Choosing Wisely Canada

Choisir avec soin

Potentially Unnecessary Diagnostic Imaging for Lower-back Pain in Alberta

Xi-Kuan (Sean) Chen
Canadian Institute for Health Information

Don’t do imaging for lower-back pain unless red flags are present

Recommendations developed by
Choosing Wisely Canada
Canadian Medical Association
Canadian Association of Radiologists

CWC Recommendation: Don't do imaging for lower-back pain unless red flags are present

- Red flags:
  - suspected epidural abscess or hematoma presenting with acute pain, but no neurological symptoms (urgent imaging is required)
  - suspected cancer
  - suspected infection
  - cauda equina syndrome
  - severe or progressive neurologic deficit
  - suspected compression fracture
- In patients with suspected uncomplicated herniated disc or spinal stenosis:
  - Imaging indicated after 6+ weeks trial of conservative management and if symptoms are severe enough that surgery is being considered

Research objectives

Choosing Wisely Canada

CIHI ICIS

Study population:

- Adult patients (18+) with **non-persistent** lower-back pain who sought medical help from **family physicians** in **Alberta**

Objectives:

- To calculate the rate of X-ray, CT/MRI scanning in patients with lower-back pain without red flags
- To identify predictors for imaging scan rates at the patient-, physician- and community-levels
- To examine regional variation in imaging scan rates

Methodology and Data Sources

Look Back Period
(PLPB, NACRS and DAD)

Index visit
(PLPB)

Follow Up Period: X-ray, CT/MRI
(PLPB and NACRS)

1 year

Exclusion criteria:

- Previous lower back pain visits
- Lower-back pain diagnosis or related diagnostic imaging
- Neurosurgery, orthopedic surgery or spine operation
- Red flags from family physician visits, ED and acute care

1st family physician visit for lower-back pain (2011)

