I. Take Control of Your Brain Health

A. Neuroscience

The study of the nervous system and brain is a constantly changing field with current research shattering long held myths on aging. The old school of thought taught that the neural pathways in the brain, critical for new learning were fixed and once formed during childhood could not be altered.

Lucky for us modern brain study has revealed the brain can fundamentally reorganize itself when confronted with new challenges, and that this can occur regardless of age. The brains ability to adapt to an endless number of life situations is known as neuroplasticity (Cohen, 2001, Gross, 2000).

Neurogenesis

Regularly engaging in persistently challenging and stimulating activities is associated with the release of neurotrophins or proteins that nurture the growth of brain cells. The development of these new neural pathways and connections in the brain is referred to as neurogenesis. This is really exciting news, confirming that age-associated mental decline is not inevitable. Likewise, neurocognitive changes associated with vascular and Parkinson’s disease, Multiple Sclerosis as well as mild traumatic brain injury can be offset by the positive benefits of engaging in activities associated with cortical enrichment.

The hippocampus and amygdala, areas of the brain critical for learning and memory, appear particularly receptive to the development of new brain cells (Greenough, 1999; Erickson, 1998; Roy, 2000). In particular, regular cognitive exercise increases synaptic density in these key learning centers, acting as a kind of “Miracle-Gro” for the brain (Katzman, 1993).

Insulation from Cognitive Decline

Neurotrophins or proteins that nurture growth of brain cells are produced when we engage in persistently challenging and stimulating activities. Likewise, research has found that people with high levels of cognitive reserve – as measured by previous experiences with cognitively stimulating activities like education – were relatively protected against abnormal brain protein deposits such as beta-amyloid plaques and late onset Alzheimer’s disease.
In other words, if you take two people with the same levels of blood plasma beta-amyloids, the person with more brain reserve (built up through prior brain exercise) is likely to have better cognitive fitness down the road. Wow!

**Reduce Stress-Induced Damage to the Brain**

The hippocampus and amygdala (the fear center of the brain) appear equally receptive to an enriched environment, as they are vulnerable to stress (Gould, et. al., 1999). When the central nervous system is exposed to stress, adrenal glucocorticoids, a type of steroid hormone, are released into the brain. Stress hormones appear to accelerate neuronal loss in the hippocampus and related cognitive loss with aging (Smith, 1996).

**B. The Good News**

**Brain Resilience**

Prior exposure to cognitively stimulating experiences creates a resilient brain. Cognitive reserve builds a flexible organization of brain networks which can be recruited into service to compensate for cognitive changes associated with normal aging, brain injuries, cancer treatment, life stressors or neurological disease.

**Brain Responsiveness**

The even better news is that there is no expiration date on the brain’s power to rejuvenate itself. We do not “age-out” and an aging brain can be kept youthful through stimulation. The nervous system possess not just a ‘morning’ of plasticity, but an ‘afternoon’ and an ‘evening’ as well. The brain is adaptive and remains responsive to the benefits of exercise and challenging intellectual stimulation throughout our lifetime.

**Brain Reserve**

If the activity is new and hard, it means that you’re stimulating your cortex and laying down a new neural network that was not there before. With continued learning, the brain develops a rich network of neural associations we refer to as brain reserve. The message is clear: cognitively stimulating activity is critical for brain health and fitness. The more you exercise your brain now; the better off you’ll be later.

Just like depositing money in the bank, regularly engaging in stimulating brain activities can build up new brain cell connections and counter balance the effects from life’s stressors (Albert, 1988; Mortimer, 1997).

**II. Brain Wellness Lifestyle**

**Opportunity**

Factors critical to cortical enrichment includes exposure to persistently challenging and stimulating activities. In addition, geriatric neuropsychologist Paul Nussbaum Ph.D. in his book Your Brain Health
Lifestyle (2009) encourages daily activities that include socialization, physical exercise, nutrition and spirituality.

A. SOCIALIZATION- DON’T RETIRE FROM LIFE

“It is social aptitude, not intellectual brilliance or parental social class that leads to a well-adapted old age.”

Always Have a Purpose for Getting Up Each Day

Being social can have a positive impact on brain health, increasing creativity, critical thought and communication skills. Research indicates that older persons with five or six social ties are significantly less likely to demonstrate cognitive decline compared to those who had no social ties.

Do not retire from life. Multiple hobbies reflect a robust brain with neurological networks that have been nurtured. A role and purpose in life are critical components to longevity. Retirement is not a healthy choice unless there are sufficient hobbies and talents to maintain a purpose-driven life.

A Nation of Loners

According to the Census Bureau, 27% of households were single person in 2015, up from just 17% in 1970. We are becoming a nation of loners. Being a loner can have unhealthy side effects the same as smoking and obesity.
An Active Social Life Can Help You Live Longer

According to a Brigham and Young Study in 2015 loneliness and social isolation pose a threat to longevity. Whether you demonstrate a preference for being alone or find yourself feeling lonely and without meaningful social connections not by choice, you could be at risk. On average, loneliness, isolation and living on your own can increase your risk of premature death by 26%, 29% and 32% respectively.

