AANS CNS

NEUROTRAUMA & CRITICAL CARE

NEWS

SPRING 2025

CHAIR'S MESSAGE

As I write this message to you in March, which is TBI Awareness Month, I want to take a moment to reflect on the care we provide to our TBI patients and any neurosurgery patients, especially regarding the decision-making that happens in emergencies.

Each of us has experienced losses and heroic saves, unexpected outcomes, and devastating suffering. I encourage you to consider how TBI care impacts you personally. What is your attitude in your decision-making for TBI patients: "There is an outcome worse than death," or "One must survive first to get better"?

Recently, I presented a palliative care grand rounds focusing on the intersection of neurosurgery, palliative care, and moral injury. Our group published research showing that rates of futile surgery correlate with moral injury, which, over time, contributes to burnout among physicians. Alarmingly, we found that one in four neurosurgeons felt they did not provide goal-concordant care for their TBI patients. This is important because practicing goal-concordant care protects against moral injury and burnout.

We often find ourselves in challenging situations due to the lack of advanced directives, an uncertain prognosis, surrogate decision-makers, and the urgency required in making a surgical decision in neurotrauma. Interestingly, one out of five neurosurgeons reported feeling uncomfortable leading the goal-of-care discussion or when delivering bad news. Communication training on handling these challenging conversations is still often buried in the hidden curriculum of our residency training. Only 11% of neurosurgery residents reported ever receiving feedback on handling these difficult conversations.

I challenge all of you to be curious about your communication skills. Understanding various communication types—social, factual, and emotional—can help you deliver bad news and provide goal-concordant care more often. For those interested, I recommend the Palliative Care Education and Practice (PCEP) curriculum from Harvard Medical School and the book *Supercommunicators* by Charles Duhigg, which explores different communication styles.

As we navigate these difficult discussions, remember that while we are trained with precision to use our scalpel, explicit training in communicating serious illness and poor outcomes is often lacking. In the words of Paul Kalanithi, "When there is no place for the scalpel, words are the surgeon's only tool." Let's strive to train our residents and ourselves in using our words as skillfully as we wield our instruments.

I also want to take a moment to celebrate our award winners for the Charles Tator Spinal Cord Injury Resident Research Award, NATUS Fellow/Resident TBI Award, and the NATUS Fellow/Resident NCC Award. We look forward to seeing you at the upcoming AANS meeting in Boston, where we will celebrate their achievements.

Additionally, I'm excited to announce an innovative panel discussion at this year's CNS meeting: "Management of Repeat Brain Injury: A Discussion with an Expert Panel." This promises to be a lively and informative session.

Lastly, the Neurotrauma and Neuro Critical Care Section is celebrating its 40th anniversary this year! In conjunction with our anniversary, we have started a membership drive. I strongly believe every neurosurgeon should be a Neurotrauma section member. Whether you work directly in neurotrauma or appreciate the contributions of others, your support matters. I encourage each member to recruit a new section member by the end of the year. If you manage to do this, please share your success on social media; we will celebrate the member with the most recruits at the CNS meeting in the fall.

Thank you for your support of the Neurotrauma Section.

Gratefully,
Your Chair,
Martina Stippler

Section on Neurotrauma and Critical Care
AANS / CNS

In this Issue...

The views reflected in this newsletter are solely the views of the authors and do not necessarily represent the views, opinions or positions of either the AANS or the CNS.

