Applying Sensory Integration Framework in Educationally Related Occupational Therapy Practice (2003 Statement)

This document states that the American Occupational Therapy Association (AOTA) recognizes that sensory integration is one of several frames of reference used by occupational therapists and occupational therapy assistants, under the supervision of an occupational therapist, working with public and private schools.

Domain and Process of Occupational Therapy

Occupational therapy practice is defined within the Occupational Therapy Practice Framework: Domain and Process (AOTA, 2002a). The domain of occupational therapy is the client’s engagement in occupations that promote healthy participation in everyday life. The process of occupational therapy services includes evaluation and intervention related to salient outcomes that are identified by the client, client’s family or caregivers, funding agency, and the occupational therapist. Occupational therapy services are initiated based on the client’s difficulties in engaging in occupations and participating in everyday life activities. The evaluation includes information related to the individual’s past and current occupational engagement as well as those desired for future participation and specific evaluation of occupational performance. The sensory integration frame of reference is considered when underlying issues in sensory integration impact the client’s performance. Intervention is designed to improve the client’s desired and expected participation through techniques and procedures aimed at the client, the activity, and the environment. Consideration is always made for the context within which the client is expected to perform.

Educationally Related Occupational Therapy Services

Educationally related occupational therapy evaluation and intervention are most often provided under federal mandates such as the Individuals With Disabilities Education Act (IDEA). This mandate dictates that occupational therapy services are provided at no charge to the parent when they “are required to assist a child with a disability to benefit from special education” (34 C.F.R. 300.24 [a]). Eligibility criteria for special education services are determined state by state based on federal code (34 C.F.R. §300.7). Another federal mandate, Section 504 of the Rehabilitation Act of 1973, dictates that people should not be discriminated against based upon their disability status (i.e., mental or physical). The responsibility of this federal civil rights law falls within the general education program to identify and provide free and appropriate accommodations and/or services for eligible persons.

A request for an occupational therapy evaluation is typically initiated when a significant discrepancy exists between the student’s expected and actual performance in the educational setting. Services may be provided under IDEA after eligibility for special education services has been identified by the educational team (AOTA, 1999b). The occupational therapist and occupational therapy assistant in educational settings must adhere to mandates within IDEA. Within those guidelines, the occupational therapist decides the frame(s) of reference and interventions that are most appropriate to meet the team-identified educationally related goals. The mandate of providing services in the “least restrictive environment” requires that services support access to the general education curriculum whenever possible. The occupational therapist provides the rationale if services are recommended (necessary) outside of the general education classroom schedule and environments.

As described in the Occupational Therapy Practice Framework, the occupational profile guides the occupational therapist in gathering information that determines the concerns, priorities, abilities, and motivations of the student in relation to engagement in daily activities. These include performance in areas of occupation such as activi-

1The delivery of occupational therapy services occurs collaboratively between the occupational therapist (OT) and the occupational therapy assistant (OTA). The OT is responsible for the overall delivery of OT services, and the OTA delivers OT services under the supervision of the OT (AOTA, 2002b).
ties of daily living, instrumental activities of daily living, education, work and work readiness, play, leisure, and social participation. It also uncovers the discrepancies between the student’s past, current, and desired patterns of performance. The occupational therapist analyzes significant aspects of the student’s performance skills (e.g., motor, process, communication) and performance patterns (e.g., habits, routines, roles), contextual factors (e.g., personal, physical), activity demands (e.g., required actions, social demands), and client factors (e.g., body functions, body structures) in order to develop hypotheses about the student’s performance. The occupational therapy assistant contributes to the evaluation process as appropriate.

Occupational therapists and occupational therapy assistants in educationally related practice often work in systems where there are various standards already established. Standards such as teachers’ expectations, peer performance, state or local academic and nonacademic expectations, and general education curriculum provide occupational therapists with information necessary to determine expected occupational performance in this setting. Using various evaluation methods, the occupational therapist identifies facilitators and barriers to performance focusing on three primary areas: the context, activity demands, and the client. One or more frame(s) of reference, such as sensory integration, may be selected to guide further evaluation and interpretation. As a result of the evaluation process, the areas to be addressed in the intervention, if needed, are defined.