Loneliness can raise the stress hormone cortisol, creating a negative effect on longevity similar to living in poverty. Maintaining a strong social network, with sympathetic friends can insulate us from life’s ups and down.

Consider Volunteering

The more you do for others the more you do for yourself. Getting outside your head and lending a hand to others reduces stress and cardiovascular disease. Volunteers also get a sense of being needed and a purpose for getting up every day, tending to ward off inactivity, depression and normal aches and pains. People older than 70 who volunteer over 100 hours a hear report better health and less chronic pain than non-volunteers.

Get Started!

- **Double the Benefits**: Socialization can sometimes be combined with another brain wellness activity. For example, by deciding to volunteer or join the community recreational center and take a dance class, one can fulfill daily social stimulation, physical activity and mental stimulation. You just hit a home run!

- **Make It Simple**: You don’t need to join a formal activity or group. Try having family night; make it a tradition and turn off the TV. You can simply sit and talk to friends or family, watch a movie, take a walk together or play a board game. Have a travelogue movie night once a month. Pick a country you would love to visit. Even better, do some research and see if you can make it a reality.

- **Make It A Priority**: By scheduling the time for a specific activity into your calendar, you increase the likelihood that it will become a reality.

- **The Possibilities Are Endless**: Check out the latest activities offered through your local recreation or senior center. Events are geared for the 50+ crowd as well as adaptive and therapeutic programs for various types of disabilities. The possibilities are endless!

B. MENTAL STIMULATION- THE AMAZING ADAPTABLE BRAIN

There is no expiration date on the brain’s power to rejuvenate itself. The brain is adaptive and remains responsive to the benefits of exercise and challenging intellectual stimulation throughout our lifetime. The brain can be kept youthful through daily cognitive stimulation, love and laughter.
The Truth about Crossword Puzzles

In order to reap the rewards the cognitive activity must be persistently challenging, in other words it has to be new to you. Many people use games like crosswords and Sudoku to sharpen their minds. Chances are if you do The New York Times crossword puzzle in pen then this activity is not sufficiently novel or challenging to stimulate neural growth.

Activities that build brain reserve include travel, learning a new language or musical instrument, picking up a new skill or taking an education class.

Computerized Cognitive Training

Just to be clear, computer games is not the same thing as computerized cognitive training. Spending hours on PlayStation or Nintendo may be a great way to wind down, but don’t fool yourself that you are going to improve your cognitive functioning. Computerized cognitive training exercises, or brain training, target the critical cognitive brain activities needed to succeed in life.

The objective of computerized cognitive training is to improve cognitive processing speed, real life working memory, fluid reasoning, executive functioning and self-control to aid in everyday living skills. Brain training also tunes up active listening, effort, self-control and mental flexibility skills needed to build and maintain self-control in a hectic world.

Qualifications of A Good Brain Training Software Program

Home based computerized cognitive training programs employ a procedural learning approach, to increase fluid intelligence by challenging cognitive faculties using novel and challenging exercises in which the difficulty level constantly adapts to each person’s individual development. When practiced routinely, these exercises can produce significant and long-lasting results.

There are numerous computerized cognitive enhancement games and brain teasers. However, research indicates in order to achieve gains in functional daily living skills, one must choose a home program that targets the “big three” cognitive skills. These include speed of information processing, working memory and fluid problem solving.

One needs to make a commitment of approximately 35 to 40 hours. In a home setting that may look like 30”/day, 7 days/week, for 3 months or so. Home programs allow you to sign up online, for a monthly fee, usually with a free trial period to determine if the program is a good match for you.

Get Started!

- **Brain Training**: Research indicates that computerized cognitive training programs, using a home program such as Lumosity (lumosity.com) or a personalized professional level program with 1:1 strategic coaching (MindPower), can provide the best return on your investment when increasing synaptic density and brain reserve. Routine practice 20” a day will increases central processing speed, working memory capacity and fluid reasoning skills. These are the “Big 3” metacognitive skills required for independent living.
Double the Benefits: Mental stimulation can often be combined with another brain wellness activity. For example, by deciding to sit in on a lecture or take a class in computer, Italian, cooking, or a golf class at the local community college or senior center, one can fulfill daily mental stimulation as well as socialization or physical activity.

Ying and Yang: An ambidextrous brain can better compensate for normal changes in aging. To build up neural circuitry in your non-dominant hand, try writing, putting together puzzles or dribbling a basketball with your non-dominant hand. Other physical activities such as gardening, knitting, and dancing (particularly tango and other pattern dance steps) require both dominant and non-dominant parts of the brain to master. Cha-Cha-Cha!

Make It Simple: You don’t need to join a formal activity or group. You can listen to your classical radio station or brush up on your world geography, national affairs, and local news. Learn a new recipe, write a letter, or better yet try writing a few lines with your non-dominant hand. Why not learn to email and send digital pictures to family and friends? Choose a word of the day. Post it and have everyone use it at least once in the day. Keep score for most creative or frequent uses.

