Radiology Driving Change in Primary Care

*The Diagnostic Imaging Appropriateness (DI-APP) Project*

Radiological Society of North America
Annual Meeting 2016

Presentation Outline

- Background
- Reasons for Action
- Project Approach
- Imaging Pathways
- Next Steps
DI Appropriateness Initiatives

**Background**

2004 - 2006

MRI & CT Expert Panel established to improve access to MRI/CT services

2009

Provincial MRI/CT Referral Guidelines published, with over 800 indications.*

2012-2013

Implemented the Diagnostic Imaging Appropriateness Pilot Project

2014-2015

Launched Diagnostic Imaging Appropriateness Tools in Primary Care Project

2016

Developing web module for widespread implementation of pathways

- Twelve clinics around Ontario piloted electronic OE tool with evidence-based decision support for MRI/CT.
- Key results: 85% compliance rate that resulted in an 18% increase in appropriate referrals.**
- Key takeaway: Feedback from referring physicians that the guidelines could be made more robust to promote increased utility.

- Sixty clinicians participated in the development of four imaging appropriateness pathways:
  - Low Back Pain
  - Headache
  - Knee Pain
  - Stroke/TIA

---

**Reasons for Action**

- **Variability** in images ordered for common clinical scenarios¹,²
  (e.g. right modality and when)

- **Uncertainty** about imaging resulting from rapid technological advances

- **Lack of integration** between community primary care providers and hospital-based imaging specialists

  – Opportunity to advance provincial primary care strategy: **Patients First: Action Plan for Health Care** by “delivering better coordinated and integrated care in the community, closer to home”³

---

1. In 2011 approximately 800 MRI/CT requisitions were collected across UHN, St. Joseph’s Healthcare Hamilton, Thunder Bay Regional Health Sciences Centre, St. Joseph’s HealthCare London and the clinical indications were cross-referenced with the Ontario MRI/CT Referral Guidelines to assess variability with guidelines.


Approach

- **Build imaging pathways** that outline if, when and what imaging is needed for common primary care presentations of:
  - Headache
  - Low back pain
  - TIA/Stroke
  - Knee pain

- Imaging pathways should be based on:
  - Best evidence
  - Clinical experience
  - Ontario population & resources
  - Preferred terminology
  - Primary care feedback

Critical Partnerships

- Started as a radiology-focused initiative; quickly realized the flaw in an imaging-centered approach
- Partnered with primary care champions and representative organizations

**Provincial Partners**

- Ontario College of Family Physicians
- Don’t Just Do Something, Stand There
- Inter-professional Spine Assessment and Education Clinics (ISAEC)
- Ontario Association of Radiologists
- Choosing Wisely Canada
- Health Quality Ontario
- Centre for Effective Practice
HOW DID WE CREATE THE PATHWAYS?

Governance Structure

- **Sponsorship Team**
  - 5 Members
  - Strategic direction

- **Steering Committee**
  - 20 System Leaders
  - Guidance and approvals

- **Clinical Review Panels**
  - CNS + Head and Neck
    - 25 PCPs, Specialists, Radiologists
    - Pathway development
  - MSK + Spine
    - 28 PCPs, Specialists, Radiologists
    - Pathway development

- **Adoption Feasibility Advisory Panel**
  - 14 members
  - Implementation recommendations

- **MOHLTC**
  - Health System Quality and Funding Branch
  - Funding body

- **Project Team**
  - 14 members
Methodology

Support the pathways with current evidence by leveraging elements of the CAN-IMPLEMENT\(^*\) framework, a streamlined version of the ADAPTE guideline adaptation methodology.

Panel Work

1. Clinical Leads Formulate Preliminary Pathway
2. Online Review by Panel
3. In-person Panel Meeting to Finalize Pathway Design
4. Build Consensus Regarding Imaging Recommendations
5. Final Pathway

Project Team Work

- Guideline Search, Screening and Summary
- Critical Appraisal of Guidelines
- Addition of Levels of Evidence

\(^*\)M.B. Harrison, RN, PhD and J. van den Hoek, BNSc for the Canadian Guideline Adaptation Study Group, CAN-IMPLEMENT Guideline Adaptation and Implementation Planning Resource, 2012
Imaging Pathways

