



Building Competency in SI: Evidence-Based Guidelines for Occupational Therapy Using Ayres Sensory Integration®

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Occupational therapy practitioners are seeking information to build their knowledge and skills through postgraduate continuing education in sensory integration.

Over the years, sensory integration (SI) has gained popularity in practice, with increasing acknowledgement for expertise in this area of occupational therapy practice (American Occupational Therapy Association [AOTA], 2011, 2015a, 2017; Royeen, & Lueben, 2009; Schaaf et al., 2014; Schaaf et al., 2015; Watling, Koenig, Davie, & Schaaf, 2011). Pediatric occupational therapy practice has also grown. A 2015 AOTA survey showed early intervention and schools as the top work settings for occupational therapists and occupational therapy assistants in terms of number of practitioners—more than one third of the total workforce (AOTA, 2015b).

From as early as 1999, Case-Smith and Bryan (1999) found that occupational therapists in the United States working with children with autism in schools most frequently used a sensory integrative approach. According to Schaaf (2011), 99% of occupational therapists apply principles of SI in their work with children with autism. SI was identified as one of the three most requested approaches by parents (Green, Pituch, Itchon, & Sigafoos, 2006; Mandell, Novak, & Levy, 2005), with a steady increase in the incidence of autism, now at 1 out of 47 children, ages 3 to 17 years (Autism Speaks, 2017).

SI originated in occupational therapy and is strongly linked to occupational therapy practice. Currently, most health and education professionals recognize that occupational therapy is the go-to profession for SI and sensory processing (Reynolds, Watling, Zapletal, & May-Benson, 2012). Because of the complex nature of SI, occupational therapy practitioners are seeking information to build their knowledge and skills in this area through postgraduate continuing education.

Historical View of SI Education in OT

With the increasing demand for occupational therapy services; an increase in the number of individuals with SI and processing issues, such as those with autism; and a rise in employment in early intervention and school-based practice, training in evidence-based practice using SI and sensory processing is essential for occupational therapy practitioners.

To determine the level of training of entry-level occupational therapists using SI, AOTA's Sensory Integration Special Interest Section (SISIS) conducted two surveys. In 1999, the SISIS conducted a survey of all occupational therapy programs in the United States, inquiring about how much SI was taught within the curricula. Results indicated that SI theory and intervention were introduced in all programs. This content was typically embedded within the curricula, varying from a brief introduction of 1 or 2 hours to approximately 10 hours on the topic. The authors concluded that this did not constitute adequate training to ensure competencies in SI at entry level (Jacobs, Koomar, Mailloux, & Roley, 1999). The SISIS revisited a similar question that prompted an additional survey with similar results in 2012 (Reynolds et al., 2012). They concluded that instruction in this knowledge base was variable in what was taught and the number of hours spent on the content. Respondents indicated a desire for additional resources for SI at entry level (Reynolds et al., 2012).

Since Ayres (1968, 1972) introduced her theory and methods to the field of occupational therapy, it has been considered an advanced level of occupational therapy practice. While diligently working within her practice on developing assessments, interventions, and research, Ayres created training programs with content that she determined to be at the master's level. The program was formalized in 1974 through the OT610 4-month clinical training course through the University of Southern California (USC), an elective within the master's program for occupational therapy. The OT610 USC course has attracted therapists from all over the world.

In 1976, colleagues and supporters of Ayres began the Center for the Study of Sensory Integrative Dysfunction (CSSID). At the suggestion of Dottie Ecker, MA, OTR/L, FAOTA, Ayres consented to offering a "certification" in SI offered through postgraduate continuing education formats. Sensory Integration and Praxis Tests (SIPT) certification entailed theory, assessment, and interpretation using the Southern California Sensory Integration Tests. When the SIPT were published, the

PROPOSED PATHWAYS TO EXPERTISE IN AYRES SENSORY INTEGRATION® (ASI)