Here’s an easy one. Summarize and present a national or local news event out of magazine or newspaper during the evening meal. Take turns. Debate! Above all, make it a point to learn something new every day and read, read, read!

C. EXERCISE – THE FOUNTAIN OF YOUTH

Miracle-Gro for the Brain

Exercise stimulates the production release of something called BDNF (brain-derived neurotropic factor), which is like “Miracle-Gro” for the brain. Neurotrophins not only increase neurogenesis, or the growth of new brain cells, but also synaptic density, the new connections between brain cells.

The brain regions most affected by the aerobic exercise include the basal forebrain, corpus callosum, hippocampus and the frontal lobes - areas vital to learning, memory, higher thinking and independent living!

Regulate Mood

Research indicates that those who engage in a regular exercise program have reduced levels of noradrenaline, resulting in greater sense of calm and wellbeing following aerobic exercise. Almost immediately when starting to exercise vigorously, galanin, a neuropeptide is released that counter balances the negative effects from stress overload.

Norepinephrine is an adrenaline like brain chemical that allows us to “wake up and get going” and fuels the frontal lobe as well as mysteriously boosts self-esteem. However, too much stress can be maladaptive, triggering a cascade of autonomic reactions, including rapid breathing, elevated heart rate over vigilance, hyperactivity, dizziness, insomnia and confusion, all symptoms frequently associated with panic.
Galanin allows one to regulate and modulate the level of norepinephrine that is released and projected to the prefrontal cortex to ensure the optimal level of noradrenaline is available to meet life’s demands.

Research indicates that those who engage in a regular exercise program have reduced levels of noradrenaline, resulting in greater sense of calm and wellbeing following aerobic exercise.

Exercise also boosts dopamine, associated with attention and mood regulation. Finally, the well-known chemical serotonin, important for mood, self-esteem and impulse control, is bumped up as well. And to add frosting to this cake, endorphins, the “feel good” hormone, are released within the brain upon exercise.

Reduce Risk of Vascular Disease

What’s good for the heart is good for the brain. While the brain weighs only 2-4 lbs. on average, it demands a full 25% of the blood and nutrients from each heartbeat. Exercise reduces the risk of cardiovascular disease and keeps the bones strong. What a deal! As little as 30 minutes of moderate aerobic physical activity 5 x week can lower the risk of heart disease by 14 percent, as well as enhance the hippocampal region, associated with learning and memory, by roughly 2 percent!

A study in JAMA found that women who began walking after age 65 were about half as likely to have heart disease or cancer as those with sedentary habits (McTiernan, 2003). This breaks down to about 10,000 steps a day. While most people may be familiar with this fact, only 35% of Americans exercise on a daily basis. Less than 22% of people ages 65-74 and 15% of those 75 or older remain active.

A Little Goes Along Way

Myth Buster: “I’m 55 years old, over weight and diagnosed with high blood pressure and late onset diabetes. Starting an exercise program now would be too hard and wouldn’t make any difference.”

Truth: Wrong on both counts. A recent study at the University of Pittsburgh (Kramer, et al., 2011) confirmed improved memory function with routine aerobic exercise in sedentary adults, ages 55 to 80. While normal aging can result in shrinkage and atrophy to the hippocampus and amygdala; areas of the brain critical for learning and memory, the study found that adults, who took part in 40 minutes of walking a day, three times a week, were found to enhance the hippocampal region by roughly 2 percent! Imagine the gains over the course of your lifetime if you could adopt the habit of walking just 3 times a week.

The Benefits of Just 10 Minutes a Day of Aerobic Exercise

In June of 2011, the American College of Sports Medicine updated its exercise guidelines for the first time since 1998 to reflect results from an American Heart Association study which indicated that as little as 75 minutes a week, or 10 minutes a day of light exercise can provide physical benefit.
The study’s author found the biggest health benefits were found in the sedentary group, “for those who went from doing nothing to those doing something small.”

Additional findings indicated that people who followed 2008 US federal guideline’s recommendation of 30 minutes of moderate intensity physical exercise (hiking, tennis, swimming, biking, jogging or racquet ball) 5 x a week or 75 minutes of high intensity activity a week have a 14% lower risk of heart disease as well as increase synaptic density in the hippocampus on the brain.

From here, the benefits increase exponentially. If you do twice the guidelines, or 300 minutes a week of moderate intensity activity, you can lower your risk 20 percent. However, at higher levels of 750 minutes a week, there was only a moderate decrease (25%) in risk.

While 30 min. of moderate intensity physical activity 5 x a week is required for maximal cognitive benefit, the study clearly shows how even a limited amount of light exercise can provide physical benefits.

