CASE REPORT

Report of an Occupational Therapy Evaluation Using the Sensory Integration and Praxis Tests

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Richard, aged 5 years 5 months, had been referred to a speech pathologist to determine whether developmental younness accompanied by auditory and visual-perceptual delays was responsible for his difficulties in his preschool classroom. The speech pathologist's report indicates that Richard is the elder of two boys. Richard's birth records show all milestones to be within normal limits. His physical developmental history shows that he began walking at 18 months of age, and his medical records show a history of frequent colds. Richard's father describes him as shy, quiet, and hard to discipline. Richard has not yet settled into a definite hand preference. Spanish is spoken in his home approximately 25% of the time. Richard's classroom teacher indicates that Richard has difficulty functioning in a group, persevering in a task, using visual-perceptual skills, and being quiet and cooperative. Richard was referred for an occupational therapy evaluation for further investigation of identified deficits in visual and auditory perception and of poor fine motor skills.

Assessment

The Sensory Integration and Praxis Tests (SIPT) (Ayres, 1989) were administered, and clinical observations were made of Richard's hand use, postural responses, and other neuromuscular conditions related to behavior and learning.

Richard appeared somewhat distractible during the 2-hr testing session, but he was able to follow the standardized directions and worked at an average pace, as compared with other children his age. His test scores are accurate within the intrinsic reliability of the tests themselves.

Results

The SIPT is scored in standard deviation scores; when several scores fall below –1.0 standard deviations, a dysfunction is suggested.

The results of Richard's performance on the SIPT (see Figure 1) show visuospatial scores within the average range for Space Visualization and in the mildly dysfunctional range for Figure–Ground Perception. His somatosensory scores were scattered, with Kinesthesia falling within the average range. The Finger Identification score was in the average range, whereas Graphesthesia and Localization of Tactile Stimuli were approximately 2 standard deviations below average. His scores on the motor subtests of Design Copying, Standing and Walking Balance, and Motor Accuracy were well within the dysfunctional range. His Bilateral Motor Coordination was average.

The test battery included five subtests measuring praxis and motor planning abilities. Richard's scores on Constructional Praxis and Postural Praxis were within the mildly dysfunctional range. His scores on

Richard's test results suggest dysfunction in processing the sensory information received from his external environment as well as that received from his own body. He exhibits a primary deficit in praxis and mild deficits in his responses to movement and gravity. Difficulties were also noted in tactile discrimination, possibly related to tactile defensiveness. These foundational deficits may underlie the identified problems in visual perception and fine motor development.

Dyspraxia, or deficits in motor planning, appears to be a problem area for Richard. His scores on Constructional Praxis and Postural Praxis fell within the dysfunctional range. The Constructional Praxis subtest requires the child to reproduce a complex block structure. The Postural Praxis subtest requires the child to imitate certain postures assumed by the examiner. Children with dyspraxia usually have a difficult time learning new motor skills, but with practice, can become skillful at specific tasks. These learned skills are called splinter skills because they must be learned by repetition and do not tend to be generalized from one activity to another similar activity.

Many children who lack this spontaneous motor planning ability learn to cope by using the thinking and reasoning areas of their brains to compensate for deficits at the lower automatic areas. Such compensation requires increased energy, which places the child at risk for fatigue, frustration, and the development of a poor self-image. Dypraxic children, often described as hard workers, may not have energy left for spontaneous, creative fun. As school tasks become increasingly complex, these children may have difficulty keeping pace with their peers who learn new tasks more efficiently.

Richard's performance of complex visuomotor tasks, such as Design Copying and Motor Accuracy, fell well within the dysfunctional range. His approach to these tasks frequently appeared disorganized and awkward. On the Design Copying subtest, for example, he worked from right to left and tended to use several short lines to complete a design rather than longer, more efficient patterns. On the Constructional Praxis subtest, he inadvertently knocked down his block construction in an attempt to place additional blocks. These difficulties are common for children with dyspraxia and may be a source of considerable frustration.

The Postrotary Nystagmus subtest is considered to be one indicator of the functioning of the vestibular system. Richard's score on this test fell in the mildly dysfunctional range at -1.16 standard deviations. He responded to the Postrotary Nystagmus subtest by requesting faster spinning, stating that he never gets dizzy. This response suggests that he may have an underresponsive vestibular system. The vestibular system provides the brain with information regarding movement and gravity. The vestibular receptors are located in the inner ear and send information to the
brain stem by way of the auditory-vestibular nerve. Besides auditory processing, the vestibular nerve is associated with the development of visual perception, balance, and muscle tone, particularly in the antigravity muscles.

Tactile defensiveness may be a problem for Richard. Adverse responses to touch were noted on the Graphesthesia subtest, accompanied by increased distractibility and lowered tactile discrimination scores. Children who overreact to light touch may have difficulty determining how to hold a pencil in the proper position for writing. They may misinterpret incidental touch and hit people or become fearful in crowds. They may have difficulty screening out unimportant touch stimuli, such as the feel of their clothes or the pressure of sitting in a chair. They may be identified as having a short attention span. Richard's parents identified distractibility and a short attention span as problem areas for him.

Richard's test results suggest that he has deficits in the sensory processing mechanisms that underlie the development of higher level skills, such as visual perception and visuomotor and fine motor skills. He exhibits definite dysfunction in praxis and mild dysfunction in vestibular processing.

Clinical observation suggests deficits in Richard's interpretation of touch sensations. These findings indicate immature development of the nervous system, which is consistent with the identified motoric delays. Many children with similar deficits have benefited from occupational therapy aimed at fostering normal sensorimotor development. The length of treatment for such deficits varies from 6 months to 2 years or longer depending on the severity of the deficits and the child's response to therapy.

**Recommendation**

Occupational therapy with the use of sensory integration approaches is recommended three times per week for 50 min per session. Treatment sessions should encourage vestibular, proprioceptive, and tactile stimulation, as tolerated, as well as gross and fine motor activities that emphasize novel motor tasks. Progress should be monitored at each treatment session, with additional evaluation as indicated during the course of treatment. A complete motor skills inventory followed by a parent conference may be scheduled in approximately 3 months to discuss Richard's response to therapy.

**Treatment Objectives**

The treatment program will address the identified problems of motor planning deficits, tactile defensiveness, decreased vestibular processing, poor muscle tone, and poor fine motor skills. Activities will be selected to facilitate spontaneous motor planning skills by providing such novel therapeutic equipment as suspended obstacle courses. Treatment will include proprioceptive activities incorporating various tactile stimuli to decrease tactile defensiveness. Vestibular system function will be facilitated with purposeful activities on suspended equipment, including therapy balls, net swings, bolster swings, scooter boards, and a flexion disk. Each treatment session will be designed to provide Richard with positive and successful experiences with gross motor, fine motor, motor planning, and sensorimotor activities.

Reevaluation procedures will include standardized tests to measure gross and fine motor skills, visuomotor integration, and vestibular efficiency, as measured by postrotatory nystagmus. Clinical observations will involve Richard's response to light touch, his performance on therapeutic equipment, and indicators of balance and muscle tone. Richard's progress will be reviewed every 3 to 6 months or sooner, if the response to treatment indicates a need for additional assessment in order to modify the original treatment plan. ▲

**Reference**


**Editor's Note.** To continue the Case Report department, we need and welcome reports that document the practice of occupational therapy for specific clinical situations. Guidelines for writing case reports are available from the Editor.