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Adoption and Benefits of EMR use in Canadian Outpatient Clinics

Benefits Evaluation Study

eHealth 2016: Reimagining Healthcare Delivery in Canada

June 6, 2016

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Today's Presentation

- Overview of EMR adoption in ambulatory care settings in Canada
- Summary of detailed findings from: *The emerging benefits of EMR use in ambulatory care in Canada: Pan-Canadian Benefits Evaluation Study*
- Saskatchewan Cancer Agency's ambulatory care EMR journey

Acknowledgements

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- Infoway Steering Committee and Working Group *(18-members)*
- Infoway AMB EMR Investment Projects/Evaluation teams
- Nielson Consumer Insights /Harris-Decima Interactive *(2015 AMB EMR Landscape Survey)*

Context

EMR adoption in ambulatory care

EMR Adoption In Ambulatory Care Survey

Canada Health Infoway commissioned Harris Decima to conduct an Ambulatory EMR Landscape survey in 2015 to determine the current adoption and maturity of EMR use in ambulatory care in Canada

- Telephone surveys were conducted with managers of ambulatory clinics, such as an Ambulatory Clinic Manager or Outpatient Clinic Manager.
- The sample frame was reflective of Canadian healthcare facilities (Large and Small hospitals).
- A total of 285 surveys were completed in English and French between September 10, 2015 and January 22, 2016.

Ambulatory EMR Landscape Survey

- A variety of clinic types were surveyed. The weighted distribution is presented below:

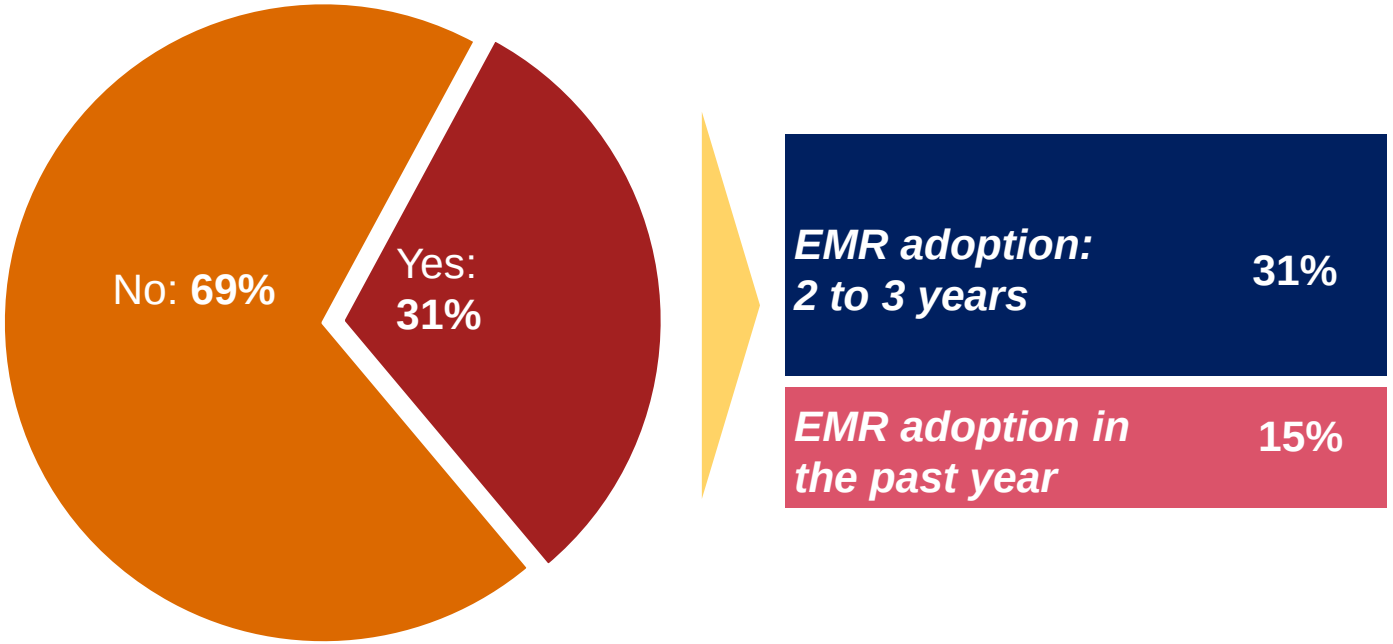
	% of Clinics
Specialty Clinics	68%
Cancer care	*21%*
Non-cancer care	*47%*
Abstracted Day Surgery	13%
Rehabilitation	8%
Specialty Day/Night Care	8%
Mental Health	3%
Total	**100%**

How did ambulatory clinics document information on their patients in 2015?

Q: How does your clinic document information on its own patients, such as detailed demographics, medical and drug history, and diagnostic information such as laboratory results and findings from diagnostic imaging?

Base: All respondents (n=285)
Source: Harris-Decima, 2015 Ambulatory EMR Landscape Survey

Routine entry of encounter notes electronically is a key measure of EMR adoption in this setting

