

IMPROVING ORDERING OF ED AND IN-PATIENT SPINE MRI: IMPACT OF ORDERING PANEL AND CARE PATHWAYS

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Introduction

Spine MRI reflects a complex study that is often confusing to order for inpatient and ED providers. At our institution, ordering error review revealed 3 recurrent issues:

1. Over-ordering of total spine imaging (vs limited C, T or L-spine)
2. Inappropriate ordering of IV contrast
3. Lack of awareness and limited access to an abbreviated acute cord compression (ACC) total spine MRI protocol
 - This is a 2 sequence Sag STIR and Axial T2 total spine protocol to rapidly exclude cord compression. If positive, we add sequences we need as all cases checked before patient off table.

Waste and confusion

- For radiologists- Total spine MRI is time consuming to read
- For hospitals- Total spine MR orders result in high utilization of MR resources:
 - At our institution routine total spine without and with contrast scan time averaged 60-90 minutes
 - Abbreviated acute cord compression total spine without contrast protocol averaged 10-20 minutes
- For healthcare providers- There is confusion on:
 - What spine MRI is needed based on reason for exam
 - When is contrast needed
 - When is an abbreviated protocol scan good enough to answer question

Project Background/Methods

- The purpose of this QI project was to redesign the spine MRI ordering process in our electronic health record (EHR) using human-centered design principles by creating a new spine MRI order panel and embedded care pathway.
 - All spine MRI orders outside of the new panel were removed.
- Model for Improvement methodology was utilized with multidisciplinary team composed of quality improvement and care signature experts, with team members from neuroradiology, neurology, spine surgery, emergency medicine and hospital medicine.

Smart Goal

Primary

To decrease ED and in-patient total spine MRI orders by 20% within 3 months of program launch

Secondary

To increase utilization of abbreviated acute cord compression total spine MRI order for patients with suspected acute cord compression

Initial state- 16 different spine MRI orders available

Order Search

MRI SPINE

Panels (No results found)

Medications (No results found)

