



KRONOS LONGEVITY RESEARCH INSTITUTE

Research to promote a longer, healthier life for you, your children, and your grandchildren.



First Quarter 2005 Vol. 4, Issue 9

## TRANS FATS AND YOUR HEALTH

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### Kronos Longevity Research Institute

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For over 30 years we have been reading that a high-fat diet is not good for us. Americans have been encouraged to cut down their fat intake to protect themselves from heart disease, and surprisingly, we have. Nevertheless, on average, we are getting fatter. In fact, we are seeing an epidemic of obesity and adult (obesity-related) diabetes, which threatens to erase the past 20 years of progress in reducing the rate of heart disease. Why? Probably because, as people have cut down on fat, they have substituted carbohydrates (carbs) in order to feel "full." Unfortunately, carbs are not as filling as fats, therefore one tends to eat more of them to get to the same level of satisfaction. The result is a higher total intake of calories. Also, a high carb diet may not be good for us either. Certain kinds of carbs, especially high fructose corn syrup, which is now used to sweeten most items in the grocery store, have a tendency to turn into fat in our bodies. So, what do we do?



Over the last 10 years, evidence has suggested that it is not fat per se that is bad for our hearts and arteries, but only certain kinds of fat. Most nutritional scientists believe that it is safe, and even helpful, to consume fat in our diets, provided we eat the right kinds of fat. It turns out that fats can be divided into the "good guys," monounsaturated and polyunsaturated fats, and the "bad guys," saturated fats and trans fats. To complicate things further, the polyunsaturated fats can be divided into two important "flavors" as well: omega-3 (which is good for us); and omega-6 (which has bad effects if consumed in large quantities). There will be more about omega-3 fats in a later issue of the Longevity Kronicle, but now we will focus on trans fats

and why they are bad for us. Trans fats have become a "hot topic." The New York Times recently (February 13, 2005) published a front-page article about the difficulties food manufacturers have in getting trans fats out of the American diet.

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## DIRECTOR'S MESSAGE

I am writing this letter from the 2nd International Conference on Healthy Ageing & Longevity in Australia. The conference is to bring together, some of the best minds and leading lights in geriatrics and aging research from all over the world for two purposes: first, to bring the problem of human aging and its affects on health and quality of life to the attention of the Australian public, medical community and government agencies, and second, to give the participants the opportunity to interact and collaborate, creating new strategies and synergies, for research and development that will lead to better ways of preventing age-related deficits and diseases, and perhaps new insights that will help us slow the aging process.

My talk was an overview of where we stand on replacement of female hormones, estrogens and progestins, in menopausal women. This relatively simple "anti-aging" intervention has been under intensive research scrutiny for at least 40 years, yet we still do not have a good "fix" on the ratio of benefit to risk, nor reliable evidence on which to base decisions regarding whom to treat, for how long, and with what. As you may know, KLRI is sponsoring the only large current study of this issue, the Kronos Early Estrogen Prevention Study (KEEPS), which is due to start up this month, after nearly two years of preparation (visit [www.keepstudy.org](http://www.keepstudy.org) for more information).

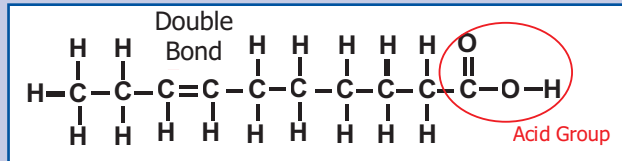
Further on in this issue of the Kronicle, you will find an article describing the results of research on trans fats, in which Dr. Walter Willet and his colleagues at Harvard University have evaluated data from observations on many thousands of research volunteers and come to important conclusions which will affect the multi-billion food industry and lead to prevention of hundreds of thousands of heart attacks and heart disease-related deaths every year (one of which might be your own). Large epidemiologic studies that produce such findings are also very expensive to organize and conduct.