### Recommended Weekly Exercise

<table>
<thead>
<tr>
<th>Exercise Duration</th>
<th>Lowered Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;14% Low Intensity 75 min a week</td>
<td>30</td>
</tr>
<tr>
<td>14% Mod Intensity 150 min a week</td>
<td>25</td>
</tr>
<tr>
<td>14% High Intensity 75 min a week</td>
<td>20</td>
</tr>
<tr>
<td>20% Mod Intensity 300 min a week</td>
<td>15</td>
</tr>
<tr>
<td>25% Mod Intensity 700 min a week</td>
<td>10</td>
</tr>
</tbody>
</table>

*American Journal of Sport Medicine 2011 Guidelines*

*Note: Test results do not list an actual percentage for the magnitude of lower heart disease risk for 75 minutes a week because of the methodology used.*

### The Benefits of Exercise Include Those Diagnosed With Dementia

Participating in regular exercise program creates necessary daily routines and structure critical for those with dementia. The brain craves a regular pattern as it relieves the burden on the working
memory. Likewise it can reduce common symptoms of depression, reinforce goal setting behaviors and provide gains in quality of life.

**Get Started!**

- **Double the benefits:** Physical exercise can sometimes be combined with another brain wellness activity. For example, by deciding to join a health club or community recreational center and take a water aerobics class, one can fulfill daily exercise requirement as well as receive a mental payoff and vital social stimulation.

- **Make It Simple:** You don’t need to join a formal activity or group. By purchasing a pedometer you can keep track of your daily steps and it will remind you to walk. Other aerobic activities include biking, your favorite exercise videos, weight lifting, climbing stairs instead of taking the elevator, shooting basketballs, washing windows and floors, raking leaves and gardening. Challenge yourself to set a goal and then reach it!

- **Make It A Priority:** Having a training partner or joining an exercise class can provide the structure, variety, challenge and camaraderie that many folks need to hang in there. Come on, just do it!

- **Make it Balanced:** Emphasize a combination of aerobic activity, strength training and flexibility. Some activities such as Tai chi improve balance and flexibility, prevent falls, plus improve heart and lung function.

**D. NUTRITION – FOOD FOR THOUGHT**

**What Your Brain Needs**

Components of a brain health diet include antioxidants and Omega 3 fatty acids. In addition, avoiding saturated and trans fats, high amounts of salt, concentrated sugar, preservatives and packaged foods will reduce risk for high cholesterol, high blood pressure and diabetes, all rapidly becoming an epidemic in adults.

**1. The Good Fats…. Omega 3 Fatty Acids**

**Why It’s Important**

Our brains are comprised of at least 60% fat. The fatty or lipid part of your brain helps to transmit information rapidly across your neural networks. Our bodies do not naturally produce fatty acids, so we are reliant on the diet to provide them. But it’s important that we consume the right fats. Today, we eat about 15 to 20 bad fats for every good fat.

**Where It’s Found in Nature**

Oily, cold water fish: lake trout, herring, sardines, albacore tuna, salmon, and mackerel. Other good sources of polyunsaturated fats include seeds, legumes, and whole grains such as walnuts, flax seed, wheat germ and canola oil.
Recommended Daily Allowance

It is recommended that 20-35% of daily calories should come from good fats. Try eating several ounces of salmon 1-2 times a week, 1-3 servings of nuts or legumes day and whole grain products liberally.

2. Antioxidants... Nature's Housekeeper

Why It’s Important

Antioxidants counteract the damaging effect of free radicals and works to guard cells from cigarette smoke, other pollutants and even stress.

Where It’s Found in Nature

<table>
<thead>
<tr>
<th>Betacarotene</th>
<th>Vitamin A</th>
<th>Vitamin C</th>
<th>Vitamin E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrots</td>
<td>Carrot juice</td>
<td>Oranges, Lemons, Limes</td>
<td>Nuts</td>
</tr>
<tr>
<td>Pumpkins</td>
<td>Sweet potato</td>
<td>Grapefruits</td>
<td>Seeds</td>
</tr>
<tr>
<td>Salmon</td>
<td>Pumpkin</td>
<td>Green peppers</td>
<td>Whole grains</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>Spinach</td>
<td>Broccoli, Blue berries</td>
<td>Green leafy veggies</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>Collard greens</td>
<td>Green leafy veggies</td>
<td>Wheat germ</td>
</tr>
<tr>
<td>Cantaloupes</td>
<td>Kale</td>
<td>Strawberries, Tomatoes</td>
<td>Canola oil</td>
</tr>
<tr>
<td>Peaches, Apricots</td>
<td>Beets</td>
<td>Raw cabbage</td>
<td>Fish/ Liver oil</td>
</tr>
</tbody>
</table>

Alternate Source: Phytochemicals

<table>
<thead>
<tr>
<th>Selenium</th>
<th>Folate</th>
<th>Anthocyanin's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil nuts</td>
<td>Fortified breakfast cereals</td>
<td>Blueberries</td>
</tr>
<tr>
<td>Canned tuna</td>
<td>Chickpeas, Broccoli</td>
<td>Cranberries</td>
</tr>
<tr>
<td>Shell fish</td>
<td>Asparagus</td>
<td>Strawberries</td>
</tr>
<tr>
<td>Lean beef, Turkey or Chicken</td>
<td>Spinach</td>
<td>Blackberries, Cherries</td>
</tr>
<tr>
<td>Enriched noodles</td>
<td>Black, kidney and lima beans</td>
<td>Eggplant</td>
</tr>
<tr>
<td>Oatmeal and other grains</td>
<td>Brussels sprouts’</td>
<td>Kiwi, Plums</td>
</tr>
<tr>
<td>Cottage cheese</td>
<td>Oranges</td>
<td></td>
</tr>
<tr>
<td>Garlic, Sesame seeds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lycopene</th>
<th>Reservatrol</th>
<th>Flavonoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomatoes</td>
<td>Red grapes</td>
<td>Vegetable and fruit skins</td>
</tr>
<tr>
<td>Pink grape fruit</td>
<td>Red wine*</td>
<td>Soy, Tea</td>
</tr>
</tbody>
</table>

