



EDITOR'S NOTES:

Addicted to Food

Sugar calms us down. It also boosts our mood, at least temporarily. Turning to a sweet treat once in a while to calm frazzled nerves probably won't hurt, but repeated trips to the cookie jar could lead to weight gain or even addiction.

For years, experts speculated that sugar addiction was an issue of habit, not substance abuse. Research at Princeton University changed all that. "We found in our studies that animals fed high-sugar diets exhibit all the symptoms of withdrawal, including agitation and nervousness, when sugar is taken away," says Bartley Hoebel, Ph.D., Professor of psychology at Princeton. "Reintroduce sugar to their diets and the animals binge, all of which are classic symptoms of substance abuse."

Changes in the animals' brains also resemble changes seen in other forms of addiction, from alcohol and drugs like morphine and heroin to gambling, sex, and tobacco. The very taste of sugar on the tongue releases endorphins in the brain, neurotransmitters that act much like morphine to provide a pleasurable response. Another neurotransmitter, called dopamine, permanently stamps the experience into our memory banks so that we are programmed to seek this yummy taste again. We literally become dependent on an inborn "high," feeling both comforted and pleased whenever we eat sugar. The response is so powerful that even the sight of food, let alone the smell, at a later date releases dopamine and a craving for another sweet taste and mood fix.

That's where the craving can turn into addiction. Repeated exposure to high quantities of palatable sweets overloads the brain's dopamine-pleasure/reward center, causing a down-regulation or hyposensitivity of the dopamine receptors. Now it takes more and more of that highly palatable food to get the same "fix." This food addiction also is associated with an increased risk for depression, obesity, anxiety, and sleep disorders.

Interestingly, these neural pathways are the exact same as those seen in addiction to drugs, alcohol, gambling, sex, etc. and, they cross over. Sugar-induced dependence in rats has been shown to promote increased consumption of ethanol, suggesting that food-related dependence may influence drug addiction.

In short, fighting a food addiction, that science now has proven is every bit as powerful as one to cocaine, heroin, alcohol, or nicotine, and every bit as difficult to break as a serious gambling addiction, is likely to require professional help. It is a lifelong process, not a get-in-and-get-out treatment. All trigger release of dopamine, result in down-regulation of that neurotransmitter with repeated use, and eventually the person seeks that "hit" not because it feels good, but to avoid feeling bad without it. The quick fix has become the problem, not the solution. The advice here to "eat less and exercise more" is about as useful as telling an alcoholic to just stop drinking.

The Tufts University study discussed in this issue (see *Rewire Your Brain*) is a breath of fresh air. It suggests that this food-addiction cycle is a two-way street. Just as we program our brains to need more and more junk, we can reprogram them to seek and enjoy healthy foods. The sooner we start, the better. Hopefully, it never is too late to retrain our brains. Of course, the best option is to not feed our children this junk – from fast food to sweet-and-creamy processed foods – in the first place and to avoid it ourselves at all costs!

Elizabeth Somer, M.A.,R.D.



Elizabeth Somer

Rewire Your Brain

People can train their brains to love healthy foods, according to a study from the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University. The researchers studied the brain's reward system in 13 overweight and obese men and women. MRI brain scans were given at the start and after a six-month period where participants either followed a weight loss protocol or served as a control group. Results showed that after six months of eating well, the area of the brain associated with learning and addiction showed significant changes in the weight-loss group. This area had increased sensitivity to healthy, lower-calorie foods, indicating an increased reward and enjoyment of healthier food cues. The area also showed decreased sensitivity to unhealthy, higher-calorie foods. This research provides hope that food addiction is reversible and that the brain can be "rewired" to love healthy foods after a lifetime of poor food choices.

Deckersbach T, Das S, Urban L, et al: Pilot randomized trial demonstrating reversal of obesity-related abnormalities in reward system responsivity to food cues with a behavioral intervention. Nutrition & Diabetes 2014: September 1st.

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Mediterranean Diet Wins Again!

Another study, this time from Harvard Medical School, concludes that eating like a Greek can save your life. Researchers asked 780 firefighters, ages 18-years-old and older how closely they followed the traditional Mediterranean diet rich in fish, nuts, vegetables, and fruit. They then gathered information on weight, cholesterol, blood pressures, and blood sugar levels during the subsequent five years. Results showed the more closely the men fol-



Yang J, Farioli A, Korre M, et al: Modified Mediterranean diet score and cardiovascular risk in a north American working population. PloS One 2014;February 4th.

lowed the Mediterranean diet, the lower their risk of developing key markers for heart disease, showing a 35% lower risk of being diagnosed with metabolic syndrome. They also had a 43% lower risk of weight gain compared to the men whose diets least resembled the Mediterranean diet.

