ACR Neuroradiology TEP Revised
August 18, 2025 (Post Comment Period)

Measure Title: Standardized Spine Fracture Classification Using Validated Systems

Measure Purpose	This measure aims to standardize the spinal fracture reporting through the description of key imaging features, such as vertebral body height loss, involvement of spinal columns, and displacement, that can be mapped to existing classification systems (i.e., AO Spine, Thoracolumbar Injury Classification and Severity Score -TLICS). Consistent fracture descriptions can enhance diagnosis accuracy, inform evidence-based treatment, improve communication among care teams, and reduce clinical variability.
Measure Description	Percentage of final reports for patients with *acute* spinal fractures undergoing initial CT of the spine that include descriptive imaging findings.
Measure Type	Intermediate 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 and spinal stability, critical for guiding evidence-based treatment decisions.[5] Standardized spinal fracture classification systems, such as the 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.[4,7] 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] **Care Gap** Despite the availability of spinal fracture classification systems such as the AO Spine and TLICS frameworks, radiologists do not consistently report all imaging findings that are needed to easily map them to a classification system. This inconsistency is concerning, as classification scores can 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] Since classification systems may include the patient's clinical status, which may not be known to the radiologist, this measure focuses on detailed fracture feature descriptions. **Clinical Justification** Patients whose imaging reports indicate spinal fractures but lack detailed fracture feature descriptions 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 reporting also contributes to poorer patient outcomes, including increased risk of neurological complications, chronic pain, and long-term disability.[5] **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 or TLICS 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).[3,7] The absence of standardized fracture feature reporting 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.[4,6] 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.

Clinical Justification

Patients whose imaging reports indicate spinal fractures but lack comprehensive standardized fracture feature reporting 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 fracture reporting may thus contribute to poorer patient outcomes, including increased risk of neurological complications, chronic pain, and long-term disability.[5] Implementing consistent use of comprehensive standardized fracture feature reporting in radiology 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 longer hospital stays, additional surgeries, and need for extended rehabilitation. Based on the average cost per spinal fracture patient and the documented benefits of using the AO Spine or TLICS 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 lack of comprehensive standardized fracture feature reporting that can be mapped to spinal fracture classification systems, such as the AO Spine and Thoracolumbar Injury Classification and Severity Score (TLICS).[3,7] The absence of

	comprehensive standardized fracture feature reporting 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.[4,6] 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 patients, regardless of age, undergoing initial cross-sectional imaging that includes the spine and with findings of an acute traumatic vertebral body fracture. **Denominator Criteria (Eligible Cases):** All patients, regardless of age **AND** Patient procedure during the performance period (CPT): 72125, 72126, 72127, 72128, 72129, 72130, 72131, 72132, 72133 **AND** 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 **Denominator Note:** This measure intends to assess the use of AO or TLICS Classification Systems for the thoracolumbar region.
Denominator Exception	Study quality limits the evaluation of the imaging signs needed for the AO or TLICS 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 or TLICS classification. Compression fractures in patients with osteoporosis, cancer, spinal osteomyelitis.
Numerator	All final reports for patients with acute spinal fracture on initial cross-sectional imaging that include comprehensive documentation of relevant injury features (see Guidance) **Numerator Note:** The measure is based on CT findings. MRI may be used to supplement evaluation when clinically indicated or available. **Numerator Codes:** ***Performance Met:*** **PM0XX:** Final report includes documentation of the five numerator elements. **OR**

Performance Not Met: **PNMXX:** Final report does not include documentation of the five numerator elements and the reason why element five was not given.

OR

Denominator Exception: **PEXX:** Documentation of medical or patient reasons* for not including descriptive imaging features or classification, such as poor image quality, limited visualization, or non-diagnostic study.

Note: *Anatomical structures that are fractured, ligaments that are injured, vertebral body position, 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.

Thoracolumbar Injury Classification and Severity Score (TLICS) was developed to guide treatment decisions for thoracolumbar spine injuries, TLICS assigns scores based on three key components—injury morphology, integrity of the posterior ligamentous complex, and neurological status. The total score helps determine whether surgical or non-surgical management is appropriate. TLICS is widely used in trauma and spine surgery settings and supports consistent triage, interdisciplinary communication, and evidence-based care.

Checklist for fracture feature reporting:

CT Imaging	
Injury Morphology	Primary pattern (compression, burst, translation, flexion-distraction)
	Basic morphology
	Estimated % height loss
	Retropulsion and % canal narrowing
	Other contiguous/noncontiguous injuries
	Degree of kyphosis
PLC Injury Predictors	Facet joint widening
	Interspinous distance widening
	Spinous process avulsion fracture
	Vertebral body subluxation/dislocation
MR Imaging	
Osseous Injuries	Osseous injuries (similar to CT)
Soft tissue injuries	PLC status (intact, indeterminate, disrupted)
	Anterior and posterior longitudinal ligament
	Supraspinous ligament
	Ligamentum flavum
	Interspinous ligament
	Facet capsules
	Disks
Neurologic injuries[1]	Spinal cord and conus (partial/complete)
	Cauda equina
	Nerve root injury
	Epidural hematoma

1. Although neurologic injuries are not directly assessed by imaging, cord or nerve injury could be potentially identified by imaging based on degree of retropulsion of fracture into spinal canal on CT. If MRI is available, abnormal spinal cord signal or presence of an epidural hematoma could be described.

Adapted from: Khurana B, Sheehan SE, Sodickson A, Bono CM, Harris MB. Traumatic

	thoracolumbar spine injuries: what the spine surgeon wants to know. Radiographics. 2013 Nov-Dec;33(7):2031-46. doi: 10.1148/rg.337135018. PMID: 24224597.
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. Pidd, K. T., Sadauskas, D., Tomatis, V., & Knight, E. J. (2024). Which is the superior thoracolumbar injury classification tool? TLICS versus AOSpine: A systematic review. *Global Spine Journal*. https://doi.org/10.1177/21925682241311303 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., Lehman, R. A., Hurlbert, R. J., Anderson, P. A., Harris, M., Hedlund, R., Harrop, J., Dvorak, M., Wood, K., Fehlings, M. G., Fisher, C., Zeiller, S. C., Anderson, D. G., Bono, C. M., Stock, G. H., Brown, A. K., Kuklo, T., & Öner, F. C. (2005). A new classification of thoracolumbar injuries: The importance of injury morphology, the integrity of the posterior ligamentous complex, and neurologic status. *The Spine Journal*, *5*(6), 630–642. https://doi.org/10.1016/j.spinee.2005.04.015 7. Vaccaro, A. R., Oner, F. C., Kepler, C. K., Dvorak, M., Schnake, K. J., Kandziora, F., Reinhold, M., Aarabi, B., Bellabarba, C., Fehlings, M. G., Fisher, C. G., Silva, P., Rajasekaran, S., & Schroeder, G. D. (2016). The development and validation of the AO Spine thoracolumbar spine injury classification system. *Spine*, *41*(19), 1375–1384. https://doi.org/10.1097/BRS.0000000000001955