ACR Neuroradiology TEP
Revised June 24, 2025

Measure Title: Standardized Spine Fracture Classification

Measure Purpose	This measure aims to standardize the use of validated spinal fracture classification systems in CT spine reports for patients with spinal fractures. By ensuring consistent fracture descriptions, it enhances diagnosis accuracy, informs evidence-based treatment, improves communication among care teams, and reduces clinical variability. The goal is to improve patient outcomes, minimize diagnostic errors, and drive quality improvement in spine trauma care.
Measure Description:	Percentage of final reports for patients with spinal fractures undergoing CT of the spine, which include the fracture classification using a Spine Trauma Classification System.
Measure Type:	Outcome
Care Setting:	Emergency, Outpatient Hospital, Inpatient Hospital
Measurement Level:	Individual Clinician or Group
Rationale:	**Background** Spinal fractures represent a significant clinical burden, with an estimated 1.5 to 2 million cases occurring annually in the United States. Given their prevalence and potential for severe morbidity, standardized classification and timely and accurate diagnosis are essential to ensure optimal outcomes[1]. Advances in imaging technologies, particularly CT and MRI, have enhanced clinicians' ability to assess fracture morphology, understand injury mechanisms, and evaluate spinal stability—critical for guiding evidence-based treatment decisions[5]. Standardized spinal fracture classification systems—such as the Magerl/AO Spine and the Thoracolumbar Injury Classification and Severity Score (TLICS)—enable consistent interpretation of imaging findings, promote uniform clinical decision-making, and support the delivery of high-quality care[74]. By establishing a common language among providers, these systems reduce variability in treatment, facilitate communication across care teams, and provide a foundation for performance measurement and quality improvement[3]. Such use has demonstrated their ability to improve patient outcomes and enhance care coordination. **Care Gap** Despite the availability of validated spinal fracture classification systems such as the AO Spine and TLICS frameworks, radiologists do not consistently apply these tools in clinical practice. This inconsistency is concerning, as classification scores directly inform critical treatment decisions, including whether a patient should undergo surgical or nonsurgical management. Studies have shown that standardized use of these systems improves interobserver reliability and supports more consistent, evidence-based decision-making[6]. Addressing this gap would prompt quality improvement goals by encouraging care coordination and reducing practice variability.

	Clinical Justification Patients whose imaging reports indicate spinal fractures but lack a structured classification system are at increased risk for delayed or inaccurate diagnosis, including misinterpretation of fracture severity. This diagnostic uncertainty can lead to inappropriate treatment decisions, such as unnecessary surgical interventions or missed opportunities for timely stabilization. The absence of standardized classification also contributes to poorer patient outcomes, including increased risk of neurological complications, chronic pain, and long-term disability[5]. Implementing consistent use of validated classification systems supports more accurate triage and enhances interdisciplinary communication. **Impact on Healthcare Utilization and Costs** The average cost per spinal fracture patient is an estimated $34,855 annually[2]. Much of that is driven by inflated patient and practice costs due to longer hospital stays, additional surgeries, and extended rehabilitation. Based on the average cost per spinal fracture patient and the documented benefits of using the AO Spine Classification system, it may be inferred that standardizing its use could reduce this amount by up to 20 percent. Spinal fractures are high-acuity injuries that often require advanced imaging, multidisciplinary evaluation, and surgical intervention. These care components contribute to substantial healthcare expenditures, particularly when complications such as neurological impairment, chronic pain, or long-term disability occur. The financial burden is further exacerbated by inconsistent use—or complete omission—of validated spinal fracture classification systems, such as the AO Spine and Thoracolumbar Injury Classification and Severity Score (TLICS)[73]. The absence of standardized classification contributes to diagnostic variability, fragmented care coordination, and inappropriate treatment decisions, which can lead to both overtreatment (e.g., unnecessary surgery) and undertreatment (e.g., missed unstable fractures). These missteps increase the likelihood of complications, readmissions, and prolonged recovery, all of which drive up healthcare costs. Although large-scale economic evaluations are limited, the clinical utility of AO Spine and TLICS systems is well-documented. These systems improve interobserver reliability, support evidence-based triage, and promote consistent decision-making across providers[46]. By reducing variability in care and aligning treatment with injury severity, classification systems help avoid unnecessary interventions and associated costs. Further, the use of structured classification tools aligns with CMS's goals under the Merit-based Incentive Payment System (MIPS) by promoting standardized, high-quality, and cost-effective care. Improved care coordination and reduced complication rates logically support cost avoidance through fewer readmissions, shorter hospital stays, and more efficient use of resources.

