HEALTH AND STRESS

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WHY DO WOMEN LIVE LONGER THAN MEN? IS IT LESS STRESS?

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Females usually live longer than males but for different reasons. In certain instances, males don't survive very long after mating since their purpose to perpetuate the species has been achieved. Some male spiders are promptly devoured by their partner, the best example being the "black widow" spider. It's an easy kill since she is 12 times larger and needs extra nourishment, especially during pregnancy. There is also a species of praying mantis that only ejaculates after its head has been bitten off.

Similar selfless behavior is seen in bees, ants and termites where males sacrifice their lives for the good of the colony. Female fish like trout and perch as well as dolphins and seals live longer than males, presumably so they can continue bearing offspring and provide care for them. **Save for humans, menopause is rare in the animal kingdom and reproductive activities do not disappear or diminish with age.** In some whale species, females are still fertile at age 60, which is close to their life expectancy.

With respect to higher forms of life, it also appears that **the parent who stays home to take care of the kids or is the primary care giver lives longer regardless of gender**. Researchers came to this conclusion after studying 10 species of primates including humans, apes and various types of monkeys. They analyzed the data from zoo populations around the world, field studies, laboratory research, and human historical and demographic documents to determine the life-span of male and female parents. While females generally had greater longevity, South African titi male monkeys, who tend to and rear their babies, live 20 percent longer than their mates. Life expectancy is similar in those species where both parents care for their offspring.

Scientists theorize that it takes a lot of energy to raise big-brained human or ape babies and the sex not caring for the infants would not be as crucial for the survival of the species. Species with big brains mature slowly and usually have only one child at a time, which requires more attention for a lengthy period. As noted in a recent article,

ALSO INCLUDED IN THIS ISSUE

"This reduces the reproductive potential of the parents because extra-special care must be provided to insure that this reduced number survive to reproductive age." Female orangutans, chimpanzees, baboons and most monkeys live longer than their mates do but the difference is not as great in gorillas because males play with their offspring and take on certain other nurturing duties.

What Determines Longevity In Humans?

A large body of research has shown that greater longevity is associated with taking care of an elderly parent or even a pet. One reason may be that looking after the welfare of others provides strong social support, which is a powerful stress buster. **Doing something for others that gives you pleasure, or what Selye referred to as altruistic egotism, is also associated with better health and therefore longer life. Many believe that this explains why so many great symphony conductors, musicians and comedians live unusually long and productive lives.** Examples of some who were still going strong in their late eighties and nineties are Sir Adrian Boult, Vladimir Horowitz, George Burns, Milton Berle and Henny Youngman. Despite the fact that their lives can be very stressful, this is more than offset by the support and satisfaction they get from the appreciation and praise of their audiences.

Although these examples are all men, this is also true for artists like Grandma Moses and successful women listed in *Who's Who*. Since child raising can be very stressful one might think it would shorten the life of a harried mother. It's just the opposite, possibly because of the health benefits of caring for someone.

Multiple genetic and environmental factors influence how long we will live and recent research may help to explain why the "weaker" sex is actually stronger in this regard. Both men and women whose parents lived well into their nineties also tend to live long although here again, females seem to have an edge. **Despite the fact that 115 males are conceived for every 100 females, there are more women than men at age twenty-five and nine out of ten centenarians in the world are female.**

Our ability to remain healthy and function optimally depends on the proper growth and division of cells. When cells divide, the information contained in their DNA is copied to instruct the new cell what to do. As this process is repeated over and over hundreds of thousands of times, mutations and errors in this genetic information can creep in. Aging is generally thought to result from an accumulation of mutations from free radical damage to DNA. While normally prevented by natural antioxidants like superoxide dismutase, sex hormones, Q10, etc., levels of these decline as we grow older. The chromosomes of healthy cells are protected at their ends by structures called telomeres. Each time a cell divides the length of its telomere is shortened and protection is reduced, which also increases the likelihood of chromosomal abnormalities as cells keep dividing. Cancer cells keep multiplying rapidly because they produce telomerase, an enzyme that prevents the loss of telomeres.

