

IM Training Sets the Stage for Success:

Learn how Brian got back to acting, and not just acting out.



Brian is the youngest of three children and lives at home with his mother, father and two older siblings. He is seven years old. His parents reported that Brian was delivered full-term; however, he was born with Transient Tachypnea of the Newborn (TTN) causing respiratory difficulties which required the use of an incubator and oxygen. Brian spent approximately a week in the Special Care Nursery before being discharged. Although Brian experienced a difficult start, his parents reported that he is currently in good health. Currently, Brian takes the medications Tofrinol and Risperadol once daily. Brian was seen for Interactive Metronome training and evaluation at the Palmetto Language & Speech Center, LLC based on a physician referral.

Caregivers expressed concern for Brian with regard to language processing, attention and focusing in activities of daily living (ADLs). During the evaluation, his parents reported that Brian exhibits low to no impulse control and a high degree of distractibility. Brian's mother also reported that he has difficulty following directions given orally which results in directions being repeated several times. According to his mother's report, Brian usually expresses his anger or frustration by yelling or having an "emotional meltdown." His parents reported that Brian exhibits the following behaviors in his natural environment: short attention span, hyperactive behavior and repetitive habits such as chewing. Brian has a very good relationship with his parents. His parents reported that he has a better relationship with his sister than his brother but both struggle with Brian's lack of impulse control. Brian attended Baptist preschool program until he was four years old. At that time, he began attending preschool at Lake Elementary. Brian then attended a 5-K program at Lake, where he is currently enrolled. His parents described him as "friendly, loving and smart."

ASSESSMENT RESULTS

The Interactive Metronome (IM) is a brain-based rehabilitation assessment and training program developed to directly improve the processing abilities that affect attention, motor planning, and sequencing. This, in turn, strengthens motor skills, including mobility, gross motor function, and many fundamental cognitive capacities such as planning, organizing and language.

The normative ranges for IM performance are as follows:

Age	6	7-8	9-10	11-12	13-15	16+
Extreme Deficiency	280+	270+	260+	240+	215+	200+
Severe Deficiency	175-279	170-269	160-259	155-239	150-214	147-199
Below Average	120-174	90-169	80-159	75-154	72-149	70-146
Average	90-119	65-89	55-79	45-74	43-71	41-69
Above Average	56-89	45-64	38-54	36-44	33-42	30-40
Exceptional	40-55	32-44	28-37	26-35	23-32	22-29
Superior	< 40	< 32	< 28	< 26	< 23	< 22

There are fourteen tasks measured in the long form assessment taken at the beginning, middle and end of IM training. Brian completed 27 sessions over a three month period. The results are displayed in the following table.

Task	Milliseconds	
	Pre	Post
Both Hands	200	67
Right Hand	173	77
Left Hand	85	45
Both Toes	168	48
Right Toe	234	76
Left Toe	365	74
Both Heels	279	83
Right Heel	214	73
Left Heel	132	63
Right Hand/Left Toe	162	78
Left Hand/Right Toe	203	102
Balance Right Foot	195	98
Balance Left Foot	183	89
Both Hands (w/ guide sounds)	289	46
Total	205.9	72.8

At the start of training, Brian scored in the severe deficiency range on IM. After completing the IM training, Brian scored in the average range for IM. Along with IM training, the examiner also measured pre/post language, focus and attending skills.

READ MORE TO FIND OUT HOW INTERACTIVE METRONOME® HELPED BRIAN GET BACK ON CUE.



FORMAL MEASURE OF RECEPTIVE AND EXPRESSIVE LANGUAGE

The *Test of Auditory Processing Skills-3 (TAPS-3)* was administered three weeks before IM training and again after his final session. The *TAPS-3* was designed to assess the processing of auditory information that pertains to the cognitive and communicative aspects of language. The *TAPS-3* subtests were designed to provide information for four areas: auditory attention, basic phonemic skills, auditory memory and auditory cohesion. Derived scores for the *TAPS-3* can be obtained using raw score conversion to scaled score, standard scores, percentiles, and test-age equivalents. All subtests were presented in a quiet listening environment without distractions. Test results are categorized below.