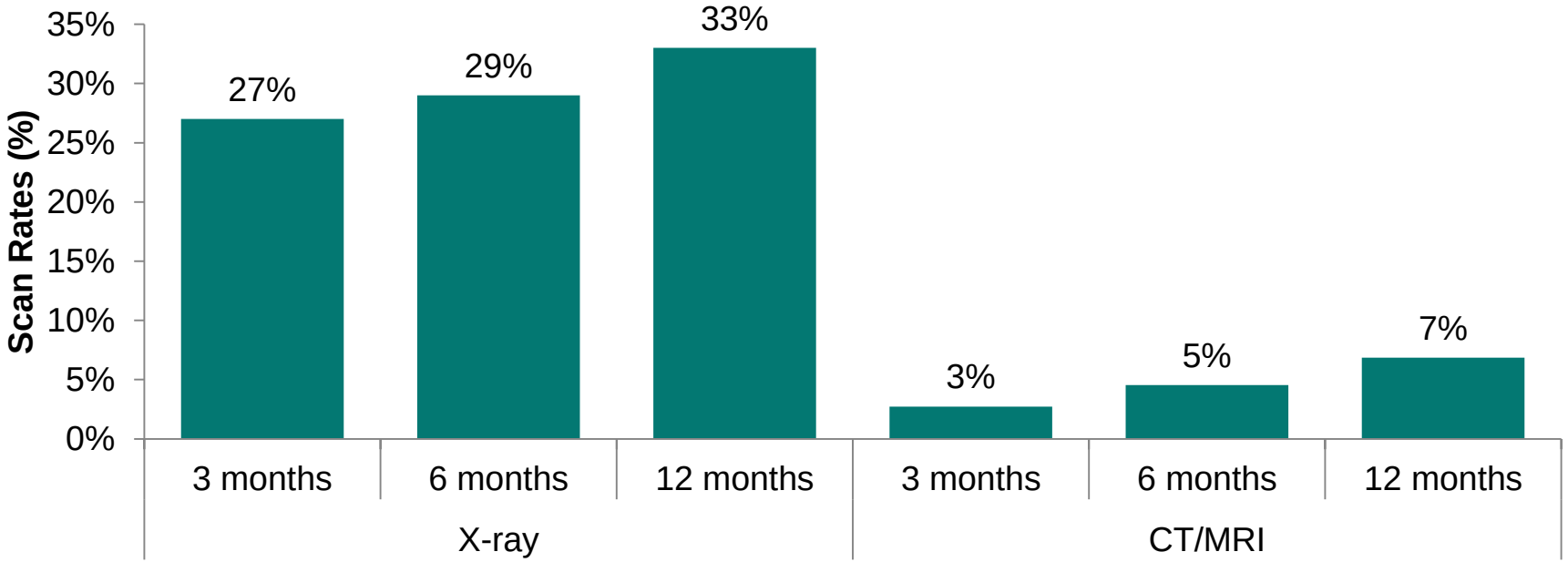
3 months

6 months

12 months

90th percentile wait times for MRI
AB: 235 days
ON: 94 days

Imaging scan rates and volume for lower-back pain patients in Alberta

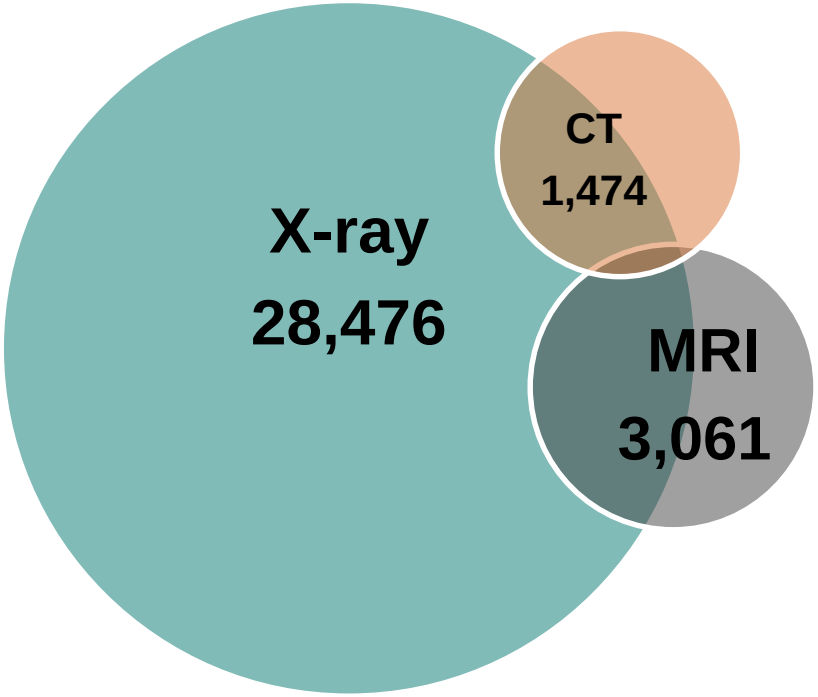


Volume of scans by follow-up period:

Follow-up period	X-ray	CT/MRI
3 months	26,031	2,665
6 months	28,476	4,449
12 months	32,452	6,705

Overlap in diagnostic imaging

- Most patients (2/3) who had CT/MRI scan also received X-ray.
- Only a small number of patients received both CT and MRI.