Calcium Supplements Safe for the Heart

Remember that media scare a few months back warning everyone to stop taking their calcium supplements because they caused heart problems? Well, here's yet another study proving that warning wrong. Researchers at Brigham and Women's Hospital in Boston conducted a prospective cohort study of supplemental calcium and heart disease risk in 74,245 women in the Nurses' Health Study. Women were free of heart disease or cancer at the start of the study, and calcium supplementation was monitored every four years. After 24 years, the group suffered 4,565 cardiovascular events (2,709 heart

disease and 1,856 strokes). Taking into account age, body mass index, dietary calcium, vitamin D intake, and other cardiovascular risk factors, women who took more than 1,000 milligrams of calcium as supplements a day compared to women who took none had an 29% lower risk for heart disease and almost no increased risk for stroke. The researchers conclude that, "...[these results] do not support the hypothesis that calcium supplement intake increases cardiovascular risk in women."

Paik J, Curhan G, Sun Q, et al: Calcium supplement intake and risk of cardiovascular disease in women. Osteoporosis International 2014;25:2047-2056.

Protein Rules for Muscles

The best muscle function comes when people spread their protein intake evenly throughout the day, according to a study from the University of Texas Medical Branch in Galveston. A total of 90 grams of protein was distributed differently throughout the day in a small sample of healthy men and women (ages 34- to 40-years-old). One diet provided 30 grams of protein at each meal, while the other provided 10 grams at breakfast, 15 grams at lunch, and 65 grams at dinner. Lean beef was the main source of protein in both diets. Blood samples and muscle biopsies were

taken. Results showed that muscle protein synthesis was 25% higher when protein was evenly distributed than when it was provided primarily at the evening meal.

IN PERSPECTIVE: *Many Americans consume diets that are low in protein at breakfast and lunch, but very high at dinner. This study showed that we don't need huge amounts of protein to maximize its benefits; we just need to distribute it evenly throughout the day.*

Mamerow M, Mettler J, English K, et al: Dietary protein distribution positively influences 24-h muscle protein synthesis in healthy adults. Journal of Nutrition 2014;144:876-880.

Junk Food Changes Brain Chemistry

A diet of junk food causes weight gain in animals, by blocking the normal regulation of appetite for a variety of foods. This leads to consumption of an unbalanced diet high in fat and calories. Researchers at the School of Medical Sciences, UNSW Australia taught young male rats to associate two different sound cues with a particular flavor of sugar water - cherry and grape. Healthy rats raised on a healthy diet stopped responding to cues linked to the flavor they had just consumed. This inborn response is characteristic of most animals and protects against overeating as well as promotes a healthy, balanced diet. After two weeks on a diet that included cafeteria-style foods, such as dumplings, cookies, pie, and cake, the rats' weight increased by 10% and their eating behavior changed. They no longer avoided the sound cues that announced an overfamiliar taste. In essence, they had lost their natural preference for novelty. This change persisted even after the animals returned to their normal diet. The researchers speculate that highly palatable junk food causes lasting changes in the reward circuitry of the decision-making areas of the brain, such as the orbitofrontal cortex. This results in an animal's inability to limit intake of junk food.

Reichelt A, Morris M, Westbrook R: Cafeteria diet impairs expression of sensory-specific satiety and stimulus-outcome learning. Frontiers in Psychology 2014; August 27th.

HOTTOPICS: Teens do not have to be super thin to have an eating disorder, state researchers at the University of Melbourne in Australia. A more accurate measure is rapid weight loss even when the child remains at a "normal" weight. *Pediatrics 2014; August 25th.*

A lifetime of being physically active slows the aging process, according to a study from Brown University. *Journal of the American Academy of Orthopaedic Surgeons 2014; 22:576-585.*



Make Those Changes Now!

You can turn the tide on future disease risk by changing bad habits today, according to a study from Northwestern University in Chicago. In this longitudinal study of 3,538 men and women enrolled in the Coronary Artery Risk Development in Young Adults (CARDIA) study, researchers evaluated the participants when they were aged 18- to 30-years-old and again 20 years later, looking for changes that predicted heart disease.

They charted five health habits: 1) not being overweight, 2) being a nonsmoker, 3) being physical active, 4) having a low intake of alcohol, and 5) having a healthy diet (defined as being low in fat and high in calcium, fiber, and potassium). At baseline, less than 10% of the participants reported all five health habits. During the subsequent 20 years, 25% of them made healthy lifestyle changes, about 35% stayed the same, and 40% had fewer healthy habits.

