

STEP 5

Anti-Aging Supplements After Age 40

Although we may pride ourselves on having evolved spiritually, intellectually, and emotionally, as a species we have not evolved very far biologically. After the age of forty, our bodies are programmed to start aging: parts wear out, tissues break down, and we become increasingly vulnerable to life-threatening diseases and infections. Embedded in our genes are the blueprints for age-related changes that will prompt our physiological features to decline and degenerate, leading ultimately to our demise.

Why do our bodies allow this to happen? Because as far as nature is concerned, once we have lived long enough to reproduce and foster the next generation, we have served our biological purpose on this planet. After that, we are taking up precious space, eating valuable food, consuming a lot of oxygen, and creating too much waste. Nature has equipped each of us with an exit strategy from the day of conception, and its highlights include crippling arthritis, loss of muscle and bone mass leading to osteoporotic fractures, angina, heart disease, congestive heart failure, virulent infections, brain degeneration with memory loss, dementia and Alzheimer's disease, macular degeneration of the eye, cataracts, and cancer.

☞ The Meschino Optimal Living Program ☞

For years it was assumed that these end-game conditions were inevitable, that there was little to be done to prevent or postpone their development. Today, however, the evidence argues against this deterministic viewpoint. Science has identified many of the body's clockwork-like biological adjustments, those changes that are designed to initiate deterioration. We now know that the body can accelerate the aging process and increase our risk of disease by triggering a decline or rise in the synthesis or secretion of certain hormones, a decline or rise in the strength of certain enzymes, and by gradually allowing the immune system to weaken. These are the primary alterations that occur automatically in the body after the age of 40. A healthy diet and exercise alone are not enough to forestall their arrival or counter their effects.

Fortunately, virtually all of these age-related changes can be influenced by the use of targeted, natural, anti-aging nutritional supplements. A comprehensive program that incorporates nutrition and exercise plus supplementation can compensate for the body's midlife reprogramming, slow biological aging, and significantly reduce your vulnerability to the degenerative ailments associated with old age. It's not necessary to accept the common discomforts of old age; there is something you can do about them.

The resilient nature of the human body is now beginning to be appreciated. Breakthrough discoveries in anti-aging and disease prevention are being made just at a time when baby boomers and young seniors are moving into their high-risk years. Many are already committed to taking proactive measures to remain healthy as long as possible and to avoid or postpone the degenerative diseases that their parents and grandparents suffered. Convinced of the benefits of nutritional supplements, they have helped drive annual sales to \$2 billion a year in Canada and \$16 billion a year in the United States. Surveys indicate that 60 to 70 percent of North American adults use nutritional supplements on a regular basis. The only issue for these motivated individuals is to know which supplements most effectively contribute to anti-aging and disease prevention.

Step 5 | Anti-Aging Supplements After Age 40

Unfortunately, some members of the medical profession are either unaware of or have chosen to ignore the burgeoning research in this area. They remain focused on a reductionist model of health delivery, providing a single remedy—usually a synthetic drug—for a single condition and treating symptoms rather than underlying causes. However, a growing number of medical doctors who belong to the American College for the Advancement of Medicine and the Academy of Anti-Aging Research hold a different view. They are strong proponents of the use of supplements and other cutting edge interventions to inhibit and reverse the biological process of aging.

Through published studies and experimental trials, ten specific supplement interventions have been shown to be highly effective. In the pages following, we'll examine the science behind these important anti-aging supplements. In my view, you should incorporate all into your lifetime wellness program after age 40: you will slow the aging process, reduce the risk of degenerative diseases, and enhance your appearance, feelings of wellbeing, and quality of life as you age.

1. Coenzyme Q10 and the Heart, Brain, and Immune System—and Cancer Prevention

Coenzyme Q10 (CoQ10), also known as ubiquinone, is a vitamin-like substance that is required for the production of energy in every cell of your body. In order to survive and carry out their specialized functions, cells must continually convert some of the food you eat into a usable source of energy called adenosine triphosphate (ATP-energy). CoQ10 enables your cells to make this conversion, within the mitochondria—the energy factory of the cell. If your cells cannot produce sufficient amounts of ATP-energy due to a CoQ10 deficiency, then a decline in cell function occurs that can hasten the onset of heart disease, a decline in brain function, a

☞ The Meschino Optimal Living Program ☞

weakening of the immune system, and a heightened cancer risk. More recently, we have seen that CoQ10 deficiency is an underlying cause of Parkinson's disease and a contributing factor in many cases of congestive heart failure and high blood pressure.

CoQ10 Synthesis Declines as We Age

The body generates optimal amounts of CoQ10 up to about age 20. After that, a decline in CoQ10 synthesis begins, becoming significant around age 40. The natural synthesis of CoQ10 is a 17-step process that involves eight vitamins (mostly the B vitamins) and several minerals. Some of the enzymes required in this process disappear with age, which impairs the ability of the body to make the amount of CoQ10 it needs. The intake of CoQ10-containing foods alone is not enough to compensate. The average daily intake of CoQ10 from food is five to 10 mg. This is adequate up to a certain age, while your body is making most of what it needs. But studies suggest that 30 to 60 mg of CoQ10 supplementation a day is desirable after age 40; dosages in the range of 150 to 300 mg a day are required to favorably affect outcomes in patients with congestive heart failure, failing memory, Parkinson's disease or for cancer treatment support. You would have to consume half a pound of sardines or two and a half pounds of peanuts a day to yield 30 mg of CoQ10 intake.

Certain medications interfere with the body's ability to absorb CoQ10. If you are taking any of the following, you should ingest 30 to 60 mg a day of CoQ10 to compensate, regardless of how young or old you are:

- Orlistat: Don't take CoQ10 supplements within 90 minutes of ingesting Orlistat
- Beta blockers
- Biguanides
- Clondine

Step 5 | Anti-Aging Supplements After Age 40

- Gemfibrozil
- Haloperidol
- HMG-CoA reductase inhibitors
- Hydralazine
- Methyropa
- Phenothiazines
- Sulfonylureas: some of these drugs decrease CoQ10 synthesis (acetohexamide, glyburide, tolazamide)
- Thiazide diuretics
- Tricyclic antidepressants

Coenzyme Q10 supplementation is a necessity by age 40 to 50. In essence, supplementation with CoQ10 allows you put the CoQ10 back into your body to compensate for what your body can no longer provide for itself. It is a safe, effective, and essential natural anti-aging intervention that counters the body's aging.

Congestive Heart Failure and CoQ10

A decline in CoQ10 levels has been shown to contribute to the development of congestive heart failure, a condition in which the heart muscle becomes too weak to pump blood through the arteries and blood vessels. More specifically, a lack of CoQ10 prevents the heart muscle from producing the ATP energy it requires to contract with enough force to pump blood through the system. As a result, blood circulation backs up and fluid leaks out of the blood vessels into the lungs, the hands and the feet, which leads to shortness of breath, swelling of the extremities, and high blood pressure. Biopsy and blood sample results from the hearts of patients with various age-related cardiovascular diseases, especially congestive heart failure, show a deficiency in CoQ10 in 50 to 75 percent of subjects.

☞ The Meschino Optimal Living Program ☞

Several well-designed clinical studies have demonstrated that CoQ10 supplementation can reverse congestive heart failure in a significant number of cases enabling the heart muscle to once again produce the ATP energy it requires. Discontinuation resulted in severe relapses of congestive heart failure in research subjects. In cases such as these, CoQ10 supplementation must be a lifelong strategy. The beneficial effects of CoQ10 supplementation may not be evident for several months, while CoQ10 concentrations build up in the heart muscle. Generally speaking, CoQ10 can be taken with other drugs that are used to treat congestive heart failure, high blood pressure, or other heart ailments, and studies show that its use often allows doctors to reduce the number of medications required to control these conditions. However, if you are currently suffering from congestive heart failure or any other heart condition or high blood pressure, you should do not undertake CoQ10 supplementation without first notifying your doctor.

As surprising as it may seem, most doctors and cardiologists in the United States and Canada do not prescribe CoQ10 supplementation as part of their usual treatment protocols for heart conditions. This is largely due to the influence of drug companies. CoQ10 cannot be patented as a drug, so it does not represent a source of profits for drug companies. However, CoQ10 supplementation is widely prescribed for the treatment of congestive heart failure and other cardiovascular conditions by doctors in Italy, Sweden, Israel, and Japan, who report significant improvement in a high percentage of their patients. In fact, many individuals in these countries take CoQ10 supplementation for prevention as well as for therapeutic purposes: 15 percent of Swedes and 20 percent of Danes take CoQ10 supplements, according to one survey. As far back as 1987, there were more than 10 million citizens in Japan using CoQ10 supplementation for the treatment of heart-related conditions.

Step 5 | Anti-Aging Supplements After Age 40

In many cases, congestive heart failure appears to be caused by the age-related decline in CoQ10 synthesis that is programmed into our genes. It makes sense to supplement your diet with CoQ10 as a way to prevent congestive heart failure from developing in the first place. Beginning between the ages of 40 and 50 years, take at least 30 mg of CoQ10 per day. By age 60 to 65, it may be wise to increase the dosage to 60 mg per day. Patients with congestive heart failure usually require higher dosages to combat the ailment on a therapeutic level. It's not uncommon for doctors to recommend 150 to 300 mg per day, taken in divided doses (50 mg three times daily or 150 mg twice daily). A significant CoQ10 blood level, usually greater than 3.5 micrograms per milliliter, is necessary to obtain a therapeutic effect.

High Blood Pressure, and Angina, and CoQ10

Preliminary research indicates that a lack of CoQ10 synthesis may also contribute to the development of high blood pressure, angina and irregular heartbeat problems. In these cases, daily dosages in the range of 100 to 200 mg have been shown to be successful in improving exercise performance in patients suffering from angina, in lowering high blood pressure by nine to 20 percent, and in reducing the number of episodes of irregular heartbeats in patients with mitral valve prolapse. To help counter these problems, begin taking a CoQ10-containing supplement after age 40.

Preserving Brain Function with CoQ10

Recent studies have highlighted the fact that the brain has higher CoQ10 concentrations than the blood, the heart, or any other organ. Just like the heart, the brain requires CoQ10 to make the

☞ The Meschino Optimal Living Program ☞

ATP energy necessary to perform its distinctive functions. And just as with the heart, brain levels of CoQ10 decline as we age, which can contribute to impaired cognitive function. A lack of CoQ10 makes it more difficult for brain cells to manufacture the chemicals they need for clear thinking, concentration, memory recall, information processing, coordination of movement, and even to maintain balance during standing and walking. CoQ10 deficiency may also be significant to the development of degenerative brain diseases such as Lou Gehrig's disease (amyotrophic lateral sclerosis), Huntington's disease, Parkinson's disease, Alzheimer's disease and other conditions that affect the brain and nervous system. In addition, CoQ10 is an important brain antioxidant, known to protect brain cells from the free radicals that are strongly associated with most brain degenerative diseases. The brain uses at least 10 percent of the body's oxygen at any given moment, a side effect of which is the creation of many oxygen free radicals, a natural if potentially harmful consequence of oxygen metabolism, as we saw in Step 2 of this book. Antioxidants such as vitamin E and vitamin C have been shown to concentrate in the brain and protect brain tissue from free radical damage, but recent studies have established that CoQ10 is also an essential brain antioxidant. Along with other antioxidants, CoQ10 supplementation is one of the best anti-aging interventions you can adopt to preserve brain function and help guard against degenerative disorders.

Parkinson's Disease and CoQ10

In the past few years a number of researchers have concluded that a significant cause of Parkinson's disease is a genetic inability to synthesize adequate amounts of CoQ10 in parts of the brain affected by the disease. They suggest that supplementation with CoQ10 can compensate for this defect and potentially prevent the disease onset or further progression. In the October 2002 issue of

Step 5 | Anti-Aging Supplements After Age 40

Archives of Neurology, Dr. Clifford Shults and fellow researchers presented the findings of a clinical trial demonstrating that patients with early-stage Parkinson's disease who were given CoQ10 supplementation for 16 months showed significantly less impairment than did patients given the placebo. The efficacy of treatment was readily apparent by the eight-month mark: those patients given the highest doses of CoQ10 had the best overall results. The test doses were 300, 600, and 1,200 mg per day. The side effects were mostly mild and included back pain, headaches, and dizziness.

The researchers indicated that the administration of CoQ10 was aimed not only at symptomatic relief, but at the underlying biochemical disorders associated with the development of the disease, namely that individuals become prone to Parkinson's as result of not being able synthesize enough CoQ10 in critical parts of the brain. As a result, those brain cells lack the ATP energy needed to make sufficient amounts of dopamine, without which the individual suffers the disease's characteristic tremors and other involuntary movements, as well as progressive weakness. The lack of ATP energy eventually leads to the degeneration and death of many of these brain cells, which allows the condition to progress to its life-threatening end-stages.

Dr. Shults's research was the first placebo-controlled study to show that CoQ10 supplementation can halt the progression of early-stage Parkinson's disease in human subjects. It involved only 80 subjects (40 in the CoQ10 group and 40 in the placebo group), but these impressive findings have paved the way for larger studies that should more clearly establish the degree to which CoQ10 supplementation is useful as a treatment and possibly as a preventive agent in high-risk populations.

Parkinson's disease primarily afflicts individuals over the age of 50, the phase of life when most people experience a significant age-related decline in CoQ10 synthesis. Today, over one

☞ The Meschino Optimal Living Program ☞

million Americans and approximately 100,000 Canadians suffer from it, but the incidence of the disease in younger people is increasing at an alarming rate, according to the American Parkinson's Disease Association.

Immune Function and CoQ10

It is well documented that the body's immune system becomes weaker and less effective as we age. This is the reason that we become prone to more serious and life-threatening infections in later years and accounts in part for the fact that cancer incidence rises with every decade of life. A well-functioning immune system helps your body kill off any potentially harmful viruses, bacteria, and other germs that can infect or alter the DNA of certain tissues, leading to cancerous mutations. Certain cells of the immune system, such as natural killer cells, actually seek out and destroy developing cancer cells before they can do damage.

Like other cells in the body, immune cells require ample CoQ10 in order to synthesize the ATP energy they need, yet the decline in CoQ10 synthesis that occurs with age results in a decline in immune function that becomes quite pronounced after the age of 50. Both animal and human studies show that CoQ10 supplementation improves immune system function in older animals and human subjects, and reverses some aspects of immune system decline. In one human study, chronically ill patients who were given 60 mg per day of CoQ10 for 27 to 98 days showed significantly increased blood levels of immu-noglobulin G (IgG), an important antibody that destroys viruses and other microbes that may cause infection.

CoQ10 and Cancer Treatment Support

CoQ10 has shown antioxidant, tumor-suppressive, and immune strengthening effects in both experimental and human studies. For

Step 5 | Anti-Aging Supplements After Age 40

these reasons it is often recommended not only to help prevent cancer, but also as part of the nutrition and supplementation support program to discourage the recurrence or progression of cancer in patients who have already been afflicted.

The most convincing evidence for its application in this regard was demonstrated by a study involving 32 women with breast cancer, aged 32 to 81 years. These women were classified as high-risk for the spread of cancer because their axillary lymph nodes showed evidence of cancer cells in biopsy examination. After completing the standard radiation and chemo-therapy that followed their surgeries, the women were given high-dose nutritional supplementation: vitamin C, 2850 mg; vitamin E, 2500 IU; beta-carotene, 32.5 mg; selenium, 387 mcg; secondary vitamins and minerals; an essential fatty acid supplement consisting of 1200 mg of gamma-linolenic acid and 3500 mg of omega-3 fats (e.g., flaxseed oil), and Coenzyme Q10, 90 to 300 mg. At the end of the 18-month study none of the patients had died during the study period (the expected number of deaths derived from medical statistics was four); none experienced a further spread or metastasis of their cancer; the quality of life scores improved (no weight loss; reduced use of painkillers); and six patients showed apparent partial remission. The patients consuming the higher dosages of CoQ10 (300 mg per day) appeared to show the best results in terms of quality of life scores and partial remission.

As a result of these findings I often recommend an updated version of this supplementation program to individuals who have had cancer to enhance immune function and help suppress tumor growth.

Whether we have experienced serious age-related disease by age 40 or not, given our declining synthesis of CoQ10 it is vital to supplement with this nutrient as a means of forestalling the aging process. I recommend that you begin taking a CoQ10-containing supplement at age 40, or at the latest by age 50. If you are

☞ The Meschino Optimal Living Program ☞

on medications that impair CoQ10 absorption or synthesis, or if you have any of the health conditions mentioned in this chapter, then begin taking it earlier. Remember that CoQ10 is a fat-soluble nutrient and therefore it is absorbed into your bloodstream only if you take it with meals that contain some fat. Don't take CoQ10 supplements on an empty stomach or with a piece of toast and jam; always take it with a meal. Be aware too that alpha-linolenic acid—an essential fatty acid found in flaxseed oil—has been shown to greatly enhance the absorption of CoQ10.

