

Autism in Education Information Paper

Research to Inform Practice

Sensory Differences and Autism Spectrum Disorder

It is frequently reported that individuals with Autism Spectrum Disorder (ASD) respond to sensory stimuli differently than their typically developing peers (Dunn, Little, Dean, Robertson, & Evans, 2016). Sensory issues are often among the earliest symptoms observed by parents, with studies reporting anywhere from 45% - 95% of individuals with ASD presenting sensory-perceptual difficulties of some kind (Baranek, Wakeford, & David, 2008; Ben-Sasson et al., 2007; Bizzell et al., 2020; Tomchek & Dunn, 2007; Watling, Deitz, & White, 2001).

More specifically, some learners with ASD may present as over-responsive/hyper-sensitive to sensory input and go to great lengths to avoid stimuli such as loud or unexpected sounds, certain food textures or smells, or the feel of specific fabrics. On the other hand, some individuals may be described as under-responsive/hypo-sensitive to sensory input, and may have a diminished response to stimuli in their environment (e.g., may appear to have a decreased reaction to painful or aversive stimuli). Others may appear to seek out certain sensations and interests and may engage in repetitive, stereotypic and/or self-injurious behaviour, such as mouthing non-food items, touching everything or everyone in the environment, repetitively flicking a toy or object in a non-functional manner, or making noises (Miller, Anzalone, & Lane, 2007). Sensory issues may present differently in different settings. The Sensory Processing Measure (Parham, Ecker, Kuhaneck, Henry, & Glennon, 2007) and the Sensory Profile (Dunn, 1999) are standardized assessment tools that are often used to evaluate possible sensory difficulties at home, at school, and in the community.

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Information Papers provide topical research summaries and recommendations based on empirical evidence in the field of Autism Spectrum Disorder.

It is our aim that the information will guide thoughtful educational planning within the context of informed evidence-based practice and build awareness of potential benefits and risks for any intervention implemented.

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Disclaimer

This document synthesizes current knowledge and offers recommendations for consideration.

It does not constitute provincial education policy or commit Departments of Education & Early Childhood Development to the activities described. This document originates with the Interprovincial Autism in Education Partnership.

The most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) includes sensory differences under the category of repetitive behaviours in the diagnostic criteria for ASD. Individuals with ASD may experience “Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement” (American Psychiatric Association, 2013).

While there is ample evidence of sensory differences in individuals with ASD, the research related to intervention approaches to address these differences has produced inconsistent and controversial findings and has led to confusion among professionals and parents. Inconsistent and inconclusive evidence of the link between sensory systems and core characteristics of ASD continues to limit our understanding of the nature of sensory differences and the most effective interventions to mitigate these difficulties (Ben-Sasson et al., 2009; Dunn et al., 2016; Foss-Feig et al., 2012).

Why is understanding sensory differences in individuals with ASD important?

Understanding the difficulty learners with ASD may have in tolerating or processing sensory information is important for all educators. Sensory differences in individuals with ASD pose a unique challenge within the school and classroom context in terms of their potential impact upon the ability of learners to manage the demands of their environment in a manner that allows them to participate and learn (Saurez, 2012). As a result, it is critical for educators to be part of the process of determining if sensory differences may be interfering with learning, and to implement evidence-based interventions to address these challenges and support learners to be as successful and independent as possible.

What does the research tell us about sensory differences and intervention practices for individuals with ASD?

There are many intervention approaches used to address sensory differences and associated behaviours as part of a comprehensive educational plan for learners with ASD. Two of the most common approaches involve: 1) the use of sensory-based interventions, founded upon theories of sensory processing (Barton et al., 2015; McGinnis et al., 2013; Sniezyk & Zane, 2015); and 2) the use of behaviour-based approaches, based on the science of Applied Behaviour Analysis (Cooper, Heron, & Heward, 2007/2020; Skinner, 1953).

