

Aphasia Insights!

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“In such complex systems a specific instance of learning is likely to lead to alterations in a large number of nerve cells insofar as the interconnections of the various sensory and motor systems involved in the learning are changed (pp 465)”. Kandel, 1998.

A New Intellectual Framework for Psychiatry. Am J Psychiatry 155:4, April 1998. pp. 457-469.

Eric Kandel, MD, 2000 Nobel Prize, Austrian-American doctor who specialized in psychiatry and neuroscientist.

Stroke Educator, Inc. is committed to educating the wider public about stroke and the 50 state *“Aim High for Aphasia!”* Aphasia Awareness Campaign.

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Aphasia Recovery and Language Repair: Darning the Damaged Neural Fabric from a Stroke

By Tom Broussard, Ph.D.

Over the years since my stroke and aphasia (loss of language), I have continued to educate the public about how the brain works and repairs itself using metaphorical stories about stroke and aphasia recovery.

When I was young, my mom would repair my socks using a traditional sewing technique for repairing holes called darning. It is often done by hand with simple stitches that are woven into rows to fill up the hole or worn area.

As an adult, my wife has been darning our socks for years using a darning egg which is an egg-shaped tool, often made of stone, porcelain, wood, or similar hard material, that is inserted into the toe or heel to hold it in the proper shape and provide a foundation for repairs.

I began to see the common denominator between repairing socks and repairing language. Once

I read about darning and “restoring the fabric to its original integrity” I was fascinated about the similarity between darning and repairing the neural fabric from a stroke.

After a stroke (and loss of oxygen), the brain loses millions of cells including dendrites, synapses and thousands of miles of fiber (Saver, 2006). Those cells and their associated neural components are destroyed from the stroke. But the *remaining* cells still have the capacity to grow new dendrites,



Darning egg with a handle

synapses and miles of fiber and rebuild the language of a person with aphasia.

The epitome of darning is “invisible darning” using similar threads to help create a patch that can become almost invisible. In much the same way, the brain grows new neural matter from the remaining cells and “fills in” the holes, gaps, and missing parts like an invisible patch in the brain.

Of course, it wasn’t invisible as much as the new threads were spun by plasticity (the capacity to grow and change neural matter) and were woven into the neural fabric, replacing the language function of the cells that had been lost.

The carrying function of language doesn't just use the cells per se as much as the cell body and axon provide the structure for the additional neural component of the cell (dendrites, synapses, and fiber) that support the synaptic learning field with trillions of connections. That is where language performs its job.

After my stroke, I had lost millions of cells, dendrites, synapses and fiber, and could not read, write or speak well. As I got better, my brain grew additional numbers of dendrites, synapses and fiber from the remaining cells, and as a result replaced the lost acres of the learning field with new ones that repaired my language again.

The language activities themselves are the "needle and thread" of neural darning after the damage from a stroke. Repairing one's language is "darn" tough and requires *much* more work (and practice) with various language activities (reading, writing, speaking) that induce neural plasticity, the foundation of all learning.

Signed: *The Johnny Appleseed of Aphasia Awareness*

Saver J. Time Is Brain-Quantified. Stroke. January 2006; 37: 263-266.

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