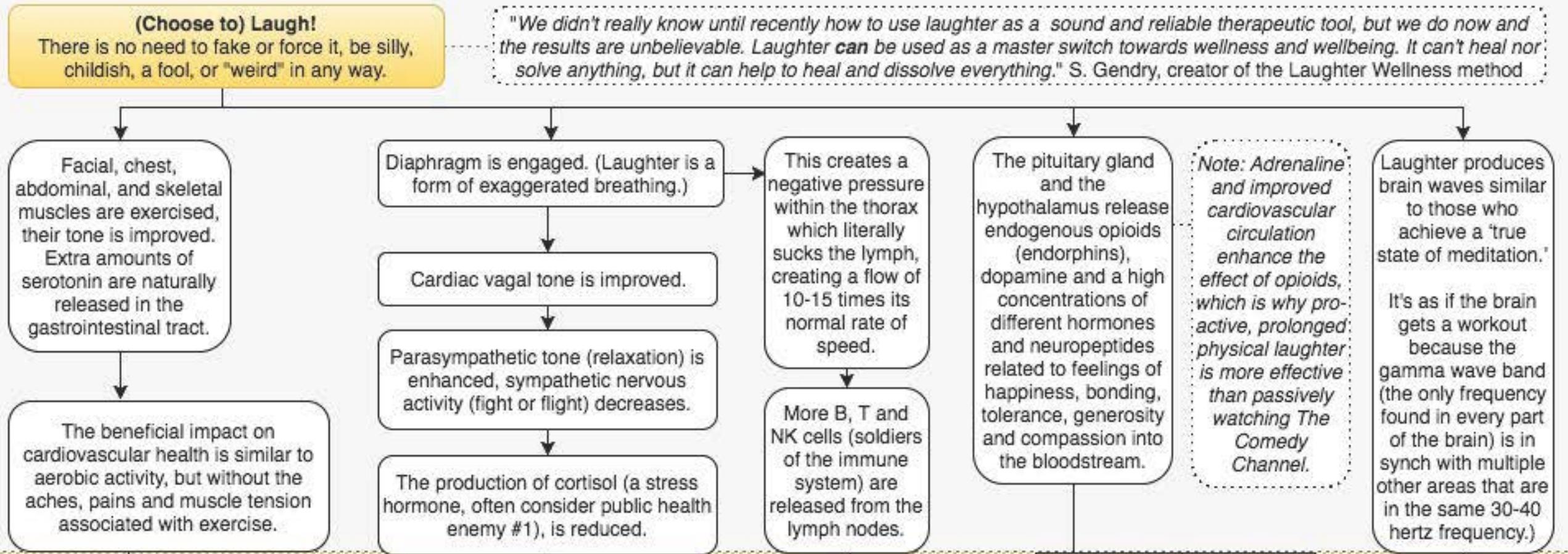


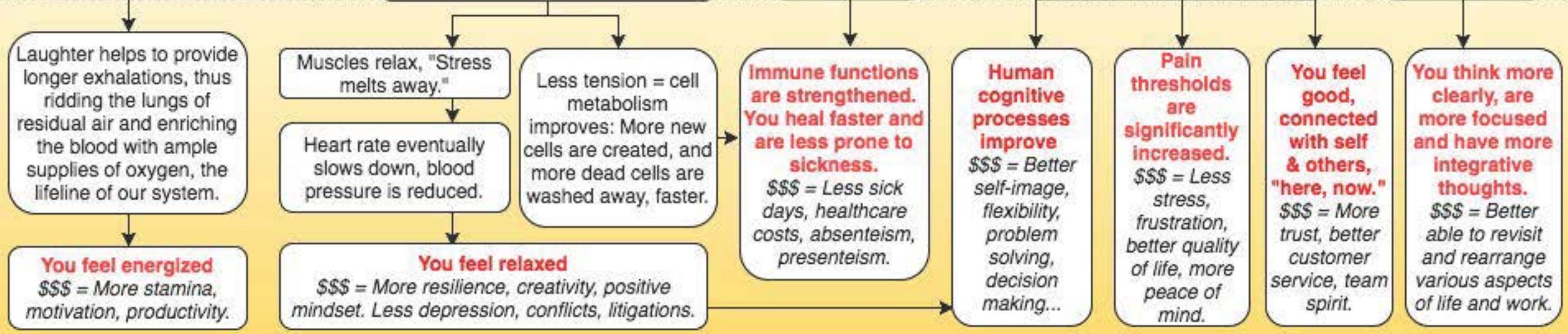
Cutting edge 21st century science was written 3,000 years ago: "A merry heart does good like a medicine, but a broken spirit dries the bones." (Proverbs 17:22)

How do you get a merry heart? Scientific studies have shown the value of meditating, planning a trip, spending time with family and friends, moving closer to work, going outside, practicing smiling, sleeping more, practicing gratitude, helping others a couple of hours a week, exercising, and more. It's all good and it works, but the new science of laughter suggests that all your efforts will work even better and often much faster if you include lots of laughter in that mix. Here is why. and it's experientially evident:

A few seconds



10-20 minutes or more (always respect your own limitations; Enjoy everything you do; No new pain)



Laughter Works: A Theoretical Framework

By Sebastien Gendry

www.LaughterOnlineUniversity.com

This document discusses the scientific foundation of a new technology that offers a universally well-tolerated, reliable, sustainable, wellbeing solution through laughter. This new technology is low-cost, easy to implement, and requires no particular space, equipment or form of clothing. It offers a valid health and wellbeing approach throughout people's lifespans. You don't have to be happy. It uses no jokes or comedy.

In a sedentary age of sharply rising healthcare costs and mental health challenges, these facts about laughter ought to gain more public attention. Laughter is too valuable to be left to chance.

Dr. Andrew Weil, a world-renowned leader and pioneer in the field of integrative medicine, went as far as telling a 2010 U.S. Senate Committee Hearing titled *Integrative Care: A Pathway to a Healthier Nation* that this new technology could help save America's healthcare system¹.

This new technology is a collective effort that goes by the names of Laughter Therapy, Laughter Wellness, and Laughter Yoga. It is based on the use of intentional (voluntary, simulated) laughter. Here is its theoretical framework.

1. FIVE CATEGORIES OF LAUGHTER

Although often associated, it is important to note that laughter and humor are distinct events. Whereas humor is a stimulus that can occur without laughter, laughter is both an emotion and a response and can occur without humor.

Laughter falls into one of five categories:

1. **Spontaneous laughter.** This is unrelated to one's free will, and is triggered by different (external) stimuli and positive emotions. Humor belongs to this group, amongst several other techniques. It has been around since time immemorial, with mixed results;
2. **Stimulated laughter** happens as a result of the physical contact or action (reflex) of certain stimuli (e.g., someone tickles you). It is a frequent source of embarrassment when practiced with strangers.
3. **Induced laughter** is new in history and of a chemical nature e.g., by inhaling laughing gas (nitrous oxide). It has its uses in clinical settings, but is not recommended for recreational purposes because it can have nasty consequences;

¹ Dr. Weil's Senate Testimony. See <http://lou.pm/2010hearing>

4. **Pathological laughter.** Pathological Laughing and Crying (PLC) is often associated with crying and tends to be uncontrollable and excessive. PLC is a relatively frequent consequence of brain damage, when not resulting from neurologic illnesses. It has been reported that the prevalence of PLC is approximately 10-20% among patients with stroke, 40% among patients with Alzheimer's disease (AD), 7-10% among patients with multiple sclerosis, and 19-49% among patients with amyotrophic lateral sclerosis (ALS)². The duration of laughter episodes is usually short (i.e., less than a minute), but may last as long as an hour or until the patient is exhausted.

The fifth category of laughter is **intentional (voluntary, simulated) laughter**. It is the most universal and inclusive way to tap into your own inner cellular pharmacy and use laughter for health and wellness. It was first conceptualized by the American Psychologist Dr. Annette Goodheart in the mid-1970s³ as way to help heal the mind, and it caught the world's attention as a way to exercise and heal the body through the Indian Laughter Yoga movement and the thousands of Community Laughter Clubs that it inspired over the course of the past two decades.