Helicase is another enzyme that protects DNA from damage. It is deficient in Werner's syndrome, a condition that causes accelerated aging and is four times more common in males than females. These patients have graying and thinning of their hair, infertility and testicular atrophy in their thirties, almost all require surgery for bilateral cataracts by the age of 40 and usually die before reaching 50 from heart attacks due to severe coronary atherosclerosis or cancer. Osteoporosis, diabetes, stroke and peripheral vascular disease due to arteriosclerosis are also common complications. Women are not affected as much since they are less likely to have helicase deficiencies. It has been suggested that this may also allow them to age more slowly than men.

Why Do Women Live Longer Than Men?

Women live longer than men do in both developed and undeveloped countries, sometimes by as much as ten years. With the exception of Alzheimer's disease, men have higher mortality rates for leading causes of death such as heart disease, cancer, stroke, chronic pulmonary disease, accidents, pneumonia/influenza, diabetes, and AIDS. Men's death rates from suicide,

homicide and cirrhosis of the liver are much higher than those for women. Another factor is occupation; compared to women, many more men are engaged in mining, agriculture, forestry, fishing and other activities that account for 90 percent of occupational deaths. Men drive more rollover-prone SUV's that contributed to last year's 42,850 traffic deaths, the highest number since 1990. Men are much more likely to suffer motorcycle fatalities, which are also up sharply due to the repeal of helmet laws in some states.

Male macho type behavior may also be responsible for their shorter longevity. More men than women smoke, drink heavily, abuse drugs, drive without a seat belt and are homeless or in prison. A report at a Center for Disease Control meeting last month found that men were twice as likely to be struck by lightning or die in a flash flood because of their risk taking tendencies. For example, they are more apt to drive around barriers in low-lying flood zones and then drown in high water. As one researcher noted, **men don't just have more accidents; they are accidents waiting to happen**.

Adolescent males are 50 percent more likely than teenage girls to die as a result of some incident associated with violence. It has been suggested that this may be related to the onset of puberty and an increase in reckless and aggressive behavior due to surges in testosterone. Mortality rates for 15-24 year old males are four to five times higher than for females in this age group largely because of a greater incidence of motor vehicle accidents, homicides, suicides and drownings. More men than women also die in the 55 to 64 year-old range due to heart disease, suicide, car accidents, and illnesses related to smoking and alcohol abuse.

Men under 65 have five times the risk of heart disease and are four times as likely to commit suicide compared to women and are more apt to be homeless and have hypertension. Men may be stronger physically than women but they are often not as healthy because they don't take care of themselves as well. They are less likely to apply sunscreen to prevent skin cancer or to practice good dental hygiene to reduce the likelihood of periodontal disease, an established independent risk factor for heart attacks. For some, going to a doctor is a sign of weakness so they tend to ignore minor symptoms that might signal a serious disorder. Medical attention is often not sought until the problem has progressed and is much more difficult to treat or cure. It is often a wife who persuades her spouse to seek help so it is not surprising that married men are healthier than those who are single.

From an evolutionary perspective, longer life implies survival of the fittest and women are more fit than men are in this regard. The more time it takes for a woman to reach menopause and the longer she lives, the more children she can give birth to and rear to reproduce the species. As a result, evolution would favor selecting the genes of such women over others who died at a young age. **A study of U.S. women aged 100 or more found that four times as many had given birth in their forties compared to women born the same year who died at age 73.** The same relationship between longevity and fecundity has been demonstrated in European centenarians. While long-lived males would also enjoy an evolutionary advantage, primate studies reveal that a male's reproductive capacity is limited more by available access to females than remaining fertile.

As an old aphorism notes, "Everyone wants to live long but nobody wants to grow old." The problem is that a longer life doesn't necessarily insure that it will be a healthier life. Another old saying that seems to support this is that "While men die from their diseases, women live with them." Men are more apt to die from disorders like heart disease and stroke while women live on with nonfatal conditions such as arthritis, osteoporosis, and diabetes. There are also important hormonal influences.

