

# The Effects of Lead Exposure on Learning: The Way Forward

## [Slide 1]

Good afternoon everyone. On behalf of the conference organizers and myself, I would like to thank all of the wonderful speakers and panel participants for their expert contributions today.

## [Slide 2]

I once had a pediatrician friend of mine say that whenever a parent would ask him what could be done to help their lead poisoned child, knowing at the time that there was no known intervention to restore cognitive function, he would tell them to just go home and give their child all of their love. I remember telling him that that just was not good enough...

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...and I can remember being just as frustrated as he was when trusting parents would look to me as the school principal to undo the cognitive damage that the invisible and silent monster of lead poisoning had done to their child.

## [Slide 4]

In the last seven to ten years, researchers focusing on the brain have literally rewritten the textbooks of knowledge. For example, it was firmly believed that brain plasticity ended in childhood and the adult brain was not capable of restoring cognitive function. We now know that brain plasticity remains with us our entire life and with the correct stimulation, the brain is capable of doing amazing cognitive repair.

## [Slide 5]

As a spin-off of the huge gaming industry, brain-training software is making the earth move with demonstrated progress in recognizing healthy cognitive domains... as well as identifying cognitive domains that have been damaged or compromised...and then powerfully stimulating brain plasticity to...in layman's terms... "rewire" and restore cognitive function. Cutting edge computer software has demonstrated to be unique in stimulating and accelerating brain plasticity regarding cognitive restoration.

### [Slide 6]

Dr. Michael Merzenich is a leading pioneer in brain plasticity and founder of Posit Science...a software company for seniors to restore memory and other cognitive functions, and the founder of Science Learning Corporation, the makers of FastForWord, a powerful computer software especially helpful with helping children with auditory processing delays or distortions. FastForWord slows down the letter sounds...we know them as phonics...and establishes a baseline where the child is hearing the sounds accurately. In the form of a game with rewards, the software slowly speeds up the sounds in milliseconds until the child experiences difficulty in recognizing the sounds...and then the computer slows the sounds down again until the child again experiences success. This process is continued over and over, each time stretching the child to hear the sounds faster and faster. Depending on the severity of the hearing delay, this company says that a child can gain normal hearing within 8 to 16 weeks. Helping children with auditory delays is just a very small piece of what this software can do.

### [Slide 7]

Cogmed, a computer software company from Stockholm, Sweden, has impressive documentation regarding restoration of working memory...childhood to adult...and impressive work with ADHD children. Reading and math scores as well as memory have made major improvements and functional brain activity has been demonstrated on MRI and fMRI.

ACTIVATE, from C8 Sciences, is relatively new and is another exciting and innovative cognitive training program specially designed to enhance and develop learning skills such as focus, self-control, and memory for all students...repeat...all students---but especially those with educational challenges associated with poverty, trauma, ADHD, Autism, and other developmental disorders or environmental effects on the brain.

### [Slide 8]

The ACTIVATE software focuses directly on the Executive Function of the brain. This is especially important for educators...

Executive function skills are the attention-regulation skills that make it possible to sustain attention, keep goals and information in mind, refrain from responding immediately, resist distraction, tolerate frustration, consider the consequences of different behaviors, reflect on the past experiences, and plan for the future.

## [Slide 9]

The company that produces ACTIVATE software is called C8 Sciences because there are 8 core cognitive capacities in regard to Executive Function in the brain:

- 1) Sustained attention
- 2) Working memory
- 3) Speed of information processing
- 4) Response Inhibition ( ability to control your response to distractions/events/situations going on around you)
- 5) Cognitive flexibility (ability to think creatively)
- 6) Category Formation (ability to prioritize tasks and organize information)
- 7) Pattern Formation (combining past experience, intuition and common sense to recognize patterns and predict what will happen next)
- 8) Multiple Simultaneous Attention (ability to multi-task with success)

After I retired the first time from Enrico Fermi School No.17 in 2002, I was invited by senior leadership at the University of Rochester Medical Center to be on the faculty of the Department of Community and Preventive Medicine. I assisted 4<sup>th</sup> year medical students in their required community projects. During this time, I earned my doctorate degree which was somewhat unique. It was a hybrid between the U of R Warner School and the University of Rochester Medical School. It focused on restoring cognitive function to lead poisoned children through computer software. It was only a doctoral dissertation, but was enough to get the notice of Mt. Sinai Hospital and it was on their website until a year and a half ago. It is now outdated, but it cracked the door open a little bit more regarding what could be possible in the future for restoring the cognitive function for children who have been delivered a cruel blow from lead poisoning, trauma, or debilitating anxiety. It also pioneered the way for the Rochester City School District and the County of Monroe to share the lead poisoning data of children without violating HIPAA or FERPA.