So, what is my bottom line? This letter is really a plea for you to get involved in the biomedical research effort. I cannot overstress how important this is. Medical research only gets done because the public demands it. Most medical research funding comes from the Federal Government, largely from the National Institutes of Health (NIH) and the National Science Foundation (NSF). The best academic physicians and PhD biomedical researchers in the country spend 3-5 months of their precious professional time writing each grant, yet 30% of them will simply not get funded.

What can you do? You can write your senator and congressperson asking them for adequate levels of funding for NIH and NSF next year, so that funding for grant applications can return to the 40 to 50% level. You can also contribute personally to your favorite private research foundation or institute, whether \$5 or \$100. There are many; at least one for every major disease and health problem. Finally you can volunteer to be a subject in research studies. Across the US, at the eight KEEPS study centers, we will need 720 women willing to be studied for a 5-year period. Without such dedicated research participants, no progress can be made in clinical research. Get involved! Do what you can do. Medical research benefits all of us.

S. Mitchell Harman, MD, PhD  
Director and President

First, what is a fat? Each molecule of a fat or oil contains three fatty acid molecules bonded to another molecule called glycerol. We call these substances fats when they are solid at room temperature and oils when they are liquid, but they are essentially the same.



The next question is what are fatty acids? A fatty acid is a long chain of carbon (C) atoms with an acid group (COOH, where H is hydrogen and O is oxygen) at one end (see diagram, above). The links that hold atoms together are called "bonds." Each carbon can bond to four other atoms. In a fatty acid chain the bonds that are not holding carbons together attach to hydrogen. Sometimes, carbons are "double-bonded" (see diagram). Such a fatty acid is said to be "unsaturated" because there is room to add more hydrogen.

- **Saturated fatty acids** have all the hydrogen the carbon atoms can hold. In a saturated fat, all three fatty acids are saturated. Saturated fats, like lard and butter tend to be solid at room temperature, and they are more stable that is they do not combine readily with oxygen and turn rancid.
- **Monounsaturated fatty acids** have only one unsaturated bond. Monounsaturated oils, like olive oil, are liquid at room temperature but start to solidify at refrigerator temperatures.
- **Polyunsaturated fatty acids** have more than one unsaturated bond. Polyunsaturated oils like corn or safflower oils are liquid at room temperature and in the refrigerator. They easily combine with oxygen in the air to become rancid.
- **Partially saturated fats** are polyunsaturated fatty acids that have been exposed to high pressure in a hydrogen atmosphere, which adds hydrogen to some of the double bonds. This process forms trans fatty acids, and fats produced are called "trans fats"

The unsaturated fatty acids found in nature are all "cis". This means hydrogen atoms are on the same side of the double bonds, as in the diagram above. In a trans fatty acid, the hydrogens are on opposite sides of the double bond (for more about "cis" and "trans" see glossary). Trans fatty acids are not found in nature. They are manufactured products. Prior to the mid-20th century these products were not available for

consumption. As it turns out they have some really bad, unanticipated effects. Research accumulated over the last 15 years has shown, beyond any doubt, that trans fats are more than twice as likely, gram for gram, to lead to heart disease as saturated fats (the "bad guys"). That is right, butter is safer than margarine and lard is better than Crisco!

Trans fats increase low-density-lipoprotein cholesterol (LDL) and reduce high-density-lipoprotein (HDL) cholesterol in the blood. Remember that LDL is the "bad" cholesterol and HDL is the "good" cholesterol that protects our hearts and arteries. According to a review article in the American Journal of Nutrition in 1997, studies have shown that trans fatty acids increase the ratio of total to HDL cholesterol in the blood nearly twofold, compared with saturated fats. A high ratio of total HDL cholesterol has consistently been found to be a strong risk factor for heart attacks. The article estimated that 30,000 premature deaths per year are attributed to the consumption of trans fats in the U.S.

Trans fats also inhibit the body's ability to properly use the "good" omega-3 fatty acids, which appears to increase inflammation of the linings of our arteries. Inflammation is known as a risk for heart attacks. This same inflammatory effect may also play a role in worsening disorders like asthma and Crohn's disease.