LEVELS	KNOWLEDGE AND SKILLS
LEVEL 1: ENTRY LEVEL OUTCOMES	<ol style="list-style-type: none"> 1. Introduction to the seminal work of A. Jean Ayres 2. Sensory contributions to development, including concepts of body-centered sensations, sensory motor skills, and praxis 3. Sensory challenges, including reactivity, perception, postural and motor skills, and praxis 4. When to refer to a professional with post-graduate specialization in ASI 5. Basic principles and equipment used in classic ASI intervention 6. Impact of sensory systems on the lived experience, including occupations, of people with sensory challenges.
LEVEL 2: CERTIFICATE LEVEL OUTCOMES Training programs typically consist of 120 contact hours or more	<ol style="list-style-type: none"> 1. Historical and Current Foundations of Sensory Integration (SI) Theory 2. Foundations of SI in Occupational Therapy and Occupational Science 3. Ayres Sensory Integration® as Trademarked Term 4. Typical SI development 5. The impact of SI across the lifespan 6. Neurobiological foundations for SI 7. Models of SI function and dysfunction 8. Terminology related to SI 9. Reliability and validity of direct and indirect assessments of SI and praxis 10. Research from factor analyses supporting knowledge of the patterns of SI function and dysfunction 11. Evidence on SI and praxis deficits in various populations 12. Clinical reasoning tools such as Data Driven Decision Making 13. Differentiating SI deficits from other types of difficulties 14. ASI intervention planning based on systematic reasoning and hypothesis generation 15. Linking engagement in occupation and participation with SI for goal setting and outcomes measurement 16. Considerations of a manualized intervention 17. Structural and process elements of ASI intervention 18. Distinguishing ASI intervention methods from other interventions 19. Evidence on effectiveness of ASI methods 20. Benefits and limitations of the ASI approach
LEVEL 2 SKILLS DEMONSTRATING THE ABILITY TO:	<ol style="list-style-type: none"> 1. Choose and administer ASI assessments that inform understanding of participation challenges relevant to the profession 2. Administer assessments reliably 3. Support interpretation with objective data 4. Interpret, synthesize, and analyze assessment data and achieve meaningful goals 5. Communicate assessment results in a conclusive and understandable way 6. Relate SI assessment finding to reasons for referral and participation 7. Make an impact and empower others to effect change for the person with SI difficulties 8. Understand therapeutic use of self in ASI intervention 9. When SI is warranted, meet criteria for fidelity in ASI intervention
LEVEL 3: ADVANCED LEVEL OUTCOMES	<ol style="list-style-type: none"> 1. Shows motivation to continue learning 2. Builds expertise in one or more areas of research, advocacy, education, and practice 3. Links with professionals with additional expertise within and outside of their own profession 4. Contributes to new knowledge and skills in ASI 5. Takes a leadership role in their community of practice 6. Shares knowledge (e.g., through publications or lectures)
LEVEL 4: EXPERT LEVEL OUTCOMES	Experts are identified as individuals with exemplary knowledge and skills who make substantial contributions to ASI research, advocacy, education, or practice.

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certification program was updated. Later, in the 1990s, an SI intervention course was added. The format and content of these courses were designed by Ayres and colleagues and continue to be the foundation for trainings that are offered throughout the world.

At the same time that CSSID was forming, AOTA started an initiative on Special Interest Sections to better support its members in their unique areas of practice. Ginny Scardina, MA, OTR/L, advocated for the inclusion of SI as an emergent and critical specialty area of occupational therapy practice. Discussions with then AOTA President Mae Hightower Vandamm included whether AOTA might take over the SI certification courses. However, it was not felt to be the sole purview of occupational therapy, and therefore not appropriate for AOTA at the time. Nonetheless, AOTA adopted the Sensory Integration Special Interest Section (SISIS) as one of the first five SISs. The SISIS has always had an active membership and continues to play an important role for AOTA members interested in this specialty area.

Although AOTA has not historically provided certification or in-depth training programs in SI, the SISIS has supported members by providing solid information and guidance for practitioners through changes in practice over these decades. In this tradition, this article provides updated information on postgraduate training in Ayres Sensory Integration® in order to assist practitioners in identifying expected standards and to help them determine the best advanced training program to meet their professional goals.