Headache

- Primary headache disorder
  - normal neurological exam, no worrisome features
  - Imaging is not routinely indicated
- Headache with red flags
- Headaches with worrisome features
- Headache suspected to be of sinus origin
- Chronic post-traumatic headache attributed to mild head injury
- Suspected cluster headache or other trigeminal autonomic cephalalgias (TACs)
- Suspected giant cell arteritis/temporal arteritis
  - Imaging is not routinely indicated

Stroke/TIA

- Suspected cluster headache or other trigeminal autonomic cephalalgias (TACs)
- Suspected giant cell arteritis/temporal arteritis
- Imaging is not routinely indicated

Low back pain

- Imaging is not routinely indicated

Knee pain

- Imaging is not routinely indicated

Headache Imaging Pathway Summary

- Urgent imaging is usually indicated to rule out serious intracranial pathology
- Consider neurology referral and/or imaging in patients with persisting or worsening symptoms
- Consider neurology referral and/or imaging in patients with recent onset cluster headache or other TACs
- Imaging is not routinely indicated
Subcategory #1: Primary Headache Disorder

Primary headache disorder
- Migraine or tension-type headache
- Normal neurological exam
- No red flags
- No worrisome features
- No neurological signs that may suggest a secondary cause

Imaging Recommendation
Imaging is not routinely indicated

Additional Considerations
Consider trial of standard therapy for headache. If patient demonstrates good response to therapy, continue; and follow-up with primary care.

Yield of Neuroimaging
The overall yield of neuroimaging studies for headache with a normal neurologic examination is low, ranging from 0.2% to 3.7% in the literature.

Imaging Modality Recommendation
MRI is preferred over CT, except in emergency settings when hemorrhage, acute stroke or head trauma are suspected.

Evidence Table: Yield of Neuroimaging

<table>
<thead>
<tr>
<th>#</th>
<th>Study/ Guideline</th>
<th>Study Population</th>
<th>Yield Ratio</th>
<th>Link To Full Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>You et al 2011, Canada</td>
<td>623 patients receiving CT for headache, normal exam</td>
<td>2.1%</td>
<td>![PDF]</td>
</tr>
<tr>
<td>2</td>
<td>Clarke et al 2010, UK</td>
<td>530 patients receiving MRI/CT for headache, normal exam</td>
<td>Migraine: 1.2%; Tension: 0.9%</td>
<td>![PDF]</td>
</tr>
<tr>
<td>3</td>
<td>Senapire et al 2004, Spain</td>
<td>1876 patients receiving MRI/CT for headache, normal exam</td>
<td>0.9% [0.5-1.4]</td>
<td>![PDF]</td>
</tr>
<tr>
<td>4</td>
<td>Tsubhini et al 2005, Japan</td>
<td>30% patients with normal exam chronic/ recurrent headache were examined with MRI</td>
<td>0.7%</td>
<td>![PDF]</td>
</tr>
<tr>
<td>5</td>
<td>Wang et al 2001, US</td>
<td>402 adult patients with chronic headache, received MRI, normal exam</td>
<td>3.7%</td>
<td>![PDF]</td>
</tr>
<tr>
<td>6</td>
<td>Jordan et al 2000, US</td>
<td>528 headache patients referred for MRI, normal exam</td>
<td>1.5%</td>
<td>![PDF]</td>
</tr>
</tbody>
</table>
Assessing Pathway Acceptance

Pathways were evaluated by primary care providers who did not participate in development (n=55)

92% agreed/strongly agreed that the pathway recommendations are relevant and applicable to their patient population

84% agreed/strongly agreed that the pathways could help facilitate communication with patients

70% agreed/strongly agreed that the pathways could help to change their practice
Assessing Pathway Acceptance

What factors would help you and your primary care colleagues use these pathways? (n=59)

- **83%** supported EMR integration
- **79%** supported materials for patient education/conversations
- **73%** supported endorsement by peers and professional bodies
- **71%** supported integration with imaging referral forms
- **60%** supported a mobile app

Expanding Primary Care Tools for Imaging

The pathways are being developed as a mobile-friendly web module
Contact Information

Jisla Mathews  
Senior Business Analyst, Office of Strategy Management  
The Joint Department of Medical Imaging  
E-Mail: jisla.mathews@uhn.ca