

# *High Tech Ingenuity Produces A Breakthrough Program To Help with the Symptoms of Autism, ADHD, Dementia and Amnesia*

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Karis was a 9-year old child who had been prescribed two medications, Gaba Pentin and Lyrica, for stomach pain. Very quickly after starting the medications, Karis lost her memory. She didn't know who she was, who her parents or siblings were and she didn't know why she was in her own home.

Karis' mother asked the prescribing doctor if the two medications he had prescribed could cause this sudden onset of amnesia. The doctor told her, "No." Uneasy with his answer, the mother stopped giving Karis the two medications anyway because she thought the correlation was obvious. Karis took the drugs; Karis lost her memory.

When Karis came to The Block Center several months' later, she was still suffering with total amnesia daily. When I looked up the two drugs in the PDR, I found that they each listed amnesia as a side-effect.

## **Finding Help**

After working with children diagnosed with ADHD and Autism for over 25 years, I had made an observation. While the children usually improved with my bio-medical approach, they often continued to experience learning and processing problems. I would refer them to different programs for auditory processing, visual training or sensory integration. In my first year of medical practice, over 25 years ago, I had discovered Sensory Integration, a program developed by Jean Ayres. Jean Ayres defined sensory integration as "the neurological process that organizes sensations from one's own body and from the environment and makes it possible to use the body effectively within the environment". This theory explains why individuals respond in a certain way to sensory input.

I attended courses and became trained in Sensory Integration. I also became familiar with developmental optometry and auditory processing. Each of these programs has a long history of success and supportive research. However, these programs worked on only one sense at a time and can take many months to make positive changes.

I wanted to make changes faster and more consistently and my research led me to the concept of "Multi-sensory Integration".

## ***Multisensory Integration***

Programs like Auditory Processing or Visual Training are all excellent programs but they utilize only one sense at a time. Studies are clear now that Multisensory Integration, stimulation of many senses at once, works faster and better than stimulating only one sense at a time. Stimulating at least two senses at one time not only improves the result but also increases the speed at which the results occur.

"Human beings in their interaction with the world do not perceive sensory events as singular events. Sound, touch, sight, taste, smell, proprioception, and vestibular information interact to form the processes and mechanics by which humans learn and experience. Integration of sensory information provides a foundation on which behavior and cognition develop and mature."<sup>1</sup>

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<sup>1</sup> Schurmann M, Caetano G, Hlushchuk Y, Jousmaki V, Hari R. Touch activates human auditory cortex. *NeuroImage*. 2006;30:1325-1331.

“Multisensory integration of cross-modal stimulus combinations yielded responses that were significantly greater than those evoked by the best component stimulus.”<sup>2</sup>

“When sound and touch were activated simultaneously, the activation of the auditory cortex was strongest. Auditory information in conjunction with tactile input assists with making tactile decisions. Tactile and auditory stimulation simultaneously and individually may positively impact neuroplastic changes in individuals with neurological deficits or impairments. Used singularly, sound produced greater brain activation than touch. When both tactile and auditory stimuli were conveyed simultaneously, the response was more intense. Differences between sound and touch verses a combination of the two stimuli were significant. Again, the combined stimuli were most significant.”<sup>3</sup>

“Early cortical centers are no longer thought to be unisensory. Multisensory stimulation results in greater activation of cortical centers and sound permits individuals to make tactile decisions.”<sup>4</sup>

At this point I developed a Multi-sensory Integration Program based on decades of published research and optimized by today's technology, for the children I see who have been diagnosed with Autism and ADHD. I call it The SAVE Program for Sensory-motor, Auditory Visual Education. The program takes one hour twice daily for five days to get the maximum benefit from it. It is passive to the client in that they do not have to be actively involved with any exercises. The client lies on the reclining chair that moves while listening to special filtered music through headphones and looking at colored lights on a screen. This computerized process has resulted in a sensory integration experience that works faster and more consistently.