An educational team determines if the student meets state regulations for entitlement to special education based on the evaluation data gathered from multiple sources. The educational team consists of the student, if appropriate; parents or guardians; teachers; school representative; and professional personnel whose related services are needed in order for a student to benefit from the educational program. Occupational therapy is a related service; therefore, the occupational therapist and the occupational therapy assistant are part of this team. This team identifies the student’s strengths and needs in order to develop educationally relevant goals and objectives for the Individualized Education Program (IEP). The student’s academic and nonacademic needs are the basis for the student’s IEP goals. Based on the identified student needs, the team determines if related services such as occupational therapy are necessary for a student to benefit from the educational program. If so, occupational therapy services are provided through the school district. Information from outside sources such as physicians or non-school occupational therapists may be considered but does not dictate either the team decision or the type of interventions provided by the occupational therapy in the educational setting. Discharge planning is an essential piece of the initial evaluation and intervention plan (AOTA, 1999a). The discharge transition plan is completed by the occupational therapist with information from the client and from the occupational therapy assistant. This ensures that the student will be discharged when occupational therapy services are no longer needed. Progress toward a goal must be measured and reported to the parents on a specific schedule. The occupational therapist reports recommendations, including discharge, to the IEP team for implementation.

The Use of Sensory Integration Within Occupational Therapy

Clinical reasoning guides the occupational therapist’s selection of the use of one or more frames of reference such as sensory integration (Parham, 1987).

“The foundation of a practitioner’s clinical reasoning rests on the conceptual framework by which the therapist organizes the way he or she thinks. Using a sensory integration conceptual framework, the therapist has a distinct set of information…to apply to a case situation” (Burke, cited in Roley et al., 2001, p. 208).

“Sensory integration theory has defined concepts and supporting principles and the relationship among the principles. These components strengthen the therapist’s ability to understand what he or she is observing and recording about a child’s behavior” (Burke, cited in Roley et al., 2001, p. 209).

Ayres conducted the seminal research linking sensory integrative functions to academic achievement for students with learning disabilities (Ayres, 1972a, 1975, 1989). She also related sensory integration to extremes in sensory responsiveness (Ayres & Tickle, 1980) and emotional well-being (Ayres, 1979). She described sensory integration as a neurobiological process that refers to the detection, assimilation, organization, and use of sensory information to allow an individual to interact effectively with the environment in daily activities at home, school, and in other settings (Ayres, 1972b). Sensory integration theory and practice has since been applied to many different populations.

In the Guide to Occupational Therapy Practice (AOTA, 1999a, Quick Reference), there are five indicators for discontinuing occupational therapy services: “1) Functional goals/outcomes have been achieved, 2) a plateau in progress has been reached, 3) participation in intervention is restricted because of complications, 4) prescribed OT maintenance program is followed independently or with assistance, 5) discharge is requested.”
and in a variety of settings, including public and private schools (Kimball, 1993; Roley et al., 2001).

Further research has tested the link between sensory integration and educationally relevant issues. Mulligan (1998a, 1998b, 2000) conducted a series of studies on more than 10,000 children who were tested using the Sensory Integration and Praxis Tests to evaluate deficits in sensory integration. These confirmatory factor and cluster analyses validated the constructs originally proposed by Ayres and identified a common factor that links those constructs. Ayres had earlier identified this same factor and labeled it sensory integration. Parham (1998) conducted a longitudinal study that correlated sensory integrative functions with arithmetic and reading achievement in school-age children. In fact, in this study, the Sensory Integration and Praxis Tests were better predictors of later math abilities than the Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1983). Parham concluded that sensory integration provides a significant contribution that goes beyond the effects of intelligence related to skill development in reading and doing arithmetic. She found that, singly, praxis was consistently the most powerful sensory integration factor in predicting academic achievement (Parham, cited in Bundy, Lane, & Murray, 2002).

Research by Dunn (2001) has focused on sensory processing issues within the theory of sensory integration. Dunn’s Model of Sensory Processing described four quadrants of sensory processing based on neural thresholds. She states that “significant differences in sensory processing from the patterns most people experience may be a considerable factor contributing to the overall behavioral, cognitive, and psychosocial manifestations of particular disorders” (Dunn, 2001, p. 614). Using the Sensory Profile (Dunn, 1999), occupational therapists are able to gain information that can be used to enhance the match among the student, context, and occupation to enable more optimal performance.

The contribution of sensory integration to functioning in various daily occupations has been well documented (Ayres, 1979; Bundy et al., 2002; Dunn, 2001; Parham & Mailoux, 2001; Roley et al., 2001; Spitzer, Roley, Clark, & Parham, 1996).

