James L. Holly, M.D.

Aging, What Can Be Done About It?

By: James L. Holly, MD

Aging!! The very word often strikes fear into our hearts. The fear of dying; the fear of obsolescence; the fear of loneliness or illness whatever the fear, aging is often associated with anxiety, regret and even fear. Many things are not known about aging, but one is -- it is inevitable. The Bible declares, "For it is appointed unto man once to die." Every person on earth will age and will die. Some will age faster; others will age slower; some will age well; others will age poorly; some will age gracefully; others will age angrily, but we will ALL age!

There are clinics in America which "specialize" in anti-aging methods. Many of those methods are controversial and unproved, but the very presence of those clinics indicate that even though aging cannot be eliminated or stopped, there is an interest in slowing its pace. If you use the internet, you can go to the following website (http://www.msnbc.com/modules/quizzes/longevity.asp) and complete a questionnaire which will show you what your average life expectancy is. Also, this questionnaire will show you the issues which you can address in your life in order to increase your life expectancy. You will not be surprised, I am sure, to find that the things you can do include:

* Changing your diet, increasing the fish and vegetables in your diet.
* Stop smoking
* Exercise
* Be happy

You may be surprised to discover that you can extend your life expectancy by:
* Driving slower
* Avoiding those who smoke
* Having active friends

Actively achieving health "taking responsibility for your own health" is one of the most exciting and promising areas of scientific inquiry. Much is not known but almost daily new discoveries are recommending life-style modifications which will encourage good health and long life. One of the most interesting is the recent discover that significant calorie restrictions slows the aging process and increases the age in rats. While more

human studies are needed, the suggestion is that eating less is not only important for weight control but that there may be an associated increase in life expectancy with decreasing the number and kind of calorie you consume daily. In the animal models restricted calories is associated with lower temperature, lower insulin levels and a steady level of a steroid hormone called DHEAS. If this proves to be true in humans, there will be one more reason for not eating "calorie rich" junk food and fast foods.

What Do We Know About Aging?

The process by which life is sustained in the human body requires the production of energy from the food we consume. That process is a common oxidative/reduction reaction. This process causes oxidative damage to cells which is thought to be a causative factor in disease and aging. The agents for this damage are referred to as "free radicals" or reactive species of oxygen, nitrogen or chlorine. Superoxide, hydroxyl ions, hydrogen peroxide, and nitric oxide are examples of free radicals. These are atoms or molecules with an unpaired electron. Free radicals are naturally occurring and an important part of biological functions such as immunity, inflammation, growth and repair.

Free radicals can have negative effects when they damage proteins, lipids and nucleic acids.. These free radicals are normally held in balance in biological systems by antioxidant defense mechanisms. Environmental insults, infections, smoking, radiation and sunlight can also cause the formation of free radicals.

Antioxidants

Antioxidant defenses act in concert in cell differentiation and growth, immune responses, cell membrane integrity, and normal DNA repair. Oxidative stress occurs when there are more free radicals than can be dealt with due to environmental insult, disease or malnutrition. Even exercise, because of an increase in oxygen demand and utilization, increases the formation of free radicals. However, regular exercise builds up body defense systems and protects against damage. An improper balance between formation and destruction of free radicals may play a role in degenerative disease and aging. Antioxidants in the diet may prevent disease and deficiencies may be deleterious to fetal and childhood development.

Antioxidant micronutrients must be supplied in the diet. Fruits, vegetables and whole grains are better sources of antioxidants than pill forms, but, in general, supplementation is beneficial. A balanced diet including several servings per day of fruits and vegetables is recommended. Following are some of the supplemental antioxidants which can be beneficial when coupled with a good diet, exercise, weight control, proper rest and good health care.

Vitamin C

Vitamin C is a water soluble antioxidant found in fruits and vegetables that directly attacks some free radicals and recycles vitamin E. It is also known as ascorbic acid and is

used in various foodstuffs to prevent rancidity, in meat curing, and to prevent fruit discoloration. It is unstable to heat and oxidation but survives freezing.

Most animals can make this vitamin, with the exception of primates, guinea pigs and some bats. The deficiency disease is called scurvy and manifests by numerous defects in connective tissue and the skin maintenance and repair. Scurvy takes 3-4 months to develop because it takes that long for bodily vitamin C stores to be depleted.