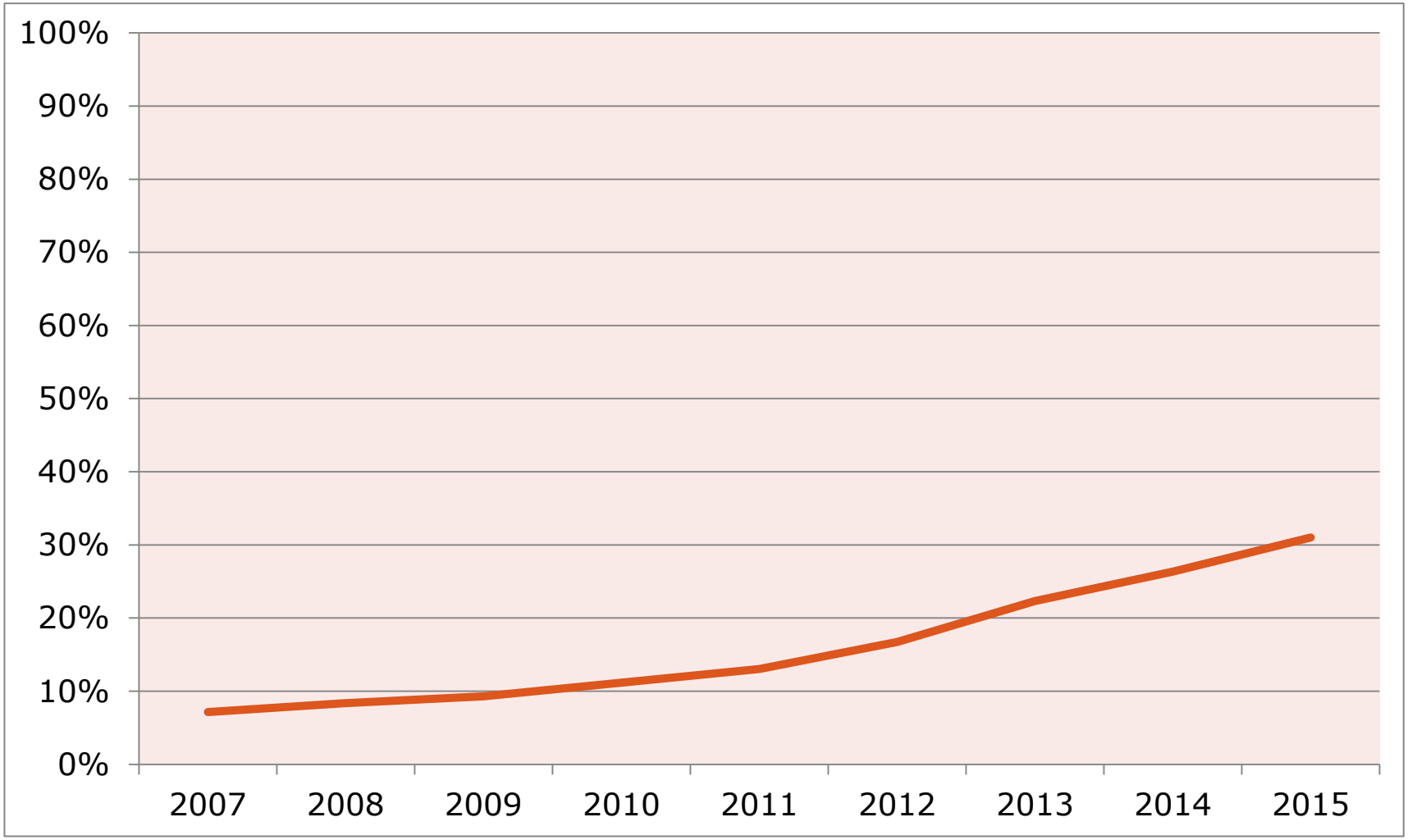


This suggests that while ambulatory EMR adoption is low in Canada overall, there is rapid growth.

Source: 2015 Ambulatory EMR Landscape Survey (Harris-Decima, 2016)

The emerging benefits of EMR use in ambulatory care in Canada: Benefits Evaluation Study

Ambulatory Care EMR Adoption: Canada 2007-2015



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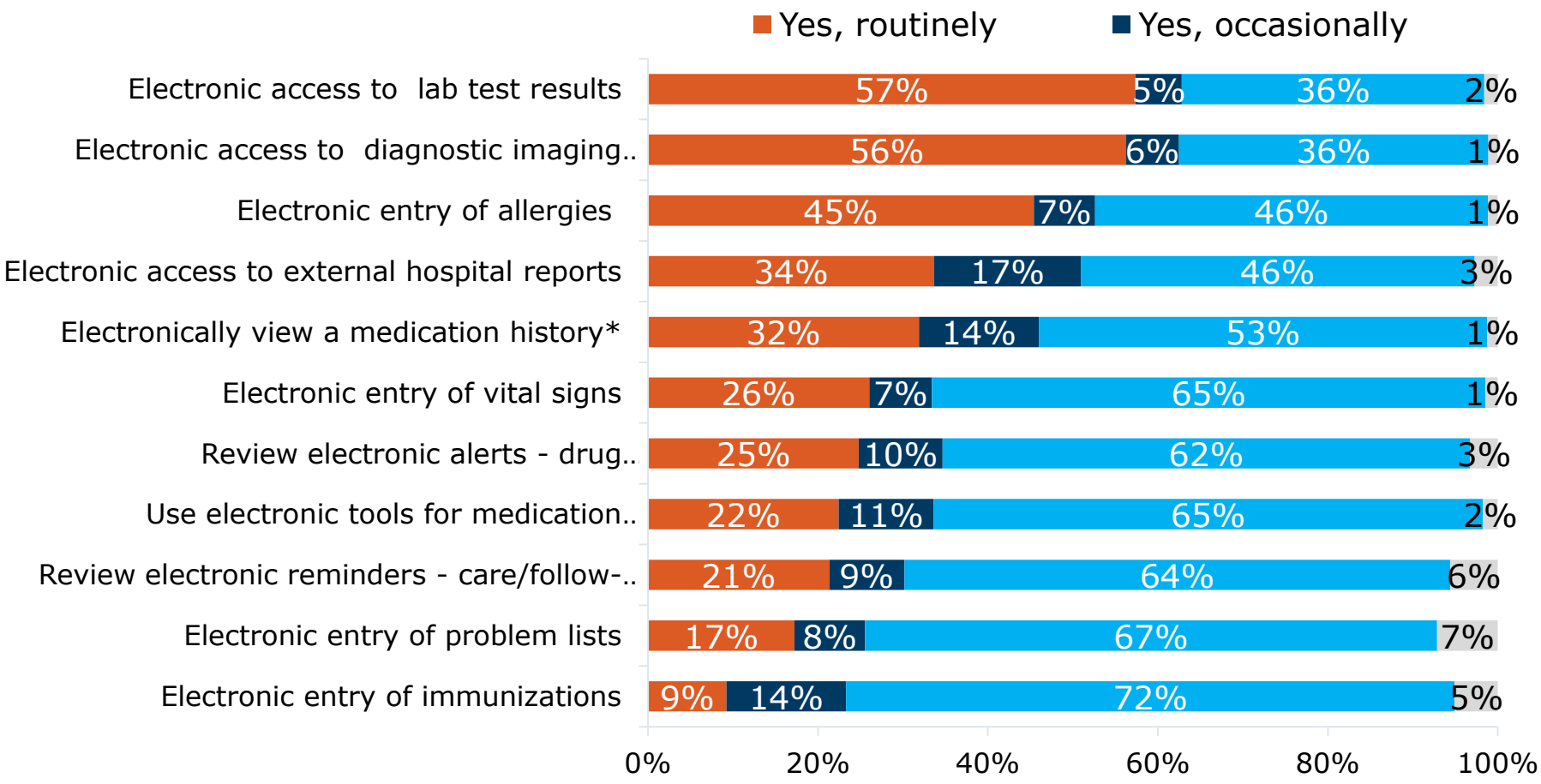
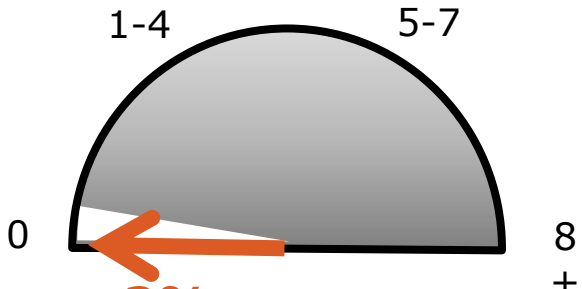
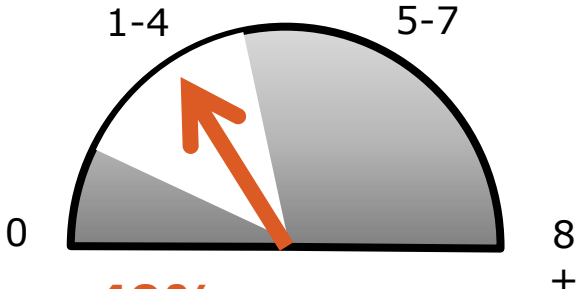
Level Of Ambulatory EMR Adoption: Functionality