*continued on page 4*



Dr. Walter Willet, at the Harvard University School of Public Health, and his colleagues have led the fight to get trans fats out of the American diet. In a large epidemiologic study (the Nurses' Health Study) they found that, "...replacing saturated and trans unsaturated fats with unhydrogenated monounsaturated and polyunsaturated fats is more effective in preventing coronary heart disease in women than reducing overall fat intake." It is likely that this finding would also hold true for men.



The Food and Drug Administration (FDA) now states that there is no healthy or safe level of trans fat in foods. The FDA has ordered food manufacturers to disclose the amount of trans fats in their products. The new labels will appear in 2006. Nonetheless, in the future, numerous products will still continue to contain trans fats in significant amounts. In a 1999 FDA supermarket survey, trans fats were in 95% of cookies, 100% of crackers and 80% of frozen breakfast foods. They are even found in "health food" products such as, some granola and yogurt bars. Why is this? It is because the food industry produces the textures and flavors that consumers want. Also, foods containing trans fats have a longer shelf life. Good substitutes for trans fats are expensive and in short supply.

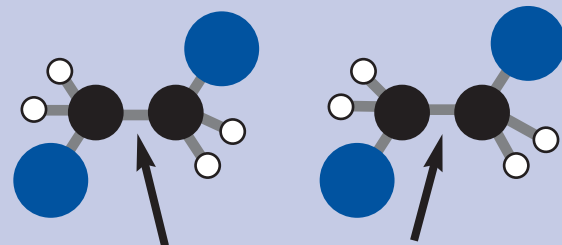
If we are going to reduce the intake of fat in our diets to reduce the amount of carbohydrate, as many are now doing, what is the answer? I suggest that we read the labels, not buy foods that contain trans fats and look for the key words, such as "partially saturated." Food manufacturers are aware of the problem. In the past two years, more and more non-trans fat products (for example, breads and cereals) have been appearing in our supermarkets. It is easier to find trans fat free foods in the "natural" food markets, but it is still wise to read the labels. So, if we stop purchasing foods labeled, "partially saturated," we will be improving our health and our family's health, and, eventually, the health of our fellow citizens.

## Glossary

### Cis/Trans Isomers

Isomers are molecules that consist of the same numbers of the same kinds of atoms, but have a different arrangement of those atoms in space. Cis/trans isomers occur where you have restricted rotation somewhere in a molecule. One example of this is the carbon-carbon double bond.

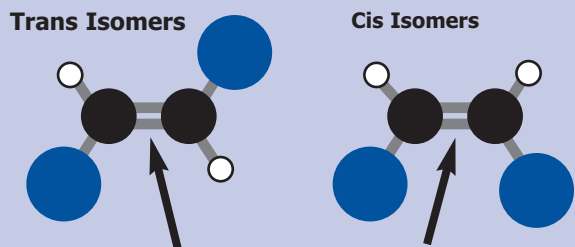
Where the carbon-carbon bonds are single there is unrestricted rotation. The next diagram shows two possible configurations of a molecule called 1,2-dichloroethane. In this model, carbon atoms are black, hydrogens white, and chlorines green "balls."



**Free rotation about this single bond**

These two models are exactly the same. You can get from one to the other just by twisting around the carbon-carbon single bond.

But what happens if you have a carbon-carbon double bond - as in 1,2-dichloroethene?



**No rotation about this double bond**

These two molecules are not the same. They are isomers. The carbon-carbon double bond won't rotate. You would have to take the models to pieces in order to convert one structure into the other. If you have to take a model to pieces to convert one form into the other, then you've got isomers. If you merely have to twist it around, then you haven't!

# IMPROVING HEALTH OUTCOMES FOR OLDER ADULTS

## TRANS FATS AND OUR LONG-TERM HEALTH

The following article is the final article in a five-part series focusing on strategies older adults can employ to improve their health and quality of life.