The *Test of Auditory Processing Skills-3 (TAPS-3)*

Subtests	Raw Score		Scaled Score		Percentile	
	Pre	Post	Pre	Post	Pre	Post
Word Discrimination	29	32	9	13	37	84
Phonological Segmentation	17	27	7	10	16	50
Phonological Blending	26	29	15	16	95	98
Number Memory (Forward)	22	24	14	15	91	95
Number Memory (Reversed)	8	7	10	8	50	25
Word Memory	14	20	9	13	37	84
Sentence Memory	16	18	7	8	16	25
Auditory Comprehension	13	23	8	12	25	75
Auditory Reasoning	6	8	9	10	37	50

The *Social Emotional Evaluation (SEE)* was administered pre and post-training to determine the child's emotional and social awareness abilities. The *SEE* was designed to evaluate children from age 6:0 to 12:11. The *SEE* is composed of one supplemental subtest, four core subtests and a Social Emotional Questionnaire that is completed by both a parent/caregiver and a specialist, such as a SLP, and/or educator. Derived scores for the *SEE* can be obtained using raw scores, z scores (mean = 0, standard deviation = 1) and percentiles. This assessment is criterion-referenced and compares the child's ability to a predetermined expected level of performance.

The *Social Emotional Evaluation (SEE)*

Subtest - Receptive	(SEE) Receptive Scores		Subtest - Expressive	(SEE) Expressive Scores	
	Pre	Post		Pre	Post
Subtest 1: Identifying Common Emotions	10	9	n/a	n/a	n/a
Subtest 2: Identifying Emotional Reactions	15	18	Subtest 2: Identifying Emotional Reactions	20	28
Subtest 3: Understanding Social Gaffes	6	16	Subtest 3: Understanding Social Gaffes	2	20
Subtest 4: Understanding Conflicting Messages	9	13	Subtest 4: Understanding Conflicting Messages	6	10
Total Receptive Raw Score	40	56	Total Expressive Raw Score	28	58
Z Score	-1.562	1.321	Z Score	-1.241	1.740
Percentile Rank	5	90	Percentile Rank	10	95

INDEX AND OVERALL SCORES

	Sum of Scaled Scores		Standard Score		Percentile	
	Pre	Post	Pre	Post	Pre	Post
Phonological Skills (Subtests 1-3)	31	39	102	116	55	86
Memory (Subtests 4-7)	40	44	100	105	50	63
Cohesion (Subtests 8 and 9)	17	22	93	105	32	63
Overall	88	105	99	108	47	70

Based on standard scores with the above measures, Brian showed significant gains in areas measured after receiving IM training. Brian showed gains in 8 out of 9 subtests measured. In addition, Brian's overall standard score on the TAPS increased from 99 to 108.

SEE Total Scores

	Pre	Post
Total Receptive Raw Score	40	56
Total Expressive Raw Score	28	58
SEE Total Raw Score	68	114
Total Z Score	-1.441	1.692
Percentile Rank	7	95

Based on raw scores, z scores and percentiles with the *SEE* measure, Brian showed significant gains in his social emotional language skills after receiving IM training.

The *Test of Everyday Attention for Children (TEA-Ch)* was first administered over the course of two days in order to obtain maximum results. The *TEA-Ch* was re-administered two months after completing IM training. The *TEA-Ch* was designed to determine the child's relative attention across different capacities (selective/focused attention, sustained attention, attentional control/switching, sustained-divided, sustained attention/response inhibition). The *TEA-Ch* has an age mean of 10 and a standard deviation of 3. The child's raw score can be converted to a standard score, which is the age scaled score.