Procedures

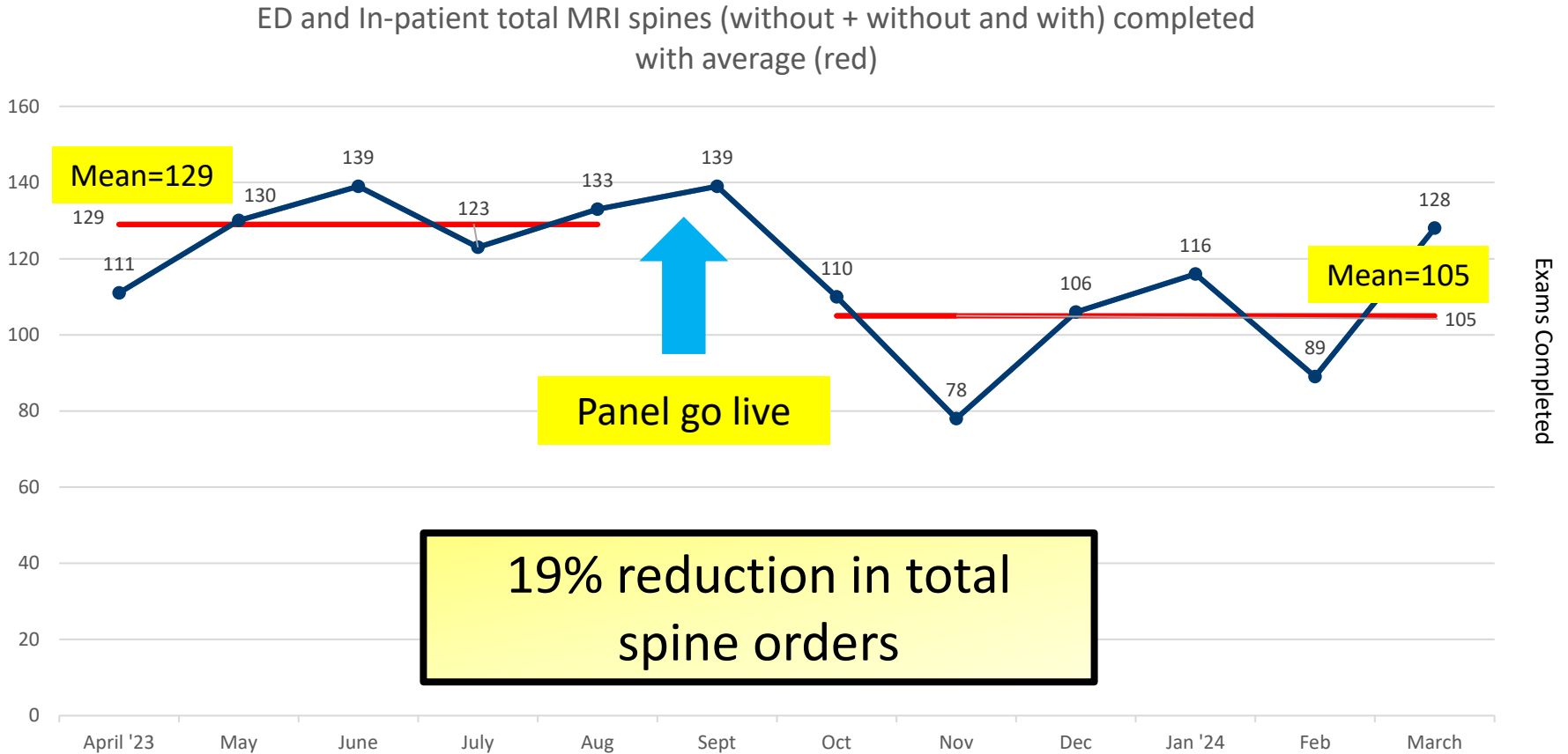
Name	Px Code
MRI Lumbar Spine w wo IV Contrast	IMG287
MRI Cervical Spine (Neuroimmuno) w wo IV Contrast	IMG285
MRI Cervical Spine w wo IV Contrast	IMG285
MRI Cervical Spine wo IV Contrast	IMG279
MRI Lumbar Spine w wo IV Contrast	IMG287
MRI Lumbar Spine wo IV Contrast	IMG283
MRI Thoracic Spine (Neuroimmuno) w wo IV Contrast	IMG286
MRI Thoracic Spine w wo IV Contrast	IMG286
MRI Thoracic Spine wo IV Contrast	IMG281
MRI Total Spine Acute Cord Compression wo IV Contrast (YH)	IMG4651
MRI Total Spine Bone w wo IV Contrast (BH YH YHC)	IMG2722
MRI Total Spine Bone wo IV Contrast (BH YH YHC)	IMG2721
MRI Total Spine w wo IV Contrast	IMG2720
MRI Total Spine wo IV Contrast	IMG2719

