



Neurosurgical Forum
LETTERS TO THE EDITOR

Education and evidence-based medicine in neurosurgery

TO THE EDITOR: As representatives of the leadership in organized neurosurgery, we are writing to commend the *Journal of Neurosurgery: Spine* for the invited publication by Hadley and Walters¹ in the October 2019 issue (Hadley MN, Walters BC. The case for the future role of evidence-based medicine in the management of cervical spine injuries, with or without fractures. JNSPG 75th Anniversary Invited Review Article. *J Neurosurg Spine*. 2019;31(4):457–463). You chose two of our current neurosurgical thought leaders who are at the forefront of education and evidence-based medicine in neurosurgery, particularly in its applied form through the development of clinical practice guideline recommendations. As noted, these authors and their colleagues were recognized by the United States Congress for their work in this field.² In their publication, the authors have identified several important issues currently within our specialty that we would like to comment upon.

There is the recognition of the value and efficacy of the systematic approach to the development of assessment, diagnostic, and treatment recommendations, as opposed to the more historical mechanism of well-known practitioners declaring the best way to approach a problem (not necessarily based on scientific evidence). The systematic, evidence-based approach improves patient care through the scientific evaluation of new, suggested management pathways, and it identifies faulty practice patterns undertaken without careful examination of proffered evidence in the literature. In addition, guideline development helps to identify areas within patient care that require further study for the generation of more solid evidence to define the most effective treatment approaches. By investing the energy and effort to create the best-possible recommendations, these authors and their colleagues provide exemplary mechanisms for improving patient care within our specialty.

In addition to detailing the value of evidence-based guideline development, the authors provide examples of where we have gone wrong in our treatment approaches by not clearly understanding the successes and failures in the science that underlie certain approaches to patient care. An example is the use of methylprednisolone to treat patients with spinal cord injury, which is a treatment paradigm followed for decades without an appreciation of the

flaws in the trials supporting its use.³ This is surprisingly still under discussion, even though there have now been several studies and guidelines refuting its use in this patient scenario.

Perhaps even more importantly, these authors bring to readers' attention the publication of other guidelines that have failed to achieve support or the imprimatur of our leading organizations (the Congress of Neurological Surgeons and American Association of Neurological Surgeons) and falsely claim to be carried out "under the auspices" of these organizations.⁴ This claim was reiterated, unfortunately, in one of our own publications,⁵ but it was refuted and clarified by these authors, to the benefit of all neurosurgeons.

Finally, we wish to thank Drs. Hadley and Walters for their steadfast support for scientific approaches to neurosurgical care and for helping their colleagues achieve a greater understanding of the best available evidence.

Steven N. Kalkanis, MD

Henry Ford Health System, Detroit, MI

Christopher I. Shaffrey, MD

Duke University, Durham, NC

Ganesh Rao, MD

University of Texas MD Anderson Cancer Center, Houston, TX

Shelly D. Timmons, MD, PhD

Penn State Health Milton S. Hershey Medical Center, Hershey, PA

Brian L. Hoh, MD, MBA

University of Florida, Gainesville, FL

John A. Wilson, MD

Wake Forest Baptist Health, Winston-Salem, NC

References

1. Hadley MN, Walters BC. The case for the future role of evidence-based medicine in the management of cervical spine injuries, with or without fractures. JNSPG 75th Anniversary Invited Review Article. *J Neurosurg Spine*. 2019;31(4):457–463.
2. Langevin JR. Recognizing the contributors to the updated Guidelines for the Management of Acute Cervical Spine and Spinal Cord Injuries. *Congr Rec*. 2013;159(130):E1394
3. Hadley MN, Walters BC. Introduction to the Guidelines for the Management of Acute Cervical Spine and Spinal Cord Injuries. *Neurosurgery*. 2013;72(Suppl 2):5–16.
4. Fehlings MG, Wilson JR, Harrop JS, et al. Efficacy and safety of methylprednisolone sodium succinate in acute spinal

cord injury: a systematic review. *Global Spine J.* 2017;7(3) (suppl):116s–137s.

- Samadani U. Is the clock ticking on “Why don’t you hang some phenylephrine and call me in the morning?” Investigating evidence beyond the Guidelines for Acute Management of Spinal Cord Injury. *Neurotrauma & Critical Care News.* Spring 2019:3–5. Accessed February 13, 2020. http://www.neurotraumasection.org/_literature_244949/2019_Spring

Disclosures

Sources of support: American Association of Neurological Surgeons (AANS) and Congress of Neurological Surgeons (CNS). Steven N. Kalkanis: president, CNS. Christopher I. Shaffrey: president, AANS. Dr. Shaffrey reports that he is a consultant for Medtronic, NuVasive, and SI Bone; owns stock in SI Bone; and receives royalties from Medtronic, NuVasive, and Zimmer Biomet. Ganesh Rao: past president, CNS. Shelly D. Timmons: past president, AANS. Brian L. Hoh: president-elect, CNS. John A. Wilson: president-elect, AANS.

