

# RADIOLOGY APPROPRIATENESS GUIDELINES

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# IMAGING UTILIZATION

10-20%  
of imaging studies are  
unnecessary

“We know that up to a third of radiological examinations are totally or partially inappropriate.”

Picano E. Sustainability of medical imaging: *BMJ* 2004;328:578–80

# OTTAWA ANKLE RULE -EFFECT OF IMPLEMENTATION-

	Reduction
IGStiell et al. JAMA 1994;271:827-832	28%
IGStiell et al. BMJ 1995;311:594-597	26%
GRAuleley et al. JAMA 1997;277:1935-1939	22%
SVerma et al. AJR 1997;169:825-827	16%
JJLddy et al. Am J Sports Med 1998;26:158-165	34%

# DIAGNOSTIC IMAGING GUIDELINES -EFFECT OF IMPLEMENTATION-

	Reduction
Ottawa knee rule	26%
Canadian C-spine rule	22%
Canadian CT head rule	22%

Perry, Stiell. Injury 2006;37:1157-1165

# IMAGING FOR HEADACHE

- Patients
  - 400 children (3-18 years)
  - Non-acute headache, no neurological findings
- Imaging
  - 185 patients (46%)
  - CT 51%, MRI 38%, both 11%
- Results
  - Normal 145: (78.4%)
  - Incidental findings: 40 (21.6%)

# UNNECESSARY IMAGING

- Radiation
- Cost
- Wait times



Diagnostic Imaging  
Referral Guidelines

A guide for physicians

First Edition  
2005



Lignes directrices pour  
les examens  
d'imagerie diagnostique

Première édition  
2005



THE CANADIAN ASSOCIATION OF RADIOLOGISTS

Diagnostic Referral Guidelines

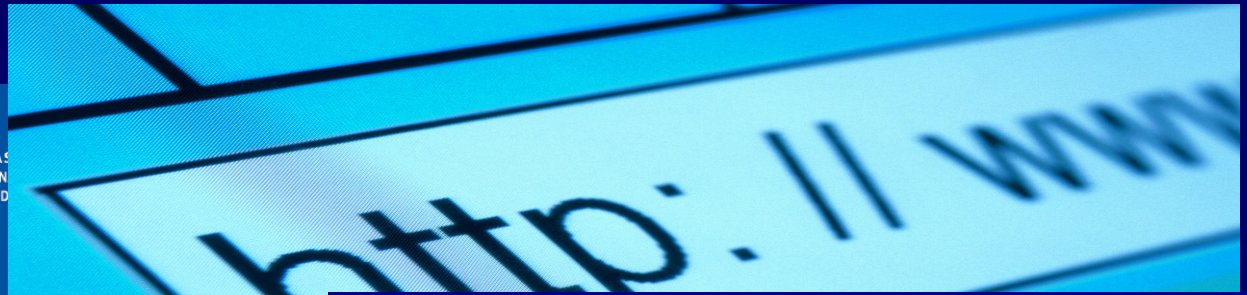
A guide for

First Edition  
2005



Lignes directrices  
pour les examens  
d'imagerie diagnostique

Première édition  
2005



CANADIAN ASSOCIATION OF RADIOLOGISTS  
ASSOCIATION CANADIENNE DES RADIOLOGISTES

English

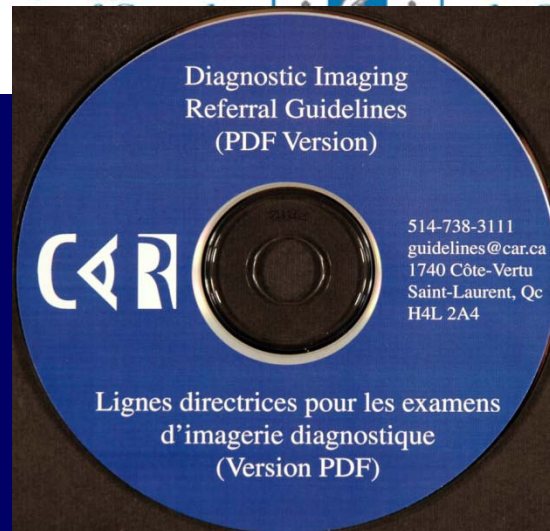
Français

## CMA INFOBASE clinical practice guidelines

The College of  
Family Physicians



Le Collège des  
médecins de famille  
Canada



Diagnostic Imaging  
Referral Guidelines  
(PDF Version)



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Lignes directrices pour les examens  
d'imagerie diagnostique  
(Version PDF)



**COMPUTERIZED ORDER ENTRY  
SYSTEM  
WITH  
DECISION SUPPORT**

Demonstration Projects

# CPOE WITH DECISION SUPPORT

Exam Selection			
To place an order select an <b>exam</b> from one of the following methods.			
Patient Name: <a href="#">Test, Test</a>		HSC MRN <a href="#">123456789</a>	
Birth Date: January 1, 2007	Age: 1 year, 1 month	Gender: Unknown	Phone Number:
Ordering Provider: <b>Reed, Martin</b>			
Created By: N/A		Ordering Site: Pediatric ED	
<b>Exam Selection:</b>			
X-ray ▼	CT ▼	MR ▼	US ▼
Head/Neck ▶			
Chest ▶	GI/GU/Fluoro ▼	Interventional Radiology ▼	
Abdomen ▶			
Pelvis/Hip ▶			
Spine ▶			
Upper Extremity ▶			
Lower Extremity ▶			
Multiple Sites ▶			
Other ▶			

