August 6, 2018

Debra Houry, MD, MPH
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention
4770 Buford Highway NE., Mailstop F-63
Atlanta, Georgia 30341

Dear Dr. Houry,

We appreciate the opportunity to comment on the Centers for Disease Control and Prevention (CDC) proposed information collection project, titled “Traumatic Brain Injury Disparities in Rural Areas (TBIDRA)” 83 Fed. Reg, 26464 (July 7, 2018)/Docket No. CDC-2018-0052.1

The American Optometric Association (AOA) represents 33,000 doctors of optometry and optometry students. Doctors of optometry serve patients as primary eye care physicians and in over 10,000 communities across the country, many of which are rural areas. In 3,500 of those communities, doctors of optometry are the only eye doctors. Doctors of optometry serve over 2,500 Federal Office of Rural Health Policy (FORHP)-eligible zip codes. As Traumatic Brain Injuries (TBIs) promptly and drastically impact vision, doctors of optometry serve an essential part of TBI prevention, care and quality of outcomes in rural areas.

We applaud CDC’s efforts to develop a knowledge base to address gaps in services to improve clinical care and TBI outcomes in rural communities. However, we are concerned that the proposed survey’s target population does not include doctors of optometry. As primary eye care physicians, doctors of optometry provide essential vision services in the detection, management, and rehabilitation processes for patients with brain injuries.2 Furthermore, patients have more access to doctors of optometry, including in rural areas, than other types eye doctors and physicians. Often, doctors of optometry are the only accessible eye care providers to patients. While 91 percent of Americans live in a county that has access to doctors of optometry and ophthalmologists, thirty-nine percent of US counties or county equivalents have access to a doctor of optometry but not an ophthalmologist.3 Overall, more than 90 percent of the US Medicare beneficiary population lives within a 15-minute drive of a doctor of optometry.4

Without including doctors of optometry, the TBIDRA survey will miss significant gaps in care as well as meaningful solutions to improve outcomes in rural areas. Our concern is codified by the fact that CDC’s own 2006 publication; *Improving the Nation’s Vision Health: A Coordinated Public Health Approach,* calls for the integration of vision health interventions into existing public health programs, advocates system and policy changes that support access to care and coordination of resources, to ensure that vision resources are understood and allocated to achieve maximum benefit.⁵

As an essential part of the TBI care team, doctors of optometry can diagnose and treat the visual sequelae of mTBI.⁶ For patients who may not realize they suffered a brain injury, a yearly comprehensive eye exam can detect visual signs that may indicate a TBI and lead to referrals to other members of the TBI care team. This is an important entry point into TBI care, without which many patients may continue to needlessly suffer from untreated TBIs. Furthermore, eye doctors can use regular eye examinations to establish baselines, which provide greater sensitivity and specificity of detection of TBIs and can serve as an aid to providers in determining the progress of the patient’s rehabilitation.

According to the CDC-sponsored report by National Academies of Sciences, Engineering, and Medicine (NASEM), *Making Eye Health a Population Health Imperative: Vision for Tomorrow (2016)*, patients with TBIs can suffer from a range of visual symptoms and disorders, including problems with visual acuity, visual fields, oculomotor function, accommodative disorders, convergence insufficiency, and saccadic dysfunction.⁷ Unfortunately, the report also concluded that *avoidable vision impairments occur “too frequently in the United States and is the logical result of a series of outdated assumptions, missed opportunities, and manifold shortfalls in public health policy and health care delivery.”⁸ To address these outdated assumptions and shortfalls, the NASEM report determined that the CDC and other federal bodies “need to prioritize eye and vision health within their official strategic plans.”⁹

Omitting doctors of optometry in the proposed survey represents another “missed opportunity” to address the “outdated assumptions” that neglect vision health’s role in the early diagnosis and management of TBIs.¹⁰¹¹ As vision occurs in the brain, and the location of the visual cortex is at the rear of the brain, optic radiations traversing from the eyes cover a substantial portion of the brain; such that vision changes serve as the “canary in the coalmine.”¹² (See Appendix A). To this end, it is critical that the CDC understand doctors of optometry role in TBI care, especially in rural areas. Even minor injuries to the brain can have significant impact on vision. In fact, 90 percent of people suffering

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⁵ https://www.cdc.gov/visionhealth/pdf/improving_nations_vision_health_508_final.pdf
⁷ https://www.nap.edu/read/23471/chapter/4?term=tbi#90. Last Accessed August 6, 2018/
¹⁰ Master CL, Scheiman M, Gallaway M, et al. *Vision diagnoses are common after concussion in adolescents.* Clin Pediatr (Phila) 2016; 55:260–267. (“A total of 100 adolescents were examined, with a mean age of 14.5 years. Overall, 69% had one or more of the following vision diagnoses: accommodative disorders (51%), convergence insufficiency (49%), and saccadic dysfunction (29%). In all, 46% of patients had more than one vision diagnosis”)
from a traumatic brain injury (TBI), stroke, or concussion will have one or more visual effects. Text books, such as Brain Injury Medicine, include chapters on evaluating and treating dysfunctions and are written by doctors of optometry. For children, undiagnosed and untreated visual symptoms of even mild TBI can have a significant impact on their development, including his/her abilities to perform in school, sports, and social functions.

Recognizing the role and impact our members have on TBI care, the AOA has developed several resources to help doctors of optometry address TBI and other brain-related vision problems. We have attached these resources to help better inform this the TBIDRA survey design. These resources include the recently released Concussion & Vision Fact Sheet (Appendix B), the Brain Injury Electronic Resource Manual (Appendix C), AOA’s concussion and neuro-optometry webpages, the Vision Rehabilitation Online Resource Manual (Appendix D), and Optometric Care of the Patient with Brain Injury fact sheet (Appendix E).