Menopause, Estrogens And HRT

Some scientists believe that a woman's lifespan is largely determined by evolutionary forces that are designed to perpetuate the species. The most important of these are the drive to pass on her genes and the need to stay healthy enough to give birth to and rear as many children as possible. Menopause helps to insure this by

protecting older women from the hazards associated with giving birth late in life. It also allows them to live long enough to care for their children and grandchildren. The only thing that men contribute is the ability to carry genes that are associated with longevity that can be passed on to their daughters. This depends on the availability of females, so from this perspective, it is female longevity that determines the life span for both sexes.

Menopause is rare in the animal kingdom and may have evolved partly in response to the amount of time offspring remain dependent on their mothers to insure survival. For example, pilot whales, one of the few other species that menstruate, suckle their young until the age of 14 or older. Centuries ago, giving birth was associated with a high death rate. This was especially true for women who were older and frail, which often occurred before they reached the age of forty. A woman who reached menopause and was now infertile had a survival advantage over others born the same date but who died giving birth. These "menopause genes" would then be passed on.

Female hormones have long been believed to provide certain health benefits. The leading cause of death is coronary heart disease and its incidence increases with age. At age 20, less than 10 percent of deaths in men are from heart disease but by age 50 and over this rises to 50 percent. A similar trend is seen in women but there is a lag of about 10 years that has been attributed to the cardioprotective effects of estrogen. Women start to catch up with men after menopause, when estrogen levels plummet. It is not until age 60 that half of all deaths in women are due to heart disease and the likelihood of dying from coronary heart disease is actually higher in women when they reach age 75 than it is for men.

There are numerous studies suggesting that estrogens can prevent heart disease. The degree of protection averages 50% but ranges from 25% to 80% in different reports. For many years this was attributed to influences on lipid levels, such as reducing total and LDL (bad) cholesterol and increasing HDL (good) cholesterol. However, the importance of this has been increasingly questioned. Estrogens do have antioxidant activities and affect nitric oxide systems, both of which have direct effects on blood vessels that help prevent heart attacks. They also inhibit the formation of angiotensin, a chemical that causes contraction of blood vessels, thus allowing them to dilate and carry more blood to ischemic areas. As a result, HRT (hormone replacement therapy) following menopause has been widely used to prevent coronary disease as well as osteoporosis and hot flashes.

Critics point out that most studies simply compare women who take hormones with controls that don't. However, the package inserts for estrogens warn that they should not be taken if you have heart disease, hypertension, diabetes or smoke, so that control groups have more high risk patients. In addition, the HRT group is apt to be better educated, wealthier, have healthier diets, exercise more and take vitamins. All of these are associated with lower risk of heart disease. **To add to the confusion, two recent large studies have found that HRT increases the incidence of coronary disease, as well as clots and breast cancer.**

The problem is that the estrogen used was Premarin, so named because it is derived from the urine of **pre**gnant **mar**es. Premarin was approved by the FDA over 60 years ago, but only for the prevention of osteoporosis. Dosages vary and it is not known how closely Premarin mimics the activities of natural estrogens that women produce. In addition, HRT usually includes a progestin compound like medroxy-progesterone in Prempro. Adding a progestin was thought to reduce risk for breast and ovarian cancer. However, a Prempro study was halted prematurely after it was apparent that the treated group had an increase in both cancer and heart attacks. The jury is still out.

Iron, Obesity, Heart Disease And Cancer

Women who have a total hysterectomy in their twenties or early thirties and undergo premature menopause subsequently have triple the risk of coronary heart disease than others the same age. While this was thought to be due to loss of

the protective effect of estrogens, the same holds true for women who have a partial procedure in which the ovaries are left intact. **Another theory that has been proposed is that women who menstruate have fewer heart attacks because they have less iron due to monthly bleeding.**

Iron promotes oxidation and free radical damage that offsets the cardiovascular protection afforded by natural and supplemental antioxidants. Support comes from studies showing that patients with hemochromatosis, a disorder in which there is excess iron, have increased heart attacks and hypertension. Stored iron accumulates in men as they age, which could account for the rise in heart attacks as they grow older. Menstruating females have lower levels of iron than males the same age but a similar increase in iron occurs after menopause when heart attack rates start to approach those for men. One study found that men with the highest amounts of iron stores had almost three times as many heart attacks as controls with less iron in their blood and bodies. Other studies have shown that men and women with low iron levels due to iron deficient diets have fewer heart attacks.

