Encoding and Consolidating Memory with ADHD and Executive Dysfunction

Have you ever read about an interesting topic but been unable to tell your friend about it because you couldn't remember the details? Or maybe you were studying for a test and couldn't recall the material, even just an hour later? This common experience is illustrated by the work of the mathematician Hermann Ebbinghaus. In 1885, he developed a formula showing how much information is forgotten over time. Ebbinghaus found that within one day of a lecture, students may lose between 50% and 80% of the presented information if nothing is done to reinforce what they learned. This percentage increases by day seven, and by day 30, students may retain only 2%-3% of the information. (*The Forgetting Curve*, n.d.) The good news is that we now know these percentages are highly variable and diminish when students find materials connected to previous learning and can engage with them. Although many people can recall this happening to them, people with ADHD and executive function challenges are especially vulnerable.

Those of us who have struggled with working memory can appreciate the times when we forget to bring the present to the party, misplace our phone, or forget a phone number we just looked up. Our memories often fail us during two key stages: encoding in working memory and consolidating into long-term memory. Working memory, a part of short-term memory,

briefly holds information while it is encoded, organized, and manipulated for tasks like recalling a two-factor authorization code. If considered important, the memory is then consolidated for long-term use.

Many people with ADHD and executive function challenges struggle with encoding. Our brains have difficulty blocking stimuli. These stimuli could be external, in our environment, or internal, within our brains and bodies. If we are studying, we may be fighting thoughts about our lives, the world, the class, or even the instructor. We may have fought with someone, and that's still rattling around in the back of our mind. Our sweater might be itching us. We may also be affected by our body's needs. Did we eat good food today? Did we drink enough water? Do we have body aches? Most importantly, did we get enough good sleep? People with ADHD often have sleep disturbances and may be working against their internal clock if they are a night owl.

Sleep is a vital factor in supporting memory consolidation and cognitive function. Different stages of sleep support distinct memory processes, strengthening and embedding these memories in our long-term memory. Sleep also influences the brain's ability to change and reorganize connections between neurons. This is known as synaptic plasticity. Sleep deprivation, especially during deep sleep, impairs memory and plasticity. (Jha & Jha, 2019) When we ignore our body's needs, it takes its toll on our cognitive abilities.

If you are seeking memory improvement strategies, it is important to know that they may work differently if you have ADHD. For example, for people without ADHD, a brief rest period after learning and then revisiting the topic can be effective. However, if you have ADHD, resting after learning might not always help and can sometimes diminish memory retention. Studies have found that for some people with ADHD, particularly those who struggle with inattention, engaging in a distracting activity instead of resting may actually improve how well they remember new information. (Scalia & Wamsley, 2025)

For those of us practicing a motor skill, such as sports, the timing of practice sessions can influence procedural memory in ADHD. People with ADHD can learn motor skills, but benefit more when practice is scheduled in the evening, closer to rest. Gains from morning training sessions are much smaller the next day. (Korman et al., 2017)

If this feels familiar, you're working with a brain that encodes and consolidates information differently. Experiment with what helps your brain stay engaged, make meaning, and revisit information in ways that work. That might look like adding movement, connecting new ideas to something you already care about, timing practice differently, or protecting your sleep as a core learning tool. Memory isn't just about effort; it's about fit and using strategies that work with your brain.

References:

Jha, S. K., & Jha, V. M. (Eds.). (2019). *Sleep, Memory and Synaptic Plasticity*. Springer Singapore. https://doi.org/10.1007/978-981-13-2814-5

Korman, Maria, et al. "Procedural Memory Consolidation in Attention-Deficit/Hyperactivity Disorder Is Promoted by Scheduling of Practice to Evening Hours." *Frontiers in Psychiatry*, vol. 8, 3 Aug. 2017, https://doi.org/10.3389/fpsyt.2017.00140. Accessed 28 Nov. 2019.

Scalia, Bridget, and Erin J Wamsley. "Resting-State Memory Consolidation in Attention-Deficit/Hyperactivity Disorder." *PLoS ONE*, vol. 20, no. 6, 11 June 2025, pp. e0323884–e0323884, https://doi.org/10.1371/journal.pone.0323884. Accessed 1 Oct. 2025.

The Forgetting Curve. (n.d.). https://www.eng.auburn.edu/current-students/documents/forgetting-curve.pdf