Intentional laughter offers important benefits that the (rare) spontaneous laughter of daily life does not:

1. **It's a valid alternative.** Imagine cutting a lemon in half, and squeezing it in your mouth. How do you feel? The more vivid your imagination of this experience is, the stronger your body will react. Your mind knows there is no lemon, but your body doesn't. It's the same phenomenon when you simulate laughter. Your mind will always know the difference between simulated and genuine laughter, but your body never will because it can't think. The body can only feel. The physiological benefits of laughter are linked to its duration and intensity, not to what motivates you to laugh.
2. **It gives you more, because you can choose to laugh for extended periods of time.** The more you laugh, the more physiological benefits you obtain. The spontaneous laughter that naturally occurs in daily life, in comparison, only comes for a few seconds here and there and does not produce the same level of benefits.
3. **It gives you more, because you can choose to laugh heartily from deep down in the belly.** This is important from a health perspective, because laughter acts as a pump and the heartier it is, the bigger its impact. Deep diaphragmatic breathing stimulates the cleansing of the lymph system by creating a vacuum effect that pulls the lymph through the bloodstream. This increases the rate of toxic elimination by as much as 15 times the normal rate⁴. In daily life, deep belly laughter is rare and generally short-lived when it does occur.
4. **It allows people to vocalize rather than verbalize tension and safely diffuse it.** Humans are feelings machines, and the flux of emotions is not always easy to control. In daily life, people resist the urge to laugh, cry, scream, or otherwise be emotional, but emotions are illogical, irrational, and unreasonable. When you have too much of them, they just come out. Imagine a pressure cooker. It's the same phenomenon. At some point, no matter how strong it is, it will explode if the pressure inside keeps

² Pathological Laughing and Crying Following Traumatic Brain Injury, J Neuropsychiatry Clin Neurosci 16:4, Fall 2004 - <http://lou.pm/plc>

³ *Laughter Therapy: How to Laugh About Everything in Your Life That Isn't Really Funny.* See <http://lou.pm/lt>

⁴ Dr. J.W. Shields, MD, Lymph, lymph glands, and homeostasis. Lymphology, v25, n4, December 1992, p. 147.

building. Intentional laughter is a very powerful tool to safely diffuse internal tension because it allows you to vocalize it without having to verbalize anything.

5. **It is sustainable.** Simulated laughter is always new, fresh and different. It's the purest form of laughter there is because there is no reason for it. It is free of conditions, beyond culture and time, and requires no particular setup or equipment.
6. **It is reliable.** There is nothing to stop you from laughing when you want to. The spontaneous laughter of daily life is not reliable because it is dependent on too many factors outside of our control. As strange as it may appear if you are new to this approach, with intentional laughter you can decide when you want to laugh, for how long, and guarantee that way that you will reap the health benefits of laughter.

2. BENEFITS OF LAUGHTER

Daily stressors and lack of time in modern lifestyle have rendered life more sedentary. Less physical exercise and more unhealthy food and damaging habits such as drinking, smoking and the use of drugs are exposing people to major lifestyle diseases, including hypertension, heart disease, diabetes, and obesity.

Laughter is an important part of the solution. It is now recognized as a legitimate form of preventive (lifestyle) medicine, and a complementary option to other established therapeutic strategies^{5,6}.

Health-related laughter research has been conducted in the following areas, with positive conclusions: allergy and dermatology; anatomy, neurology, and imaging; biophysics and acoustics; cardiology; complementary and alternative medicine (CAM); critical, palliative, and terminal care; dentistry; endocrinology and metabolism; epidemiology and public health; general patient care and primary care; geriatrics and aging; home care; hospice care; immunology; internal medicine and rheumatology; medical and health sciences training; obstetrics; oncology; pediatrics; psychiatry and medical psychology; pulmonology; rehabilitation; surgery.

Laughter has been recognized as a powerful tool in chronic care and is finding growing acceptance in aged care⁷, critical care⁸, general patient care⁹, home care¹⁰, hospice care¹¹, oncology^{12,13}, palliative care¹⁴,

⁵ Source *The Therapeutic Value Of Laughter In Medicine*, Ramon Mora-Ripoll, *Alternative Therapies*, Nov/Dec 2010, Vol 16, No 6, p56. Buy this most excellent report at www.copyright.com (use ISSN #10786791) or preview it at <http://lou.pm/benefits>

⁶ Specific research on Laughter Yoga can be found at <http://lou.pm/lyresearch>

⁷ Williams H., *Humor and healing: therapeutic effects in geriatrics*, *Gerontion* 198613147. Medline: <http://goo.gl/Tz3DC>

⁸ Leiber D.B., *Laughter and humor in critical care*, *Dimens Crit Care Nurs* 1976516270.

⁹ Mallett J., *Use of humor and laughter in patient care*, *Br J Nurs* 1993231725. Medline: <http://goo.gl/NyMe4>

¹⁰ Hunter P., *Humor therapy in home care*, *Caring* 1997169567. Medline: <http://goo.gl/AxKU5>

¹¹ Balzer J.W., *Humor — a missing ingredient in collaborative practice*, *Holist Nurs Pract* 1993742835. Medline: <http://goo.gl/S0UrO>

psychiatry^{15,16}, rehabilitation¹⁷, rheumatology¹⁸ and terminal care¹⁹. It is regarded as the most easily accessible analgesic for pain and depression.

More health professionals are increasingly implementing laughter interventions as a routine clinical practice in their therapeutic portfolio, both individually and in groups.

Laughter is recommended by institutions around the world for people suffering from Alzheimer's, arthritis, asthma, bronchitis, cancer, circulatory problems, diabetes, eczema, heart disease, high blood pressure, mental disorders, obesity, schizophrenia and a host of other conditions.

There is no evidence that you should expect to extend your life with laughter, but you can expect to live better.

Here is a list of the most commonly known benefits. (The regrouping in the following five categories is my own):

Physiological benefits:

- Elevates pain threshold and tolerance
- Exercises and relaxes muscles, stimulates circulation
- Improves respiration
- Increases immune system's defenses and provides important natural defenses against illness

Mental benefits:

- Improves mental functioning
- Enhances memory, creative thinking and problem-solving skills
- Decreases stress hormones

¹² Bellert J.L. Humor: A therapeutic approach in oncology nursing. Cancer Nurs 1989;12:265-70. Medline: <http://goo.gl/WR7ei>

¹³ Trent B., Ottawa lodges add humor to armamentarium in fight against cancer, CMAJ 1990;142:2163-4. Medline: <http://goo.gl/d5x8S>

¹⁴ Dean R.A., Humor and laughter in palliative care, J Palliat Care 1997;13:349. Medline: <http://goo.gl/k8vQ9>

¹⁵ Saper B., The therapeutic use of humor for psychiatric disturbances of adolescents and adults, Psychiatr Q 1990;61:426-172. Medline: <http://goo.gl/Wd4lc>

¹⁶ Gelkopf M., Kreitler S., Sigal M., Laughter in a psychiatric ward. Somatic, emotional, social, and clinical influences on schizophrenic patients, J Nerv Ment Dis 1993;181:528-39. Medline: <http://goo.gl/O6Jtx>

¹⁷ Basmajian J.V., The elixir of laughter in rehabilitation, Arch Phys Med Rehabil 1998;79:1215-97. Medline: <http://goo.gl/wDfNV>

¹⁸ Cousins N., Anatomy of an illness as perceived by the patient, N Engl J Med 1976;295:2614-5863. Medline: <http://goo.gl/8qS1P>

¹⁹ Herth K., Contributions of humor as perceived by the terminally ill, Am J Hosp Care 1990;71:3640. Medline: <http://goo.gl/WR70U>

- Reduces stress, anxiety, tension and counteracts depression symptoms
- Creates a new perspective

Emotional benefits:

- Elevates mood, energy and vigor
- Promotes recovery from negative emotions (helps us bounce back when we are down)
- Intensifies mirth and is contagious
- Improves quality of life and patient care

Social benefits:

- Improves interpersonal interaction, relationships, attraction and closeness
- Increases friendliness, helpfulness and builds group identity, solidarity, and cohesiveness
- Promotes psychological wellbeing

Spiritual wellbeing:

Intentional laughter (as practiced by Laughter Yoga, Laughter Wellness and similar methods) helps:

- Elevate self-esteem and hope;
- Build resilience
- Change our perception of the world and redefine stress from “threat” to “challenge”
- Change our mental map from NMA (Negative Mental Attitude) to PMA (Positive Mental Attitude), through the practice of releasing negative thoughts and emotions

2.1. PHYSIOLOGICAL BENEFITS

2.1.1. LAUGHTER MAKES WORKING OUT FUN, NOT TEDIOUS. GOOD FOR THE HEART

Let's look at what physically happened to you as you were doing this simple “ha ha ha ha ha” exercise with sincere enthusiasm. Could you feel your abdomen engaging? This is just what was happening on the surface.

