Modified Imaging Algorithm for Patients Presenting with Suspected Acute Cord Compression (ACC) in the Emergency Department

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Objective
To improve the speed (MRI safety sheet completion to scan start) in which patients with suspected acute cord compression receive diagnostic MRI imaging by 20%. To reduce the “table” time to complete the total spine MRI performed for acute cord compression by 20% by creating a targeted MRI protocol specifically for ruling in or ruling out ACC.

Methods
Baseline EMR data was obtained from 10/1/17 - 3/31/18 for all patients presenting to a Yale New Haven Hospital ED location who obtained a total spine MRI for suspected acute cord compression. Data assessed included MRI order to MRI begin time and total “table” time (actual length of the scan). After the QI project was completed with ACC redesign, the same data was re-assessed from 7/2/18 through 6/24/19 assessing impact of new protocol.

Results
The redesigned ACC protocol has exceeded our goal reductions in scan start time (the O to B metric) and total scan “table” time. Median delay in starting MRI scan after safety sheet completion pre-intervention was 255 minutes, which reduced by 41% post intervention to 105 minutes. Median total MRI scan “table” time pre-intervention was 54 minutes, which was reduced by 43% to 23 minutes post intervention.

Discussion
Acute spinal cord compression (ACC) is a neurosurgical emergency where rapid radiological diagnosis via MRI has the potential to greatly impact clinical care and patient outcomes. Our QI project aimed at re-structuring the diagnostic work-up for patients presenting to the emergency room with symptoms of acute cord compression to allow for more streamlined diagnoses and decreased delays for these cases that often reflect a surgical emergency. Through creation of a new multi-specialty designed/approved EPIC order set, and in conjunction with a new MRI ACC protocol, we were able to surpass our goal metrics with reductions in median safety sheet completion to MRI start time by 41%, and reductions in total scan “table” time by 43%. Order set utilization has also been consistent with appropriate utilization of the new algorithm.