Sensory-based interventions such as sensory integration therapy (SIT), auditory integration training (AIT), and sensory diets have evolved from a theory of neurodevelopment first proposed by A. Jean Ayres, an occupational therapist, in the early 1970s. Ayres set forth a hypothesis to explain the brain’s ability to perceive sensory information from the environment,

organize and interpret it, and then formulate a physical or emotional response. Ayres proposed that, in addition to the basic five senses (hearing, vision, taste, smell and touch), the body must also process information from the vestibular system (movement, speed, balance and direction) and the proprioceptive system (feedback from muscles and joints regarding where our body parts are in relation to each other and how they are moving). According to Ayres's theory, the sensory system integrates these seven senses with each other to provide an appropriate and functional interaction with a variety of contexts and people (Ayres, 1972; Cook, 1990; Williams, Lee, & Lalena,, 2009). Ayres proposed that the ability to do this skillfully develops over time and when this does not progress correctly, sensory integration or processing dysfunction occurs (Ayres, 1972; Hoehn & Baumeister, 1994; Miller et al., 2007). Based on this theory, Ayres developed a very specific approach to sensory-based intervention, often referred to as Ayres Sensory Integration (ASI). This approach requires a trained professional, usually an occupational therapist (OT), to follow clearly-defined procedures and engage in continuous monitoring of the intervention to ensure appropriate and consistent implementation (Schoen et al., 2019). It is important to note that many other sensory integration therapies and sensory-based interventions have grown from this theory as well, many without the defined training, structure, and monitoring requirements associated with Ayres Sensory Integration (Schoen et al., 2019).

Proponents of sensory integration theory hypothesize that many behaviours demonstrated by individuals with ASD may be caused by sensory abnormalities associated with this underlying deficit in processing and modulating sensory input. They contend that the central nervous system ineffectively interprets environmental stimuli, interfering with an adaptive response (Addison et al., 2012). Sensory Integration Therapy (SIT) and sensory-based interventions have evolved from this theory of sensory processing and integration. The strategies associated with these interventions attempt to change how the brain processes and organizes sensations with the belief that, through facilitating sensory integration, individuals will be able to make more adaptive responses (Devlin, Healy, Leader, & Hughes, 2011). Examples of atypical responses to sensory stimuli are described in a number of parent/caregiver questionnaires used by practitioners in the assessment of sensory systems in individuals with ASD and other developmental disorders, e.g., the Sensory Profile (Dunn, 1999) and the Sensory Processing Measure – SPM (Parham, Ecker, Kuhaneck, Henry, Glennon, 2007). For a more detailed account of the most commonly used questionnaires please refer to TARGET: Texas guide for effective teaching sensory assessment (Texas Statewide Leadership for Autism Training, 2009).

Sensory integration therapy and sensory-based interventions involve a variety of activities that typically include a blend of controlled sensory stimulation and motor activity (Ayres, 1972; Ayres, 2005; Bundy & Murray, 2002; Hoehn & Baumeister, 1994; Vargas & Camilli, 1999). Sensory stimulation involves directly applying one type of sensation, such as deep pressure, to the individual with the intention of evoking a response and facilitating the reorganization of the vestibular, tactile, and proprioceptive systems (Bundy & Murray, 2002; Hodgetts & Hodgetts, 2007). Activities are selected through the use of specialized sensory tools such as brushes, net swings, trapezes, scooter boards, therapy balls, blankets, weighted vests and ramps (Parham et al., 2007; Pollock, 2009).

