



Newsletter

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Don't Forget Hormones...

Forgetfulness and cognitive decline are some of the most commonly reported symptoms of menopause. In fact, peri-menopausal women were 1.4 times as likely to report forgetfulness compared to pre-menopausal women, according to the Study of Women's Health Across the Nation (SWAN), and this was independent of additional factors including reported stress. There are a number of mechanisms through which changes in hormones affect brain function and memory.

Estrogens have direct effects in the brain by increasing the number of synapses in the hippocampus, the region of the brain where transferring short term memories to long term memories is thought to occur. Estrogen and progesterone **both** help to protect the brain from exogenous and endogenous toxins including glutamate-induced excitotoxicity, and progesterone is a potent anti-inflammatory agent in the central nervous system, working to rebuild the blood-brain barrier, reduce edema and down-regulate the inflammatory cascade in the event of physical or ischemic trauma.

Another important mechanism through which hormones enhance memory is by increasing acetylcholine activity. Acetylcholine is an important neurotransmitter involved in learning and encoding new memories and its production is greatly decreased in conditions of compromised memory including Alzheimer's disease. Estrogen increases the activity of the enzyme choline-acetyl transferase, which stimulates the synthesis of acetylcholine.

Maintaining optimal hormone levels throughout the menopausal transition can not only aide in the management of classically "menopausal symptoms" such as hot flashes and night sweats, but can prevent and treat memory loss and protect the brain from chemical and physical assault. As always, the correct balance of hormones is important, so remember to test, not guess. Baseline salivary hormone and urinary neurotransmitter levels is the best first step toward protecting and enhancing the memories of your peri-menopausal and menopausal patients. Test Now. Treat Right.

Resources

1. Gold EB, Sternfeld B, Kelsey JL, et al. Relation of demographic and lifestyle factors to symptoms in a multi-racial / ethnic population of women 40-55 years of age. *Am J Epidemiol* 2000; 152:463-73.
2. Greendale GA, Derby CA, Maki PM. Perimenopause and Cognition. *Obstet Gynecol Clin North Am.* 2011 September; 38(3): 519-535.

3. McEwen BS. Invited review: Estrogens effects on the brain: Multiple sites and molecular mechanisms. *J Appl Physiol* 2001;91:2785-801.
4. McEwen BS. Invited review: Estrogens effects on the brain: Multiple sites and molecular mechanisms. *J Appl Physiol* 2001;91:2785-801.
5. Norbury R, Cutter WJ, Compton J, Robertson DM, Craig M, Whitehead M, Murphy DG. The neuroprotective effects of estrogen on the aging brain. *Experim Geront.* 2003. 38:109-117.
6. Prokai L, Prokai-Tatrai K, Perjesi P, Zharikova AD, Perez EJ, Liu R, Simpkins JW. Quinol-based cyclic antioxidant mechanism in estrogen neuroprotection. *Proc Natl Acad Sci U S A.* 2003 Sep 30;100(20):11741-6.
7. Green PS, Simpkins JW. Neuroprotective effects of estrogens: potential mechanisms of action. *Int J Dev Neurosci.* 2000 Jul-Aug;18(4-5):347-58.
8. Brann DW, Dhandapani K, Wakade C, Mahesh VB, Khan MM. Neurotrophic and neuroprotective actions of estrogen: basic mechanisms and clinical implications. *Steroids.* 2007 May;72(5):381-405. Epub 2007 Feb 21.
9. Kaur P, Jodhka PK, Underwood WA, Bowles CA, de Fiebre NC, Singh M. Progesterone increases brain-derived neurotrophic factor expression and protects against glutamate toxicity in a mitogen-activated protein kinase- and phosphoinositide-3 kinase-dependent manner in cerebral cortical explants. *J Neurosci Res.* 2007 Aug 15;85(11):2441-9.
10. Stein DG. Progesterone exerts neuroprotective effects after brain injury. *Brain Res Rev.* 2008 Mar;57(2): 386-397.
11. Bartus RT, Dean RL, 3rd, Beer B, Lippa AS 1982 The cholinergic hypothesis of geriatric memory dysfunction. *Science* 217:408-414
12. Gabor R, Nagle R, Johnson DA, Gibbs RB. Estrogen enhances potassium-stimulated acetylcholine release in the rat hippocampus. *Brain Res.* 2003 Feb 7;962(1-2):244-7.
13. Van Amelsvoort T, Murphy DGM, Robertson D, Daly E, Whitehead M, Abel K. Effects of long-term estrogen replacement therapy on growth hormone response to pyridostigmine in healthy postmenopausal women. *Psychoneuroendocrinology.* 2003. 28,101-112.

Upcoming events

Labrix Advanced Workshop
February 1-2, 2014
[Register Here](#)

Neurotransmitter Primer Webinar
August 22, 2013 at 10am PST
[Register Here](#)