NEUROTRAUMA OFFERINGS AT AANS

Plenary 1: From Drop to Ocean: Neurotrauma
Saturday April 26 | 8:15–8:23 am
Dr. David Okonkwo

Trauma Rapid Fire Abstracts
Saturday April 26 | 2:15–3:00 pm

Trauma Oral Paper Posters
Sunday April 27 | 12:15–1:30 pm

Management of Repeat Brain Injury: A Discussion with an International Panel of Experts
Sunday April 27 | 1:30–3:00 pm
Moderators: Martina Stippler, MD & Berje H. Shammassian, MD, MPH

Update on Spinal Cord Injury and Natus Best Paper Awards
Sunday April 27 | 3:30–5:00 pm
Moderators: Paul Arnold, MD & Randy Bell, MD, FAANS

Neurotrauma Awarded Abstracts at AANS

Charles Tator Spinal Cord Injury Resident Research Award
Patients with Traumatic Spinal Injuries Treated in a Low-Middle Income Country: What Happens After Discharge?
Presenting Author: Chibuikem A. Ikwuegbuenyi, MD
Time: Sunday April 27 | 4:18–4:24 pm

Natus Fellow/Resident TBI Award
Paroxysmal Electrographic Slowing Predicts Post-Traumatic Epilepsy Following Severe Traumatic Brain Injury
Presenting Author: Mark A. MacLean, MD, MSc
Sunday April 27 | 4:02–4:08 pm

Natus Fellow/Resident NCC Award
Non-invasive Vagus Nerve Stimulation Improves Glycemic Control in Neurocritical Care Patients Following Subarachnoid Hemorrhage
Presenting Author: Anna L. Huguenard, MD
Time: April 27 | 4:10–4:16 pm

Invited Lecturers at AANS

Chuck Noll Lecture
Faculty: David Okonkwo, MD, PhD
Time: April 27 | 1:35–2:05 pm

Miller Lecturer
Faculty: Suzanne Tharin, MD, PhD, FAANS
Time: Sunday April 27 | 3:37–4:02 pm

Tator Lecturer
Faculty: Zhigang He, PhD
Time: Sunday April 27 | 4:26–5:00 pm

Marmarou Lecture
Faculty: Peter Hutchinson, MD
Time: Sunday April 27 | 2:35–3:00 pm

Distinguished Advocate Award
Shelly D. Timmons MD, PhD, FACS, FAANS
Plenary 1: April 27 | 8:51–8:56 am

UPCOMING EDUCATIONAL OPPORTUNITIES

CNS

2025 CNS NEUROSURGICAL EMERGENCIES COURSE

April 2, 9, & 16, 2025

This virtual course is perfect for neurosurgeons, neurosurgery APPs, neurologists, intensivists, and emergency medicine physicians!

REGISTER NOW

cns.org/trauma

ACS AMERICAN COLLEGE OF SURGEONS

Brain Trauma FOUNDATION

Fundamentals in the Management of Traumatic Brain Injury Course

Course Modules

- Initial Patient Assessment
- Overview of Guidelines and Resources
- Adult Severe TBI Guidelines (4th edition)
- The SIBICC Algorithms
- Surgical Management
- International Perspective

Become a **Member** and take advantage of this opportunity

For questions about the course: traumaeducation@facs.org

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CLINICAL UPDATE: BLOOD TRANSFUSIONS IN ACUTE BRAIN INJURY

T. Jayde Nail, MD

The debate regarding transfusion thresholds in patients with acute brain injuries continues. To review, in 2009 Kramer et al reported that lower hemoglobin (Hb) levels were associated with worse outcomes in patients with aneurysmal SAH. In 2012 Sekhon et al. published an increase in hospital mortality in patients with severe TBI and an average Hb < 9g/dL over 7 days. In a 2014 study published by Claudia Robertson, et al, they investigated the effects of erythropoietin administration and different transfusion thresholds (liberal Hb < 10g vs restrictive < 7g) on neurological recovery in patients with traumatic brain injury. The randomized clinical trial included patients assigned to receive erythropoietin or placebo and to maintain hemoglobin levels at either 7 g/dL or 10 g/dL. The results indicated that erythropoietin did not significantly improve neurological outcomes compared to placebo. Additionally, maintaining a higher hemoglobin threshold of 10 g/dL did not result in better neurological recovery compared to the lower threshold of 7 g/dL. These findings supported the use of a restrictive transfusion strategy and highlighted the limited benefit of erythropoietin in this patient population. In 2019, Gobatto et al published a single center randomized study comparing mortality and neurologic status at 6 months in patients with TBI in liberal (<9 g/dL) vs restrictive (< 7g/dL) and found lower mortality and improved neurologic status in the liberal group.

