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# Objective measures for the diagnosis of ADHD: practicality and ethics

In the Spring issue of *ADHD in practice*, the potential limitations of subjective information forming the basis of a diagnosis of attention deficit hyperactivity disorder (ADHD) and the objective measures that are available were reviewed, reflecting on their place in clinical practice.<sup>1</sup> If objectivity can be achieved in the diagnostic process, patient care is less likely to be influenced by potential biases and personal opinions of parents, teachers and clinicians. Unfortunately, there are limited data on the diagnostic accuracy of these objective measures, particularly on the differentiation of children with ADHD from healthy controls and other psychiatric patients. The value of these measures lies in their ability to add to the current diagnostic process by providing objective information as a component of a broader assessment process.

Through an exploration of the available literature, this article seeks to consider whether the use of such measures in clinical practice is justified, from a practical and ethical perspective.

## Is it practical to use objective measures in the diagnosis of ADHD?

At a time when services are not only feeling the burden of financial constraints but are also required to justify their work, cost-effectiveness is of crucial importance. However, there is a paucity of

data in the published literature on objective measures for the diagnosis of ADHD that addresses this matter, perhaps because the primary concern is whether the tests have a high diagnostic utility.

It has been suggested that objective measures are extremely cost-effective when contrasted with the time and effort required to complete a comprehensive diagnostic evaluation.<sup>2</sup> It is further claimed that continuous performance tests (CPTs) are easy to administer, rely only on the individual being evaluated and can take measurements in various settings.<sup>2</sup> However, each of these arguments may be countered. Administration of CPTs often requires specialist training, and this is almost always necessary for the process of interpreting the results.

CPTs cannot, as yet, be used in isolation; indeed, none of the tests studied have been designed for use in this way. Therefore, clinical interviews and rating scales are still required. Finally, although theoretically objective measures may be taken at home and at school, equipment is usually only available in the clinic setting and, therefore, the pervasiveness of symptoms cannot be identified by the test itself.

In 2005, Gualtieri and Johnson summarised the current costs of a range of tests, including the Conners CPT™, the integrated visual and auditory CPT, the auditory CPT, the Test of Variables of Attention® (TOVA) and the Gordon Diagnostic System® (GDS).<sup>3</sup> These ranged in price from US\$100 to over US\$1,500. Comparing costs with current practice is complex because the current assessment process involves a variety of methods and professionals, and the level of incremental value, if any, offered by the objective measures is unclear. The tests require that clinical team members are trained both in the use of the equipment and in the interpretation of the results, or that test results are sent away for an external report. Even if objective measures do not have diagnostic utility to be used alone, if they can improve sensitivity and specificity as part of a comprehensive assessment then this may be a persuasive argument for their use. Therefore, the incremental information to the diagnostic process may justify their use.<sup>4</sup>

## Is it ethical to use objective measures for the diagnosis of ADHD?

Healthcare professionals must work within a legal system while also adhering to guidelines and professional norms. This framework is underpinned by common ethical principles, described by Beauchamp and Childress.<sup>5</sup> The four principles described are autonomy, beneficence, non-maleficence and justice (see Box 1). Foreman stated that ethical principles should form a model for clinicians, which can provide guidance in common cases, and that is both clinically and legally reliable in daily clinical work. He further argued that such a framework can assist practitioners in deciding whether their current approach conforms to good practice, as well as in defending their decisions

## The diagnostic accuracy of the test is of crucial importance

against inappropriate pressure, identifying potential areas of difficulty or uncertainty and suggesting appropriate courses of action.<sup>8</sup>

### Autonomy

The principle of autonomy in children is particularly complex. Not only must autonomy be supported, but its limits must also be acknowledged. In practice, while it may be agreed that a child does not possess the capacity to make the decision as to whether or not to undergo testing for ADHD, the objective measures cannot generally be carried out without the child's co-operation. Issues of consent, competency and confidentiality are all subject to the principle of autonomy. As with all matters of consent, it is necessary for the decision-maker to be given adequate information. Specifically, it would be important to provide details regarding the process of the testing itself, any risks involved or side effects, the accuracy of the results and what may be gained from carrying out the test.

### Beneficence

The second key principle, beneficence, is to a great extent dependent upon the evidence base for the objective measures. Simply put, if objective measures increase the likelihood of achieving the correct diagnosis, or speed up the diagnostic process, then this in itself may be considered beneficial to the patient.