Sensory integration is only one of many factors that influence occupation; it interplays with social expectations, physical environments, and personal experiences in shaping an individual’s occupational life. [It is a] complex process through which the nervous system mediates transactions between individuals and their world. In this view, sensory integration serves as a scaffold for human agency and, therefore, is inextricably linked with occupation. (Parham, cited in Bundy et al., 2002, pp. 431–432)

Impact of Sensory Integration on Client, Activity Demands, and Environmental Factors

Evaluation of sensory integration provides information about the client’s sensory processing and perception and how these impact planning and function. The evaluation of sensory processing and praxis relies specifically on data from which occupational therapists hypothesize about a student’s neurobiological process of sensation and its impact on performance. Both formal and informal assessments are used for this purpose (Windsor, Roley, & Szklut, 2001). Evaluation also includes analysis of the sensory, motor, and cognitive demands of the activities; the social and physical characteristics of the environment(s); and the effectiveness of the student’s performance skills and patterns in those activities and environments. The results are interpreted in conjunction with information obtained through the occupational profile, and an intervention plan is developed (Bundy et al., 2002; Windsor et al., 2001).

Occupational Therapy Intervention Using Sensory Integration

During the intervention process, the occupational therapist integrates information from the evaluation process with frames of reference, clinical reasoning, and evidence-based practice to develop the intervention plan. The occupational therapy assistant provides input into the intervention plan. The Occupational Therapy Intervention Plan is not part of the IEP but rather a professional record required by the AOTA Standards of Practice for Occupational Therapy (AOTA, 1998). It includes client collaboration toward the outcome of engagement in occupation to support participation. The plan includes intervention approaches, such as create/promote, establish/restore, maintain, modify, and prevent (AOTA, 2002a). When the plan is put into action, the occupational therapist directs intervention at changing the context, activity demands, client factors, performance skills, or performance patterns. The occupational therapist may delegate aspects of the intervention process to the occupational therapy assistant as appropriate. The type of occupational therapy intervention(s) used relates to the intervention approach(es) that were chosen. The following table, based on the Occupational Therapy Practice Framework (AOTA, 2002a), provides examples of various approaches that may be used within the sensory integration frame of reference.

Outcomes

Occupational therapy using the sensory integration frame of reference or any other frame of reference targets occupa-
tionally relevant goals. The occupational therapy program seeks to facilitate engagement within typical contexts of daily life. In school-based practice, the occupational therapist works with the IEP team to develop educationally relevant goals and objectives for the student. When appropriate, the occupational therapy assistant works with the occupational therapist in carrying out strategies to meet designated goals and objectives. At the time that the goals are set, the occupational therapist predicts the outcomes of the intervention as a result of the analysis of the occupational profile and the analysis of occupational performance. Continued review of the issues and outcomes provides a method for evaluating the success of the occupational therapy intervention program. Progress is noted through improved occupational performance, client satisfaction, role competence, improved health and wellness, prevention of further difficulties, and improved quality of life.

Case Studies

These following case studies are imbedded in the Occupational Therapy Practice Framework (AOTA, 2002a) to illustrate the use of a sensory integrative frame of reference in educationally based occupational therapy practice.

Case Study 1: Preschool-Age Child

EVALUATION

Referral: Natasha is a 3-year-old child enrolled in a special education preschool. The IEP team recommended an occupational therapy evaluation due to concerns related to Natasha's ability to perform at school (in the areas of classroom transitions and social interactions).

Occupational Profile

Natasha's family and educational team are seeking occupational therapy services due to her difficulty transi-
tioning and coping in the classroom. Natasha is sensitive to noise, cries a lot, and clings to the aide in the classroom. She performs well at skilled tasks. Additional information was gathered from her medical, developmental, educational, and occupational histories. The priorities listed by the clients (teacher and parents) include social interactions (friendships) and performance within the flow of the classroom (transitioning).

**Evaluation and Analysis of Occupational Performance**

**Interview Data:**
- Speech and language pathologist report: Natasha does not appear to understand what was being said to her unless it is very quiet.
- Teacher report: Natasha has difficulty adapting to the flow of classroom activities. She needs an exceptional amount of attention from adults in order to stay calm. Natasha is able to cognitively perform the tasks but is overwhelmed with the noise and movement in the room.
- Parent report: Natasha's mother is concerned about her unhappiness at school and her inability to play and make friends.

**Observation Data:**
- Natasha preferred to sit alone or next to an adult.
- She does not like to go to lunch and refused to eat anything but chips.
- Natasha needed extra cues to pay attention. She did not complete the fine-motor activity without adult direction.
- She did not initiate social interaction with other children and became irritable when children came near her.
- She began crying when entering the lunchroom or when a group of children ran past her screaming during recess.