Results showed that the more healthy habits that were added, the lower the risk of heart disease. The more health habits dropped, the higher the disease risk. For example, those who kept the same habits during the following 20 years had about a 20% risk of developing early onset of heart disease, while those who discarded three to four healthy habits had a 32% risk. Those participants who added three to four healthy habits had lowered their risk to a mere 5%. The two habits with the greatest impact on future health were 1) maintaining a lean body and 2) not smoking.

Spring B, Moller A, Colangelo L, et al: Healthy lifestyle change and subclinical atherosclerosis in young adults. Circulation 2014;130:10-17.

Chromium to the Diabetes Rescue

Chromium helps with glycemic control in diabetics, according to a study from Mahidol University in Bangkok. In this meta-analysis of 22 studies, the researchers investigated both chromium yeast combined with vitamins C and E, chromium picolinate with biotin, and chromium supplements without any other nutrient. Results showed that chromium both alone and with other nutrients improved glycemic control, while chromium alone also lowered triglycerides and increased HDL-cholesterol, thus helping to lower heart disease risk. It appears from the data, that 200 micrograms of chromium is needed for optimal benefits to blood sugar regulation. No adverse effects were noted for chromium supplementation at any of the dosages studied.

In a study on rats from Ain Shams University in Cairo, researchers report that chromium picolinate supplementation lowered plasma lipids and improved

platelet aggregation, thus reducing blood clots associated with heart attack and stroke.

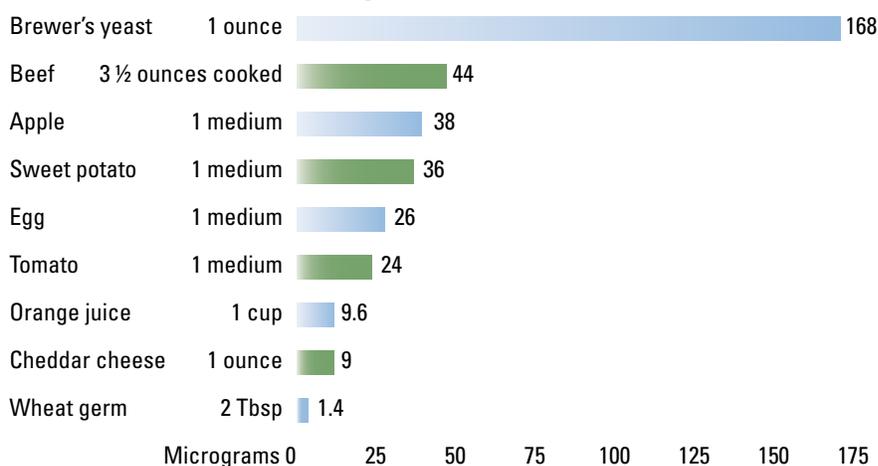
According to the Centers for Disease Control and Prevention (CDC) in Atlanta, two out of every five Americans will develop type 2 diabetes in their lifetime. Odds are even worse for black women and Hispanic men and women – where the risk increased to one in every two – all due to the increasing obesity epidemic in this country. “We weren’t necessarily surprised that [the diabetes risk] increased, but we didn’t expect it to increase this much,” state the researchers.

Suksomboon N, Poolsup N, Yuwanakorn A: Systematic review and meta-analysis of the efficacy and safety of chromium supplementation in diabetes. Journal of Clinical Pharmacy and Therapeutics 2014;39:292-306.

Seif A: Chromium picolinate inhibits cholesterol-induced stimulation of platelet aggregation in hypercholesterolemic rats. Irish Journal of Medical Science 2014;March 15th.

Lancet Diabetes & Endocrinology 2014;August 13th.

Do You Get Enough Chromium from Your Diet?



Southern Cooking - Deadly to Kidneys

The fried foods, sweet drinks, and processed foods typical of Southern-style cooking could be deadly for people with kidney problems, according to a study from the University of Alabama School of Medicine at Birmingham. Researchers analyzed diets of 3,972 patients with kidney problems who were not on dialysis. Results

showed that those who ate processed and fried foods, organ meats, and sweetened beverages had a 51% increased risk of death during the subsequent six year follow-up. Patients who ate plant-based diets had significantly better odds of survival compared to those eating the Southern-style diet. The researchers speculate that

kidney patients have an impaired ability to filter out the harmful junk in the high-fat, high-salt, high-phosphorus, high-sugar diet typical of Southern cooking.

Gutierrez O, Muntner P, Rizk D, et al: Dietary patterns and risk of death and progression of ESRD in individuals with CKD. American Journal of Kidney Disease 2014;64:204-213.