A related intervention involves the use of "sensory diets." This intervention, comprised of activities that are assumed to meet the individual's sensory needs, is based upon sensory integration theory, but requires less equipment than classical SIT and is often used in school and classroom settings. In a school or home program the learner is often provided a schedule of applied stimulation such as brushing and/or deep pressure (massage, joint compression weighted vests, etc.) followed by other learner-specific activities. (Smith, Press, Koenig, & Kinealy, 2005). A sensory diet is designed to help the learner use modulating activities to stay calm, yet alert and organized. It is intended to help the learner obtain the sensory experiences they may be seeking from the environment in a more proactive way. When carried out at school, these activities are often integrated into the student's daily schedule and are typically provided under the supervision of a staff member who has been trained to carry out the intervention. The various techniques used within a sensory diet may be incorporated within a broader sensory-integration based program, but also are used in isolation, e.g., therapy balls as alternative seating, weighted vests, etc. (Barton et al., 2015; Case-Smith & Arbesman, 2008; Case-Smith, Weaver, & Fristad, 2015; Leong, Carter, & Stephenson, 2015; Yunus, Liu, Bissett, & Penkala, 2015).

Comprehensive reviews of sensory-based interventions report inconsistent and limited evidence that these interventions can correct underlying sensory problems and/or benefit children with ASD.

Despite the fact that sensory integration therapy and sensory-based interventions are among the most widely studied treatments within the discipline of occupational therapy, there is still little empirical evidence to support most sensory-based interventions for individuals with ASD (Barton et al., 2015; Case-Smith, Weaver, & Fristad, 2015; Davis, Durand, & Chan, 2011; Dunn et al., 2016; Leong, Carter, & Stephenson, 2015; Losinski, Sanders, & Wiseman, 2016; Murdock, Dantzler, Walker, & Woods, 2014; Nowell et al., 2020; Sniezky & Zane, 2015; Watkins & Sparling, 2014). Studies are threatened by weak treatment fidelity (implementation of the intervention) and methodological rigor (adequate selection and description of participants, random assignment to alternative interventions, adequate sample sizes and defined outcome measures) which makes it difficult to draw conclusions regarding outcomes of sensory-based interventions with any degree of confidence (Barton et al., 2015; Case-Smith, Weaver, & Fristad, 2015; Baranek, 2002; Lang et al., 2012; Losinski, Sanders, & Wiseman, 2016; Parham et al., 2007; Pollock, 2009; Sniezky & Zane, 2015). Comprehensive reviews of sensory-based interventions including weighted vests, brushing programs, sensory diets, multi-sensory environment (e.g., Snoezelen room, sensory rooms) and auditory integration training (AIT), provide minimal evidence these interventions correct underlying sensory problems or provide any benefit for individuals with ASD (Kane, Luiselli, Dearborn, & Young, 2004; Lang et al., 2012; Leong & Carter, 2008; National Autism Center, 2009/2015; Nowell et al., 2020; Odom et al., 2010; Prior et al, 2011; Sinha, Silove, Hayen, & Williams, 2011; Steinbrenner et al., 2020; Wong et al., 2013). However, it is also important to recognize that there is ongoing research examining if and how sensory processing may impact emotional regulation in individuals with ASD (Critchley & Garfinkel, 2017; DuBois, Ameis, Lai, Casanova, & Desarkar, 2016; Fiene & Brownlow, 2015; Schauder, Mash, Bryant, & Cascio, 2015) and

investigating the possible effectiveness of particular sensory-based interventions (Krombach, 2016; Schilling & Schwartz, 2004). Recent research into the effects of activities such as exercise and movement, which may be related to sensory input, has supported that such activities may be helpful in targeting a variety of skills and behaviours for learners with ASD (Steinbrenner et al., 2020). Future well-controlled scientific studies may provide additional valuable information in these areas (Dunn et al., 2016).