Denominator:	All final reports for patients, regardless of age, undergoing cross-sectional imaging that includes the spine and identifies a spinal injury at the initial presentation. **<u>Denominator Criteria (Eligible Cases)</u>:** All patients, regardless of age **<u>AND</u>** Patient procedure during the performance period (CPT): 72125, 72126, 72127, 72128, 72129, 72130, 72131, 72132, 72133 **<u>AND</u>** Diagnosis of spinal fracture (ICD-10): S12.0, S12.1, S12.9, S22.0, S22.1, S22.9, S32.0, S32.1, S32.9, S14.1, S14.9, S51.0, S51.9 **<u>Denominator Note:</u>** This measure intends to assess the use of AO classification per part of spine (craniocervical junction, subaxial, thoracolumbar) as applicable.
Denominator Exception:	Study quality limits the evaluation of the imaging signs needed for the AO classification.
Exclusions:	Final reports of patients undergoing **follow-up** imaging of the spine who have spinal fractures. Patients for whom a prior exam exists with AO classification.
Numerator:	All final reports for patients with a spinal fracture on initial cross-sectional imaging that include utilization of the AO Spine Classification System(s). • Upper Cervical Injury Classification System • Subaxial Injury Classification System • Thoracolumbar Injury Classification System **Numerator Codes:** ***Performance Met:*** **PM0XX:** Final report includes AO classification. **<u>OR</u>** ***Performance Not Met:*** **PNMXX:** Final report does not include AO classification, reason not given. **<u>OR</u>** ***Denominator Exception:*** **PEXX:** Documentation of medical or patient reasons for not including reference to AO classification, such as the study quality limits the evaluation for the imaging signs needed for the AO classification. **<u>Numerator Notes:</u>** Elaborate on exceptions, guidance from AO documentation.

	Anatomical structures that are fractured, ligaments that are injured, vertebral body position, extent of the fracture, shape of the spine, any displacements.
Guidance	Association for the Study of Internal Fixation (AO) Spine Thoracolumbar Injury Classification System is designed to systematically classify thoracolumbar spine injuries. • Upper Cervical Injury Classification System • Subaxial Injury Classification System • Thoracolumbar Injury Classification System
References	1. Centers for Disease Control and Prevention. (2025, January 15). FastStats - Accidents or Unintentional Injuries. National Center for Health Statistics. 2. Centers for Disease Control and Prevention. (n.d.). WISQARS™ - Web-based Injury Statistics Query and Reporting System. https://wisqars.cdc.gov/ 3. Curfs, I., Schotanus, M., van Hemert, W. L. W., Heijmans, M., de Bie, R. A., van Rhijn, L. W., & Willems, P. C. P. H. (2020). Reliability and clinical usefulness of current classifications in traumatic thoracolumbar fractures: A systematic review of the literature. International Journal of Spine Surgery, 14(6), 956–969. https://doi.org/10.14444/7145 4. Joaquim, A.F., et al. (2013). Clinical application of the AO Spine thoracolumbar spine injury classification system. Journal of Neurosurgery: Spine. 5. National Institute of Neurological Disorders and Stroke. (n.d.). Spinal Cord Injury. National Institutes of Health. https://www.ninds.nih.gov/health-information/disorders/spinal-cord-injury 6. Vaccaro, A. R., et al. (2005). A new classification of thoracolumbar injuries: the importance of injury morphology, the integrity of the posterior ligamentous complex, and neurologic status. Spine Journal. 7. Vaccaro, A. R., et al. (2016). The development and validation of the AOSpine thoracolumbar spine injury classification system. Spine, 41(19), 1375–1384. https://doi.org/10.1097/BRS.0000000000001700