

Better Thinking

With A Leaner Brain and Body

Robert W Adams D.C., DABCN

Sonoma, CA

Robert@theneurotechnologies.com

Purpose: Increase awareness of the need for brain activation with specific neurologically based exercises, and the benefits of calorie restrictions in the diet for better brain function and Alzheimer's prevention.

A new study finds obese people have 8 percent less brain tissue than normal-weight individuals. Their brains look 16 years older than the brains of lean individuals.

Those classified as overweight have 4 percent less brain tissue and their brains appear to have aged prematurely by 8 years.

The results, based on brain scans of 94 people in their 70s, represent "severe brain degeneration," said Paul Thompson, senior author of the study and a UCLA professor of neurology. ⁱ

"That's a big loss of tissue and it depletes your cognitive reserves, putting you at much greater risk of Alzheimer's and other diseases that attack the brain," said Thompson. "But you can greatly reduce your risk for Alzheimer's, if you can eat healthily and keep your weight under control."

Obesity packs many negative health challenges, including increased risk of heart disease, Type 2 diabetes, hypertension and some cancers. It's also been shown to reduce sexual activity.

More than 300 million worldwide are now classified as obese, according to the World Health Organization. Another billion are overweight. The main cause, experts say: poor dietary habits, including an increased reliance on highly processed foods.

Obese people had lost brain tissue in the frontal and temporal lobes, areas of the brain critical for planning and memory, and in the anterior cingulate gyrus (attention and executive functions), hippocampus (long-term memory) and basal ganglia (movement). Overweight people showed

brain loss in the basal ganglia, the corona radiata, white matter comprised of axons, and the parietal lobe (sensory lobe).

"The brains of obese people looked 16 years older than the brains of those who were lean, and in overweight people looked 8 years older," Thompson said.

Obesity is measured by body mass index (BMI), defined as the weight in kilograms divided by the square of the height in meters. A BMI over 25 is defined as overweight, and a BMI of over 30 as obese. In common American figures a 5'8" 152 pound male would have a BMI of 23 which is just about the right proportion. A 5'8" male that weighs 174 pounds would have a BMI of 26 and would be overweight. That same male at 192 pounds would have a BMI of 30.6, a value above the obesity threshold according to the BMI.

The research was funded by the National Institute on Aging, National Institute of Biomedical Imaging and Bioengineering, National Center for Research Resources, and the American Heart Association

As if we need more reasons to tend to our families' diet, this here is yet another bit of bad news. It bears repeating that , according to this new study* of obese adults, in addition to increased risk of heart disease, Type2 diabetes, and cancer, obesity also contributes to "severe brain degeneration".

The study examined the brain scans of 94 adults in their seventies and found that the obese subjects had 8% less brain tissue than their normal-weighted counterparts and brains that looked 16 years older. People who were classified at overweight had 4% less brain tissue and brains that appeared 8 years older.

Researchers found losses in the areas of the brain responsible for higher functioning, like problem-solving, language and impulse control (frontal lobe), memory and spacial navigation(temporal lobe, hippocampus), and motor functions and learning (basal ganglia).

This information only adds to the growing arsenal of reasons to get serious about what we eat. ..and what we teach and model for our children about food. The American diet is replete with short-cut, processed foods that are quick and accessible, but totally void of nutrition. Most of us really must rethink what and how we eat.

When you carry too much weight, you not only considerably shorten your life expectancy, taxing all of your body's systems from cardiovascular to your musculo-skeletal system, but you reduce your quality of life. You don't feel well. You don't get around well. And now, this study suggests, that you are likely not even thinking straight!!

With regard to children, we know that the habits we teach our children in childhood stick with them throughout adulthood, especially eating habits. This is why so many of us have a hard time staying with positive life changes that we know can save our own lives. Perhaps this study's bit

of bad news will be the impetus you need to begin your family's commitment to eating well and getting active.

Not only can extreme obesity take 10 years off your life, it could also be prematurely aging your brain. In this study the brains of obese people look 16 years older than those of lean people, due to eight percent less brain tissue on average. The brains of individuals classified as "overweight" appear eight years older than those of normal-weight people. The researchers concluded that the loss of brain tissue due to weight problems could put patients at higher risk of Alzheimer's. According to study author and UCLA neurology professor Paul Thompson, "you can greatly reduce your risk for Alzheimer's, if you can eat healthily and keep your weight under control." So shape up your body, and the mind will follow.

A Previous study concluded a relationship with obesity and brain atrophy. "These findings suggest that middle-aged obese adults may already be experiencing differentially greater brain atrophy, and may potentially be at greater risk for future cognitive decline."ⁱⁱ

True and lasting health comes to a balance in five essential elements: a sound central nervous system, appropriate exercise, adequate rest, good nutrition, and a positive mental attitude. Each of these five elements must be balanced to maintain health.

Eating appropriate quantities of quality food coupled with the essential principle of exercise will assist with the achievement of leaner brain and body. Movement is important in the maintenance of our brains, physical frames, muscles, tissues, the health of our bones, and the strength of our immune system.