*Note: Taken in moderation. 4-6 oz. glass of red wine per day for women and 4-8 oz. for men as directed by physician
The Best of the Best: Foods that contain the largest concentrations of antioxidants per serving

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Nuts</th>
<th>Vegetables</th>
<th>Spices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranberries</td>
<td>Pecans</td>
<td>Pintos/ Kidney beans</td>
<td>Ground Cinnamon</td>
</tr>
<tr>
<td>Blueberries</td>
<td>Walnuts</td>
<td>Artichokes</td>
<td>Ground cloves</td>
</tr>
<tr>
<td>Blackberries</td>
<td>Hazelnuts</td>
<td>Black- eyed peas</td>
<td>Dried Oregano</td>
</tr>
<tr>
<td>Black plums</td>
<td>Pistachios</td>
<td>Red cabbage</td>
<td>Turmeric</td>
</tr>
</tbody>
</table>

3. A No-Brainer - Avoid High Amounts of Salt, Concentrated Sugar, Preservatives and Prepackaged Foods

Why It’s Important

Eating too much sodium can increase your risk for high blood pressure, which is associated with cardiovascular disease and stroke.

Consumption of concentrated sugars can spike insulin levels, resulting in fatigue and compromising cognitive functioning. Keeping to complex, instead of simple, carbohydrates helps slow and balance sugar absorption, resulting in more stable energy levels. Complex carbohydrates generally include those in wholegrain form.

Where It’s Found in Nature

Trick question, it is not found in nature. Canned vegetables and soups, frozen microwave dinners, smoked or processed meats such as hot dogs, sausages, lunch meats.

Recommended Daily Allowance

Look on the nutrition label of packaged food item. An ideal amount of sodium would be 140 milligrams or less per serving.

4. Eliminate Bad Fats... Saturated and Trans Fats

Why It’s Important

Saturated fats boost your bad cholesterol levels, or LDL (low density lipoprotein). Furthermore, trans fatty acids, or “partially hydrogenated” oils not only raise LDL’s, triglycerides and lipoprotein A, they also lower the good cholesterol levels, or high density lipoprotein (HDL). Both saturated and trans fats are associated with increased risk for arteriosclerosis, heart attack and stroke.

Where It’s Found in Nature

Some saturated fats are worse than others. Whole dairy products can raise LDL levels, while beef fat has less of an effect. Tran’s fats aren’t found in nature and will be hard to avoid if you eat a lot of commercially produced foods like baked goods. Check food labels carefully. Folks, there’s a reason why these fats stay solid at room temperature! Not all vegetable oils are winners either; as coconut, palm, palm kernel oils and cocoa butter are types of saturated fats.
Recommended Daily Allowance

Zero tolerance. Instead, use monounsaturated fats such as olive, peanut and canola oil, or polyunsaturated fats like soy and corn oil. Replacing 2% of unhealthy trans fats with same amount of healthy mono or polyunsaturated fats could lower risk of heart disease by 50%! Limit dairy servings to 1-2 servings of low fat dairy products or a daily calcium and Vitamin D supplement.

5. Hydration

Not drinking enough water has detrimental effects on our brains. When your body lacks water, brain cells and other neurons shrink and biochemical processes involved in cellular communication slow. A drop of as little as 1 to 2% of fluid levels can result in slower processing speeds, impaired short-term memory, tweaked visual tracking and deficits in attention.

With proper hydration however, neurons work best and are capable of reacting faster. Unfortunately, most people are chronically dehydrated, due in large part to the prevalence of alcohol, caffeine, sugar and high protein foods. Eight glasses of water per day is ideal.

6. Get Started

- **Ideal Body Weight:** Your Height: ______________
  
  If you are male: 106 lbs for 5 ft tall. Add 6 lbs for every inch over 5 ft. 
  
  Male: 106 + (6 lbs x _____)   Your IBW = ___________
  
  If you are female: 100 lbs for 5 ft tall. Add 5 lbs for every inch over 5 ft.
  
