# Growing utilization of total relative to localized spine magnetic resonance imaging (MRI) for patients presenting through emergency departments over the past decade

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**Disclosures:** Jonathan N Grauer (North American Spine Society Journal Editor-in-Chief).

**INTRODUCTION:** Spine magnetic resonance imaging (MRI) is increasingly considered for patients in the emergency department (ED). These can be localized to defined regions of the spine (typically higher resolve and/or shorter studies) or be of the total spine (typically lower resolve and/or longer studies). The current study aimed to assess trends localized versus total spine MRIs for patients who received an MRI within 7 days of presenting to the ED tracked over a decade.

**METHODS:** The 2010 to 2021 M151Ortho PearlDiver dataset was used to identify patients who received a spine MRI within 7 days of presenting to the ED. Such MRIs were categorized as localized MRI (cervical, thoracic, lumbar, cervical and thoracic, or thoracic and lumbar) or total spine. Patient characteristics were then defined, including: patient age, sex, Elixhauser Comorbidity Index (ECI), insurance, geographic region, and diagnosis (trauma/infection/neoplasm or degenerative/other). These characteristics were compared with univariate and multivariate analyses.

**RESULTS:** Of 275,999 patients in the ED and received a spinal MRI, localized MRI was performed for 93.2% and total spine MRI was performed for 6.8%. Over the years of the study, total spine MRIs increased from 4.85% in 2010 to 12.38% in 2021 (significant increase with $p<0.0001$, Figure 1).

Independent predictive factors for receiving a total spine MRI for patients in the ED included younger age (odds ratio [OR] 1.47 per decade decrease), male sex (OR 1.21), higher ECI (OR 1.38), region of the country (relative to South, West OR 1.32), insurance (relative to Commercial, Medicare OR 1.10 and Medicaid OR 1.23) and diagnosis (relative to Degenerative/Other, Trauma, Infection, or Neoplasm OR 1.30) with $p<0.0001$ for each.

Further analysis showed that of the 18,632 patients who had a total spine MRI, 8378 (45.0%) had to have another MRI compared to 108,698 (42.2%) of the 257,367 patients who had a localized MRI had to have another MRI within two weeks of their original scan.

**DISCUSSION:** Of those patients getting spine MRIs, total spine MRIs are constituting increasing percentage of the studies over the years. The current study found an increase in total spine MRI use over a decade for patients admitted to the ED revealing evolving imaging ordering processes. Several predictive factors for patients receiving a total spine MRI versus a localized spine MRI were identified, suggesting certain patients may be viewed to be more clinically favorable for total spine imaging.

**SIGNIFICANCE/CLINICAL RELEVANCE:** Indications for ordering a total spine MRI versus a localized spine MRI need to have clear understandings to facilitate appropriate imaging and reduce healthcare expenditures where possible.

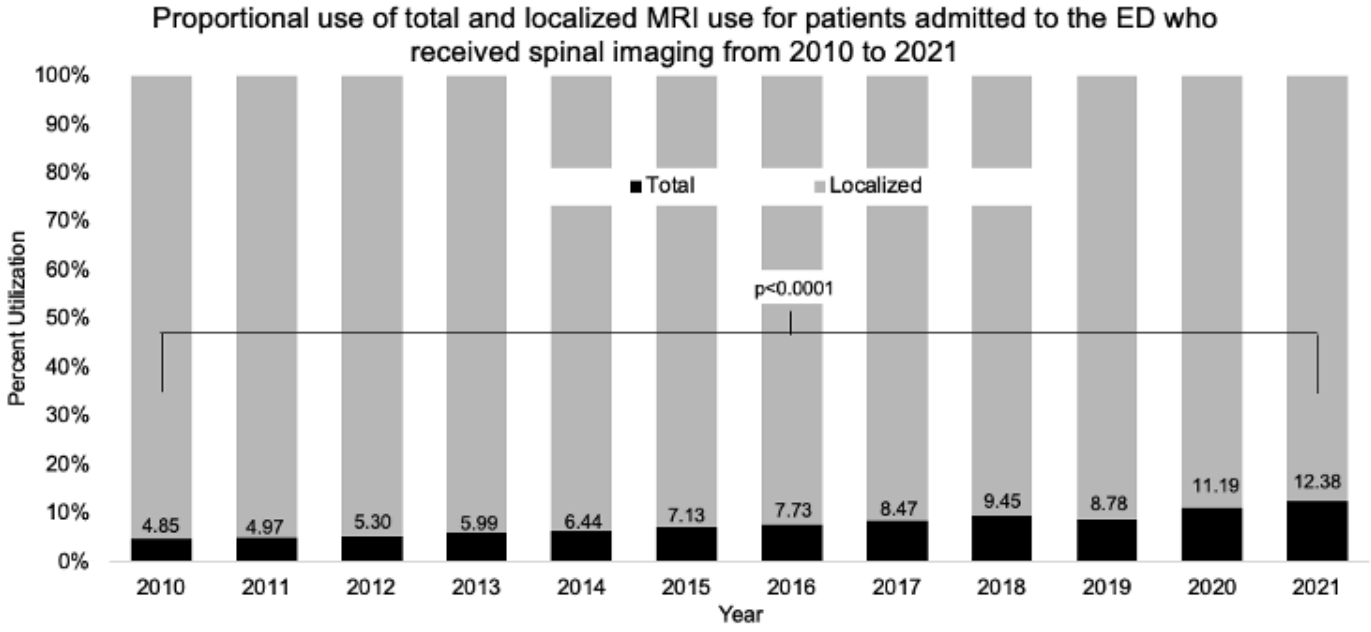


Figure 1. Trend in total spine utilization for patients admitted to the ED compared to localized MRI over a decade.