

## Case Study – The Listening Program®

### Kenny, Age 11, Dyspraxia

Submitted by: Joanne Swanson, OT, Sue Beasley OT and Sheila Smith-Allen, MA OTR BCP  
Pediatric Therapeutics in Chatham, NJ

Name: Kenny  
Date: 11:2:00  
Date of Birth: 8:12:89  
Gender: Male  
Chronological Age: 11 years 2 months  
Clinical Diagnosis: Dyspraxia; Coordination Disorder

### BACKGROUND INFORMATION

Kenny was a full term baby born by way of vaginal delivery following an unremarkable pregnancy. Delivery was complicated by the umbilical cord wrapped around his neck and assistive use of forceps. Kenny experienced a normal neonatal period and infancy. Medical history is remarkable in that Kenny experienced chronic serous otitis media from ten to fifteen months of age and had bilateral myringotomies at fifteen months. At three years his tonsils and adenoids were removed. Early developmental motor milestones were achieved within a normal time frame. Kenny's parents first observed his motor difficulties at 2 years of age. Evaluations of vision and hearing at 5 years of age found both to be within normal limits. Kenny also presented with a mild articulation disorder.

Kenny underwent an occupational therapy evaluation in July of 1995. He was found to have sensory-motor problems which were felt to underlie his below average gross motor function. These problems included: 1)a sensory integrative dysfunction characterized by sensory defensiveness involving tactile and auditory systems, inadequate reception and procession of vestibular and proprioceptive sensory input and tactile discrimination problems. 2)a compromised gross physical base characterized by hypotonia and generalized weakness, and 3)dyspraxia.

In the fall of 2nd grade (1996) Kenny's self esteem was negatively affected by social problems with peers he encountered while engaged in playground activities and games at school. He grew to dislike school and also began to demonstrate auditory processing, visual motor and organizational difficulties.

Clinically based individual occupational therapy began in September of 1995 and continues to the present. Kenny also received school-based occupational therapy from the beginning of 1st grade to the end of 3rd grade. Additionally, Kenny has received speech therapy services from first grade through 5th grade to address a mild articulation problem. Kenny has been wearing glasses to correct mild farsightedness since August of 1998.

### TREATMENT

Treatment methods have included a combination of sensory integrative techniques, neurodevelopmental techniques, exercise, adaptation and compensation. Through his course of treatment, Kenny has made gains in all areas, including elimination of sensory defensiveness and tactile discrimination problems. Despite his gains, he continues to present with issues related to motor control, balance, bilateral coordination and organization of written language. It was also felt that Kenny had reached a plateau in treatment. The Listening Program was chosen in order to provide additional input to the vestibular system with the primary goal of impacting postural control and balance. The second goal was to improve attention and organizational skills.

## PROGRAM IMPLEMENTATION

TLP was implemented at home by his parents following a base schedule. Equipment used was Sony CD player and Sony V-600 headphones. TLP began 6/13/00 and was completed on 8/15/00. Due to family time constraints during weeks 4 and 6, the program was a total of 10 weeks instead of the planned 8 weeks. Throughout this period, Kenny was seen for individual occupational therapy in the clinic for seven one-hour sessions with the treatment focus on gross motor function and postural control. Monitoring during the first seven weeks took place during his occupational therapy sessions, and by phone on a weekly basis during the last 3 weeks. Additionally, during the seven clinic visits, the Sensory Integration Extension CD was used over headphones for 30 minutes during motor activities.

## PRE/POST TLP

Prior to implementation of TLP, Kenny underwent a series of baseline assessments which included the following measures. These measures were also used to assess performance a month after Kenny had completed TLP.

The Quick Neurological Screening Test (QNST), an instrument comprised of 15 tasks used with children 3 and up to assess areas of neurological integration as they relate to learning: performance scores are grouped into one of three categories - Normal response, moderate discrepancy and severe discrepancy.

The Beery-Buktenica Test of Visual Motor Integration (VMI), a shape copying task for children 3-17 years 11 months measuring the ability to integrate visual input and motor response (also administered were supplemental components for comparison of relatively pure visual and motor performances).

The Screening Test for Auditory Processing Disorders (SCAN), a screening used to determine auditory development in children ages 3 to 11 years and to identify efficient and inefficient auditory processing performance in this age group.

The Sensory Profile, a caregiver questionnaire containing statements about the responses of children ages 3-10 to sensory events in their daily lives.

Structured clinical observations including Draw-A-Person, writing samples, and measures of antigravity postural control (ie: prone extension and supine flexion).

## SUMMARY OF CHANGES

As observed in the clinic, by Kenny's parents, and during the QNST, Kenny is now exhibiting righting and equilibrium responses needed for balance, suggesting improvement in his processing of vestibular and proprioceptive input. Related changes on the QNST included Kenny's newfound abilities to tandem walk and skip, motor functions which incorporate dynamic balance and bilateral integration.

Improvement in antigravity postural control was demonstrated by gains in Kenny's ability to maintain both prone extension (increasing from 4 to 8 seconds) and supine flexion (increasing from 3 to 10 seconds).