The final piece of information to know regarding CoQ10 supplementation is that the active ingredients in hawthorn berries and hawthorn leaves maximize the ATP energy-generating effect of CoQ10. Hawthorn (*crataegus oxyacantha*) is a spiny tree or shrub that is native to Europe. Its leaves and berries contain flavonoids compounds known as proyanidins that provide its medicinal effects. In Japan and other Asian countries, as well as Germany and other parts of Europe, supplementation with a standardized grade of hawthorn has been shown to reverse congestive heart failure, lower blood pressure, and improve cases of angina. When taken together, CoQ10 and hawthorn optimize the production of ATP energy in many body tissues. (Patients on digitalis or digoxin should not take hawthorn without a physician's consent.)

It is important to use a standardized grade of hawthorn, which contains three to five percent flavonoid or procyanidin content, to ensure enough of its active ingredients to be effective. My preference is to take a CoQ10 supplement that also contains hawthorn, to simplify the process. In general, there should about 37.5 mg of hawthorn for every 30 mg of CoQ10 present in the supplement. This provides an ideal anti-aging synergistic effect to maximize ATP energy production in the body.

Step 5 | Anti-Aging Supplements After Age 40

2. The “Detoxification and Immune Function Four”: Milk Thistle, Indole-3-Carbinole, Reishi Mushroom Extract, and Astragalus

Part of nature’s plan for the decline of our bodies after age 40 is the deterioration of detoxification enzymes in our liver cells and the disabling of our white blood cells—the very cells that identify and destroy cancer cells and fight off viruses and potentially fatal infections. This loss of detoxification capacity and immune function accounts for the rise in cancer rates in older populations. It’s also the reason why someone who is 85 years of age is more likely to find himself in a life-threatening situation, if he contracts pneumonia, than would an 18-year-old. Among men, 75 percent of new cancer cases and 82 percent of cancer deaths occur after the age of 60. Women in the same age group experience 63 percent of new cases of cancer and 78 percent of cancer deaths.

All this is related in part to a faulty detoxification function (which allows carcinogens to build up in our bodies as we age), coupled with the weakening of the immune system (which impairs the ability of our immune cells—the white blood cells—to destroy cancer cells and fend off infections). It is well known that drugs like prednisone, which suppresses the body’s immune system, increase cancer risk to a significant degree. It is also acknowledged that individuals with AIDS, who have compromised immune function, are extremely susceptible to the development of certain cancers. There is no doubt that a healthy immune system and the prevention of cancer go hand-in-hand.

☞ The Meschino Optimal Living Program ☞

Researchers have discovered that the use of certain nutritional supplements can boost the performance of the body's detoxification enzymes and immune. By taking a combination of these herbal agents in conjunction with the nutritional program outlined in this book and a high-potency multivitamin and mineral supplement, you can provide your body with the daily nutrient support it needs. The four herbal products to add to your list of daily anti-aging and disease preventing supplements are milk thistle, indole-3-carbinol, reishi mushroom extract, and astragalus. To understand their benefits, it's helpful to know how our detoxification and immune systems operate.

Detoxification and Nutrition

The liver is the primary site for the detoxification of carcinogens, toxins, end products of metabolism, older circulating hormones, and other food-borne environmental chemicals, such as pesticides, herbicides, and artificial food additives. Almost two quarts of blood pass through the liver every minute. Its detoxification enzymes purify the blood and keep it free from substances that can cause cancer at various tissues sites within the body. As well, some 99 percent of any bacteria in the blood is intercepted and destroyed by the liver's Kupffer cells before the blood is allowed to recirculate.

In liver cells, and in other cells that fulfill detoxification duties, undesirable and harmful substances are neutralized by detoxification enzymes in a two-phase process. These enzymes are highly responsive to dietary and supplementation practices, which means we can actively counter their age-related decline. Phase I detoxification involves a group of enzymes called the mixed function oxidase enzymes, which comprise 50 to 100 different detoxifying enzymes. Essentially, these enzymes convert toxins either to less poisonous water-soluble forms, or to more active and dangerous metabolites such as free radicals, which are then neutralized in Phase II. Some Phase II detoxification enzymes act directly on other toxins—heavy

Step 5 | Anti-Aging Supplements After Age 40

metals, liver toxicants, bacterial and microbial compounds and endotoxins—converting them into compounds that the body can more easily eliminate. However, for the most part, Phase II is designed to intercept those harmful metabolites produced by Phase I, neutralize them, and prepare them for elimination through the urine or fecal matter.

Dietary factors and nutritional supplementation exert a profound influence on the ability of these systems to sustain performance and prevent the buildup of toxins and carcinogens in the bloodstream.

Among the foods known to promote Phase I detoxification enzymes are cabbage, cauliflower, turnips, kale, bok choy, broccoli, and Brussels sprouts. These cruciferous vegetables contain a substance called indole-3-carbinol, which stimulates detoxification to a significant degree. Studies show that individuals who consume higher amounts of these vegetables throughout their lifetimes have markedly less colon, breast, and prostate cancer incidence. Limonene, a flavonoid found in oranges and orange juice, also stimulates Phase I detoxification enzymes, as do niacin (vitamin B3), riboflavin (vitamin B2), and vitamin C. Interestingly, grapefruits and grapefruit juice, which contain a flavonoid called naringenin, slow Phase I detoxification by up to 30 percent.

To support Phase I and Phase II detoxification in the liver, follow these strategies:

- Take a daily high-potency multiple vitamin and mineral supplement that is enriched with a B-50 complex and antioxidants:
 - Vitamin C: 1,000 mg
 - Vitamin E: 400 I.U.
 - Selenium: 100-200 mcg
 - Molybdenum: 50-75 mcg
 - Beta-carotene: 10,000-20,000 I.U.

☞ The Meschino Optimal Living Program ☞

- After age 40, consider adding an immune-detox support supplement containing indole-3-carbinol (the active detoxifier in cruciferous vegetables) and milk thistle (standardized to 80 percent silymarin content).
- Drink a daily protein shake, rich in soy whey protein (provided you are not sensitive to these proteins). These proteins enhance liver function, strengthen the immune system, and reinforce the intestinal barrier to toxins. Soy isoflavones also assist the performance of many Phase II liver enzymes, making them more efficient.

Let's look at how supplementation with milk thistle and indole-3-carbinol can supercharge your body's detoxification capacity.

Milk Thistle

The medicinal use of milk thistle was acknowledged by the well-known seventeenth-century pharmacist, Nicholas Culpeper, who cited it as a useful agent for opening "obstructions" of the liver and spleen and for the treatment of jaundice. Even the Greeks and Romans noted its ability to protect against and repair certain liver conditions. More recently, scientific investigation of liver-related conditions in the 1960s led to the isolation of silymarin from the plant's ripe seeds. It is silymarin—a mixture of flavonolignans consisting chiefly of silibinin, silidianin, and silicristin—that improves liver health and boosts the detoxification capabilities of Phase II enzymes. To be effective, milk thistle extracts should contain a minimum of 80 percent silymarin content.

Here's why milk thistle is so important:

- **Antioxidant function:** Silymarin has been shown to be at least ten times more potent an antioxidant than vitamin E in the liver, stomach, and intestine. Experimental evidence has revealed that silymarin protects animals from liver damage after exposure to such diverse toxic chemicals as

Step 5 | Anti-Aging Supplements After Age 40

carbon tetrachloride, ethanol, galactosamine, and amanita phalloides and its toxins, a lethal agent found in toadstool mushrooms.

- **Liver glutathione:** Silymarin increases liver glutathione content by over 35 percent in healthy human subjects and by over 50 percent in rats. Glutathione is an active protein in both Phase I and Phase II detoxification processes and acts as an intracellular antioxidant that protects cells against dangerous free radicals from various sources. In many liver and immune-related diseases, glutathione liver concentrations are depleted, permitting faster disease progression. The ability of milk thistle to help restore glutathione levels makes it an effective treatment for various liver conditions.
- **Blocking leukotrienes:** Silymarin inhibits the formation of inflammatory chemicals called leukotrienes, thereby helping to control swelling and inflammation resulting from mechanical and chemical assaults.
- **Stimulating protein synthesis:** Silibinin stimulates the enzymes that cells use to replicate DNA and RNA, which in turn leads to new liver cell development. This means that the regenerative capacity of liver cells is enhanced with damaged cells repaired and old ones replaced.
- **Increasing superoxide dismutase concentrations:** Silymarin raises the concentrations of superoxide dismutase enzyme, a powerful intracellular antioxidant that neutralizes the superoxide anion—an aggressive and reactive free radical oxygen species. This action helps protect liver cells from the cumulative effects of free radicals as we age.

Milk thistle's influence on the liver is so powerful that it has been used therapeutically in the treatment of such serious ailments as cirrhosis and chronic and acute viral hepatitis, and cases in of sluggish liver or minor hepatic insufficiency—a term used by

☞ The Meschino Optimal Living Program ☞

European physicians and American naturopaths to describe a myriad of symptoms, including an ache beneath the ribs, fatigue, unhealthy skin appearance, general malaise, constipation, allergies, premenstrual syndrome, and chemical sensitivities. In addition, milk thistle has been beneficial in the treatment of psoriasis and other skin problems where toxins in the bloodstream trigger immune inflammatory reactions that aggravate these conditions.

I recommend daily milk thistle supplementation—300 mg per day, standardized to 80 percent silymarin content—to slow or prevent some of the major biological effects of aging and for its general health-promoting properties.

Indole-3-Carbinol

Indole-3-carbinol is a member of the class of naturally occurring sulfur-containing chemicals called glucosinolates. It is formed by the action of the myrosinase enzyme on the parent compound glucosinolates whenever cruciferous vegetables are crushed (for example, in chewing) or cooked. Indole-3-carbinol (and other glucosinolates) are antioxidants and potent stimulators of Phase I and Phase II detoxification enzymes in the liver and intestinal lining. It helps the body eliminate toxic compounds, including many carcinogens, and it acts as a phytoestrogen, reducing the ability of stronger estrogens to overstimulate reproductive tissues—the breast, cervix, uterus, and in males, the prostate gland. Observational and experimental studies indicate that it plays an important role in the prevention of reproductive organ cancers and colon cancer. Since breast, prostate, and colon cancer occur at higher rates in older populations, it is prudent to boost your body's defenses after age 40 by supplementing with 50 mg of indole-3-carbinol per day, in addition to the frequent consumption of cruciferous vegetables.

Step 5 | Anti-Aging Supplements After Age 40

Immune and Nutrition Function

Like the body's detoxification system, the immune system also becomes less effective between the ages of 40 and 50, thanks to a decline in the function of the thymus gland and the cumulative effects of free radicals acting on our immune cells.

The thymus gland instructs certain immune cells to identify and kill germs that may enter the body and to identify and eliminate emerging cancer cells before they can pose a real threat. Furthermore, the thymus produces T-lymphocytes, a type of white blood cell that is responsible for fighting infections, in particular those from mold-like bacteria, yeasts (including *Candida Albicans*), fungi, parasites, and viruses. It also secretes various hormones which have far-reaching positive effects on the entire immune system. Low levels of thymus gland hormones in the blood are associated with decreased immunity and increased susceptibility to infection.

Vitamin and Mineral Supplements

Researchers have established that the decline in thymus gland function can be modified to a significant degree by supplementing with the high-potency multivitamin and mineral recommended in Step 2. Supplementation with vitamin A, for example, prevents stress-induced premature shrinkage of the thymus and actually promotes its growth and regeneration. Studies examining zinc supplementation have discovered its many positive effects on immune function, including enhanced release of thymus hormones. Selenium supplementation is also known to stimulate white blood cell and thymus function. The National Health and Nutrition Examination Surveys have told us that a significant portion of the

☞ The Meschino Optimal Living Program ☞

population do not ingest the recommended levels of these vitamins and minerals every day and few do so at levels are not sufficient to support high immune and thymus gland function.

In the 1980s and 1990s, a number of researchers explored the potential of specific vitamins, at supplemented levels, to improve immune system function and reduce the risk of infections and related diseases. They demonstrated that not only were certain vitamin deficiencies in animals associated with an increased incidence of disease, but that vitamin supplementation could reverse impaired immune system function in humans and animals. Vitamin E supplementation enhanced tissue immune system function in healthy older human subjects and rodents. Vitamin C supplementation significantly improved the respiratory condition of asthmatic patients. A combination of vitamins C and E increased blood levels of vital immune system agents (immunoglobulin G and complement 3) in healthy elderly women, enhanced the production of T-lymphocytes and white blood cells, and prevented the development of autoimmune disease in animals. And as we saw in Step 2, vitamin E supplementation reduces the production of the harmful prostaglandin hormone series-2, which tends to weaken the immune system, and it protects immune cells from free radical damage.

Several double-blind studies have shown that the elderly experience better immune function and a reduced rate of infection when taking a multiple vitamin and mineral formula. One study demonstrated that supplementation with 100 mcg of selenium and 20 mg of zinc, with or without additional vitamin C, vitamin E, and beta-carotene, led to fewer infections. Others reported improved outcomes when subjects were supplemented with either vitamin C, beta-carotene, vitamin A, lycopene, or vitamin B12.

The body of evidence suggests that all of these nutrients combined will provide the best possible benefits for immune function. This synergy was well illustrated by a study that was published

Step 5 | Anti-Aging Supplements After Age 40

in the *American Journal of Clinical Nutrition* in December 1996. Dr. Kee-Ching, G. Jeng and their colleagues recruited forty healthy male and female volunteers, aged 22 to 55 years, from the staff and students of the Taichung Veteran's General Hospital and Providence University in Taiwan. The subjects were administered either vitamin C (1,000 mg per day), or vitamin E (400 mg per day) alone, or vitamin C and vitamin E in combination at the dosages, for 28 days. Those receiving the combination of vitamin C and vitamin E had the most improved results in immune system function and demonstrated the lowest levels of free radical damage. This group also had the lowest production of prostaglandin E2. The conclusion of the researchers was that combined supplementation with vitamins C and E is more effective than supplementation with either vitamin alone in healthy adults. This finding is shared by other investigators, who have concur that nutrients work together to optimize the function of the immune system and improve overall health status.

Reishi Mushroom Extract

The Reishi mushroom (Ling Zhi or *Ganoderma lucidum*) has been used for thousands of years by herbal practitioners in China and Japan. It is listed as a "super herb" in China's pharmacopoeia because of its ability to modulate immune function and for its anti-cancer and liver-protective properties. Reishi mushrooms contain unique polysaccharides, carbohydrates which exert positive effects on the immune system. Other active constituents include the ganoderminic acids, classified as triterpenoids, which are compounds with a structure similar to steroid hormones.

Reishi mushroom extract boosts the cancer-cell-killing capacity of certain immune cells, increases their ability to identify and kill many microorganisms, and encourages the release of cytokines, hormones that act as signaling agents to improve immune system

☞ The Meschino Optimal Living Program ☞

efficiency. Studies have revealed that reishi mushroom extract can reestablish normal white blood cell levels following radiation therapy, leading to its use as a cancer treatment by many practitioners in Asia.

To ensure that sufficient amounts of immune-strengthening agents are present you should use reishi mushroom supplements that are a standardized grade yielding at least 10 percent polysaccharide and four percent triterpene content.

Astragalus

The root of the astragalus membranaceus is a common herbal remedy in traditional Chinese medicine. Its key active ingredients include saponins, flavonoids, and polysaccharides. Astragalus can affect immune function in many ways: it enhances the ability of natural killer cells to destroy cancer cells and microorganisms; it encourages the proliferation of splenocytes, spleen cells that destroy foreign invaders; and it exhibits direct antiviral properties.

In human studies, astragalus supplementation has increased serum levels of various immunoglobulins, proteins that are an important part of our immune defense. IgM, IgE, and nasal secretions of IgA and IgG all contribute to immune function at various levels. When used as a daily preventive measure, astragalus has been shown to reduce the incidence of the common cold. It improves the responsiveness of lymphocytes in normal subjects and cancer patients, stimulates natural killer cell activity in normal subjects and those with lupus, and strengthens the immune system in individuals with AIDS and cancer. Like reishi mushroom extract, astragalus is safe to take on daily basis.

The combination of milk thistle, indole-3-carbinol, reishi mushroom extract and astragalus can boost immune function and detoxification and reverse certain aspects of age-related decline.

