



**EMBARGOED UNTIL**  
**Sunday, April 27, 2014**  
**12:45 PM PST**

### **Fight Memory Loss with a Smile (or Chuckle)**

*Watching a funny video increased memory, learning ability in elderly people*

San Diego, CA (April 27, 2014) — Too much stress can take its toll on the body, mood, and mind. As we age it can contribute to a number of health problems, including high blood pressure, diabetes, and heart disease. Recent research has shown that the stress hormone cortisol damages certain neurons in the brain and can negatively affect memory and learning ability in the elderly. Researchers at Loma Linda University have delved deeper into cortisol's relationship to memory and whether humor and laughter—a well-known stress reliever—can help lessen the damage that cortisol can cause. Their findings will be presented on Sunday, April 27, at the Experimental Biology meeting (San Diego Convention Center from 12:45–3:00 PM PST).

Gurinder Singh Bains et al. showed a 20-minute laugh-inducing funny video to a group of healthy elderly individuals and a group of elderly people with diabetes. The groups were then asked to complete a memory assessment that measured their learning, recall, and sight recognition. Their performance was compared to a control group of elderly people who also completed the memory assessment, but were not shown a funny video. Cortisol concentrations for both groups were also recorded at the beginning and end of the experiment.

The research team found a significant decrease in cortisol concentrations among both groups who watched the video. Video-watchers also showed greater improvement in all areas of the memory assessment when compared to controls, with the diabetic group seeing the most dramatic benefit in cortisol level changes and the healthy elderly seeing the most significant changes in memory test scores.

***From the authors:*** “Our research findings offer potential clinical and rehabilitative benefits that can be applied to wellness programs for the elderly,” Dr. Bains said. “The cognitive components—learning ability and delayed recall—become more challenging as we age and are essential to older adults for an improved quality of life: mind, body, and spirit. Although older adults have age-related memory deficits, complimentary, enjoyable, and beneficial humor therapies need to be implemented for these individuals.”

Study co-author and long-time psychoneuroimmunology humor researcher, Dr. Lee Berk, added, “It’s simple, the less stress you have the better your memory. Humor reduces detrimental stress hormones like cortisol that decrease memory hippocampal neurons, lowers your blood pressure, and increases blood flow and your mood state. The act of laughter—or simply enjoying some humor—increases the release of endorphins and dopamine in the brain, which provides a sense

of pleasure and reward. These positive and beneficial neurochemical changes, in turn, make the immune system function better. There are even changes in brain wave activity towards what's called the "gamma wave band frequency", which also amp up memory and recall. So, indeed, laughter is turning out to be not only a good medicine, but also a memory enhancer adding to our quality of life.”

#### Full Abstract

#### **Effectiveness of humor on short term memory function and cortisol levels in age matched elderly and diabetic subjects vs. control group**

With ageing, the damaging effects of stress can impair the ability to learn and sustain memory. The purpose was to examine the effect of watching a humor video on short term memory in 3 age matched elderly groups: elderly ( $69.9 \pm 3.7$  years), diabetic ( $67.1 \pm 3.8$  years), and control ( $68.7 \pm 5.5$  years) (no video). Humor and the associated mirthful laughter can reduce stress by decreasing the stress hormone cortisol. Excess cortisol can damage hippocampal neurons leading to impairment of learning and memory. The standardized neuropsychological memory assessment tool, Rey Auditory Verbal Learning Test (RAVLT) was used to assess for 1) learning ability, 2) recall ability, and 3) visual recognition ability. Salivary cortisol measurements, at 3 predetermined time points, were obtained. RAVLT was given to 30 elderly individuals before and after watching a humor video of their choice for 20 minutes vs. no humor video. Results showed that 1) learning ability improved by 38.45% , 33.38%, and 23.96% in the elderly, diabetic, and control groups respectively ( $p=.025$ ); 2) delayed recall improved by 43.61%, 48.10%, and 20.25% in the elderly, diabetic, and control groups respectively ( $p=.064$ ); and 3)visual recognition increased by 12.55%, 16.72%, and 8.33% in the elderly, diabetic, and control groups respectively ( $p=.321$ ). Results, for the changes in salivary cortisol levels, at the predetermined time points, indicated there were 1) borderline significant changes in the elderly group ( $p=.047$ ,  $.046$ , and  $.062$  respectively), 2) significant changes in the diabetic group ( $p=.047$ ,  $.025$ , and  $.035$  respectively), and 3) no changes in the control group ( $p=.323$ ,  $.323$ , and  $.187$  respectively). Due to decreased cortisol levels, elderly and diabetic elderly individuals that watch a humor video that induces mirthful laughter vs. not watching a humor video have greater enhancement in: 1) capability to learn, 2) have greater recall, and 3) improve visual recognition in short term memory function.

**NOTE TO JOURNALISTS:** To schedule an interview with a member of the research team, please contact Stacy Brooks at [sbrooks@the-aps.org](mailto:sbrooks@the-aps.org) or (240) 432-9697.

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#### **About Experimental Biology 2014**

Experimental Biology is an annual meeting comprised of more than 14,000 scientists and exhibitors from six sponsoring societies and multiple guest societies. With a mission to share the newest scientific concepts and research findings shaping current and future clinical advances, the meeting offers an unparalleled opportunity for exchange among scientists from throughout across the United States and the world who represent dozens of scientific areas, from laboratory to translational to clinical research. [www.experimentalbiology.org](http://www.experimentalbiology.org)

**About the American Physiological Society (APS)**

APS is a nonprofit organization devoted to fostering education, scientific research and dissemination of information in the physiological sciences. The Society was founded in 1887 and today represents more than 11,000 members and publishes 14 peer-reviewed journals.

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