There are numerous programs and a plethora of information available to older adults who wish to learn self-management techniques in order to reduce both the pain and costs associated with chronic disease and illness.

For example, the Arthritis Self-Help Course, sponsored by the Centers for Disease Control and Prevention (CDC), has been shown to reduce arthritis pain by 20 percent and visits to physicians by 40 percent. Unfortunately, less than 1 percent of Americans with arthritis participate in such programs, and courses are not available in many areas.

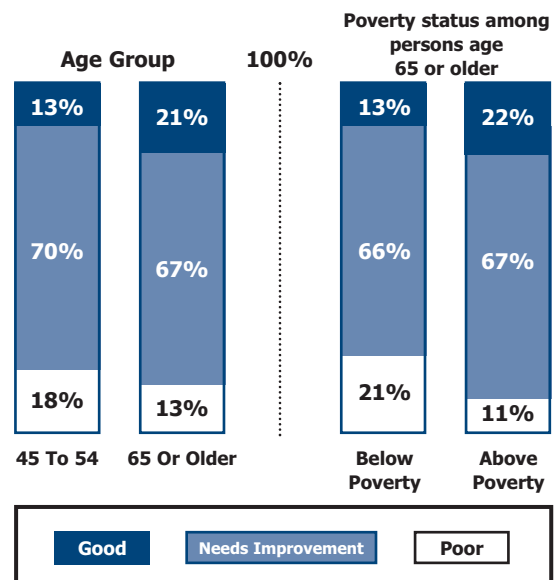
Fortunately, self-management techniques can be learned through the dissemination of information, in addition to self-help courses and programs. Research shows that if seniors maintain just three healthy habits – moderate physical activity, good nutrition and no smoking – they can delay disability by as much as 10 years.

Many organizations, including KLRI, seek to promote awareness and educate the public about healthy-aging issues that affect quality of life. This is achieved by providing high-quality health information and resources to public health professionals, consumers, health-care providers and aging experts. It also is achieved by conducting important research studies that are

designed to answer questions surrounding various aging issues, such as the role hormones play in relation to the development of heart disease.

For more information on aging-related issues, please visit KLRI's Web site at [www.kronosinstitute.org](http://www.kronosinstitute.org).

**Dietary quality ratings of persons age 45 or older, as measured by the Healthy Eating Index, by age group and poverty status, 1994 to 1996.**



Note: Dietary quality was measured using the Healthy Eating Index. See "Indicator 6: Poverty" for information on the definition of poverty. The data were collected between 1994 & 1996. Relevance population: The data refer to the civilian noninstitutional population. Source: Continuing Survey of Food Intakes by Individuals.

**Dietary quality plays a major role in preventing or delaying the onset of chronic diseases. The Healthy Eating Index (HEI) is a summary measure of dietary quality. The HEI consists of 10 components, each representing a different aspect of a healthful diet based on the U.S. Department of Agriculture's Food Guide Pyramid and the Dietary Guidelines for Americans. Scores for each component are given equal weight and added to calculate an overall HEI score with a maximum value of 100. An HEI score above 80 indicates a good diet, an HEI score between 51 and 80 signals a diet that needs improvement, and an HEI score below 51 indicates a poor diet.**

## SEXUALITY AFTER 65?

### Sexuality After 65?

Originally, the purpose of sexual activity was reproduction, but for thousands of years we have been practicing sexual activity for social, non-reproductive purposes.

Despite this fact, the discussion about sexual function and dysfunction, until recently, made most people uncomfortable even in the most advanced societies. Physicians and other healthcare professionals are now being asked by more patients for help with sexual issues. The need has always been there, but has not been discussed openly. Starting with the Kinsey studies in the 1940's and 50's and other studies in the 60's and 70's, it became clear that people are more concerned about marital relationship issues than any other their aspect of social life, including work, income, alcohol and drug addictions. When there is marital discord, there is normally sexual dysfunction. Even in healthy marriages, it is not uncommon.

