CORR Insights

CORR Insights®: Can Surgeons Adequately Capture Adverse Events Using the Spinal Adverse Events Severity System (SAVES) and OrthoSAVES?

Y. Raja Rampersaud MD, FRCSC

Where Are We Now?

The Institute of Medicine has recommended systems for reporting medical errors. However, at a basic level, a standard language and consistent definitions for what constitutes an adverse event (AE)

This CORR Insights® is a commentary on the article “Can Surgeons Adequately Capture Adverse Events Using the Spinal Adverse Events Severity System (SAVES) and OrthoSAVES?” by Chen and colleagues available at: DOI: [10.1007/s11999-016-5021-y](https://doi.org/10.1007/s11999-016-5021-y).

The author certifies that he, or a member of his immediate family, has no funding or commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted article.

All ICMJE Conflict of Interest Forms for authors and *Clinical Orthopaedics and Related Research*® editors and board members are on file with the publication and can be viewed on request.

The opinions expressed are those of the writers, and do not reflect the opinion or policy of CORR® or The Association of Bone and Joint Surgeons®.

have been lacking [11]. Current terminology, such as “complication,” “AE,” “adverse occurrence,” or “near misses,” are often used interchangeably, but have different meanings (between or within institutions depending on case definition) and varying methods for identification and reporting [10]. In addition, concerns regarding malpractice, professional, and financial implications (personal, practice group, or institutional) of AEs can result in variable reporting of AEs [7]. The inconsistency of AE reporting in surgery reflects the complexity and challenges of this important issue, and currently is a focus of many surgical societies and institutions.

Specific to the current article by Chen and colleagues, underreporting

This CORR Insights® comment refers to the article available at DOI: [10.1007/s11999-016-5021-y](https://doi.org/10.1007/s11999-016-5021-y).

Y. R. Rampersaud MD, FRCSC (✉)
Toronto Western Hospital, University of
Toronto, 399 Bathurst St., Toronto,
ON M5T 2S8, Canada
e-mail: raja.rampersaud@uhn.ca

of AEs by physicians is one of the evidentiary challenges in patient-safety initiatives [12]. Chen and colleagues prospectively assessed the use of a Spinal Adverse Events Severity System (SAVES) (developed by this writer) for spine and orthopaedic surgery [10, 11]. They demonstrated relative under-reporting by surgeons regarding minor AEs and appropriately questioned the cost-benefit of using third-party reviewers. They also noted that specific training may have improved physician reporting.

Where Do We Need To Go?

A thorough discussion of the existing body of science on the broader needs, methods, and evaluation of processes for improving patient safety and quality initiatives (QIs) is beyond the scope of this brief commentary. But from my perspective, Chen and colleagues raise several critical questions regarding physician participation and consistent AE reporting across the healthcare

CORR Insights

sector: (1) As it relates to reporting AEs, is it about education or the broader need for cultural change regarding medical errors? (2) What are the key education components and implementation enablers that address specific system and regional barriers for change? (3) What are the system and regional incentives/drivers for change from the perspective of patients, providers, institution and payer? (4) What is the effectiveness (that is, the impact on reduction of AEs) and cost consequence(s) of current and future interventions?

How Do We Get There?

For Questions 1–3, the subjective and often-emotional aspects (such as perception of punitive action or professional “shame”) of reporting AEs requires the addition of qualitative research to traditional quantitative methods. Future studies can build on the current study by Chen and colleagues by adding a qualitative component that can add insight into why the surgeons did not feel it was necessary to report the more frequent “minor” AEs. For example, if the prevailing theme from such an exercise was that the more minor events, such as an UTI, were not perceived to have any serious clinical impact, then perhaps education regarding the

cumulative financial impact of minor AEs and how it directly affects the surgeons’ practices (such as with respect to bed availability) would result in greater incentive to actively participate [3]. Furthermore, to determine relevant barriers and enablers for implementation of a safety initiative, the regional context requires more explicit exploration. For example, the scenario of reporting a minor event such as UTI will have very a different context in the United States as it pertains to issues such as “never events” and the shifting of the cost burden for such events from payers to providers [2]. This issue is further complicated by variable mechanisms and layers of accountability for a given payer, provider, and institution [8]. Comparatively, in the single-payer context of Canada, other than the need for treatment of a given AE, there is no real personal consequence for the surgeon or immediate actionable consequence for the institution [3]. Consequently, patient safety, QI research, educational efforts, and interventions must take these varying, context specific, factors into consideration and adapt the process to achieve appropriate alignment and incentive across multiple stakeholders, including patients [4]. As demonstrated in previously published studies [6, 13], SAVES functions well when the process of identification and classification of AEs

is done by the healthcare team, rather than individual providers or institutional processes [1]. Utilization of the existing healthcare team (doctors, trainees, nurses, allied health providers, and pharmacists) partially addresses concerns regarding cost-benefit of third-party reviewers, but not the cost requirements of data entry and database management.