It is worth noting that current research indicates that there is very limited evidence to support the use of multi-sensory environments (Snoezelen/ sensory rooms) with individuals with ASD. These rooms were initially developed by two Dutch therapists, Jan Hulsegge and Ad Verheul, in the 1970s and were designed to provide a soothing and stimulating environment for patients with dementia and profound developmental disorders by delivering stimuli to various senses, using lighting effects, color, sounds, music, scents, etc. (Kwok, To, & Sung, 2003). One review concluded that, “there is no evidence to support the rationale of this practice, and multisensory rooms do not meet the principles and elements of best practice and effective intervention” (Prior et al., 2011, p. 36), a finding supported by well-controlled research studies (McKee, Harris, Rice, & Silk, 2007; Nowell et al., 2020; Stephenson & Carter, 2011). This is especially significant given that Snoezelen rooms or versions of such sensory rooms, are located and utilized in a number of schools across the Atlantic Provinces.

The one sensory-based treatment approach for individuals with ASD that has recently been determined to have sufficient research support to be classified as an evidence-based intervention is the Sensory Integration approach originated by A. Jean Ayres (1979/2005). A recent comprehensive review of the literature on interventions for individuals with ASD completed by the National Clearinghouse on Autism Evidence and Practice (NCAEP) identified three well-controlled scientific studies that support the effectiveness of Ayres Sensory Integration (Steinbrenner et al., 2020). The report emphasized that the approach for which sufficient empirical support exists includes the following characteristics (Nowell et al., 2020; Steinbrenner et al., 2020):

- Active engagement of the learner
- Naturalistic intervention approaches for arousal, attention, and motor planning, which includes carefully planned arrangement of the environment
- Individualized one-to-one treatment with a trained and certified clinician/therapist (typically a certified occupational therapist) in a clinic-based setting
- Intensive treatment sessions multiple times per week

The review’s findings also indicate that Ayres Sensory Integration was only found to be effective for “children with autism who have clinically significant sensory processing dysfunction” and noted that “not all children with autism have these challenges and, therefore, SI would not be appropriate for all children with autism” (Nowell et al., 2020, p. 3). Importantly, the authors of this review also provide a strong caution for educators and parents, explaining that “educators and caregivers are not qualified or expected to independently deliver Ayres SI treatment to children with autism.” They explain that, “though an OT trained in this approach may address

sensory concerns in the classroom, classical SI therapy takes place in clinical settings (Nowell et al., 2020, p. 4).

In spite of the recent developments with respect to the evidence in support of Ayres Sensory Integration, the most limiting factor in the majority of the research concerning sensory-based interventions is that many studies fail to show any connection between the interventions and improvements in any specific areas of difficulty or target behaviour in learners with ASD (Davis, Durand, & Chan, 2011; Leong, Carter, & Stephenson, 2015; Murdock, Dantzler, Walker, & Woods, 2014; Sniezky & Zane, 2015; Watkins & Sparling, 2014). It is also questioned if the treatment effects suggested by some supporters of sensory interventions are truly the result of the prescribed intervention or the result of other factors such as parental expectations, approval, added attention, practice, desensitization to stimuli, poorly-defined or inappropriate intervention goals, and/or imposed structure (Baranek, 2002; Barton et al., 2015; Devlin et al., 2011; Myers, Plauché Johnson, 2007; Perry & Condillac, 2003; Schaaf et al., 2018; Stephenson & Carter, 2009; Yunus, Liu, Bissett, & Penkala, 2015).

It is important to note that much of the literature related to sensory-based interventions refers to unusual responses to sensory information as a sensory processing disorder (SPD); yet it is unclear whether or not SPD exists as an identifiable developmental diagnosis. Researchers continue in their efforts to identify significant biomarkers of sensory processing disorders in individuals with ASD. However, currently there is no strong evidence that the sensory pathways of the brain are disordered or that these sensory differences are unique to those with ASD (American Academy of Pediatrics, 2012). Difficulty in tolerating or processing sensory information is evident in learners with a range of diverse needs (Perry & Condillac, 2003; Tomchek & Dunn, 2007; Watling & Deitz, 2007). These observations have led the American Academy of Pediatrics to recommend pediatricians not use SPD as a diagnosis. SPD is not included as a specific diagnosis in the current edition of the Diagnostic and Statistical Manual (DSM-5), as the committee responsible for the most recent edition of this manual recommended that more research be done before considering sensory processing disorder a separate diagnostic category (American Academy of Pediatrics, 2012).