The *Test of Everyday Attention for Children (TEA-Ch)*

	Raw Score		Aged Scale Score		Percentile Band	
	Pre	Post	Pre	Post	Pre	Post
Sky Search: Selective/Focus Attention						
Correctly identified targets	17	14	9	6	30.9 - 43.4	6.7 - 12.2
Time per target	8.06	7.36	7	8	12.2 - 20.2	20.2 - 30.9
Attention score	6.46	5.86	8	8	20.2 - 30.9	20.2 - 30.9
Score: Sustained Attention	6	7	7	8	12.2 - 20.2	20.2 - 30.9
Creature Counting: Attentional Control/Switching						
Total Correct	2	5	5	10	3.3 - 6.7	43.4 - 56.6
Timing Score	n/a	5.3	n/a	9	n/a	30.9 - 33.4
Sky Search DT: Sustained-Divided Attention Score	32.53	-3.19	1	16	< 0.2	96.7 - 98.5
Map Mission: Selective/Focus Attention	18	34	7	11	12.2 - 20.2	56.6 - 69.2
Score DT: Sustained Attention	11	10	7	6	12.2 - 20.2	6.7 - 12.2
Walk, Don't Walk: Sustained Attention/Response Inhibition	19	18	16	14	96.7 - 98.5	87.8 - 93.3
Opposite Worlds: Attentional Control/Switching						
Same World Total	31	37	8	6	20.2 - 30.9	6.7 - 12.2
Opposite World Total	74	49	1	6	< 0.2	6.7 - 12.2
Code Transmission: Sustained Attention	9	32	2	9	0.2 - 0.6	30.9 - 43.4

Based on raw scores, age scaled scores and percentile bands with the above measures, Brian showed significant gains in areas measured after receiving IM training. Brian showed significant gains in 8 out of 13 subtests measured.

IM PARENT SURVEY

Brian's parents were given parent surveys pre and post-IM training. The parent survey asks them to rate their child's behavior on daily function tasks and communication tasks with ratings ranging from 1 being "strongly disagree" and 10 being "strongly agree." For example, a daily function task item is "My child is able to multi-task well." An example of a communication task is "My child indicates understanding of things being said to him/her." The parents rated an improvement in 12 out of the 16 opinion statements after the completion of the IM training.

FUNCTIONAL OBSERVATIONS

Brian's parents and his classroom teachers reported that he was unable to attend and focus when we first met for training consideration. Brian was impulsive and struggling with behavior outbursts in school and his natural environments. Caregivers reported that he has been prescribed a variety of medications to help manage anxiety, attention/focusing and behavior including Prozac, Risperadol, Adderal and Imipram. However, medications have been changed several times due to Brian having "three bad days for every two days." His parents described a "bad day" as Brian acting "silly, using 'bathroom' language and being impulsive." According to his mother, Brian's teacher reported that he was sent to the administrative offices, was interruptive, slow to follow directions and disruptive. His teacher also "backed off" of academics with Brian to manage behavior. During his pre-assessment sessions, Brian struggled with sitting at the table and staying on task for more than twenty minutes. During IM training and post-assessment, Brian's parents and others noticed marked changes in his ability to attend, focus and cope with ADLs. Classroom teachers reported big improvements in Brian, noting better skills with "behavior, interaction, attention and work completion."

Teacher comments included the following:

"He seems like himself again."

"He read and answered questions and did his writing well without whining."

"Whatever is going on is really helping him!"

"Please keep it up!"

"Brian is interested in writing now and can write for some time."

"I can read what he wrote!"

"He read with the middle-schoolers and with me in small reading groups and was able to stay on task."

Brian's parents shared that he is more cooperative with his siblings and peers. He is also easier to calm and better able to self-regulate before his emotions escalate out of control. Brian's motor skills have improved with eye/hand coordination. He was very excited and proud to be able to keep up with his sister during a putt-putt golf game and was able to complete a full game with a very competitive score. One of the most noticeable benefits and rewards for Brian was being able to act in local theatre. His mother shared that this was a dream for Brian, but he was previously unable to self-regulate, attend, or focus well enough to carry out such a task. Brian and his family were very pleased and proud of him for making such great gains in all areas.

SUMMARY OF FINDINGS

- During pre-testing, Brian scored in the severe deficiency range. After completing the IM training, Brian scored in the average range.
- In support of the IM assessment, the formal receptive language, expressive language and relative attention/focus evaluation measurements also support that Brian made significant gains.

RECOMMENDATIONS

- Reevaluate Brian's IM scores in one year for maintenance.
- To find out more information about IM updates, refer to IM website at www.interactivemetronome.com

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