Choosing Wisely Canada

Diagnostic Imaging List Proposed by Canadian Association of Radiologists

1. Imaging for low back pain is only indicated where red flags are present.1

The Canadian Association of Radiologists’ lower back pain guideline released in 2012 states that imaging is only indicated if there are the following “red flag” indications:

- Suspected epidural abscess or hematoma which may present with acute pain but no neurological symptoms, urgent imaging is required
- Suspected cancer
- Suspected infection
- Cauda equina syndrome
- Severe/progressive neurologic deficit
- Suspected compression fracture

In patients with suspected uncomplicated herniated disc or spinal stenosis imaging is only indicated after at least a six week trial of conservative management and if symptoms are severe enough that surgery is being considered.

Literature Search

A literature search was undertaken by the Canadian Agency for Drugs and Technologies in Health (CADTH) with respect to the imaging of low back pain recommendation. The following research questions were asked:

1. What is the clinical evidence regarding diagnostic imaging for the evaluation of low back pain?
2. What is the cost-effectiveness of diagnostic imaging for the evaluation of low back pain?
3. What are the evidence-based guidelines regarding diagnostic imaging for the evaluation of low back pain?

As research methods, a limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 1), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI (Health Devices Gold), Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, economic studies, and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2008 and February 19, 2013. Internet links were provided, where available.

CADTH identified a number of evidence-based publications relevant to the recommendation.

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1 This recommendation has also been accepted as a part of the Council of the Federation’s clinical practice guideline and appropriateness initiative lead by its Health Care Innovation Working Group.
Three systematic reviews,\(^1\)\(^-\)\(^3\) and eight evidence-based guidelines,\(^4\)\(^-\)\(^11\) were identified regarding diagnostic imaging for the evaluation of low back pain. No relevant health technology assessments, randomized controlled trials, or economic studies were identified. Additional references of potential interest were identified by CADTH.\(^12\)\(^-\)\(^20\)

In addition to the above literature, the Canadian Association of Radiologists had identified supplementary information to support the recommendation.\(^21\)\(^-\)\(^30\)

### 2. Imaging for minor head trauma is only indicated where red flags are present.\(^2\)

It is recommended to follow the Canadian CT Head Rule, the creation of which was led by an Ottawa emergency physician. The Canadian CT Head Rule defines the red flags that should be watched for. This rule is also reflected in the Canadian Association of Radiologists head injury guideline released in 2012.

#### Literature Search

A literature search was undertaken by the Canadian Agency for Drugs and Technologies in Health (CADTH) with respect to the imaging of minor head trauma recommendation. The following research questions were asked:

1. What is the clinical evidence regarding diagnostic imaging for the evaluation of minor head trauma?
2. What is the cost-effectiveness of diagnostic imaging for the evaluation of minor head trauma?
3. What are the evidence-based guidelines on diagnostic imaging for the evaluation of minor head trauma?

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 2), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, economic studies and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2008 and February 19, 2013. Internet links were provided, where available.

CADTH identified a number of evidence-based publications relevant to the recommendation.

One relevant health technology assessment report,\(^31\) one systematic review and meta-analysis,\(^32\) 10 evidence-based guidelines,\(^33\)\(^-\)\(^42\) and two economic studies,\(^43\)\(^-\)\(^44\) regarding the use of diagnostic imaging for the evaluation of minor head trauma. No relevant randomized controlled trials were identified. Additional references of potential interest were identified by CADTH.\(^45\)\(^-\)\(^70\)

In addition to the above literature, the Canadian Association of Radiologists had identified supplementary information to support the recommendation.\(^71\)\(^-\)\(^73\)

\(^2\) This recommendation has also been accepted as a part of the Council of the Federation’s clinical practice guideline and appropriateness initiative lead by its Health Care Innovation Working Group.
3. Imaging for uncomplicated headache is only indicated where red flags are present.³

The Canadian Association of Radiologists’ headache guideline released in 2012 states that in the absence of focal features, imaging is not often helpful. The following features significantly increase the likelihood of finding a major abnormality and justify requesting diagnostic imaging:

- Recent onset and rapidly increasing frequency and severity of headache
- Headache causing the patient to wake from sleep
- Associated dizziness, lack of coordination, tingling or numbness, new neurologic deficit
- New onset of a headache in a patient with a history of cancer or immunodeficiency

The CAR believes that inappropriate imaging of the head is a significant issue and thus has recommended two guidelines in this area for this phase.

Literature Search

A literature search was undertaken by the Canadian Agency for Drugs and Technologies in Health (CADTH) with respect to the imaging of uncomplicated headache recommendation. The following research questions were asked:

1. What is the clinical evidence regarding diagnostic imaging for the evaluation of uncomplicated headache?
2. What is the cost-effectiveness of diagnostic imaging for the evaluation of uncomplicated headache?
3. What are the evidence-based guidelines regarding diagnostic imaging for the evaluation of uncomplicated headache?