Step 5 | Anti-Aging Supplements After Age 40

This is why I recommend that after the age of 40 you supplement your diet with a formula that fortifies these systems beyond the levels attainable by a high potency multi-vitamin and mineral alone.

Amount per two capsules:

- Milk thistle: 300 mg (standardized to 80 percent silymarin content)
- Indole-3-carbinol: 50 mg (standardized to 97 percent indole-3-carbinol content)
- Astragalus: 200 mg (2:1 extract)
- Reishi mushroom extract: 60 mg (standardized to 10 percent polysaccharide and four percent triterpene content)

3. Protecting the Prostate: Saw Palmetto, Pygeum Africanum, Beta Sitosterol, Soy Iso Flavones, Stinging Nettle, and a Healthy Lifestyle

The male prostate gland lies below the bladder and surrounds the urethra, that part of the male plumbing system that serves as a flexible pipe for the flow of urine out of the body. Enlargement of this walnut-shaped gland can put pressure on the urethra and obstruct the flow of urine as it exits the bladder, reducing the force of the urine stream and producing other symptoms (such as difficulty in initiating urination, or urgent urination). Enlargement of the prostate is an extremely common problem in men over the age of forty; it's due largely to age-related hormonal changes that occur in the male body. Many of the same age-related changes to the prostate gland that cause enlargement are also associated with the development and spread of prostate cancer.

☞ The Meschino Optimal Living Program ☞

Nearly 60 percent of North American men between the ages of 40 and 59 years will develop an enlarged prostate gland, also known as benign prostatic hyperplasia. By age 80, ninety percent experience significant symptoms. More alarming, 200,000 American men are diagnosed with prostate cancer every year and 30,000 die of it. Canadian statistics indicate that one in every eight men develops prostate cancer and one in 26 men in Canada die from this disease. Those who survive face formidable treatment choices, such as surgery or radiation which do not always work but which commonly cause side effects, including impotence and incontinence. These numbers are expected to increase as the baby boom generation of North American men enters the prostate cancer risk years.

After age 40, blood levels of testosterone, the main male hormone, begin to fall. At the same time, blood levels of other hormones, such as estrogen, prolactin, luteinizing hormone, and follicle stimulating hormone, start to rise. These changes lead to greater concentrations of testosterone in the prostate gland and an increased conversion of testosterone to dihydrotestosterone (DHT) by the 5-alpha-reductase enzyme within prostate cells. The buildup of DHT stimulates the cells to divide and multiply at a faster rate than is considered normal or safe. More prostate cells mean not only prostate enlargement and its attendant problems, but more chances of cancerous DNA mutations. (When cells divide more quickly they make a greater number of genetic mistakes, with less time for DNA repair enzymes to correct them.) Indeed, males born with a genetic inability to synthesize DHT are immune to prostate cancer. DHT is also known to promote the spread of existing prostate cancer and the production of free radicals, a direct cause of cancerous mutations in the DNA of prostate cells.

The encouraging news is that attention to proper diet and the use of specific supplements can help block the conversion of testosterone to DHT and deliver other protective benefits to the prostate. There are several known natural agents that, when taken at the

Step 5 | Anti-Aging Supplements After Age 40

correct dosage and standardized grade, are proven effective in the treatment of enlarged prostate and have been associated with the prevention of prostate cancer or with its successful management.

Supplements that Block the Buildup of DHT

Saw Palmetto

Saw palmetto is a small palm tree with berries that contain various unsaturated fatty acids and sterols. Numerous studies have demonstrated that these fatty acids and sterols block the conversion of testosterone to DHT and exert other favourable influences on prostate health. Concentrated saw Palmetto extract is an established therapy for enlarged prostate conditions, and it has recently been used in trials with prostate cancer patients. A systematic review of saw palmetto and its effects was published in the *Journal of the American Medical Association* in the late 1990's. After evaluating studies from around the world, the authors concluded that saw palmetto produces improvements in urinary tract symptoms and urinary flow similar to those of the drug finasteride (also known as Proscar, prescribed for the treatment of enlarged prostate glands), with fewer adverse side effects. For example, erectile dysfunction rates are nearly five percent with finasteride use but approximately one percent with for saw palmetto. For the treatment of benign prostatic hyperplasia, the usual dose is 160 mg, twice daily, of saw palmetto extract (standardized to 90 percent fatty acids and sterols) or 320 mg, twice daily, of a standardized grade containing 45 percent fatty acids and sterols.

Pygeum Africanum

Pygeum africanum, a natural agent derived from the bark of the pygeum africanum tree, contains active compounds known as triterpenes, which have been demonstrated effective in the treatment of enlarged prostate in several human studies. The active ingredients in pygeum africanum reduce blood levels of leutinizing hormone

☞ The Meschino Optimal Living Program ☞

and prolactin and suppress the synthesis of cholesterol in the prostate. Within the prostate the synthesis of cholesterol leads to a greater build of testosterone and DHT, as testosterone is made from cholesterol. By-products of cholesterol metabolism have also been shown to promote the degeneration of prostate cells, leading to prostate enlargement. Research has shown that pygeum africanum supplementation can reverse prostate enlargement problems. The usual dose for prevention and treatment is 100 to 200 mg per day (standardized to 12 to 14 percent triterpenes).

Beta-sitosterol

Beta-sitosterol is a common sterol that occurs naturally in saw palmetto, soy products, and other plant foods. Epidemiological and experimental studies suggest that it and other plant sterols offer protection against colon, prostate, and breast cancer. Recent findings published in the *Lancet* and the *British Journal of Urology* focused on its benefits for the prostate: when taken at a dosage of two mg three times a day, or 65 mg twice a day, beta-sitosterol reversed enlarged prostate symptoms. It does this by inhibiting the 5-alpha-reductase enzyme that converts testosterone to DHT and by blocking the formation of estrone hormone in fat cells, another mechanism that encourages the conversion of testosterone to DHT.

Soy Isoflavones

Soy products, including soy extract, contain several important isoflavones, among them genistein and diadzein. Genistein inhibits the accumulation of DHT and exhibits other properties that are related to the prevention of prostate disease and enlargement. Soy isoflavones are known to induce the programmed cell death of prostate cancer cells, while lowering testosterone and DHT stimulation, slowing the cell division rate of prostate cells and prostate cancer cells, and acting as an antioxidant.

Step 5 | Anti-Aging Supplements After Age 40

Stinging Nettle

Stinging nettle (*urtica dioica*) is a natural agent that has been used successfully in European studies to reverse prostate enlargement. It is a weed whose aerial parts and roots contain its active ingredients, including specific flavonoids, sterols, lignans, fatty acids, polysaccharides, and lectins. Stinging nettle extract inhibits the ability of DHT to bind to the nuclei of prostate cells, thereby protecting their DNA material.

All-in-One Prostate Supplement

Men 40 years of age and older should take an all-in-one prostate supplement every day to counter the age-related changes that encourage the development of prostate enlargement and prostate cancer. A well-designed prostate support supplement will contain the following in a single capsule; I recommend two capsules per day:

- Saw palmetto – 320 mg (standardized to 45 percent fatty acids and sterols)
- Pygeum africanum – 100 mg (standardized to 14 percent triterpenes)
- Beta-sitosterol – 65 mg
- Soy extract – 100 mg (standardized to 10 percent isoflavone content)
- Stinging nettle extract – 30 mg (5:1 extract)
- Pumpkin seed extract – 25 mg
- Lycopene powder – 12.5 mg

This dosage is appropriate for the treatment of enlarged prostate conditions. For men with prostate cancer, four to six capsules per day may be used in conjunction with traditional medical treatment. Prostate cancer patients must check with their attending physicians before commencing a supplementation program of this kind.

☞ The Meschino Optimal Living Program ☞

Prostate Cancer

As we saw earlier, prostate cancer is the most frequently diagnosed cancer among men in Western countries, accounting for a third of all cancers that afflict them. In Africa, Eastern Europe, and Japan, the disease is far less prevalent, and research is showing us why.

In 1996, in an article in the *Journal of the National Cancer Institute*, Dr. W. Willet suggested that as many as 75 percent of prostate cancers could be prevented if men followed healthier nutritional practices. It appears that dietary and lifestyle factors influence not only the development of the disease but its rate of progression as well. Post-mortem studies have shown evidence of latent—that is, existing but not manifest—prostate cancer at similar levels in both high- and low-risk regions of the world. In other words, by their late forties, between 13 and 32 percent of all men will have cancer cells present in their prostate glands, regardless of where they live. (Some examples: in Singapore, this applies to roughly 13 percent of the male population; in Hong Kong, 16 percent; and in Sweden, 32 percent.) However, in low-risk areas, these latent cancer cells tend not to progress to a clinically significant malignant state, remaining dormant and non-life-threatening instead.

Another intriguing finding emerged from migration studies. In Japan, the incidence of serious prostate cancer is 80 percent lower than in North America. When men relocated from Japan to higher-risk Western countries and abandoned their traditional dietary habits, their incidence of prostate cancer approached that of North American men.

Diet, Lifestyle, and Prostate Cancer

A variety of nutritional and lifestyle factors have been strongly linked to the development of prostate cancer. To reduce the risk, be aware of the hazards to avoid and the habits to adopt.

Step 5 | Anti-Aging Supplements After Age 40

- **Alcohol:** Data on alcohol consumption was collected by the Harvard Alumni Study, a project that followed 7612 Harvard alumni (mean 66.6 years) from 1998 through 1993. The results, published in 2001, revealed that men with moderate liquor consumption (between three drinks per week and three drinks per day) showed a 61 to 67 percent increased risk of developing prostate cancer compared to men who never or infrequently consumed alcohol. Wine and beer did not appear to be as dangerous as liquor, but men who consumed alcohol of any kind between 1977 and 1988 had a twofold increased risk of prostate cancer compared to those with almost no alcohol consumption.
- **Heterocyclic amines:** Animal studies confirm that heterocyclic amines from pan-fried meats are known carcinogens. In 2001, a study by Drs. K.T. Bogen and G.A. Keating provided evidence that higher intakes of heterocyclic amines among African-American males may partially explain why they experience prostate cancer at twice the rate of Caucasian males. U.S. blacks were shown to consume up to three times more heterocyclic amines from blackened meat and fish at ages less than 16 and over 30.
- **Indole-3-Carbinol and Cruciferous Vegetables:** In the journal *Oncogene*, Dr. SR Chinni and fellow researchers provided strong evidence to show that the indole ring structures present in cruciferous vegetables may play an important role in the prevention of prostate cancer. Their study demonstrated that indole-3-carbinol can inhibit the growth of PC-3-type human prostate cancer cells by arresting their cell division cycle and hastening their demise through programmed cell death. They concluded that indole-3-carbinol could be an effective chemopreventive or therapeutic agent against prostate cancer—another incentive to consume cruciferous vegetables every day.

☞ The Meschino Optimal Living Program ☞

- **Aerobic Fitness and Blood Pressure:** A link between vascular disease and increased risk of prostate cancer has recently been reported suggesting that increased levels of excitation, which can lead to elevated blood pressure and heart rate, may overstimulate the testosterone and DHT activity of prostate cells as well. Heart rate and blood pressure may represent indirect markers of potentially harmful androgen activity in the prostate. Findings released in 2001 by the Cardiovascular Health Study of 2442 subjects demonstrated that men with a resting heart rate equal to or greater than 80 beats per minute had a 60 percent greater chance of developing prostate cancer during a 5.6-year follow-up period than those with a resting heart rate of less than 60 beats per minute. A moderate to high level of aerobic fitness appears to offer some protection against prostate cancer.
- **Saturated fat:** Numerous studies have linked a high-animal-fat diet to an increased risk of prostate cancer, most likely because higher intakes of saturated fat promote the overproduction of testosterone. Consuming only low-fat animal products, as outlined in the nutrition guidelines of this book, is the best course.
- **Omega-3 fats:** In contrast to the undesirable effects of saturated fat, omega-3 fats have been shown to inhibit the growth of prostate cancer in experimental studies. The results of one investigation published in the *Lancet* in June 2001, demonstrated that in a population of 6,000 Swedish men, those who regularly consumed fish (salmon, sardines, herring, mackerel, all rich in omega-3 fats) showed a 33 percent reduction in prostate cancer risk during the 30-year follow up period, compared to men who ate little or no fish.

Step 5 | Anti-Aging Supplements After Age 40

- **Soy intake and isoflavones:** Higher intakes of soy products have consistently resulted in marked reductions in prostate cancer incidence. As reported in 2004 by CancerSci, a recent study that analyzed the dietary consumption of individual phytoestrogens by patients with and without prostate cancer pointed to the significant protective effect of the soy isoflavones genistein and diadzein, as well as the phytoestrogen coumestrol. Moreover, soy isoflavones may have a role as chemotherapeutic. In one case study, a 66-year-old prostate cancer patient took a phytoestrogen supplement (160 mg per day) for one week prior to radical prostatectomy surgery. There was evidence of a significant shrinkage of the tumour mass, suggesting tumour regression, when compared with the preoperative needle biopsy.

The traditional Asian diet contains an average isoflavone content of 50 mg per day. That dosage—obtained from soy-based foods, supplements containing soy extract, or soy protein shake mixes—is highly recommended as one means of prostate cancer prevention.

Prostate Antioxidants

Like other cancers, prostate cancer may arise when free radicals attack prostate cells, converting them into mutant cancer cells. The antioxidant lycopene, described in Step 2, is especially effective in protecting prostate cells from free radical damage. It concentrates in the prostate gland at levels much higher than those found in the bloodstream, making it a tissue-specific antioxidant in prostate health. Human studies such as the Physicians' Health Study and the Health Professionals' Follow-Up Study have shown a striking correlation between higher lycopene blood levels or intake levels (6.5 mg per day or more), and lower rates of prostate cancer

☞ The Meschino Optimal Living Program ☞

development—as much as a 40 percent reduction. We know that tomatoes are an excellent source of lycopene; others include guava, papaya, red grapefruit, and watermelon. Remember that lycopene is a fat-soluble antioxidant (a sister compound to beta-carotene) and needs some fat in the stomach to be absorbed. When you eat these foods, make sure you consume a bit of allowable fat at the same time.

Soy isoflavones also provide antioxidant protection to the prostate gland, and two recent human intervention trials by Dr. L.C. Clark et al and Dr. O.P. Heinon et al respectively suggest that vitamin E supplementation (60 IU per day) and selenium supplementation (200 mcg per day) can reduce the risk of prostate cancer by 40 to 50 percent.

Other Prostate-Protective Nutrients

Zinc – The prostate gland contains a higher concentration of zinc than any other organ in the body. Zinc is required to maintain semen volume and testosterone synthesis. In some studies, men with prostate enlargement have shown lower levels of zinc. Its absence allows the 5-alpha-reductase enzyme to convert testosterone into DHT at increased rates. Moderate zinc supplementation can help reverse prostate enlargement; a total daily zinc intake of 25 to 30 mg a day is recommended for the management of the condition. A minimum of 15 mg a day from a high-potency multiple vitamin and mineral supplement is suggested for general prostate health.

Vitamin D – Epidemiological studies have revealed that where year-round sunlight intensity is low, the rate of prostate cancer is high. In North America, for example, the incidence of prostate cancer is much higher in regions above the fortieth degree latitude, which roughly divides the United States in half, north to south. This phenomenon, which exists for breast cancer and colon cancer as well, has been attributed to the influence of direct sunlight exposure on blood levels of vitamin D.

Step 5 | Anti-Aging Supplements After Age 40

Experimental and animal research has demonstrated that in some types of prostate cancer the administration of vitamin D can transform malignant cancer cells to more normal prostate cells, inhibit prostate cancer cell replication, and suppress metastasis. Preliminary human studies have yielded encouraging results, but it is too soon to know if high-dose vitamin D supplementation (2,000 IU per day) is useful as an adjunct to prostate cancer treatment. As a means to help prevent prostate cancer, however, it is prudent to take a high-potency multiple vitamin and mineral each day that contains 400 IU of vitamin D. Each 400 IU elevates blood levels of vitamin D by 40 (nanomoles per liter, nmol/L). It is not uncommon to see low levels in the range of 15 to 45 nmol/L in individuals living in the northern United States and Canada. Cancer studies suggest that blood levels of vitamin D should be in the range of 85 to 110 nmol/L, which is also ideal for the prevention of osteoporosis. Men over the age of 40 who live in these high-risk regions of North America should consider taking an additional 400 to 600 IU of vitamin D every day, especially between October and May.

