



## Breaking the rules: is it the neurointensivists' turn?

The Harvard community has made this article openly available. [Please share](#) how this access benefits you. Your story matters


Citation	Gritti, Paolo, Oluwaseun Akeju, Ferdinando Luca Lorini, Andrea Lanterna, Carlo Brembilla, and Federico Bilotta. 2018. "Breaking the rules: is it the neurointensivists' turn?" <i>Critical Care</i> 22 (1): 21. doi:10.1186/s13054-017-1919-3. <a href="http://dx.doi.org/10.1186/s13054-017-1919-3">http://dx.doi.org/10.1186/s13054-017-1919-3</a> .
Published Version	<a href="https://doi.org/10.1186/s13054-017-1919-3">doi:10.1186/s13054-017-1919-3</a>
Citable link	<a href="http://nrs.harvard.edu/urn-3:HUL.InstRepos:35014405">http://nrs.harvard.edu/urn-3:HUL.InstRepos:35014405</a>
Terms of Use	This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at <a href="http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA">http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA</a>

LETTER

Open Access



# Breaking the rules: is it the neurointensivists' turn?

Paolo Gritti<sup>1\*</sup> , Oluwaseun Akeju<sup>2</sup>, Ferdinando Luca Lorini<sup>1</sup>, Andrea Lanterna<sup>3</sup>, Carlo Brembilla<sup>3</sup> and Federico Bilotta<sup>4</sup>

See related research by Cnossen et al. <https://ccforum.biomedcentral.com/articles/10.1186/s13054-017-1816-9>

We have read with interest the results of the survey by Cnossen et al. [1], in which the authors affirm that substantial variation was found regarding monitoring and treatment policies in TBI patients and intracranial hypertension among 66 European neurotrauma centers. We observe that this result is no different from the conclusion of a similar survey on blood transfusion and coagulation management of TBI patients belonging to the same research group [2]. Moreover, these results agree with another survey on the management of mild TBI patients [3]. The authors' conclusion shows that, even among high-volume specialized neurotrauma centers, there is a substantial variation in structures and processes of TBI care and a discrepancy between BTF guidelines and reported policies [1–3].

Although this variability between European neurotrauma centers provides an opportunity to study the effectiveness of specific aspects of TBI care and to identify best practices with comparative effectiveness research, the lack of BTF guideline application remains a concern. Compared to a previous study from a decade ago, the data from Cnossen et al. [1] show a reduction in application of the BTF guidelines to 49% and 51% in aggressive and conservative centers respectively. The low adherence to guidelines may explain the variability and heterogeneity of the treatment as we

reported recently in the neurointensive care setting of subarachnoid hemorrhage patients due to cerebral aneurysm rupture [4].

While it seems that neurointensivists do not follow the rules, we do not have to forget that this phenomenon has also occurred in other fields of medicine. Arts et al. [5] reported in a recent systematic review that intentional non-adherence to guidelines varied between 8.2 and 65.3%. The same authors concluded that nonadherence is often supported by valid reasons in up to 93.6%. Guideline deviations are intentional, mainly related to contraindications or due to the patient's decision, and these deviations do not necessarily impact on the quality of care [5].

However, none of the studies analyzed by Arts et al. [5] was carried out in the neuro-ICU setting where the critical situation of the patients, most of them unconscious, postpones any possible consensus decision. Moreover, therapy contraindications disappear when a second-line life treatment is requested. In the hardest of ICU settings, where the patients 'will disappear', following guidelines seems to assume a different meaning. We are confident that future studies in the perspective of the CENTER-TBI study can shed light on the actual role of guidelines and protocols in the complex context of neuro-ICUs.

## Authors' response

Maryse C. Cnossen, Mathieu van der Jagt, Ewout W. Steyerberg and On behalf of the coauthors

We would like to thank Gritti and colleagues for their letter about our recently published manuscript describing considerable variation in monitoring and treatment policies in patients with TBI and intracranial hypertension

[1]. This variation probably reflects the lack of evidence [6] and guideline adherence [7] for the treatment of patients with TBI.

Based on Table 1 in the original paper [1], Gritti and colleagues infer that, in comparison to a previous report, guideline adherence to the BTF guidelines has been reduced to 49% and 51% in aggressive and conservative centers, respectively. This statement, however, is incorrect. Of the total sample, the BTF guidelines were used in 49 (74%) centers. Among these 49 centers, 25 (51%) could be

\* Correspondence: [Grittip@libero.it](mailto:Grittip@libero.it)

This comment refers to the article available at: <https://doi.org/10.1186/s13054-017-1816-9>.

<sup>1</sup>Department of Anaesthesia and Critical Care Medicine, Ospedale Papa Giovanni XXIII, Bergamo, Italy

Full list of author information is available at the end of the article



classified as ‘aggressive’ and 24 (49%) as ‘conservative’ with regard to ICP management.