In 2024, three studies were published on this topic, again with conflicting results. The HEMOTION trial, published in June 2024, did not find that a liberal transfusion strategy (<10 g/dL) reduced risk of unfavorable outcome vs restrictive (<7 g/dL); however, there was a trend toward improved quality of life. The TRAIN trial, published in October 2024, randomized 850 patients with TBI, aneurysmal SAH, and ICH across 72 ICUs among 22 countries into a liberal transfusion threshold (<9 g/dL) or a restrictive transfusion threshold (<7 g/dL). The primary outcome was unfavorable neurologic outcome defined as GOSE 1-5 at 180 days. 62.6% of those in the liberal transfusion group had an unfavorable outcome vs 72.6% in the restrictive group. Furthermore, when evaluating cerebral ischemic events, these occurred more frequently in the restrictive group (13.5%) vs the liberal group (8.8%), although screening was not standardized in the clinical relevance of this is not clear based on data aggregated. A second trial published in December 2024 evaluated liberal versus restrictive transfusion strategies in patients with aneurysmal subarachnoid hemorrhage with hemoglobin levels of less than 10 g/dL versus less than 8 g/dL for their groups. In this study there were no difference in unfavorable neurologic outcomes with similar adverse events (33.5% in liberal group vs 37.7% in restrictive).

The goal in maintaining a certain Hb threshold is to maintain elevated/adequate oxygen carrying capacity of the blood. How transfusions affect cerebral oxygenation, however, is not clear. Gouvea et al noted that blood transfusion was associated with a significant increase in PbtO2 in only 41% of patients/transfusions. A lower starting oxygenation was associated with a response to transfusion, whereas starting Hb was not.

Overall, when to transfusion remains an unanswered question. There are likely patients that would benefit from the increased oxygen carrying capacity afforded by a more liberal transfusion threshold, however, which patients and why have not yet been clearly defined. Further studies investigating the impact of a transfusion on cerebral physiology are necessary.

References

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Kramer AH, Zygun DA, Bleck TP, Dumont AS, Kassell NF, Nathan B. Relationship between hemoglobin concentrations and outcomes across subgroups of patients with aneurysmal subarachnoid hemorrhage. Neurocrit Care. 2009;10(2):157-165. doi:10.1007/s12028-008-9171-y

Robertson CS, Hannay HJ, Yamal JM, et al; Epo Severe TBI Trial Investigators. Effect of erythropoietin and transfusion threshold on neurological recovery after traumatic brain injury: a randomized clinical trial. JAMA. 2014;312(1):36-47. doi:10.1001/jama.2014.6490

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Taccone FS, Rynkowski CB, Møller K, et al. Restrictive vs Liberal Transfusion Strategy in Patients With Acute Brain Injury: The TRAIN Randomized Clinical Trial. JAMA. 2024;332(19):1623–1633. doi:10.1001/jama.2024.20424