Watermelon and Carrots Against Cancer

The carotenoids, lycopene and beta carotene, halt cancer cell growth, state researchers at the Federal University of Rio de Janeiro in Brazil. Human cancerous breast cells were treated with carotenoids for 48 and 96 hours, while cell activity and viability were monitored. Results showed a significant decrease in the number of viable cancer cells when treated with these carotenoids. Lycopene and beta carotene exposure also caused increased cancer cell death, called apoptosis. The researchers conclude that these carotenoids, "...inhibit cell proliferation, arrest the cell cycle in different phases, and increase apoptosis...[thus] are potential agents for biological interference with cancer."



IN PERSPECTIVE: *The best dietary sources of lycopene are watermelon and tomatoes, while beta carotene is found in most orange or dark green fruits and vegetables.*

Gloria N, Soares N, Brand C, et al: Lycopene and beta-carotene induce cell-cycle arrest and apoptosis in human breast cancer cell lines. Anticancer Research 2014;34:1377-1386.



How Much Beta Carotene is in Your Diet?

	milligrams
Carrot juice, 1 cup.....	22
Pumpkin, 1 cup.....	17
Spinach, frozen, cooked, 1 cup.....	14
Sweet potato, 1 medium.....	13
Carrots, cooked, 1 cup.....	13
Collards, cooked, 1 cup.....	11.6
Kale, cooked, 1 cup.....	11.5
Carrots, raw, 1 medium.....	10
Cantaloupe, 1 cup.....	3.2
Broccoli, cooked, 1 cup.....	1.5
Green peas, cooked, 1 cup.....	1

Vitamin D Against Alzheimer's

Seniors with low vitamin D intake have twice the odds of developing Alzheimer's disease compared to seniors with optimal vitamin D levels. In a study from the University of Exeter Medical School in the U.K., 1,658 seniors free from dementia, heart disease, and stroke were tested for vitamin D status and their mental status was assessed roughly six years later. During the subsequent years, 171 seniors in the group developed all-cause dementia, including 102 cases of Alzheimer's. Results showed

that the risk for Alzheimer's and other forms of dementia increased with the severity of vitamin D deficiency. Those with the lowest vitamin D levels at the study's start had a 2.25-fold increased risk for dementia and a 2.2-fold increased risk for Alzheimer's compared to seniors who were optimally nourished in the vitamin. Dementia risk markedly increased with blood vitamin D levels below 50nmol/L.

Littlejohns T, Henley W, Lang I, et al: Vitamin D and the risk of dementia and Alzheimer disease. Neurology 2014;August 6th.

Vitamin D Lowers Cancer Mortality

Vitamin D might not help prevent cancer, but it does help lower the risk of dying from it, according to a study from Harvard School of Public Health. In this meta-analysis of randomized, controlled trials looking at vitamin D supplementation and cancer incidence and mortality, researchers found that taking vitamin D supplements at a level of 400IU to 1,000IU a day for two to seven years did not protect against the development of cancer. However, vitamin D supplementation did lower the risk of dying from cancer by 12%.

Kerum N, Giovannucci E: Vitamin D supplementation and cancer incidence and mortality. British Journal of Cancer 2014;June 10th.

Vitamin D and Pregnancy

A woman's vitamin D status could determine whether or not she can get pregnant through in vitro fertilization, according to a study from Ospedale Maggiore Policlinico in Milan, Italy. Researchers compared the success of in vitro fertilization in 154 women who were low in vitamin D to the success rate of 181 women with sufficient vitamin D status. Results showed that those who were well nourished in vitamin D were twice as likely to get pregnant as those who were low in the vitamin. Women with sufficient vitamin D status also were more likely to have better quality embryos and have a greater likelihood of an embryo implanting in the uterus. While this study does not prove cause and effect, the researchers state that these findings, "...certainly suggest that low levels of vitamin D contribute to infertility."

A review of research from Austria University Women's Hospital in Heidelberg, Germany concludes that women undergoing in vitro fertilization should make sure they consume enough vitamin D to keep their blood levels at or above 30ng/ml.

Paffoni A, Ferrari S, Vigano P, et al: Vitamin D deficiency and infertility. Journal of Clinical Endocrinology & Metabolism 2014;August 14th.

Lerchbaum E, Rabe T: Vitamin D and female fertility. Current Opinion in Obstetrics and Gynecology 2014;26:145-150.



The E Ticket for Brain Health

Vitamin E might be just what the neurologist ordered, if the results of a study from the University of Technology Mara in Malaysia prove true. More than 120 volunteers between 35-years-old and older who had cardiovascular risk factors and MRI-confirmed lesions in the white matter of their brains were randomized to receive either 200 milligrams of mixed tocotrienols (a form of vitamin E) or placebo twice daily for two years. Lesions were measured from MRI images taken at baseline, 1 year, and 2 years. Results showed that after 2 years, the average white matter lesion volume had decreased significantly in the supplemented group, but not in the placebo group.