**Test Data:**

- **Miller Assessment for Preschoolers and Sensory Profile results:**
  - Adequate cognitive performance
  - Adequate motor performance
  - Poor tactile discrimination
  - Poor motor planning

**INTERVENTION (includes, but not limited to, the following ideas)**

**IEP Goals:**
- Natasha: Will transition between classroom activities independently
- Will initiate interaction with her peers during free play
- Will participate in classroom activities

**OT Intervention Plan includes the following goals:**
- OT is provided within the classroom setting during routine activities. Natasha's response to intervention in relation to learning, behavior, and adjustment to preschool will be monitored closely for progress and signs of a disorder in sensory integration. Changes to the service delivery may be recommended, as needed, to the IEP team.

Natasha:
- Will regulate her responses to environmental stimuli to remain calm during routine class transitions
- Will self-regulate her responses to environmental stimuli to sit next to several peers and focus on the activity during playground and eating activities
- Will motor plan movements of her hands to manipulate preschool play and writing tools

**OT Intervention Process and Strategies:**

The occupational therapist will facilitate and enhance performance through these interventions:

**Client Level:**
- Increase sensory modulation through the use of heavy work activities
- Improve motor planning to increase repertoire of action schemes and play skills

**Activity Level:**
- Increase texture and weight of materials used during class activities
- Use visual cues for improved independence during familiar sequences and routines

**Environmental Level:**

- Before class, Natasha will arrive early to work with an adult on the playground (program designed by occupational therapist) and will enter classroom prior to other children.
- Natasha will transition before other children to avoid the noise.

**OUTCOMES**

Outcomes were reported by members of the IEP team:

**Occupational Performance:**
- Easier transitions
- Increased attention
- Developed friendship
- Participates during classroom activities without withdrawing

**Client Satisfaction:**
- Teacher and parent were pleased that Natasha could participate in her program and is happier at school.

**Adaptation:**
- Improved self-regulation and adaptation for preschool routine

**Case Study 2: Elementary-Age Student**

**EVALUATION**

**Referral:** Billy is a 7-year-old student in a general education classroom environment. An occupational therapy evaluation
was requested due to Billy's extremely poor handwriting.

**Occupational Profile**

Billy's family and educational team requested an occupational therapy evaluation due to his difficulty with writing, attention, and peer relationships. Information was obtained from the medical, developmental, educational, and occupational histories. Client priorities include wanting Billy to complete work legibly, engage with peers, and stay on task at school.

**Evaluation and Analysis of Occupational Performance**

**Interview Data:**

Teacher report:
- Billy has above-average academic ability.
- He does not interact with his peers.
- He expressed concerns that, as the demands of school increased, he was going to fall further and further behind.
- He has poor use of his hands for any tasks, even opening his lunch.
- Billy's writing is illegible.

Parent report:
- They are very concerned that he has no friends.
- Comprehension of simple verbal instructions is difficult.
- He has unusual habits and rituals.
- He has poorly established patterns of activity such as getting ready to go to bed or mealtimes.

**Test Data:**

**Sensory Integration and Praxis Tests and clinical observations results:**
- Good visual perception
- Poor visual–motor control
- Good visual construction
- Poor bilateral motor control
- Poor oral praxis and postural praxis
- Poor tactile discrimination
- Poor posture and eye control
- Poor praxis on verbal command

**Sensory Profile** revealed that he is somewhat underresponsive to sensation; however, he is easily overwhelmed with activity in the environment.

**INTERVENTION (includes, but not limited to, the following ideas)**

**IEP Goals:**

Billy:
- Will be able to write three legible sentences in his journal during a 20-minute writing period
- Will stay on topic for the duration of a 15-minute social studies lesson
- Will participate in a structured playground activity appropriately for 10 minutes during the recess or lunch break

**OT Intervention Plan includes the following goals:**

Occupational therapy was recommended to improve visual–motor control and improve overall attention

OT provided to student and provides consultation to the IEP team members

Billy:
- Will organize visual–motor information in order to write legible words
- Will organize sensory input from his body to imitate and follow visual directions during structured playground activities
- Will self-regulate his attention to teacher instruction so he remains focused on the topic during social studies

**OT Intervention Process and Strategies:**

The occupational therapist will facilitate and enhance performance through these interventions:

**Client Level:**
- Use weight-bearing and heavy work activities to increase strength of Billy's trunk and upper extremities
- Increase intensity of somatosensory information to improve sensitivity and stereognosis in his hands