Improvements in visual motor skills, as demonstrated during the Beery Test of Visual Motor Integration Motor Supplement Test, and writing and drawing samples, included qualitative gains in accuracy of motor control and gradation of pressure, and quantitative gains in speed of execution of movement. To this end, letter formation and spatial organization were positively influenced.

Kenny's performance on the SCAN pre and post TLP indicated notable changes in auditory processing skills. His ability to process Filtered Words increased from the 1st percentile to the 50th percentile and Auditory Figure Ground scores increased from the 16th percentile to the 63rd percentile. Performance on the Competing Words subtest was unchanged. Kenny's composite score for the SCAN increased from the 3rd percentile to the 21st percentile.

Comparison of Kenny's parents' responses on the Sensory Profile, based on their observation of his behavior pre and post TLP is viewed rather loosely considering that his age exceeds that of the normative sample by one year. In the area of sensory processing, Kenny's responses to oral sensory stimuli changed the most and became less atypical. With regard to modulation of sensory input for use in daily life, appreciable changes in point scores were noted in two areas - Kenny's sensory processing related to endurance/tone and his modulation of visual input affecting emotional responses and activity level.

Yet even with these changes, Kenny's sensory processing related to endurance/tone remained definitely different in comparison to other children. His modulation of visual input remained in the typical category.

Kenny's parents report his speech is more organized and direct, he is completing his homework without difficulty and is able to organize his written language for essays. He is managing changing classes throughout the day, arriving on time and having needed materials with him. Kenny's mother also feels he is developing better peer relationships and is beginning to assume leadership roles in certain situations.

#### FOLLOW-UP RECOMMENDATIONS

Speech and language CD for 2-3 weeks, 2 week break followed by the High Spectrum CD. Continued use of Sensory Integration CD during clinically-based gross motor activities.

#### DISCUSSION

Kenny's 10 weeks of TLP was a worthwhile experience for Kenny and his family. For the most part, the base listening schedule was easily managed at home, with Kenny's complete compliance. Based on pre and post testing and observation, this program of soundwork has contributed to gains toward goals and established prior to Kenny's listening, including improved postural control, balance, attention and organization skills. These gains are particularly noteworthy in consideration of a few points. During this period of time when Kenny was involved in TLP, he experienced a remarkable growth spurt. As previously mentioned, prior to TLP, he had reached a plateau in occupational therapy treatment where he was not making measurable gains in postural control or gross motor function. While his endurance/tone and sedentary lifestyle continue to contribute to his differences from others, he is once again making gains in these areas. It is likely that these gains are positively influencing his sociability, as his parents have remarked that peer relations are improving. Perhaps also the use of the Sensory Integration CD had some influence on physical/movement changes. During TLP, Kenny was not involved in any clinical, home-based or school activities to promote organizational skills. Similarly, Kenny was not involved in any specific activities to improve his visual motor skills, yet as mentioned, he has made noticeable changes in his handwriting. Based on Kenny's positive response to the program, it is anticipated that he will benefit from continued soundwork.

SUMMARY OF PRE AND POST TEST SCORES

<b>Pre-Program</b>				
Beery	raw score	std. score	percentile	other
VMI	26	145	99%	>14 yrs.
Visual	27	128	97%	>14 yrs.
Motor	22	98	45%	>10 yrs.

<b>Post-Program</b>				
Beery	raw score	std. score	percentile	other
VMI				yrs.
Visual				yrs.
Motor	23	100	50%	>11 yrs.

<b>Pre-Program</b>				
SCAN	raw score	std. score	percentile	other
Filtered words	25	3	1%	
Auditory Figure Ground	31	7	16%	
Competing Words	67	6	9%	
Composite	123	72	3%	
Age equivalent	6Yrs. 1month			

<b>Post Program</b>				
SCAN	raw score	std. score	percentile	other
Filtered words	35	10	50%	
Auditory Figure Ground	35	11	63%	
Competing Words	73	6	9%	
Composite	143	88	21%	
Age equivalent	8Yrs. 1month			

<b>Pre-Program</b>		
DAP	Number of parts	
		29

Post-Program		
DAP	Number of parts	29

-Pre-Program-



-Post-Program-



Pre-Program		
QNST		
Total Scores		
Normal Responses		10
Moderate Discrepancies		3
Severe Discrepancies		2

Post-Program		
QNST		
Total Scores		
Normal Responses		10
Moderate Discrepancies		4
Severe Discrepancies		1

Joanne Swanson, OT  
 Sue Beasley, OT  
 Sheila Smith-Allen, MA OTR BCP of Pediatric Therapeutics in Chatham, NJ.

End of Case Study

© 2003 Advanced Brain Technologies, LLC

 **ADVANCED BRAIN TECHNOLOGIES**  
 5748 South Adams Avenue Parkway | Ogden, UT 84405  
 801.622.5676 | fax: 801.627.4505  
 provider@advancedbrain.com | www.advancedbrain.com