Correspondence

Steven N. Kalkanis: skalkan1@hfhs.org.

INCLUDE WHEN CITING

Published online March 6, 2020; DOI: 10.3171/2019.12.SPINE191505.

Response

We are very grateful for and humbled by the letter to the editor from our esteemed colleagues who represent the current, immediate past, and future leadership of our two national neurosurgical member service societies, the American Association of Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (CNS). Their response demonstrates their recognition of the importance of evidence-based medicine (EBM) to our specialty, particularly in the management—including assessment, diagnosis, and treatment—of patients with neurosurgical disease. The rigid application of evidence-based medicine in the development of a comparative study design to obtain at least class II medical evidence is essential. This stance was embraced early on by both of our large national organizations.¹

In researching our article, we found it ironic and astonishing that several AANS/CNS Trauma Section leaders have suggested in a recent edition of the *Neurotrauma & Critical Care News* that evidence-based medicine may be over-rated, perhaps too rigid and onerous, preferring a return to “practice-based medicine.” In other words, they would prefer to take a stance of “this is what we do and it seems to make sense” rather than to rigorously study what is being done scientifically to determine whether it makes a difference (positive or negative) based on the principled science of evidence-based medicine.^{2,3} That these stances are in direct contradistinction to those espoused and supported by our basic science colleagues (among whom these authors surprisingly number) is unfathomable. This is the opposite of everything we have been taught regarding translational research by these esteemed colleagues, and it is in direct contrast to the standards espoused by our national organizations and outlined by our leaders in their letter to the editor as “exemplary mechanisms for improving patient care within our specialty.”

For example, the AANS/CNS Trauma Section authors specifically reference early surgery for decompression of the spinal cord after a patient has sustained traumatic cervical or thoracic spinal trauma associated with spinal cord injury.³ Early is better for intracranial epidural hematomas, so why shouldn’t the same principle apply to acute spinal cord compression? In fact, it might, and while it makes a lot of sense to decompress the compromised spinal cord early, it unfortunately hasn’t been proven yet with any degree of scientific certainty (level I or II comparative medical evidence).⁴

In addition, they appear to favor the abandonment of the scientific rigor of evidence-based medicine in the study of traumatic neurosurgical injuries and suggest a more casual, less scientific, practice-based approach to traumatic brain and cervical spine and spinal cord injuries, harking back decades to reliance on level III prognosis-with-treatment case series.² We may personally favor (and have practiced) early, rapid realignment and reduction of cervical and thoracic fracture dislocation injuries by either closed or open surgical means—spinal cord injury present or not—in the hope of preventing potential neurological injury if the reduction and/or decompression is not early enough, and have both exemplified this paranoid bias all of our respective careers. However, we are aware that because we “believe it to be so” doesn’t “make it so” scientifically. For this scenario—and for others—we concur with our organizational leaders who continue to embrace the pursuit of the “best available evidence” derived by the application of evidence-based medicine to the care of our neurosurgical patients.

Mark N. Hadley, MD

University of Alabama at Birmingham, AL

Beverly C. Walters, MD, MSc, FRCS

University of Alabama at Birmingham, AL

Henry Ford Health System, Detroit, MI

References

- Walters BC. Clinical practice parameter development in neurosurgery. In: Bean JR, ed. *Neurosurgery in Transition: The Socioeconomic Transformation of Neurological Surgery.* Lippincott Williams and Wilkins; 1998:99–111.
- Ngwenya LB, Foreman B. Does neurotrauma need practice-based medicine? *Neurotrauma & Critical Care News.* Spring 2019:9–10. Accessed February 13, 2020. http://www.neurotraumasection.org/_literature_244949/2019_Spring
- Samadani U. Is the clock ticking on “Why don’t you hang some phenylephrine and call me in the morning?” Investigating evidence beyond the Guidelines for Acute Management of Spinal Cord Injury. *Neurotrauma & Critical Care News.* Spring 2019:3–5. Accessed February 13, 2020. http://www.neurotraumasection.org/_literature_244949/2019_Spring
- O’Toole JE. Timing of surgery after cervical spinal cord injury [letter]. *World Neurosurg.* 2014;82(1-2):e389–e390.

INCLUDE WHEN CITING

Published online March 6, 2020; DOI: 10.3171/2020.2.SPINE191525.

©AANS 2020, except where prohibited by US copyright law