  Female: 100 + (5 lbs x _____)   Your IBW = ___________

- **Healthy Range For Blood Pressure:** Your Blood Pressure Level: __________

<table>
<thead>
<tr>
<th>Blood Pressure</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/80 mm Hg or lower</td>
<td>Optimal</td>
</tr>
<tr>
<td>130/85 mm Hg or lower</td>
<td>Normal</td>
</tr>
<tr>
<td>130/85 - 139/89 mm Hg</td>
<td>High normal</td>
</tr>
<tr>
<td>140/90 mm Hg or higher</td>
<td>Hypertension</td>
</tr>
</tbody>
</table>

- **Healthy Range For Cholesterol Level:** Your Total Cholesterol Level: __________

<table>
<thead>
<tr>
<th>Total Cholesterol Level</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 200 mg/dl</td>
<td>Desirable</td>
</tr>
<tr>
<td>200 - 239 mg/dl</td>
<td>Borderline High</td>
</tr>
<tr>
<td>240 mg/dl or above</td>
<td>High</td>
</tr>
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</table>
• **Healthy Range For Low Density Lipoprotein Level:** Your LDL Level: __________

<table>
<thead>
<tr>
<th>LDL Cholesterol Level</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100 mg/dl</td>
<td>Optimal</td>
</tr>
<tr>
<td>100-129 mg/dl</td>
<td>Near Optimal</td>
</tr>
<tr>
<td>130-159 mg/dl</td>
<td>Borderline High</td>
</tr>
<tr>
<td>160-189 mg/dl</td>
<td>High</td>
</tr>
<tr>
<td>190 mg/dl or above</td>
<td>Very High</td>
</tr>
</tbody>
</table>

• **Healthy Range For High Density Lipoprotein Level:** Your HDL Level: __________

<table>
<thead>
<tr>
<th>HDL Cholesterol Level</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 40 mg/dl</td>
<td>Low (representing risk)</td>
</tr>
<tr>
<td>60 mg/dl or above</td>
<td>High (heart protective)</td>
</tr>
</tbody>
</table>

• **Healthy Range For Triglyceride Level:** Your Triglyceride Level: __________

<table>
<thead>
<tr>
<th>Triglyceride level</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 150 mg/dl</td>
<td>Normal</td>
</tr>
<tr>
<td>150-199 mg/dl</td>
<td>Borderline High</td>
</tr>
<tr>
<td>200-499 mg/dl</td>
<td>High</td>
</tr>
<tr>
<td>500-mg/dl or above</td>
<td>Very High</td>
</tr>
</tbody>
</table>

**E. MENTAL RESTORATION—KEY TO STRESS REDUCTION**

We’re all overcommitted, overworked and stressed out. We wake up in the morning, go full charge until we sleep at night, and most times we don’t sleep all that well because we can’t turn the thoughts off. The autonomic nervous system, triggered by chronic stress, is going all day which leads to sympathetic overload. As a result, thyroid levels are affected, blood pressure, heart rate and cholesterol levels go up and testosterone goes down.

The secretion of adrenaline and noradrenaline not only increases the risk of lifestyle disease such as hypertension, cardiovascular disease, diabetes, stroke and heart attacks it also increases risk of anxiety, depression and insomnia. And to make matters worse, the hippocampus and the amygdala, the parts of the brain critical for memory and learning, can become damaged by chronic stress as well.

**Neuroanatomy of Stress**

The stress response is generally adaptive and allows the body to quickly react to short term demand situations. It gives us the motivation to arrive to work on time and meet daily commitments. However, under traumatic or prolonged periods of emotional duress, stress is no longer is adaptive.

The locus coeruleus is located in the brainstem and receives and sends input to the amygdala, cingulate gyrus and prefrontal cortex of the brain. Its purpose is to regulate the production of galanin, a neuropeptide that ensures the optimal level of norepinephrine is projected to the prefrontal cortex of the brain to meet life’s demands.
Norepinephrine or noradrenaline is a neurotransmitter essential for mood regulation. Too little noradrenaline, the “wake up and get going” fuel, you lack urgency and can’t get to work on time. Too much norepinephrine and you go into stress overload. Interestingly, the reason why you may feel so calm after a run is that routine exercise can stimulate the production of galanin and reduce excess levels of norepinephrine.

Excess norepinephrine sends a signal to the amygdala triggering feelings of perceived danger, vigilance and hyperarousal. The fight or flight response has been hard wired into brain. However, in most cases we are not experiencing a life threatening emergency, and the enemy is our own negative and irrational thoughts.

Like a domino, the hypothalamus then unleashes a cascade of autonomic responses in the body, including accelerated heart rate, breathing, restlessness, sweating, dizziness and insomnia, all the physiological symptoms frequently associated with panic.

**Stress Can Rewire the Brain**

When the central nervous system becomes over activated, in preparation for fight or flight, adrenal glucocorticoids, a type of steroid hormone, is released into the brain. Stress hormones appear to accelerate advanced aging related to neuronal loss in the hippocampus.

The limbic system or the emotional center of the brain is made up of the amygdala and the hippocampus, brain regions critical for memory and emotional stability as well as the anterior cingulate gyrus essential for cognitive flexibility and motivation.

The brains vulnerability to cognitive decline from chronic stress hormones as well as the enduring power of negative reinforcement and phobic behaviors becomes better understood when considering the close proximity of these emotional, learning and memory regions to one another.

**The Mind Does Matter**

Sometimes it’s not simply a question of mind over matter. *It’s a matter of the mind does matter.* The body listens to the mind. By some estimates at least 60% of doctor visits are for problems associated with stress. The antidote for stress is relaxation, a physiological response induced by repetition or meditation.