We strongly urge the CDC to include doctors of optometry in its proposed TBIDRA survey. As the NASEM report specifically called upon the CDC to prioritize eye health and collaborate with interested stakeholders, we invite the Center to meet to discuss how the AOA can best support CDC’s initiatives and mobilize our members to improve TBI outcomes.

If you have additional questions, please contact Jensen N. Jose, JD, at jjose@aoa.org. We thank you for this opportunity to comment.

Sincerely,

Samuel Pierce, OD
President, American Optometric Association

Attachments:
- Appendix A: Evidence for Consideration
- Appendix B: Concussion, Vision & Your Eye Doctor Fact Sheet
- Appendix C: AOA Brain Injury Electronic Resource Manual (Volumes 1A & 1B)
- Appendix E: Optometric Care of the Patient with Brain Injury fact sheet
Appendix A
Evidence for consideration:


Of the 880 patients with homonymous hemianopia 103 patients had a TBI. Most of the cases of TBI were from motor vehicle related accidents (57.1%), violence-related (17%), falls (15.2%), and blunt head trauma (10.7%). The study emphasized the importance of early, systematic evaluation of all patients with traumatic brain injury for homonymous hemianopia, as it is important for the functioning and rehabilitation of the patient.


The majority of individuals with either TBI (90%) or CVA (86.7%) manifested an oculomotor


About 20%-30% of all patients in neurological rehabilitation centers have homonymous visual field disorders. Among these, 70% show a visual field sparing of 5° or less. About 7% of all patients with cerebrovascular infarctions develop cerebral blindness with a variable degree of residual visual capacities.27 Cerebral blindness often occurs in children with cerebral hypoxia with slow and incomplete recovery. Furthermore, patients with visual field disorders from traumatic brain lesions show substantial cognitive deficits due to diffuse disseminated lesions.


Eight symptoms were identified as being specific to mTBI: headache, dizziness, intolerance of stress, forgetfulness, poor concentration, taking longer to think, blurred vision, and personality change.

Ongoing symptoms are either a prolonged version of the concussion pathophysiology or a manifestation of other processes, such as cervical injury, migraine headaches, depression, chronic pain, vestibular dysfunction, visual dysfunction, or some combination of conditions. The pathophysiology of ongoing symptoms from the original concussion injury may reflect multiple causes: anatomic, neurometabolic, and physiologic.


In conclusion, our findings indicate that eye movement function in PCS does not follow the normal recovery path of eye movements after mCHI, marking ongoing cerebral impairment independently of patient self-report and neuropsychological assessment


A total of 100 adolescents were examined, with a mean age of 14.5 years. Overall, 69% had one or more of the following vision diagnoses: accommodative disorders (51%), convergence insufficiency (49%), and saccadic dysfunction (29%). In all, 46% of patients had more than one vision diagnosis.


Approximately 90% of individuals with a mild traumatic brain injury (mTBI) examined in a clinic setting and having vision-related symptoms were diagnosed with one or more oculomotor dysfunctions following their acute care phase and natural recovery period. Moreover, six of the 12 cranial nerves directly bear on the visual process. Hence, a range of oculomotor-based visual deficits and related symptoms would be expected. One such oculomotor subsystem that is frequently adversely affected


Head trauma has a multitude of effects on the visual system, necessitating a careful neuro-ophthalmic examination. Tests of visual function can be a sensitive means to assess minor head injury…”


Vision problems were commonly reported in children with concussions and were independently associated with those reporting academic difficulty. Comprehensive vision assessment should be considered in children reporting academic difficulty and in the development of return-to-learn protocols.

Jenness. *The consequence of spatial visual processing dysfunction caused by traumatic brain injury (TBI)*. *Brain Injury* Vol. 31, Iss. 5, 2017

Understanding vision as a bi-modal process facilitates a new perspective of visual processing and the potentials for rehabilitation following a concussion, brain injury or other neurological events.
Appendix B:
Fact Sheet
Concussions, Vision, & Your Eye Doctor

The attached fact sheet is designed for patients. It will be available for our members to provide to their patients and other providers. The fact sheet is intended to patients on the risks of TBIs and encourage them to see an eye doctor for detection, referral, and treatment.
Attached is AOA’s Brain Injury Electronic Resource Manual. Brain injury affects 2.4 million Americans each year. With many optometrists already involved in the diagnoses and rehabilitation of Traumatic Brain Injury (TBI), the AOA has developed the Brain Injury Electronic Resource Manual (BIERM). The BIERM serves as a comprehensive resource to aid optometrists in evaluating patients with brain injury.

Volume 1A of the BIERM focuses on evaluation and assessment of common visual conditions associated with TBI, including binocular vision, accommodative, and eye movement disorders. To make it easier to use, helpful elements such as a glossary, lists of commonly used equipment and an overview of the numerous tests involved in evaluation are included.

Volume 2B focuses on treatment and management of brain-injured patients over time.
Appendix D:
AOA Vision Rehabilitation Electronic Resource

Attached is AOA’s Vision Rehabilitation Online Resource Manual. The Online Resource Manual contains valuable practice management information to assist doctors of optometry in treating vision impairments that may be associated with mTBIs. This information includes:

- Equipment Lists
- Descriptions of Devices
- Definitions
- Training Tips
- Links to Other Low Vision Industry Resources
- Coding Guidelines
- Sample Patient Forms
Appendix E:
Optometric Care of the Patient with Brain Injury fact sheet

The Attached Fact sheet is intended to educate the media, the government, and the public regarding optometric care with respect to optometry’s role in treating patients with brain injuries.