



## Letter to the Editor

### Regarding “Cervical spine clearance in the adult obtunded blunt trauma patient: A systematic review”



Dear Editor,

We would like to commend the authors Viega et al. for their systematic review for spine clearance in adult obtunded blunt trauma patients. (Veiga and Mitchell, 2019) We have a few questions and comments about the study.

We would request the authors to specify the date range for the search strategy. This is an area of active interest with multiple recent publications showing limited utility of MRI after a negative cervical spine CT (Malhotra et al., 2018). It would also be important to specify the basis for cervical spine clearance in the included studies - and the definition of instability used. There is significant heterogeneity in previous literature, partly due to differing definitions of “clinically significant” and “unstable injury” (Malhotra et al., 2017). We also recently conducted a meta-analysis and found low utility of MRI after a negative CT in both alert and obtunded trauma patients (Malhotra et al., 2017). The Western Association of Trauma recently published a prospective study assessing over ten thousand intoxicated patients and found CT to have 100% NPV for identifying unstable injuries (Martin et al., 2017).

We agree with the author's conclusion that the evidence supports the discontinuation of use of the cervical collar after a negative c-spine CT scan result alone. Routine use of MRI after a negative cervical spine CT is not cost-effective in both alert and obtunded blunt trauma patients (Wu et al., 2018a,b).

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.iccn.2019.04.005>.

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## Response from Authors

### Cervical spine clearance in the adult obtunded blunt trauma patient: A systematic review



Dear Editor,

Thank you very much for your interest in and commendation of our paper ‘Cervical spine clearance in the adult obtunded blunt trauma patient: A systematic review’ (Veiga and Mitchell, 2019).

You requested we specify the date range for the search strategy. The search of the literature was performed in October 2016 with

## References

- Malhotra, A., Durand, D., Wu, X., Geng, B., Abbed, K., Nunez, D.B., et al, 2018. Utility of MRI for cervical spine clearance in blunt trauma patients after a negative CT. *Eur. Radiol.* 28, 2823–2829.
- Malhotra, A., Wu, X., Kalra, V.B., Nardini, H.K., Liu, R., Abbed, K.M., et al, 2017. Utility of MRI for cervical spine clearance after blunt traumatic injury: a meta-analysis. *Eur. Radiol.* 27, 1148–1160.
- Martin, M.J., Bush, L.D., Inaba, K., Byerly, S., Schreiber, M., Peck, K.A., et al, 2017. Cervical spine evaluation and clearance in the intoxicated patient: a prospective Western Trauma Association Multi-Institutional Trial and Survey. *J. Trauma Acute Care Surg.* 83, 1032–1040.
- Veiga, J.R.S., Mitchell, K., 2019. Cervical spine clearance in the adult obtunded blunt trauma patient: a systematic review. *Intensive Crit. Care Nurs* 51, 57–63.
- Wu, X., Malhotra, A., Geng, B., Kalra, V.B., Abbed, K., Forman, H.P., et al, 2018a. Cost-effectiveness of magnetic resonance imaging in cervical clearance of obtunded blunt trauma after a normal computed tomographic finding. *JAMA Surg.* 153, 625–632.
- Wu, X., Malhotra, A., Geng, B., Liu, R., Abbed, K., Forman, H.P., et al, 2018b. Cost-effectiveness of magnetic resonance imaging in cervical spine clearance of neurologically intact patients with blunt trauma. *Ann. Emerg. Med.* 71, 64–73.

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no year limitation. Thus, the articles you mention (Malhotra et al., 2017, Malhotra et al., 2018) were published after this date.

You also requested we specify the basis for cervical spine clearance and the definition of instability used. We used Raza et al.'s (2013, p. 1589) definition “an injury to the c-spine is considered ‘significant’ when if overlooked it could result in irreversible neurological deterioration, including paralysis and death”.

Thank you for mentioning more recent evidence (Martin et al., 2017; Wu et al., 2018a, Wu et al., 2018b) that supports the same

conclusion of the discontinuation of use of the cervical collar after a negative c-spine CT scan result alone. However, we would like to reemphasise our statement in the ‘Generalisability of Results’ related to resource-poor areas: “The articles all used data from the USA and UK. The majority also only used data from modern Multidetector CT Scanners (MDCT). In resource poor areas where modern MDCT scans are not available, reliance on negative CT scan results alone to clear the c-spine is unlikely to be appropriate. If MRI is also not available, then spinal precautions are likely to be required despite all the potential negative sequelae associated with them” (Veiga and Mitchell, 2019, p. 62).

## References

- Malhotra, A., Durand, D., Wu, X., Geng, B., Abbed, K., Nunez, D.B., et al, 2018. Utility of MRI for cervical spine clearance in blunt trauma patients after a negative CT. *Eur. Radiol.* 28, 2823–2829.
- Malhotra, A., Wu, X., Kalra, V.B., Nardini, H.K., Liu, R., Abbed, K.M., et al, 2017. Utility of MRI for cervical spine clearance after blunt traumatic injury: a meta-analysis. *Eur. Radiol.* 27, 1148–1160.
- Martin, M.J., Bush, L.D., Inaba, K., Byerly, S., Schreiber, M., Peck, K.A., et al, 2017. Cervical spine evaluation and clearance in the intoxicated patient: A prospective Western Trauma Association Multi-Institutional Trial and Survey. *J. Trauma Acute Care Surg.* 83, 1032–1040.
- Veiga, J.R.S., Mitchell, K., 2019. Cervical spine clearance in the adult obtunded blunt trauma patient: A systematic review. *Intensive Crit Care Nurs.* 51, 57–63.
- Wu, X., Malhotra, A., Geng, B., Kalra, V.B., Abbed, K., Forman, H.P., et al, 2018a. Cost-effectiveness of magnetic resonance imaging in cervical spine clearance of obtunded blunt trauma after a normal computed tomographic finding. *JAMA Surg.* 153, 625–632.
- Wu, X., Malhotra, A., Geng, B., Liu, R., Abbed, K., Forman, H.P., et al, 2018b. Cost-effectiveness of magnetic resonance imaging in cervical spine clearance of neurologically intact patients with blunt trauma. *Ann. Emerg. Med.* 71, 64–73.

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