Folks, we certainly didn't get into the business of educating children to get rich. Teachers, school psychologists, schools board members, school councilors, school administrators and most personnel who work with children work very hard and are devoted professionals and paraprofessionals. We got into our profession because we want to make this world a little better place by our actions...The fact that you are here in this conference, has proven that fact. You are the real heroes and champions for children...

However... we cannot move forward within our profession with a horse and buggy mentality... or not being aware of current brain research and technology... or dragging our feet. We've always known that the lives of children are at stake.

We know that lead is a powerful neurotoxin and can literally change the structure of the brain. We also know that severe trauma can do much of the same thing to the brain, as well as prolonged and sustained high anxiety.

### [Slide 10]

Let's take out our magic wand....and start imagining.

Think of a world where all or most children are able to learn normally by the end of grade 2 to begin grade 3.

Special education is a vortex...children go in and rarely come out declassified. Think of a world where we can declassify large numbers of children rather quickly and a world where very few children are classified in the first place.

Think of a world where we can neutralize the bone-crunching effects of severe poverty on the brain and have all or most children begin their education with all 8 core cognitive capacities in regard to Executive Function operating in a healthy, coordinated and strong way.

Of all of the brain training software on the market, I am most impressed with C8 Science's ACTIVATE. I have read many case studies regarding this software and I looked closely to what the school principals and teachers say. One high poverty school in NYC, for example, brought their standard assessments from the bottom third to the top third after using this brain training software. The comments that principals, classroom teachers, and parents make regarding the ACTIVATE program are very hard to ignore or discount.

Assessment of each child's special needs and abilities is imbedded within the program. We all know that conventional assessment processes are time-consuming and expensive, so they are reserved for children who demonstrate clear signs of cognitive or emotional issues. Most children just sink or swim until a problem is noticed, and by then they have already fallen behind. Early diagnosis and intervention can put children on a success trajectory at the beginning of their formative years.

In most case studies that I read, the entire school was introduced to the software so no child would be isolated or stigmatized. The software runs an assessment of each child and adjusts to the individual needs of that child.

Let me be clear...I'm not here to run a commercial for the ACTIVATE software. As I mentioned a few minutes ago, there are a number of brain training software programs on the market and they all deserve a long, hard look.

**[Slide 11]**

I believe that educators should make strong connections and partnerships with researchers, especially brain researchers, and we have the largest number of colleges and universities, per capita, of any city in the nation.

**[Slide 12]**

If I was still in the Principal's chair, I would organize a small pilot, randomized field study in partnership with the University of Rochester Medical Center to measure the effectiveness of these programs. If the results of the pilot randomized field study match the case studies of this product, I would provide it for my entire school...

Research and technology are making giant leaps forward daily and we have to do our very best to keep up with what is on the leading curve. By partnering with colleges and universities we can vet and test the new products on the market and bring them to our children with confidence as quickly as possible.

**[Slide 13]**

We don't have to wring our hands in desperation and see so many of our children falling through the cracks daily. We can institute interventions like Principal Caterina Leone Mannino is doing at Enrico Fermi School No.17.

**[Slide 14]**

She has had her school embrace restorative justice circles and trauma-informed classrooms school-wide...and much more.

**[Slide 15]**

As a School District, Rochester...or any surrounding district... can examine the brain-training options and provide the best of these programs for children...and we can and should do these things immediately.

**[Slide 16]**

My magic wand indicates to me that if we do these things and more, there will never be another pediatrician or school principal that explains to heartbroken parents that there is nothing that can be done for their child...

**[Slide 17]**

And we can start moving toward these interventions....today!

Thank you