Lifestyle Decisions

Because of the prevalence of prostate gland enlargement and the almost certain growth in prostate cancer incidence, it is worth summarizing the preventative measures that can be taken. The following recommendations should be seriously considered by all men throughout their lifetimes:

- Follow a diet that is low in saturated fat.
- Remain at or near your ideal body weight.
- Drink alcohol in moderation or not at all.
- Consume tomato or tomato products on a daily basis, as well as other lycopene-containing fruits and vegetables.
- Use more soy products, such as tofu, veggie burgers, miso soup, soy nuts, and soymilk.

☞ The Meschino Optimal Living Program ☞

- After age 40, consider taking an all-in-one prostate support supplement that contains the herbal ingredients outlined in this chapter. It is vital that the herbal and accessory compounds be present in the correct dosages and standardized grades in order to be effective.
- Take a high-potency multivitamin and mineral that is enriched with the following antioxidants: vitamin E (400 IU), selenium (100 to 200 mcg), vitamin C (1000 mg), plus 15 mg of zinc and 400 IU of vitamin D.
- Eat cruciferous vegetables at least three times per week.
- Avoid pan-fried meats and other sources of heterocyclic amines (charred barbecued meats and blackened fish and meats).
- Stay fit, especially from a cardiovascular fitness standpoint, striving for a resting heart rate below 80 beats per minute.

4. Managing Menopause: Black Cohosh, Soy Isoflavones, and Gamma-Orzanol

Today men and women are enjoying greater longevity than ever, thanks to better sanitation and hygiene practices, advances in the fight against infectious diseases, modern medical care, and improved nutrition. Women can expect to live fully one-third of their lives after the onset of menopause, years that should be satisfying, productive, and blessed with a sense of wellbeing.

It can be a challenge to combat the age-related changes that occur at this stage of life, to cope safely with the uncomfortable physical symptoms of menopause, and to minimize the risk of osteoporosis, heart attack, breast cancer, and other health problems that are prevalent in women over 50. These changes result from the dramatic yet inevitable decline in the synthesis of estrogen, progesterone, and testosterone in the body. Adhering to a healthy diet and a regular exercise program while maintaining a positive mental

Step 5 | Anti-Aging Supplements After Age 40

attitude are important first steps, but these alone cannot deter or slow the profound effects of the aging process. Specific natural supplements should be added to the program when menopause arrives. To appreciate the difference supplements can make, it's useful to understand the physical alterations that occur in the body at the onset of menopause.

The Cause and Effects of Estrogen and Progesterone Decline

Throughout a woman's fertile years, the hypothalamus gland in her brain monitors her blood levels of estrogen and progesterone. At the end of every menstrual cycle, when it senses that these levels have dropped significantly, it releases hormones that prompt the pituitary gland to produce follicle stimulating hormone (FSH) and luteinizing hormone (LH). The release of FSH and LH into the bloodstream stimulates some of the immature egg cells in the ovaries to begin a maturation process that leads to one of the eggs outpacing the rest, bursting out of the ovaries around day fourteen and entering the fallopian tube. During this ovulation process, the egg secretes estrogen. If the egg is not fertilized by a sperm cell, it will eventually shrivel and die. When this occurs, estrogen levels in the bloodstream fall again, which the hypothalamus's cue to initiate another menstrual cycle by releasing the hormones that stimulate the release of FSH and LH from the pituitary gland.

Most of the estrogen in a woman's body is supplied by these developing and maturing egg cells, although small amounts are also secreted by the adrenal glands and fat tissue, sources that continue to make estrogen after the cessation of menstrual cycles. These amounts are minimal, however. During a woman's fertile years her daily estrogen secretion is 250 to 300 micrograms per day. After menopause, estrogen production—now from adrenal glands and fat tissue alone—drops to 20 micrograms per day, a 90 percent decline.

☞ The Meschino Optimal Living Program ☞

When a woman approaches the age of 50, her ovaries become less responsive to the influence of follicle stimulating hormone and luteinizing hormone. This means that even though there are about 10,000 immature egg cells remaining in her ovaries, they cannot be prompted to mature by FSH and LH. This lack of response by the immature egg cells at the outset of menopause simply sends the pituitary into overdrive, releasing greater amounts of FSH and LH, which contribute to the onset of hot flashes and other symptoms. Still, ovulation will not occur, and little or no estrogen will be secreted. The resulting drop in the body's estrogen levels has far-reaching effects on the acceleration of aging and the development of degenerative conditions, in addition to introducing a range of attendant ills (including reduced energy, forgetfulness, dry mucous membranes throughout the body, atrophy or thinning of the skin and vaginal tissue, decreased libido, changes in hair texture, mood swings, and anxiety). As if this weren't enough, the decline in estrogen also encourages the loss of calcium from bones, setting the stage for osteoporosis, and a decrease in the body's ability to clear cholesterol from the bloodstream, thereby raising the risk of heart attack and stroke.

What about progesterone? Where does it come from and what effects result from its decline during menopause? The part of the maturing egg follicle that is left behind in the ovary after ovulation occurs, known as the corpus luteum, is the primary source of progesterone in a woman's body. As with estrogen, when the egg cells become unresponsive to the effects of FSH and LH and stop maturing, there is a drop-off in progesterone secretion. At the onset of menopause, blood levels of progesterone fall from 1.6 nanograms per milliliter to 0.5 nanograms per milliliters, a decrease that further promotes the development of osteoporosis and is associated with reduced libido, and thinning skin.

Until recently, many in the medical profession encouraged the use of hormone replacement therapy to combat menopausal symptoms and the threat of osteoporosis in postmenopausal

Step 5 | Anti-Aging Supplements After Age 40

women. Although effective for these problems, hormone replacement therapy is now known to have inherent hazards that outweigh its benefits. The natural alternatives are all the more attractive when these dangers are examined closely.

The Dangers of Hormone Replacement Therapy

Women worldwide have recently had cause to reconsider hormone replacement therapy (HRT) as a means to reduce menopausal symptoms. Over the past decade, a growing number have turned to the use of herbal remedies as an alternative to HRT, and this interest in natural therapies is expected to rise in the wake of two alarming and widely reported studies. These studies confirmed previous suspicions that hormone replacement therapy increases the risk of breast cancer and that unopposed estrogen (that is, estrogen not given with progesterone, as is often the case for women who have undergone hysterectomies) substantially increases the risk of ovarian cancer.

In July 2002, researchers the National Institutes of Health announced that they were ending the long-term American Women's Health Initiative trial of 16,000 women who were taking hormone replacement therapy because they discovered, just over five years into the study, that there was a 26 percent increased incidence of breast cancer in the women using HRT compared to those receiving the placebo. Women taking HRT also showed a 41 percent increased incidence of stroke and a 29 percent increased incidence of heart attack (myocardial infarction), compared to women receiving the placebo.

Further alarming news about estrogen replacement therapy appeared in the July 17, 2002, issue of the *Journal of the American Medical Association*. In a follow-up study of 44,241 former participants in the Breast Cancer Detection Demonstration Project, researchers discovered that the use of estrogen replacement therapy

☞ The Meschino Optimal Living Program ☞

(without the concurrent use of progesterone) increased the incidence of ovarian cancer. The longer the use of the therapy, the greater the risk of developing the cancer. This mirrored earlier findings from the Nurses' Health Study, which demonstrated that for every year a woman remained on HRT, her risk of developing breast cancer increased by 2.3 percent. Thus a postmenopausal woman taking HRT for 10 years had a 23 percent increased risk of developing breast cancer, compared to women who were non-users of HRT. After 20 years of HRT use, a woman's risk of developing breast cancer would be 46 percent greater than that of a woman who had never used HRT during her menopausal years.

Clearly there is a need for safe and credible alternatives to HRT to alleviate menopausal symptoms, to enhance a healthy appearance and an active sex life, and to help maintain high quality of life for as long as possible. Any nutrition, supplementation, or lifestyle recommendations designed to accomplish these objectives must first address the three major health concerns for women 50 years and older: breast cancer, osteoporosis, and heart disease.

Heart disease

In the premenopausal years, high blood estrogen levels increase the production of low-density lipoproteincholesterol receptors, which enable cells to extract harmful LDL cholesterol—known to increase the possibility of heart attack and stroke—from the bloodstream. In menopause, the drastic drop in estrogen levels appears to reduce the ability of cells to produce LDL cholesterol receptors, allowing cholesterol to accumulate in the bloodstream, stick to the walls of the arteries and cause a narrowing of the coronary blood vessels, which can lead to heart attack. In fact, heart disease is the number-one killer of postmenopausal women.

Step 5 | Anti-Aging Supplements After Age 40

Since a high-saturated-fat diet is the main culprit in raising LDL cholesterol levels, postmenopausal women should adjust their diets to reduce saturated fat intake in order to keep their blood cholesterol levels below 200 mg per decilitre (5.2 millimoles per litre). Animal protein sources should be confined as much as possible to chicken, turkey, Cornish hen or fish, and all milk and yogurt products should be non-fat or 1% varieties. Avoid any cheese above three percent milk fat content, as well as butter, ice cream, whipping cream, regular chocolate products, items containing coconut or palm oil, and deep fried products of all types.

Increasing consumption of soluble dietary fiber can also reduce blood cholesterol levels by literally dragging cholesterol out of the body, as do bile acids which aid the synthesis of cholesterol in the liver. Soluble fiber is found in many fruits, especially apples, peaches, pears, and plums, and in vegetables, oat bran, psyllium husk fiber, ground flaxseeds, beans and peas. Remaining physically fit with regular aerobic exercise and staying at or near your ideal weight are equally important lifestyle factors in preventing heart attack and stroke in the postmenopausal years.

Osteoporosis

With one in four women affected by age 50, osteoporosis is reaching epidemic proportions in North America. Experts blame its widespread incidence on insufficient calcium intake and accumulation of bone early in life, especially between the ages of 11 and 24, and on the loss of calcium from bone during menopause. Canadian statistics indicate that complications arising from osteoporotic hip fractures, such as the development of pneumonia, claim more lives every year than breast and ovarian cancer combined. The lifestyle recipe to prevent osteoporosis in later life is this:

☞ The Meschino Optimal Living Program ☞

1. If you are not taking HRT, ingest a total of 1,500 mg of calcium a day from diet and supplements. Note that calcium carbonate and calcium citrate are absorbed equally well if taken with meals. Since calcium carbonate is less expensive, it represents a more economical source. However, if you have a previous history of kidney stones, calcium citrate may be preferred due to its greater solubility.
2. Supplement with 600 to 1,000 IU of vitamin D, necessary for the absorption of calcium from the intestinal tract. For general health reasons, take a high-potency multiple vitamin and mineral, which normally includes 400 IU of vitamin D. After menopause, top up that dosage with an additional 200 to 400 IU per day. Studies show that postmenopausal women ingesting these levels of vitamin D may reduce their risk of hip fractures by as much as 50 percent. A high-potency multiple vitamin and mineral (including extra antioxidant protection and a B-50 complex) contains other nutrients important to bone health, among them zinc, magnesium, and copper.
3. Perform weight-bearing or resistance exercises three to six times per week. Weight-bearing activities such as walking or jogging, and weight training exercises place increased stress on the spine and femurs, which respond by holding their calcium in the bone to help withstand the demand on their structures. Research suggests that postmenopausal women can increase their bone density without HRT by simply ingesting more calcium and performing a series of specific weight training exercises, twice a week. Focus on these five weight resistant stations at the gym: hip extension, knee extension, abdominal machine, back extension machine, and lateral pull down machine. Perform two sets of 10 repetitions at each station, at 80 percent of your maximal effort.

Step 5 | Anti-Aging Supplements After Age 40

4. Supplement with a product that contains black cohosh and soy isoflavones. As we'll see shortly, the standardized grade of black cohosh and soy extract can reduce menopausal symptoms and also help to preserve bone mineral density.

Breast Cancer

Breast cancer incidence has increased by 40 percent in the United States in last 50 years, with one in every 403 women afflicted between ages 50 and 59, one in 266 women between ages 60 and 69, and one in 220 at age 70 and over. Currently one in 9 women in North America is expected to develop breast cancer during her lifetime, and one in 27 will die from the disease. It is the most frequently diagnosed cancer in women in this part of the world, accounting for 32 percent of all cancers in women.

It's well documented that women who are overweight during their postmenopausal years have roughly a three times higher risk of developing breast cancer. As fat mass increases, there is a greater conversion of the hormone androstenedione to estrone within fat tissue. Estrone hormone, one of three types of estrogens made by the female body, increases the cell division rate of breast cells. As we've seen, this means a greater chance of genetic mutations occurring. Once formed, estrone can be further converted into beta-estradiol, another powerful estrogen hormone that is associated with increased breast cancer risk. This is exactly the mechanism through which HRT was shown to raise the threat of breast cancer.

Consequently, postmenopausal women are advised to attain and maintain an ideal body weight and a body mass index below 25. The New York University Women's Health Study, one of the longest and most respected studies of its kind, suggested in a 1995 report that postmenopausal women with a body mass index higher than 24.87 had a three times greater risk of developing breast cancer

☞ The Meschino Optimal Living Program ☞

within a five-year follow-up period than did postmenopausal women with a body mass index below 24.87. You can calculate your body mass index by dividing your weight (in kilograms) by your height (in meters) squared. For example, let us say your weight is 130 lbs, or 58.5 kilograms, and your height is 5'7", or 1.675 meters. The square of 1.675 is 2.8. Divide 58.5 by 2.8 to arrive at your body mass index of 20.89, well within the safe range.

Finally, avoiding the use of HRT is emerging as a significant factor in the prevention of breast cancer in postmenopausal women.

Safe and Effective Herbal Supplements for Menopausal Women

Although so far underutilized by medical doctors in the western world, the benefits of black cohosh, soy extract, and gamma-oryzanol are supported by substantial and convincing evidence from European and Asian studies. They have demonstrated an ability to significantly reduce menopausal symptoms, support bone density, lower high cholesterol, prevent atrophy and dryness of vaginal tissues, help maintain a radiant complexion, and improve overall vitality. Unlike HRT, these natural substances are not associated with an increased risk of breast cancer, ovarian cancer or heart disease.

Black Cohosh

Black cohosh is a plant that is found in northeastern North America; its thick fibrous stock has long been used for medicinal purposes by First Nations peoples, in particular the Cherokee and the Iroquois. The discovery of its value for gynecological complaints led to its use in the management of menopause, and North American physicians prescribed black cohosh for this purpose in the early decades of the twentieth century. However, the proliferation of synthetic drugs and the rise in influence of pharmaceutical

Step 5 | Anti-Aging Supplements After Age 40

companies after the first and second world wars has created a medical education system in the U.S. and Canada that no longer pays credence to effective herbal remedies, among them black cohosh. Curiously, although black cohosh is native to North America, most of the clinical investigations of its efficacy have been performed in Germany, where it is the most widely used and thoroughly studied natural supplement for the management of these symptoms. Since 1956, over 1.5 million menopausal women in that country have used black cohosh extract with noted success and without significant side effects. Studies have pointed out that to be effective black cohosh must be standardized to contain 2.5 percent triterpene content. These triterpene compounds account for most of the herb's therapeutic and anti-aging effects.

Four major independent human studies in Germany have demonstrated the ability of black cohosh to help manage menopausal signs and symptoms. In the first (an open study where no placebo or other product was given to a control group), involving 131 doctors and 629 female patients, 80 percent of patients experienced improvement of the physical and psychological symptoms associated with menopause, within six to eight weeks of treatment with black cohosh extract. Significant reductions were reported in the frequency and intensity of hot flashes, profuse sweating, headache, vertigo, heart palpitations, tinnitus, nervousness and irritability, sleep disturbances, and depressive moods. Only seven percent of subjects reported mild transitory stomach complaints.

A second study, using a control group, compared the effects of black cohosh to estrogen replacement therapy (0.625 mg C.E.E.) [Conjugated equine estrogen] and diazepam (two mg) for 12 weeks. Black cohosh outperformed both Premarin (C.E.E.) and Valium (diazepam) using the Kupperman Menopausal Index, one of the standard assessment tools in clinical studies of menopause. (This quantitative assessment of menopausal symptoms measures a range of symptoms by grades of severity.)

☞ The Meschino Optimal Living Program ☞

The third study, this one double-blind, compared the effects of black cohosh to estrogen replacement therapy (0.625 mg C.E.E.) or a placebo over a 12-week period. In this study, black cohosh produced better results in controlling menopausal symptoms, as determined by the Kupperman Menopausal Index and Hamilton Anxiety Test, and produced greater improvement in the condition of the vaginal lining than estrogen or the placebo. In the black cohosh group, the number of hot flashes dropped from an average of five a day to less than one. In the estrogen group, the number fell from five to 3.5 hot flashes a day on average.

