

# ARROWSMITH PROGRAM: THE AGING BRAIN



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Over the last forty years the Arrowsmith Program has worked with hundreds of adults of all ages. At Eaton Arrowsmith Center for Neuroeducation these adults are often the parents or grandparents of the children, teenagers or young adults that attend our onsite and online programs. They contact us and ask if they could do either one or several of the cognitive exercises that have resulted in positive behavioural shifts in their child or grandchild. They realize that they also struggle with aspects of attention, processing speed, memory or problem solving/reasoning. This is especially the case for those moving into their retirement years who want to keep their brain sharp.

The research on the aging brain is revealing fascinating information. In particular, neuroscientists are finding that as we age our large-scale brain network connectivity within and between networks begins to weaken (Varangis, Habeck, Razlighi, & Stern, 2019) (Hughes, Faskowitz, Cassidy, Sporns, & Krendl, 2020). Weakened connectivity has a significant impact on how regions of our brain communicate with each other, and slows down our processing, impacts our ability to recall remember, and makes it more difficult for us to efficiently solve problems that face us in our daily living.

To understand the concept of functional connectivity within and between brain regions and large-scale brain networks one could image an orchestra playing a symphony. Not as complicated as the human brain, but it is an analogy on which to reflect. Mental activity has to flow from orchestrated neural activity from various brain regions through neural networks. In an orchestra the executive functioning leader, the conductor, must coordinate the numerous instrumental sections under their command. Brass, percussion, string and woodwind sections must communicate and understand their purpose and timing. The flow of sound and movement must be automatic and understood between the conductor and the sections. If there is a disturbance the performance will be weakened. There will be confusion within the orchestra.



For example, if you are beginning to write an email on your computer you have to engage your brain areas involved with attention. You must select what to focus on, determine how to proceed and eventually how to execute on the task. You need to focus solely, if possible, on your laptop, open the email application, avoid distractions, remember that you are emailing someone, find their email address, give the email a title, begin to reach into the recesses of your brain for language, construct ideas mentally, recall those ideas long enough to get the thought on paper, hope your keyboarding skills are fast enough to keep up with fading language recall, reread what you wrote most likely, and construct the next sentence, ignore a

text from a friend wanting to go for a treat, and so on and so on. Complex! Many of your brain regions and networks between them are active, engaged and doing their best to help you achieve results.

All of the above requires various brain region activations and networks between regions to communicate with each other quickly and efficiently. As we age, these brain regions and networks begin to weaken. Connectivity can slow down or increase, depending on the task. In short, you have atypical connectivity which can lead to frustration and disappointment. You may wonder if your quality of life will continue to decrease with each passing year.



The truth is, yes, there is no stopping the slow decline of cognitive functioning. What matters is improving the quality of life at the moment, over the next month or year. This is something we can do as adults, and thus parents and grandparents of Eaton Arrowsmith Center of Neuroeducation register to work on the Arrowsmith Program, often online in our Four Hour a Week Program, so they can access the cognitive exercises anywhere and often anytime, they wish.

Centers for Disease Control and Prevention (CDC) in the USA stated on their website that, "As we age, our brains change, but Alzheimer's disease and related dementias are not an inevitable part of aging. In fact, up to 40% of dementia cases may be prevented or delayed. It helps to understand what's normal and what's not when it comes to brain health. Normal brain aging may mean slower processing speeds and more trouble multitasking, but routine memory, skills, and knowledge are stable and may even improve with age." (Centers for Disease Control and Prevention, 2021)

The CDC recommends that we can slow the process of aging in the brain by not smoking, maintaining healthy blood pressure and weight, being physically active, getting enough sleep, and managing blood sugar. Interestingly, focusing on the goals above also improve large scale brain network connectivity (Ryan, Karim, Aizenstein, Helbling, & Toledo, 2018) (Sung, et al., 2020) (Won, et al., 2021) (Wirth, et al., 2022) (Lin, Wu, Zhu, & Lei, 2014) (Tan, et al., 2021). Thus, smoking, blood pressure weight, physical activity, sleep, and blood sugar maintenance all impact large scale brain network connectivity. The ability of your brain to orchestrate daily living activity is determined by how you treat your body. No question.

Eaton Arrowsmith Centre for Neuroeducation can help adults on this journey. The feedback we are getting from our clients speaks for itself:

*I'm less uptight and rigid, more relaxed and able to go with the flow than I used to be because I'm no longer drowning in a sea of confusion. (Elaine, Age 68)*

*It's always been my lifelong dream to overcome some of my cognitive weakness and this program is doing that. Not a day goes by that my husband and I don't see first-hand the many positive changes happening. Here's a few examples: my ability to retrieve a lifetime of stored vocabulary in my brain (I keep telling my husband I don't know where all these words are coming from and he says that they have been stored in my brain). I'm amazed at times at my determination to give my all every day in class and now I see possibilities instead of barriers. My time at Eaton Arrowsmith has been life-changing and all of you have been instrumental in my success! And I look forward to continuing this journey with all of you this Fall! (Debbie, Age 65)*

*I have always wanted to challenge my brain and ability to reason. At 88 years of age, I find this possible with the online Symbol Relations exercise at Eaton Arrowsmith. I can feel my brain changing when engaged. This is so much better than other online programs I have used. I also really appreciate the cognitive instructor who is with you all the way. (George, Age 88).*

It is so important to maintain the connectivity within and between your large-scale brain networks. Working on the lifestyle changes noted by the CDC and engaging with our programs at Eaton Arrowsmith can help you improve your quality of life as you age. Let's get started!

Connect with us to learn more.

Eaton Arrowsmith Center for Neuroeducation offers the Arrowsmith Program online with teacher-guided classes and in person in Vancouver BC, and Redmond WA.



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Center for Neuroeducation

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