For the last few decades, it has become acceptable for people to discuss these issues and to seek the appropriate help. It has become clear that when the physician initiates the discussion, 15-50% of patients will admit that there is some degree of sexual dysfunction and most will express an interest in doing something to address these issues.

To avoid confusion, we must realize that sexual functioning and/or performance is one component of sexuality. Sexuality is an essential part of every person's personality and is the abstract sum of many facets of human expressions including physiological (sexual function), psychological (sexual drive, attraction, love), intellectual (clicking together, being on the same wave length with the partner, modifying behavior to best fit his or her intellectual goals) and societal/ethical (what society considers appropriate, acceptable behaviors).

There are no well-designed scientific surveys addressing measurable factors of sexuality in older people. Most studies included very few subjects over



65. Data on frequency of sexual activity in older men and women, and relationship to marital status and health, are based on relatively small numbers of people participating in few longitudinal studies (for example, the Baltimore and Duke University studies).

With more Americans living longer and healthier (in 2020 almost 20% of the population will be 65 or older), the issue of aging and sexuality needs to be addressed more fully. The attitude of society, in general, on the subject of sexuality in middle and older ages is schizophrenic. Many middle-aged to elderly men and women have negative attitudes about continuing sexual

interest and activity among their aging peers. Many doctors and gerontologists can testify, and have published scientific papers showing, that healthy middle age and older people are able to engage in and enjoy sexual activity (even at advanced ages) and many of those who experience sexual issues seek help to maintain interest and function. The fact that medications related to these problems are being prescribed more often is proof. Testosterone prescriptions in the U.S. are doubling roughly every two years, and medications that help erectile function (Viagra, Cialis and Levitra) represent billions of dollars in sales primarily in the US and Europe.

### Sexual Function In Aging Men

#### The male sexual response cycle

The model for sexuality commonly used by healthcare professionals was developed more than 30 years ago by Masters and Johnson. A simple version is as follows: Sex is a natural function that involves almost every system of the human body.

1. Excitement phase - a response to appropriate sexual stimuli (touch, visual images, smells, sounds, and imagination), an increased amount of arterial blood enters the penis causing an erection.
2. Plateau phase – the changes described above are maintained in a steady state for some time.

## SEXUALITY AFTER 65?

3. Orgasmic phase - a series of spasms, about one second apart, develops, originating at the prostate and spreading to the rest of the pelvis and the genitals, leading to ejaculation.

4. Resolution phase - all systems gradually return to the pre-excitement level. This phase includes the refractory period, during which new sexual stimulation cannot cause any response.

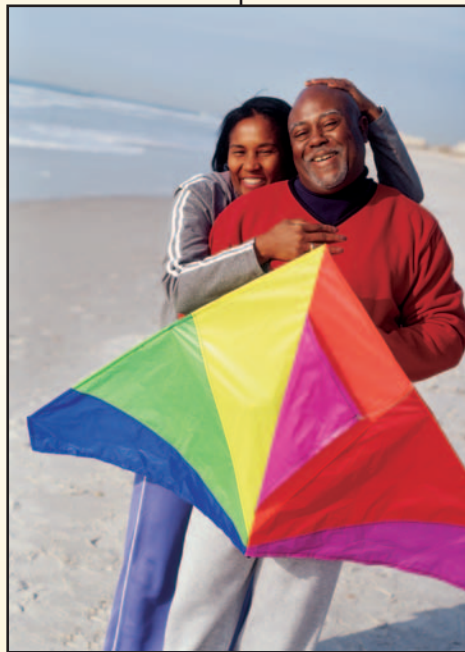
### Effects of Aging on Sexual Activity and the Sexual Response Cycle

The fact that sexual drive (libido) and sexual performance decline with age has been widely recognized for more than 24 centuries ago. Documented data, however, did not exist until 1948 when Kinsey and his co-workers published their controversial (at that time) reports. They found that in the US, the overall frequency of sexual activity in men peaks in the late teens and starts declining in the late twenties and early thirties, reaching almost zero in the late eighties and nineties. With normal aging, there is no change in the general character of the sexual response cycle, but there are several differences compared with norms for younger men. The earliest change is that the refractory period becomes longer, starting in the early twenties. This causes a decline in the capacity for repeated successive orgasms within a short time. As men grow older, there is also an increase in the amount of stimulation required. In addition, responses from other body systems diminish with age.