In the fourth study, also double-blind, black cohosh was compared to a placebo in a study following 110 women. Here again the black cohosh group demonstrated significant improvement in menopausal symptoms and blood hormone measurements. In addition to relieving hot flashes, it produced impressive age-reversal results on the vaginal lining as confirmed by vaginal smear analysis.

Black cohosh extract appears to mimic the effects of estriol, which is the weakest of the three forms of estrogen made by the body. The other two, estrone and estradiol, are powerful estrogens that can overstimulate breast cells and endometrial cells, encouraging cancer development. The triterpenes found in black cohosh act more like estriol, which does not overstimulate breast tissue and is not associated with an increased risk of breast and reproductive cancers.

Black cohosh extract also inhibits the oversecretion of luteinizing hormone (LH), proof of its estrogen-like properties. Remember that the pituitary gland secretes LH only when it senses that estrogen levels have significantly dropped. When a woman supplements with black cohosh extract, the hypothalamus and pituitary glands sense that estrogen activity is sufficient, and they respond by shutting down the over-secretion of LH. Remarkably, active constituents that are unique to black cohosh have also

Step 5 | Anti-Aging Supplements After Age 40

been shown to serve as building blocks for the synthesis of progesterone in the body. As there is a 66 percent decline in progesterone levels at menopause, black cohosh can help preserve progesterone balance, which is important to bone health, libido and psychological well-being.

Attempts have been made by certain interest groups to discredit black cohosh by questioning its safety. There is no doubt that the rising popularity of natural agents such as black cohosh and soy isoflavones is eroding the sales of HRT drugs and hurting the profitability of the companies who manufacture them. Medications to manage menopause represent huge revenues to the pharmaceutical industry, since they are prescribed for daily use for 30 years or more on average. That will add up to hundreds of millions of dollars as female baby boomers enter their late forties and fifties. To lure women back to pharmaceutical solutions to the problems of menopause—which, after the hormone replacement scare, has switched to the use of anti-depressant drugs, anti-anxiety drugs, and anti-bone resorption drugs—the companies are looking for any opportunity to discourage the use of soy and black cohosh. They have publicized the most trivial studies of questionable significance that call into question the safety of these natural substances.

Let's examine the real facts. Black cohosh has been recommended or prescribed in the United States for more than 100 years and was an official drug in the U.S. pharmacopoeia from 1820 to 1926, prior to the moves that allowed patented drugs, manufactured by pharmaceutical companies, to dominate the drug market. Over the years many studies have documented black cohosh's effectiveness and safety. Published reports from Germany have established its high safety profile and relatively few and infrequent side effects, which include nausea, vomiting, headaches, dizziness, and breast pain. No drug interactions are reported in the medical literature for black cohosh, adding to its

☞ The Meschino Optimal Living Program ☞

record as a safe intervention for the management of menopausal symptoms, as well as for PMS, dysmenorrhea, and other female reproductive complaints.

Throughout its documented use by millions of women over the past 40 years, there has been no indication that supplementation with black cohosh increases the risk of breast cancer, any other female reproductive cancer, or heart disease and stroke. In fact, given the findings of the American Women's Health Initiative study, it has a safety profile superior to that of hormone replacement therapy. Additionally, all of the experimental studies performed to date involving the use of human breast cells and human breast cancer cells have shown that standardized extracts of black cohosh actually block the development of breast cancer or decrease the ability of breast cancer cells to divide and multiply.

Reporting in the journal *Breast Cancer Research and Treatment* in 2002, Drs. C. Bodinet and J. Freudenstein showed that black cohosh extract significantly inhibited the division and spread of human breast cancer cells. They also demonstrated that black cohosh enhanced the ability of the anti-cancer drug Tamoxifen to suppress the proliferation of breast cancer cells, while managing the hot flashes induced by Tamoxifen. These researchers concluded that black cohosh extract treatment may be a safe, natural remedy for menopausal symptoms in patients who have had breast cancer. Their experimental data suggested too that black cohosh should be considered as part of the treatment protocol when Tamoxifen is administered to patients who have had breast cancer in the past.

A study by Drs. D. Dixon-Shanies and N. Shaikh, published in 1999 in *Oncology Report*, also demonstrated that black cohosh extract blocks the growth of human breast cancer cells. They concluded that certain herbs, such as black cohosh extract and soy (particularly the genistein isoflavone), may have potential in the

Step 5 | Anti-Aging Supplements After Age 40

prevention of breast cancer. Based on such findings, some experts recommend that women use a well-designed black cohosh and soy isoflavone supplement as a preventive measure throughout their adult lives (unless contraindications are present) to discourage the development or spread of breast cancer. Theoretically, the anti-proliferative effects of these herbal agents acting on breast cells could give the immune system a better chance to destroy cancer cells before they have an opportunity to take hold and grow.

Another supporting study by Dr JE Burdette and colleagues demonstrated that the natural ingredients in black cohosh extract inhibit free radical damage to the DNA of human breast cells when exposed to menadione, a potent free radical source. These substances (methyl caffeate, caffeic acid, ferolic acid, cimracemate A, fukinolic acid) exhibited powerful antioxidant effects, suggesting that black cohosh can protect against cellular mutations caused by reactive oxygen free radicals. Other studies examining the toxicity of black cohosh, using high dosages in rats over extended periods, concluded that black cohosh is nontoxic and safe for long-term use.

Overall, the body of evidence indicates that black cohosh is a safe and effective alternative to hormone replacement therapy as a natural anti-aging intervention for the management of menopausal symptoms and that it offers significant benefits when combined with other nutrients.

Soy Isoflavones

Soy extract is another natural alternative to hormone replacement therapy for the treatment of menopausal symptoms. In clinical trials, soy isoflavone products have been credited with reducing hot flashes by as much as 40 percent. Soy isoflavones also possess phytoestrogen (plant-based estrogen) characteristics. They act as a “selective estrogen receptor modulator” or SERM, stimulating beta estrogen

☞ The Meschino Optimal Living Program ☞

receptors on reproductive and other tissues and helping provide weak estrogenic support to reproductive tissue and bones, without overstimulating breast and endometrial cells.

Among the additional benefits of soy isoflavones are an antioxidant protection against free radicals, the slowing of breast cell proliferation, a reduction of the synthesis of estrone hormone by inhibiting the estrogen synthase enzyme in fat tissue, and an increase in the detoxification of harmful chemicals and hormones. The historically low incidence of breast cancer among Asian women has been linked to the protective effects of soy products, a staple of the traditional Asian diet. Unfortunately, steep increases in breast cancer incidence and mortality have been reported more recently in urban areas of China, Japan, and Singapore, where women have increased their consumption of animal fat. Asian women living in North America, eating a North American diet, exhibit breast cancer rates as high as other North American women.

The same phenomena have been demonstrated by research into ovarian cancer incidence among Asian and North American women. A recent study by Drs X. Chen and J Anderson showed that the soy isoflavones genistein and diadzein independently reduced the proliferation of human ovarian cancer cells in vitro. Although ovarian cancer affects only about 2 percent of women in the U.S., it is the fourth-leading cause of cancer deaths among women, in part because it is so difficult to diagnose in its early stages. Indeed, more than 60 percent of ovarian cancers are not diagnosed until they reach an advanced and, too often, fatal stage. As many as 95 percent of cases are linked to nutrition and environmental causes, making the protective effect of soy isoflavones all the more important.

Finally, soy isoflavones support bone mineral density in postmenopausal women, and help keep cholesterol levels within a safer range.

Step 5 | Anti-Aging Supplements After Age 40

Gamma-oryzanol

Gamma-oryzanol is derived from rice bran oil. In Japan, where much of the research on this natural agent has been done, it is an approved drug, routinely prescribed for the treatment of menopausal symptoms. In North America, it is classified as a natural health product.

Like black cohosh, gamma-oryzanol will reduce the secretion of luteinizing hormone by the pituitary gland and encourage endorphin release by the hypothalamus. Clinical trials reveal that 67 to 85 percent of women treated with gamma-oryzanol have experienced significant relief of menopausal symptoms; a bonus is that gamma-oryzanol supplementation at the proper dosage can reduce high cholesterol levels by up to 12 percent. It too is an extremely safe and non-toxic natural agent that should be part of any formulation aimed at controlling menopausal complaints and improving the health status of women during the menopausal stage of life.

Daily Dosages of Menopausal Supplements

It is now possible to find combination supplement products that provide all three menopausal nutrients—black cohosh, soy isoflavones and gamma-oryzanol—in a single formulation. As these three nutrients work synergistically, a combination formula gives a woman the best possible chance of managing her symptoms and enhancing her wellbeing, without resorting to hormone replacement therapy. Not all individuals respond equally to natural supplementation; however, in my experience, the majority of women report extremely positive results with the following dosages and standardized grades in a single all-in-one capsule. Menopausal and postmenopausal women should take two capsules per day.

- Black cohosh extract: 80 mg (standardized to 2.5 percent triterpene content)

☞ The Meschino Optimal Living Program ☞

- Soy extract: 250 mg (yielding 25 mg of soy isoflavones)
- Gamma-oryzanol: 150 mg

This combination of nutrients can be used safely as a viable alternative to HRT and by women who have contraindications to estrogen replacement therapy (those suffering fibrocystic breast disease, endometriosis, uterine fibroids, liver or gallbladder disease, pancreatitis, or unexplained uterine bleeding). Monitoring of bone density and blood lipids should be performed periodically. As well, women taking HRT may want to use this formula for general nutrient support, in order to acquire important isoflavones and related phytoestrogens to protect their breast tissues from the proliferative effects of HRT.

The only precautionary note is that this supplement cocktail should not be taken by women who have been afflicted with breast cancer or ovarian cancer, unless approved by their oncologist. It may be safe for breast and ovarian cancer survivors, and some research argues that it may in fact help reduce the risk of recurrence of breast cancer. However, until further study results are available, we cannot be certain that the use of this supplement combination is appropriate for breast cancer and ovarian cancer survivors.

To summarize, this supplement formula is highly recommended:

- as a natural alternative to estrogen replacement or HRT for postmenopausal women who demonstrate normal bone density or osteopenia (minimal or marginal bone loss);
- as an important source of phytoestrogens and phytonutrients for women of all ages to help reduce the risk of female-related diseases (cut the dosage in half for women 15 to 49 years of age);
- as a supplement for women with PMS, fibroids, endometriosis and fibrocystic breast disease;

Step 5 | Anti-Aging Supplements After Age 40

- as an alternative treatment for postmenopausal women with contraindications to estrogen replacement therapy;
- as a dietary adjunct to estrogen replacement therapy or the birth control pill, to help tone down the over-stimulation effect of these drugs on breast and uterine tissues.

Unsafe Herbs for Menopause

There are other herbal agents in the marketplace that can help manage women's health problems, including meno-pausal symptoms, but virtually all are associated with significant and sometimes dangerous side effects or drug-nutrient interactions. Avoid red clover isoflavones and angelica species (dong quai), both of which have potent anti-coagulant effects and can increase the risk of bleeding disorders. These herbs taken on their own or in conjunction with other anti-coagulant drugs, such as aspirin, put women at risk of internal bleeding. The presence of coumarins in these herbs also adds to the possibility of severe sun-induced dermatitis (skin rash). Licorice root frequently causes high blood pressure after prolonged use.

Final Considerations

At or before age 50, women should have a bone mineral density test to determine their bone status. If osteoporosis is not found, then most women can simply follow the lifestyle program outlined in this section as part of their anti-aging and prevention program. In instances where significant bone loss has already occurred, the attending physician may wish to consider the use of biphosphonate drugs which can slow future calcium loss, or Raloxifen or other SERMs (such as Tamoxifen). All postmenopausal women should have their bone density tracked periodically to monitor the effectiveness of

☞ The Meschino Optimal Living Program ☞

the program to which they are subscribing, whether it includes natural substances or conventional drugs. Blood work to determine fasting cholesterol and triglyceride levels and other biomarkers of cardiovascular disease should part of that regular screening.

5. Vitamin D for the Prevention of Osteoporosis and Cancer

Frequently underestimated and underappreciated, vitamin D acts as both a vitamin and a hormone. It plays a strong supporting role to calcium in the maintenance of bone density and deterring the processes that can lead to the development of various cancers. There is evidence to suggest that high vitamin D blood levels can also reduce the risk of multiple sclerosis, thanks to its positive effects on immune system function.

Until your mid-forties, the amount of vitamin D contained in a high-potency multivitamin and mineral, plus that derived from dietary sources (such as fortified dairy products and fish), is usually sufficient to maintain healthy bones and help discourage the establishment of cancer cells. After age 45, however, the alpha-hydroxylase enzyme in the kidneys that converts vitamin D to its most active form—1,25 dihydroxy vitamin D, also known as calcitriol—becomes less active. The resulting decline in the synthesis of calcitriol in the kidneys is a major contributor to the development of osteoporosis in women and men after 50 and to the risk of cancer in later life. It's possible to compensate for the age-related drop in calcitriol synthesis by raising levels of a less potent form of the vitamin, known as 25-hydroxy vitamin D, but consuming adequate amounts of vitamin D should be a lifelong concern.

Vitamin D deficiency has been described as an unrecognized epidemic in adult women of childbearing years (15 to 49) in the U.S., and researchers suspect it is equally prevalent among males

Step 5 | Anti-Aging Supplements After Age 40

of the same age. Older individuals are at risk due to vitamin D deficient diets, reduced sunlight exposure, and the decline in the conversion of vitamin D to calcitriol with age. Furthermore, many drugs inhibit the action or absorption of vitamin D. It is well known that cortisone or prednisone therapy interferes with the metabolism of vitamin D, as do barbiturates and anticonvulsants. All cause an increased breakdown of vitamin D and its metabolites and so increase osteoporosis risk. Other drugs that reduce vitamin D's effectiveness:

- Allopurinol
- Bile acid sequestrants (e.g., Cholestyramine and colestipol)
- Cimetidine and other H-2 antagonists
- Oral contraceptives
- Heparin
- Hydroxychloroquine
- Indapamide
- Isoniazid
- Mineral oil
- Neomycin
- Thiazide Diuretics
- Rifampin- (may reduce blood vitamin D levels by 70 percent)
- Orlistat- (reduces blood levels of vitamin D)

Several surveys have shown that a large percentage of adults of all ages have inadequate vitamin D in their blood to prevent osteoporosis, as well as prostate, breast and colon cancers. Research conducted at Boston's Massachusetts General Hospital found that 57 percent of people hospitalized for a variety of reasons were vitamin D deficient. Of those, 37 percent had consumed the recommended daily amounts of vitamin D (200 IU per day for

☞ The Meschino Optimal Living Program ☞

adults under the age of 50, 400 IU per day for adults 51 to 70, and 600 IU for adults over 70). These levels are too low to guard against vitamin deficiency and osteoporosis and certainly insufficient to reduce the risk of cancer.

Vitamin D and Bones

Vitamin D's most familiar function is to aid in the absorption of calcium for bone development and density. One of its traditional sources, cod liver oil, has been used since the Middle Ages as a safeguard against rickets, a disease of infancy and childhood that we now know is caused by vitamin D deficiency. When fibrous bone or cartilage goes without sufficient calcium and other minerals, it fails to form hard, mature bone. The pull of muscles and the simple weight of gravity will bend and distort the bones as the child grows. In 1930, vitamin D was isolated and identified as the fat-soluble compound that made cod liver oil an effective protection and treatment for the disease.

However, it's not just infants and young children who need vitamin D. It's essential at every stage of life, to increase bone mineral density to its maximum at around age 24, to maintain it through the young adult years, and to prevent the loss of calcium from the bones after age 50. Your lifetime vitamin D status is critical to the integrity of your bones and other hard tissues. Here's how it works:

- Vitamin D in the bloodstream assists the absorption of calcium and phosphorous by stimulating the synthesis of calcium-binding protein in intestinal cells. Insufficient vitamin D blood levels can set the stage for the development of osteoporosis and related bone fractures.

Step 5 | Anti-Aging Supplements After Age 40

- Vitamin D regulates the metabolism of calcium and phosphorous, both vital for neuromuscular function and mineralization of bone, nails, and teeth.
- Vitamin D acts directly on bone, aiding in its formation and repair. When necessary, it will trigger the release of calcium from bone to help maintain blood calcium levels within the normal range, a function it shares with parathyroid hormone.

