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EDITORIAL

Eye movements in general neurology and its subspecialties: introduction to the topical collection

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I am sure that all of us in the neurological specialties remember our fascination with neuro-ophthalmology while we were training as residents, often seeing the clinical examination of eye movements, the reactions of the pupil, and examination of the ocular fundus as vital tools for seeing how the brain functions and malfunctions as well as pointing to the location of the lesion. For many of us, this aspect of neurology led to a choice of careers in neuro-ophthalmology or neuro-otology but even for those who chose other subspecialties, the neuro-ophthalmological examination was still a key part of the examination. This importance of eye movements is not surprising as above all we are visual creatures and, without exaggeration, almost all the brain, including areas associated with the highest levels of cognition—memory, prediction, attention, motivation, and affect—are influenced by or themselves influence ocular motor behavior. Consequently, for both basic neuroscientists of many ilks and medical practitioners from many specialties, eye movements become a window to the brain.

Of course, computed tomography and magnetic resonance imaging have dramatically improved neurological diagnosis, though even today there are areas of clinical neurology, for example, the evaluation of the acutely dizzy patient, in which a targeted bedside examination still outperforms early imaging to tell us whether our patient might be having an ominous stroke. The "HINTS+" set of rules—with its triad of a negative head impulse sign, a direction changing gaze-evoked nystagmus, and a skew deviation, coupled with gait ataxia—provides the branchpoint in the decision algorithm to tell us when we must consider the patient is having a posterior fossa stroke until proven otherwise. This new emphasis on a "proper" bedside examination of eye movements including the vestibular system is applicable not only to the dizzy patient but also to other subspecialities of neurology including movement disorders, cognitive disorders and dementia, and all types of genetic, developmental, and degenerative disorders. Furthermore, with the availability of easy-to-use tools to measure and quantify eye movements, we have an ideal biomarker, not only for localization and diagnosis but for documenting the natural history of a disease and for evaluating the effects of treatment.

The pandemic has also brought the clinical examination of eye movements to the fore because patients must often be evaluated at home, using computer screens or mobile phones. Advanced testing including imaging may not be possible when access to imaging facilities comes with a risk of exposure in a pandemic, and especially for older patients, who are the group that most frequently suffers from dizziness, and at the same time are the most vulnerable to the complications of the coronavirus. So, somewhat paradoxically, the importance of telemedicine and the new communication technologies (which are here to stay even after the pandemic) are forcing us to become better old-school, thinking, and observing clinicians. We again must rely on an efficient, hypothesis-driven history and innovative examination techniques, especially when we do not have easy access to imaging and other laboratory tests. The ocular motor and vestibular examination are key aspects to the remote evaluation of any patient with dizziness or vertigo, as we are resurrecting the old-fashioned "House Call" of the country doctor. Our teaching strategies, too, must reflect this reality and reemphasize the older dictums and principles that we had to use previously to arrive at a diagnosis.

With these ideas in mind, we plan to encourage more scholarship for our journal in the areas of neuro-otology

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and neuro-ophthalmology, both for their own sake and for their relevance to so many subspecialties of modern-day neurology. The study of eye movements in patients, normal human subjects, and experimental animal models is an exemplar of the iterative processes of translational medicine with the back and forth between basic science and the clinic that moves the practice of medicine forward.

Compliance with ethical standards

Conflict of interest The author declare that there is no conflict of interest.

Ethical approval None

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