Referral, Access, Advice, Placement, Information and Destination), Specialist LINK and Connect MD to promote advice services to reduce wait times for specialty access;
- Partnering with the Alberta Netcare eHealth Support Services and AHS' Path to Care teams at conferences to share educational materials about referral management, communication standards and practical tips for accessing Alberta Netcare;
- Developing referral pathways to provide clear guidance on reasons for referral, standardized minimal requirements and appropriate specialty services;
- Supporting the Edmonton Zone Gastroenterology and PCN collaboration in the development of three clinical pathways;
- Collaborating with Digestive Health Strategic Clinical Network (SCN) to promote Advice Request and the developed clinical pathways.

In collaboration with primary and specialty care, 14 provincial/zonal referral pathways were developed and published to improve referrals for the following specialties: Adult Gastroenterology (Calgary Zone), Pediatric Gastroenterology (Provincial), Breast Health (Provincial), Breast Cancer (Provincial), Concurrent Disorders (Provincial), Eating Disorders (Provincial), Interventional Pulmonary Medicine (Calgary Zone), Lung Cancer (Provincial), Nephrology (Provincial), Pulmonary Medicine (Calgary Zone), Sleep Disorders (Calgary Zone), Tuberculosis Services (Calgary Zone), and Urology (Calgary Zone and Edmonton Zone).

Recommendations

Final recommendations are based on suggestions provided by existing and potential eReferral users during the Phase One of evaluation as well as eReferral usage patterns. Participants included primary care physicians, specialists, nurses, clinic/unit managers, referral coordinators, triage clinical and administrative staff, and MOAs, who represented diverse perspectives in the referral and consultation processes. However, these suggestions are not exhaustive as they do not represent all of the existing and potential users' perspectives. The following recommendations are categorized according to the four AHS Goals (Quadruple AIM) and are not listed in the order of importance.

Table 9: Recommendations for eReferral Advice Request & Consult Request

Recommendation	Scope
AHS' Goal 1: Improve Patient and Family Experience	
R1: Enable patient notification of referral status and appointments.	System level (AH and AHS)
R2: Increase the number of available specialized services in the Central, North and South Zones to reduce patient travel and cost for out-of-zone specialist consults.	Organizational level (AHS)
AHS' Goal 2: Improve Patient and Population Health Outcomes	
R3: Enhance the ability to edit the eReferral form once submitted. Current functionality is not as intuitive as it could be to allow status updates from the referring provider if a patient's condition changes (i.e. deteriorates); instead, a new referral is created and faxed as urgent.	IT Operations team, Access Improvement team and responding specialties
R4: Reduce the target response time for Advice Request from five (5) days down to two (2) calendar days.	Access Improvement team and specialties offering Advice Request
R5: Maintain up-to-date information on the statuses of Consult Request on eReferral and enable attachments of the specialist's consult letter into eReferral upon appointment completion.	Specialized services receiving Consult Request, Access Improvement team and IT Operations team
R6: Reduce incomplete Advice Requests (i.e. where referring providers do not provide clear clinical questions or adequate information) to allow specialists to better assess and provide timely recommendations for appropriate care.	System level (AH, AHS, Medical Colleges and Associations)

Recommendation	Scope
AHS' Goal 3: Improve the Experience and Safety of Our People	
R7: Upgrade eReferral to a more user-friendly design (e.g. ability to easily attach documents from a patient's chart).	System level (AH and AHS) and IT Operations team
R8: Increase awareness of provider notifications.	Access Improvement team
R9: Add more specialties and reasons for referral in each eReferral release cycle.	IT Operations team
R10: Promote eReferral service and recruit more receiving providers for Advice Request and available specialized services/programs for Consult Request.	Access Improvement team
R11: Improve Advice Request's current response time by specialists to meet the proposed time target.	Specialties offering Advice Request
R12: Provide more initial one-on-one training sessions instead of by webinars only.	Access Improvement team and Alberta Netcare eHealth Support Services team
R13: Increase the number of auto-populated fields in the eReferral standard form which pulls existing data from other Alberta Netcare data repositories.	IT Operations team
R14: Better integrate eReferral into EMR systems.	System level (AH and AHS) and IT Operations team
R15: Increase awareness and understanding of eReferral workflows that support staff can also submit and track referrals on behalf of physicians.	Access Improvement team and Alberta Netcare eHealth Support Services team
R16: Enhance the Alberta Netcare training environment by regularly removing previously created test referrals and by maintaining consistent document naming conventions for test patients (such as laboratory results).	IT Operations team
AHS' Goal 4: Improve Financial Health and Value for Money	
There were no recommendations made by participants. However, an economic evaluation for Advice Request is planned for 2020.	Access Improvement team

