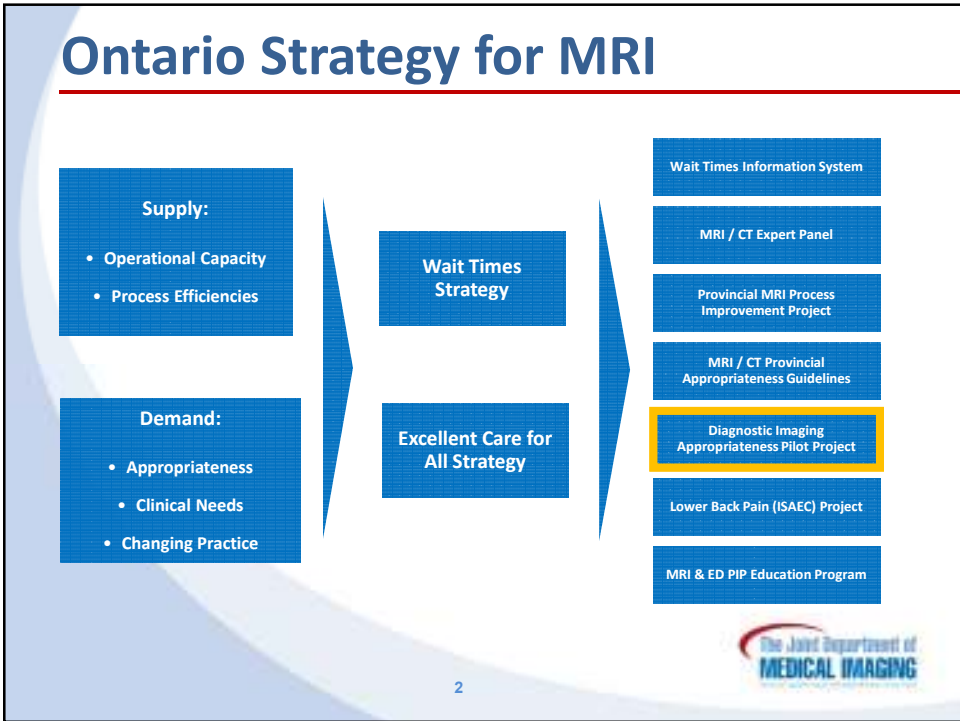
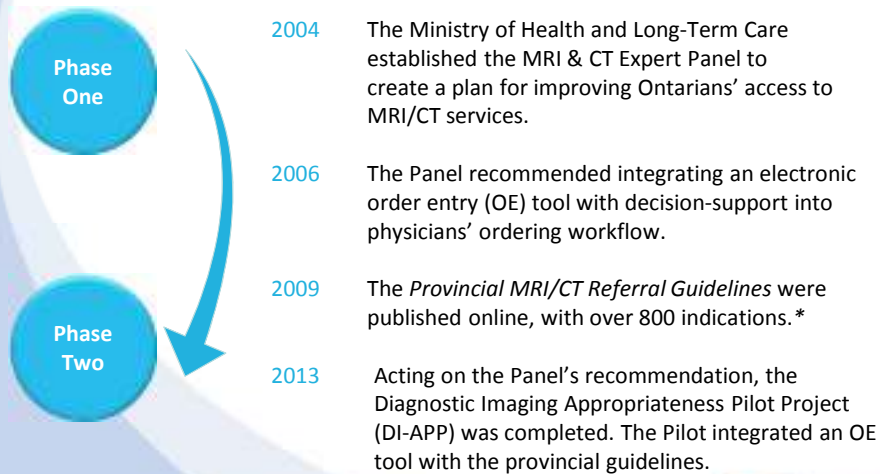


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Mount Sinai Hospital • University Health Network • Women's College Hospital

**Ontario's Diagnostic Imaging
Appropriateness Pilot Project**



Ontario's Appropriateness Initiatives



*The Provincial MRI/CT Referral Guidelines can be located at:
https://www.mri.ct.decisionsupporttool.ca/OEB/IndicationSearch/Help_Introduction



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Pilot Description

The Diagnostic Imaging Appropriateness Pilot Project (DI-APP) implements **an electronic order entry tool** with evidence-based **decision support** for MRI/CT in community physicians' offices across Ontario.