Whether a mantra, sound, prayer, repetitive motion or a few minutes of ritualized quiet, these practices can decrease heart rate, blood pressure, strength the immune system, improve sleep and reduce risk for heart attack and stroke. Anxiety and panic attacks, autoimmune diseases like lupus and asthma can also find relief with systematic relaxation practices.

Meditation can actually change gene structure, lengthening the telomeres, the end of the chromosomes that contain genes. For certain illnesses, the longer the telomeres are, the less likely you are to express certain genes for chronic disease, such as central hypertension.
Meditation

The definition of meditation can be as varied as the means in which it is practiced. Meditation training allows one to increase voluntary control over attention and self-awareness to develop improved internal states of calm, clarity of thought, self knowledge, focus and wellbeing.

In a nutshell, meditation is the practice of paying attention and focusing awareness – in short, being fully conscious of the here and now. While mediation can be accompanied by various states of relaxation, it is not the goal, but a side effect. Meditation is a skill, and it takes practice. Although disciplines vary, generally meditation falls into two categories:

1. Calming Meditation

Like the name implies, the goal of calming meditation is a quieter more peaceful mind. Beneficial side effects are wide ranging affecting the mind and body. Reduction in adrenal overload can improve a number of metabolic functions, including digestion and gut, energy level, thyroid function and sleep, to name a few. A balanced level of noradrenaline can aid in mental initiation, focus and critical thinking, boosting length and frequency of “power hours”. Remember, these are periods when you feel optimistic, creative, and relaxed.

What, you never feel that calm, focused state of optimism? Well, you can learn to generate this energy state by paying careful attention to your current body rhythms as well as the effect from minor change ups in sleep pattern, nutrition, exercise and rested states of wakefulness, AKA meditation.

Mediation techniques involve concentrating on a particular object, such as a breath, a mantra, visualization, a physical object or even a physical sensation within the body. Andy Puddicombe, co-founder of Headspace, http://www.getsomeheadspace.com, offers a free computer app. that aims to demystify meditation and make it applicable to everyday life. Meditation is presented in 10 easy-to-learn steps to help you find a bit more clarity and calm in your everyday life.

Binaural Beats

*Brainwave entrainment* utilizes sequences of binaural tones to stimulate brainwave frequencies associated with various states of mind. In this process two different tones are played through headphones or earbuds. These binaural tones differ in frequency on the left and right side by an amount matching the target brainwave frequency. When processing these binaural tones the human brain perceives the frequency difference as an inaudible, periodic beat.

This periodic beat is often referred to as the binaural beat for a given sequence and the tones themselves as binaural beats, however, this beat is indirectly perceived as opposed to directly heard since it is below the range of human hearing (Perceived human hearing is limited to the range of frequencies from 20 Hz to 20,000 Hz, whereas human brainwave frequencies typically range from .5 to 40 Hz).

For each brainwave sequence the frequency of this perceived beat has been engineered to precisely match a target brainwave frequency. The effect on the brainwaves depends on the
difference in frequencies of each tone: for example, if 300 Hz was played in one ear and 310 in
the other, then the binaural beat would have a frequency of 10 Hz.

After a few minutes of use the listener's own brainwaves will begin to fall into step with, and
synchronize with, this binaural beat, inducing states ranging from deep sleep to intense
concentration and focus. This synchronization process, also known as the "frequency following
response", is referred to as brainwave entrainment.

This perceived beat frequency corresponds to the delta, theta, alpha, beta, or gamma range of
brainwave frequencies used in the different stages of each brainwave program to entrain the
users brainwaves towards the beat frequency.

*Brainwave entrainment* is not to be confused with neurofeedback therapy. Neurofeedback is a
type of brain restructuring process, performed by a board certified neurofeedback therapist.

**Brainwave 30 Advanced Binaural Programs** [https://itunes.apple.com/us/app/brain-wave-30-
advanced-binaural](https://itunes.apple.com/us/app/brain-wave-30-advanced-binaural) by Benzai Labs offers 15 binaural programs for improved sleep, concentration, relaxation, focus, creativity, stress relief, yoga, memory, motivation, coordination, headache, quick reflexes, energy and mental stamina. On Tunes apps. for $2.99

2. **Mindfulness Meditation**

Insight meditation aims at transforming the mind, developing self-insight, wisdom and
compassion. Mindfulness practiced properly leads to a greater *awareness* of whatever you are
experiencing and learning to accept your situation without judgment. It’s only natural that we
would prefer pleasure over pain, happiness over sadness, winning over losing and health over
sickness. Certainty and predictability are appealing because they provide a sense of perceived
security and safety. The truth is, though, we control much less of our lives than we’d like.

**Buddha’s Great Awakening**

What it means to be human can be boiled down into two experiences, unpredictability and
impermanence. The human condition refers to the ever changing nature of our day to day life
and the inevitability of some tough times. Whether you choose to perceive impermanence as a
glass half full or half empty, to be dismayed by fleeting joyful experiences or heartened by
knowing that tough times don’t last forever is up to you. Denying, or even resisting, that life is
uncertain and unpredictable can be a great source of stress and unhappiness for us.