IN PERSPECTIVE: *White matter lesions are signs of cerebral small vessel disease and reflect degeneration of nerves and other tissue damage.*

Gopalan Y, Shuaib I, Magosso E, et al: *Clinical investigation of the protective effects of palm vitamin E tocotrienols on brain white matter. Stroke* 2014;45:1422-1428.

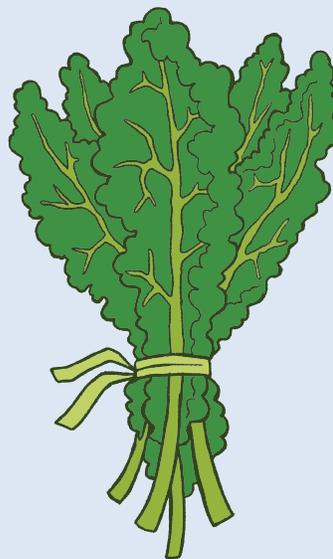
Kidney Stone Cure

A supplement of potassium, magnesium, and vitamin B6 might help ward off future kidney stones, according to a study from Narayana Medical College and Hospital in India. Almost 250 patients with a recurrent history of kidney stones took supplements of potassium citrate (1,100 milligrams), magnesium citrate (375 milligrams), and vitamin B6 (20 milligrams) every 8 hours for three years. Results showed that during supplementation, urinary citrate excretion rose to a range of normal to high levels, urinary pH rose significantly, and stone recurrence declined from more than three stones per year to an average of 0.35 stones per year. The researchers conclude that this combination supplement was effective at reducing kidney stone recurrence.

Reddy S, Shaik A, Bokkisam S: *Effect of potassium magnesium citrate and vitamin B6 prophylaxis for recurrent and multiple calcium oxalate and phosphate urolithiasis. Korean Journal of Urology* 2014;55:311-416.

Lutein: The Seeing, Thinking Carotenoid

The link between the carotenoids, lutein and zeaxanthin, and visual and cognitive health throughout life is growing stronger, according to a review of the research from Tufts University in Boston. Numerous studies, starting with the AREDS research, supports a role for lutein and zeaxanthin in vision. Lutein's role in cognition has only recently been studied. Lutein and its isomer, zeaxanthin, are taken up selectively into



eye tissue. Lutein is the predominant carotenoid in human brain tissue. Lutein and zeaxanthin in neural tissue have biological functions, including antioxidation, anti-inflammation, and structural actions. In addition, lutein and zeaxanthin are protective against eye disease by absorbing damaging blue light that enters the eye. In pediatric brains, the relative contribution of lutein to the total carotenoids is twice that found in adults, accounting for more than half the concentration of total carotenoids. The greater proportion of lutein in the pediatric brain also suggests a need for lutein during neural development. In adults, higher lutein status is

associated with improved cognitive function, and lutein supplementation has been shown to improve cognition.

Lutein accounts for 59% of the carotenoids in the infant's brain, even when it is low in the diet, according to a study from Jean Mayer Human Nutrition Research Center on Aging at Tufts University.

IN PERSPECTIVE:

Lutein and zeaxanthin are two carotenoids found in dark green leafy vegetables, such as kale,

spinach, chard, and collard greens. Research suggests we need at least 10 milligrams of lutein and 2 milligrams of zeaxanthin every day to protect ocular tissue from damage associated with macular degeneration and cataracts. That dosage requires at least a cup or more of dark green leafies every day, or supplement. Optimal intake for brain function has not been determined.

Johnson E: *Role of lutein and zeaxanthin in visual and cognitive function throughout the lifespan. Nutrition Reviews* 2014;August 8th.

Vishwanathan R, Kuchan M, Sen S, et al: *Lutein is the predominant carotenoid in infant brain. Journal of Pediatric Gastroenterology and Nutrition* 2014;March 31st.

Fish Really is Brain Food

Including fatty fish in the weekly menu boosts brain power, according to a study from the University of Pittsburgh School of Medicine. The researchers followed 260 people who provided information on their dietary intakes, had high-resolution MRI scans, and were cognitively normal at two time points during the 10-year study. A subset of these participants filled out more detailed questionnaires on their eating habits, such as how much fish they consumed and how it was prepared. Results showed that people who ate baked

or broiled fish at least once a week had greater grey matter brain volumes in areas of the brain responsible for memory and cognition compared to those participants who didn't eat fish regularly. Consumption of fried fish was not associated with improved cognition, possibly because omega-3 fats are destroyed at high heat or because of the omega-6 fats used in frying that counter the benefits of the omega-3s.