There are prominent individual differences among the elderly in the frequency of sexual activity. On the average, those with more active sexual lives in their teens and twenties tend to have higher levels of activity when they get older, while those with low levels in their younger years have lower frequency of activity in older age and a higher rate of erectile dysfunction.

Erectile dysfunction (also known as ED or impotence) is the inability to achieve an erection adequate for vaginal penetration and maintain it for an adequate amount of time.

Erectile dysfunction is rare under the age of 50; after that, it increases rapidly. Nearly 20% of men at age 65 and 50% of men at age 75 suffer from ED. Fearful of inadequate sexual performance or rejection, men who experience ED often avoid sexual intimacy, which affects their personal relationships, and ultimately their quality of life. However, the majority of such men still feels sexual desire and is interested in treatments that can address their issue. The truth is that, although most of them can be helped, the single greatest reason that men suffering from ED aren't helped is that 1) they don't tell and 2) their doctors don't ask.



When the first effective ED medications were introduced six years ago, both the media, comedians and political circles took note, which prompted political debates regarding insurance coverage for ED. It had a major impact in treating several types of ED and has helped the open lines of communication between physicians and their patients. Unfortunately, some physicians and other healthcare providers are still reluctant to discuss sexuality with their patients, even when the patients express their concerns. "What do you expect at your age?" is a common response, but not the appropriate one. This is not surprising since fewer than 20% of physicians have had any organized courses in sexuality during their

medical training. Because of all the attention these drugs are receiving and the extensive advertising campaigns, many patients do initiate the interaction with a simple request for a prescription. While these drugs could be the first line of defense against ED, if physicians treat impotence only with one of these three drugs, then they may miss the underlying diseases that cause ED.

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## Causes of ED

The causes of ED can be classified into two main categories: psychological and organic. Independent of whether organic causes are found, psychological factors are an issue in most impotent males and should be addressed along with the organic problem.

**Psychological Causes:** The most common psychological factor leading to ED is the feeling of pressure to perform. In response to this perceived pressure, men, who normally are focused on sensation during sex, become preoccupied with observing the size of their erection. This interrupts the normal sexual response cycle by altering the pelvic blood flow.

Other social factors, such as anxiety and/or depression associated with job loss, retirement, marital discord, independence of children and financial losses or concerns are also major causes of ED. Fatigue or boredom with accustomed sexual practices are additional psychological factors that can interfere with erection. Creativity such as, sexual position, improved body image and rigor through health optimization programs may result in restoration of erectile effectiveness. The quality of sexual response is limited by the unrealistic expectation that mutual orgasm should occur and that both partners will have the same level of interest during a sexual experience.

**Organic Causes:** Sexual functioning has been associated with the reproductive glands since the middle ages. We now know that the aging process cannot be attributed to a simple lack of testosterone, yet the development of decreased libido and ED in older men may be related to testosterone deficiency.

Many older patients have low levels of testosterone in their blood (hypogonadism). Restoring testosterone to normal levels (with testosterone gel, patches or injections) will often increase their sexual drive (libido) and may improve the quality of their erection alone or in combination with Viagra or similar drugs. Other diseases that can cause ED include: diabetes mellitus, hypo- and hyperthyroidism, hypertension, vascular diseases, severe elevations of blood cholesterol, diseases of the nervous system, kidney failure, liver dysfunction, vascular surgeries, genital surgeries and Peyronie's disease. Diagnosing and managing these

diseases are essential in evaluating ED. Only if the problem persists after appropriate management of such underlying problems, should additional treatments be tried.

