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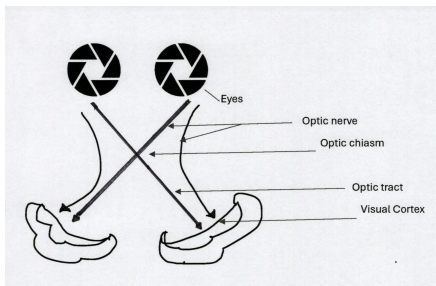
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QUESTION: *My TBI client has 20/20 vision—why can't they read?*

Medical Settle, LLC Response:

Vision is complex—it doesn't happen solely in our eyes. Vision involves our eyes, retinas, optic nerves, and brain working together to process reflected light and interpret electrical signals.

Our eye is like a camera—with an aperture (opening) at the front, a lens to focus the light, and then something that absorbs the light at the back (e.g., the retina). The retina then sends electrical signals through our optic nerves, some of whose fibers cross in the optic chiasm, and then travel via the optic tracts to the back of our brain (visual cortex) where the first stages of visual perception take place. Visual acuity remains intact if the 'eye camera,' optic nerves, and chiasmal nerve tracts are not damaged.



Many traumatic brain injury (TBI) patients will have normal visual acuity and yet have problems reading because of injury to the *post*-chiasmal nerve networks. The most common visual problem in TBI patients is oculomotor dysfunction (problems with eye movement), which occurs in 90% of TBI patients. * Oculomotor function involves communication between post-chiasmal nerve networks in the brainstem, motor cortex, cerebellum, and cranial nerves. In an acceleration-deceleration injury, like whiplash, shearing forces can cause diffuse injury to these nerve networks which results in eye focusing and eye tracking problems, like “jiggly” eyes (nystagmus), eye-tracking overshoots or undershoots, eye fixations while tracking, slow tracking, eye spasms, and/or trouble aligning both eyes to focus.

In addition to these eye movement problems which can affect a client's 'mechanical' ability to read, if nerve networks in other regions of the brain experience shearing forces (e.g.,

frontal, parietal, temporal, and/or occipital lobes), then the client may also have trouble with reading and language comprehension, and speech.

Thus, the typical eye chart exam (e.g., Snellen chart), which is the most administered vision test, may show 20/20 vision, but fail to identify eye tracking dysfunction or visual processing abnormalities typical of TBI injuries.

The moral to this story is to ensure that your TBI client has an eye exam by an optometrist or ophthalmologist who can render a comprehensive evaluation, such as described by the [Vision Center of Excellence](#), Defense Health Agency.

Treatment is available for these visual impairments and may involve eye tracking and focusing exercises (vision therapy) administered by an occupational therapist or neuro-optometrist, as well as various eyeglass lenses (including prisms) prescribed by neuro-optometrists. If speech, language, and/or cognitive functions (e.g., reading comprehension) are impaired, then referrals to speech pathology and neuropsychology may also be necessary.

In summary, your TBI client may have 20/20 vision, yet be unable to read due to nerve network injury beyond the optic chiasm. A Snellen chart exam is not an adequate evaluation of their vision system, and they should be referred to a knowledgeable optometrist or ophthalmologist for a comprehensive exam. The exam should be consistent with the Defense Health Agency's [Vision Center of Excellence](#) recommendations. If vision impairment is diagnosed, then your client may need referrals to occupational and/or speech therapy, neuro-optometry, and neuropsychology.

*Citations from the medical literature are provided in Medical Settle's formal Medical Opinion Reports.



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