### ***Senses Addressed with The SAVE Program***

1. **Tactile/Kinesthetic** -Important for the development of body awareness, fine motor skills and motor planning. Unorganized kinesthetic input may be seen as someone who has trouble in crowds, pulls away from hugs, is bothered by certain clothes or foods, or has to touch everything. If someone is attending to the tags in their clothes or the seams in their socks.
2. **Vestibular**-Development of balance, coordination, eye control, attention, being secure with movement, emotional security and even language development. Disorganized vestibular processing may be seen when someone has difficulty with attention, coordination, following directions, reading or eye-hand coordination. Language delay may be the result of immature sensory processing.
3. **Proprioception**-Requires input from kinesthetic and vestibular systems. Unorganized processing of proprioception is seen as someone who is clumsy, falls or stumbles, is aggressive, walks on toes, constantly chewing on food or objects, has difficulty motor planning, is messy at mealtime.
4. **Auditory**-“The brain's left hemisphere is more involved in language processing.” Listening with the right ear allows the information to go directly to the left hemisphere.

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<sup>2</sup> *J Neurophysiol* 97: 3193–3205, 2007. doi:10.1152/jn.00018.2007. Multisensory Versus Unisensory Integration: Contrasting Modes in the Superior Colliculus, Juan Carlos Alvarado, J. William Vaughan, Terrence R. Stanford, and Barry E. Stein  
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<sup>3</sup> Kayser C, Petkov CI, Augath M, Logothetis NK. Integration of touch and sound in the auditory cortex. *Neuron*. 2005;48:373-384.3

<sup>4</sup> Foxe J, Wylie G, Martinez A, et al. Auditory-somatosensory multisensory processing in auditory cortex: an fMRI study. *J Neurophysiol*. 2002;88:540-543.

5. **Visual**-Learning disabilities or visual stress may cause reduced perceptual visual fields. This affects the volume of information processed through the eyes and affects all aspects of daily living including academic achievement, work proficiency and athletic performance.

I did not include taste and olfaction because so many have food and smell sensitivities.

### ***Ear Dominance***

One of the major changes that occur with The SAVE Program is changing the individual from “left” to “right” ear dominance. Studies find that most people prefer to listen with their right ears and actually are more likely to perform a favor when the request is made in the right ear instead of the left. “The brain's left hemisphere is more involved in language processing, which justifies the preferential use of the right (contralateral) ear for listening in everyday situations.” “Not only do humans prefer to hear in the right ear, we actually hear information better in our right ears”. In order to report from the left ear, the signal has to travel from the right auditory cortex, via the corpus callosum, to the language dominant left temporal region.<sup>5</sup> This is because the left side of the brain controls the right side of the body.

In other words, if you listen with your right ear, the information goes directly to the listening center in the left side of the brain and you only have to hear it once. However, if you listen with the left ear, the information goes to the right side of the brain. You must then send the information to the left side of the brain to actually understand it. That takes an extra step. If you are giving more than one instruction at a time, you can see how someone would have difficulty transferring what you told them. They might get the message scrambled or they might miss the message completely.

I tested ear dominance in 100 children diagnosed with ADHD. 100% were “left” ear dominant. After The SAVE Program everyone had converted to “right” ear dominance. Parents and teachers observed subjective changes of improved listening.

### **ADHD**

Using prescription medication for the symptoms of ADHD does nothing for treating the actual underlying cause of ADHD symptoms. Making diet changes, treating allergies, chronic strep and nutritional deficiencies can help reverse the symptoms called ADHD. Too often learning and processing problems are not addressed when treating children with an ADHD diagnosis.

“Learning and paying attention depend on the ability to integrate and organize information from our senses. To be successful learners, our senses must work together in an organized manner. A person diagnosed with ADD or ADHD, due to their difficulty paying attention, may in fact have an immature nervous system causing dysfunction, making it difficult to filter out nonessential information, background noises or visual distraction and focus on what is essential.”<sup>6</sup>

### **Visual Processing in Learning**

“Compared to the normal control group, the children with ADHD showed abnormal functional activity in several regions of the brain involved in the processing of visual attention information. The researchers also found that communication among the brain regions within this visual attention-processing pathway was disrupted in the children with ADHD. Functional brain pathways disrupted in children with ADHD.”<sup>7</sup>

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<sup>5</sup> Luca Tommasi and Daniele Marzoli of the University "Gabriele d'Annunzio" in Chieti, Italy

<sup>6</sup> Sensory Integration by Dana Nicholls OTR/L and Peggy Syvertson M.A. Johns Hopkins School of Education

