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Dear Editor,

My name is Dr. Matthew Fuller, MD, and I am an Associate Professor of Emergency Medicine and Director of Global Health, active as an educator and academician. As many of your readers will know, it has become fashionable to argue that cervical immobilization is not only ineffective but potentially harmful to patients. Many point to observational studies and lack of high-quality data when making their argument. Some historical arguments against cervical immobilization include the following:

1. **No “high quality” evidence proving efficacy**
2. **All published evidence either on healthy volunteers or cadaveric specimens.**
3. **Can increase ICP/Intracranial Pressure→ leading to further cerebral injury in TBI**
4. **Pressure ulcers can occur from prolonged use**
5. **Cervical Immobilization can complicate airway management**

Addressing each of these criticisms, rather than dismissing them outright, is important in the discussion of *appropriate* cervical immobilization. Each is addressed in order, below.

1&2 -There will never come a time where a high-quality (Randomized-Control Trial) to study an immobilized vs an immobilized population in high-risk trauma is undertaken. This would be unethical to subject a study population to potential devastating neurologic injury(as a control where no collar is applied). The most often quoted study, comparing cervical injury in an immobilized patient population(New Mexico, USA) and a non-immobilized population(rural Malaysia) found no differences in neurologic injury/outcomes. However, this study compared two vastly different patient populations. The immobilized patient population suffered trauma in high-velocity mechanisms(MVC, motorcycle accident, falls from great height) whereas the non-immobilized population most often suffered low-

velocity trauma(falls from ground level, falls from <10 feet, etc). This introduced significant bias in the data analysis because it assumed that the two study populations were similar in injury risk and pattern, rather than correctly assuming that they had vastly different risk for musculoskeletal injury. I contend that these populations were inappropriate for comparison. This was a poorly designed study with poor control and trial arms, and inappropriate for concluding that cervical immobilization does little to benefit patients with high-risk injury. As such, I contend it is imperative that a **spinal motion reduction** device is designed to minimize potential harm, and maximize potential benefit for any patient, and is used in conjunction with appropriate protocols and training for personnel.

3 - There is published literature suggesting that RIGID cervical immobilization devices may impede cerebral venous outflow, thereby increasing cerebral congestion and leading to increased cerebral parenchymal injury by further metabolic derangement. Traditional hard cervical collars have pressure points on points of venous outflow; namely the jugular vein. The AER collar is designed to avoid pressure points on these venous tracts and therefore is theorized**(pending study with U/S to quantify) to reduce any impedance on venous outflow. Further, the AER collar rigidity can be adjusted by inflating/releasing air to reduce pressure on any potential area of obstruction.

4 - Pressure ulcers are common in patients with prolonged cervical immobilization(ICU setting typically). Because the AER collar is designed to be adjustable without having to remove the collar, appropriate care can be made to minimize pressure points and reduce potential for soft tissue damage in patients who require prolonged immobilization.

5 - A rigid cervical collar or immobilization device that is difficult to remove or manipulate has been shown to be an impediment to airway control/intubation/cricothyroidotomy, etc. The AER collar is designed to provide adequate access to the patient for the medical practitioner in all airway emergencies. Quick deflation, adjustment of rigidity or access to the anterior neck is all possible with the AER collar.

I will conclude by saying that there are many medical interventions that not only fail to meet the standard of high-quality evidence but also may contribute to patient harm. There is evidence that tonsillectomy may lead to increased weight gain in children, bariatric surgery is cited as having a complication rate of close to 50%, with a mortality rate approximating 1 in 50 patients, circumcision, perhaps the most common surgical procedure worldwide, has little evidence of efficacy, and yet continues as a standard of care. We should be critically appraising all medical interventions-including cervical immobilization-and working to improve or clarify their benefit, while reducing their risk of harm to patients. The AER collar does just that.

As a final note, it is important to cite that the **STANDARD OF CARE REMAINS CERVICAL IMMOBILIZATION IN SELECT POPULATIONS**. The American Association of Neurological Surgeons(AANS) and The Congress of Neurological Surgeons(CNS) still recommends cervical immobilization. The American College of Emergency Physicians(ACEP), The American College of Surgeons-Committee on Trauma(ACS-COT) and The National Association of EMS Physicians(NAEMSP) published a joint position statement in 2018 supporting the use of devices assist with Spinal Motion Reduction(SMR)

Sincerely, Matthew J. Fuller

CONFLICT OF INTEREST: Matt J. Fuller is the co-founder with the designer Carl Yeip of the company OTEC (outdoor technical emergency care), producer of the AER Cervical Collar.