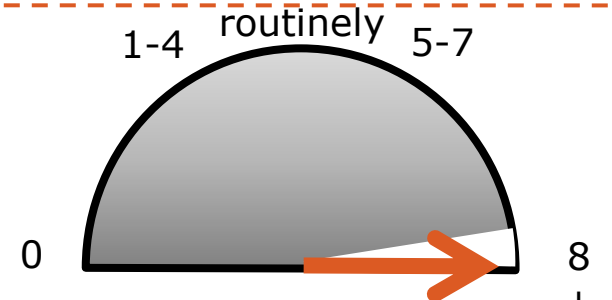


2% of clinics do not use **any** of the functionalities routinely



40% of clinics use 1-4 of the functionalities routinely

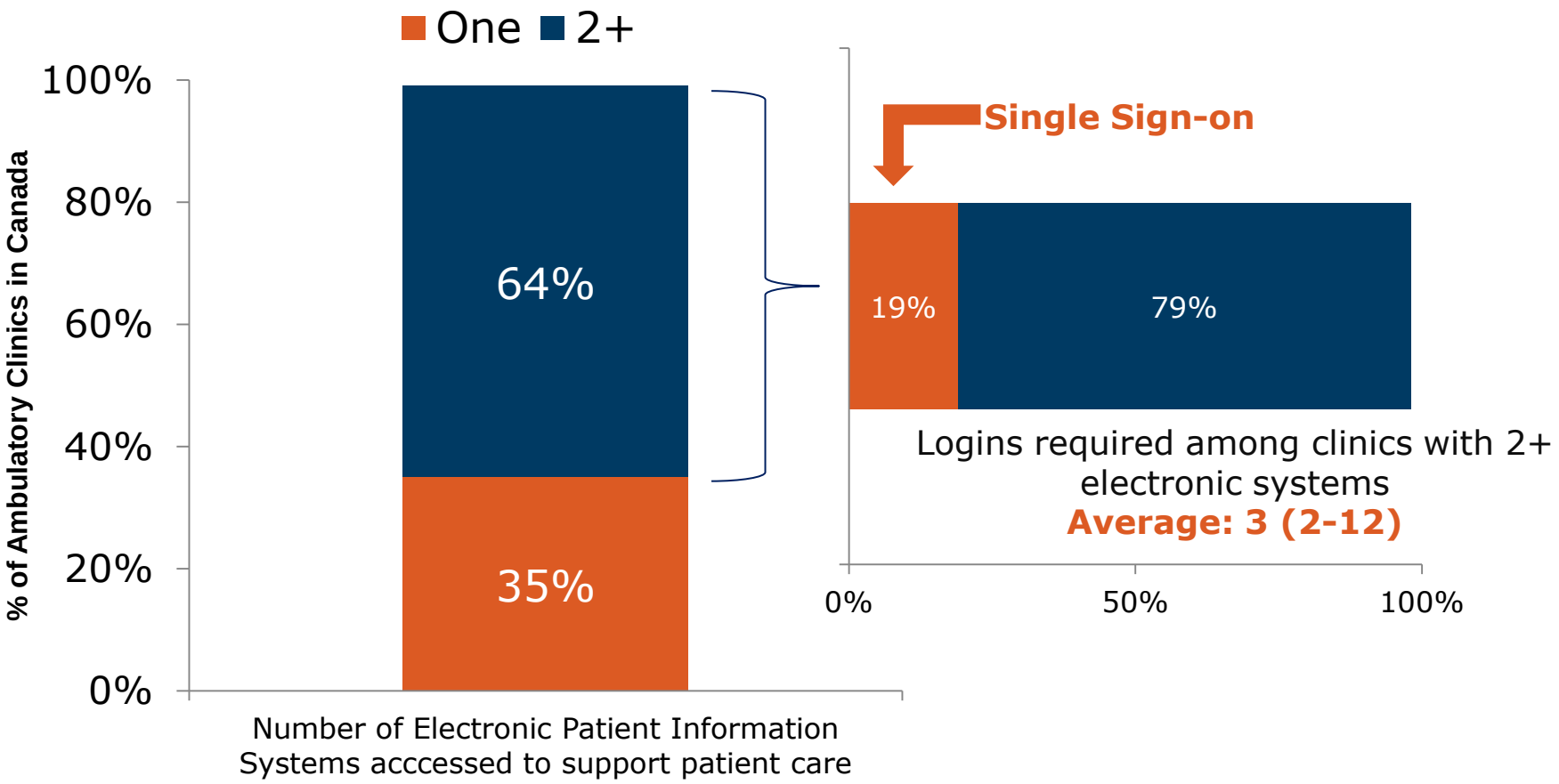
31% of clinics use 5-7 of the functionalities routinely



27% of clinics use 8 or more of the functionalities routinely

Number of Functionalities Routinely Used

In 2015, EMR-enabled ambulatory clinics access multiple electronic systems, with multiple logins to support patient care



How many electronic systems do you or clinic staff (including clinicians) typically access to support a patient encounter from registration to discharge?
Base: Respondents whose clinics capture electronic data across two or more systems (n=107)

Emerging Benefits of EMR Use in Ambulatory Care in Canada: Benefits Evaluation Study

- **Purpose**: to determine the current and emerging benefits of EMRs in hospital-affiliated outpatient ambulatory care in Canada
  - ~ 45 million visits in 2014
  - In partnership with healthcare providers & jurisdictions, Infoway has invested in 22 ambulatory care EMR implementation projects, impacting ~ 25,000 clinicians in 9 provinces
- Part of an on-going series of pan-Canadian synthesis reports

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The emerging benefits of EMR use in ambulatory care in Canada:
Benefits Evaluation Study

Executive Summary Deck

April, 2016

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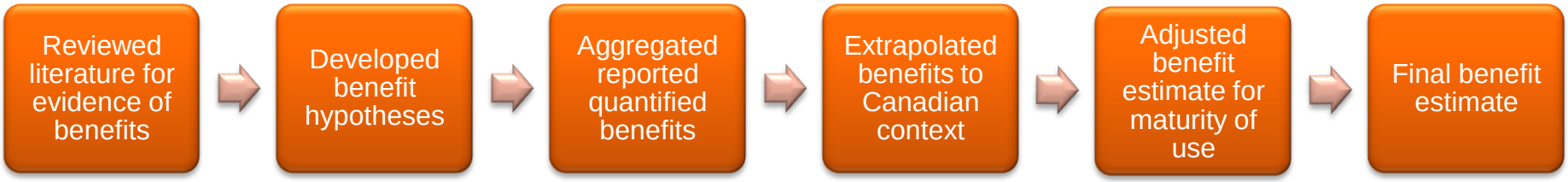
Overview

- Approach
- Summary of Current Benefit Estimates and Emerging Benefit Areas
- Key Messages and Recommendations

Approach

Overview



Models to estimate benefits were based on multiple data sources:

- 200 research articles;
- 2015 Ambulatory EMR Landscape Survey of clinics across Canada;
- Evaluation reports from Infoway AMB EMR & HIS Connect investment projects; and
- Key informant interviews.

- Literature reviewed focused primarily on the benefits of EMR use in hospital ambulatory/outpatient settings.
- Additional literature was reviewed regarding benefits realized in or applicable to Canadian ambulatory cancer care settings.
- Each model includes an adjustment to reflect “maturity of use” - Defined as the (%) clinics using EMRs who could expect to be realizing the benefit as a result of their use of specific functionalities.
- Where appropriate, estimates were extrapolated to a pan-Canadian level.