<sup>7</sup> November 30, 2011, Radiological Society of North America

“Dyslexic children seem to have some highly specific visual deficits in processing moving stimuli.”<sup>8</sup>

### **Auditory Processing in ADHD**

“Children with learning problems exhibited plasticity of neural encoding following participation in a remediation auditory processing program. The plasticity was accompanied by changes in behavioral performance.”<sup>9</sup>

### **Vestibular Processing in ADHD**

“Vestibular and visual stimulation together, especially the vestibular part, may benefit children with ADHD.”<sup>10</sup>

### **Proprioception in ADHD**

“Motor learning relies on integrated sensory inputs in ADHD, but over-selectively on proprioception in autism spectrum conditions. Slower rate of adaptation and anomalous bias towards proprioceptive feedback during motor learning are characteristics of autism, whereas increased variability in execution is a characteristic of ADHD.”<sup>11</sup>

“Children with ADHD symptoms displayed greater abnormalities in sensory modulation.”<sup>12</sup>

### **Autism**

Paul was diagnosed with Autism at age 2. Although he attended school and could do his assignments fairly well, his mother explained that Paul could not speak. “He spoke *gibberish* and an occasional repetitive phrase, but never really spoke a meaningful sentence in his entire life,” she said. Paul would make his needs known by pointing at things. He was 16 years old when he participated in The SAVE Program.

Soon after completing The SAVE Program, Paul did something unexpected. During a trip to the mall with his mother, Paul walked up to an attendant at a carousel and asked how much it would cost to ride. “He had never done anything like that before,” his mother recalled. “Usually he would have just climbed on the ride.” She credits The SAVE Program for the change in her son. He is now talking in full,

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<sup>8</sup> Clinical Neurophysiology 115 (2004) 90–96 Visual information processing in dyslexic children, P. Scheuerpflug,\*, E. Plumea, V. Vettera, G. Schulte-Koerneb, W. Deimelb, J. Bartlingb, H. Remschmidtb, A. Warnkea, Dept. of Child and Adolescent Psychiatry, University of Wuerzburg, Wuerzburg, Germany, 28 July 2003

<sup>9</sup> Neural Plasticity Following Auditory Training in Children with Learning Problem, Hayes, E.A., Warrier, C.M., Nicol, T.G., Zecker, S.G., & Kraus, N. (2003). Neural plasticity following auditory training in children with learning problems. *Clinical Neurophysiology*, 114, 673-684.

<sup>10</sup> Arnold, L. E., Clark, D. L., Sachs, L. A., Jakim, S., & Smithies, C. (1985). Vestibular and visual rotational stimulation as treatment for attention deficit and hyperactivity. *American Journal of Occupational Therapy*, 39, 84–91.

<sup>11</sup> [Autism Res.](#) 2012 Apr;5(2):124-36. doi: 10.1002/aur.1222. Epub 2012 Feb 22. [Izawa J](#), [Pekny SE](#), [Marko MK](#), [Haswell CC](#), [Shadmehr R](#), [Mostofsky SH](#).

<sup>12</sup> Sensory Modulation Dysfunction in Children with ADHD.” Mangeot, et al, Colorado Health Science Center

complete and complex sentences for the first time, with purpose and understanding. He has continued to expand his vocabulary and his family and teachers are quite surprised and pleased with his progress.

Paul's response to The SAVE Program is not unique. Many children on the Autism Spectrum have begun to speak or communicate for the first time after completing The SAVE Program. Since these children are generally unable to follow directions, they were not candidates for programs requiring that. The SAVE Program requires no effort on the part of the patient allowing these children to benefit from it.

There are multiple studies associating Autism with sensory dysfunction. Children on the Autism spectrum often have problems with touch or don't make eye contact or have sound sensitivity problems.

"Autism Spectrum Disorders (ASDs) are defined clinically by impairment in communication, social interaction, and behavioral flexibility. There is mounting evidence for disruption of the auditory and visual processing pathways and a surging interest in multisensory integration." "Many of the atypical perceptual experiences reported in those with ASD are believed to be due to an inability to properly filter or process simultaneous channels of visual, auditory, and tactile inputs. There is evidence that sensory illusions that require proper inputs across multiple domains operate at a different level in ASD, compared with typically developing individuals."<sup>13</sup>

## **Alzheimer's**

Paul, an active and bright attorney and CPA, had been diagnosed with Alzheimer's. He had gradually lost his memory until he could no longer work. If he tried to tell a story, he quickly asked his wife to finish it because he could not remember what he was trying to say. He could not keep up with his belongings and could no longer do the things he loved. He was unable to do math even though he was a CPA and a math major in college. His handwriting disintegrated until it was illegible. He felt anxious, was agitated and socially shut down and couldn't interact with others.