Let's look at some recent research that underscores these benefits. In 1994 Dr. M. Chapuay and fellow researchers reported the results of a study of 3,720 elderly women living in nursing homes. Those who received 1,200 mg of calcium plus 800 IU of vitamin D each day experienced a 43 percent reduction in hip fractures over a three-year period compared to those not taking these supplements. Another study, conducted by Dr. B. Dawson-Hughes et al and published in 1995, demonstrated that supplementation of postmenopausal women with 700 IU of vitamin D daily reduced the annual rate of hip fractures from 1.3 percent to 0.5 percent, a difference of nearly 60 percent. Another Dawson-Hughes investigation combined the daily supplementation of 500 mg of calcium with 700 IU of vitamin D and revealed a significantly reduced hip fracture rate in men and women taking the combination compared to the placebo group at the end of a three-year follow-up period.

After the age of 45 it is extremely important for both men and women to increase their vitamin D supplementation. You will recall the alarming statistic that osteoporosis affects one in four women over the age of 50 and one in eight men over the age of 50. However, the benefits of increased vitamin D supplementation don't end with the prevention of osteoporosis.

☞ The Meschino Optimal Living Program ☞

Vitamin D and Cancer

Vitamin D receptors exist on intestinal cells, as we've learned, and they are also present in other tissues and organs, including the brain, pancreas, skin, gonads, prostate, stomach, colon, breast, kidney, connective tissue, parathyroid gland, mononuclear cells, and activated T and B lymphocytes. Recent studies indicate that these tissues are able to convert 25-hydroxy vitamin D, extracted from the bloodstream, into calcitriol for their own needs. Calcitriol exerts a number of anti-cancer effects on local tissues: it slows the rate of replication of the tissue's cells, an effect associated with decreased cancer development; it has been shown to slow the rate of replication of human prostate, breast and colon cancer cells under experimental conditions; and it promotes newly formed cells to mature to their full adult potential, which also decreases the chance of these cells being transformed into cancer cells by some external influence. Calcitriol also favourably affects immune function, which is thought to account for some of its anti-cancer properties, including its ability to transform the appearance of human prostate cancer cells back to healthy, non-malignant-looking cells and to inhibit their replication in experimental studies, an effect that is lost once the calcitriol is no longer administered.

Some of the earliest research linking optimal vitamin D status with protection against cancer was conducted by Drs. C.F. and F.C. Garland. F.C. Garland was among the first to examine the effects of geographical location on cancer incidence, tying sun exposure and resulting vitamin D synthesis to cancer prevention. Together, the Garlands have undertaken several studies of vitamin D and cancer, among them one described in 1999 in the *Annals of the New York Academy of Sciences*. It showed that daily intake levels of 800 IU

Step 5 | Anti-Aging Supplements After Age 40

of vitamin D plus 1,000 to 1,200 mg of calcium prevents the development of colon cancer, and that 800 IU a day of vitamin D is the intake level that is associated with a significant decrease in the incidence of breast and prostate cancer, as well as enhanced survival rates for breast cancer.

The evidence that vitamin D reduces the incidence of colon cancer has been strengthened by the findings of several large human studies. Dr. C.F. Garland's Chicago-based Western Electric Study followed 1,954 men over a 19-year period, examining various risk factors for colon and rectal cancers. This study revealed that dietary vitamin D and calcium were independent factors in assessing colon cancer risk. Subjects who ingested more than 3.75 mcg (150 IU) of vitamin D per day from dietary sources experienced a 50 percent reduction in the incidence of colon cancer, compared to men ingesting less. A daily intake of 1200 mg of calcium was associated with a 75 percent reduction in colon cancer incidence. In his Washington County Maryland Study, which tracked 25,620 volunteers from 1975 to 1983, Dr. Garland reported that the risk of colon cancer was reduced by 75 percent in men and women who had blood levels of vitamin D between 67.5 and 80.0 nmol/L, and by 80 percent in those with blood levels of vitamin D between 82.5 and 102.5 nmol/L.

An Italian study by Dr. C. La Vecchia published in 1997 in *The International Journal of Cancer* compared the dietary habits of 2,053 colon and rectal cancer patients with 4,154 individuals who were free from colon cancer but who lived in the same vicinity and were admitted to the same hospital with other health issues. The results showed that high intakes of antioxidants (carotenes and vitamin C) as well as calcium and vitamin D were associated with a 54 percent reduction in colon cancer incidence.

☞ The Meschino Optimal Living Program ☞

A 2000 review of the Nurses' Health Study by Dr. E.A. Platz confirmed that women with low blood levels of vitamin D had a significantly higher incidence of colon cancer. This came to light when women who had provided blood samples in 1989 and 1990 later underwent endoscopic exams between 1989 and 1996.

Most recently, a 2003 paper in the *Journal of the American Medical Association* reported on the results of a study of 3,121 patients, aged 50 to 75 years, who were tested at thirteen Veterans Affairs medical centers across the United States between 1994 and 1997. The subjects showed no symptoms of colon cancer, but colonoscopy examination revealed that 329 participants had advanced cases of the disease. Those with a close family history of colon cancer or who smoked and drank alcohol at moderate to high levels were all at high risk of developing it. Those who ate more than 4.2 grams of cereal fiber every day or who were frequent users of non-steroidal anti-inflammatory drugs such as aspirin demonstrated significantly lower rates of colon cancer development, as did those who ingested more than 645 IU of vitamin D from food and supplements on a daily basis. Higher intakes of calcium were also shown to be protective, but to a lesser degree in this study.

Reviewing the extensive scientific evidence pertaining to vitamin D and cancer in the July 2002 edition of the *American Journal of Clinical Nutrition*, Dr Michael Holick of Boston University Medical Center stated that the production of calcitriol may be essential for the regulation of cellular health, thereby decreasing the risk of developing cancers. Though it's not widely acknowledged by health professionals or generally known by members of the public, high intakes of vitamin D and optimal blood levels of 25-hydroxy vitamin D have demonstrated a strong influence on the prevention of breast, colon, and prostate cancer, as well as osteoporosis.

Step 5 | Anti-Aging Supplements After Age 40

The data is accumulating to show that vitamin D is also important in the prevention of ovarian cancer and multiple sclerosis. For example, in a study released in 2004, Dr K.L. Munger and colleagues showed that participants in the Nurses' Health Study who ingested 400 IU of vitamin D from supplements each day (from a multivitamin product) showed a 40 percent reduction in risk of multiple sclerosis compared to women who did not use supplements containing vitamin D. Other human and animal investigations have confirmed the effects of vitamin D on immune function that are consistent with preventing multiple sclerosis.

The Sources of Vitamin D

Moderate exposure to sunlight is the most natural way to restock your vitamin D stores; indeed, research has shown that vitamin D from sun exposure is the most potent in terms of preventing internal cancers as well as osteoporosis. Evolutionary theory suggests that as our dark-pigmented African ancestors migrated farther from the equator, those who possessed the genetic mutation for lighter skin were the ones who survived: the weaker sunlight could penetrate their skin more easily and vitamin D synthesis could occur. Today, for example, Scandinavians sport the fair skin that allows them to live in a region where sunlight intensity is relatively feeble.

To achieve the greatest possible vitamin D synthesis in the skin, simply enjoy 15 to 20 minutes of direct sunlight exposure on your face, arms and legs, three times a week. (This degree of exposure is not typically associated with an appreciable risk of skin cancer.) Unfortunately, few of us can hope for this amount of sunshine, especially those who live above the fortieth parallel where sunlight intensity between October and May is inadequate to make vitamin D in the skin. We have to look to other sources.

☞ The Meschino Optimal Living Program ☞

Among the preferred dietary sources are fish, vitamin D-fortified dairy products, and supplements. Fatty fish such as salmon and mackerel are rich in vitamin D and may be eaten three to four times a week to help meet the body's requirements. Fortified milk, despite its claims to contain 100 IU in every eight ounces, has been found to vary widely in vitamin D content depending on season, the breed of cow, the animal's diet, its exposure to sunlight, and the procedures used in fortification. The most reliable source of consistent and essential vitamin D levels is a supplement.

Low-Fat Food Sources of Vitamin D

Foods	Approximate I.U. of Vitamin D per 3.5 oz.
Sardines (canned)	1150-1570
Mackerel (raw)	1100
Salmon (fresh)	154-550
Salmon (canned)	220-440
Herring (fresh)	315
Herring (canned)	330
Shrimp	150
Halibut	44
Chicken	50-67
Oysters	5 IU per 3-4 medium sized oysters
Non-fat and 1 % milk	up to 100 IU per ounces and yogurt (Vitamin D fortified)
Low-fat cheese (less than 4% 12-15 milk fat)	

Ensure Optimal Vitamin D Status by Supplementing after Age 45

Establish your vitamin D status with an annual blood test to measure circulating levels of 25-hydroxy vitamin D. Abundant

Step 5 | Anti-Aging Supplements After Age 40

research shows that adults who maintain levels in the range of 85 to 120 nmol/L have a significantly lower risk of developing osteoporosis, breast cancer, ovarian cancer, prostate cancer, colon cancer, and multiple sclerosis.

To ensure that your blood levels are within this protective range, it is important to increase your vitamin D supplementation to 800 to 1,000 IU per day after the age of 45. To the 400 IU of vitamin D from a high-potency multiple vitamin and mineral, add another daily supplement that contains 400 to 600 IU in a formulation that also provides an extra 500 to 700 mg of calcium. If the product contains additional magnesium, zinc and other bone support nutrients, so much the better.

Dr. Michael Holick points out that vitamin D consumption is completely safe up to 2,000 IU a day for ages one year and above, and that the risk of vitamin D toxicity has been greatly exaggerated by many health policy makers. Vitamin D toxicity has never occurred at blood levels below 250 nmol/L, so there is a wide margin of safety should you choose to implement vitamin D supplementation at 1,000 IU per day as recommended.

Personally, I derive 500 mg of calcium and 400 IU of vitamin D every day from a high-potency multiple vitamin and mineral supplement. Since I am older than 45 and my body no longer efficiently converts 25-hydroxy vitamin D to 1,25 hydroxyvitamin D, I take two caplets of an additional supplement that contains the following nutrients. In each caplet:

- 200 IU vitamin D
- 250 mg calcium
- 100 mg magnesium
- 2.5 mg zinc

☞ The Meschino Optimal Living Program ☞

6. Glucosamine Sulfate for Joints and Blood Vessels

Another age-related condition that is engineered into our genetic program is osteoarthritis. Also known as degenerative arthritis, osteoarthritis is the most common joint disease in humans and vertebrate animals. Its symptoms become increasingly prevalent after 45 and nearly half the population will suffer from it by age 65. Virtually everyone who lives past the age of 75 will develop it to some degree. Because of its prevalence, let's begin by examining the causes and remedies for this condition.

Glucosamine Sulfate and Osteoarthritis

In the past the development of osteoarthritis has been accepted as simple wear and tear on the joints of the body, but recent evidence suggests that it is caused by complex changes in the repair mechanisms that keep joints functioning smoothly. With age there comes a decline in the ability of cartilage cells in the joints to manufacture sufficient amounts of a substance called glucosamine sulfate. Under normal conditions, our cartilage cells continually synthesize glucosamine sulfate, one of the raw materials needed to make chondroitin sulfate, an important component of cartilage. The cartilage in our joints consists mostly of a tough protein material called collagen, which provides the structural backbone of joint cartilage. Chondroitin sulfate fills in the space between the collagen fibers, just as mortar fills in the spaces between the bricks of a house, and it increases the joint's shock-absorbing capabilities. Because old collagen fibers and old chondroitin sulfate are continually broken down by the body, we need to support the systems that manufacture both throughout our lifetimes.

Step 5 | Anti-Aging Supplements After Age 40

By age 40 the rate of glucosamine sulfate synthesis is slowing and the production of chondroitin sulfate is much reduced. The soft, rubbery, shock-absorbing joint cartilage at the ends of our bones becomes thinner and gradually erodes, reducing the normal joint space between bones and allowing them rub against each other, causing pain and inflammation. Erosion of the joint cartilage also leads to the joints becoming tight, less flexible, even disfigured, with accompanying morning stiffness and loss of normal range of motion. Osteoarthritis doesn't mean just chronic pain and suffering, but a much reduced quality of life, restricting an individual's ability to perform work-related tasks or enjoy any number of recreational activities.

Many studies have demonstrated that glucosamine sulfate supplementation can compensate for the impaired glucosamine synthesis that occurs after age 40, providing cartilage cells with the ability to make more optimal levels of chondroitin sulfate and thereby slow or reverse the aging effects on our joints that lead to osteoarthritis. In fact, research suggests that glucosamine sulfate is an effective natural treatment for individuals who already suffer from osteoarthritis and joint cartilage injuries.

Glucosamine is a small and simple molecule that is readily absorbed from the gastrointestinal tract: it's been demonstrated that 90 to 98 percent of glucosamine sulfate is taken up intact. (By contrast, less than 13 percent of chondroitin sulfate is absorbed from the intestinal tract, making it significantly less effective than glucosamine sulfate as an agent in the prevention and management of osteoarthritis.) Once absorbed, glucosamine circulates through the bloodstream, where it can be taken up by the cartilage cells and contribute to the production of chondroitin sulfate. In addition, glucosamine sulfate is required for the synthesis of hyaluronic acid

☞ The Meschino Optimal Living Program ☞

by the synovial membrane of the joint. Hyaluronic acid increases the viscosity of the synovial fluid and thus reduces the stress on the cartilage and related joint structures.

Investigations on the efficacy of glucosamine have used it in the form of glucosamine sulfate, a manufactured compound of glucosamine and the mineral sulphur. Only glucosamine sulfate is approved as a treatment for osteoarthritis in more than 70 countries around the world, where it has been used by millions of people for more than 20 years. Glucosamine sulfate delivers glucosamine to the joint cartilage, along with the mineral sulfur, a nutrient that stabilizes the connective tissue matrix of cartilage, tendons, and ligaments. The popularity of sulfur hot springs and the recent demand for methyl sulfonyl methane (MSM) among arthritis patients offer strong anecdotal evidence that sulfur can help alleviate arthritis symptoms to a significant degree; indeed, preliminary trials with oral MSM in humans appear to support these endorsements. Other forms of glucosamine such as N-acetyl-glucosamine and glucosamine hydrochloride are available, but at present there is insufficient evidence to support their use and neither provides the benefits of sulfur.

Glucosamine sulfate has been the subject of more than 300 scientific investigations and over 20 double-blind clinical studies. In a comprehensive analysis of glucosamine clinical trials in the treatment of osteoarthritis published in the *Journal of the American Medical Association* in 2000, Dr. T.E. McAlindon and colleagues indicated that glucosamine sulphate supplementation reduced the symptoms and signs of osteoarthritis by 40.2 percent on average, compared with a placebo.

Glucosamine sulfate supplementation has also been investigated in head-to-head studies against non-steroidal anti-inflammatory drugs (NSAIDs) such as aspirin and ibuprofen for the treatment of osteoarthritis. In a number of these trials, glucosamine sulphate

Step 5 | Anti-Aging Supplements After Age 40

produced better results in relieving pain and inflammation, without the adverse side effects that are frequently encountered with NSAIDs such as gastritis, peptic ulcer, bleeding and erosion of the intestinal lining, liver and kidney toxicity, and tinnitus. In a 1998 therapeutic investigation conducted by Dr. G.X. Qiu and others involving 178 Chinese patients suffering from osteoarthritis of the knee, a group given a daily dose of 1,500 mg of glucosamine sulfate experienced greater relief of their symptoms than did another group given ibuprofen at 1,200 mg per day. In this study, glucosamine sulfate was also better tolerated than ibuprofen: sixteen percent of the ibuprofen group dropped out due to adverse side effects from the drug, while six percent of the glucosamine group withdrew. The authors concluded that glucosamine sulfate is a selective intervention for osteoarthritis, as effective for the symptoms of the disease as NSAIDs but significantly better tolerated. Glucosamine sulfate therefore seems particularly suited for the long-term treatment needed in osteoarthritis.

In answer to the skepticism of some in the medical profession who questioned the validity of the initial glucosamine research conducted in Europe and Asia, Dr. J.Y. Reginster and fellow researchers at the World Health Organization's Collaborating Center for Public Health Aspect of Osteoarticular Disorders in Liege, Belgium, published their findings in the journals *Arthritis and Rheumatology* and *Lancet* in 1999 and 2001 respectively. Their three-year study was a large, randomized-control intervention trial analysis of 212 patients with knee osteoarthritis. It was placebo-controlled, double-blind, and prospective in nature. Weight-bearing and antero-posterior radiographs of each knee were done at one and three years; joint space width was measured. Symptoms and functional status were scored every four months using the Western Ontario and McMaster University Osteoarthritis index. The two groups—a glucosamine sulphate group and a placebo group—began

☞ The Meschino Optimal Living Program ☞

with comparable baseline conditions, but after three years the glucosamine group showed no further joint space narrowing. The placebo group exhibited increased joint space narrowing and evidence of disease progression. As well, symptoms worsened in the placebo group while the glucosamine group experienced a marked reduction in symptoms over the three-year period, with no untoward side effects. This was a landmark study that finally convinced the medical community that glucosamine sulfate was an effective natural agent for the treatment of osteoarthritis.