Comparisons to other studies

- The combined CT/MRI scan rate was lower in Alberta than in Ontario (Alberta: 5%, Ontario: 8%)
- Imaging scan rates in Alberta were comparable to those in the United States
  - X-ray: 29% in Alberta and 30% in the United States
  - CT/MRI: 5% in Alberta and 4% in the United States

Source: Pham et al, Arch Intern Med. 2009; 169 (10):972-981

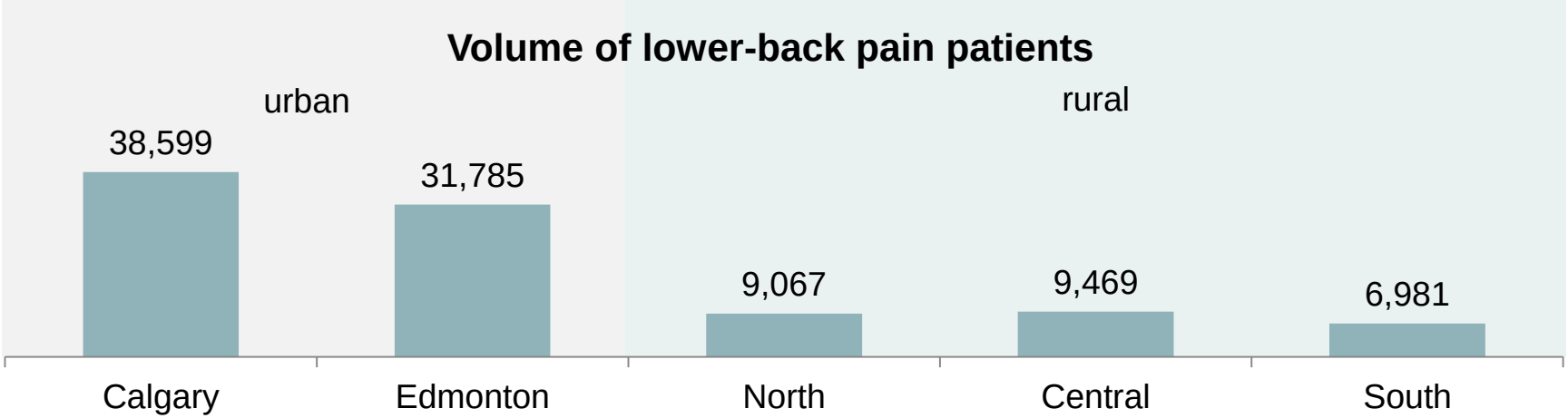
Predictors for Imaging

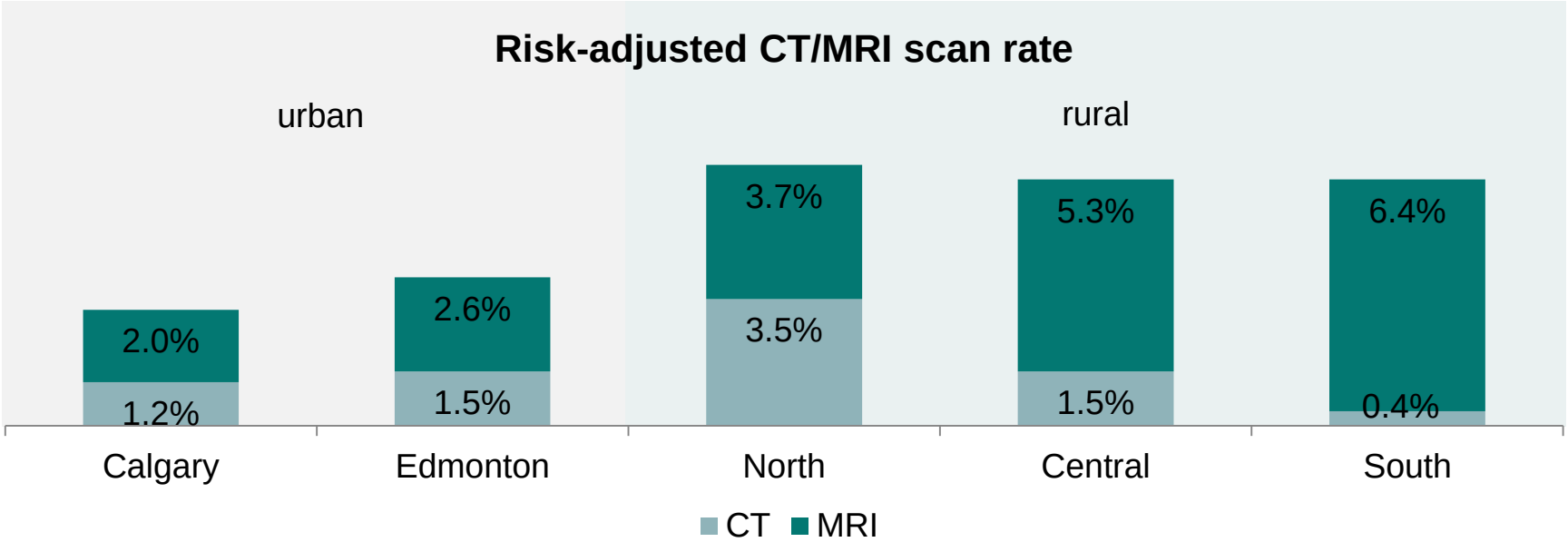
- Patient predictors: advanced age and male
  - Old age and male were associated with higher scan rates for all types of imaging
  - Comorbidities were not associated with scan rates
- Community predictors: Rural residence and high income neighborhood
  - Patients from higher income neighborhood had higher scan rates for all types of imaging
  - Rural residence was a predictor for CT/MRI
- Physician predictors: low patient volume
  - Physicians who saw fewer lower-back pain patients were associated with more imaging
  - Length of practice not a predictor for any type of imaging