Future Directions

Timely Access to Specialty Care:

Timely access to appropriate specialty care remains a problem in the Canadian healthcare system. The recently published *Report and Recommendations of the Blue Ribbon Panel on Alberta's Finances* states that patients in Alberta wait a median of 26 weeks from a referral made by a primary care physician to treatment by a specialist, which is three (3) weeks longer than in British Columbia and 10 weeks longer than in Ontario and Quebec [14]. Research shows that electronic advice has significant potential to improve timely access to specialty care and reduce unnecessary specialist visits with high primary care adherence to specialist recommendations; this suggests that broad implementation and promotion of the widespread use of electronic advice may have a substantial positive impact on patient health outcomes in settings that are more convenient for patients in a more cost-effective way [15-21].

Enhanced Care in Patient's Medical Home:

eReferral Advice Request enables better asynchronous communication between providers by allowing referring and receiving providers to submit and reply to requests at a time that is more convenient for them. The receiving specialist can also potentially use the requests to inform further development of continuing medical education as well as clinical pathways. The conversations between providers can support better care in the patient's medical home by increasing referring providers' competence in managing chronic and/or complex conditions in-house. The Advice Request survey results correlate with this theory, as most primary care providers indicated they were more comfortable providing appropriate care to patients in their medical home after having completed an Advice Request. This is also consistent with findings from the evaluation of other similar electronic advice programs [22, 23]. As an example, Nephrology was the first group to use Advice Request provincially to provide recommendations for the primary care support of patients with CKD. Evidence suggests most patients with CKD are at low risk for progression to end-stage kidney disease and can be safely managed in primary care settings [24].

Appropriate Care at a Reduced Cost:

Multiple factors delay surgical assessment in the Canadian healthcare system. One major factor is the number of referrals to surgeons for patients who are not surgical candidates (e.g. 75 - 85% of referrals to spine surgeons for lower-back pain), leading to longer wait times for surgical candidates [25, 26]. Electronic advice from specialists can encourage appropriate utilization of diagnostic imaging and enhance the number of

appropriate referrals for both surgical and nonsurgical patients according to practice guidelines or clinical pathways such as spine models of care in Ontario and Saskatchewan [27-29]. Gastroenterologists in the Edmonton Zone have suggested the use of Advice Request to support surgeons to determine the appropriate course of action for patients with non-malignant polyps in their colorectal region. The Digestive Health SCN found that outcomes are the same for surgical versus endoscopic polyp removal, but at a significantly reduced cost when done endoscopically – \$985.69 per endoscopic procedure with no associated hospital admission, versus \$16,472 per surgical procedure with a typical associated eight-day hospital stay [30]. Widespread use of Advice Request may have a major positive impact on health outcomes for patients - in a more cost-effective setting than what occurs with the current healthcare system.

Improved Communication with Patients:

Robust provider-patient communication is essential in the referral and consultation process where patients and caregivers interact with multiple healthcare providers and teams. Communication quality impacts patient health outcomes, satisfaction [31, 32] and adherence to treatment [33]. Research suggests that innovation via electronic communication platforms can decrease inappropriate referrals and improve communication quality [34, 35]. Advice Request and Consult Request have built the foundation for electronic patient notifications pertaining to their referral statuses; however, there is yet clear direction on implementing patient notifications for eReferral. A referral survey for patients and caregivers is currently underway to study their satisfaction with the referral process and their perspectives on receiving notifications electronically.

Common Challenges:

Despite that the Access Improvement team has recruited more specialists to participate in eReferral and has successfully engaged more primary care providers to use eReferral, the evaluation findings identify challenges to spread eReferral services with high physician adoption rate across the province. The common challenges to further spread the adoption of eReferral include: lack of familiarity with eReferral, perceived technical challenges to use the platform, and lack of integration with EMR systems. These challenges are similar to those identified by other studies [22, 36], and in the previous eReferral evaluation report.