Glucosamine Sulphate, Blood Vessels, and Other Health Benefits

The clinical use of glucosamine supplementation may extend beyond its application as an effective intervention to halt joint cartilage destruction and help regenerate new cartilage in osteoarthritis cases. Glucosamine sulfate is required for the synthesis of other substances that are integral components of the filler material between skin cells in the epidermis and collagen and elastin fibers in the dermal layers of the skin. Glucosamine is also part of the matrix material that supports the intestinal tract lining and the walls of blood vessels; experimental studies and human anecdotal evidence support its application for post-surgical wound healing.

There is also experimental and anecdotal evidence to suggest that glucosamine sulfate supplementation may be beneficial as part of a nutritional regime for the management of inflammatory bowel diseases. It's been suggested that glucosamine supplementation can strengthen the basement membrane of gut blood vessels, helping prevent the leakage of blood into the intestinal tract and inflammatory immune reactions. Further, glucosamine has been shown to have a healing effect on the lining of the intestinal tract itself: anecdotal evidence supports the trial of glucosamine in both Crohn's disease and ulcerative colitis.

Step 5 | Anti-Aging Supplements After Age 40

Finally, glucosamine sulfate supplementation may reduce the chances of blood vessel fragility, associated with the stroke and vein disorders that frequently occur with advancing age.

Side Effects, Toxicity, and Contraindications to the Use of Glucosamine

The reported adverse side effects from the use of glucosamine sulphate are generally mild and infrequent. These include minor gastrointestinal upset, drowsiness, skin reactions, and headache. Glucosamine sulfate is nontoxic at prescribed doses and safe for patients allergic or sensitive to sulfa drugs or sulfate-containing food additives. The word sulfate in this instance indicates the presence of the mineral sulfur, not the sulfa compounds used in sulfa drugs or sulfate-containing food additives. All body cells contain the mineral sulfur and consequently it's not possible to be allergic to it.

However, glucosamine sulfate is manufactured from the chitin exoskeleton of shellfish, such as lobster, crab, and shrimp. A person with severe allergies to shellfish may be sensitive, although the pharmaceutical grade of glucosamine is generally devoid of shellfish contaminants. Nevertheless, caution should be exercised in these cases.

A few preliminary animal experiments and human trials on healthy individuals reveal that glucosamine supplementation may increase insulin resistance in some individuals by down-regulating the synthesis of insulin receptors. In large clinical trials, this has not surfaced as a concern and no indication of pronounced glucose intolerance has been demonstrated in the many well-documented glucosamine studies, including the Reginster study and the comprehensive analysis published by the *Journal of the American Medical Association*. Some doctors have advised their patients not to take glucosamine if they are diabetic, but this is an unwarranted caution

☞ The Meschino Optimal Living Program ☞

since many diabetic patients have benefited from the use of glucosamine without any adverse effects on their blood sugar. In fact, if glucosamine can relieve the pain and disability of osteoarthritis that is preventing a diabetic from performing endurance exercise, he or she is better advised to take it: endurance exercise improves glucose tolerance and stabilizes blood sugar. These people should simply have their blood glucose levels monitored during the first few weeks of glucosamine sulfate supplementation to identify any blood sugar irregularities that may occur.

Dosages and Additional Natural Supplements

For the treatment of osteoarthritis, the usual daily dosage of glucosamine sulfate is 1,500 mg, which can be taken at one time or in divided doses of 500 mg per dose. Individuals taking diuretic drugs may require an additional 500 mg a day to compensate for their increased excretion rates. Those weighing more than 200 pounds may also be advised to up their dosage to 2,000 mg a day. I generally recommend glucosamine sulfate in a combination formula with other natural anti-inflammatory agents, as outlined below. It should be noted that experts have concluded that adding chondroitin sulfate to glucosamine has shown no benefits beyond glucosamine alone.

While glucosamine sulfate provides the raw material from which cartilage cells make more chondroitin sulfate and hyaluronic acid, it does not directly target the inflammation that is associated with osteoarthritis and joint injury problems. I usually advise patients to add a combination of natural anti-inflammatory herbal agents to their glucosamine sulphate supplement to speed pain relief and reduce joint swelling. You'll often find these herbs already incorporated into manufacturers' glucosamine formulations. Studies indicate that many of these natural agents are as effective

Step 5 | Anti-Aging Supplements After Age 40

as conventional anti-inflammatory drugs with fewer reported adverse side effects. Their availability offers arthritis sufferers another effective treatment for the management of their symptoms and can help eliminate or minimize their reliance on NSAIDs and other synthetic solutions.

Natural anti-inflammatory agents modulate the activity of cyclooxygenase and 5-lipoxygenase, the enzymes that are involved in the inflammatory process. The former enzyme converts arachidonic acid to prostaglandin series -2. PG-2 synthesis is known to produce an inflammatory effect, exacerbating joint pain and irritation. Likewise, 5-lipoxygenase enzyme converts arachidonic acid to leukotriene B4 (LTB-4) within white blood cells, and also contributes to inflammation of the joints. White blood cell count in normal synovial fluid is less than 100 ml on average; however, cellular response rises to 800 ml or more in osteoarthritis and much higher again in rheumatoid diseases. Like many synthetic anti-inflammatory drugs, the active constituents of anti-inflammatory herbs block the activity of the cyclooxygenase and lipoxygenase enzymes, inhibiting the synthesis of pro-inflammatory chemicals, primarily PG-2 and LTB-4 series, and relieving the inflammation and pain associated with arthritis and traumatic joint injuries. Unlike their synthetic counterparts, they have not been shown to cause erosion injury to the intestinal tract, accelerate cartilage destruction, or produce liver and kidney toxicity. For these reasons, the following herbal agents can be considered viable alternatives to conventional anti-inflammatory drugs in a large percentage of arthritic patients and those suffering from other muscle and joint inflammatory conditions. Lower doses may be used if the herbal agent is one of several in a combination formula of anti-inflammatory agents.

☞ The Meschino Optimal Living Program ☞

Curcumin—the active anti-inflammatory agent found in the spice turmeric. It inhibits the activity of the 5-lipoxygenase and cyclooxygenase enzymes, blocking the synthesis of PG-2 and LTB-4. One large double-blind study demonstrated that curcumin was as effective as the powerful anti-inflammatory drug phenylbutazone in reducing pain, swelling and stiffness in rheumatoid arthritis patients. It has also been helpful in the treatment of post-surgical inflammation. Other studies indicate that curcumin can lower histamine levels and is a potent antioxidant, factors that may contribute to its anti-inflammatory capabilities. For best results, use a 95 percent standardized extract of curcumin derived from turmeric. As a singular agent—that is, if used alone—the recommended daily dosage is 400-600 mg, taken one to three times per day. Side effects are rare, comprising primarily heartburn and esophageal reflux. Curcumin has a mild anti-coagulant effect and caution should be exercised if it is combined with powerful anti-coagulant drugs like coumadin, warfarin or plavix, although no drug-nutrient interactions leading to bleeding disorders have been reported in the scientific literature to date.

Boswellia—in clinical studies, the gum resin of the boswellia tree (yielding 70 percent boswellic acids) has improved symptoms in patients with osteoarthritis and rheumatoid arthritis. Research indicates that boswellic acids inhibit the 5-lipoxygenase enzyme in white blood cells. As a singular agent the usual dosage is 150 mg, taken one to three times per day. Boswellia appears to have no significant side effects or drug-nutrient interactions of concern.

White willow bark extract—provides anti-inflammatory phenolic glycosides, such as salicin, which have proven effective in the treatment of arthritis, back pain, and other joint inflammatory conditions. These phenolic glycosides inhibit cyclooxygenase, blocking the production of PG-2 and exert a mild painkilling effect. Unlike aspirin (synthetic acetylsalicylic acid or ASA), naturally occurring salicin does not increase the risk of bleeding disorders. White

Step 5 | Anti-Aging Supplements After Age 40

willow extract is slower-acting than ASA, but its effects last longer. The usual dosage is 20 to 40 mg of salicin, one to three times per day (note that 100 mg of white willow extract at a 15 percent standardized grade of salicin content yields 15 mg of salicin per dosage). Side effects are rare, but include nausea, headache and digestive upset. Contraindications may include conditions where ASA is also contraindicated, such as gout, diabetes, hemophilia, kidney disease, active peptic ulcer, glucose-6-phosphate dehydrogenase deficiency, and possibly asthma. However, the salicin content in a single dosage of white willow extract is very low compared to the acetylsalicylic acid content of ASA (15 mg vs. 320 mg); thus, these conditions may not be absolute contraindications for the use of white willow bark extract. Besides salicin, white willow extract contains other phenolic glycosides known to possess anti-inflammatory properties.

Ginger root extract—contains oleo-resins that have shown clinical benefits in the management of various arthritic and muscle inflammation problems, including rheumatoid arthritis, osteoarthritis, and myalgias. The active constituents are gingerols which inhibit the cyclooxygenase and lipoxygenase enzymes. The usual dosage is 500 mg, one to three times daily, standardized to five percent gingerol content. Side effects are rare, but include heartburn and digestive upset. It should not be given to patients with gallstones.

Bromelain—contains anti-inflammatory enzymes that suppress the inflammation and pain of rheumatoid and osteoarthritis, sports injuries, and other joint inflammatory conditions. Bromelain inhibits the cyclooxygenase enzyme, suppressing the synthesis of PG-2. Bromelain also helps to break down fibrin, thereby minimizing local swelling. The usual dosage is 400 mg, one to three times per day. Bromelain may inhibit platelet clotting and so boost the effects of anticoagulant drugs such as warfarin and coumadin; bleeding time should be monitored by a physician if it is used in cases where these drugs are also taken.

☞ The Meschino Optimal Living Program ☞

Quercetin—is a bioflavonoid compound that blocks the release of histamine and other pro-inflammatory enzymes at minimum doses of 1,000 to 1,500 mg per day. Although human studies with arthritic patients have yet to be undertaken, anecdotal and experimental evidence is strong for this application. There are no known side effects or drug-nutrient interactions for quercetin. I have used and recommended quercetin in a formula with glucosamine, methyl sulfonyl methane and bromelain enzymes, and have been very impressed with the ability of this combination to relieve arthritic pain more quickly than glucosamine sulfate alone.

Methyl Sulfonyl Methane—MSM is a natural sulfur-containing compound that is produced by the human body and is found in limited quantities in certain foods, such as fruits, vegetables, and meats. MSM ingested in higher doses as a supplement produces anti-inflammatory effects and helps support the integrity of joint cartilage. It has pain-relieving properties and has been used to treat a wide variety of muscle and joint inflammatory conditions. Studies suggest that it may also inhibit the formation of scar tissue around joints and slow the degeneration of cartilage in cases of osteoarthritis. When used on its own the usual dosage is 1,500 to 3,000 mg per day; however, a daily dosage of 200 to 400 mg per day can be beneficial if taken in conjunction with glucosamine sulfate and other natural anti-inflammatory agents. MSM is a very safe substance and is not associated with any drug-nutrient interactions. Its rare side effects may include stomach upset, headache, or more frequent bowel movements.

Devil's claw—contains the anti-inflammatory agent harpogonin. Devil's claw has demonstrated its effectiveness in the management of low back pain and is a traditional anti-inflammatory among many southern African tribes. The usual dosage is 100 to 400 mg, one to three times per day. The only consistently reported side effect is mild and infrequent digestive upset. It is contraindicated in patients with active gastric ulcers (may increase gastric acid

Step 5 | Anti-Aging Supplements After Age 40

secretion) and in patients taking warfarin or coumadin, due to its anticoagulant effects.

A number of companies manufacture single and combination natural anti-inflammatory supplement products that meet the dosage and standardized grade criteria that I have outlined in this section. In conjunction with the use of glucosamine sulphate, these anti-inflammatory agents are a natural, safe, and effective means to help reduce the inflammation and pain associated with osteoarthritis and other joint inflammatory conditions.

For patients with low-grade osteoarthritic symptoms I recommend the use of a supplement that contains glucosamine sulfate, MSM, quercetin, and bromelain enzymes. For patients with more advanced osteoarthritic conditions, I suggest that they add to these a supplement that contains a combination of turmeric (curcumin), boswellia, white willow bark, and ginger.

For patients with rheumatoid arthritis, lupus, other autoimmune inflammatory conditions, tendonitis, bursitis, and joint or muscle inflammation, I recommend the combination of turmeric (curcumin), boswellia, white willow bark, and ginger only, as there appears to be no benefit from glucosamine for primarily inflammatory conditions.

7. Brain Support After 50: CDP-Choline, Phosphatidylserine, Acetyl-L-Carnitine, Bacopa Monnieri, and Huperzine A

One of the cruelest fates is that of the individual who has taken care to stay in good physical condition well into his sixties, seventies, or eighties, only to develop senile dementia, Alzheimer's disease, or debilitating loss of mental capacity while otherwise healthy. According to the U.S. National Institute on Aging, Alzheimer's disease currently affects approximately six to eight percent of all

☞ The Meschino Optimal Living Program ☞

North Americans over the age of 65 and 47 percent of those over the age of 85. Many of us have witnessed the devastating emotional trauma of these conditions for the afflicted and for their families and friends, and many of us fear this late-life scenario above all others.

Spurred by the advancing years of the baby boomer cohort, anti-aging research has made significant recent progress in understanding long-term brain function. Among the areas of investigation is the influence of natural agents when taken as nutritional supplements, and here researchers have made important discoveries that promise the possibility of slowing or reversing the age-related changes that make us susceptible to memory loss and diminished mental acuity.

How the Brain Ages

There are two main processes at work in the aging of the brain. The first involves the damage to brain cells caused over a lifetime by free radicals. As described earlier, the brain is consuming at least 10 percent of the body's oxygen for energy production at any given moment. This high utilization of oxygen gives rise to oxygen free radicals, which are known to damage brain cells and are suspected of encouraging the formation of the amyloid protein that promotes the development and progression of Alzheimer's disease. The older you are, the greater your brain's cumulative exposure to free radicals and the more extensive the brain cell damage or destruction.

In Step 2 of this book, I suggested that you can protect your brain with the help of a daily high-potency multivitamin that is enriched with antioxidants such as vitamin E, beta-carotene, and vitamin C. Supplementation with melatonin may also be prudent after the age of 40. Lifetime antioxidant supplementation is emerging as a key step in preventing mental deterioration and is the first measure to adopt to preserve functional brain cells as you age.

Step 5 | Anti-Aging Supplements After Age 40

The second component of brain aging is a decline in the formation of certain brain chemicals known as neurotransmitters, the substances that allow the transfer of impulses from nerve to nerve or nerve to muscle. For instance, after a certain age it appears that the body is programmed to make less of the enzyme necessary for the creation of acetylcholine, the critical brain chemical that is responsible for memory and recall ability. After the age of 60 there is often a significant drop in acetylcholine synthesis. If the decline is severe enough, the result is progressive memory loss and other manifestations of cognitive dysfunction.

It's now known that specific natural supplements can help boost the body's acetylcholine levels. I recommend that after age 50 you incorporate a brain support nutritional supplement into your anti-aging regimen. Here are the nutrients that have been shown to help combat age-related memory loss, cognitive decline, and failing mental acuity.

CDP-choline

CDP-choline (cytidine 5-diphosphocholine or citidinediphosphocholine or citicholine) is a recently discovered nutrient that has proven effective in the management of senile dementia, Alzheimer's disease, and Parkinson's disease.

As described above, choline is one of the essential building blocks of the brain chemical acetylcholine.

In addition to its ability to increase the synthesis of acetylcholine and other important brain chemicals, CDP-choline contributes to the structure of the outer skin, or membranes, of brain cells, the sites of impulse transfers across the brain. In human trials, supplementation has been effective in cases of senile cognitive impairment, slowing the progression of Alzheimer's disease and Parkinson's disease. In experimental settings, it has increased levels

☞ The Meschino Optimal Living Program ☞

of noradrenaline and dopamine in the central nervous system, two chemicals essential to many cognitive and unconscious brain functions. It also hastens the resorption of cerebral swelling in experimental models. In studies of patients with head trauma, CDP-choline accelerated the recovery from post-traumatic coma and the recuperation of walking ability. Its use reduced the hospital stay of these patients and improved the cognitive and memory disturbances common to post-concussion syndrome.