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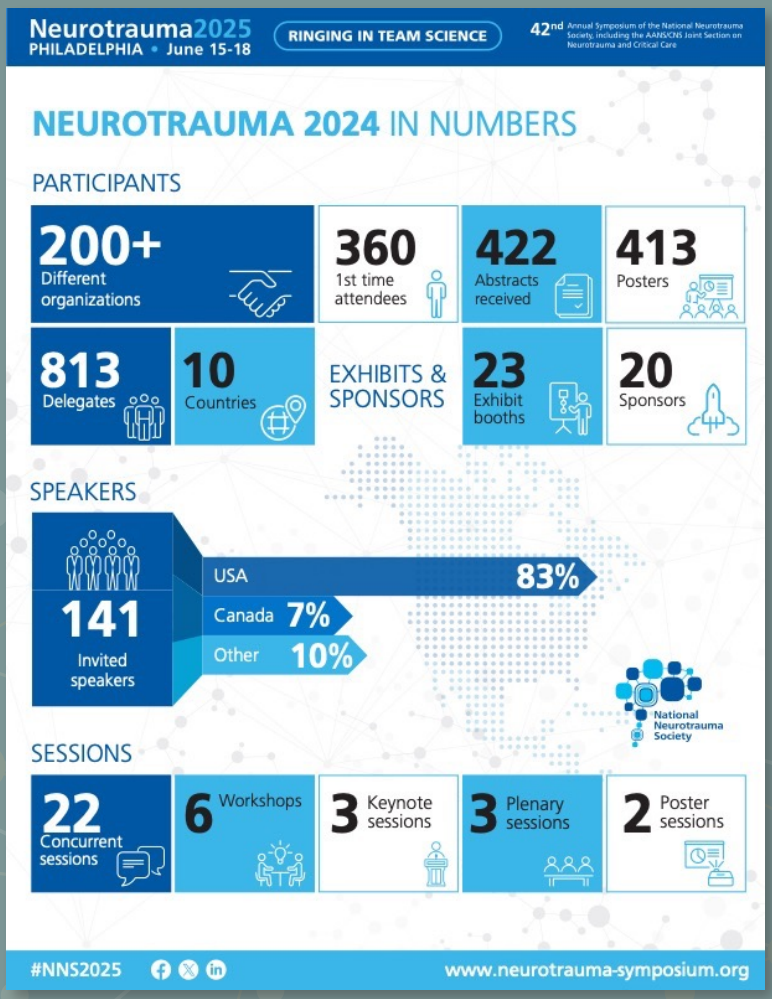
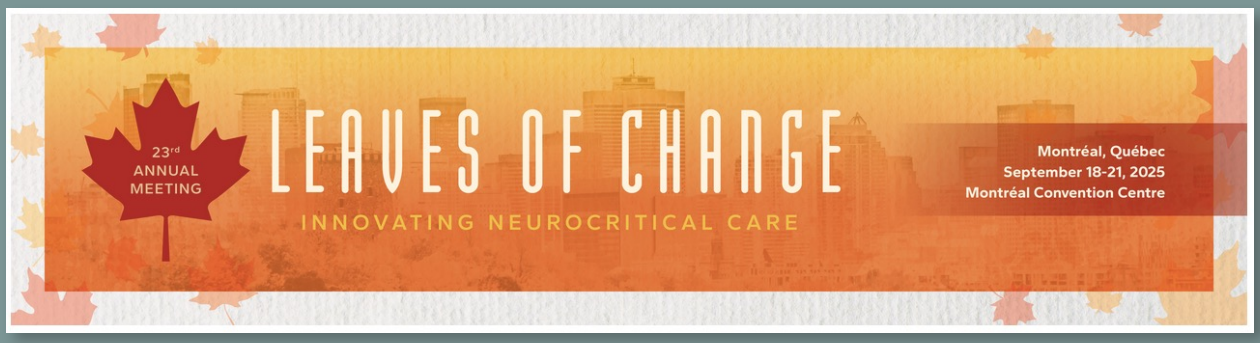
Gouvêa Bogossian E, Rass V, Lindner A, et al. Factors associated with brain tissue oxygenation changes after RBC transfusion in acute brain injury patients. Crit Care Med. 2022;50(6):e539-e547. doi:10.1097/CCM.0000000000005460

UPCOMING MEETINGS— SAVE THE DATE!



Please mark your calendars for the National Neurotrauma Society, June 15–18 2025!
neurotrauma-symposium.org



Please mark your calendars for the annual NCS meeting, September 18–21, 2025!
neurocriticalcare.org/Events/Annual-Meeting