**Activity Level:**
- Instruct teacher in kinesthetic and visual support method to re-teach fundamentals of handwriting
- Use weighted pencils, pencil grips, and paper with highlighted areas
- Allow Billy to do some of his work while standing or lying on his stomach

**Environmental Level:**
- Provide written text for him to copy rather than copying from blackboard
- Provide written instructions and pictures of his daily sequences of activities with times and locations
- Allow structured time for movement throughout the day as needed

**OUTCOMES**

Outcomes that were reported by IEP team members:

**Occupational Performance:**
- Improved handwriting skills, but minimally
- Increased attention to topic
- Increased engagement in structured activities
- Improved participation in daily routines

**Case Study 3: Middle-School Student**

**EVALUATION**

Referral: John is 12 years old and entering middle school. The IEP team requested an occupational therapy evaluation because he cannot find his way around the middle-school campus and is refusing to go to his new school.

**Occupational Profile**

John's family and the educational team requested an occupational therapy evaluation due to his difficulty finding his way around his school and his resulting depression. Addi-
tional information from medical, developmental, educational, and occupational histories was reviewed. Client priorities include being able to get around school without getting lost.

Evaluation and Analysis of Occupational Performance

Interview Data:

Parent report:
• John gets lost easily
• Works best in self-contained classroom with group transitions; however, this was not available at the middle school
• Demonstrates poor spatial abilities such as aligning numbers in math
• Can talk his way out of anything

John report:
• Has anxiety attacks
• Feels sick during rides in the car
• Feels stupid
• Wants to be home-schooled
• Spends most of his day in sedentary activities
• Cannot tolerate backward movement of his head in space
• Cannot play sports well

Data From Record Review:

Elementary school file indicates that John is good in academics but rarely finishes written work on time in a legible manner. He is well-behaved and liked by peers. Teacher noted that John did not want to walk around school grounds unless he could go with a peer.

Observation Data:
• Poor 2- and 3-dimensional construction ability
• Poor balance with eyes closed
• Poor disassociation of his head, neck, and body
• Cried during this observation
• Inability to locate familiar landmarks such as office

INTERVENTION (includes, but not limited, to the following ideas)

IEP Goals:

John:
• Will get to all of his classes on time, independently, with no errors for 2 weeks
• Will willingly come to school and be comfortable for 8–10 days as noted by self-report

Occupational therapy was recommended for this student in his school setting.

OT Intervention Plan includes the following goals:

John:
• Will identify a strategy out of three options (map, written sequence, or self-instruction) that works best for him to get to familiar places
• Will identify, select, and participate in extracurricular physical activities
• Will learn to identify antecedents to the periods of his increased anxiety and utilize relaxation techniques to remain calm when transitioning from home to school and between classes

OT Intervention Process and Strategies

The occupational therapist will facilitate and enhance performance through these interventions:

Client:
• Practice various strategies developed by the OT to improve awareness of the geography of the campus
• Avoid increased amounts of vestibular stimulation and increase proprioceptive activities to improve sense of body in space

Activity Level:
• Provide cues, landmarks, and signs that John can record as he walks to his class
• Enroll John in extracurricular activities such as karate, yoga, swimming, science, or computer class and rock climbing

Environmental Level:
• Pair John with a peer initially to walk to class
• Make a list of visual details to look for or take pictures to use to get to different classes

OUTCOMES

Outcomes reported by IEP team:

Role Competence:
• Arrives at class on time
• Able to finish and find 75% of his assignments independently
• No longer resists going to school
• Initiates participation in school clubs

Client Satisfaction:
• John is proud that he can travel between class without assistance.
• Parents report that he is much happier at home and at school.
• There are no further reports of anxiety.

Summary

Based on the educational team recommendations, occupational therapists and occupational therapy assistants working in educationally related settings provide services to students who are eligible for Section 504 or special education under IDEA and need occupational therapy to benefit from their education program. It is the occupational therapist’s responsibility to develop an intervention plan based on the student’s needs and the therapist’s professional knowledge base.

The occupational therapist chooses and applies any frame of reference within the domain and process of occupational therapy. Regardless of the frame of reference utilized, the desired outcome of occupational therapy services
is always engagement in occupations that allows participation in a student’s daily life. When students demonstrate deficits in sensory integration that contribute to a significant and documented discrepancy in their skills within their educational program, the use of a sensory integrative approach may be one frame of reference for intervention chosen by the occupational therapist.

References


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