

In Reply: Guidelines for the Management of Severe Traumatic Brain Injury: 2020 Update of the Decompressive Craniectomy Recommendations

To the Editor:

We thank the authors¹ for their thoughtful commentary related to the DECRA (DECompressive CRAniectomy) and RESCUEicp (Randomized Evaluation of Surgery with Craniectomy for Uncontrollable Elevation of intracranial pressure) randomized controlled trials. We are pleased to provide further thoughts on the controversy related to the extended Glasgow Outcome Scale (GOS-E) cut-point used in the RESCUEicp trial as well as the need to improve prognostication related to the performance of secondary decompressive craniectomy.

In conjunction with our analysis² of the DECRA and RESCUEicp trials, we performed a sensitivity analysis examining the influence of the cut-points on the primary endpoints of the 2 trials. Of note, DECRA's trial registration specified the GOS-E cut-point to be used *a priori*, while RESCUEicp's trial registration did not specify a GOS-E cut-point. The results of our analysis (shown in Table) demonstrate that the distinct cut-points influence the results of the DECRA study but not the RESCUEicp study. The atypical dichotomization used in the RESCUEicp study thus did not influence its primary outcome though it does alter the magnitude of the nonsignificant effect seen, as highlighted in your letter. The difference in cut-points was an impediment to comparing the 2 studies; ultimately, we

abandoned efforts to directly compare the 2 trials because of their important differences.

We emphatically agree with the need to better elucidate which patients stand a high probability of achieving good outcomes from secondary decompressive craniectomy.³ The success of the CRASH (Corticosteroid Randomization After Significant Head Injury)⁴ and IMPACT (International Mission for Prognosis And Clinical Trials in Traumatic Brain Injury)⁵ prognostic models has been a significant recent advance for traumatic brain injury care. Hopefully, these efforts have blazed a trail that other prognostic efforts will be able to follow. Notably, both prognostic models depend upon very large databases with over 9 000 severe traumatic brain injury patients to overcome the marked heterogeneity of this population. It is therefore anticipated that a similarly large dataset may be needed to generate robust prognostic information related to secondary decompressive craniectomy.

Funding

This study did not receive any funding or financial support.

Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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TABLE. Results of Chi-Square Analyses Comparing Primary Outcomes of DECRA with RESCUEicp, Measured by Dichotomous GOS-E for Two Cut-Points

	DECRA	RESCUEicp
GOS-E	No significant difference between treatment groups	No significant difference between treatment groups
1-3 unfavorable		
4-8: favorable		
GOS-E	Significantly more patients in unfavorable outcomes group	No significant difference between treatment groups
1-4: unfavorable		
5-8: favorable		

Gray cells denote the published dichotomization used in reporting the primary outcome measure (6-mo GOS-E) in each study.

REFERENCES

- Caudia Niño M, Cohen D, Armando Mejía J, Andrés Gutiérrez J, González M. Letter: Guidelines for the Management of Severe Traumatic Brain Injury: 2020 update of the decompressive craniectomy recommendations. *Neurosurgery*. 2021;88(4):E370-E371.
- Hawryluk G, Rubiano A, Totten A, et al. Guidelines for the Management of Severe Traumatic Brain Injury: 2020 update of the decompressive craniectomy recommendations. *Neurosurgery*. 2020;87(3):427-434.

3. Hutchinson PJ, Kolias AG, Tajsic T, et al. Consensus statement from the International Consensus Meeting on the Role of Decompressive Craniectomy in the Management of Traumatic Brain Injury: consensus statement. *Acta Neurochir.* 2019;161(7):1261-1274.
4. Roberts I, Yates D, Sandercock P, et al. Effect of intravenous corticosteroids on death within 14 days in 10008 adults with clinically significant head injury (MRC CRASH trial): randomised placebo-controlled trial: randomised placebo-controlled trial. *Lancet.* 2004;364(9442):1321-1328.
5. Maas AI, Marmarou A, Murray GD, Teasdale SG, Steyerberg EW. Prognosis and clinical trial design in traumatic brain injury: the IMPACT study. *J Neurotrauma.* 2007;24(2):232-238.

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10.1093/neuros/nyaa576