Raji C, Erickson K, Lopez O, et al: *Regular fish consumption and age-related brain gray matter loss. American Journal of Preventive Medicine* 2014;August 4th.



IN THE NEWS

- A vegan diet and vitamin B12 supplements help ease diabetic neuropathy pain, according to a study reported at the American Association of Diabetes Educators in Orlando.
- The American Academy of Dermatology issued a report stating that stress affects inflammatory skin conditions such as psoriasis, and may play a role in skin aging and skin cancer.
- The more physically fit middle-school girls are, the less likely they are to be depressed, according to a study from the University of North Texas reported at the annual meeting of the American Psychological Association in Washington, D.C.
- Researchers at the University of Oslo report that excessive body weight generates an unfavorable inflammatory condition, which might explain why obesity is linked to heart disease, stroke, cancer, and other ills.
- In a review of seafood safety, Consumer Reports concludes that pregnant women should avoid eating tuna, especially canned tuna and sushi made with tuna, because of its high mercury content.
- One way to fight childhood obesity is to read labels, advises the Food and Drug Administration. Check serving size, which might be different from the amount a child typically eats. Also, 5% of any nutrient is low, while 20% or more is high. Avoid any product that contains sugar in the first few ingredients.
- Energy drinks can cause arrhythmias and even sudden death, according to a study reported at the annual meeting of the European Society of Cardiology in Barcelona.
- Red wine only helps lower heart disease risk if a person also exercises, according to a study reported at the annual meeting of the European Society of Cardiology in Barcelona.

The Low-Salt Diet for MS

People with multiple sclerosis (MS) would do well to limit salt intake, according to a study from the Raul Carrea Institute for Neurological Research in Buenos Aires. Sodium intake was estimated from sodium excretion samples obtained from 70 relapsing-remitting MS patients who were followed for two years. The samples were compared to samples obtained from 52 patients with MS. Sodium intake was divided into three levels: 1) less than 2 grams daily, 2) between 2 and 4.8 grams daily, and 3) more than 4.8 grams daily. Results showed that people with daily sodium intakes between 2 and 4.8 grams and those who consumed more than 4.8 grams were up to four times more likely to have episodes of worsening MS symptoms compared to those who consumed the

least amount of salt. The researchers also checked the progression of the disease in patients' brains by using X-rays and scans. They found that patients who had the highest salt intake were about 3.4 times more likely to have their disease worsen compared to patients with the lowest salt intake.

IN PERSPECTIVE: *Relapsing-remitting MS is the most common form of the disease and is characterized by symptoms that subside and then become worse. The upper limit for sodium intake is 2.4 grams and the optimal intake is closer to 1.5 grams, according to the American Heart Association.*

Farez M, Fiol M, Galtan M et al: Sodium intake is associated with increased disease activity in multiple sclerosis. Journal of Neurology, Neurosurgery & Psychiatry 2014; August 28th.

Healthy Habits Extend Life

Women who exercise, eat well, and sleep soundly protect themselves against the negative effects of stress and slow the aging process, according to a study from the University of California, San Francisco. The researchers followed 239 postmenopausal, non-smoking, disease-free women during one year to assess if major stressors predicted telomere length, the protective caps at the ends of chromosomes that affect how quickly cells age. Results showed that the more stressors a woman had, the more her telomeres shortened. However, women who maintained active lifestyles and slept and ate well before, during, and following stress appeared to side-step the ravages of stress, with their telomeres showing no significant additional

shortening. "The hopeful message is if you engage in these healthy behaviors, you can decrease some effects that stress can have on your body," conclude the researchers.

IN PERSPECTIVE: *Telomeres on the ends of chromosomes are like the plastic tips on the ends of shoelaces that keep the laces from unraveling. Composed of DNA and protein, they protect the ends of chromosomes and keep them from unraveling. As telomeres shorten, their structural integrity deteriorates and cells age and die faster. They naturally shorten with age, but unhealthy habits and stress accelerate the process.*

Puterman E, Lin J, Krauss J, et al: Determinants of telomere attrition over 1 year in healthy older women. Molecular Psychiatry 2014; July 29th.

Add This to Your Workout Supplements

Magnesium supplements improved workouts in seniors in a study from the University of Padova, Italy. Almost 140 healthy women between the ages of 66- and 76-years-old attending a mild fitness program were randomly assigned to take either 300 milligrams of magnesium or placebo. After 12 weeks, the supplemented group showed higher scores on measures of workout ability, including

walking speeds and chair stand times, compared to controls. The researchers conclude that, "...these findings suggest a role for magnesium supplementation in preventing or delaying the age-related decline in physical performance."