The Recommend Daily Allowance (RDA) of Vitamin C is 60 mg/day but higher doses are well tolerated up to about 1800 mg/day; even if there is no evidence that megadoses are beneficial. Vitamin C has been suggested to be protective against coronary heart disease, presumably because it prevents LDL (the bad cholesterol in our blood) oxidation.

Beta carotene

Beta carotene is a water soluble precursor to Vitamin A, but is an antioxidant in itself. Vitamin A has no antioxidant activity. Beta carotene gives vegetables such as corn, squash and carrots their rich yellow color. It is found in many other pigmented fruits and vegetables and in egg yolk, butter, and milk as well.

Vitamin E

Vitamin E comes in six naturally occurring forms (found in whole grains, fish oils, nuts and seeds) but alpha tocopherol is the most potent as a vitamin and is widely distributed in food. Vitamin E is the most potent and least toxic fat soluble antioxidant and is important in protecting cell membranes from oxidative damage. The RDA is 10 IU for men and 8 IU for women and normal blood levels are in the range of 0.5-0.7 mg/dL. Deficiency has not been seen in otherwise healthy children or adults, but experimentally the symptoms include muscular weakness and fragile red blood cells.

Flavanoids

Flavanoids are antioxidant molecules found in plant sources such as fruit, flowers, roots, stems, tea, wine, grains and vegetables. They are often responsible for the beautiful coloring of plant structures. Indeed, a general rule of nutrition is the relationship of the vibrancy or depth of color to the nutritional content of the fruit or vegetable. More pigment is usually associated with greater nutritional value.
Flavanoids have been shown to have antiviral, antiallergic , anti-inflammatory, antithrombogenic and anticarcinogenic effects in vitro. Flavanoids act as antioxidants by directly attacking free radicals, chelating reactive elements such as iron, or by inhibiting oxidative enzymes. Many of the other actions are mediated by their inhibitory action on mediators of inflammation.

Some 4000 flavanoids have been found. There are four main groups of flavanoids; 1) flavones, 2) flavanones, 3) catechins, and 4) anthocyanins. It is the flavones and catechins that appear to be important flavanoids in oxidation defenses.

Perhaps the most important flavone is quercetin found in apples, onions, broccoli and berries. The flavanones are found primarily in citrus fruits and peels. Catechins are found in teas and red wine. Anthocyanins are present in cherries, berries, wine, grapes and tea. No daily requirement for flavanoids has been established, but a balanced diet containing fresh fruits and vegetables and tea is recommended.

Selenium

Selenium is an essential trace element in the diet that is distributed in the earth's crust at 0.09 ppm. The RDA for selenium is 70 ug/day for adults. Selenium toxicity has been seen at higher levels. Glutathion peroxidase is a free radical scavenging enzyme that contains selenium. It acts to destroy peroxides and thus protects lipid membranes as does Vitamin E. Indeed, these two antioxidant defense mechanisms work in concert and spare one another.

Superoxide Dismutase

Superoxide dismutase is an enzyme that, in concert with the enzyme catalase, can disarm and destroy free radicals, particularly superoxide. Claims that taking supplements is beneficial to forestall or reduce the effects of aging have not been proven. In fact, superoxide dismutase taken orally (even sublingually) is destroyed in the digestive system. Copper, manganese and zinc are required in the functioning of cytosolic superoxide dismutase.

Conclusions:

You can't stop aging, but you can improve how well you age. Antioxidants are not the eternal fountain of youth, but there is enough evidence of their benefit for everyone to:

1. Increase the fruits and vegetables, particularly brightly colored vegetables in their diet. There is no doubt that the phytohemicals and antioxidants which are consumed in your diet have greater heatlh benefits than food supplements.

2. Find a reasonable supplement of antioxidants, vitamins and minerals which will aid the health process. Ask your healthcare provider or if you would like contact SETMA for a recommendation.

3. You will not physically live forever, but you can leave well for as long as you live, if you make the right choices.

4. Remember, it is your life and your health. It is rare that anyone will care as much about your future health as you will.