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Using Technology in the diagnosis of Attention-Deficit/Hyperactivity Disorder

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Attention-Deficit/Hyperactivity Disorder (ADHD) is among the most prevalent chronic health disorders affecting school-age children [1]. The disorder attracts a lot of controversies [2,3]. One of the main reasons for criticism is the diagnostic process, which in some aspects is subjective and can be relatively easily biased [4].

There is a discrepancy between the expanding scientific biological, genetic and imaging knowledge and the clinical based procedure of ADHD diagnosis [4].

In the absence of available biological markers that would support diagnosis on a routine clinical visit, professionals are asked to continue and use clinical interview, extensive history taking, parent-teacher rating scales, review of psycho-educational test data, and direct observation [4,5]. Shortcomings associated with standard clinical approaches suggest an increasing need to consider complementary strategies for determining diagnostic standing and assessing treatment outcome [4,5].

As in other areas in neurology, there has long been interest in developing laboratory-based technology supported measures that could support ADHD diagnosis and in using technology in order to improve assessment and treatment methods [6-8]. Computerized continuous performance tests (CPT), virtual reality class-room simulators, and even using Nintendo and Wii remote controller through controlling environmental stimulation were suggested [9-11].

The clinical utility of these technological measures in the diagnosis and/or treatment of ADHD is the subject of much controversy due to relatively high false negative errors, and low overall utility [4,6].

Most researchers concluded that the data available supporting the validity of these measures is limited and that there is a need for further validity studies [2,4,12].

Through modifying the existing hardware or by adopting software technology, many commercial high-technology products possessing the characteristics of special sensors can be reset or modified in terms of their default functions, and turned into high performance assistive devices to meet the special needs of people with ADHD [10].

Clearly, the diagnostic process of ADHD requires the development of more definitive measures [2,4]. The solution lies in more research that will guide us towards better diagnostic tools. The impact of undiagnosed or misdiagnosed ADHD might have a significant effect on the lives of many children. Therefore, there is a need to compile a mandatory, more accurate, and generally accepted diagnostic battery of tests for all clinicians who assess ADHD children, while strongly considering the incorporation of various technological tools which might improve the validity and accuracy of the diagnosis process and of treatment assessment.

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