The DI-APP solution's desired outcome is a decrease in inappropriate scans, ultimately decreasing both booking turn around times and wait times within the province.



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Rising Demand for MRI/CT Exams

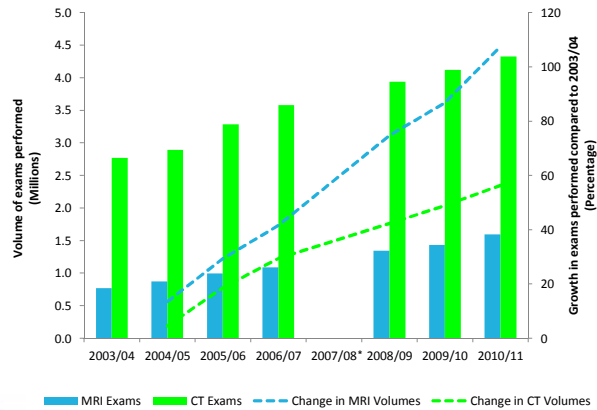
Growth:

- In Canada volumes of MRI and CT exams performed are increasing annually by 11% and 5%, respectively.¹

Appropriateness:

- According to the Health Council of Canada approximately 30% of MRI and CT requests are inappropriate.²

Growth in volumes of MRI and CT exams performed in Canada between 2003-2011³



¹ Canadian Institute for Health Information, "Medical Imaging in Canada: 2011", http://www.cihi.ca/CHI-ext-portal/pdf/Internet/MIT_SUMMARY_2011_en

² Health Council of Canada, "Decisions, Decisions: Family Doctors as Gatekeepers to Prescription Drugs and Diagnostic Imaging", September 2010

³ Canadian Institute for Health Information, "MIT 2011 Data Release: Static Figures and Tables", http://www.cihi.ca/CHI-ext-portal/Internet/EN/Quick_Stats/quick-stats/quick_stats_main?xTopic=Specialized%20Care&pageNumber=5&resultCount=10&filterTypeBy=undefined&filterTopicBy=13&autoRefresh=1

* An inventory was not conducted in 2008

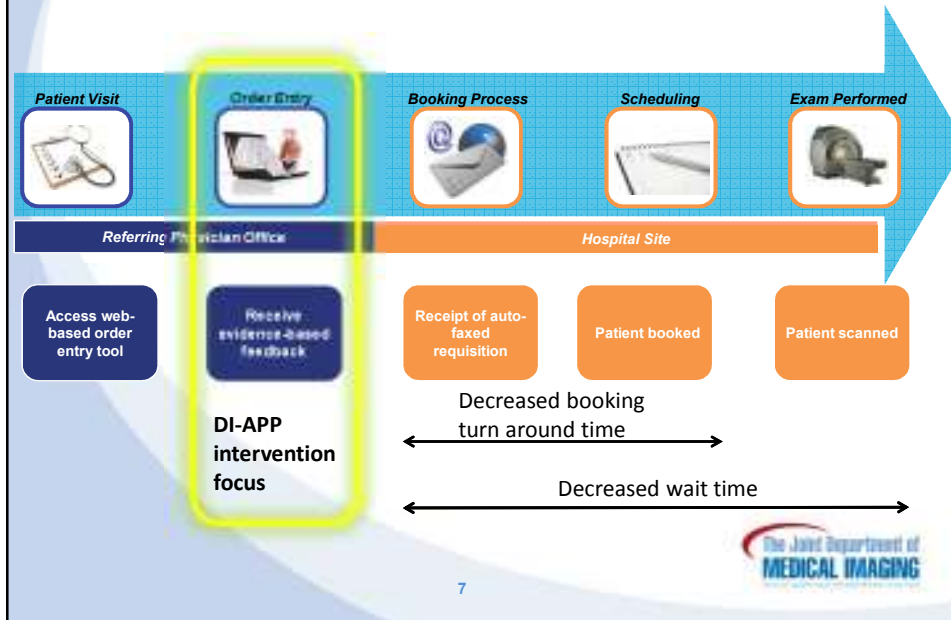


Pilot Goals

- Implement the DI-APP solution (order entry tool with referral guidelines)
- Assess Impact of DI-APP solution on appropriateness
- Collect participant feedback on the DI-APP solution
- Inform on the future of appropriateness in Ontario



MRI/CT Ordering Workflow



Feedback Score

Before placing the order, the referring physician will receive one of the below scores for the requested modality.