Lack of iron intake is uncommon in the U.S. because of iron-fortified foods and the popularity of multivitamin supplements that contain iron. Men can cut their iron stores in half by donating a pint of blood a year. Those who donate two or three pints a year could theoretically reduce their iron stores to the same level found in menstruating women. A Finnish study found that men who donated blood regularly were less likely to suffer a heart attack, presumably because their iron stores were lowered in a manner similar to menstruation. Several studies in the U.S. have not confirmed this. In one that followed men who regularly donated blood, although iron stores were reduced, heart attack rates were not. The jury is still out on this as well.

Obesity is an established risk factor for hypertension, stroke, heart attacks, heart failure and a host of other things ranging from lung and kidney disease to diabetes, insulin resistance and certain cancers. It's easy to comprehend how considerable excess weight can elevate blood pressure and put a strain on the heart, lungs and kidneys, or that increased caloric intake boosts blood sugar to trigger repeated releases of insulin that eventually exhaust the pancreas, resulting in diabetes. Why obesity increases cancer risk is less clear but has been documented in several studies.

In the largest and longest one reported in the *New England Journal of Medicine* last April, more than 900,000 people age 30 and over who were cancer free in 1982 were followed for 16 years. The study was designed to determine if their weight at the start of the study influenced the subsequent incidence of cancer. **Researchers reported that women who were the most overweight had a 62% higher death rate from cancer compared to others whose weight was normal.** There was a clear correlation between increased weight and deaths due to cancer. A woman five and a half feet tall weighing 165 lbs. was 8% more likely to die from cancer than a normal-weight woman and at 200 lbs., risk increased to 23%. This soared to 62% for obese women weighing 245 lbs.

Overweight men had 52% higher mortality rates from malignancies than others. The heaviest men were 34% more likely to die from prostate cancer and had 84% more deaths from colorectal cancers. The most frequent malignant tumors in women were in the breast, cervix, uterus and ovaries. It was suggested that excess body fat weight increases the amount of circulating estrogen, which raises the risk for developing these cancers. However, hormone levels were not measured, nor does this explain the increase in multiple myeloma, non Hodgkins's lymphoma, pancreatic, liver and stomach cancers that have also been documented in other reports. The amount of extra weight was determined in this study by calculating the BMI (Body Mass Index). This gives you a clue as to how much excess fat you may have but not where it is located.

Cushing's, Cortisol And Beer Bellies

The BMI is a number that has adverse health implications if it is outside the normal range. To determine this, multiply your weight in lbs. by 703 to obtain (A). Multiply

your height in inches by your height in inches to obtain (B) and then divide (B) into (A) to find your BMI. As an example, if you weighed 140 lbs. and were 67 inches tall (A) is 98,420, (B) is 4,489 so your BMI would be 22. A BMI of 18 or under indicates the need to gain weight or may reflect anorexia. 19-24 is healthy and 25 to 26 is overweight. A BMI of 27 or higher indicates obesity and the likelihood of increased risk for some obesity-related health problem.

The BMI is a more accurate indicator of how overweight you are than the standard height and weight tables for men and women, including those that take into account whether you have a large, medium or small frame. However, a BMI does not tell you where those extra pounds are deposited. There is an old saying that the three most important things about real estate are Location, Location and Location. The same may apply to how likely being overweight will have adverse health effects since **where those extra pounds are located may be even more important than how many of them there are. It is probably much better for you to sit on your fat than to have it sit on you. Women appear to have an advantage over men in this regard.**

Men tend to gain weight in the form of deep abdominal or visceral fat so that they develop a "beer belly" and an apple-shaped figure. Women are more apt to accumulate fat in their hips and buttocks so that excess deposits result in a pear-shaped contour. It is well established that people with apple-shaped figures due to increased abdominal fat are at greatest risk for metabolic and cardiovascular complications. Recent research has shed some light on the reasons for this as well as the causes of deep belly fat. Eating too much and not exercising enough are certainly contributing factors but may not be as important as endocrine influences. Cortisol, a steroid hormone manufactured in the adrenal cortex, appears to be the major culprit.

