

Guest Editorial ► Eye Tracking Technology for Clinical Practice: Benefits, Limitations, and Considerations

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Eye tracking has become a popular tool in clinical practice and research for understanding brain function and eye health. Since 2010, there have been almost 80,000 research articles, books, and papers on eye tracking technology.

Eye tracking technology has been used to examine clinical conditions and provide indicators for Autism Spectrum Disorder, Attention Deficit Hyperactivity Disorder, Parkinson's disease, essential tremors, stroke, small vessel ischemia, reading disorders, dyslexia, binocular vision issues such as convergence, divergence, amblyopia, depth perception; drug and alcohol levels, concussion, and brain injury.

Benefits

Eye tracking technology provides many benefits that complement clinical practice. It is highly specific, capturing pictures of the eye many (30-1000) times a second and can provide output that can assist a clinician with a diagnosis. For example, when assessing eye movements associated with a concussion, a typical clinical protocol is the Vestibular Ocular Motor Screening (VOMS), where the patient is asked to follow the clinician's finger in various ways to assess saccadic and smooth pursuit eye movements. The same process can be digitized with stimuli that is eye tracked. Data output from eye tracking is quantitative allowing the clinician and patient to receive numbers that can then be compared to others as well as to the individual patient over time. This data can be used to track recovery or change in health status and determine if therapies are working. Results are objective and the technology is non-invasive. Clinicians and customers can be provided reports as well as replay of gaze to assist in communication with the patient.

Limitations

There is no technology, including eye tracking, that can replace the clinician. Furthermore, eye tracking can only provide part of a person's overall health. Clinical exams often contain assessments that are beyond the capability of technology. For instance, when assessing for a possible concussion, the clinician evaluates balance, speech, memory, and a patient's overall health status. These are not assessed using eye tracking technology.

Considerations

When evaluating any technology for your practice, consideration should be taken to determine if the tool will be useful in supplementing your clinical assessment. Will the technology fit into your clinical practice routine? What is the cost/benefit ratio? Is the tool FDA cleared and HIPPA compliant? Does it allow you to obtain medical reimbursement? Do you need technology that is portable?

If you determine that a specific technological tool is right for your practice then it is important to assess the different options available. To do this, there are some key considerations, such as, is there data on the reliability of the technology? Has the tool been validated against another clinical tool? Does the output provided have associated norms and/or other interpretive data? Is the output easy to understand, instantly available? Are there peer reviewed clinical research papers using the technology? Are some of your colleagues using the tool? If so, what are their opinions as to its overall worth and usability?

In summary, eye tracking technology, can be a useful supplement to clinical decision making. It can provide quantitative data to

otherwise qualitative assessments. Allowing both the clinician and the patient a way to measure recovery and change over time. No technology is a panacea, and cannot replace the work of the clinician. In assessing if eye

tracking is right for your practice, be sure to consider the reliability and validity of the data along with interpretation guidelines such as normative comparisons.

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