After The SAVE Program, Paul's memory was much better, his wife said. "He could recall and tell stories from start to finish again. His word-find improved. He was using words that were lost to him for a long time," she explained.

Paul became motivated to do things again. He helped out around the house where before he would have just slept, his wife said. "He is working in the yard and asked the doctor to give him permission to use the lawnmower again." His wife says that Paul's visual perception has improved.

There appears to be no question that those diagnosed with Dementia also have sensory problems.

"Central auditory speech-processing deficits may be an early manifestation of probable Alzheimer's disease and may precede the onset of dementia diagnosis by many years."<sup>14</sup>

"In patients with Alzheimer's disease (AD), compared with age-matched and young healthy control subjects, visual deficits in the following functions were observed: color, stereoacuity, contrast sensitivity, and backward masking (homogeneous and pattern)."<sup>15</sup>

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<sup>13</sup> Sensory Processing in Autism: A Review of Neurophysiologic Findings, Elysa J Marco, Leighton B N Hinkley, Susanna S Hill and Srikanth S Nagarajan

<sup>14</sup> Central Auditory Dysfunction May Precede the Onset of Clinical Dementia in People with Probable Alzheimer's Disease George A. Gates MD<sup>1</sup>, Alexa Beiser PhD<sup>2</sup>, Thomas S. Rees PhD<sup>1</sup>, Ralph B. D'Agostino PhD<sup>3</sup>, Philip A. Wolf MD<sup>4</sup> Journal of the American Geriatrics Society Volume 50, Issue 3, pages 482-488, March 2002

<sup>15</sup> Visual dysfunction in Alzheimer's disease: Relation to normal aging; Dr Alice Cronin-Golomb PhD<sup>1,\*</sup>,

“Alzheimer’s disease is a complex disorder whose etiology is still controversial. It is proposed that vestibular loss may contribute to the onset of Alzheimer’s disease, which initially involves degeneration of cholinergic systems in the posterior parietal-temporal, medial-temporal, and posterior-cingulate regions. A major projection to this system emanates from the semicircular canals of the vestibular labyrinth, with vestibular damage leading to severe degeneration of the medial-temporal region. The vestibular loss hypothesis is further supported by the vestibular symptoms found in Alzheimer’s patients as well as in various diseases that are major risk factors for Alzheimer’s disease.”<sup>16</sup>

### **Karis’ Memory Returns**

Karis and her mom returned on a Thursday for the fourth day of The SAVE Program. Karis was smiling. Her family had not seen her smile for months. She had only shown fear. Karis was smiling because when she woke up that morning all of her memory had returned. She knew who she was. She knew who her parents were. She even knew who I was. She wanted to surprise me with this good news.

One year later, Karis has continued to retain her memory with no problems. She is now back to being that happy 9-year old girl she had always been.

### **Summary**

Sensory disorders can result in significant cognitive dysfunctions. Sensory integration and other individual processing trainings, which address these issues, can take months to see results and are not designed for the many patients who cannot follow directions.

In an age of expedient technological advancements, The SAVE Program can deliver sensory integration to more people, no matter how limited their abilities, in a consistent and accelerated program. It was designed to use automation and digital accuracy to optimize the opportunity to advance sensory integration in the 21st century.

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Suzanne Corkin PhD<sup>1</sup>, Joseph F. Rizzo MD<sup>2</sup>, Jennifer Cohen BA<sup>3</sup>, John H. Growdon MD<sup>3</sup>, Kathleen S. Banks MA<sup>1</sup>; *Annals of Neurology*; Volume 29, Issue 1, pages 41–52, January 1991

<sup>16</sup> Vestibular loss as a contributor to Alzheimer’s disease; Fred H. Previc; Texas A&M University – San Antonio, One University Way, San Antonio, TX 78224, United States Abstract