



# ADHD and Sensory Integration Disorders

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**A**ttention Deficit Hyperactivity Disorder (ADHD) is a well-known, if controversial disorder. Prior to DSM-5, ADHD was seen as one of the Disruptive Behaviour Disorders (DBDs), the other two being Oppositional Defiant Disorder and Conduct Disorder. DSM-5 now classifies ADHD as a NEURODEVELOPMENTAL DISORDER and I think that this change is correct and important. ADHD is actually a reflection of a degree of neurological immaturity and not 'just a behavioural disorder'. Likewise, I will argue that Sensory Integration Disorders are also due to a neurological immaturity.

#### THERE ARE THREE 'CORE' SYMPTOMS OF ADHD:

1. Inattention (This is a relative inattention, as the absolute inability to concentrate is a severe and obvious disability). Associated with this are high levels of distractibility. These individuals struggle to make sense of the myriad sensory inputs that are present in the classroom.
2. Impulsiveness (poor emotional regulation).
3. Hyperactivity (probably the least important of the three, unless severe).

Underlying these relatively simple symptoms are impairments in cognitive executive functions. These are the cognitive processes that regulate thought processes. They allow us, amongst other things, to initiate cognitive tasks, to switch tasks, to remember sequences (as simple as number sequences and as complex as an intricate plot in a well-written novel – known as sequential

memory) and to recall information from the past to integrate it with newly-acquired information (for example, when writing a thesis or paper on a topic, you must be able to recall what you read days or even weeks before – known as simultaneous memory). Most IQ tests tap directly into these executive functions. Thus, discrepancies in IQ tests (such as a significant difference in verbal and non-verbal IQ) are often seen in children with ADHD, and particularly in those with learning disabilities. The specific learning disabilities that often occur with ADHD also have their basis in the impaired executive functions.

Individuals with ADHD struggle to organise their thoughts and are therefore often very disorganised as individuals. It's a bit like having a

powerful computer with insufficient Random Access Memory (RAM). It works, but is often slow and will frequently bomb out. A common response to stimulant medication is "it helps me think better".

In addition, individuals (especially children) with ADHD have either gross motor coordination problems, fine motor coordination problems, or both. They sometimes show bilateral cerebellar signs (such as past-pointing and Dysdiadochokinesia). These are also, at least partly due, to the underlying neurological immaturity and are often aggravated by impulsiveness, making many children with ADHD very accident-prone.

Sensory Integration Disorders, on the other hand, derive from sensory integration theory, which was first developed by Jean Ayres, an Occupational Therapist and Educational Psychologist during the 1970s. The theory is growing and evolving but has been criticised in some medical quarters. I think this is sometimes done without even reading either the original literature or good reviews (reading reviews is more realistic for busy clinicians). We, in the medical profession, sometimes forget that all the paramedical professions have their own bodies of research and academic literature.

Ayres described Sensory Integration as the central nervous system (CNS) translating information into action. At its most basic level, the theory states that, to function successfully in our environment, we must successfully integrate all our senses. In addition to the usually recognised five senses taught in all pre-schools (sight, sound, touch, taste and smell), Ayres directed much of her attention to two other (so-called