CSSID, later known as Sensory Integration International, offered SIPT certification courses until it closed in 2007. USC continued its commitment to postgraduate SI training and offered the Certificate Program in Sensory Integration from 1998 to 2016, in partnership with Western Psychological Services (WPS), owner and publisher of the SIPT. Unfortunately, the closure of the USC/WPS program has resulted in concerns that there is no longer a need or availability for certificate-level postgraduate training in SI. That is not the case.

Current View of SI Education in OT

Modeled after Ayres' original training programs, there are well-established programs offering SI certification through organizations such as the Austrian Society of Sensory Integration, the Sensory Integration Network UK/Ireland, the South African Institute for Sensory Integration, 7Senses Portugal, and the Finnish SI Association. Most of these SI-training organizations have either nonprofit or university-affiliated status. Starting in 2016, two U.S.-based nonprofit organizations, the Spiral Foundation and the Collaborative for Leadership in Ayres Sensory Integration, began offering in-depth training programs, including a certificate in Ayres Sensory Integration. In 2017, USC offered a new postgraduate education program in SI. In each of these examples, instructors have been trained by Ayres or by first-generation experts who were trained by Ayres. Another organization, the STAR Institute, provides training for sensory processing disorder, a derivative of Ayres' work in SI.

With the increasing popularity of SI throughout the world, additional organizations for training and research are proliferating in other countries. A critical concern among leaders of the organizations is maintaining the integrity of the body of work of SI and supporting best practice in occupational therapy. Some organizations offering SI training restrict the SI certificate to occupational therapists. Some organizations, such as those in the United States, additionally offer training to speech-language pathologists, physical therapists, and physicians. Professionals outside of these professions are not eligible for an SI certificate through the organizations previously mentioned.

In 2008, at the USC/WPS annual instructor meeting, U.S. representatives and leaders from several international SI organizations, including those previously noted, joined efforts to ensure equivalency in quality of educational materials and an exchange of ideas, including innovative educational methods. This informal group became the International Coalition for Education in Sensory Integration (ICESI) and is in the process of formalization as the International Council for Education in Ayres Sensory Integration (ICEASI).

In 2016, the leaders of the organizations partnering in ICESI and others, including representatives from the United States, met to establish international guidelines for education in ASI.

Considerations for drawing up guidelines included the varying levels of professional education for occupational therapy in different countries, including the foundations in neuroscience and typical development. In some countries, there has been encroachment of other disciplines into the use of sensory methods, often without adequate knowledge of the research and fidelity to the methods.

Proposed guidelines for building expertise in ASI include the following:

Instructors are experienced occupational therapists with acknowledged training in sensory integration.

Curricula are rigorous and research-based developments of SI theory by Ayres and her successors, including the neurophysiological bases, specific sensory integrative clinical reasoning based on knowledge of assessment and interpretation of the results, the intervention approach as described by the Fidelity Measure to SI (Parham et al., 2011), and relationship between sensation, engagement in needed and desired occupations, and participation in life.

All courses are based on empirical research and evidence, from Ayres' research to current studies, and emphasize the occupational therapy perspective (i.e., strongly linking sensory integrative processes to health and participation via engagement in daily life occupations).

There are four levels of entry into the process of developing expertise in ASI. The length and style of courses may vary depending on the program. Individual mentorship and hands-on experience are highly recommended.

Postgraduate Education in Ayres SI: Relevance to OT Practice

According to co-author D'Andre Holland, a relatively recent occupational therapy graduate, "The SI certification course was instrumental in progressing my clinical reasoning and judgment through the following ways: (1) Building a solid foundation in understanding the body of ASI evidence; (2) increasing my knowledge of assessment and treatment approaches that govern an SI intervention; and (3) improving my ability to communicate the 'why in the middle of the what' in my interventions from a sensory standpoint."

We have often heard that advanced training in SI is transformative to one's occupational therapy practice. SI educational programs have been built on a model of evidence-based occupational therapy practice; guided by theory; discretely

identifying the concerns through rigorous assessments; and using research to guide the goal setting, intervention, and outcomes measurement. With concern for supporting therapists to move from novice to expert, a variety of options exist through postgraduate education and mentorship. Ultimately, consumers should request high-quality continuing education no matter who the provider and should ensure adherence to evidence-based practice with the best available research and practice possible.

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