Primary Intervention

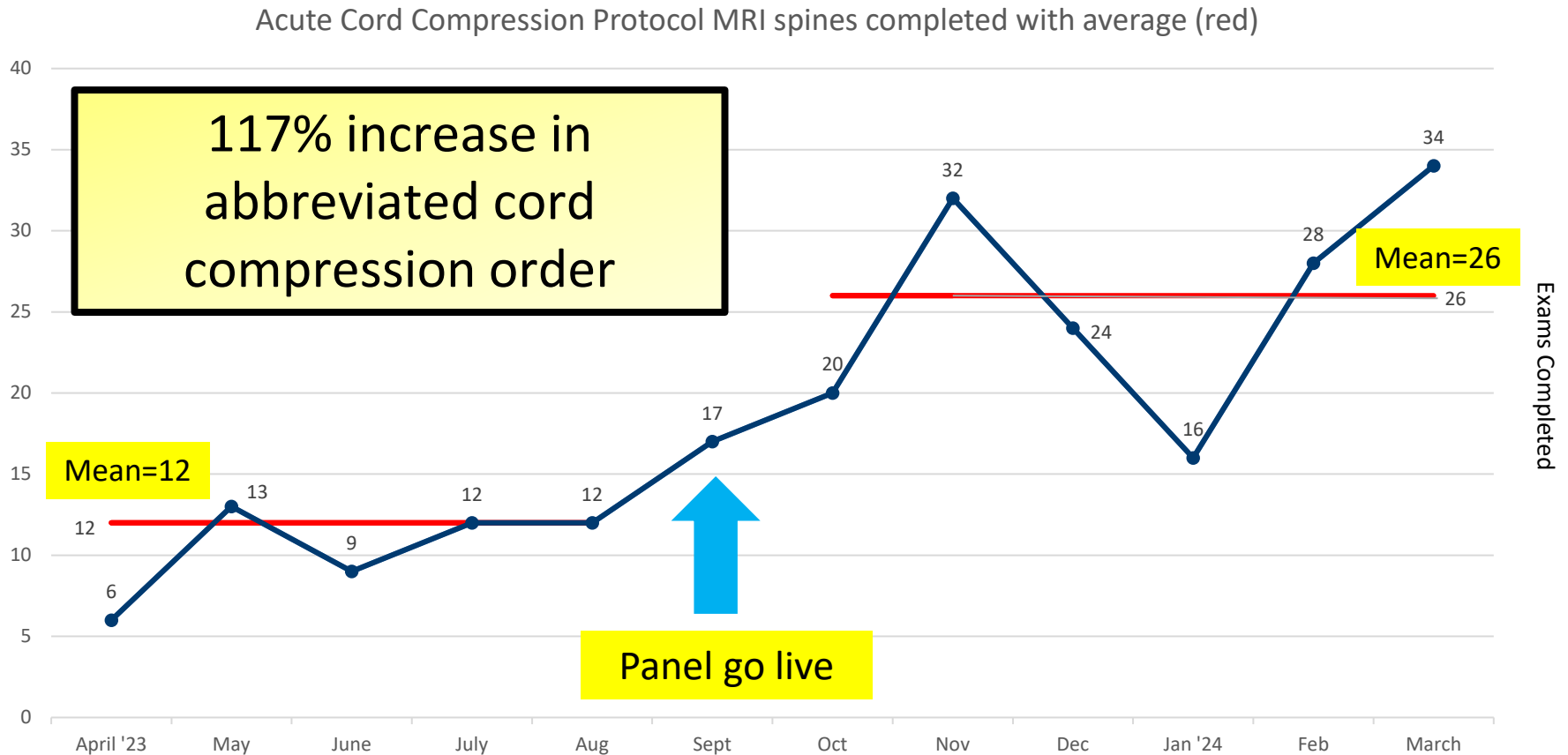
New order panel for spine MRI inside our EHR

- All spine MRI orders removed, can only order spine MRI via new panel
- First step is making provider pick if clinical concern for acute cord compression or not:
 - If yes → they are directed to a care pathway on cord compression
 - If no → they are directed to other top clinical indications (based on content expert input) for ED and in-patient spine imaging with the correct imaging orders embedded

Impact on total spine orders



Impact on use of acute cord compression protocol



Conclusion

- This QI project assessed impact of a novel method to redesign how ED and in-patient providers order spinal MRI by giving top clinical indications as the first question and then directly linking in the correct imaging orders within our EHR. This resulted in
 - **19% sustained reduction** in monthly total spine orders (both without contrast and without and with contrast exams)
 - **117% increase in** monthly utilization of acute cord compression order protocol order:
 - Saves 45-60 minutes scan time and is faster to report for radiologist
- Positive feedback from providers that panel makes it easier to pick the right test
 - Fewer phone calls to and from radiology → radiologists and providers happier and more efficient.