Indicated Preferred	There is clinical evidence to support the use of either CT or MRI to investigate or followup a specific clinical condition but one modality has been shown to provide superior information.
Indicated	There is clinical evidence to support the use of the modality selected to provide relevant and useful information in the diagnosis and/or management of the clinical indication given.
Consult	There is inconclusive clinical evidence to support the use of the modality selected to provide relevant and useful information in the diagnosis and /or management of the clinical indication given. Radiology should be consulted to further review the patient's case or to seek alternatives to the examination requested.
Inconclusive	The clinical indication terminology does not exist within the Referral Guidelines' terminology.
Not Indicated	There is no clinical evidence to support the use of the modality selected to provide relevant and useful information in the diagnosis and/or management of the clinical indication given.
Contra-Indicated	The requested modality may potentially harm the patient's safety based on hospital screening questions.

Order Entry Tool Steps

1



Login Screen

Each referring physician is given a unique username and password.

2



Patient Search Screen

Patient demographics is uploaded from the EMR system into the order entry (OE) tool.

Patients can be searched by first name, last name, date of birth, or OHIP #.



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Order Entry Tool Steps

3



Create New Patient Screen

For new patients, information must be entered for all the bolded fields.

4



Desired Modality Search

The desired procedure may be searched by modality type or body site.



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Order Entry Tool Steps

5



Clinical Indication Search

Desired clinical indication may be searched by the body site or clinical indication.

A synonym database was uploaded to increase matches with Ontario's MRI/CT referral guideline terminology.

6



Screening Questions Screen

The screening questions reflects the hospital's MRI and CT requisitions

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Order Entry Tool Steps

7



Feedback Screen

Scores range from Indicated Preferred, Indicated, Consult, Not Indicated, Contraindicated to Inconclusive.

If a 'Not Indicated' exam is selected, the referring physicians is required to enter a reason for their selection.

8



Warning Screen

Warnings appear if there is negative impact on the patient's safety or additional information is required.

Responses to these warning may be entered in the comment box.

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Order Entry Tool Steps

9



Transmission Screen

The system auto-faxes the requisition to the hospital site.

10



Requisition

Physicians have the option to save a PDF copy of the requisition or print the document.

13



Participating Communities



Community	Toronto	Hamilton	London	Thunder Bay
Referring Physicians Population	<ul style="list-style-type: none"> Non-hospital affiliated clinics and solo practices 	<ul style="list-style-type: none"> Non-hospital affiliated solo practices 	<ul style="list-style-type: none"> Hospital embedded clinics 	<ul style="list-style-type: none"> Non-hospital affiliated clinics

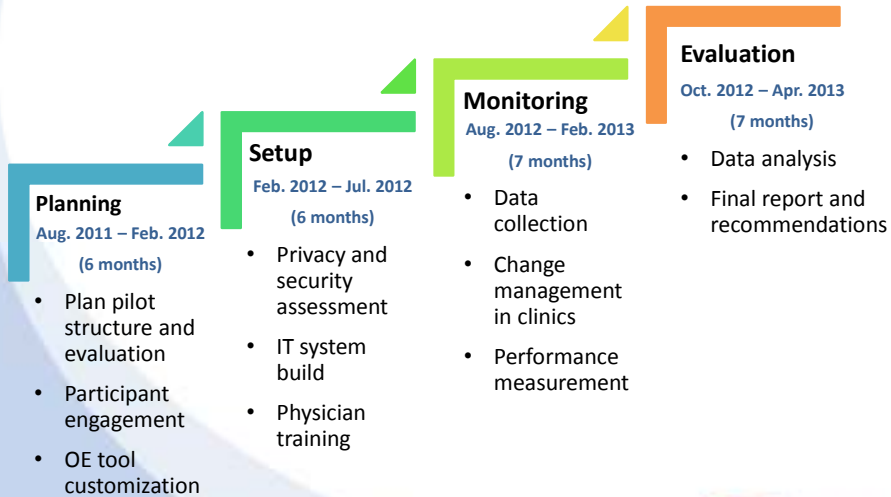
Total Participants: 12 clinics with 50 referring physicians

