



Information about Sensory Integration and the clinical evidence base for Ayres' Sensory Integration® (ASI) Intervention Approach

The following document has combined the most recent research and literature. This is provide information about Sensory Integration (SI) and the evidence base relating to the effectiveness of ASI interventions with children with Autism Spectrum Disorder (ASD). This is to highlight why a Occupational therapist (qualified in sensory integration) is an essential part of your multidisciplinary team.

What is Sensory Integration?

Sensory Integration is a neurological process. The brain organises and processes information from our body and surrounding environment, giving a basis for learning and behaviour (Ayres 2005).

What happens if a child/young person has difficulties in SI?

Literature and neuroimaging support relationships between difficulties with sensory integration and functional performance in activities of daily living. Difficulties within SI will impact everyday activities, such as sleeping, eating, tolerating personal care tasks, engaging in play, and participating in leisure and school curriculum activities (Di Martino et al. 2009; Mazurek and Petroski 2015; Miller-Kuhaneck and Britner 2013).

What is ASI?

ASI therapy focuses on combining the underpinning neuroscience within the child and therapist interaction in a playful framework. This is essential for developing and using functional skills in all areas of participation (Schaaf and Mailloux, 2015). Activities are individually tailored sensory-motor activities, contextualised in a playful, sensory rich environment, and fostered through the therapeutic relationship between the child and the therapist. There is an emphasis on sensory-motor factors and how they affect participation in daily activities. There is also an emphasis on using sensory activities to facilitate a calm and regulated state for optimal engagement. In ASI the therapist develops intervention based on a comprehensive sensory integration assessment and identified needs (Schaaf et al. 2018). ASI is based on the assumption that the brain is capable of change and is plastic (Bundy and Lane 2020). Studies support this assumption and have found increased dendritic branching in response to active engagement within enriched environments (Kempermann and Gage 1999). Improvements have also been seen in motor performance and active participation

(Lacourse et al. 2004). Motor and neurological changes can occur quickly (Pantev et al. 2003) and can be long lasting (Stoeckel et al. 2004).

The current evidence in literature:

Schaaf et al. (2014) state a common feature of ASD is difficulties with processing sensory integration information. ASI interventions basis is incorporating sensory-motor activities within individualised play, to encourage an adaptive response by offering the just right challenge (Ayres 2015). Kashefimehr et al. (2018) suggest that ASI interventions are beneficial to children with ASD, therefore, strengthening the importance of evaluating this specific client group further and the evidence base within ASI interventions. Furthermore, Schaaf and Mailloux (2015) highlight that children with ASD often have associated difficulties with sensory difficulties which impact on participation within daily activities, such as, self-care, play and learning.

Throughout the clinical process the qualified therapists apply the Data-Driven Decision-Making Table (DDDM) (Schaaf 2015) as a framework to assist and structure clinical reasoning, guide ASI intervention, plan and implement ASI intervention and measure and monitor progress. All therapists use the ASI interpretation tool (Schaaf and Mailloux 2015) to guide and support interpreting the assessment information gathered.

Clinical environment, approach and dosage recommended:

When implementing ASI therapy, Ayres' Sensory Integration® Fidelity Measure (ASIFM) (Parham et al. 2011) is applied to ensure therapists adhere to principles of therapy. The fidelity measure defines 10 essential elements of ASI which must be followed to be classified as ASI (Parham et al, 2011).

Current recommend dosage of ASI therapy is typically for one hour a week and will range from 16 – 28 sessions, depending on the sensory integration difficulties identified with the child, this could include; postural, praxis and/or regulation (Schaaf et al. (2018) and Schoen et al. (2019). This will then be followed by a review to determine if children have met their goals or require more ASI intervention.

Goal Attainment Scaling (GAS) (Mailloux et al. 2007) goals are applied to measure functional performance of the child within ADLs. These are sensitive measures designed to capture any changes pre and post intervention (Pfeiffer et al. 2011; Schaaf et al. 2014; Schaaf et al. 2018)

How will having access to SI therapist help children in education?

A recent systematic review (Hume et al. 2020) classified ASI as an evidence-based intervention for children with ASD. Literature (Iwanaga et al. 2014; Kashefimehr et al. 2018; Pfeiffer et al. 2011; Schaaf et al. 2014; Schoen et al. 2019) has found that ASI improves functional performance, participation, and sensory processing abilities in children with ASD.

Significant improvements have been seen in habituation, communication, cognition, attainment, motor skills and regulation. All skills needed to be able to attend and learn within educational settings (Iwanaga et al. 2014; Kashefimehr et al. 2018; Pfeiffer et al. 2011; Schaaf et al. 2014; Schoen et al. 2019). Literature has also found significant improvements in goals set for

improved sleep, and a reduction of caregiver assistance. Case-Smith et al (2014) completed a systematic review which supports the aforementioned positive results of ASI on functional outcomes for children with ASD and reported a positive effect of ASI on a child's individualised goals.

ASI intervention for this specific client group is effective (Pfeiffer et al. 2011; Dunbar et al. 2012; Kashefimehr et al. 2018; Schaff et al. 2014; Schaaf et al. 2018; Schoen et al. 2019). Research conducted by Pfeiffer et al. (2011) and Schaaf et al. (2014) has provided significant strength to the evidence, within their findings, to support effectiveness of ASIFM within children with ASD. Dunbar et al. (2012) research found there was a notable improvement in the children's performance from having structured sensory interventions in school.

Environmental adaptations, home, and school programmes compliment ASI (Bundy and Lane 2020). Upskilling parents and teachers to manage sensory needs to improve occupational participation using coaching principles to encourage self-management has also shown evidence of effectiveness (Miller-Kuhaneck and Watling 2018; Simpson 2015; Schaaf et al. 2015). The evidence recommends the use of sensory based interventions as one component of a comprehensive intervention that uses a variety of methods to promote performance.

By supporting the children's underpinning sensory integration needs within the educational environment, it will enhance their engagement in the curriculum. Reducing their anxiety, giving them tools to help with better emotional regulation, improving their academic results. What's more is by having regular access to a specialist, it will also provide consultation to staff and parents to improve their understanding of the children's sensory needs and how these impact learning and behaviour.

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Dated: 10th November 2022

Appendix:

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