Physical fitness stemming from laughter is a benefit known to few. The diaphragm is the only muscle in the body attached to other muscles. This is why laughter jogs all your internal organs. The mere act of laughing exercises the diaphragm, as well as the abdominal, respiratory, facial, leg, and back muscles.

Laughter is particularly important for seniors as well as bedridden²⁰ or wheelchair-bound people. It is a unique way to enhance one's daily wellbeing.

²⁰ Laughter Yoga with dialysis patients: <http://lou.pm/dialysis>

Professor A. Berk of Johns Hopkins University writes²¹, *“Laughing creates a total body response that is clinically beneficial. It exercises the facial, chest, abdominal, and skeletal muscles and improves their tone (Paskind, 1932), which can be particularly important for bedridden or wheelchair-bound older people.”*

Michael Miller, M.D. (Director of Preventive Cardiology at the University of Maryland Medical Center) agrees and said after a study on the health impact of laughter²² *“The magnitude of change we saw in the endothelium is similar to the benefit we might see with aerobic activity, but without the aches, pains and muscle tension associated with exercise. We don’t recommend that you laugh and not exercise, but we do recommend that you try to laugh on a regular basis. Thirty minutes of exercise three times a week, and 15 minutes of laughter on a daily basis is probably good for the vascular system.”*

Just like Dr. Miller, I am not claiming that laugh-letics is a sport that can replace a workout and one should laugh instead of exercise. It is low-impact after all and you are unlikely to build muscle mass laughing. But sweating profusely and building strong muscles is not what exercise is all about, or is it?

While many forms of exercise may leave you tired, laughter sessions leave you bursting with energy and ready for anything. Laughter makes working out fun, not tedious. Best of all is that it requires no special equipment, environment or clothing.

RELEVANT STUDIES

- Fewer arrhythmias and recurrences of myocardial infarctions during cardiac rehabilitation (after myocardial infarction) when self-selected viewed humor was used as an adjunct to standard therapy²³;
- Genuine voiced laughter caused a 10-20% increase in energy expenditure (EE) and heart rate above resting values, which means that 10-15 minutes of laughter per day could increase total EE by 10-40 kcal²⁴;
- Inverse association between propensity to laugh and coronary heart disease²⁵;
- Laughing had an acute effect on systolic blood pressure²⁶;
- Laughter elicited by cinematic viewing improved endothelial-dependent vasodilation²⁷;

²¹ The active ingredients in humor: psychophysiological benefits and risks for older adults: <http://lou.pm/rberk>

²² School of Medicine Study Shows Laughter Helps Blood Vessels Function Better: <http://lou.pm/umm>

²³ Tan SA, Tan LG, Berk LS. Mirthful laughter an effective adjunct in cardiac rehabilitation. *Can J Cardiol.* 1997;13 (supplB):190

²⁴ Buchowski MS, Majchrzak KM, Blomquist K, Chen KY, Byrne DW, Bachorowski JA. Energy expenditure of laughter. *Int J Obes (Lond.)* 2007;31 (1):131-137

²⁵ Clark A, Seidler A, Miller M. Inverse association between sense of humor and coronary heart disease. *Int J Cardiol.* 2001;80 (1):87-88.

²⁶ McMahon C, Mahmud A, Feely J. Taking blood pressure - no laughing matter! *Blood Press Monit.* 2005;10 (2):109-110.

- Laughter increased stroke volume and cardiac output, and decreased arterial-venous oxygen difference and systemic vascular resistance²⁸;
- Laughter induced by a comic movie led to a significant decrease in aortic stiffness and wave reflections²⁹;
- Laughter with physical exercise may be effective to lower the blood pressure as a long-term effect³⁰;
- Mirthful laughter led to lower the incidence of myocardial infarction in high-risk diabetic patients³¹.

2.1.2. MORE LAUGHTER = MORE OXYGEN, THE LIFELINE OF OUR SYSTEM

Oxygen is one of the primary catalysts for biological energy in the human body. We breathe in oxygen and exhale carbon dioxide. It is an element of intracellular energy that's absolutely necessary to sustain human life. It plays an important role in the circulatory and respiratory systems. It purifies the blood by removing the toxic wastes in the blood stream.

To keep the lungs healthy and provide enough oxygen for the body to perform at peak levels, one needs to take deeper breaths and flush the stale air from the lungs. A normal inhalation fills just 25% (tidal volume) of the total lung capacity. The remaining 75% (residual volume held in the lower 2/3's of our lungs) remains filled with old stale air. Respiration becomes even shallower when compounded by stress.

Laughter helps to provide longer exhalations, thus ridding the lungs of residual air and enriching the blood with ample supplies of oxygen, the lifeline of our system.

When you breathe shallowly:

- You are making your heart work more because most of the gas exchange takes place in the lower lungs, and it has to beat more to achieve the same input of oxygen and output of carbon dioxide;
- You do not help your lymphatic system much (it is the engine of your immune system and what keeps you healthy), as that system has no pump. To move the lymph you need to either exercise and/or breathe deeper.

The easiest way to sustain deep exhales is to laugh.

Here is what the experts are saying about the importance of oxygen:

²⁷ Miller M, Mangano C, Park Y, Goel R, Plotnick GD, Vogel RA. Impact of cinematic viewing on endothelial function. *Heart*. 2006;92 (2):261-262.

²⁸ Boone T, Hansen S, Erlandson A. Cardiovascular responses to laughter: a pilot project. *Appl Nurs Res*. 2000;13 (4):204-208.

²⁹ Xaplanteris P, Vlachopoulos C, Baou K, et al. Divergent effects of laughter and mental stress on aortic stiffness and wave reflections. *Eur Heart J*. 2007;28 (Abstract supplement):588

³⁰ Kajiura M, Ohira T, Sato S, Tanaka H, Shimamoto T. Effects of laughter and physical exercise on health status among healthy elderly men and women [abstract]. *Auton Neurosci* 2007;135 (1-2):150.

³¹ Berk LS, Tan L, Tan S. Mirthful laughter, as adjunct therapy in diabetic care, attenuates catecholamines, inflammatory cytokines, C-RP, and myocardial infarction occurrence (abstract). *FASEB J*. 2008;22 (Meeting abstracts):1226.2

“Deep breathing techniques which increase oxygen to the cell are the most important factors in living a disease-free and energetic life... Remember: where cells get enough oxygen, cancer will not, cannot occur.” – Dr. Otto Warburg³²

“Oxygen plays a pivotal role in the proper functioning of the immune system. We can look at oxygen deficiency as the single greatest cause of all diseases.” – Stephen Levine³³

“Breathing correctly is the key to better fitness, muscle strength, stamina, and athletic endurance.” – Dr. Michael Yessis³⁴

“All body functions are breathing related. Proper oxygen delivery to all parts of your body is crucial to health and well-being. Aerobic exercise increases the body's available oxygen and therefore promotes wellness. Delivering oxygen to the body is the responsibility of the respiratory system. Breathing is the process by which air enters the bloodstream, by way of the lungs. Thus, proper breathing, and correcting common breathing disorders, is the ultimate form of aerobics.” – Dr. Robert Fried³⁵

“(Belly) Laughter creates convulsive reactions, which free up muscular tension within the body, and charge and mobilize the voice and breathing.” – Alexander Lowen, father of Bioenergetic Psychotherapy

Video: *Laughter Yoga in a Cardiac and Pulmonary Rehabilitation Center*³⁶.