*The Provincial MRI/CT Referral Guidelines can be located at:
https://www.mriandctdecisionsupporttool.ca/OEBI/IndicationSearch/Help_Introduction

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Timelines



Pilot Results

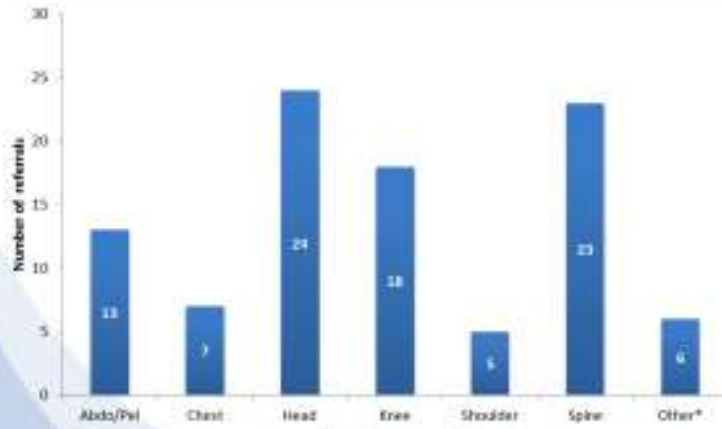
Metric	Pre-Pilot Study <i>n</i> = 778	Pilot Study <i>n</i> = 96*
Indicated Referrals <i>Proportion of orders that initially match guideline recommendations</i>	42%	60%
Not Indicated Referrals <i>Proportion of orders that initially do not match guideline recommendation</i>	13%	6%
Unmatched Requests <i>Proportion of all requests that do not match the guideline terminology</i>	32%	20%
Consults <i>Proportion of all requests where a consultation with radiology was recommended</i>	13%	14%
Compliance <i>Proportion of initial orders that are changed to follow guidelines</i>	N/A	85%
Requisition Completeness <i>Proportion of orders received through OE tool that are complete</i>	89%	97%

Most referrals came in over a 3 month collection period from the 50 engaged referring physicians (general physicians and specialists)

* Statistically significant



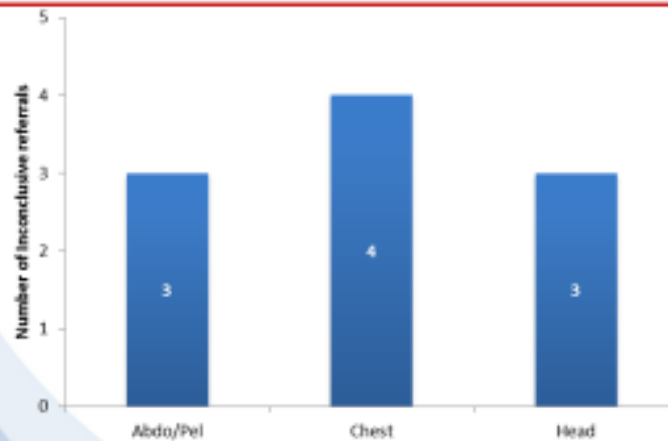
Referrals by Body Site



Other represents body sites that were rarely requested in the pilot, such as cardiac, foot, wrist

This graph generally matches typical referral patterns as Head, Spines, and Knees are usually the most requested exam types for MRI and CT.

Unmatched Referrals by Body Site



While the samples are small, this graph may provide some initial direction regarding areas of opportunity in terms of assessing the comprehensiveness of the referral guidelines.