Moving Forward:

eReferral is the first EHR platform that manages both electronic advice and referrals in Canada. Strong championship from AH and AHS Executive Leadership team is fundamental to the full realization of eReferral's benefits. This leadership is required in order to secure stable financial and technological resources to support eReferral's improvement, implementation, adoption and IT strategy alignment. Without this support, Alberta will miss an opportunity to leverage and advance an existing platform that could substantially improve patient safety and health outcomes at a reduced cost compared to what currently exists.

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Credits

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Appendices

Appendix 1: eReferral Implementations

Specialty	Zone	Advice and/or Consult Request
July 2014		
Oncology – Breast Cancer	All	Advice & Consult Request
Oncology – Lung Cancer	All	Advice & Consult Request
Orthopaedic Surgery (Hip & knee joint replacement)	All	Advice & Consult Request
Oct. 2016		
Nephrology	Edmonton, Calgary	Advice Request
Sept. 2017		
Urology	Edmonton	Advice Request
Dec. 2017		
Internal Med - Adult Gastroenterology (Adult gastroenterology issue)	Calgary, Edmonton, North, South	Advice Request
Internal Med – Adult Gastroenterology (Colon cancer screening)	Edmonton, North	Advice Request
Internal Med – Adult Gastroenterology (Hepatology issue)	Edmonton, North	Advice Request
Internal Med – Endocrinology	Calgary	Advice Request
OBS-GYN	Calgary	Advice Request
Internal Med – Pulmonary Medicine	Calgary	Advice Request
Neuro Surgery – Spinal Neurosurgery	Calgary	Advice Request
Feb. 2018		
Internal Med – General Internal Med	Calgary	Advice Request
Addiction and M H – Addiction Medicine	Provincial	Advice Request
June 2018		
Internal Med – Adult Gastroenterology (Adult gastroenterology issue)	Central	Advice Request
Internal Med – Adult Gastroenterology (Fecal Immunochemical Test (FIT) positive finding)	Edmonton	Consult Request
Internal Med – Cardiology	Central	Advice Request
Pain Medicine – Chronic Pain Med	Calgary	Advice Request
Surgery – General Surgery (Breast Health)	Calgary	Advice Request
Internal Med – Infectious Disease	Edmonton	Advice Request
OBS-GYN – Maternal Fetal Medicine	Edmonton	Advice Request

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Specialty	Zone	Advice and/or Consult Request
Ophthalmology (Adult)	Provincial	Advice Request
Ophthalmology (Paeds)	Provincial	Advice Request
Otolaryngology	Central	Advice Request
Palliative Care – Palliative Medicine	Calgary	Advice Request
Urology	Central	Advice Request
Urology	Edmonton	Consult Request
Urology (Paeds)	Edmonton	Advice Request
Dec. 2018		
Surgery – General Surgery (Breast Health)	Calgary	Consult Request
Nephrology (including Northern Alberta Renal Program)	Edmonton, North, Central	Consult Request
Internal Med – Pulmonary Medicine	Calgary	Consult Request
Feb. 2019		
Paediatrics – Community Paediatrics	Calgary	Advice Request
Neurology	Calgary	Advice Request
Dec. 2018 – March 2019		
Internal Med – Adult Gastroenterology (Hepatology issue)	Calgary, South	Advice Request
Internal Med – Cardiology	Calgary	Advice Request
May 2019		
Psychiatry – Child and Adolescent	Calgary, Central (patients in Red Deer & south), South	Advice Request
Internal Med – Pulmonary Medicine (Interventional Pulmonary Medicine)	Calgary	Consult Request
Internal Med – Sleep Medicine	Calgary	Consult Request
Internal Med (Tuberculosis Services)	Calgary	Consult Request
Internal Med – Medical Oncology (ATOP)	Calgary	Consult Request
Provider Notifications implemented		
July 2019		
Family Medicine – Transgender Care	Provincial	Advice Request
Oct. 2019		
Surgery – General Surgery	Edmonton	Advice Request