Cortisol secretion is increased in Cushing's syndrome, a disorder that is associated with increased abdominal fat and an apple-shaped figure. Most cases of Cushing's syndrome are due to a tumor that produces excess amounts of ACTH, a pituitary hormone that stimulates the adrenal cortex to secrete cortisol. Following removal of the tumor this excess abdominal fat diminishes or disappears as cortisol levels return to normal.

This led to the hypothesis decades ago that some forms of obesity might represent a mild form of Cushing's syndrome, but since most obese people do not have elevated cortisol levels this theory was discarded. Researchers subsequently compared cortisol concentrations in samples of subcutaneous and deep abdominal fat obtained from patients undergoing surgery. Although most of these patients were of normal weight, the deep belly fat was found to have significantly higher levels of cortisol than fat from other body sites. It was then determined that the reason for this was that deep belly fat contained much more of an enzyme that can regenerate cortisol from inactive precursors. Thus, despite high tissue levels, blood concentrations remained normal.

This finding resurrected interest in the role of cortisol but there was little progress until a few years ago, when advances in genetic engineering made it possible to link the gene for this enzyme in mice to a promoter that only activated it in fat tissue. Genetically altered mice bred in this fashion had 2.5 times more enzyme activity and 14 to 30% higher concentrations of cortisol in their belly fat than normal mice. Although there was no increase in blood cortisol levels, these pot-bellied mice still started to develop insulin resistant diabetes, hypertension and other manifestations of the metabolic syndrome that increases risk for coronary heart disease in humans. The clinical relevance of this is supported by a recent report showing that apple-shaped men had higher levels of this cortisol recycling enzyme activity in their deep belly fat than controls classified as normal or lean. As in most other obese people, blood cortisol measurements were normal in these "beer belly" men.

Stress And Apple And Pear-Shaped People

Stress causes increased pituitary secretion of ACTH that also results in an elevation of cortisol and a shift in fat distribution to the abdomen. Chronically

stressed primates with high cortisol levels develop a corresponding increase in abdominal fat deposits. **A study of Swedish men similarly found that with those with the highest levels of chronic stress also had the highest cortisol measurements and the greatest amount of deep belly fat.** Since the only way to accurately determine how much deep belly fat you have is with expensive CT or MRI scans, most researchers rely on the WHR (waist/hip ratio). This only requires a flexible tape measure to determine the circumference of your waist and hips at their widest points and dividing the first figure by the second. Weight related health problems due to apple-shaped figures are much more likely to be seen in men with values over 10 and women with a WHR of 8 or more. Although men with a waist circumference over 40 inches and women with waists wider than 35 inches are at greater risk, increased abdominal fat can still be demonstrated in others whose measurements are an inch or two less.

There are also numerous links between a high WHR and increased stress. One study found that premenopausal women with a high WHR reported more chronic stress and had greater reactivity to stressful challenges compared to low WHR controls. In another, a high WHR in middle-aged men was associated with increased depression, anxiety, sleep disturbances and other stress related symptoms. Apple-shaped people are much more likely to suffer the metabolic consequences of obesity that cause insulin resistance, diabetes and cardiovascular disease. Since men are more likely to develop apple shapes, this may partially explain why they don't live as long as women.

Indeed, Danish researchers reported last month that **older women with excess fat in the arms, legs, hips and buttocks had less atherosclerosis than others of normal weight whose fat was primarily abdominal**. The reason appears to be that peripheral fat secretes hormone-like substances that can actually decrease insulin resistance.

These chemicals are being intensively investigated since there is reason to believe that they might be useful in preventing or treating patients with metabolic syndrome. Obesity due to stress and increased cortisol secretion is not as likely to occur in younger individuals because of the protective effects of hormones like testosterone, estrogen and progesterone. **It is after age 40, when these sex steroids start to decline that we begin to see what is commonly called "middle aged spread".**

Men do not have as abrupt a fall in sex hormone secretion as that seen during menopause but there is a steady decline in testosterone levels after age 50 sometimes referred to as the "andropause". Others prefer the acronym ADAM (Androgen Deficiency in Aging Males). This is often associated with a decrease in libido, strength and muscle mass and an increase in deposition of abdominal fat. One study showed that testosterone replacement not only lessened these symptoms, but also resulted in an average loss of 3 kilograms of fat and a gain of 2 kilograms of muscle mass, regardless of pretreatment testosterone levels.