# CPOE WITH DECISION SUPPORT

X-ray Chest PA/Lat Indications			
Patient Name: <a href="#">Test, Test</a>		HSC MRN <a href="#">123456789</a>	
Birth Date: January 1, 2007	Age: 1 year, 1 month	Gender: Unknown	Phone Number:
Ordering Provider: <b>Reed, Martin</b>			
Exam: <b>X-ray Chest PA/Lat</b>		Order ID: 21770	
Created By: N/A		Ordering Site: Pediatric ED	
<input type="button" value="Next"/>			
<b>Signs and Symptoms: (Select one or more)</b>			
<input type="checkbox"/> Asymptomatic	<input type="checkbox"/> Fever		
<input type="checkbox"/> Increased Work of Breathing	<input type="checkbox"/> Dyspnea		
<input type="checkbox"/> Tachypnea	<input type="checkbox"/> Tachycardia		
<input type="checkbox"/> Cyanosis	Cough ▶ Type	<ul style="list-style-type: none"><li>Productive</li><li>Recurrent Unproductive</li><li>Recurrent Productive</li><li>Unproductive</li></ul>	
<input checked="" type="checkbox"/> Wheeze	Stridor ▶		
<input type="checkbox"/> Hemoptysis	<input type="checkbox"/> Murmur		
Pain ▶			
Other: <input type="text"/>			
<b>Relevant History: (Select one or more)</b>		<b>Differential Diagnosis: (Select one or more)</b>	
<input type="checkbox"/> Asthma	<input checked="" type="checkbox"/> Pneumonia		
<input type="checkbox"/> Cystic Fibrosis	<input checked="" type="checkbox"/> Bronchiolitis		

# CPOE WITH DECISION SUPPORT

Decision Support		Ord	
Patient Name: <a href="#">Test, Test</a>		HSC MRN <a href="#">123456789</a>	
Birth Date: January 1, 2007	Age: 1 year, 1 month	Gender: Unknown	Phone Number:
Ordering Provider: <b>Reed, Martin</b>			
Exam: <b>X-ray Chest PA/Lat</b>		Order ID: 21770	
Signs and Symptoms: <b>Cough(Type:Unproductive), Wheeze</b>			
Differential Diagnosis: <b>Pneumonia, Bronchiolitis</b>			
Created By: N/A		Ordering Site: Pediatric ED	
Decision Support			
<input type="checkbox"/> TM			
<p>In most children with wheeze, the CXR is either normal or shows features of uncomplicated asthma or bronchiolitis, such as hyperinflation or peribronchial cuffing and will not change management of the patient. Where patient presents with fever or localized crackles, or if there is clinical suspicion of an inhaled foreign body, a CXR may be considered.</p>			
<a href="#">Grade of Recommendation: B</a>			
<input type="button" value="Keep Current Exam"/>		<input type="button" value="Reset Order"/>	

# PROJECTS

- Children's Hospital, Winnipeg
  - IA: October 2006-August 2007
    - 77 pediatricians, 27 residents and fellows
  - IB: September 2008-February 2009
    - 75 pediatricians
- Steinbach Family Medicine Centre, Steinbach
  - II: November 2008-February 2009
    - 15 family practitioners

# RESULTS

Project	Total orders	Inappropriate orders	Advice accepted
IA	8757	957 (10.9%)	19 (1.9%)
IB	5161	708 (13.7%)	150 (21.2%)
II	478	50 (10.5%)	11 (22%)

# RESULTS

## - PROJECT IB -

### Head injury

#### - Modality

- CT – 41
- X-ray – 6

#### - Results

- Appropriate – 35
- Cancel accepted – 10
- Cancel ignored - 2

# RESULTS

## - PROJECT IB -

### Wheeze

- 93 orders – advice ignored in all
  - Physician A 27 (29%)
  - Physician B 10 (11%)
  - Physician C 7 (8%)
  - Physician D 6 (6%)



# WHAT HAVE WE LEARNED?

- Quantitative information
- $\geq 10\%$  inappropriate
- Physicians will take advice

# WHERE DO WE GO FROM HERE?

- Improve the software
- Update the guidelines
- Work with physicians
  - Test interventions
  - Longer term projects
  - Larger scale projects
  - Different settings

## CAR Guidelines Symposium

April 23, 2009

### Implementing Appropriateness Guidelines in Diagnostic Imaging: Pooling National Knowledge

[Register online now!](#)

#### Objectives

- To provide a forum for interchange among the three Diagnostic Imaging (DI) Guidelines projects currently underway in Canada and others who are interested in or planning similar endeavours. Currently there are active projects in Manitoba, Nova Scotia and Saskatchewan.
- To inform healthcare administrators, health policy makers and clinicians about the concepts and delivery of clinical appropriateness guidelines functioning as part of an electronic order entry system.
- To emphasize the necessity of medical leadership in setting clinical appropriateness guidelines and in the change management required to implement guidelines in medical practices.

#### Invited speakers

- **Keynote Address**  
Richard N. Shiffman, MD, MCIS  
Professor of Pediatrics  
Associate Director,  
Center for Medical Informatics  
Yale School of Medicine
- Martin Reed, MD  
CAR Guidelines Chair,  
Clinical Project Lead  
Overview of the CAR's work with appropriateness criteria; overview and results of the CAR managed DI control project series in Manitoba.
- Speakers from each province with a current DI guidelines implementation project will provide an overview of their approach, evaluation model, lessons learned and next steps planned.