Guideline adherence is higher for recommendations based on more robust evidence than for recommendations based on relatively weak evidence [7]. However, subsequent editions of the BTF guidelines have progressively reduced the strength of the recommendations, after reevaluation of the weak evidence. We believe that strengthening the evidence base will result in an improvement in guideline adherence, and subsequently will reduce treatment variation.

Comparative effectiveness research (CER) provides a promising framework for expanding our knowledge of TBI treatment effectiveness. The CENTER-TBI study is currently recruiting approximately 5000 patients from 20 European countries. Once these patient-level data become available, the first step will be to compare the results of the provider profiling questionnaires with the actually observed treatment variation among centers. The next step will be to examine the association between treatment and outcome with CER approaches, to strengthen the evidence underpinning TBI guidelines. A third step will be to develop a tentative set of quality indicators for TBI, which could potentially be used for benchmarking and quality assurance of future TBI care.

As Sackett wrote, “Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patient” [8].

As such, a set of rules to be blindly followed or to be broken has never been proposed. We are confident that detailed large data collection, advanced methodology, and global collaboration with other projects (e.g., TRACK-TBI in the United States) will provide better evidence for grounding better treatments for TBI victims.

#### Abbreviation

TBI: Traumatic brain injury; BTF: Brain Trauma Foundation; CENTER-TBI: Collaborative European Neurotrauma Effectiveness Research in Traumatic Brain Injury; ICU: Intensive care unit

#### Acknowledgements

None to report.

#### Funding

No funding source.

#### Availability of data and materials

Not applicable.

#### Authors' contributions

PG, OA, FLL, AL, CB, and FB drafted the letter. All authors read and approved the final manuscript.

#### Ethics approval and consent to participate

Not applicable.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare that they have no competing interest.

#### Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

#### Author details

<sup>1</sup>Department of Anaesthesia and Critical Care Medicine, Ospedale Papa Giovanni XXIII, Bergamo, Italy. <sup>2</sup>Department of Anaesthesia, Critical Care and Pain Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA. <sup>3</sup>Department of Neurosurgery, Ospedale Papa Giovanni XXIII, Bergamo, Italy. <sup>4</sup>Department of Anaesthesia and Critical Care Medicine, “Sapienza” University, Rome, Italy.

Received: 31 October 2017 Accepted: 5 December 2017

Published online: 29 January 2018

#### References

- Cnossen MC, Huijben JA, van der Jagt M, Volovici V, van Essen T, Polinder S, et al. Variation in monitoring and treatment policies for intracranial hypertension in traumatic brain injury: a survey in 66 neurotrauma centers participating in the CENTER-TBI study. *Crit Care*. 2017;6:21–233.
- Huijben JA, van der Jagt M, Cnossen MC, Kruij MJHA, Haitsma I, Stocchetti N, et al. Variation in blood transfusion and coagulation management in Traumatic Brain Injury at the Intensive Care Unit: a survey in 66 neurotrauma centers participating in the Collaborative European NeuroTrauma Effectiveness Research in Traumatic Brain Injury (CENTER-TBI) study. *J Neurotrauma*. 2017. doi:<https://doi.org/10.1089/neu.2017.5194>.
- Cnossen MC, Polinder S, Lingsma HF, Maas AIR, Menon D, Steyerberg EW, et al. Variation in structure and process of care in traumatic brain injury: provider profiles of european neurotrauma centers participating in the CENTER-TBI Study. *PLoS One*. 2016. doi:<https://doi.org/10.1371/journal.pone.0161367>.
- Gritti P, Cazzaniga S, Castioni CA, Lorini FL, Velly LJ, Bilotta F, European Neuroanaesthesia, Critical Care Interest Group (ENIG). Variability by country in the European Neuroanaesthesia and Critical Care Interest Group subarachnoid haemorrhage survey. *Eur J Anaesthesiol*. 2016;33:387–90.
- Arts DL, Voncken AG, Medlock S, Abu-Hanna A, van Weert HC. Reasons for intentional guideline non-adherence: a systematic review. *Int J Med Inform*. 2016;89:55–62.
- Bragge P, Synnot A, Maas AI, Menon DK, Cooper DJ, Rosenfeld JV, Gruen RL. A state-of-the-science overview of randomized controlled trials evaluating acute management of moderate-to-severe traumatic brain injury. *J Neurotrauma*. 2016;33(16):1461–78.
- Cnossen MC, Scholten AC, Lingsma H, Synnot A, Tavender E, Gantner D, Lecky F, Steyerberg EW, Polinder S. Adherence to guidelines in adult patients with traumatic brain injury: a living systematic review. *J Neurotrauma*. 2015. Epub ahead of print.
- Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. 1996. *Clin Orthop Relat Res*. 2007;455:3–5.