Our nervous system has primarily two functions: one is to receive information and the other is to transmit it. The information comes into the brain through activation of specific receptors often referred to as the senses: vision, hearing, taste, temperature, chemical changes, mechanoreceptor, (motion, stretch, or touch receptors). The touch receptors are found in the skin in the underlying fascii, in the muscles in the form of muscle spindle receptors, and in the joints of the spine. Exercise is important in maintaining the activation of the central nervous system through the stimulation of specific movement receptors.^{iiiivvvii} Research into what excites and activates the brain shows that 90% is from the accumulation of movement receptor stimulation. It is helpful when the exercises chosen are pleasant, enjoyable, and effective. It is good to create and experience novel exercises. Changing the exercise program on a regular basis is essential. Ideally, one would change their program routine of repetitions on a monthly basis.

To maintain a lean strong muscle it must be contracted. An important fact is that the half life of muscle protein is 6-10 days. Muscle protein is what makes up the elements associated with the contracting of the muscle. When the muscle protein is reabsorbed due to inactivity, the muscles become weaker, smaller, and less effective. This places more load on the tendons and ligaments

and other supportive structures associated with the joints. Unfortunately, this leads to more frequent injuries.

Since this muscle protein has a half life of 6-10 days, inactivity or a significant reduction in the movement in the joint for 6-10 days results in a reduction of half of the protein in that muscle. Hence, when there is inactivity, or a lack of motion, there will follow a significant reduction in the strength of that muscle, physical capacity, beauty (in the appearance of a fit shape), and maintenance of lean tissue in the form of muscle.

Muscle requires a significant amount of energy in the form of calories to not only grow but to also be maintained. Each pound of muscle requires 100 calories a day for its maintenance. This is useful information in that if an individual gained five pounds of muscle through resistance strength training, they would increase the metabolic requirements to 500 calories per day. Five hundred calories per day, 7 days per week, equals 3,500 calories which is equal to 1 pound of fat being burned per week as a consequence to the additional muscle. This is significant when comparing calories burned when running a mile. For most individuals, running a mile burns 100 calories. Therefore, they would require 35 miles of running to burn up 3,500 calories or a pound of fat. This demonstrates how efficient and effective we are with burning when fat performing aerobic exercise. We get “good mileage” from our fat. Most people may walk a mile and burn up 80 calories. It would take about 41 miles to burn up 3,500 calories or a pound of fat with walking. Therefore, we are **most effective at fat loss by increasing lean mass** with resistance strength training.

To be fair, after exercising for 30 minutes there is a 2-hour post exercise increased metabolic rate, such that 2 hours after a 30-minute work-out is approximately 2 hours of increased activity and burning 25% more calories. Therefore, the combination of resistance strength training to build muscle and a reasonable aerobic program for increasing metabolic activity would be useful for maintaining cardiovascular health and a lean form. Too many neglect to take advantage of this muscle building benefit. The best exercises for over strength include: Bench Press, Squats, and Dead Lifts.

Incorporating exercises that integrate central neurological activity will further enhance exercise benefits. These exercises should include cross-crawls, cervical extension, special eye exercises, and balance exercises, which promote intrinsic spinal muscle activity.

Another benefit to exercise is cancer prevention. Studies indicate that women, who average 3 hours of exercise per week, reduced their risk of breast cancer by 30%. Women who exercised 4 hours per week, reduced their risk of breast cancer by 60%. Men who exercised by walking 5 miles per week reduced all cancer by 50%. That would be inclusive of prostate cancer.

Therefore, the combination of aerobic activity and resistance strength training are essential components to fitness. The benefits are: maintenance of lean tissue for purposes of maintaining

good core stability, and activation of mechanoreceptor populations to stimulate greater brain function.

Since 90% of the brain is activated by movement receptor input and the greatest concentration of mechanoreceptors are associated with spinal motions, activities which promote greater spinal mobility, are essential. Also, since the paraspinal muscles are richly populated with muscle spindle afferents and muscle protein, activities which would promote greater spinal mobility and spinal muscle activity, would promote greater levels of activation of movement receptors.^{viiiixxi}

Recent studies on brain activity have shown that the brain releases Brain-Derived Growth Factors (BDGF) when presented with novel stimuli and novel activities. Therefore, for most efficient results for a healthy brain, back and body, it is important to incorporate a fitness routine that includes: resistive strength training exercises that are novel, that engage spinal muscles to a high degree, that incorporate postural and balancing activities, and that are relatively fun and enjoyable. Incorporating these aspects with exercise will result in better shape, better stamina, stronger bones, more muscle tissue for strength capacities and calorie consumption. This will provide greater brain activation through the stimulation of mechanoreceptor populations, activation of higher brain centers, and thus a greater sense of well-being through the release of neurotransmitters, and endogenous or naturally found opiates.^{xii}

Seek out interesting new resistance strength training neurologically integrating exercises. Implement consistent caloric restriction practices. Use exercise programs that incorporate cervical extension, cross-crawl patterning, use of weights, exercise bands, exercise balls for core stabilization, muscle growth and improved balancing activities. You can then expect better thinking with a leaner brain and body.