Parameters and Considerations

- The benefit estimates in this Study are:
  - a reflection of the research and evidence currently available;
  - intended to be illustrative of the current and emerging impacts of EMRs in ambulatory care, and;
  - representative of a segment of the full scope and scale of benefits likely being realized.

Parameters and Considerations (Continued)

To address the considerations, the Study team:

- focused on benefit areas where the most evidence was available;
- used Canadian findings to the extent possible, supplemented by data collected as part of Canadian Benefits Evaluation reports and key informant interviews;
- where possible, gave preference to more recent, higher quality studies;
- where possible, included multiple sources of data to minimize variation among study results;
- used ranges and conservative assumptions to increase the reliability of estimates; and
- cross-referenced and validated results with multiple sources of data and reviewed them with experts from clinical and research communities.

Classification of Benefits Hypotheses for Inclusion in the Economic Model

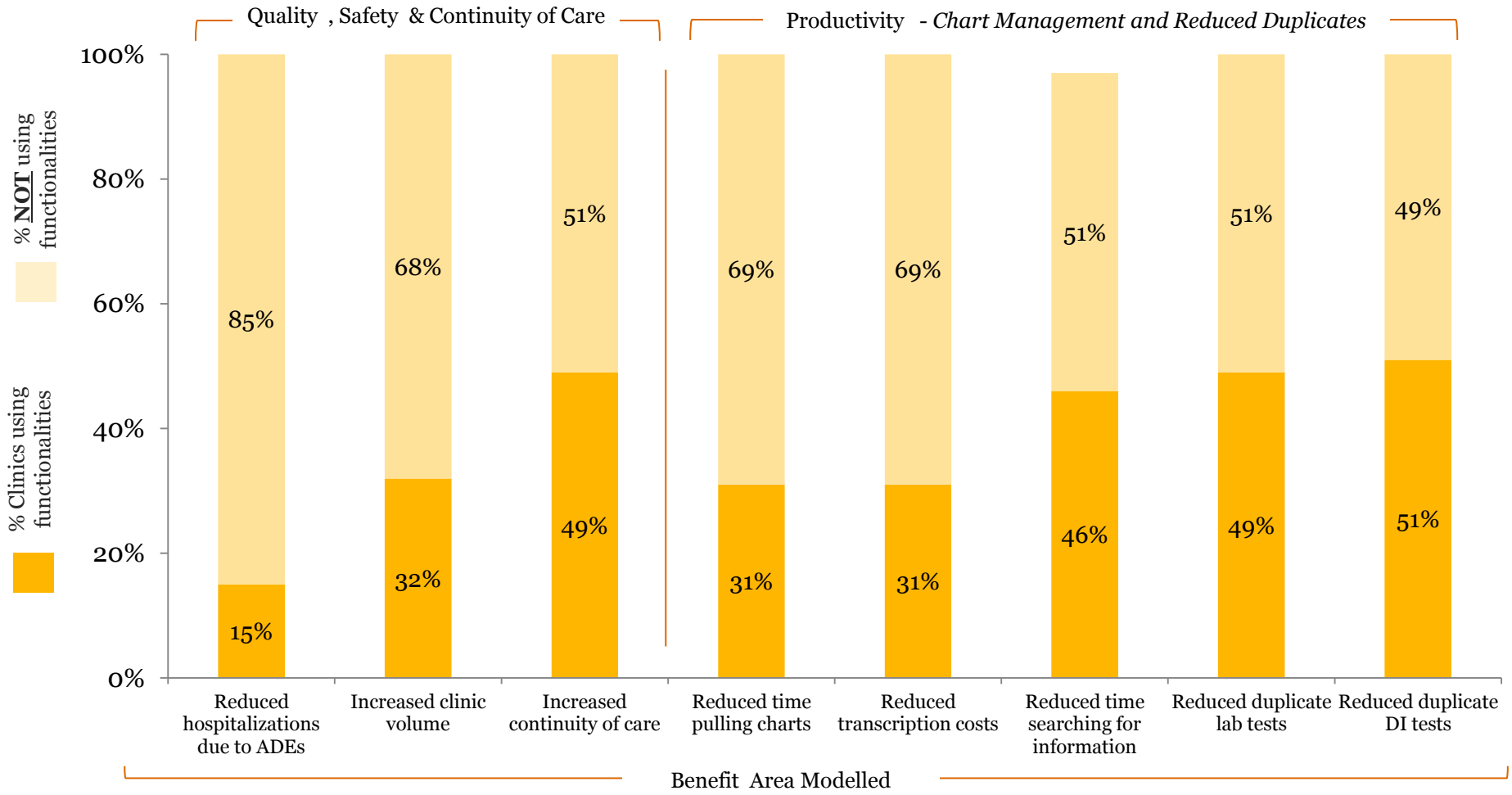
Is there strong evidence to Support the Hypothesis?	*Are the Study Results Quantifiable?*	*Can the Data / Evidence Support Valuation?*	*Suitable for Inclusion in Economic Model?*
Yes	Yes	Yes	Yes
Yes	No	No	No
No	No	No	No

EMR Adoption and Maturity of Use

- "Maturity of use" for this study is defined as the percentage of ambulatory clinics using EMRs who could expect to be realizing a specific benefit as a result of their use of specific functionalities.
  - For example, all ambulatory clinics that routinely enter clinical encounter notes including medical history and follow-up notes electronically are expected to realize the benefits from reduced chart pulls.

EMR Adoption and Maturity of Use

Maturity of use for benefit estimates: % of hospital-based ambulatory clinics estimated to realize benefit by area



Source: 2015 Ambulatory EMR Landscape Survey (Harris-Decima, 2016)

Reduction in Number of Chart Pulls

Hypothesis: EMR use in ambulatory care can *reduce the number of Adverse Drug Event (ADE)-related emergency department visits and subsequent hospitalizations*

Benefit estimate from hypothesis	Extrapolation	Maturity
Findings based on 2 studies: Systematic review and multispecialty provider serving 250 000 patients, at 14 locations, in 60 clinics. Studies indicate an **average reduction in potentially harmful ADEs: 36.6%**, (34.0% to 39.2%).	Number of annual hospital ambulatory care visits: **45M** Average number of Rx per visit: Number of ADEs per Rx (pre): Average cost per ED visit ADEs: Rate of hospital admission for ED visits for ADEs: Average cost per hospital admission for ADEs:	**15% of ambulatory care clinics in Canada** report routine review of EMR alerts or prompts about a drug dose/interaction **and also** routinely view a comprehensive electronic medication history (including medications not prescribed in clinic)

Study Results

Benefit Estimates - Summary

This study identifies $200 million ($136Mto $266M)in annual value related to EMR use in ambulatory care in Canada in 2015, plus 1.2 M more clinic visits thanks to expanded capacity. Additional areas of emerging benefit are summarized.