Abdominal fat contains more cortisol receptors than other tissues and it has been suggested that circulating cortisol is preferentially attracted here so the liver can have easy access to fuel that may be needed for physical activity during stressful situations. Deep belly fat releases large amounts of free fatty acids into the portal circulation that continually stimulate the liver to produce glucose. In that regard, it should be noted that stress causes increased secretion of adrenaline and hormones from the adrenal medulla that also increase fatty acid and blood sugar levels.

When abdominal fat cells are stimulated in laboratory studies, they secrete many more inflammatory molecules than fat cells from subcutaneous sites. Abdominal fat cells produce large amounts of interleukin-6 and other inflammatory cytokines that can contribute to diabetes, insulin resistance and coronary disease. **This is particularly important because of a striking correlation between increased abdominal fat, increased levels of CRP (C-reactive protein, a measure of inflammation) and increased heart attacks.**

Is Inflammation The Cause Of Coronary Disease? (And Almost Everything Else?)

An elevated CRP has been shown to be superior to LDL for predicting coronary events. This has significant clinical implications in view of the prevailing dogma that heart attacks are due to elevated LDL. Up to 30 million Americans are taking statin drugs under guidelines that mandate lowering LDL to an arbitrary level that the vast majority never achieves. This means that the dosage of statins has to continually be increased, which is why an 80-mg. Lipitor pill was recently approved. Lipitor is the most profitable drug that has ever been prescribed, with sales of over $8.6 billion last year. Another statin, Zocor brought in $6.2 billion. Statins can interfere with memory and concentration and have other effects that have been suppressed by powerful vested interests. Laboratory tests used to monitor statin safety do not detect these side effects, muscle disease or peripheral neuropathy that escalate with higher dosages. If you increase the daily dose of Lipitor from 20 mg. daily to 40 mg., side effects triple. **At 80 mg./day, side effects increase 13 fold!**

The cardioprotective effects of statins occur much too rapidly to be due to lipid lowering and are not related to changes in LDL, which is why current therapy guidelines are so dangerous. The majority of heart attacks occur in individuals with normal cholesterol and LDL and many **authorities now agree that the reason statins are effective is because they reduce inflammation rather than LDL or other lipids**. AstraZeneca's Crestor, the most powerful statin ever, is projected to produce annual sales of $5 billion when it becomes available later this year and will likely replace Lipitor as the leader. It has already jumped on the inflammation bandwagon with its long-term, double blind JUPITER study in 15,000 subjects designed to show the cardioprotective effects of Crestor in patients with normal to low LDL but high CRP. If heart attacks were due to high LDL they would never take such a gamble unless they were confident it would pay off, and it will.

Inflammation participates in all phases of coronary atherosclerosis, including initiation and progression of lesions and thrombotic complications. CRP has been shown to be elevated in heart attacks, stroke, sudden cardiac death, type II diabetes, insulin resistance, obesity, cigarette smoking, age and other disorders associated with accelerated atherosclerosis. Statins have now been reported to provide benefits in numerous other conditions. One report found they reduced the number of lesions in multiple sclerosis by 43% and another reported a 79% reduction in risk of Alzheimer's. Statins have also been found to prevent stroke, diabetic kidney disease, osteoporosis and bone fractures in postmenopausal women, atrial fibrillation and even depression and anxiety. None of these are associated with high cholesterol, LDL or other lipids.

Anti-inflammatory drugs like aspirin and NSAID's used to treat arthritis have also been found to help prevent colon cancer, heart attacks and stroke, but have a different mechanism of action. It is crucial to realize that CRP simply reflects inflammation. **Giving drugs to lower CRP rather than treating the cause of the problem is as inane as targeting LDL.** Stay tuned for more!

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