RELEVANT STUDIES

- Following laughter, there is a corresponding decrease in heart rate and respiratory rate³⁷;
- Laughter and smiling induced by a humor intervention (clowning) were able to reduce hyperinflation in severe and very severe COPD patients³⁸;
- Laughter led to immediate increases in heart rate, respiratory rate, and oxygen consumption^{39,40,41,42,43} and may improve oxygen saturation levels⁴⁴;

³² Dr. Otto Warburg, President, Institute of Cell Physiology, Nobel Prize Winner. Dr. Warburg is the only person to ever win the Nobel Prize twice in medicine, and he was nominated for a third.

³³ Antioxidant Adaptation—Its Role in Free Radical Pathology, 1985.

³⁴ Dr. Michael Yessis, PhD, President Sports Training Institute, Fitness Writer – Muscle and Fitness Magazine.

³⁵ Breath Connection, Insight Books, 1990, p. 52.

³⁶ See <http://lou.pm/cprc>

³⁷ Fry WF. The biology of humor. *Humor* 1994;7 (2):111-126

³⁸ Brutsche MH, Grossman PG, Müller RE, et al. Impact of laughter on air trapping in severe chronic obstructive lung disease. *Int J COPD*. 2008;3 (1):185-192.

³⁹ Fry WF, Rader C. The respiratory components of mirthful laughter. *J Biol Psychol*. 1977;19 (2):39-50.

⁴⁰ Fry W, Savin W. Mirthful laughter and blood pressure. *Humor*. 1988;1:49-62.

⁴¹ Fry WF Jr. The physiologic effects of humor, mirth, and laughter. *JAMA*. 1992;267 (13):1857-1858.

- Viewing a humorous film decreased bronchial responsiveness in asthmatic patients⁴⁵.

2.1.3. MORE LAUGHTER = LESS GERMS

The germ theory of disease was a scientific discovery of the late 19th century and states that some diseases are caused by microorganisms. These small organisms, too small to see without magnification, invade humans, animals and other living hosts. Their growth and reproduction within their hosts can cause a disease. “Germ” may refer to a virus, bacterium or fungus. Microorganisms that cause disease are called pathogens, and the diseases they cause are called infectious diseases. Logically, if we get rid of them then health should return. This theory is the foundation of our current healthcare system and in essence little has changed in the past 100 or so years in the way mainstream medicine treats sickness: it’s either cut, kill or numb.

Laughter is known to improve and bring balance to all components of the immune system, starting with the lymphatic system. It keeps us healthy.

LAUGHTER STIMULATES THE LYMPHATIC SYSTEM, THE CLEANSING AGENT OF THE HUMAN BODY

The lymphatic system aids the immune system in removing and destroying waste, debris, dead blood cells, pathogens, toxins and cancer cells. It absorbs fats and fat-soluble vitamins from the digestive system and delivers these nutrients to the cells of the body where they are used by the cells. It also removes excess fluid and waste products from the interstitial spaces between the cells.

...and the lymphatic system has no pump. There are only two ways to move lymph: exercising and/or breathing.

The field of Lymphology is still in its infancy in the USA, but this is not true in Europe⁴⁶. Biophysical studies there have shown that belly laughter accomplishes the diaphragmatic breathing necessary (diaphragm fluttering up and down at a very quick rate) to create a strong negative pressure within the thoracic duct (the largest lymphatic vessel in the body). The impact: “*Deep diaphragmatic breathing stimulates*

⁴² Filippelli M, Pellegrino R, Iandelli I, et al. Respiratory dynamics during laughter. J Appl Physiol 2001;90 (4):1441-1446.

⁴³ Sakuragi S, Sugiyama Y, Takeuchi K. Effects of laughing and weeping on mood and heart rate variability. J Physiol Anthropol Appl Human Sci. 2002;21 (3):159-165.

⁴⁴ Fry WF Jr, Stoft PE. Mirth and oxygen saturation levels of peripheral blood. Psychother Psychosom. 1971;19 (1):76-84.

⁴⁵ Kimata H. Effect of viewing a humorous vs. non-humorous film on bronchial responsiveness in patients with bronchial asthma. Physiol Behav. 2004;81 (4):681-684.

⁴⁶ More information on the lymphatic system: <http://lou.pm/lymph>

the cleansing of the lymph system by creating a vacuum effect which pulls the lymph through the bloodstream. This increases the rate of toxic elimination by as much as 15 times the normal rate.” – Dr. J.W. Shields, MD⁴⁷

When you laugh, the diaphragm becomes a powerful pump for your lymphatic circulation, much like your heart serves as the central pump that propels blood through your blood vessels. This assists the lymphatic vessels in carrying this fluid through your body and helps your lymph nodes to clean and filter this fluid, removing waste products, dead cells, and even unwanted microorganisms. Maintaining clean body fluids is important because these are necessary for you to be at your best.

The bottom line: increased lymphatic flow = an elevated, improved immune system just by the simple nature of more lymph flowing through the nodes, thus producing more lymphocytes, antibodies, etc.

Watching a one-hour comedy video for example has been found to produce:

- Increased number and activation of T cells;
- Increased number of Helper T cells (the cells attacked by the AIDS virus);
- Increased ratio of Helper/Suppressor T cells;
- Increased number and activity of Natural Killer (NK) cells;
- Increased levels of Gamma Interferon;
- Increased number of B cells.

RELEVANT STUDIES

- Exposure to a humorous stimulus increased NK cell activity^{48,49}; increased SIgA^{50,51,52,53,54}; increased serum IgA, IgG, IgM⁵⁵;

⁴⁷ Dr. J.W. Shields, MD, Lymph, lymph glands, and homeostasis. *Lymphology*, v25, n4, December 1992, p. 147.

⁴⁸ Bennett MP, Zeller JM, Rosenberg L, McCann J. The effect of mirthful laughter on stress and natural killer cell activity. *Altern Ther Health Med*. 2003;9 (2):38-45.

⁴⁹ Takahashi K, Iwase M, Yamashita K, et al. The elevation of natural killer cell activity induced by laughter in a crossover-designed study. *Int J Molecular Med*. 2001;8(6):645-650.

⁵⁰ McClelland R, Cheriff A. The immunoenhancing effects of humour on secretory IgA and resistance to respiratory infections. *Psychol Health*. 1997;12 (3):329-344.

⁵¹ Lefcourt H, Davidson-Katz K, Kueneman K. Humor and immune system functioning. *Humor: Int J Humor Res*. 1990;3:305-321.

⁵² Dillon KM, Minchoff B, Baker KH. Positive emotional status and enhancement of the immune system. *Int J Psychiatry Med*. 1985-1986;15 (1):13-18.

⁵³ Labott SM, Ahleman S, Wolever ME, Martin RB. The physiological and psychological effects of the expression and inhibition of emotion. *Behav Med*. 1990;16 (4):182-189.

⁵⁴ Martin RA, Dobbin JP. Sense of humor, hassles, and immunoglobulin A: evidence for a stress-moderating effect of humor. *Int J Psychiatry Med*. 1988;18 (2):93-105.

- Mirthful laughter decreased serum pro-inflammatory cytokine and increased anti-inflammatory cytokine levels⁵⁶, growth hormone, and IGF-1⁵⁷; reduced serum interleukin-6 levels^{58,59};
- Laughter and humor reduced allergen-induced wheat reactions⁶⁰, reduced allergen-specific IgE production⁶¹, and improved night-time waking⁶²;

2.1.4. MORE LAUGHTER = LESS PAIN

We all face pain in our lives. This may come in the form of physical or psychological illness, financial or family problems. When a problem is acute, it can take over our lives and bring us down emotionally, leaving us with no energy or hope.

Laughter is now respectfully regarded as the most easily accessible analgesic for pain, and we understand the neurochemistry of how this is achieved.