The most common organic cause of impotence is drug use. Although illegal drugs use can cause ED, legally used drugs, either prescribed or over-the-counter, are the most frequent offenders. Prescribed drugs, that can cause ED, include some anti-depressants, anti-psychotics, sedatives, sleeping medications, seizure medications, estrogens, some blood pressure control meds, corticoids (in high doses) and lithium. The over-the-counter medications when used frequently or abused include cimetidine, cold medications (containing substances that dry the mouth and nose lining) and anti-allergy medications.

Alcohol is a frequent cause or contributor to the development of ED. Regular daily use, of as little as four drinks per day, may have some effects. Consuming 8 or more drinks per day will, almost certainly, lead to ED.



## Treating ED

Although medications help ED, doctors should always treat it as a symptom and try to find and treat its cause. The appropriate approach includes a detailed medical and sexual history, a physical examination, a psychological evaluation and basic laboratory studies, including appropriate hormone evaluation.

Viagra, Cialis and Levitra are the most successful treatments available today for ED because they are much easier to use, have fewer side effects and/or are less painful than other older modalities. However, not all men will respond to these drugs. For example, men with no nocturnal erections (as determined by overnight monitoring with a special instrument) have minimal success with these agents.

Men who have not had good results using these drugs may be treated with prostaglandin products (urethral pellets or penile injections). Another modality to try is the air vacuum device. If all of the above have failed, a last resort would be an "inflatable" ("hydraulic") penile implant, which, at least mechanically, is almost always successful, regardless of cause.

**Viagra, Cialis, Levitra**

# SEXUALITY AFTER 65?

All these medications are known as PDE5 inhibitors and work the same way. Although they work for ED in some patients, they are not safe for everyone. For example, patients who:

- take any medicines called nitrates, which is commonly used to treat angina (chest pain from heart disease).
- take medicines called alpha blockers, which are prescribed for prostate problems and, sometimes, high blood pressure.

If you are considering these medications, you should also know that there are some differences between the three available PDE5 inhibitors and there are some side effects.. Details about the differences and side effects are listed in Table 1. The best advice for any person considering these drugs is to discuss them with his primary care physician, allowing him/her to give you individualized advice.

## Sexual Function In Aging Women

The exact definition of sexuality, the components of the sexual response cycle and what constitutes abnormal levels or quality of sexual behavior in women is the subject of intense debate and will be addressed in detail in a future article. In closing, three facts should be kept in mind:

1. The female sexual response, while resembling the male cycle of excitement, plateau, and resolution superficially, is really quite different in many important ways. Treating women as "another kind of man" is generally inappropriate.
2. Many of the sexual changes in older women can be directly traced to the decline of female hormone (especially estrogens) associated with menopause and treatments are available.
3. PDE5 inhibitors (Viagra, Cialis, and Levitra) DO NOT work in women.

**Table 1.**

Medication	Viagra	Cialis	Levitra
Strengths Available	25, 50, 100 mg	5, 10, 20 mg	2.5, 5, 10, 20 mg
Starting Dose	50 mg	10 mg	10 mg (if older than 65: 5 mg)
Duration of Action	Up to four (4) hours	About 36 hours	Up to four (4) hours
Side Effects	16%	11-15%	15%
Headache	7%	4-10%	4%
Dyspepsia	<2%	3-6%	2%
Back Pain	4%	2-3%	9%
Nasal Congestion	10%	2-3%	11%
Flushing	3%	<0.1%	<2%
Abnormal Vision	3%	<2%	<2%
Diarrhea	<2%	1-4%	<2%
Myalgia			
Maximum Use Frequency	Once per day	Every 48 hours	Once per day



## BOARD MEMBER PROFILE

### Terry Goddard, Arizona Attorney General

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Throughout his career, Terry Goddard has worked to improve the lives of Arizonans – a commitment he continues as the State's Attorney General.