Veronese N, Berton L, Carraro S, et al: Effect of oral magnesium supplementation on physical performance in healthy elderly women involved in a weekly exercise program. American Journal of Clinical Nutrition 2014;100:974-981.



HOT TOPICS

1 Iron supplementation during infancy results in greater adaptive behavior by age 10-years-old, which would improve school performance and work, mental health, and personal relationships, state researchers at the University of Michigan. *Journal of Nutrition* 2014;144:838-845.

2 L-carnitine supplementation reduces the risk for heart failure, the damage from a heart attack, and the severity of ventricular arrhythmias, as well as improving survival from heart disease, state researchers at Saint Luke's Hospital in Kansas City. *Reviews in Cardiovascular Medicine* 2014;15:52-62.

3 Curcumin, the spice in turmeric that gives it the bright yellow color, is a promising anti-tumor agent since it reduces cancer cell growth and encourages cancer cell death (apoptosis), according to a study from West China Hospital. *Die Pharmazie* 2014;69:229-233.

4 Type 2 diabetics who consume high-salt diets have twice the risk of developing cardiovascular disease compared to those who consume low-sodium diets, according to researchers at the Centers for Disease Control and Prevention in Atlanta. Researchers at Tufts University estimate that every year 1.65 million cardiovascular deaths result from high-salt diets worldwide. *Journal of Clinical Endocrinology & Metabolism* 2014;July 22nd/*New England Journal of Medicine* 2014;371:624.

5 Elementary school kids appear to be satisfied with the healthier school lunches being offered as part of the new USDA's National School Lunch Program, state researchers at the University of Illinois at Chicago. *Childhood Obesity* 2014;10:349-356.

6 Soft drinks and sports beverages are acidic enough to cause permanent damage to tooth enamel, report researchers at the University of Adelaide in Australia. *Journal of Dentistry* 2014;August 5th.

7 Adults who abuse alcohol are more than twice as likely to develop severe memory problems later in life, according to a study from the University of Exeter Medical School in England. *American Journal of Geriatric Psychiatry* 2014;July 30th.

8 People who are overweight and work in manufacturing jobs have endurance times that are up to 60% less than that of healthy weight employees. Being overweight was associated with less strength, increased discomfort, and declines in task performance, according to studies from Texas A&M University in College Station, TX. *Journal of Occupational and Environmental Hygiene* 2014;11:583-590/*Applied Ergonomics* 2014;July 31st.

9 A study from Saban Research Institute, Children's Hospital Los Angeles found that alcohol consumption during pregnancy negatively changes how a child's brain signaling develops during childhood and the teen years, long after being exposed to alcohol in the womb. *Cerebral Cortex* 2014;August 4th.

10 Overweight and obese preschoolers show risk factors for heart disease and diabetes, according to a study from Bambino Gesù Children's Hospital in Italy. *JAMA Pediatrics* 2014;August 11th.

11 Regular vigorous exercise lowers breast cancer risk in older women, according to a study from the Institute Gustave Roussy in France. *Cancer Epidemiology, Biomarkers & Prevention* 2014;August 11th.

12 The U.S. is the only country experiencing a decrease in colorectal cancer incidence, despite increasing prevalence of major risk factors for this disease, and the decline appears to be at least partially a result of folic acid fortification, state researchers at Harvard School of Public Health. *American Journal of Preventive Medicine* 2014;46:S65-S72.

13 Women who regularly consume instant noodles (think Top Ramen) are at highest risk for heart disease, state researchers at Baylor Heart and Vascular Hospital, who speculate that the link might result from increased body weight or the chemical bisphenol A or BPA used in packaging the noodles in Styrofoam containers. *Journal of Nutrition* 2014;144:1247.

14 Aerobically and physically fit children have greater brain power and superior cognition compared to less-fit peers, according to a study from the University of Illinois at Urbana-Champaign. *Frontiers in Human Neuroscience* 2014; August 19th.

15 The risk for colorectal cancer decreases by 9% for every 300 milligrams increase in calcium intake up to and possibly beyond 1,000 milligrams a day, state researchers at Harvard School of Public Health. *International Journal of Cancer* 2014;135:1940-1948.

16 A national survey conducted by the Centers for Disease Control and Prevention found that one in every five Americans consumes at least one soft drink a day. That number jumps to 32% in some states, such as Mississippi. One 12-ounce soft drink exceeds the recommended total daily sugar intake for women by 33%. *Morbidity and Mortality Weekly Report* 2014; August 15th.

17 People who are obese between the ages of 30- and 39-years-old have a 3.5 times greater risk for developing dementia later in life compared to people who are fit and lean during those years, according to a study from the University of Oxford. *Postgraduate Medical Journal* 2014;August 20th.