Appendix 2: eReferral Reasons for Referral

Advice Request – Reasons for Referral

Specialty	Reason For Referral	Zone
Addiction and M H – Addiction Medicine	Opiate agonist therapy	All Zones
Family Medicine – Transgender Care	Transgender health general consultation	All Zones
Internal Med – Adult Gastroenterology	Adult gastroenterology issue	All Zones
Internal Med – Adult Gastroenterology	Colon cancer screening	Edmonton, North
Internal Med – Adult Gastroenterology	Hepatology issue	Edmonton, North, South
Internal Med – Cardiology	Cardiology issue	Calgary, Central
Internal Med – Endocrinology	Diabetes	Calgary
Internal Med – Endocrinology	Endocrinology issue	Calgary
Internal Med – General Internal Med	Medical issue	Calgary
Internal Med – Infectious Disease	Infectious disease issue	Edmonton
Internal Med – Pulmonary Medicine	Pulmonary issue	Calgary
OBS-GYN – Maternal Fetal Medicine	Maternal fetal medicine issue	Edmonton
Nephrology	Acute kidney injury	Calgary, Edmonton
Nephrology	Chronic kidney disease	Calgary, Edmonton
Nephrology	Kidney stone chronic (non-obstructing)	Calgary, Edmonton
Nephrology	Electrolyte abnormalities	Calgary, Edmonton
Nephrology	Hematuria microscopic (greater than 3 rbc/hpf)	Calgary, Edmonton
Nephrology	Nephrology issue	Calgary, Edmonton
Nephrology	Proteinuria	Calgary, Edmonton
Neuro Surgery – Spinal Neurosurgery	Neurosurgery procedure	Calgary
Neurology	Neurology issue	Calgary

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Specialty	Reason For Referral	Zone
OBS-GYN	Colposcopy procedure	Calgary
OBS-GYN	Gynecological issue	Calgary
OBS-GYN	High risk obstetrics	Calgary
OBS-GYN	Pelvic floor issue	Calgary
OBS-GYN	Obstetrical issue	Calgary
Ophthalmology	Ophthalmology issue	All Zones
Ophthalmology	Paeds ophthalmology issue	All Zones
Otolaryngology	Otolaryngology issue	Central
Pain Medicine – Chronic Pain Med	Chronic pain issue	Calgary
Palliative Care – Palliative Medicine	Palliative medicine issue	Calgary
Paediatrics – Community Paediatrics	Paediatric behavioural finding	Calgary
Psychiatry – Child and Adolescent	Child and adolescent psychiatric health issue	Calgary, Central (patients in Red Deer & south), South
Surgery – General Surgery	Breast health issue	Calgary
Surgery – General Surgery	Benign breast tumor issue	Edmonton
Surgery – General Surgery	Colorectal issue	Edmonton
Surgery – General Surgery	Gallbladder issue	Edmonton
Surgery – General Surgery	Hernia issue	Edmonton
Surgery – General Surgery	Suspected breast cancer issue	Edmonton
Surgery – General Surgery	Suspected gastrointestinal cancer issue	Edmonton
Surgery – General Surgery	Other general surgery issue	Edmonton
Urology	Urology issue	Central, Edmonton