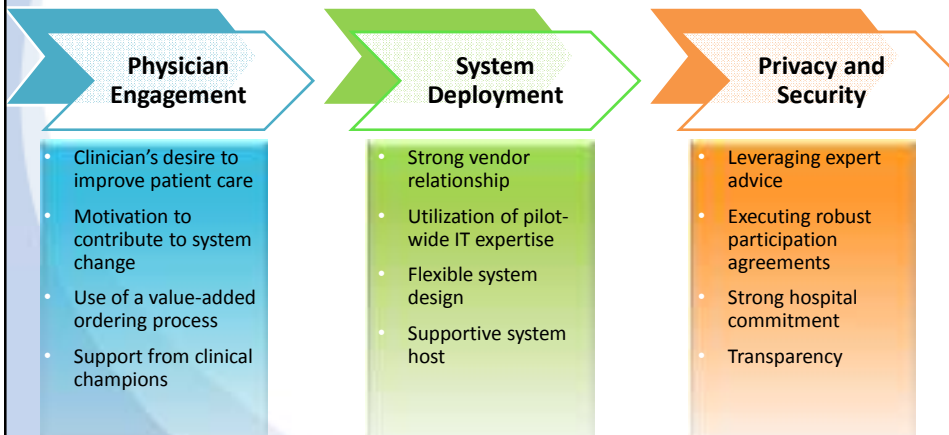
Requisition Completeness



This graph demonstrates the primary reasons requisitions are deemed incomplete. Incomplete requests contribute significantly to the booking effort. Results were collected from the project's pre-pilot study.



Key Success Factors



Lessons Learned

Appropriateness Concept

- ➔ Common and broadly accepted definition for “appropriateness” is critical
- ➔ Better understanding of drivers behind inappropriate ordering practices required
 - Patient pressure noted as one of the primary reasons for this ordering behaviour

Champions

- ➔ Clinical, administrative and executive champions are critical to successful community engagement

Physician Engagement

- ➔ Without a tangible incentive physicians engagement was challenging
- ➔ Lack of integration with clinics’ EMR is a barrier to participation
- ➔ Time taken to complete an online order prohibitive to physicians

Referral Guidelines

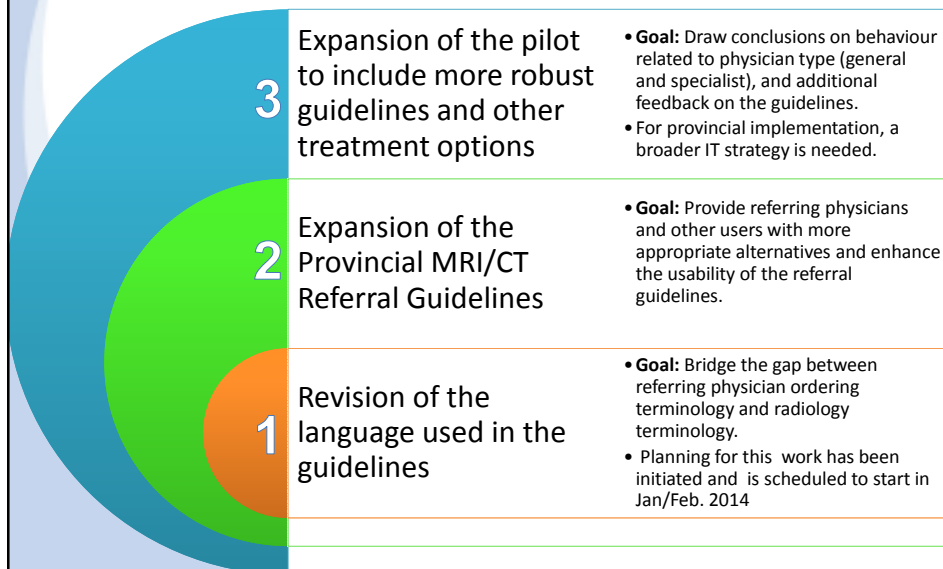
- ➔ Critical to include up-to-date guidelines
- ➔ Specialist language was a common complaint among referring physicians
- ➔ Referring physicians are looking for a line of communication with radiologists

Privacy

- ➔ Feasible under current provincial privacy legislation



Next Steps



Conclusion

- Successfully gathered lessons learned and recommendations to inform next steps of appropriateness initiatives in Ontario.
- Valuable opportunity to build awareness of evidence-based guidelines.
- While concrete conclusions about the impact of the OE cannot be drawn due to limited data captured, the pilot successfully proved the concept of providing effective clinical decision support through an OE tool with built-in guidelines.

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Contact Information

For more information please contact Tania Simoes, Business Analyst for the Joint Department of Medical Imaging at tania.simoese@uhn.ca



Thank you for your interest in Ontario's Diagnostic Imaging Appropriateness Pilot Project.

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