Estimated benefits realized in 2015

$95M	By reducing staff time spent on chart management processes – chart pulls, searching for information and transcription: **($63 to $133M)**
$46M	By reducing the number of duplicate laboratory tests : **($31 to $64M)**
$37M	By reducing the number of duplicate diagnostic imaging tests : **($27 to $43M)**
$13M	By reducing adverse drug event -related emergency department visits and hospitalizations **($13 to $14M)**
$4M	By reducing unnecessary delays in care through availability of required information (benefit accrues to patients) **($2 to $6M)**

Special Focus: EMR use supports increased system capacity & reduced time to receive cancer treatment

- Fewer days waiting from specialist consultation to first treatment : **201,000 days** *(range: 98,000 to 352,000)* in 2015

- Reduced adverse drug event-related emergency department visits and subsequent hospitalizations: **$3MM** in 2015

- Additional care realized through increased clinic capacity in 2015 **:**

  4,000 for systemic therapy *(range: 2,100 to 6,400)*
  15,500 for radiation therapy *(range: 8,300 to 24,800)*

* All figures reflect estimates for 2015.

Emerging Benefit Areas

Adherence to Treatment Guidelines

EMR use supports reduced practice variation, impacting patient safety and the proportion of patients eligible to receive evidence-based care or treatment.

Improved Scheduling

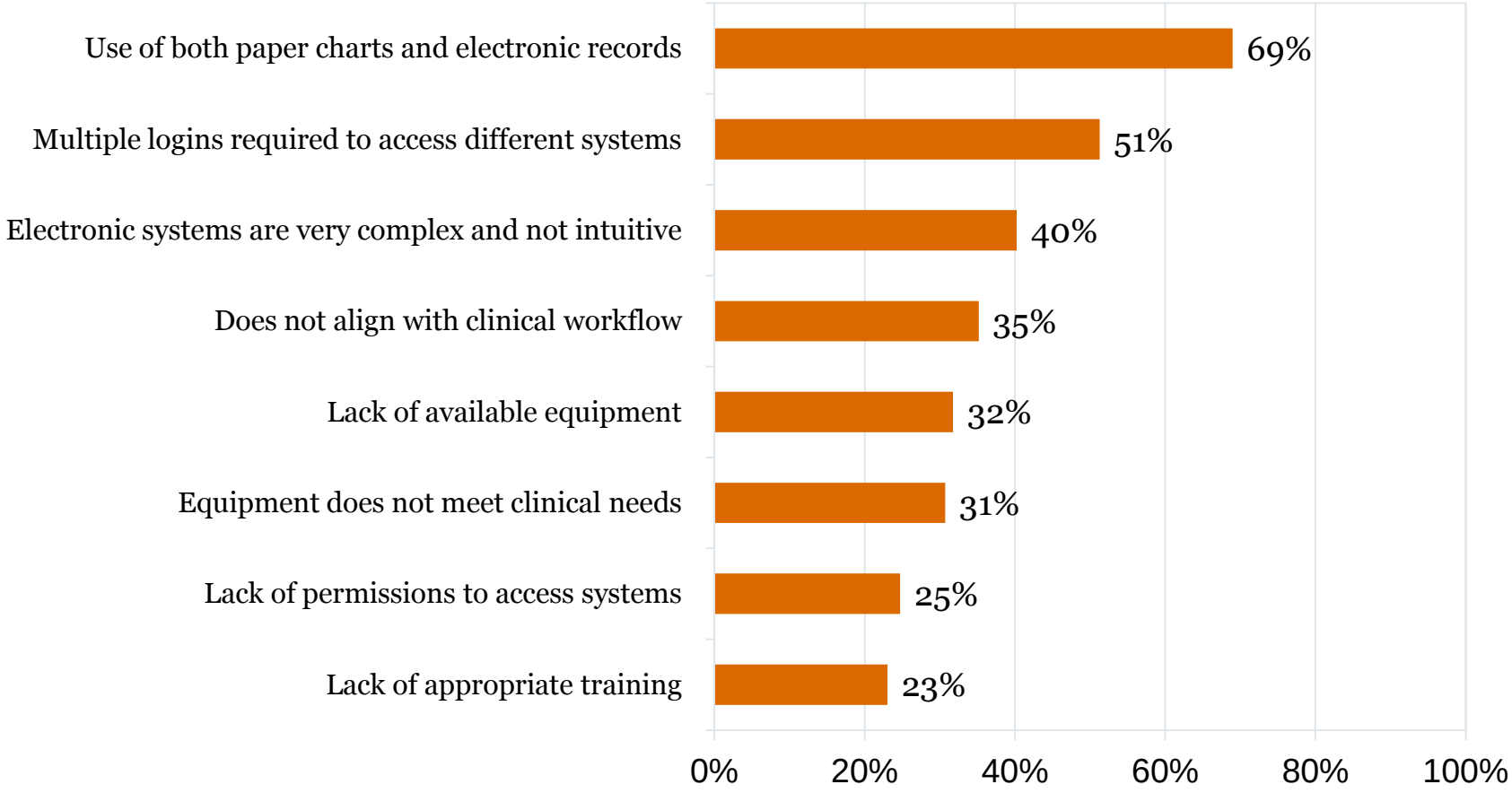
Electronic booking (e-booking) systems have demonstrated value by enhancing overall scheduling efficiency for patients and clinicians and minimizing the number of missed and no-show appointments.

Analytics

Informing hospital and health system planning; has the potential to revolutionize clinical and health services research, quality improvement, preventative care, and post-acute care coordination.

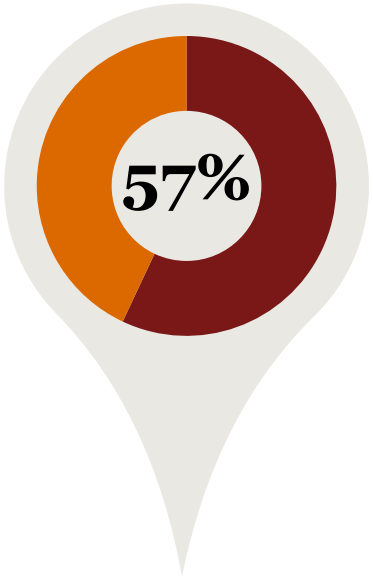
Critical Success Factors

Barriers to Benefits Realization



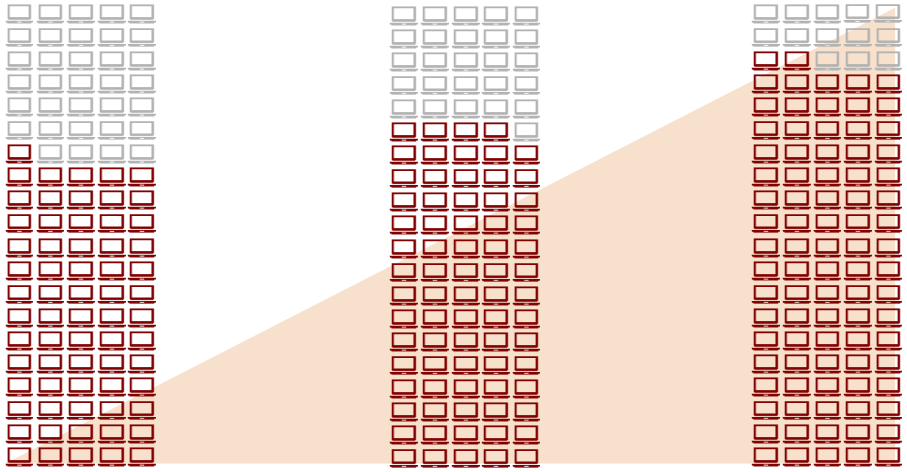
Source: 2015 Ambulatory EMR Landscape Survey (Harris-Decima, 2016)
Base: Respondents whose clinics use some electronic format or are close to paperless (n=185)

EMR use setting the foundation for Quality of Care



Overall, 57% of EMR-enabled clinics report that EMR use has been beneficial or very beneficial for improving quality of care

Clinics with access to **external data sources**, that use more **advanced functions**, and have transitioned to a **fully paperless** environment are significantly* more likely to report that EMR use has had a beneficial impact on improving quality of care



66%
access to external data sources

74%
using 5 or more advanced functions

87%
fully paperless

Source: Infoway analysis, (Harris-Decima, 2016).
* *($p < 0.001$)*

EMR use results in health system benefits, such as improved patient safety, care continuity & efficiency

There is evidence that effective **use of EMRs and complementary technologies can improve quality of care, patient safety, access, and productivity** in ambulatory care.