Consult Request – Reasons for Referral

Specialty	Reason For Referral	Zone
Internal Med – Adult Gastroenterology	Fecal Immunochemical Test (FIT) positive finding	Edmonton
Internal Med – Pulmonary Medicine	Asthma consult	Calgary
Internal Med – Pulmonary Medicine	Asthma education	Calgary
Internal Med – Pulmonary Medicine	Bronchiectasis	Calgary
Internal Med – Pulmonary Medicine	Chronic cough	Calgary
Internal Med – Pulmonary Medicine	COPD consult	Calgary
Internal Med – Pulmonary Medicine	COPD education	Calgary
Internal Med – Pulmonary Medicine	Dyspnea (shortness of breath)	Calgary
Internal Med – Pulmonary Medicine	Hemoptysis	Calgary
Internal Med – Pulmonary Medicine	Hypoxemia	Calgary
Internal Med – Pulmonary Medicine	ILD – interstitial lung disease (pulmonary fibrosis)	Calgary
Internal Med – Pulmonary Medicine	Lung transplant assessment	Calgary
Internal Med – Pulmonary Medicine	Lymphadenopathy (hilar/mediastinal)	Calgary
Internal Med – Pulmonary Medicine	Neuromuscular related respiratory disorder	Calgary
Internal Med – Pulmonary Medicine	Pleural disease	Calgary
Internal Med – Pulmonary Medicine	Pleural effusion	Calgary
Internal Med – Pulmonary Medicine	Pulmonary embolism (chronic)	Calgary
Internal Med – Pulmonary Medicine	Pulmonary hypertension suspected (includes known)	Calgary
Internal Med – Pulmonary Medicine	Pulmonary rehabilitation	Calgary
Internal Med – Pulmonary Medicine	Respiratory infection	Calgary
Internal Med – Pulmonary Medicine	Sarcoidosis	Calgary
Internal Med – Pulmonary Medicine	Tobacco cessation	Calgary
Internal Med – Pulmonary Medicine	Bronchoscopic airway debulking (laser, electrocautery, cryotherapy)	Calgary
Internal Med – Pulmonary Medicine	Bronchoscopic airway stent placement	Calgary
Internal Med – Pulmonary Medicine	Asthma thermoplasty	Calgary
Internal Med – Pulmonary Medicine	Endobronchial ultrasound	Calgary
Internal Med – Pulmonary Medicine	Navigation bronchoscopy	Calgary
Internal Med – Pulmonary Medicine	Rigid bronchoscopy	Calgary
Internal Med – Pulmonary Medicine	Tracheobronchial stenosis (large airway obstruction / benign airway stenosis / malignant airway obstruction)	Calgary
Internal Med – Sleep Medicine	Sleep apnea	Calgary

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Specialty	Reason For Referral	Zone
Internal Med – Sleep Medicine	CPAP / BPAP / oxygen funding (as required by government funding agency)	Calgary
Internal Med – Sleep Medicine	Insomnia	Calgary
Internal Med – Sleep Medicine	Excessive daytime sleepiness	Calgary
Internal Med – Sleep Medicine	Abnormal behaviours during sleep	Calgary
Internal Med (Tuberculosis Services)	Active tuberculosis disease (TB)	Calgary
Internal Med (Tuberculosis Services)	Latent tuberculosis infection	Calgary
Internal Med (Tuberculosis Services)	Sputum induction testing	Calgary
Nephrology	Acute nephrotic syndrome	Central, Edmonton, North
Nephrology	eGFR < 15 mL/min/1.73m ²	Central, Edmonton, North
Nephrology	eGFR < 30 mL/min/1.73m ²	Central, Edmonton, North
Nephrology	eGFR declining over weeks to months plus hematuria and/ or albuminuria	Central, Edmonton, North
Nephrology	Hereditary kidney disease	Central, Edmonton, North
Nephrology	Hypertension refractory to treatment with 4 or more antihypertensive agents	Central, Edmonton, North
Nephrology	Persistent albuminuria (ACR > 60 mg/mmol) - confirmed on repeat testing (2 out of 3 samples) within 2-4 weeks	Central, Edmonton, North
Nephrology	Persistent electrolyte abnormalities	Central, Edmonton, North
Nephrology	Persistent hematuria – confirmed on repeat testing (2 out of 3 samples) within 2 - 4 weeks	Central, Edmonton, North
Nephrology	Rapid decline in eGFR over days to weeks	Central, Edmonton, North
Nephrology	Recurrent or extensive nephrolithiasis	Central, Edmonton, North
Nephrology	Suspected glomerulonephritis	Central, Edmonton, North