Since being elected Attorney General in 2002, Terry has fought for consumer justice by:

- Filing suit against Honeywell International for, among other things, repeatedly misrepresenting or hiding data requested by the Arizona Department of Environmental Quality.
- Fighting Internet crime, especially identity theft and crimes against children.
- Participating in and negotiating settlements of various Consumer Fraud lawsuits against drug manufacturers, pay day loan providers and Qwest, resulting in millions of dollars for the State and forcing significant changes in these companies' business practices.
- Drafting and urging passage of legislation to tackle the evils of predatory lending.

Serving the public is nothing new for Terry. His first job out of law school was with the Attorney General's Office prosecuting corporate fraud.

During his career as a practicing attorney, Terry spearheaded an effort to bring City Council Districts to Phoenix, opening up City government in 1982. The year before, he led a fight to stop an unconscionable gas tax increase.

Terry was elected Mayor of Phoenix four times, leading the City from 1983 to 1990. In those years, Phoenix made significant strides in expanding and modernizing law enforcement, increasing citizen participation in government, revitalizing downtown, and setting up nationally-recognized programs in arts, economic development and historic preservation. During his time as Mayor, Terry was named "Municipal Leader of the Year" by City and County Magazine and elected President of the National League of Cities.

From 1995 to 2002, Terry served as the Arizona State Director for the U.S. Department of Housing and Urban Development (HUD).

Terry is an Arizona native, born and raised in Tucson. He received his law degree from Arizona State University. Terry served an active duty tour in the Navy and retired as a Commander after 27 years in the Reserves. He and his wife Monica have a five-year-old son.

## DIRECTOR'S FORUM

The Director's Forum is an event held to communicate the latest scientific discoveries in longevity research, study status and potential studies being considered. The industry's update also will include information on government issues that may affect the progress of longevity research. The Forum is comprised of our valued friends.

**The next Forum is on April 21, 2005 • To attend the Director's Forum, please call (602) 778-7499.**

# Who we are!

**K**ronos Longevity Research Institute (KLRI) is a not-for-profit, 501(c)(3) organization conducting state-of-the-art clinical translational research on the prevention of age-related diseases and the extension of healthier human life. KLRI tests new strategies to detect and prevent chronic diseases associated with aging and investigates the effects of innovative interventions to slow the aging process and improve health outcomes for older persons. In addition, KLRI helps the medical and lay communities understand important aging issues. KLRI research findings support a healthier quality of life and a robust lifestyle in our senior years.

KLRI also performs research to increase our healthy years by improving muscle strength, understanding the role of various nutritional components in our diets, and achieving a better grasp of human aging physiology.

There are many “anti-aging” remedies and recommendations on the market today. However, most lack scientific evidence, and have potential side effects. We need reputable scientific organizations to spearhead research to further our understanding of treatments developed to increase our healthy years.

Our world-renowned scientific team is comprised of experts in their fields, who are conscience driven to perform at their highest potential to ensure that all research projects are safe, carefully performed and accurately communicated. The KLRI studies performed differ from those of many narrowly focused institutions because we have a wide range of scientific expertise and our focus is on aging itself rather than a single disease.

## OUR MISSION

To perform and foster clinical translational research aimed at healthier human longevity and communicate results to the professional and lay communities.

## OUR GOVERNANCE

A distinguished board of directors, with a unique mix of scientists, longevity specialists, and community leaders governs KLRI. There is also a scientific advisory board of recognized international experts in medical and scientific fields, including nutrition, exercise, hormones, bone and joint diseases, cancer and heart disease.



**... join the TEAAM  
Healthy Men Needed**

**Men over 60 years of age are invited to participate in a clinical trial to study Testosterone's Effects on the Progression of Atherosclerosis in Aging Men (TEAAM Study)**  
*Compensation Provided*

**You can make a difference!**

**Call (602) 778-7480 to see if you qualify**

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