In addition to patient safety and quality of care, AEs have a significant financial impact [3]. Cost-effectiveness analysis (CEA) is the preferred form of health economic assessment, however, large scale CEAs are challenging and costly to execute. Furthermore, the results of CEAs are often difficult to translate to a different regional context. A practical alternative may be cost-consequent analysis which comprises of a disaggregated presentation of relevant variables (including costs and benefits) that provides decision makers with detailed information about the intervention under evaluation, thus allowing different stakeholders to identify components most relevant to their perspective [9]. Regarding outcomes, a recent systematic review [5] demonstrated variable effectiveness in the ability of patient safety initiatives to reduce surgical harm and also implementation feasibility. Continued studies on effectiveness of a given patient safety initiative are paramount,

CORR Insights

however, studies should also concurrently evaluate the cost consequences.

References

1. Bohl DD, Russo GS, Basques BA, Golinvaux NS, Fu MC, Long WD 3rd, Grauer JN. Variations in data collection methods between national databases affect study results: a comparison of the nationwide inpatient sample and national surgical quality improvement program databases for lumbar spine fusion procedures. *J Bone Joint Surg Am.* 2014;96:e193.
2. Daniels AH, Kawaguchi S, Contag AG, Rastegar F, Waagmeester G, Anderson PA, Arthur M, Hart RA. Hospital charges associated with “never events”: Comparison of anterior cervical discectomy and fusion, posterior lumbar interbody fusion, and lumbar laminectomy to total joint arthroplasty. *J Neurosurg Spine.* 2016;25:165–9.
3. Hellsten EK, Hanbidge MA, Manos AN, Lewis SJ, Massicotte EM, Fehlings MG, Coyte PC, Rampersaud YR. An economic evaluation of perioperative adverse events associated with spinal surgery. *Spine J.* 2013;13:44–53.
4. Hemingway MW, O'Malley C, Silvestri S. Safety culture and care: a program to prevent surgical errors. *AORN J.* 2015;101:404–12; quiz 413–415.
5. Howell AM, Panesar SS, Burns EM, Donaldson LJ, Darzi A. Reducing the burden of surgical harm: a systematic review of the interventions used to reduce adverse events in surgery. *Ann Surg.* 2014;259:630–641.
6. Karstensen S, Bari T, Gehrchen M, Street J, Dahl B. Morbidity and mortality of complex spine surgery: A prospective cohort study in 679 patients validating the Spine Adverse Event Severity (SAVES) system in a European population. *Spine J.* 2016;16:146–153.
7. Krizek TJ. Surgical error: Ethical issues of adverse events. *Arch Surg.* 2000;135:1359–1366.
8. Lee MJ, Shonnard N, Farrokhi F, Martz D, Chapman J, Baker R, Hsiang J, Lee C, Gholish R, Flum D; Spine SCOAP-CERTAIN Collaborative. The Spine Surgical Care and Outcomes Assessment Program (Spine SCOAP): A surgeon-led approach to quality and safety. *Spine (Phila Pa 1976).* 2015;40:332–341.
9. Mauskopf JA, Paul JE, Grant DM, Stergachis A. The role of cost-consequence analysis in healthcare decision-making. *Pharmacoeconomics.* 1998;13:277–288.
10. Rampersaud YR, Anderson PA, Dimar JR 2nd, Fisher CG; Spine Trauma Study Group and Degenerative Spine Study Group. Spinal Adverse Events Severity System, version 2 (SAVES-V2): Inter- and intraobserver reliability assessment. *J Neurosurg Spine.* 2016;25:256–263.
11. Rampersaud YR, Neary MA, White K; Spine adverse events severity system: content validation and interobserver reliability assessment. *Spine (Phila Pa 1976).* 2010;35:790–795.
12. Rowin EJ, Lucier D, Pauker SG, Kumar S, Chen J, Salem DN. Does error and adverse event reporting by physicians and nurses differ? *Jt Comm J Qual Patient Saf.* 2008;34:537–545.
13. Street JT, Lenehan BJ, DiPaola CP, Boyd MD, Kwon BK, Paquette SJ, Dvorak MF, Rampersaud YR, Fisher CG. Morbidity and mortality of major adult spinal surgery. A prospective cohort analysis of 942 consecutive patients. *Spine J.* 2012;12:22–34.