**Accepting Life on Its Own Terms**

Buddha didn’t sugarcoat the experience of being human. He was pretty clear that the intense
desire to make things different than they are, to make what’s uncertain certain, to make
pleasant and joyful experiences permanent, and to never feel sadness or sorrow again is not
only futile, but painful as well.

When we resist experiences that could be of great value because our preference is to shut out
painful information, we end up focusing all our energies on changing the message and miss the
insights that are available in broadening our perception.
However, when we’re no longer deluded or confused about what to expect from life and can accept life on its own terms the possibility for peace arises.

**Discerning Bliss from Happiness**

We have all heard the saying, “Follow Your Bliss”. Real bliss is accepting life on its own terms, warts and all. While happiness is one end of the pendulum and grief the other, bliss is the center point and is available to us every moment of every day. Bliss is present in times of physical, mental, emotional, and spiritual pain as it is in times of joy. However, we are closer to experiencing real bliss during difficult times because it challenges us to break our attachment to happiness, allowing us to ascend to the next rung on the ladder, see life from a new perspective and awake to new truths. Once the spell of certainty is broken the opportunity for “Ah-Ha” moments and personal growth occurs.

**Cognitive Benefits of Meditation**

Participating in an 8-week mindfulness meditation program appears to make measurable improvement in brain regions associated with memory, sense of self, empathy and stress. In a study that appears in the January 30, 2012 issue of Psychiatry Research: Neuroimaging, a research team led by Massachusetts General Hospital (MGH) analyzed brain MRI’s of the study’s participants and found increased grey-matter density in the hippocampus, known to be important for learning and memory, and in structures associated with self-awareness, compassion and introspection.

The participant-reported reductions in stress also were correlated with decreased grey-matter density in the amygdala, which is known to play an important role in anxiety and stress. "It is fascinating to see the brain's plasticity and that, by practicing meditation, we can play an active role in changing the brain and can increase our well-being and quality of life." says Britta Hölzel, Ph.D., the lead researcher.

**Decrease Stress While Multitasking**

Need to do some serious multitasking? Some training in meditation beforehand could make the work smoother and less stressful. Results from a research study at University of Washington, published in the May 2012 edition of Proceedings of Graphics Interface, participants who received eight weeks of mindfulness-based meditation training reported lower levels of stress during a test of multitasking abilities, requiring them to use email, calendars, instant-messaging, telephone and word-processing tools.

Researchers measured the participants' speed, accuracy and the extent to which they switched tasks. The participants' self-reported levels of stress and memory while performing the tasks were also noted. While engaging in mediation did not actually improve speed, it did decrease off task behaviors as well as reducing reported levels of stress during periods of high task demand.
Benefits of Sleep

Getting enough sleep at night helps consolidate learning and the formation of new memories from the day’s experiences. People typically do best with 7-9 hours a night. Remember, it is just as important to establish evening habits as it is to have early morning routines...sometimes more important. What you do the evening before can help you plan for a successful day. Begin the process by setting a regular time to go to bed every night. If your chosen bedtime is 10:00 pm, you should be thinking of winding down activities by 8:00 pm.

Bed time routines could include listening to relaxing music, reading or listening to books on tape, drinking tea or engaging in evening meditation exercise.

Sleep Apnea and Risk for Dementia

As we age, our sleep patterns change. The same is true following a head injury or onset of a neurological problem. Common problems include getting to sleep or staying asleep, tending to wake up on and off through the night. Either way, you wake up feeling tired the next day and want a nap by midday.

Some sleep experts estimate that as many as 40 percent of older adults suffer sleeping problems such as sleep apnea and insomnia. Now, researchers have found a link between disrupted sleep and cognitive decline. Hypoxia is associated with periventricular white matter change, disabling the basal forebrain and the mediodorsal nucleus; the core consolidated learning centers of the brain. A diagnosis of sleep-disordered breathing or sleep apnea can increase the risk of developing dementia by almost twofold.

This is why it is critical to be routinely screened for sleep problems. If diagnosed, treatments include use of various kinds of sleep breathing machines, including a C-PAP or V-PAP. Early diagnosis can not only can help you sleep better, but down the line, can potentially reduce the risk of cognitive decline. There really is no down side, which is not the case with prescriptive sleep medications. Narcotics should be avoided by those suffering from sleep-disordered breathing or sleep apnea, tending to increase the risk of hypoxia.

Get Started

- **Make It Simple:** Learn relaxation techniques such as deep breathing and muscle relaxation. Go for a walk to clear your mind. Pray or meditate on a daily basis. Prioritize your activities based on what is most meaningful in life to you. Cut back on what is not essential.

- **Make It A Priority:** The brain needs a balance between stimulation and mental restoration. Make a conscious effort to slow down, sit and just be. Take 30 minutes a day, every day, for yourself.

- **The Possibilities Are Endless:** Check out the latest activities offered through your local recreation or senior center. Meditation practices are available to heal the heart, clarify your thoughts and increase tranquility.
REFERENCES