While theories related to sensory processing difficulties underlie one approach to addressing behaviours believed to be caused by sensory difficulties, a second explanation for many behaviours reported as atypical sensory responses is provided by the field of Applied Behaviour Analysis (ABA). ABA is defined as *“a scientific approach for discovering environmental variables that reliably influence socially significant behaviour and for developing a technology of behaviour change that takes practical advantage of those discoveries”* (Cooper, Heron, & Heward, 2007, p. 3). From a behaviour analytic perspective, atypical sensory responses observed in individuals with ASD can be explained by understanding the relationship between the environment and the behaviour. Behaviour analysts examine the ways in which factors in the environment influence behaviour and/or the purpose (function) of the behaviour for the individual (Addison et al., 2012; Devlin et al., 2011; Hanley, Iwata, & McCord, 2003).

Proponents of an environmental explanation of behaviour contend that in order to address behaviour, including behaviours believed to be responses to sensory information, it is necessary to identify the events or conditions in the environment that precede and follow that behaviour (Devlin et al., 2011). Behaviours believed to be associated with sensory differences may be explained by the effect these behaviours produce for the individual which, in turn, serve to maintain the behaviour (Hanley et al., 2003). The understanding of behaviour is drawn from

Behaviour analytic procedures have proven effective across a range of behaviours, including those often associated with sensory difficulties.

established principles of learning (Cooper et al., 2007/2020; Devlin et al., 2011; Ryan, 2011), which demonstrate that behaviours are learned through interactions with the environment and are maintained by the consequences they produce (i.e. behaviours that produce a desired effect are more likely to occur in the future). These consequences can include access to a desired outcome, object, or activity; escape from, or avoidance of, a non-preferred or aversive situation; or consequences that are pleasurable in and of themselves, such as pleasurable sensory stimuli from finger mannerisms, humming or tapping (Dounavi, 2011; Hanley et al., 2003; Hodgetts, Evans, & Misiasek, 2011).

Behaviour analysis focuses on determining the underlying function of a particular behaviour (i.e. the environmental influences on these behaviours). Practitioners conduct a functional behaviour assessment (direct observation and repeated measurement of behaviour) to assess the sensitivity of behaviour to specific consequences (Hanley et al., 2003; Iwata et al., 1982/1994). This analysis provides a means to determine which function-based interventions are likely to be effective in addressing the target behaviour. Interventions may include procedures to teach or increase alternative behaviours and skills, as well as to strategies to reduce or prevent interfering or problem behaviours (ASAT, 2012).

Well-controlled scientific studies have shown that interventions based on Applied Behaviour Analysis are effective in making meaningful changes in a wide range of behaviours that may interfere with learning and independence, including those often associated with sensory difficulties, such as tantrums, self-injury, repetitive vocal and motor behaviour, food refusal, etc. (Addison et al., 2012; Cooper et al., 2007; Devlin et al., 2011; Dounavi, 2011; Hanley et al., 2003; Potoczak, Carr, & Michael, 2007; Ryan, 2011). Several systematic reviews conducted over the past fifteen years have highlighted the effectiveness of behavioural approaches in treating the difficulties associated with ASD (National Autism Center, 2009/2015; Odom et al., 2010; Prior et al., 2011; Steinbrenner et al., 2020). Additionally, recent studies comparing the effects of behaviour analytic procedures to the effects of sensory integration strategies have demonstrated that ABA-based interventions result in the most significant improvements in target behaviours (Addison et al., 2012; Cox, Gast, Luscre, & Ayres, 2009; Devlin et al., 2011; Dounavi, 2011; Leong, Carter, & Stephenson, 2015; Quigley, Peterson, Frieder, & Peterson, 2011; Sniezyk & Zane, 2015; Yunus, Liu, Bissett, & Penkala, 2015).

