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News Release

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Connecting the Dots: VA researchers find yet another benefit to exercise - slowing the progression of macular degeneration

Macular degeneration is the leading cause of vision problems in people over the age of 60. Vision loss has been considered one of the most devastating disabilities that can affect an individual. The Centers for Disease Control and Prevention (CDC) estimates that the condition currently affects about 1.8 million Americans over 40 and the numbers are growing. There are also an increasing number of legally blind and visually impaired veterans, primarily due to both the aging of our veteran population and the increase in numbers of individuals serving in the military.

Macular degeneration is characterized by a loss of vision in the center of the visual field because of damage to the retina. More specifically, it is caused by the death of light-sensing nerve cells in the retina called photoreceptors. Although several studies in animals and humans point to the protective effects of exercise in neurodegenerative diseases or injury, less was known about how exercise affects vision.

Machelle Pardue, PhD and colleagues Eric Lawson and Jeffrey H. Boatright, PhD at the Atlanta VA Center for Visual and Neurocognitive Rehabilitation and Emory University now have findings demonstrating the protective effect that exercise may have on the retina – protecting it against retinal degeneration and disease.

Dr. Pardue and her colleagues ran mice on a treadmill for two weeks before and after exposing the animals to bright light that causes retinal degeneration. The researchers found that treadmill exercise preserved photoreceptors and retinal cell function in the mice.

“This is the first report of simple exercise having a direct effect on retinal health and vision,” Pardue said. “This research may lead to tailored exercise regimens or combination therapies in treatments of retinal degenerative diseases.” She goes on “in the near future, ophthalmologists could be prescribing exercise as a low-cost intervention to delay vision loss.”

Similar to the effects of exercise in the muscle and the hippocampus, exercise produced an increase in the levels of a survival factor in the retina, called brain derived neurotrophic factor (BDNF). When Dr. Pardue’s team blocked the BDNF

pathway, the protective effects were eliminated, demonstrating that BDNF is involved in the beneficial effects.

Dr. Pardue and Dr. Boatright are continuing to test other exercise regiments to see if exercise is beneficial to other eye diseases such as glaucoma and diabetic retinopathy. There is a lot more coming up on the horizon for this research team, and we all wait anxiously to see what they will find next.

This work has been recently published in the Journal of Neuroscience (January 12, 2014) and is featured on the Fox News story “Moderate exercise may prevent age-related blindness” on February 12, 2014.