Opioid peptides (opioids) are a group of endogenous (internally produced) neural polypeptides (amino acid chains such as endorphins and enkephalins). Endogenous opioids are released when we laugh. Opioids bind to central nervous system opiate receptors and naturally produce some of the pharmacological properties of powerful drugs like morphine, without the dangerous side effects of plant-produced opiates. Other instances when opioids are released include when we are happy with a positive self-image or exercise vigorously (the “runner’s high” or the “dancer’s high”).

Laughter may also break the pain-spasm cycle common to some muscle disorders. It helps people forget about pain. Studies show that children watching comedy films tolerate pain more easily. Researchers at UCLA did a study that showed that watching funny shows on TV improved children’s tolerance for pain⁶³.

⁵⁵ Kimata H. Reduction of plasma levels of neurotrophins by laughter in patients with atopic dermatitis. *Pediatr Asthma Allergy Immunol.* 2004;17 (2):131-135.

⁵⁶ Matsuzaki T, Nakajima A, Ishigami S, Tanno M, Yoshino S. Mirthful laughter differentially affects serum pro- and anti-inflammatory cytokine levels depending on the level of disease activity in patients with rheumatoid arthritis. *Rheumatology (Oxford).* 2006;45 (2):182-186.

⁵⁷ Ishigami S, Nakajima A, Tanno M, Matsuzaki T, Suzuki H, Yoshino S. Effects of mirthful laughter on growth hormone, IGF-1 and substance P in patients with rheumatoid arthritis. *Clin Exp Rheumatol.* 2005;23 (5):651-657.

⁵⁸ Yoshino S, Fujimori J, Kohda M. Effects of mirthful laughter on neuroendocrine and immune systems in patients with rheumatoid arthritis. *J Rheumatol.* 1996;23 (4):793-794.

⁵⁹ Nakajima A, Hirai H, Yoshino S. Reassessment of mirthful laughter in rheumatoid arthritis. *J Rheumatol* 199;26 (2):512-513.

⁶⁰ Kimata H. Effect of humor on allergen-induced wheat reactions. *JAMA.* 2001;285 (6),738.

⁶¹ Kimata H. Reduction of allergen-specific IgE production by laughter. *Eur J Clin Invest.* 2004;34 (9):76-77.

⁶² Kimata H. Viewing humorous film improves nighttime waking in children with atopic dermatitis. *Indian Pediatr.* 2007;44 (4):281-285.

⁶³ Watch a short video where drug addicts in recovery explain how laughter helps them feel less pain at <http://lou.pm/pain>

In a study of 35 patients in a rehabilitation hospital, 74% agreed with the statement, “*Sometimes laughing works as well as a pain pill.*” These patients had a broad range of conditions, such as spinal cord injury, traumatic brain injury, arthritis, limb amputations, and other neurological or musculoskeletal disorders.

Keiko Hayashi, RN, PhD of the University of Tsukuba, Japan, observed that some patients are able to reduce their pain and nausea medications following a Laughter Yoga session.

RELEVANT STUDIES

Laughter increased pain tolerance and discomfort thresholds^{64,65,66,67,68,69,70}.

2.2. MENTAL BENEFITS

2.2.1. MORE LAUGHTER = LESS STRESS = BETTER HEALTH AND MORE ENERGY

Have you been stressed this year? If yes, could this have been instrumental in you having been depressed and/or sick as well, even if it didn't last long? How much money did this cost you? What impact did it have on your personal and professional life? How did it impact your appetite? Energy? Sleep?

You don't need to tell. Official statistics already have, and the picture is grim. It's a global phenomenon. Stress is a well-known slow killer, is rampant in our society, and is very expensive on all levels. Its mechanisms are complex. It impacts everybody differently, but its end-result is easy to observe and explain. It creates havoc in the human body, leads to depression, kills creativity, isolates people when they most need social connections and slowly destroys one's self-esteem. Stress cannot be ignored. Why allow so much pain and unnecessary expenses when they can be substantially minimized in the first place?

Laughter relieves tension by dilating blood vessels and fostering muscular relaxation, while stress constricts and tightens the same. All relaxation response is exhalation based.

⁶⁴ Van Zandt S, LaFont C. Can a laugh a day keep the doctor away? *J Pract Nurs.* 1985;35 (3):32-35.

⁶⁵ Cogan R, Cogan D, Waltz W, McCue M. Effects of laughter and relaxation on discomfort thresholds. *J Behav Med.* 1987;10 (2):139-144.

⁶⁶ Hudak DA, Dale JA, Hudak MA, DeGood DE. Effects of humorous stimuli and sense of humor on discomfort. *Psychol Rep.* 1991;69 (3 Pt 1):779-786.

⁶⁷ Nevo O, Keinan G, Teshimovsky-Arditi M. Humor and pain tolerance. *Humor.* 1993;6 (1):71-88.

⁶⁸ Rotton J, Shats M. Effects of state humor, expectancies, and choice on postsurgical mood and self-medication: a field experiment. *J Appl Social Psychol.* 1996;26 (20):1775-1794.

⁶⁹ Weisenberg M, Raz T, Hener T. The influence of film-induced mood on pain perception. *Pain.* 1998;76 (3):365-375.

⁷⁰ Zwyer K, Velker B, Ruch W. Do cheerfulness, exhilaration, and humor production moderate pain tolerance? A FACS study. *Humor.* 2004;17 (1-2):85-119.

Laughter helps improve the cardiac vagal tone, which reflects how much your heart rate is influenced by your breathing. It's an indication of your body's capacity to regain calm after you've been in a stressful situation. Low vagal tone has been linked to chronic inflammation throughout the body, which is a known risk factor for heart failure, stroke and diabetes. Research suggests that the more positive social connections people had over a nine week period, the more their vagal tone increased.

2.2.2. WHY CHRONIC STRESS IS BAD

The stress theory of disease states that the root cause of disease is not germs. Those are already inside of you in larger numbers than you'll ever know. You only get sick when you create an internal environment that is conducive to the growth of stress.

It has long been recognized that chronic stress weakens the immune system, leaving you more vulnerable to illness. This is because stress restricts the proper flow of blood and lymph, thereby slowly starving cells and weakening the immune system.

According to the Mayo Clinic, typical stress symptoms include:

- A negative state of mind with a cynical, sarcastic and critical outlook;
- Changes in sleep and appetite habits;
- Disillusionment;
- Headaches, neck and lower back pain;
- Irritability and lack of patience;
- Lack of energy;
- Lack of motivation;
- Lack of productivity and efficiency;
- Lack of satisfaction with one's own life and personal achievements;
- Loss of the ability to experience joy;
- Self-medication using food, alcohol and drugs to feel better or to not feel;
- The feeling of facing insurmountable barriers.

When the body is under deep stress, it releases a hormone called cortisol that has a profound impact on your health because it directly suppresses the immune system. This makes a stressed person more vulnerable to attack from bacteria and viruses and can cause anything from generally feeling run down to full-blown flu and heart attacks.

High levels of cortisol lead to impaired cognitive performance, suppressed thyroid function, blood sugar imbalances such as hyperglycemia, decreased bone density, decrease in muscle tissue, increased blood pressure, lowered immunity and inflammatory responses in the body, and memory problems. Repeated increases in cortisol levels lead to depression-like behavior and greater signs of anxiety, especially in males. High cortisol levels also lead to increased abdominal fat, which is associated with a greater amount of health problems than fat deposited in other areas of the body. Health problems associated with increased stomach fat are heart attacks, strokes, the development of "bad" cholesterol (LDL) and lower levels of "good" cholesterol (HDL), which in turn lead to other health problems.

Low serotonin levels caused by stress create feelings of depression, impulsive actions, short attention span, a blocked and scattered feeling, and even suicidal tendencies.

Low beta-endorphin levels due to stress lead to feeling tearful, isolated, depressed and hopeless, low self-esteem, a low tolerance for emotional & physical pain and feeling emotionally overwhelmed.

There is more: Stress causes the right side of your brain to shut down. The right brain is responsible for emotions and looking at the big picture. It is the more “arty and creative” part of you. This explains why artists and writers find it almost impossible to work when stressed because they cannot access the creative streak within them. The left brain is responsible for looking at things logically, in parts rather than in wholes. A stressed person usually becomes fixated on details and small things rather than looking at the big picture. They can often be seen to be going over and over irrelevant things, making problems seem worse than they actually are.

