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On behalf of the American Occupational Therapy Association (AOTA), I would like to commend the American Academy of Pediatrics for issuing a policy statement on sensory integration therapy (SIT) that is both fair minded and highly informative. Key conclusions such as the viability of using SIT as an acceptable component within a more comprehensive treatment plan, the necessity to conduct further studies on the efficacy of SIT treatment, the need to better validate sensory integration dysfunction as a separate disorder, and the importance of involving families in the treatment process are all extremely important.

In its review, the Academy identified research supportive of SIT (e.g., Miller, Coll, & Schoen, 2007; Tochel, 2003), as well as at least one study (Devlin, Healy, Leader, & Hughes, 2011) that demonstrated no effect. Such discrepancies in the results of SIT outcome research have been commonplace, and suggest that it is critical to identify the characteristics that differentiate the intervention protocols that produced positive versus no effects. In surveying the broad set of randomized group comparisons and single-subject designs that have been conducted, it becomes apparent that positive results are most likely to emerge when the SIT intervention: (a) involves sufficient dosage (minimally several weeks and ideally at least 6 months); and (b) includes the application of multiple forms of sensory input tailored to the needs of the child as opposed to a single type of sensory stimulation (such as vestibular) or modality (such as a weighted vest). Sensory interventions that do not contain these two features tend to yield null effects (e.g., Devlin et al., 2011; Kane, Luiselli, Dearborn, & Young, 2004; Leew, Stein, & Gibbard, 2010; Reilly, Nelson, & Bundy, 1983). In contrast, interventions that meet these criteria usually produce positive outcomes (e.g., Case-Smith & Bryan, 1999; Fazlioglu & Baran, 2008; Linderman & Stewart, 1999; Pfeiffer, Koenig, Kinnealey, Sheppard, & Henderson, 2011). Because real world applications of SIT generally involve at least several weeks of exposure to a wide array of tailored sensory opportunities presented in an enriched environment, the results for interventions that are short in duration or that are limited to a single stimulus are questionable in terms of their ability to properly inform policy regarding SIT as it is currently practiced. Therefore, AOTA is concerned about the emphasis in the policy statement on the study conducted by Devlin et al. (2011). Insofar as participants in that study received sensory treatment for an average of 4.5 days only, which reflects insufficient dosage for any realistic expectation of positive effects, the negative outcome should be interpreted cautiously.

In order to promote best practice, AOTA encourages pediatricians to consider the evolving evidentiary base of SIT that is being established through studies on the beneficial effects of interventions that meet the above criteria (e.g., Case-Smith & Bryan, 1999; Fazlioglu & Baran, 2008; Linderman & Stewart, 1999; Miller et al., 2007; Pfeiffer et al., 2011). Among these, three are randomized controlled trials demonstrating positive outcomes in areas such as social responsiveness, stereotypies, attention, and goal attainment (Fazlioglu & Baran, 2008; Miller et al., 2007; Pfeiffer et al., 2011). Additionally, pediatricians may wish to review the AOTA *Practice Guidelines for*

Children and Adolescents With Challenges in Sensory Processing and Sensory Integration (Watling, Koenig, Davies, & Schaaf, 2011) which is available through the Agency for Healthcare Research and Quality National Guideline Clearinghouse (<http://www.guideline.gov/>).

In another vein, AOTA was impressed with the Academy's citing of neuroscience research that underscores the link between exposure to sensory input and brain functioning. Such research is voluminous and provides general theoretical backing for the concept of SIT. For example, numerous studies using animal models demonstrate that environments that allow for exploration or play with objects such as wheels, swings, toys, and tactile media stimulate neural firing and sculpt synaptic connections, resulting in increased cortical thickness, neuronal size, synaptic density, or neocortical neurotransmission (Diamond, Lindner, & Raymond, 1967; Diamond, Rosenzweig, Bennet, Lindner, & Lyon, 1972; Gómez-Pinilla, Ying, Roy, Molteni, & Edgerton, 2002; Greenough & Volkmar, 1973; Greenough, Volkmar, & Juraska, 1973; Greenough, West, & DeVoogd, 1978; Merzenich, 2000; Zhang, Bao, & Merzenich, 2001). Consistent with these findings, recent models of neurodevelopment in humans posit that atypical sensory processing in disorders such as autism may disrupt the neurobiological circuitry that underlies the later development of motor skills, behavioral regulation, social interaction, language, and adaptive behaviors (Thompson & Levitt, 2010). It is interesting to consider that, at the neurobiological level, any correction for these types of adverse effects is expected to minimally require several weeks to several months to unfold (e.g. Baranek, 2002; Humphries, Wright, Snider, & McDougall, 1992; Miller et al., 2007; Ottenbacher, Short, & Watson, 1979; Wilson & Kaplan, 1994; Ziviani, Poulsen, & O'Brien, 2010), a time span that further underscores the assertion that extremely short-term sensory interventions should not be used to inform policy about SIT. Again, to best meet the challenge of studying the effectiveness of SIT, a key goal noted in the AAP Policy Statement, it will be critical to confirm that the studies considered meet the above criteria of sufficient dosage and availability of multiple forms of sensory input.

Overall, AOTA is pleased with the content of the AAP policy statement. Although occupational therapy treatment provision draws from a wide range of intervention approaches to be responsive to the needs of the child and his or her family, SIT is one approach frequently included in an overall plan of care. Such plans are aimed at promoting functional, participatory, and behavioral gains, which are continuously monitored. Also, in accord with the policy statement, AOTA recognizes the need to promote further research to determine whether the diagnosis of sensory processing disorder should be included in the *Diagnostic and Statistical Manual of Mental Disorders* in the future. Given this, it has recently urged the American Psychiatric Association to continue to monitor and promote research in this area. Finally, AOTA appreciates the guidance the policy statement provides to families with respect to collaborating with teams, obtaining a thorough assessment, prioritizing treatment options, and monitoring outcomes.

As a whole, the AAP policy statement presents an excellent summary of the pressing issues surrounding SIT, with sensible recommendations that reflect the body of

currently available information. Accordingly, the policy statement promises to contribute to sound pediatric practice. AOTA would welcome opportunities to discuss these issues with AAP experts to further our mutual interest of helping children and families address developmental and behavioral disorders.

Sincerely,



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