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 1 of 12), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, economic studies and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2008 and February 15, 2013. Internet links were provided, where available.

CADTH identified a number of evidence-based publications relevant to the recommendation.

One health technology assessment,⁷⁴ seven guidelines,⁷⁵-⁸¹ and one economic study,⁸² were identified regarding the use of diagnostic imaging for the evaluation of uncomplicated headache. No relevant systematic reviews, meta-analyses, or randomized controlled trials were identified. Additional references of potential interest were identified by CADTH.⁸³-⁸⁴

In addition to the above literature, the Canadian Association of Radiologists had identified supplementary information to support the recommendation.⁸⁵-⁸⁶

³ This recommendation has also been accepted as a part of the Council of the Federation’s clinical practice guideline and appropriateness initiative lead by its Health Care Innovation Working Group.
4. Don’t do computed tomography (CT) for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option.

Although CT is accurate in the evaluation of suspected appendicitis in the pediatric population, ultrasound is nearly as good in experienced hands. Since ultrasound will reduce radiation exposure, ultrasound is the preferred initial consideration for imaging examination in children. If the results of the ultrasound exam are equivocal, it may be followed by CT. This approach is cost-effective, reduces potential radiation risks and has excellent accuracy, with reported sensitivity and specificity of 94 percent.

Literature Search

A literature search was undertaken by the Canadian Agency for Drugs and Technologies in Health (CADTH) with respect to the diagnostic imaging with computed tomography compared with ultrasound for children with suspected appendicitis recommendation.

The following research questions were asked:

1. What is the clinical evidence regarding diagnostic imaging with ultrasound compared with computed tomography for children with suspected appendicitis?

2. What is the cost-effectiveness of diagnostic imaging with ultrasound compared with computed tomography for children with suspected appendicitis?

3. What are the evidence-based guidelines for diagnostic imaging of children with suspected appendicitis?

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type for questions #1 and #2. A filter was added to limit the retrieval to guidelines for question #3. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between Jan 1, 2008 and Oct 31, 2013. Internet links were provided, where available.

CADTH identified a number of evidence-based publications relevant to the recommendation.

Ten non-randomized studies, and one economic evaluation, were identified regarding diagnostic imaging with computed tomography compared with ultrasound for children with suspected appendicitis. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or evidence-based guidelines were identified. Additional references of potential interest were identified by CADTH.

In addition to the above literature, the Canadian Association of Radiologists had identified supplementary information to support the recommendation.
5. a. Do not do an ankle x-ray series in adults unless there is pain in the malleolar zone and any of these findings:
   1. bone tenderness at the posterior edge or tip of the lateral malleolus
   OR
   2. bone tenderness at the posterior edge or tip of the medial malleolus
   OR
   3. inability to bear weight both immediately and in ED

   b. Do not do a foot x-ray series in adults unless there is pain in the midfoot zone and any of these findings:
   1. bone tenderness at the base of the 5th metatarsal
   OR
   2. bone tenderness at the navicular
   OR
   3. inability to bear weight both immediately and in ED


Literature Search

A literature search was undertaken by the Canadian Agency for Drugs and Technologies in Health (CADTH) with respect to the Ottawa ankle rules to determine the need for X-rays to identify potential bone fracture recommendation.

The following research questions were asked:
1. What is the clinical evidence for the accuracy of the Ottawa ankle rules to determine the need for X-rays to identify potential bone fracture?
2. What is the cost-effectiveness of using the Ottawa ankle rules to determine the need for X-rays to identify potential bone fracture?
3. What are the evidence-based guidelines for ankle or foot X-ray series for patients with suspected foot or ankle injury?

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI (Health Devices Gold), Canadian and major international health technology agencies, as well as a focused Internet search. No methodological filters were applied to limit retrieval by publication type for questions 1 and 2. A guideline filter was used to limit retrieval to guidelines for question 3. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2013 and October 30, 2013. Internet links were provided, where available.

CADTH identified a number of evidence-based publications relevant to the recommendation.

Two systematic reviews, one meta-analysis, six non-randomized studies, one economic evaluation, and four evidence-based guidelines were identified regarding the Ottawa ankle rules to determine the need for X-rays to identify potential bone fracture. No health technology assessments or randomized controlled trials were identified. Additional references of potential interest were identified by CADTH.

In addition to the above literature, the Canadian Association of Radiologists had identified supplementary information to support the recommendation.
References


See: Imaging for non-specific low back pain, page 7 and page 12


See: Diagnostic Imaging, page 12, Diagnostic Tests, page 14


See: Initial Visit


See: page 2


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333  PubMed: 21835403


See: Section 5.2 Neuroimaging, page 15


PubMed: PM21352214


PubMed: PM10993991

PubMed: PM23317620

PubMed: PM22192815

PubMed: PM22508920

PubMed: PM22841176

PubMed: PM22849662

PubMed: PM23217887

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PubMed: PM21324843

PubMed: PM20053244

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