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Specialty	Reason For Referral	Zone
Nephrology	Unexplained decline in eGFR greater than or equal to 5 mL/min/1.73m ² that occurs over 6 months	Central, Edmonton, North
Oncology – Breast Cancer	Ductal carcinoma in situ - post segmental resection breast cancer	All Zones
Oncology – Breast Cancer	Locally advanced breast cancer	All Zones
Oncology – Breast Cancer	Lymphangitic carcinomatosis (symptomatic) breast cancer	All Zones
Oncology – Breast Cancer	Metastases asymptomatic breast cancer	All Zones
Oncology – Breast Cancer	Metastases bone (symptomatic)	All Zones
Oncology – Breast Cancer	Metastases brain	All Zones
Oncology – Breast Cancer	Metastases visceral (symptomatic +/- life-threatening) breast cancer	All Zones
Oncology – Breast Cancer	Node negative breast cancer	All Zones
Oncology – Breast Cancer	Node positive breast cancer	All Zones
Oncology – Breast Cancer	Superior vena cava obstruction	All Zones
Oncology – Lung Cancer	Mesothelioma	All Zones
Oncology – Lung Cancer	Metastases bone (symptomatic)	All Zones
Oncology – Lung Cancer	Metastases brain	All Zones
Oncology – Lung Cancer	Non small cell lung cancer	All Zones
Oncology – Lung Cancer	Small cell lung cancer	All Zones
Oncology – Lung Cancer	Superior vena cava obstruction	All Zones
Oncology – Lung Cancer	Thymoma / thymic cancer	All Zones
Orthopaedic Surgery	Benign bone tumor	Calgary, Edmonton, North, South
Orthopaedic Surgery	Hip pain	Calgary, Edmonton, North, South
Orthopaedic Surgery	Idiopathic avascular necrosis	Calgary, Edmonton, North, South
Orthopaedic Surgery	Inflammatory arthritis	Calgary, Edmonton, North, South
Orthopaedic Surgery	Knee joint valgus deformity (finding)	Calgary, Edmonton, North, South
Orthopaedic Surgery	Knee joint - varus deformity (finding)	Calgary, Edmonton, North, South

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Specialty	Reason For Referral	Zone
Orthopaedic Surgery	Knee pain	Calgary, Edmonton, North, South
Orthopaedic Surgery	Leg length inequality (finding)	Calgary, Edmonton, North, South
Orthopaedic Surgery	Legg-Calve-Perthes disease	Calgary, Edmonton, North, South
Orthopaedic Surgery	Loose body in joint	Calgary, Edmonton, North, South
Orthopaedic Surgery	Osteoarthritis of hip	Calgary, Edmonton, North, South
Orthopaedic Surgery	Osteoarthritis of knee	Calgary, Edmonton, North, South
Orthopaedic Surgery	Osteonecrosis	Calgary, Edmonton, North, South
Orthopaedic Surgery	Prosthetic joint infection	Calgary, Edmonton, North, South
Orthopaedic Surgery	Toxic effect of metal	Calgary, Edmonton, North, South
Orthopaedic Surgery	Traumatic arthritis	Calgary, Edmonton, North, South
Surgery – General Surgery	Abnormal findings on breast exam	Calgary
Surgery – General Surgery	Abnormal findings on diagnostic imaging	Calgary
Surgery – General Surgery	Benign findings on diagnostic imaging	Calgary
Surgery – General Surgery	Breast cancer invasive	Calgary
Surgery – General Surgery	Ductal carcinoma in SITU (DCIS)	Calgary
Surgery – General Surgery	High risk lesion found on breast biopsy	Calgary
Surgery – General Surgery	Increased risk of breast cancer	Calgary
Surgery – General Surgery	Suspicious abnormality found on breast exam	Calgary
Urology	Balanitis	Edmonton
Urology	BPH (Benign prostatic hyperplasia)	Edmonton
Urology	Kidney stone chronic (non-obstructing)	Edmonton
Urology	Cystocele	Edmonton

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Specialty	Reason For Referral	Zone
Urology	Erectile dysfunction	Edmonton
Urology	Female voiding dysfunction	Edmonton
Urology	Hematuria microscopic (greater than 3 rbc/hpf)	Edmonton
Urology	Hydrocele	Edmonton
Urology	Incontinence	Edmonton
Urology	Lower urinary tract symptoms (LUTS)	Edmonton
Urology	Male infertility	Edmonton
Urology	Male sexual dysfunction	Edmonton
Urology	Pelvic organ prolapse	Edmonton
Urology	Peyronies Disease	Edmonton
Urology	Phimosis	Edmonton
Urology	Spermatocele	Edmonton
Urology	Testicular pain chronic (non-STD)	Edmonton
Urology	Urinary tract infection	Edmonton
Urology	Varicocele	Edmonton
Urology	Vasectomy	Edmonton
Urology	Vasectomy reversal	Edmonton