Summary

Although not all individuals with ASD display sensory difficulties, there is evidence these types of difficulties are prevalent in this population and may interfere with performance and learning (Baranek, 2002; Ben-Sasson et al., 2009; Foss-Feig et al., 2012; Kashefimehr, Kayihan, & Huri, 2018; Myles et al., 2004; Schaaf et al., 2014). When considering interventions to address behaviours believed to be related to sensory difficulties in the school setting, the strongest research evidence, at present, supports the use of behaviourally based interventions. By contrast, the lack of research supporting the use of most sensory-based interventions for learners with ASD, particularly in the school setting, places the role of these therapies in question (Barton et al., 2015; Case-Smith, Weaver, & Fristad, 2015; National Autism Center, 2009/2015; Nowell et al., 2020; Odom et al., 2010; Prior et al., 2011; Leong & Carter, 2008; Sniezyk & Zane, 2015; Steinbrenner et al., 2020).

Despite limited evidence supporting the efficacy of most sensory-based interventions for learners with ASD (Nowell et al., 2020), these approaches remain popular and are frequently included in students' educational plans. In surveys conducted in 1999 and 2004, a high percentage (82%) of occupational therapists surveyed reported using sensory integration as a frame of reference and incorporating sensory integration techniques when working with learners with ASD (Olson & Moulton, 2004; Watling, Deitz, Kanny, & McLaughlin, 1999). This trend was also evident in a 2006 survey of 552 parents of individuals with ASD. In this survey, SIT was reported as the third most commonly implemented treatment for ASD, ahead of interventions with strong empirical support such as those based on Applied Behaviour Analysis (Leong, Carter, & Stephenson, 2015; Green et al., 2006; Sniezyk & Zane, 2015).

Implications for Practice

In light of the questions surrounding the efficacy of sensory-based interventions, what are the "best practice" guidelines for educators in addressing sensory difficulties in learners with ASD?

Based on the current research, it cannot be said with any degree of certainty that sensory-based interventions facilitate educational goals for learners with ASD or have any positive effect when carried out by school-based personnel in a classroom or school environment without direct support, oversight, and monitoring by a trained occupational therapist. While the most recent comprehensive review of the research into evidence-based practices for individuals with ASD classifies Ayres Sensory Integration as an evidence-based practice (Steinbrenner et al., 2020), the authors of that review clearly indicate that there is currently no evidence to support the use of this intervention in an educational setting without the direct and ongoing involvement of an occupational therapist trained in this approach (Nowell et al., 2020). Although some of the sensory-based practices that may be intended to address sensory difficulties in individuals with ASD may not be harmful, and indeed some may even be

pleasurable, they may interfere with learning opportunities or delay the implementation of proven and more effective interventions. Experts caution that the inappropriate implementation of these approaches (e.g., contingent use of sensory input following disruptive behaviour) may inadvertently reinforce and strengthen challenging behaviours over time (Devlin et al., 2011; McGinnis, Blakely, Harvey, Hodges, & Rickards, 2013). Research has shown that many of the activities that are incorporated in sensory-based interventions **may function as positive reinforcers** for learners with ASD (Barton et al., 2015; McGinnis et al., 2013). Since reinforcement causes behaviour to increase over time, this can be problematic if the sensory activity immediately follows a challenging or interfering behaviour. However, if the sensory activity functions as a reinforcer for a particular learner, and it is used strategically and

Many of the activities that are incorporated in sensory-based interventions may function as positive reinforcers for learners with ASD and may increase challenging and interfering behaviour over time.

intentionally as such (i.e. the learner is provided with the activity as a consequence of engaging in a desired behaviour), the result may be an increase in desired behaviour in the future.