2.2.3. LAUGHTER IS NATURE’S COUNTER TO BAD STRESS

Laughter is the #1 natural enemy of bad stress because they are physiological opposites. The predominance of one tends to prevent the other. A clue to this may be found in the body’s typical actions after extreme stress of the fight or flight kind: deep panting and using laughter to make light of events that provoked fear. The predominance of one (deeper breathing and laughter) tends to prevent the other (fear).

Laughter helps reduce the stress hormones produced in the hypothalamus section of the brain, lowering blood pressure, reducing risk of heart attack and stroke. Significant reductions can occur in minutes and last for days.

2.2.4. EUSTRESS

Laughter is a form of good stress, known as eustress.

Life is all about the balance of tension and relaxation. We need tension to stand erect, move, do anything. If we didn't resist our own movement each time we drank a cup of water, the cup would crash into our face. Life, therefore, is also all about balance, or rather learning to be balanced in our thoughts and actions. Just like we must learn to fine-tune the push and pull forces in all of our movements to perform smooth actions, we must also learn to relax and slow down (or engage and speed up, depending) in our daily life. If we don't, the tensions we naturally experience will escalate and create pain.

Therefore, pain, anxiety and stress have an important role to play in our lives. They are the voice of the body calling for attention, saying that something is out of balance.

Eastern wisdom says that any pain, anxiety or stress that prompts us to take action is good. Otherwise it's just a waste of time and energy, because it's like sitting on a rocking chair. One gets the illusion of movement, but he or she won't be going anywhere.

Intentional laughter allows us to vocalize our aches and pains in a positive manner without having to verbalize anything. There is no need to explain why we are laughing.

Laughter reduces stress levels quickly and naturally and provides new ways of dealing with stress, which can lead to long-term stress reduction. By providing a new mental perspective, choosing to laugh often converts the perceptions of problems that were seen as huge to minor irritations.

2.2.5. LESS BAD STRESS = MORE ENERGY

“Anger and anxiety are energy-sapping emotions,” explains humor expert Paul McGhee. “If your job causes you stress day after day, week after week, the anger, anxiety and depression you live with drains the energy you need to provide quality work. It also lowers your morale and job satisfaction, and sets you up for burnout.”

Laughter on the other hand relieves tension and is a big revitalizer. It recharges your batteries by enriching the blood with ample supplies of oxygen, the lifeline of our system, and cutting through energy-sapping emotions and replacing them with energizing emotions. It fights burnout by giving you back the energy you’re supposed to have, and by making your life and work more enjoyable.

Laughter is an excellent natural way to provide violent-free emotional release through catharsis. It also provides new ways to deal with these strong emotions in a healthy, non-violent and non-confrontational way. In summary: Laughter is a natural antidote to many of the illness-causing effects of stress.

RELEVANT STUDIES

- After watching a comic film, laughter reduced serum cortisol levels^{71,72,73}, increased salivary chromogranin A (CgA) levels⁷⁴, and increased ordinary excretion of epinephrine and norepinephrine⁷⁵;
- Behavior of perceptual anticipation of mirthful laughter decreased serum cortisol, epinephrine, and dopac⁷⁶;
- Humor desensitization reduced fear as effectively as traditional techniques⁷⁷;
- Laughter elevated breast-milk melatonin in both healthy and atopic eczema mothers⁷⁸;

⁷¹ Berk LS, Felten DL, Tan SA, Bittman BB, Westengard J. Modulation of neuroimmune parameters during the eustress of humor-associated mirthful laughter. *Altern Ther Health Med.* 2001;7 (2):62-72, 74-76.

⁷² Berk LS, Tan SA, Fry WF, et al. Neuroendocrine and stress hormone changes during mirthful laughter. *Am J Med Sci.* 1989;298 (6):390-396.

⁷³ Berk LS, Tan SA, Nehlsen-Cannarella SL, et al. Humor associated laughter decreases cortisol and increases spontaneous lymphocyte blastogenesis. *Clin Res.* 1988;36:435A.

⁷⁴ Toda M, Kusakabe S, Nagasawa S, Kitamura K, Morimoto K. Effect of laughter on endocrinological stress marker chromogranin A. *Biomed Res.* 2007;28 (2):115-118.

⁷⁵ Levi L. The urinary output of adrenalin and noradrenalin during pleasant and unpleasant emotional states: a preliminary report. *Psychosom Med.* 1965 Jan-Feb; 27:80-85.

⁷⁶ Berk LS, Tan SA, Berk D. Cortisol and catecholamine stress hormone decrease is associated with the behavior of perceptual anticipation of mirthful laughter [abstract]. *FASEB J.* 2008;22 (Meeting abstracts):946.11.

⁷⁷ Ventis WL, Higbee G, Murdock SA. Using humor in systematic desensitization to reduce fear. *J Gen Psychol.* 2001;128 (2):241-253.

⁷⁸ Kimata H. Laughter elevates the levels of breast-milk melatonin. *J Psychosom Res.* 2007;62 (6):699-702.

- Laughter increased beta-endorphins and human growth hormones (HGH)⁷⁹;
- Laughter may help dissipate tension, fear and frustration⁸⁰;
- Laughter may reduce stress and improve NK cell activity⁸¹;
- Laughter moderated stress or anxiety in healthy adults^{82,83};
- Periods of intense laughter are followed by relaxed muscle tone⁸⁴ or H-reflex depression⁸⁵;
- Laughter reduces stress in the workplace⁸⁶;

2.3. EMOTIONAL BENEFITS

2.3.1. MORE LAUGHTER = BETTER MOODS

MOTIONS CREATE EMOTIONS

As it turns out, the human brain is wired to respond positively to laughter and smiles, generating ‘feel-good’ chemicals. The wiring is so strong that the brain responds even when we smile at ourselves in the mirror or simulate laughing with enthusiasm. You can even stretch your mouth into a smile shape by using a chop stick or a pen across the mouth to pull back the corners.

The American psychologist and philosopher William James proposed the theory in the 1880s that “*we don't laugh because we're happy, we're happy because we laugh.*”

This is not a working hypothesis. Today we have a much better understanding of the body-mind connection and the science of embodying emotions⁸⁷.

⁷⁹ Berk LS, Tan SA. [beta]-endorphin and HGH increase are associated with both the anticipation and experience of mirthful laughter [abstract], FASEB J. 2006;20 (4):A382.

⁸⁰ Robinson V. The purpose and function of humor in OR nursing. Today's OR Nurse. 1993;15 (6):7-12.

⁸¹ The Effect of Mirthful Laughter on Stress and Natural Killer Cell Activity, Mary P. Bennett, DNSc, RN, Janice M. Zeller, PhD, RN, FAAN, Lisa Rosenberg, PhD, RN, Judith McCann, DNSc, RN, Alt Ther, Mar/Apr 2003, Vol. 9, No. 2 – See <http://lou.pm/ml>

⁸² Yovetich NA, Dale JA, Hudak MA. Benefits of humor in reduction of threat-induced anxiety. Psychol Rep. 1990;66 (1);51-58.

⁸³ Moore DB. Make them laugh. Therapeutic humor for patients with grief-related stress or anxiety. Adv Nurse Pract. 2000;8 (8):34-37.

⁸⁴ Paskind HA. Effects of laughter on muscle tone. Arch Neurol Psychiatry 1932;28 (3):623-628.

⁸⁵ Overeem S, Taal W, Ocal Gezici E, Lammers G, Van Dijk J. Is motor inhibition during laughter due to emotional respiratory influences? Psychophysiology. 2004;41 (2):254-258.

⁸⁶ The Efficacy of Laughter Yoga on IT Professionals to Overcome Professional Stress. See <http://lou.pm/bs>

⁸⁷ Embodying Emotion, Paula M. Niedenthal, et al, Science 316, 1002 (2007); DOI: 10.1126/science.1136930 - <http://lou.pm/eemotions>.