Imaging scan rates within 6 months by patient residential zone (%)

	X-ray	CT/MRI
North 8,437 patients	29.3%	7.2%
Edmonton 33,768 patients	28.5%	4.1%
Central 9,134 patients	31.0%	6.8%
Calgary 39,383 patients	28.4%	3.2%
South 6,825 patients	29.7%	6.8%

Urban health zones have higher patient volumes, but lower scan rate for CT/MRI





*Health zone was based on patient postal code.

Higher CT and MRI scan rates might be related to higher availability of machines and shorter wait times

	Calgary (urban zone)	Edmonton (urban zone)	North	Central	South
CT/MRI scan rate for lower-back pain patients (2011/12)	**3.2**	4.1	**7.2**	6.8	6.8
Availability of machines[1]					
Number of CT/MRI machine per million population	**1.6**	1.8	**2.9**	1.8	2.1
Wait times (10/2014 – 09/2015)[2]					
Median CT wait time (weeks)	**3**	4	**1**	2	1
Median MRI wait time (weeks)	**15**	6	**15**	9	14

Sources:
1. CIHI, Medical Imaging equipment, 2012
2. Alberta Health Services, Alberta Wait Times Reporting

Limitations of the study

- Used only the first-3 digits of the ICD-9 diagnostics codes
  - The 4th digit of an ICD-9 code captures details about a diagnosis such as etiology, site, or manifestation of the disease
  - Effect on the study: Possible overestimation of patients with lower-back pain and over-exclusion of red flags
- Not all imaging scans were specific to lower back
  - Effect on the study: could have overestimated the imaging scan rates by including scans that were for other back areas
- A small number of CT/MRI scans could have been done in private clinics
  - Effect on the study: small underestimation of scan rates

Key messages

- In Alberta, about 30% of patients who visited their doctor for lower-back pain had potentially unnecessary scans within 6 months.
  - Most were for X-ray, about 5% for CT/MRI
- Risk factors associated with higher imaging scan rates:
  - Advanced age, male, living in high income neighborhood, or living in rural area (for CT/MRI only)
  - Seeing a doctor with a lower volume of lower-back pain patients, practicing in a rural region
- Zones have similar X-ray scan rate, but variation in CT and MRI
  - Higher CT and MRI scan rates might be related to higher availability of machines and shorter wait times.

Canadian Institute for Health Information

Better data. Better decisions. Healthier Canadians.

cihi.ca

HSR@cihi.ca

@cihi_icis