With expert recommendations against the use of Ayres Sensory Integration in educational settings unless under the direction of a trained occupational therapist, and without sufficient empirical evidence of effectiveness of other sensory-based interventions for learners with ASD, educators are encouraged to use interventions with a stronger evidence base. There are many school and classroom appropriate empirically supported interventions for the types of functional problems and behaviours that sensory-based therapies claim to address (National Autism Center,

2009/2015; Odom et al., 2010; Prior et al., 2011; Leong & Carter, 2008; Steinbrenner et al., 2020). Refer to the Autism in Education Partnership's Information Paper, *Evidence-Based Practice* (Bulmer et al., 2012/2016/2021), which summarizes the results of comprehensive research reviews and identifies those practices classified as having sufficient empirical evidence of effectiveness. Additionally, the paper considers the requirements necessary for schools to implement evidence-based practice system-wide. It highlights the importance of selecting interventions based upon an understanding of the empirical evidence. Further, it emphasizes that this understanding should be integrated with knowledge about the student and related circumstances, the expertise and experience of the educators and professionals involved, and by the ongoing collection and analysis of data as an intervention is implemented.

Comprehensive educational programs for learners with ASD benefit from input and collaboration from professionals representing a variety of disciplines, including ASD consultants/specialists, occupational therapists, psychologists, speech-language pathologists, behaviour analysts, and physiotherapists, among others. The range of training, experience, and expertise these professionals bring to the discussion can prove to be a valuable resource, and can assist educators to integrate meaningful activities (communication, self-care, play, leisure and learning) into daily routines and natural environments (Baranek, 2002; CAOT, 2015; Law, 2006; Sahagian & Whalen, 2003; Scheibel & Watling, 2016). It should also be recognized that

problem behaviours, especially those representing a significant change from the individual's typical behaviour, may indicate an underlying medical condition. The learner's educational plan or behaviour support plan may require input from appropriate medical professionals.

One of the challenges of working with such a diverse team, however, is that partner professionals may view challenging or interfering behaviour from different perspectives and may put forward different recommendations to address such behaviours. This can create disagreement within a team, and confusion for parents and school staff. When this situation arises, it may be helpful to consider the following (Brodhead, 2015; Scheibel & Watling, 2016; Stango, 2017):

- Establish clear priorities based on
 - skills and behaviours that are meaningful for the learner and family
 - the learner's strengths, needs, interests, and current repertoire of skills
 - supporting the learner's independence and successful participation in school, home, and community
- Clarify the roles and nature of involvement of each partner professional
- Collaborate to write goals that are specific, measurable, and have clear timelines
- If addressing a challenging or interfering behaviour, work as a team to clearly define the behaviour in observable and measurable terms
- When deciding on the intervention approach, consider
 - the research base for the intervention
 - any risk to learner safety, dignity, and/or instructional time
 - the values and preferences of the learner and family
 - the resources required to implement the intervention
 - the "fit" between the proposed intervention and the context
- Collaborate to determine how the effectiveness of the intervention will be measured, including
 - what data will be collected, when, and by whom
 - what data collection system will be used
 - how often will data be reviewed
- Agree upon how the team will respond if data indicate that the intervention is effective in changing the behaviour in the desired way, AND how the team will respond if data indicate that the intervention is not effective

Although multidisciplinary collaboration in support of learners with ASD who experience sensory differences can present challenges, it also provides a unique opportunity to enhance professional experience, engage in respectful critical dialogue, and build mutual respect and understanding, while also serving the best interest of the learner and family. As Leaf and McEachin (1999, p. 5) point out, "We must work together. We have to agree to disagree. We have to rely upon data that supports treatment effectiveness. We have to focus on the child. We have to value the unique blend that comes from incorporating all the perspectives within a team."

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This paper is produced by the Autism in Education (AIE) Partnership. It will be amended as new information comes to light through relevant research and literature. If you would like to make a comment or provide additional information related to this topic area, please forward to: [Shelley McLean@apsea.ca](mailto:Shelley_McLean@apsea.ca)

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