Clinic and clinician efficiencies account for the largest share of value measured in this study (e.g. chart management processes and reduced duplicate testing), but quality of care benefits are also important. They are expected to rise over time as EMR use grows and matures.

Quality of care is driven by mature use and interoperability. Clinics with access to external data sources, those using more advanced functions, and especially those who have transitioned to a fully paperless environment are more likely to report EMR use has had a positive impact improving quality of care.

The most common **barriers to benefits realization that clinics report** include: mixed paper/electronic systems, multiple logins, system design and functionality gaps, misalignments with clinical requirements and workflow, and a lack of available equipment.

Study Recommendations

Study Recommendations

1. Continue to realize the benefits of ambulatory care EMRs by investing in their adoption and maturity of use through key enabling strategies and technical solutions that meet clinical requirements

2. Accelerate regional and national measurement of EMR adoption and maturity of use in the ambulatory care setting using established standards

3. Continue to improve the connectivity and interoperability of ambulatory EMR systems with local and provincial systems, including EHRs and e-Referral solutions to support communication

4. Address priority research areas in order to develop robust evidence on the advanced use of EMRs in ambulatory care settings to drive clinical value and quality outcomes of patient care and system sustainability

Saskatchewan Cancer Agency

Ambulatory EMR Journey

Brenda Jameson, CIO, Saskatchewan Cancer Agency

June 2016

Who We Are

- A provincial healthcare organization with a legislated mandate to provide cancer control for the more than 1.13 million people in Saskatchewan
- More than 790 employees provide clients, patients and families with safe, quality treatment, innovative research, early detection and prevention programs

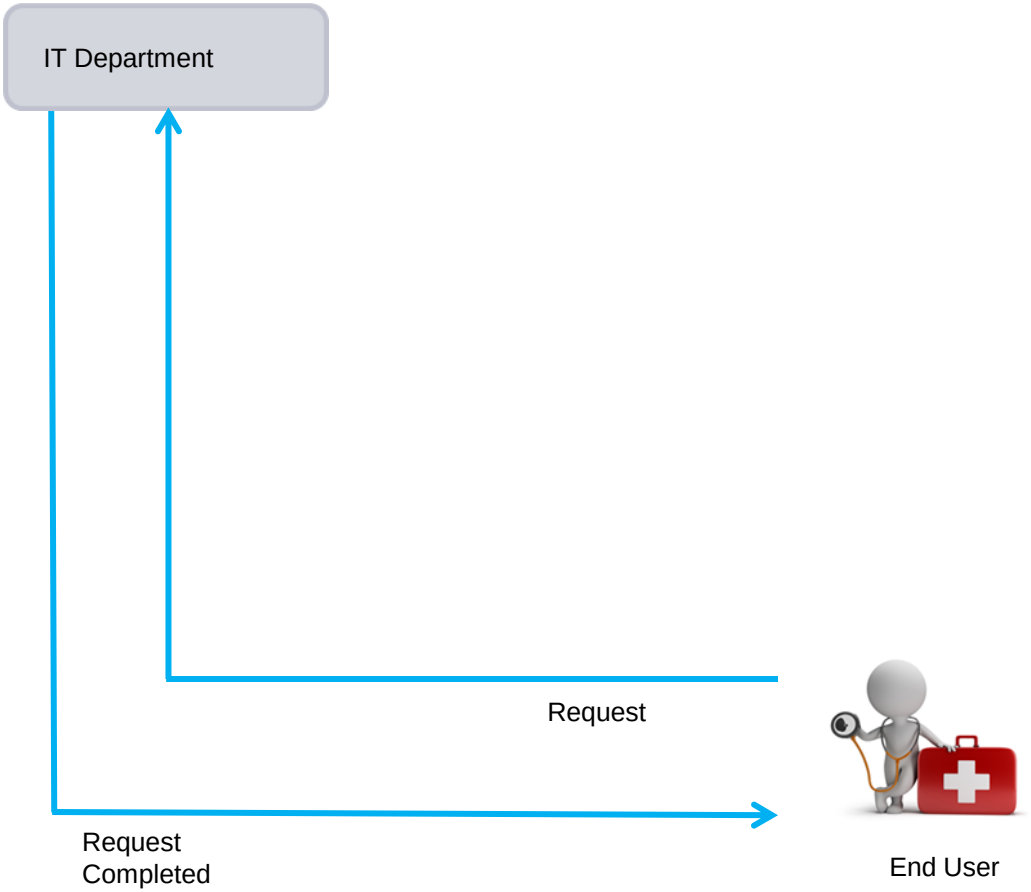
SCA EMR Background

- In June 2001, the Agency developed a multi-year Information Management Strategic Plan
  - A clinical management system was a major cornerstone of the Plan
- Project kicked off in September 2004
  - Registration & Scheduling Go-Live in April 2005
  - Regina lab and microbiology results paperless in October 2006
  - Regina pathology reports paperless in February 2007
  - All SCA physicians using dictation as of January 2008
- Project stalled….

Why Did We Stall?

- The project was viewed as an IT project, resulting in clinicians viewing the EMR being “done to them”
- The project started before we were a Provincial Organization, resulting in a lack of alignment on the vision for the EMR
- There was a lack of documented evidence of issues that the EMR could resolve, resulting in less desire to change workflow or to standardize processes to take advantage of the features of the software to resolve these issues
- Implementing the EMR prior to having provincial repositories hampered adoption as we could not consume required data (such as lab results, pathology reports etc)
- There was no governance in place to set priorities, manage the change and ensure adoption was maintained

