Impact of R-SCAN in Sustaining Long-Term Lumbar Spine MRI Appropriateness for Low Back Pain
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Background

• Uncomplicated low back pain (LBP) common and self-limited
• Imaging abnormalities in asymptomatic patients¹
• Asymptomatic patients with abnormalities are unchanged or improved after LBP onset²
• Routine imaging for uncomplicated LBP common despite evidence-based guidelines³

¹ Brinjikji et al. Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. AJNR. 2015;36:811-6.
Background

• What is R-SCAN? – Radiology Support, Communication and Alignment Network
  1. Created by the ACR
  2. Empower radiologists and referring physicians to collaborate on reducing inappropriate tests
  3. Exposure to clinical decision support (CDS)

• Inception occurred in the backdrop of a move toward value-based care
Purpose

Through the use of R-SCAN, to evaluate the impact educational sessions and guideline dissemination on improving lumbar spine (LS) MRI appropriateness for LBP
Materials and Methods

Pre-Intervention Preparation and Data Collection

- Identified 3 Baylor-affiliated county clinics with disproportionately high volume LS MRIs
- Initiative in collaboration with Dept of Family Medicine, head of outpatient clinics, and clinic directors
- All LS MRIs referrals from the 3 clinics reviewed from June 1\textsuperscript{st}, 2015 – March 31\textsuperscript{st}, 2016
- Tracked the number of monthly MRI referrals by clinic
- Rated appropriateness of LS MRIs based on the ACR Appropriateness Criteria Score
Materials and Methods

First Intervention

• Gave on-site educational presentations on LBP imaging guidelines to clinicians, trainees, and mid-level providers
• Guidelines by non-radiological societies including the ACP, *Choosing Wisely* campaign, ACP, and AAFP
• Presentations included interactive case-based vignettes to apply knowledge in commonly encountered clinical scenarios of LBP
• Presentations given in April and May 2016
Results

Monthly Lumbar Spine MRI Referral Before and After First Intervention

- Clinic A: Before (6/2015 - 3/2016) and After (6/2016 - 10/2017), with \( p < 0.01^* \)
- Clinic B: Before and After, with \( p < 0.01^* \)
- Clinic C: Before and After, with \( p = 0.12 \)
- Combined: Before and After, with \( p = <0.01^* \)

*\( p < 0.01^* \), two independent samples Mann-Whitney test
Results

ACR Appropriateness Criteria Score Before and After First Intervention

- Clinic A: p = 0.94
- Clinic B: p = 0.03*
- Clinic C: p < 0.01**
- Combined: p = 0.01*

*p<0.05, **p<0.01, two independent samples t-test
Materials and Methods

Second Intervention

• To sustain LS MRI appropriateness, a repeat intervention was given in November 2017
• Each clinic received a different type of intervention
  • Clinic A: guideline dissemination (imaging algorithm placard)
  • Clinic B: no reintervention (control)
  • Clinic C: refresher on-site educational presentation
Materials and Methods

Second Intervention
November 14th, 2017

Clinic A
Guideline Dissemination
Reassess

Clinic B
No Reintervention
Reassess

Clinic C
Educational Session
Reassess

No Reintervention
Reassess

Guideline Dissemination
Reassess

Educational Session
Reassess
Materials and Methods

Guideline Dissemination

4 x 6 inch laminated placard
Results

Monthly Lumbar Spine MRI Referral
Before and After Second Intervention

Clinic A
Before (4/2017 - 10/2017)\n\nClinic B
Before and After Second Intervention

Clinic C
Before (4/2017 - 10/2017)\n\nClinic C
After (12/2017 - 8/2018)
Results

ACR Appropriateness Criteria Score
Before and After Second Intervention

ACR Appropriateness Criteria Score

Clinic A
Before: 5
After: 6
p = 0.33

Clinic B
Before: 5
After: 6
p = 0.15

Clinic C
Before: 8
After: 8
p = 0.80
Results

Monthly Lumbar Spine MRI Referral Rate Over Time

- First Intervention
- Second Intervention

Clinic A: clinic A's referral rate over time
Clinic B: clinic B's referral rate over time
Clinic C: clinic C's referral rate over time
Conclusions

• The R-SCAN platform:
  • Empowers radiologists to engage referring physicians
  • Allows referring clinicians to gain experience with clinical decision support
  • Reduces unnecessary imaging exams and lower the cost of care

• Our institutional experience demonstrated significant reductions in LS MRIs and inappropriateness

• Could the lack significant improvement on second intervention explained by plateau effect (diminishing returns)?