Ontario’s Diagnostic Imaging
Appropriateness Pilot Project

Ontario Strategy for MRI

Supply:
- Operational Capacity
- Process Efficiencies

Demand:
- Appropriateness
- Clinical Needs
- Changing Practice

Wait Times Strategy
Excellent Care for All Strategy

Wait Times Information System
MRI / CT Expert Panel
Provincial MRI Process Improvement Project
MRI / CT Provincial Appropriateness Guidelines
Diagnostic Imaging Appropriateness Pilot Project
Lower Back Pain (ISAEC) Project
MRI & ED PIP Education Program
Ontario’s Appropriateness Initiatives

Phase One

2004 The Ministry of Health and Long-Term Care established the MRI & CT Expert Panel to create a plan for improving Ontarians’ access to MRI/CT services.

2006 The Panel recommended integrating an electronic order entry (OE) tool with decision-support into physicians’ ordering workflow.

2009 The Provincial MRI/CT Referral Guidelines were published online, with over 800 indications.*

2013 Acting on the Panel’s recommendation, the Diagnostic Imaging Appropriateness Pilot Project (DI-APP) was completed. The Pilot integrated an OE tool with the provincial guidelines.

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

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.
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

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* An inventory was not conducted in 2008

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**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**

**Order Entry**
- Access web-based order entry tool
- Receive evidence-based feedback

**Booking Process**
- DI-APP intervention focus
- Decreased booking turn around time
- Decreased wait time

**Scheduling**
- Receipt of auto-faxed requisition
- Patient booked

**Exam Performed**
- Patient scanned

**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 follow up 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 #.

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.
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 reflect the hospital’s MRI and CT requisitions.

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.
Order Entry Tool Steps

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

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

Participating Communities

<table>
<thead>
<tr>
<th>Community</th>
<th>Toronto</th>
<th>Hamilton</th>
<th>London</th>
<th>Thunder Bay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referring Physicians Population</td>
<td>• Non-hospital affiliated clinics and solo practices</td>
<td>• Non-hospital affiliated solo practices</td>
<td>• Hospital embedded clinics</td>
<td>• Non-hospital affiliated clinics</td>
</tr>
</tbody>
</table>

Total Participants: 12 clinics with 50 referring physicians

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

**Planning**
- **Aug. 2011 – Feb. 2012** (6 months)
  - Plan pilot structure and evaluation
  - Participant engagement
  - OE tool customization

**Setup**
  - Privacy and security assessment
  - IT system build
  - Physician training

**Monitoring**
- **Aug. 2012 – Feb. 2013** (7 months)
  - Data collection
  - Change management in clinics
  - Performance measurement

**Evaluation**
- **Oct. 2012 – Apr. 2013** (7 months)
  - Data analysis
  - Final report and recommendations

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Pilot Results

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

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

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

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

**Physician Engagement**
- Clinician’s desire to improve patient care
- Motivation to contribute to system change
- Use of a value-added ordering process
- Support from clinical champions

**System Deployment**
- Strong vendor relationship
- Utilization of pilot-wide IT expertise
- Flexible system design
- Supportive system host

**Privacy and Security**
- Leveraging expert advice
- Executing robust participation agreements
- Strong hospital commitment
- Transparency
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

1. Revision of the language used in the guidelines
   - Goal: Bridge the gap between referring physician ordering terminology and radiology terminology.
   - Planning for this work has been initiated and is scheduled to start in Jan/Feb. 2014

2. Expansion of the Provincial MRI/CT Referral Guidelines
   - Goal: Provide referring physicians and other users with more appropriate alternatives and enhance the usability of the referral guidelines.

3. Expansion of the pilot to include more robust guidelines and other treatment options
   - Goal: Draw conclusions on behaviour related to physician type (general and specialist), and additional feedback on the guidelines.
   - For provincial implementation, a broader IT strategy is needed.
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.

Contact Information

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