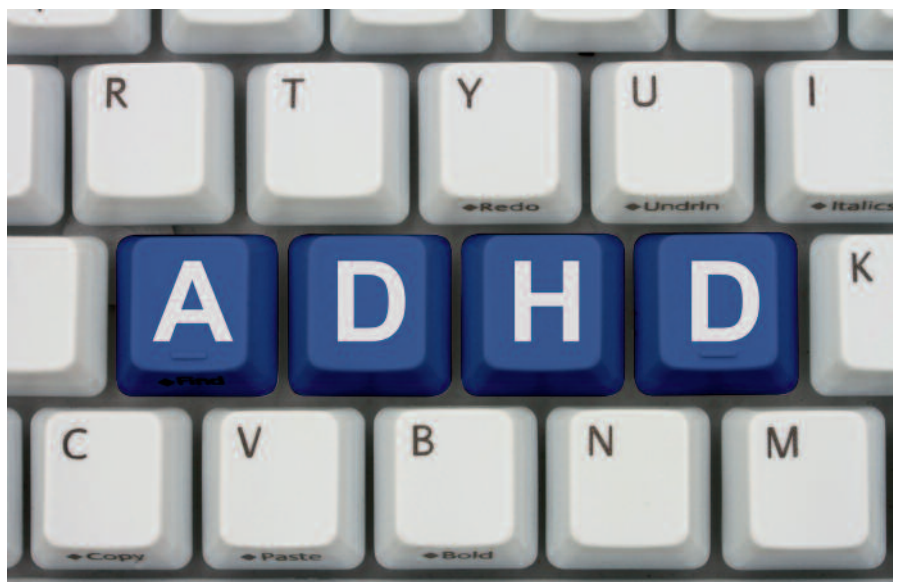
non-traditional) senses: vestibular sensation (which senses acceleration and three-dimensional movement) and proprioception (which senses the position of a body part in space relative to the rest of the body). Temperature is regarded as the 8th non-traditional sense.

#### IT GETS MORE COMPLEX. AYRES THEORISED THAT THERE WERE THREE GROUPS OF SENSES:

1. Interoception – internal sensations perceived through the viscera. Example: hunger or fullness, palpitations, nausea.
2. Proprioception - sensation about body position and movement, perceived through the vestibular, proprioceptive and kinaesthetic sensory systems. Example: the feeling of the biceps flexing and causing movement at the elbow.
3. Exteroceptors – sensations from without the body, or the five traditional senses.

Ayres is reputed to be the first to recognise the importance of the hidden sensations, and that the first two body-centred groups of sensations must be successfully integrated with the five traditional senses. It should also be obvious that we need to be able to integrate all five traditional senses as well. It follows that unsuccessful integration leads to Sensory Integration Disorders. As the CNS matures, our bodies become more adept at this process, which occurs very rapidly during the first two decades of life, but probably continues until death. A very young infant is almost completely unable to integrate his or her internal senses with the external senses.

It's very common for parents and patients to view medical intervention for ADHD as a last resort. This feeds into commonly-held ideas of the medical model. In the classic medical model, the symptoms, signs and special investigations are used to make a single diagnosis. For example: chest pain, cough and rigors (the symptoms), elevated temperature, lung consolidation by percussion of the chest and crepitations (the signs), consolidation seen on chest X-ray and a bacterium cultured from the sputum (the special investigations) lead to a diagnosis of Pneumococcal Lobar Pneumonia, a single diagnosis.







In Psychiatry, and especially child Psychiatry, the traditional medical model fails and multiple diagnoses are the rule and not the exception. For example: ADHD is commonly accompanied by specific learning disabilities (that most commonly affect written language i.e., non-verbal learning disabilities) and are often complicated by an Anxiety Disorder that's secondary to the child's educational difficulties.

The Sensory Processing Disorders are often part of these multiple diagnoses and can be regarded as a common co-morbidity with ADHD. Therefore, the best approach is to manage all the disorders simultaneously with recognised treatment protocols. All too often Occupational Therapy appears to have failed because some of the ADHD symptoms present in the child

have not been treated with appropriate medical protocols, while the child was receiving Occupational Therapy. This, wrongly, leaves the parents angry with the Occupational Therapist because the child is now seen as having ADHD and not a Sensory Integration Disorder. This can also occur in reverse, with a child with both Sensory Integration Disorder and ADHD receiving medical treatment only for the latter and not receiving simultaneous Occupational Therapy.

The reality is that frequently, the child has both disorders. There is also the intriguing possibility that the complex clinical presentation is actually the same disorder that is seen from two different points of view: the sensory integration Occupational Therapist and the Physician diagnosing ADHD. The two diagnoses are not mutually exclusive which is why, in the ideal world, ADHD should always be managed in a multi-disciplinary setting. **MHM**

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