Governance Structure - Before



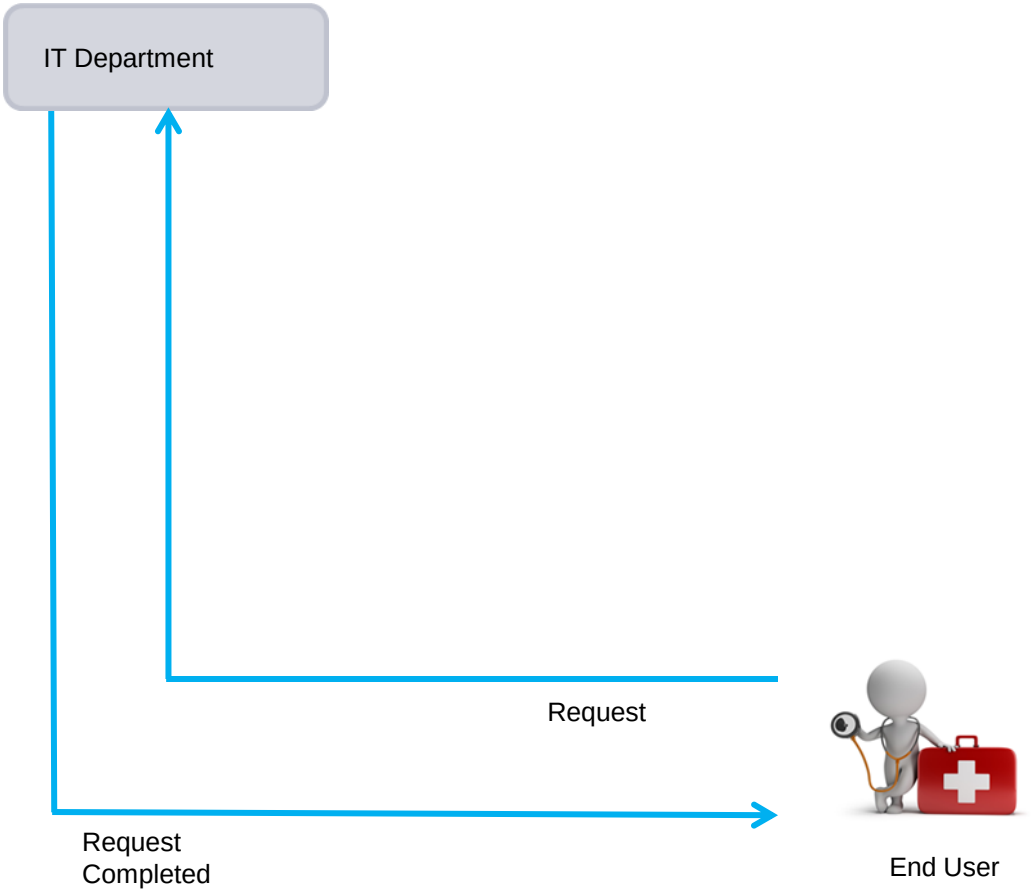
What has changed?

- Our EMR is the #1 priority on our 5 year Strategic Plan
- Our Incident Reporting system has given us the evidence of the issues we need to resolve
- The Provincial EHR has matured, allowing us to consume the data we need and to share information easier with our patient's other health care providers
- The EMR software has matured
- We created a shared vision for the future state of our EMR, and a Roadmap to get us there
- We put the priority setting and decision making in the hands of the clinicians by creating a governance structure that is lead by clinicians, and supported by IT
- We don't do this off the side of our desks.
- We agree that doing it right is more important than doing it fast.

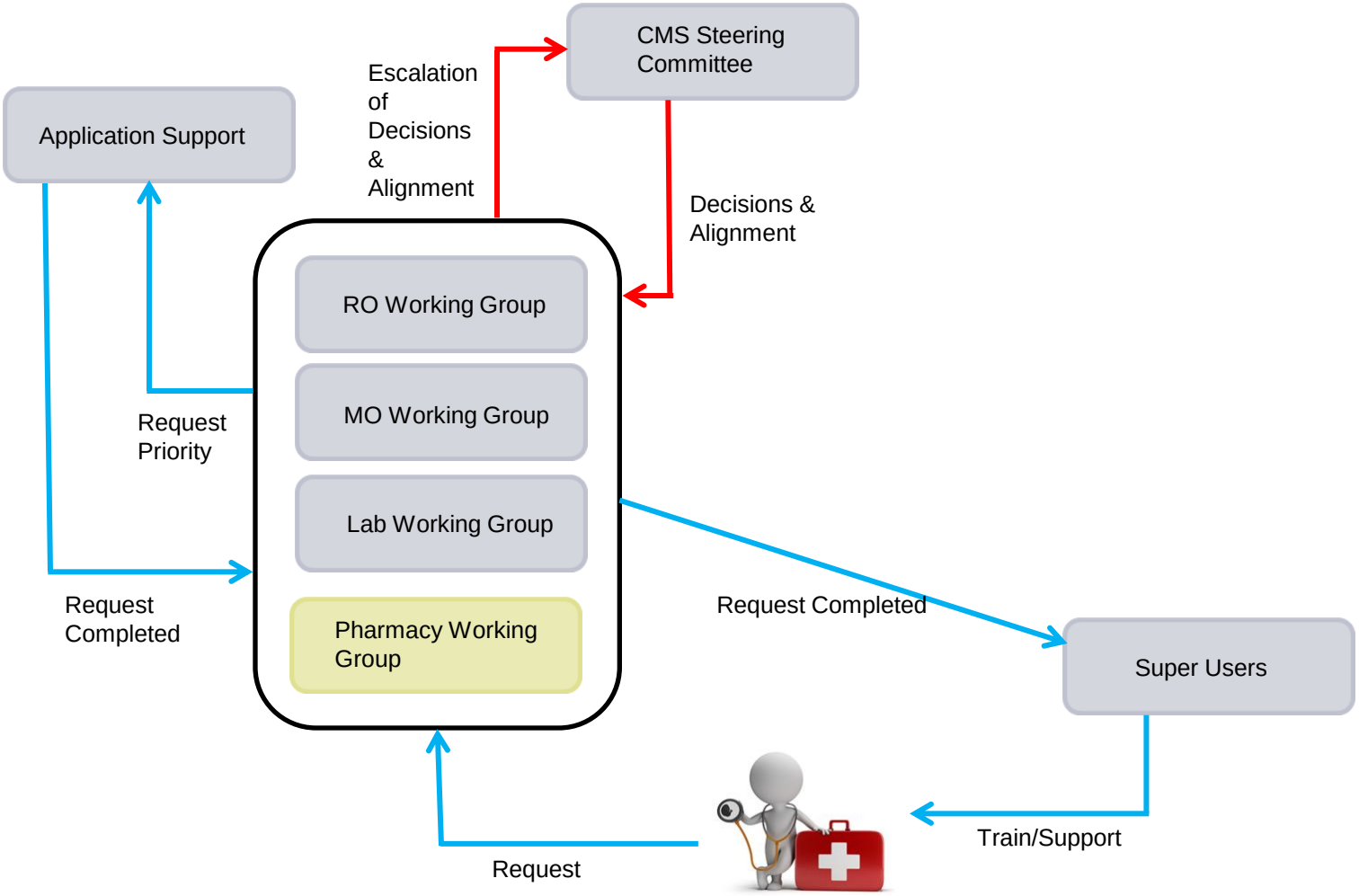
Information Governance Strategy

- The goal is to have decision made at the right level by the right people, without involving the same people in an endless cycle of meetings
- In essence, like the Lean system, pushing decision making down to the factory floor
- Strong governance facilitates good planning and decision making, and should prevent most surprises
- These groups are not set up once then ignored. They are meant to exist in perpetuity, and evolve as the organization evolves

Governance Structure - Before



Governance Structure



Evidence to Support the Benefits of EMR use

Our Incident Reporting System recorded:

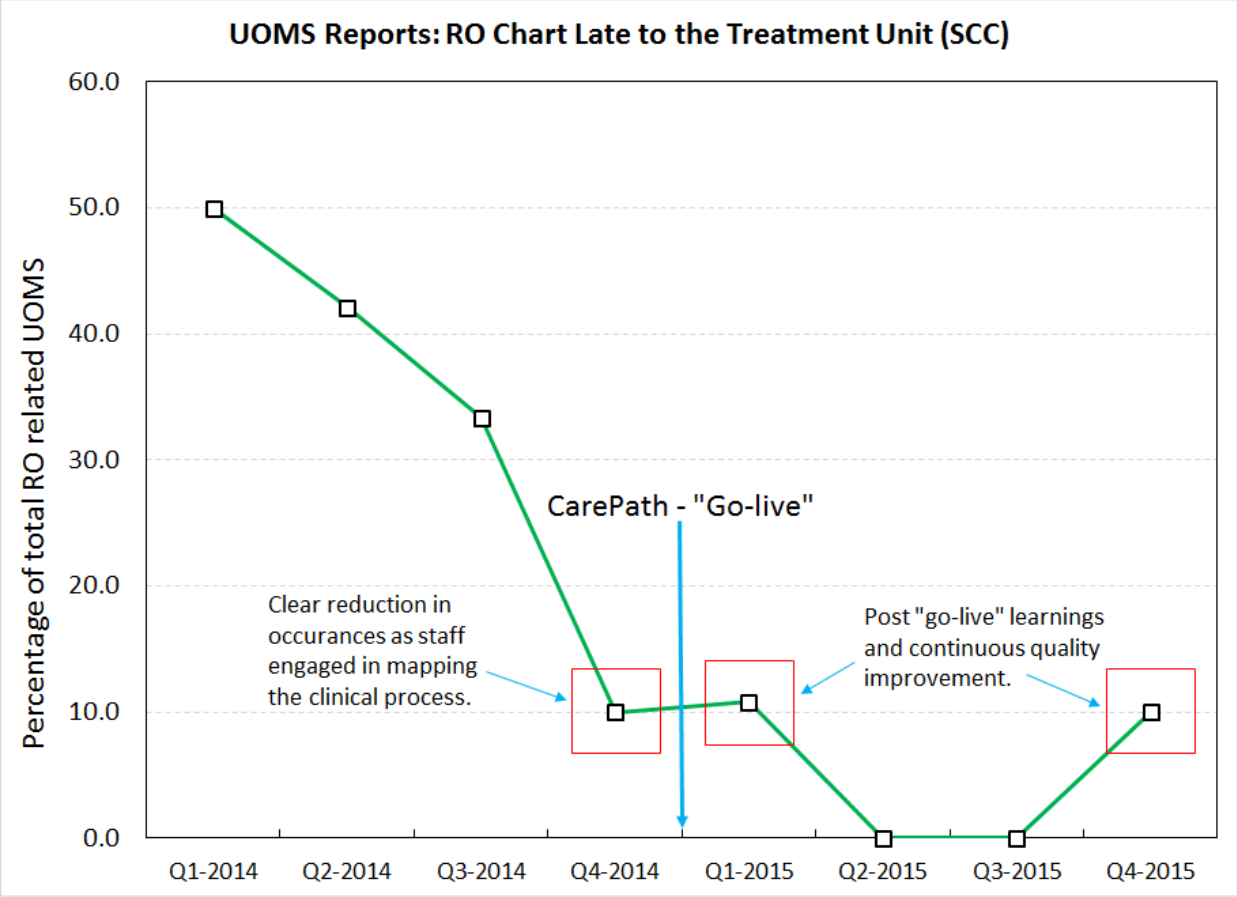
- In Q4 of 2015-16, 178 patients had their new patient visit delayed due to missing pathology reports
- Since implementing our incident Reporting System, we have recorded 671 medication related incidents

Evidence to Support the Benefits of EMR use

Since restarting this EMR implementation in 2014:

- 68% decrease in Phlebotomy staffs' time spent on tracking down missing test results with Saskatoon clinic staff.
- 100% decrease in Saskatoon clinic Community Liaison Nurse's time spent on tracking down missing test results.
- Workflow changes to optimize utilization of the scheduling function in the EMR to move patients from Phlebotomy to their next appointment
- New processes were implemented so that phone messages are recorded electronically in the patient's medical record, instead of on a paper slip.

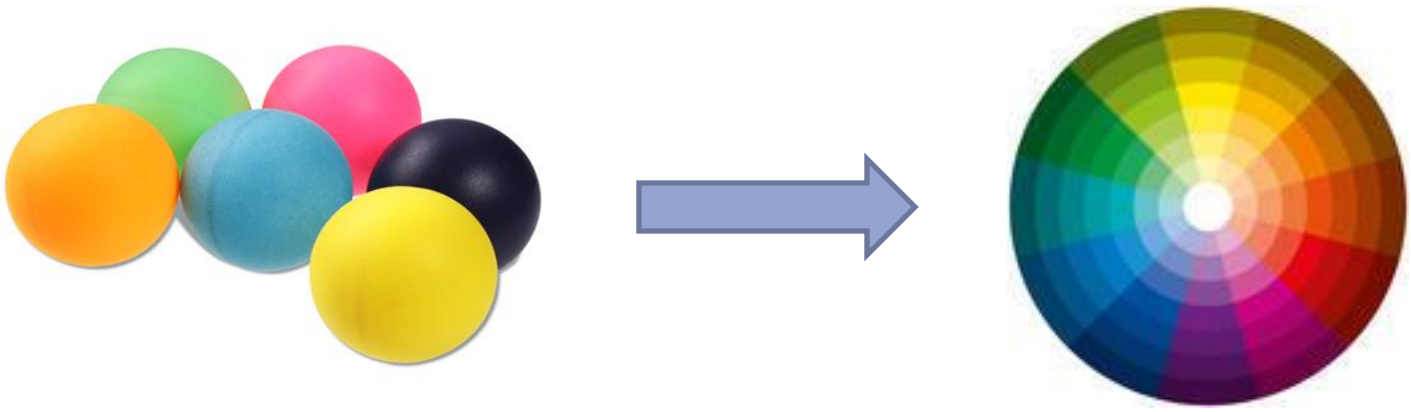
Evidence to Support the Benefits of EMR



Emerging benefit areas

- Adherence to Treatment Guidelines
  - EMR use supports reduced practice variation, impacting patient safety and the proportion of patients eligible to receive evidence-based care or treatment.
  - SCA standardized drug regimens, minimum clinical dataset
- Improved Patient Experience
  - Ability for entire multidisciplinary team to access information instantaneously rather than having to wait for the paper chart to get around – patient's visit in the ambulatory clinic is quite short and various members of multidisciplinary team need either sequentially or concurrently see the patient in that time
  - Ability to amalgamate information from multiple systems/jurisdictions for clinical decision support and reduce the need for duplicate tests and procedures when patient using multiple levels of healthcare (e.g. primary care, surgical care, oncology care) for multiple health issues

Goal



Rich data stores that are integrated to support the continuum of cancer care services, decision making, outcome measurement and the agency's research initiatives, while protecting patient privacy.

Questions