By: Robert W. Adams DC, DABCN private practice of Chiropractic Neurology

To arrange Speaking Engagements on applications contact: Robert@theneurotechnologies.com

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Cyrus A. Raji, April J. Ho, Neelroop N. Parikshak, James T. Becker, Oscar L. Lopez, Lewis H. Kuller, Xue Hua Alex D. Leow, Arthur W. Toga, Paul M. Thompson **“Brain structure and obesity”, The Journal of Human Brain Mapping, Online Edition September 2009.**

ii **Michael A Ward, Cynthia M Carlsson, Mehul A Trivedi, Mark A Sager and Sterling C Johnson** The effect of body mass index on global brain volume in middle-aged adults: a cross sectional study

BMC Neurology 2005, **5**:23doi:10.1186/1471-2377-5-23

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- iii . Pickar, Joel DC, PhD, and McLain, Robert, MD. "Responses of Mechanosensitive Afferents to Manipulation of the Lumbar Facet in the Cat." *Spine*, 20 (22): 2379-2386. Lippincott-Raven (1995).
- iv . Hongxing Jiang MB, PhD; Moreau, Marc MD; Raso, James MASC; Russell, Gordon MB, ChB, MSc; and Bagnall, Keith PhD. "Identification of the Location, Extent, and Pathway of Sensory Neurologic Feedback After Mechanical Stimulation of Lateral Spinal Ligament in Chickens." *Spine*, 22 (1): 17-25. Lippincott-Raven (1997).
- v . Gordon, James. "Spinal Mechanisms of Motor Control." *Principles of Neuroscience* (3rded.): 593. Elsevier Science Publishing Company, Inc. (1991).
- vi . Gordon, James and Ghez, Claude. "Muscle Receptors and Spinal Reflexes; The Stretch Reflex." *Principles of Neuroscience* (3rded.): 374. Elsevier Science Publishing Company, Inc. (1991).
- vii . Wyke, Barry. "Articular Neurology and Manipulative Therapy." *Aspects of Manipulative Therapy: 72-77*. Edited by Glasgow, E. Churchill Livingstone, New York (1985).
- viii . Gilman, Sid M.D., Department of Neurology, University of Michigan. *The Annals of Neurology*, 35(1): 3-4. January 1994.
- ix . Koester, John, "Voltage-Gated Ion Channels and The Generation of the Action Potential," *Principles of Neuroscience* (3rded.): 111. Elsevier Science Publishing Company, Inc. (1991).
- x . Davey, Nick PhD and Lisle, Rebecca BS. "Activation of Back Muscles During Voluntary Abduction of the Contralateral Arm in Humans." In *Spine*, 27 (12): 1355-1360. (2002).
- xi . Melillo, Robert and Leisman, Gerry. "Neuro Behavioral Disorders of Childhood," p. 76, Kluwer Academic-Plenum Publishers, New York (2004).
- xii . Doidge, Norman MD. "The Brain That Changes Itself." *England Books*: 80-81 (2007).

Increase Brain Neuroplasticity

For Balance and Fall Prevention

The Brain Back Body Exercise Program

The Brain Back Body DVD Program is a combination of specific Neuro integration exercises combined with traditional strength building protocols. The Brain Back Body DVD Exercise program was designed to increase Brain Neuroplasticity, Core spinal strength, and overall body conditioning. In an article in the March 26, 2009 Wall Street Journal about "Brain Gyms" and neuroplasticity, the demand for "scientific-based brain-fitness workouts" was evident by the following : " Consumers spent more than 80 million in 2008 on mental fitness." We have been at this for decades but as you will read some call it "new".

"The industry pins its claims for brain exercise on a relatively new scientific discovery:

neuroplasticity, the brain's ability to rewire itself throughout life by creating neural connections in response to mental activity."....." ...bulking up the brain, what brain scientists refer to as "cognitive reserve". The theory: People engaged in greater degrees of mental stimulation increase their brain mass and neural pathways, protecting them if a brain injury or dementia starts chipping away at brain connections."

The Brain Back Body Exercise Program creates a real “Brain Gym” in the privacy of your home. This program increases brain health by **activating the main pathways into the brain**. Three exercise chapters are divided to focus on specific brain and body areas:

Chest and Shoulders(Bench Press),

Arms and Back (Dead Lifts),

and Legs(Front Squat)

Each Chapter begins with a unique pattern of neuro integrative warm-up exercises (body swivels, eye exercises-pursuits, VOR, fixations, vergence, and saccades, cross crawls, neck and core against small ball) that are followed by resistance strength training procedures using exercise bands, and balls to increase neck and back strength, for Core strength, stability, and balance. The program objectives are to increase activation of the parts of the brain that control the spinal muscles (midline cerebellum) and for increasing the health of the cerebrum (increased frequency of firing of higher brain centers) for enhanced cognition, increased neuroplasticity, and postural control. The program will assist with muscle growth. This results in smoother motions, a better appearance, and improved thinking.

Brain Back Body DVD Program Package INCLUDES:

- The Brain Back Body DVD
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- FitBALL® Light Exercise & Extra Heavy Exercise Band s

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