Feelings and emotions do not exist in thin air. You don't "walk" into a cloud of anger, sadness, love, etc. We live in a world of action, and this implies that everything has a physical manifestation. Feelings and emotions require a very specific chemistry to exist, which in turn is tied to specific muscular engagement patterns. Try to truly "feel" happy and relaxed as you tense your body, cross your arms and legs, breathe fast and shallow and make a mean face for 10 minutes. It's not going to be easy.

There is a complex reciprocal interaction between the body and the mind and what happens in one reflects in the other⁸⁸. If you change the quality of your thoughts, you will feel a change in body behavior. Conversely, if you bring a change in your body behavior you will experience a change of your mental state. All physiological functions are connected. Stress or relax one and you will stress or relax them all. In the bigger picture: Stress or relax your body, and you will stress or relax your head.

When we smile for example, the brain releases dopamine, a neurotransmitter that produces feelings of happiness. Interestingly enough, this effect works both ways. The release of dopamine when we feel happy causes us to smile, and the mere act of smiling causes the brain to release dopamine, which in turn makes us feel happy.

This is not just about dopamine. Laughter causes the body to release into the bloodstream high concentrations of different hormones and neuropeptides related to feelings of happiness, bonding, tolerance, generosity, compassion and unconditional love. Let's call this a joy cocktail.

The presence of this joy cocktail precludes the production of other hormones and neuropeptides that are related to feelings of hatred, fear, violence, jealousy, aggression and the emotions associated with war and oppression. It is impossible to sustain feelings of hate and the desire to fight with someone with whom you are laughing unconditionally.

When you change, the world around you changes. When you feel good, you are more likely to address the challenges you have to face constructively and with a positive attitude.

2.3.2. WHY BETTER MOODS = BETTER HEALTH

It is said in the King James Bible "*A merry heart does good like a medicine, but a broken spirit dries the bones.*" (Proverbs 17:22)

This is still a modern medical statement. You may have heard the claim that the issue with many people is not what's wrong with their body, but that they have a broken spirit. Many don't die of cancer but of depression.

Here is why:

⁸⁸ Read more about the mind-body debate at <http://lou.pm/mbd>.

We now know that the brain and immune system represent a single, integrated system of defense⁸⁹, and that our moods and emotions affect our health.

In 1985, research by neuropharmacologist Candace Pert revealed that neuropeptide-specific receptors are present on the cell walls of both the brain and the immune system. This showed their close association with emotions and suggested mechanisms through which emotions and immunology are deeply interdependent. Showing that the immune and endocrine systems are modulated not only by the brain but also by the central nervous system itself has had an impact on the understanding of emotions as well as of disease.

Negative thoughts manifest into chemical reactions that can impact the body by bringing more stress into the system and decreasing its immunity. In contrast, positive thoughts and emotions trigger neurochemical changes that reduce the immunosuppressive effects of stress.

This is why laughter is so important. It disrupts the cycle of negativity and promotes a happier mood state. This has a lot to do with the fact that dopamine (which floods into your system when you are positive) has two functions. Not only does it make you happier, it turns on all the learning centers in your brain, allowing you to adapt to the world in a different way.

Watch Professor June Gruber from Yale University explain the research findings of Dr. Fredrickson & Levenson (1998) that showed that laughter helps us get rid of negative emotions: <http://lou.pm/fl>

Side note: Emotional memories last longer than factual memories⁹⁰. Laughter makes you feel good even after it subsides. I observe that the feel-good chemistry generated during a laughter session lasts from several hours to several days, even though people don't necessarily connect the dots and remember "why" they feel better after a while.

RELEVANT STUDIES

- Laughter improved mood and positive affect in healthy adults^{91,92,93};
- Laughter temporarily improved the mood of people suffering from depression⁹⁴;
- Laughter and humor improved quality of life in depressed patients^{95,96};

⁸⁹ This is the underlying premise of the field of Psychoneuroimmunology (the study of the interaction between psychological processes and the nervous and immune systems of the human body). Read more at <http://lou.pm/pni>

⁹⁰ What role do emotions play in memory? <http://lou.pm/mem>

⁹¹ Foley E, Matheis R, Schaefer C. Effect of forced laughter on mood. *Psychol Rep.* 2002;90 (1):184.

⁹² Neuhoff CC, Schaefer C. Effects of laughing, smiling, and howling on mood. *Psychol Rep.* 2002;91 (3 pt 2):1079-1080.

⁹³ Szabo A, Ainsworth SE, Danks PK. Experimental comparison of the psychological benefits of aerobic exercise, humor, and music. *Humor.* 2005;18 (3):235-246.

⁹⁴ Morgan AJ, Jorm AF. Self-help interventions for depressive disorders and depressive symptoms: a systematic review. *Ann Gen Psychiatry.* 2008 Aug 19;7:13.

- Laughter promoted psychological wellbeing in different clinical settings^{97,98,99,100,101};
- Laughter and humor improved coping abilities^{102,103,104}.

2.4. SOCIAL BENEFITS: THE HUMAN ELEMENT

Laughter is mainly about relationships. We live in a society that tends to isolate and divide people.

Laughing together can greatly improve cooperation and empathy between people of different cultural backgrounds. It fosters better communication, which leads to a less confrontational approach in tense situations and a change from individual competitiveness to team cooperation. Intentional laughter in particular is most beneficial for very socially and culturally diverse groups thanks to its universal and inclusive nature, because it means that they can all join in and develop a sense of belonging.

The English comedian John Cleese said, *“I’m struck by how laughter connects you with people. It’s almost impossible to maintain any kind of distance, any sense of social hierarchy when you are just howling with laughter. Laughter is a force for democracy”*¹⁰⁵.

Laughter is usually an indicator of family vitality and healthy couples. Laughter is very attractive at the interpersonal level, especially for women. Men use much more humor and laughter when it comes to discussing sensitive health issues. In women, laughter would be more associated with greater social support in relationships and as a tool to cope with stress.

⁹⁵ Walter M, Hänni B, Haug M, et al Humour therapy in patients with late-life depression or Alzheimer's disease: a pilot study. *Int J Geriatr Psychiatry*. 2007;22 (1):77-83.

⁹⁶ Takayanagi K. Laughter education and the psycho-physical effects: introduction of smile-sun method. *Jpn Hosp*. 2007 Dec; (26):31-35.

⁹⁷ Erdman L. Laughter therapy for patients with cancer. *Oncol Nurs Forum*. 1991;18 (8):1359-1363.

⁹⁸ Schmitt N. Patients' perception of laughter in a rehabilitation hospital. *Rehabil Nurs*. 1990;15 (3):143-146.

⁹⁹ Tennant KF. Laugh it off. The effect of humor on the wellbeing of the older adult. *Geronto Nurs*. 1990;16 (12):11-17.

¹⁰⁰ Borod M. SMILES - toward a better laughter life: a model for introducing humor in the palliative care setting. *J Cancer Educ* 2006;21 (1):30-34.

¹⁰¹ Dean RA, Gregory DM. Humor and laughter in palliative care: an ethnographic investigation. *Palliat Support Care*. 2004;2 (2):139-148.

¹⁰² Saper B. The therapeutic use of humor for psychiatric disturbances of adolescents and adults. *Psychiatr Q*. 1990;61 (4):261-272.

¹⁰³ Abel MH. Humor, stress and coping strategies. *Humor*.2002;15 (4):365-381.

¹⁰⁴ Nezlek JB, Derks P. Use of humor as a coping mechanism, psychological adjustment, and social interaction. *Humor*. 2001;14 (4):395-413.

¹⁰⁵ John Cleese BBC Report on Laughter Yoga. See <http://lou.pm/jcq>

A research paper suggests that 80% of our laughter occurs during everyday comments in everyday social situations and only acts as social signals of goodwill and friendship¹⁰⁶.

Robert Provine, a neurobiologist who studies laughter, with help from three graduate students, went to places such as shopping malls and eavesdropped on more than 1200 conversations¹⁰⁷. They noted who was speaking, who was listening, who laughed and when, and whether the speaker and listeners were female or male. They found that the person speaking laughed 46% more than the listeners. Furthermore, the response to the speaker depended on the speaker's gender. People, whether male or female, laughed more readily in response to a male speaker. The researchers observed that laughter rarely interrupted speech. Instead, laughter came at the end of a phrase, much as punctuation follows a written sentence. They also found out that it is up to 30 times easier to laugh in a group than on your own.

