

Study finds body's response to repetitive laughter is similar to the effect of repetitive exercise

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Laughter is a highly complex process. Joyous or mirthful laughter is considered a positive stress (eustress) that involves complicated brain activities leading to a positive effect on health. Norman Cousins first suggested the idea that humor and the associated laughter can benefit a person's health in the 1970s. His ground-breaking work, as a layperson diagnosed with an autoimmune disease, documented his use of laughter in treating himself—with medical approval and oversight—into remission. He published his personal research results in the *New England Journal of Medicine* and is considered one of the original architects of mind-body medicine.

Dr. Lee S. Berk, a preventive care specialist and psychoneuroimmunology researcher at Loma Linda University's Schools of Allied Health (SAHP) and Medicine, and director of the molecular research lab at SAHP, Loma Linda, CA, and Dr. Stanley Tan have picked up where Cousins left off. Since the 1980s, they have been studying the human body's response to mirthful laughter and have found that laughter helps optimize many of the functions of various body systems.

Berk and his colleagues were the first to establish that laughter helps optimize the hormones in the endocrine system, including decreasing the levels of cortisol and epinephrine, which lead to stress reduction. They have also shown that laughter has a positive effect on modulating

components of the immune system, including increased production of antibodies and activation of the body's protective cells, including T-cells and especially Natural Killer cells' killing activity of tumor cells. Their studies have shown that repetitious "mirthful laughter," which they call Laughercise©, causes the body to respond in a way similar to moderate physical exercise. Laughercise© enhances your mood, decreases [stress hormones](#), enhances immune activity, lowers bad cholesterol and systolic blood pressure, and raises good [cholesterol](#) (HDL).

As Berk explains, "We are finally starting to realize that our everyday behaviors and emotions are modulating our bodies in many ways." His latest research expands the role of laughter even further.

A New Study: Humor versus Distress, Effect on and Appetite Hormones

Berk, along with his colleague Dr. Jerry Petrofsky at Loma Linda University, and their team have recently completed a new study, which is being presented at the 2010 Experimental Biology conference in Anaheim, CA between April 24-28, 2010.

In the current study, 14 healthy volunteers were recruited to a three-week study to examine the effects that eustress (mirthful laughter) and distress have on modulating the key hormones that control appetite. During the study, each subject was required to watch one 20-minute video at random that was either upsetting (distress) or humorous (eustress) in nature. The study was a cross-over design, meaning that the volunteers waited one week after watching the first video to eliminate its effect, then watched the opposite genre of video.

For a distressing video clip, the researchers had the volunteer subjects watch the tense first 20 minutes of the movie Saving Private Ryan. This

highly emotional video clip is known to distress viewers substantially and equally.

For the eustress video, the researchers had each volunteer choose a 20-minute video clip from a variety of humorous options including stand-up comedians and movie comedies. Allowing the volunteers to "self-select" the eustress that most appealed to them guaranteed their maximum humor response.

During the study, the researchers measured each subject's blood pressure and took blood samples immediately before and after watching the respective videos. Each blood sample was separated out into its components and the liquid serum was examined for the levels of two hormones involved in appetite, leptin and ghrelin, for each time point used in the study.

When the researchers compared the hormone levels pre- and post-viewing, they found that the volunteers who watched the distressing video showed no statistically significant change in their appetite hormone levels during the 20-minutes they spent watching the video.

In contrast, the subjects who watched the humorous video had changes in blood pressure and also changes in the leptin and ghrelin levels. Specifically, the level of leptin decreased as the level of ghrelin increased, much like the acute effect of moderate physical exercise that is often associated with increased appetite.

Berk explains that this research does not conclude that humor increases appetite. He explains, "The ultimate reality of this research is that laughter causes a wide variety of modulation and that the body's response to repetitive laughter is similar to the effect of repetitive exercise. The value of the research is that it may provide for those who are health care providers with new insights and understandings, and thus

further potential options for patients who cannot use physical activity to normalize or enhance their appetite."

Appetite Loss may have a new Treatment Option

For example, many elderly patients often suffer from what is known as "wasting disease." They become depressed and, combined with a lack of physical activity, lose their appetite and jeopardize their health and well-being. Based on Berk's current research, these patients may be able to use Laughercise© as an alternative, initially less strenuous, activity to regain their appetite.

A similar loss of appetite is often seen in widowers, who typically suffer depression after the loss of a spouse. This often results in decreased immune-system function and subsequent illness in the surviving spouse. Chronic pain patients also suffer from appetite loss due to the chemical changes in their body that cause intolerable discomfort.

While laughter may seem unimaginable in the face of deep depression or intense chronic pain, it may be an accessible alternative starting point for these patients to regain appetite and consequently, improve and enhance their recovery to health.

Berk's current research expands the role of laughter on the human body and whole-person care, but also complicates an already complicated emotion. He acknowledges, "I am more amazed by the interrelatedness of laughter and body responses with the more evidence and knowledge we collect. It's fascinating that positive emotions resulting from behaviors such as music playing or singing, and now mirthful laughter, translate into so many types of [biological] mechanism optimizations. As the old biblical wisdom states, it may indeed be true that [laughter](#) is a good medicine."

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