18 Engaging in leisure-time physical activity lowers endometrial cancer risk, with the risk lowering as women increase activity from zero to 15 hours per week, state researchers at Harvard School of Public Health. *International Journal of Cancer* 2014;135:682-694.

19 Being overweight or obese is associated with brain atrophy, white matter changes, disturbances of blood-brain barrier integrity, and risk of all-cause late-onset dementia and Alzheimer's disease, state researchers at Radboud University Medical Center in The Netherlands. *Lancet: Neurology* 2014;13:913-923.



Weird Cravings in Pregnant Teens

Pregnant teens have a high risk for pica, a craving and intentional consumption of non-food stuffs, such as vacuum dust, soap, baby powder, ice, and cornstarch. Researchers at Cornell's College of Human Ecology studied 158 pregnant teens and their risk for pica. Of the almost 47% who reported pica behaviors, most, or about 82%, craved ice, followed by starches, powders, soap, paper, plastic foam, baking soda, and more. When they craved ice, they consumed cups and cups of it. Those teens experiencing pica were at high risk for iron deficiency compared to teens who did not eat nonfood items. Pica behaviors and iron deficiency also increased over the course of the pregnancies.

Lumish R, Young S, Lee S, et al: Gestational iron deficiency is associated with pica behaviors in adolescents. Journal of Nutrition 2014;August 13th.

HOT TOPIC: A spinach extract containing green leaf membranes called thylakoids decreases hunger and increases weight loss, according to a study from Lund University in Sweden. *Appetite 2014;81:295.*

NUTRITION ALERT

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REVIEW

What Makes a Superfood?

Most age-related disease, and even aging itself, are at least in part a result of free radical or oxidative damage to tissues. The good news is - your body has an anti-free radical system, called the antioxidants, that prevents oxidants from damaging cells. The trick is to maintain an antioxidant arsenal equal to or better than the daily oxidant onslaught.

Stockpiling antioxidants is essential throughout life, especially during stress and as a person ages. Stress is a death sentence for cells. Feeling tense and anxious sets off a cascade of events, releasing chemicals and hormones, including cortisol, that generate a free-radical flood toxic to all cells, including brain cells. No wonder people with high blood levels of cortisol score lower on memory tests compared to people who are relatively stress-free. With age, oxidative damage to tissues, including the brain, intensifies. Hence, a 60-year-old needs more antioxidant-rich foods than a 30-year-old woman, who needs more than a 12-year-old.

All colorful fruits and vegetables, 100% whole grains, legumes, tea, cocoa powder, and red wine, in short, just about any real, unprocessed food, has antioxidants. So, what makes one a superfood and one not? It's the amount of antioxidants. Some foods are super stars when it comes to their boatloads of antioxidants, while others are merely supporting cast members. You can't only check for the vitamin C or vitamin E content or for one or two phytonutrients, since it is the whole array of antioxidants that counts. For example, an apple is a vitamin C wimp compared to an orange, but it's entire antioxidant content, which includes all of the phytonutrients, is equivalent to 1,000 milligrams of vitamin C!

To measure a food's antioxidant content, researchers use the ORAC assay, which stands for Oxygen Radical Absorbance Capacity. This is a measure of the total antioxidant content in a given food. ORAC is a way to measure how many free radicals a specific food can absorb and destroy. The more oxygen radicals a food absorbs, the higher its ORAC score. Theoretically, the higher its ORAC score, the better it is at preventing memory loss, coping with stress, and staying disease-free. Granted, there is a downside to this measurement, since an ORAC score in a laboratory might not equate to how potent that antioxidant level is once in the body or even if it is absorbed from the GI tract. However, we do know that the more colorful produce a person eats, the higher the antioxidant arsenal to combat disease and aging.

Nutrition experts estimate each one of us needs a minimum of 3,000 ORAC points a day to protect the mind and body (most Americans average less than half that amount). A daily ORAC intake of 10,000 or more is even better. An upper limit has not been identified. The body has a limited ability to store antioxidants, so ORAC points must be replenished every day.

A word of caution: Many tests promise to evaluate antioxidant status. They might take urine, skin, or blood samples to measure by-products of free radical metabolism. However, assessing antioxidant status is not that simple. For example, one test uses a scanner to shine a laser through your finger. It only measures a handful of carotenoids, not the tens of thousands of antioxidants in real foods. The only way to guarantee a super antioxidant arsenal is to load every plate with produce.

Food Chemistry 2014;164:81-88/BMC Complement Alternative Medicine 2014;14:161.

HOT TOPIC: In a review of 50 studies including almost 7,300 people, researchers at McMaster University in Ontario found that any diet works, whether it is low-fat or low-carb, if a person sticks to it. *Journal of the American Medical Association 2014;312:923.*