RELEVANT STUDIES

- Conversational laughter helped prevent or resolve risk of confrontation in addiction group therapy¹⁰⁸;
- In patients with schizophrenia, a humor and laughter intervention reduced hostility and depression/anxiety scores; improved activation scores and social support^{109,110}; lowered the levels of psychopathology; and improved social competence¹¹¹;
- Laughter enhanced patient care in different clinical settings¹¹²;
- Laughter may enhance conversation between health care professionals and patients¹¹³.

¹⁰⁶ Laughter by R. Provine, in American Scientist, 1996. <http://lou.pm/provine>

¹⁰⁷ Robert Provine: Cracking the Laughing Code - <http://lou.pm/code>

¹⁰⁸ Arminen I, Halonen M. Laughing with and at patients: the role of laughter in confrontations in addiction group therapy. Qual Rep. 2007;12 (3):484-513.

¹⁰⁹ Gelkopf M, Kreitler S, Sigal M. Laughter in a psychiatric ward. Somatic, emotional, social, and clinical influences on schizophrenic patients. J Nerv Ment Dis. 1993;181 (5):283-289.

¹¹⁰ Gelkopf M, Sigal M, Kramer R. Therapeutic use of humor to improve social support in an institutionalized schizophrenic inpatient community. J Soc Psychol 1994;134 (2):175-182.

¹¹¹ Gelkopf M, Gonen B, Kurs R, Melamed Y, Bleich A. The effect of humorous movies on inpatients with chronic schizophrenia. J Nerv Ment Dis. 2006;194 (11):880-883.

¹¹² Scholl JC, Ragan SL. The use of humor in promoting positive provider-patient interactions in a hospital rehabilitation unit Health Commun. 2003;15 (3):319-330.

¹¹³ Karl KA, Peluchette JV, Harland L. Is fun for everyone? Personality differences in health care providers' attitudes toward fun. J Health Hum Serv Adm. 2007;29 (4):409-447.

2.5. SPIRITUAL WELLBEING: FROM NMA TO PMA

The regular practice of intentional laughter exercises as proposed by Laughter Yoga, Laughter Wellness and other similar methods has a marked impact on spiritual wellbeing. It helps people shift from a negative mental attitude (NMA) into a positive mental attitude (PMA).

Spiritual wellbeing is about wholeness on all levels: physical, mental, emotional, and spiritual. It is about finding meaning and purpose in our life and our place in the greater universe; positively engaging with others, self and our environment. (Note: Although the terms spirituality and religion are often used interchangeably, they also have their distinction. One may be spiritual without attending services or belonging to a particular religion. Similarly, one may be religious, yet not have a connection to their spirituality).

Laughter is a tool that can disarm, open doors and possibilities and enable other elements of levity such as play, wonder and celebration of life.

Choosing to laugh does not change your outer circumstances but how you perceive them. A meaningful life and a happy life overlap in certain ways, but are ultimately very different. Seeking to lead a happy life is associated with being a “taker” (there is an emptiness inside that you are trying to fill) while leading a meaningful life corresponds with being a “giver” (you are full inside and want to share that). Take time to think about this.

Happiness without meaning characterizes a relatively shallow, self-absorbed or even selfish life, in which things go well, needs and desire are easily satisfied, and difficult or taxing entanglements are avoided.

Beyond its health benefits, intentional laughter (as practiced by Laughter Yoga, Laughter Wellness and similar methods) is about changing your mental map through the practice of releasing negative thoughts and emotions. The experience of being able to genuinely laugh when you want to (you get there with a bit of practice), simply because you want to, creates an inner pool of attraction for a different way to be in the world and how to react to its many challenges. It may not make you feel like laughing all the time, but it creates the awareness that you always have that option.

If you ever find yourself buried in the deepest darkest night of your soul, that is when you will need to laugh the most because that is a time for immediate action, not complaints or finger pointing. It's not about making fun of anybody or anything, being careless or insensitive. It's about staying sane, functional and positive, emotionally ready for what's coming next. It's not because you care less, but because you care more.

Choosing to remain positive and be comfortable with your imperfections and the challenges in your life does not mean you have to be complacent about them. You should not. Laughing about them is a sign of maturity. Accepting and embracing our frailty and shortcomings as human beings opens the door to compassion.

In the words of Bernie DeKoven, “*Playing and laughing together, especially when we play and laugh in public, because we choose to, just because, is a profound, and, oddly enough, political act. Political, because when we play or dance or just laugh in public, people think there's something wrong with us. It's rude, they think, childish, a disturbance*”

of the peace. Normally, they'd be right. Except now. Now, the peace has been deeply disturbed – everywhere, globally. And what those grown-ups are doing, playing, dancing, laughing in public is not an act of childish discourtesy, but a declaration of freedom, a demonstration that we are not terrorized, that terror has not won, that we refuse to let fear, anger, guilt or resentment win and rule our lives.”

Choosing to laugh with life and others (not at them) is a practice that will teach you to first see what works before what doesn't work.

Proponents of “positive psychology” have identified humor and laughter as one of the 24 positive personal values and attributes¹¹⁴.

PRACTICAL APPLICATION

Always ask yourself the following question, which is also a constant call to action: “*What can I do now with a smile? Me, not you. Do, not try. Now, not later. With a positive attitude.*”

2.6. DOES LAUGHTER HAVE CONTRAINDICATIONS?

IN GENERAL

Yes. Laughter is contraindicated for people suffering from advanced (bleeding) piles and hemorrhoids or any bleeding tendencies in any part of the body, any acute symptoms of cough, any kind of hernia, cold and fever, epilepsy, heart disease with angina pain, incontinence of urine, persistent cough with breathlessness, severe backache, uncontrolled high blood pressure, within three months of a major surgery, and way too many other conditions to list here. If in doubt first ask your doctor if it's OK for you to laugh.

No. Laughter is about breathing, and breathing is not a contraindication to life. Research carried out in December 2013 in a Kidney Dialysis Hospital unit in Melbourne, Australia, showed that a 30-minute Laughter Yoga session every two days for 30 days had no adverse effect on patients with extreme conditions¹¹⁵.

It depends. Are you using force or being gentle with yourself and respectful of your own limitations?

IN PARTICULAR

Laughter is universally well tolerated, but caution is advised in patients with certain concerning health conditions.

¹¹⁴ Seligman MCP, Stee RA, Park N, Peterson C. Positive psychology progress: empirical validation of interventions. *Am Psychologist* 2005; 60 (5): 410-421.

¹¹⁵ See <http://lou.pm/kdp>

A literary review of 67 years of research on laughter published in the *British Medical Journal* in December 2013¹¹⁶ reviewed what modern science knows about its beneficial and harmful effects. They found **one** case of death by laughter¹¹⁷. She was 50, schizophrenic, and was referred for polymorphic ventricular tachycardia (she had a history of heart problems) after Ziprasidone therapy (an antipsychotic drug known to increase mortality in people with dementia-related psychosis). She had intense, sustained laughter one day after hearing a joke, collapsed and could not be revived. For the record, this is why pathological laughter can be dangerous. People with these symptoms just can't control themselves and fall into excess, or distress.

More valid concerns were raised in that particular review against hearty and “*intense side-splitting laughter*” that can adversely impact certain people with pre-existing health conditions. The conclusion however was unavoidable and predictable: “*The benefit-harm balance of laughter is probably favorable.*”

“*The incidence of heart attack while shoveling snow, for persons with impaired heart function, is alarmingly high,*” says Dr. William Fry, professor emeritus at Stanford University, a man who has studied the health aspects of laughter for decades. “*But unexpectedly and against logic, the incidence of heart attacks suffered while laughing is surprisingly low.*”

¹¹⁶ Methodical Investigation of Risibility, Therapeutic and Harmful: narrative synthesis - <http://lou.pm/bmj>

¹¹⁷ 50 year old schizophrenic woman with a heart condition died after intense sustained laughter - <http://lou.pm/dbl>