### Non-maleficence

Closely related to beneficence is the third principle, non-maleficence. If objective measures have side effects or associated risks, these must be carefully balanced against the intended benefits, in order to reach appropriate decisions regarding the use of the measures. Yet again, the diagnostic accuracy of the test is of crucial importance, due to the potential repercussions of a missed or incorrect diagnosis.

### Justice

The costs involved in carrying out the tests are naturally a matter of importance when considering the principle of justice. This principle is involved in the consideration of which patients should be offered the tests, if they are to be used. If, for example, the tests were used as a primary screening tool for all children, then a greater number of children may be identified with ADHD, but this may also result in a diagnosis of ADHD in asymptomatic or generally well-functioning children, who may not otherwise present to services.

Foreman stated that 'ordinary practice usually accepts that parents of hyperactive children have a right to refuse treatment',<sup>8</sup> but countered this with the notion that those acting on behalf of children

## Box 1 The four principles of medical ethics<sup>5</sup>

### • Autonomy

Feinberg stated that autonomy requires an individual to make a decision free from the control of others, while at the same time having a level of understanding that allows for meaningful choice.<sup>6</sup> Lawrence elaborated that, in order to be autonomous, a person must 'have the capacity to deliberate a course of action, and to put that plan into action'.<sup>7</sup>

### • Beneficence

Beneficence is action that is taken for the benefit of others. It can refer to both actions that do good, or those that prevent harm.<sup>7</sup>

### • Non-maleficence

This principle is often described using the Latin phrase *primum non nocere*, which roughly translates as 'first do no harm'. Lawrence argued that this principle is about 'distinguishing between effects and side effects of treatment' and that it serves to act as a reminder that 'the balance of benefit of intended and unintended effects of an intervention should always be positive'.<sup>7</sup>

### • Justice

This principle addresses the notion that patients in similar positions should be treated in a similar manner. Lawrence stated that 'justice addresses the questions of distribution of scarce healthcare resources, respect for people's rights and respect for morally acceptable laws'.<sup>7</sup>

are expected to act in their best interests. Seeking medical attention for a child with symptoms of ADHD is usually considered the prerogative of the caregiver, unlike other illnesses where not seeking help may be considered negligent. This is perhaps a reflection of the ongoing debate surrounding ADHD as a medical or cultural construct, and the varying thresholds for diagnosis globally.

Foreman also argued that ADHD 'presents practitioners with ethical conflicts between beneficence/non-maleficence and justice',<sup>8</sup> and provided the example of a child not being given special educational provision, unless a diagnosis of ADHD was confirmed. Similarly, there may be pressure from the education system refusing a child attendance at school if not suitably medicated.

Macklin, in critiquing medical practice based upon these principles, argued that 'context is often the single factor leading to a decision and the inability to know accurate predictions of good or bad consequences will always be a challenge when using this approach'.<sup>9</sup> While the above principles are commonly encountered in medical ethics discourse, there is significant variation in how they are used in practical policy making and in the implementation of guidelines, as they are influenced by a multitude of factors, ethics being only one.

## Conclusion

In addition to the issue of the diagnostic utility of available objective tests and their suitability to specific clinical situations and patient types, their

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place in clinical practice depends upon various aspects of practicality. The tests reviewed show significant variation in terms of costs, with respect to both equipment and manpower. From a clinical perspective, there are several advantages. These include not only being able to obtain information about a child that is free from potential subjectivity, but also as a source of quantified data that may be presented to families when explaining the diagnostic decision.

As with any change to medical practice, the use of objective measures in ADHD diagnosis must be subject to ethical scrutiny. The principles upon which this may be considered have been briefly examined and, as newer tests are developed and further studies carried out, these principles may be used as a framework upon which to consider the ethicality of proposed changes to practice. Any ethical conclusions drawn must be based upon a sound evidence base and, therefore, further studies are required to shed light upon the issues raised in the research thus far ■

#### Declaration of interest

The author declares that there is no conflict of interest.

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## Key Points

- A multitude of commercially available tests exist that are designed to objectively measure the symptoms of ADHD. These tests are not commonly part of the current ADHD diagnostic process.
- The costs of these tests vary greatly, both in terms of manpower and equipment. Clinical uptake is likely to depend on these factors as well as incremental diagnostic accuracy, an aspect not addressed sufficiently in the available literature.
- Ethical conclusions must be grounded in a strong evidence base, but as this does not currently exist, further research is required in terms of both accuracy as well as practicality before conclusions about ethicality may be drawn.