CDP-choline is well tolerated by patients. No serious side effects have occurred in any of the groups treated with doses in the range of 1,000 mg per day. Toxicology studies likewise indicate that it is a safe intervention, with no adverse effects on the brain function. It is the most reliable form of choline supplementation available to support the brain's synthesis of the memory chemical acetylcholine.

Phosphatidylserine

Phosphatidylserine is a fatty, waxy substance in the body that supports the integrity and fluidity of nerve cell membranes. Low brain levels of phosphatidylserine are associated with impaired cognitive function and depression among the elderly, and in Italy, Scandinavia, and other parts of Europe, phosphatidylserine supplementation is widely used to help address these conditions in the aged. In addition, the serine portion of phosphatidylserine can be converted by the brain into choline, thereby contributing to acetylcholine synthesis.

Numerous studies involving elderly patients (65 to 93 years) with moderate to severe senility, including Alzheimer's patients and depressed elderly patients, have demonstrated significant improvement in memory, behaviour, mood states, and cognitive function with phosphatidylserine supplementation of 100 mg three times daily.

Step 5 | Anti-Aging Supplements After Age 40

Most of these studies used bovine-derived phosphatidylserine, a product that has since been withdrawn because of the risk of Creutzfeld-Jacob or “mad cow” disease. Today the majority of phosphatidylserine products are derived from soy, but there have been few cognitive function studies so far using this source of phosphatidylserine. Soy and bovine-derived phosphatidylserine are not chemically identical; however, preliminary animal studies show that soy-derived phosphatidylserine does have positive effects on brain function similar to that of bovine-derived, and it is undoubtedly a safer substance. No significant side effects or adverse reactions have been noted with its use, other than mild gastrointestinal distress on rare occasions.

Acetyl-L-Carnitine

Acetyl-L-Carnitine (ALC) is a nutrient produced by the body, with high concentrations found in the brain, muscles, liver, kidney, and testes. It is thought that the decline in ALC synthesis by the body after age 50 is a major contributor to age-related cognitive impairment and possibly Alzheimer’s disease.

Double-blind clinical trials showed improvement in such patients when ALC was administered at daily dosages ranging from 1,000 to 2,000 mg per day. ALC has been shown to be nontoxic and extremely safe for human use. Rare side effects include skin rash, nausea, vomiting, and agitation.

Bacopa Monnieri

The leaf of bacopa, or water hyssop, has been used in Ayurveda, traditional Hindu medicine, since the sixth century to help improve mental performance. Its active ingredients enhance nerve transmission and are potent antioxidants.

☞ The Meschino Optimal Living Program ☞

Currently, bacopa is being used and studied as a natural substance to strengthen memory and general cognition and to help control epilepsy. The data suggests that bacopa supplementation can increase learning ability in laboratory animals, while human studies have provided evidence that it may improve intellectual activity in children and memory and mental performance in adults. In one study reported by *Psychopharmacology* in 2001, healthy volunteers were given bacopa monnieri supplementation (300 mg per day) or a placebo, with follow-up neuropsychological testing performed at weeks 5 and 12. Compared to the placebo group, the subjects given bacopa significantly improved their speed of visual information processing, learning rate, and memory consolidation, and they demonstrated reduced anxiety levels. The researchers concluded that bacopa monnieri may improve higher-order cognitive processes that are dependent on the input of information such as learning and memory. There are no well-known side effects from the use of bacopa monnieri at recommended doses.

Huperzine A

Huperzine A is an alkaloid compound found in low concentrations in a moss from the Lycopodiaceae family. It has been used for centuries in Chinese folk medicine to treat a range of ailments, but in modern times research has focused on its ability to raise brain levels of acetylcholine. When used therapeutically, huperzine A, or hupA, is given as a concentrated extract. Commercially available products contain up to 95 percent hupA concentration.

Huperzine A is rapidly absorbed by the brain, where it acts as a potent inhibitor of the enzyme acetylcholinesterase, which breaks down the memory chemical acetylcholine. A feature of

Step 5 | Anti-Aging Supplements After Age 40

Alzheimer's disease is reduced concentrations of acetylcholine in specific areas of the brain. Huperzine A supplementation appears to help boost these levels in cases where the condition has not yet advanced to the point of permanent brain cell damage.

Studies show that huperzine A provides a longer-lasting effect than tacrine or donepezil, drugs which are often prescribed for Alzheimer's disease, and with fewer side effects.

In a 1995 double-blind clinical study of Alzheimer's disease patients by Dr. S.S. Xu and colleagues in China, the group given 200 mcg of huperzine A twice a day for eight weeks demonstrated marked improvement in memory, cognitive, and behavioural functions. It has also been used successfully in a clinical setting in China with approximately 100,000 Alzheimer's and dementia patients. At Beijing's Institute of Mental Health it was tested against foline, another drug for Alzheimer's disease, in 101 patients with benign senescent forgetfulness. After four weeks of supplementation, 70 percent of the group receiving huperzine A showed improvement in their memory, prompting the researchers to include an additional 111 Alzheimer's patients in the study. Overall, the group receiving hupA demonstrated a 10 percent improvement in the memory quotient over the four-week test period, and significant improvement in other measures of cognitive function. Side effects occurred in only three percent of these patients, the most frequent being dizziness and gastrointestinal symptoms. Other reliable studies undertaken in China showed similar positive results with Alzheimer's patients and favourable comparisons to synthetic drugs.

Side effects associated with huperzine A supplementation are rare at recommended doses, but as mentioned may include dizziness and gastrointestinal symptoms.

☞ The Meschino Optimal Living Program ☞

Don't Mix Brain Support Supplements with Other Brain Support Medications Without Your Doctor's Consent

Individuals with Alzheimer's disease, dementia, depression, or other mental or psychological ailments who are on medication for these conditions must check with their attending physicians before taking the herbal and accessory nutrients described here.

Combining prescription medications with these supplements can amplify the effects of certain drugs to the point of toxicity and life-threatening crisis.

Do Take Brain Support Supplements Before Age-Related Changes Take Hold

As a measure of prevention, it is advisable to take an all-in-one brain support supplement to combat the body's pre-programmed decline in memory ability and cognitive function. This supplement should be used in conjunction with a high-potency multivitamin and mineral and an essential fatty acid supplement, both of which contain nutrients that also play a vital role in preserving the integrity of brain cells.

An all-in-one brain support supplement that I recommend for anti-aging purposes includes the following ingredients and dosages per capsule:

- CDP-Choline – 50 mg
- Phosphatidylserine – 50 mg (100 mg at 50% grade)
- Huperzine A – 25 mcg
- Bacopa Monnieri – 50 mg (standardized to 20 percent bacosides content)

Step 5 | Anti-Aging Supplements After Age 40

Take two capsules a day for brain support, beginning between the ages of 50 and 60.

Be Cautious with the Use of Other Brain Support Supplements

There are three other brain support supplements that are considered beneficial in preserving or restoring memory and other aspects of cognitive function, but their potential side effects demand proper monitoring by a qualified health care professional. These supplements are ginkgo biloba, vinpocetine, and dimethylaminoethanol.

Ginkgo biloba extract increases blood flow to the brain and has been known to improve cases of memory loss, Alzheimer's disease, and age-related cognitive decline. Unfortunately, some of its active ingredients produce a powerful anti-coagulant effect, which has caused internal bleeding in several reported cases, including bleeding in the brain.

Vinpocetine is an isolated substance from a plant called lesser periwinkle. Like ginkgo biloba, vinpocetine increases blood flow to the brain and has shown success in patients with Alzheimer's disease, ischemic stroke, dementia and chronic cerebral insufficiency (reduced blood flow to the brain causing disturbances in memory and cognitive function). It too is a strong anti-coagulant with the associated risk of internal bleeding.

Ginkgo biloba and vinpocetine should not be taken by individuals who regularly use other anti-coagulant drugs such as aspirin, coumadin, warfarin, or plavix. As a general rule, these supplements should not be taken without proper monitoring by a doctor, and their indiscriminant use is not advised.

Dimethylaminoethanol (DMAE or Deanol) is a natural product that may increase brain levels of choline. However, clinical trials have brought to light frequent side effects, including drowsiness,

☞ The Meschino Optimal Living Program ☞

confusion, lucid dreams, depression, dull headache, increased tension of the jaw and other muscles, and insomnia. I do not recommend its use at this time.

8. Preserving Libido and Sexual Function: Muir Puama, Tribulus Terrestris, Epimedium, Damiana, and Avena Sativa

One very common aspect of aging that deserves attention for its influence on quality of life after 50 is reduced libido and compromised sexual function in both men and women.

For men, the difficulty is defined as erectile dysfunction, a consistent inability to achieve or maintain an erection sufficient for satisfactory sexual relations. Complete erectile dysfunction is the absolute inability to achieve penetration at any stage of sexual relations. The 2004 Massachusetts Male Aging Study of 1,300 men between the ages of 40 and 70 suggested that just over half of all men in this age group have some degree of erectile dysfunction; five percent of 40-year-olds and 25 percent of 75-year-olds have complete erectile dysfunction. In another study of 216 men aged 40 to 79 who experienced varying degrees of erectile dysfunction, Dr. F.E. Kaiser et al reported that no patient over the age of 70 experienced full erections, even of short duration. This investigation also showed that the most significant alterations in testosterone secretion related to erectile dysfunction and the most significant decline in blood flow to the penis resulting from narrowed arteries occur after the age of 50.

For women, menopause may trigger a loss of interest in sex and introduce physiological changes, such as vaginal dryness, that can make intercourse painful. A 2004 investigation by Dr. J.E. Blumel and fellow researchers concluded that between 40 and 64 years of age, approximately 40 percent of women cease to have sexual relations. Unhappy personal relationships with partners and

Step 5 | Anti-Aging Supplements After Age 40

an absence of partners were both cited, but sexual dysfunction—low sexual desire—was the primary reason given in 49 percent of these cases.

The Causes of Sexual Dysfunction

For men, the age-related decline in testosterone synthesis and secretion is closely associated with reduced libido and erectile dysfunction problems. Between 40 and 70 years of age, the average testosterone level drops by about one percent every year—a significant 30 percent reduction.

Other reasons for male sexual dysfunction include diabetes (due to narrowed arteries, a frequent complication of this disease), atherosclerosis (the buildup of cholesterol plaque on the walls of the arteries, causing reduced blood flow to the erectile tissues of the penis), the use of drugs used in the treatment of depression or psychological disorders or that lower blood pressure, alcohol consumption, and social-psychological factors (lack of attraction, poor relationship with partner, anxiety, depression). Prostate enlargement, and the accompanying lower urinary tract symptoms (LUTS), is another common cause. Men with LUTS have a higher risk of erectile dysfunction than those with no clinically significant prostate enlargement, and they report a higher incidence of ejaculatory loss and painful ejaculation. This is further justification for the use of a prostate support supplement after the age of 40.

Erectile dysfunction can also be attributed to a decrease in vibrotactile sensitivity due to a loss of nerve receptors in the skin of the penis. These receptors register tactile sensations when the penis is touched and transmit pleasurable sexual signals through the nerve pathways that lead to the spinal cord and up to the brain. With age, there are fewer of these receptors, so there can be too little sensory stimulation to produce or sustain an erection through the normal automatic reflex nerve channels.

☞ The Meschino Optimal Living Program ☞

In women, age-related sexual dysfunction and loss of libido are most strongly linked to the significant drop in estrogen, progesterone, and testosterone that accompanies menopause.

Potentially Risky Treatments

The medical profession has largely approached the treatment of sexual dysfunction and loss of libido with a “topping up” strategy—hormone replacement therapy for women, testosterone replacement for men, and growth hormone injections for both. Also frequently prescribed for both is the administration of extra DHEA (dehydroepiandrosterone), a steroid hormone that the body can convert into testosterone and estrogen. These drugs have been proven effective, no question. However, their use increases the risk of breast cancer, heart disease, and stroke, and may increase the risk of colon and prostate cancer.

Hormone Therapy for Women

As outlined earlier, the use of hormone replacement therapy by women for the management of menopause and to prevent osteoporosis has fallen out of favor since the findings of the Women’s Health Initiative Study were made public. As a treatment for sexual dysfunction, it is no less risky.

DHEA Supplementation

DHEA has been used as an agent to help manage menopause in women and andropause in men, and some studies suggest that it can be effective in cases of sexual dysfunction. This steroid hormone is created from cholesterol in the adrenal glands. As we age, blood levels of DHEA decline, providing less of the raw material for testosterone and estrogen synthesis to our reproductive tissues.

Step 5 | Anti-Aging Supplements After Age 40

Some anti-aging experts have recommended DHEA supplementation beginning between ages 40 and 50 as means of allowing the body to make its own testosterone and estrogen. Thus far, reports of its effectiveness as an anti-aging supplement have been mixed and inconclusive. Although some patients have experienced enhanced sexual performance and libido, experimental evidence suggests that DHEA supplementation may encourage the growth of latent breast cancer and prostate cancer, both known to occur at higher rates in individuals over 50.

Until DHEA can be shown to be a safe intervention in this respect, and I think that is unlikely to happen, I don't recommend it as a treatment option for men with erectile dysfunction problems and loss of libido, or as a libido-enhancing treatment for women

Testosterone Replacement Therapy for Men

Testosterone replacement therapy is a proven method to enhance male sex drive and sexual performance in men with these problems. However, testosterone is also known to foster the growth and spread of detected prostate cancers, and many practitioners are reluctant to prescribe it to maintain sexual virility for fear it may promote the development of undetected prostate cancer cells that otherwise may not have posed a threat.

My view is that any therapy that encourages higher levels of DHT (the male prostate converts testosterone into DHT) in the body is likely to promote the development of prostate cancer. I recommend that men use more natural remedies as their first approach to this problem, as I will outline shortly

Growth Hormone Injections

We'll deal with growth hormone in greater detail in the section that follows this one, but in the context of libido and sexual function,

☞ The Meschino Optimal Living Program ☞

research studies have shown that growth hormone injections and Insulin-like Growth Factor-1 (IGF-1) can help both men and women.

Remember that higher circulating levels of growth hormone in the bloodstream stimulate higher secretions of IGF-1 from the liver. It is IGF-1 that actually produces the physiological effects of growth hormone. Injecting either growth hormone or IGF-1 will produce a rise in IGF-1 blood levels. It may be the case, though, that these injections will raise IGF-1 levels into a range that promotes the development of undetected cancers. At the moment, no one can identify the precise optimal level of IGF-1 that will reverse aging and enhance sexual performance without increasing cancer risk. The medical evidence is consistent that excess growth hormone, whether from injections or caused naturally (for example, by the condition acromegaly, in which the pituitary gland secretes excess growth hormone) is associated with an increased risk of colon cancer. More recently it has been shown that various cancer cells increase their synthesis of IGF-1, fostering their own growth and replication, when stimulated by growth hormone.

Consequently, using growth hormone injections as a treatment for sexual dysfunction is not without safety concerns. It appears that the growth hormone secretagogue is a safer choice, in that they do not elevate IGF-1 levels above 275 to 300 ng/ml. That is a level that has not been associated with increased cancer risk. Preliminary reports suggest that secretagogue supplements can improve sexual function and libido in men and women and can be considered for this purpose by individuals who have no history of personal cancer.

Viagra

The prescription drug Viagra has gained tremendous popularity for its ability to reverse erectile dysfunction and improve sexual performance in men. Viagra works by increasing the amount of nitric

Step 5 | Anti-Aging Supplements After Age 40

oxide in the blood vessels that feed the erectile tissues of the penis. This opens up blood flow to the erectile tissues, supporting erection ability and endurance. Yet even this miracle medication is not without hazards.

Viagra is not to be taken by men who have heart disease (angina, congestive heart failure, or patients taking multi-drug anti-hypertensive agents), kidney or liver disease, or who are taking the drugs erythromycin or cimetidine. These precautions are in place because Viagra can cause a precipitous decline in blood pressure during the 24 hours after ingestion, at which point nitroglycerine drugs must also be avoided.

In 2001 a research team from Cedars-Sinai Medical Center in Los Angeles analyzed reports of Viagra's ill effects collected by the Food and Drug Administration. In 1,473 serious adverse events reported, 522 men had died, most of cardiovascular causes. The majority of deaths (70 percent) were associated with the standard Viagra dosage of 50 milligrams; two-thirds of the victims had taken Viagra within five hours of their deaths being reported; and most of the dead were younger than 65 and had no reported heart disease risk factors.

The study confirmed the well-documented danger of combining nitrate use with Viagra. Of the 90 patients who were on nitrates and taking Viagra, 68 percent died, and another 20 percent suffered non-fatal heart attacks. (Viagra's manufacturer, Pfizer, officially discourages mixing Viagra and organic nitrates, such as nitroglycerin.) But a whopping 88 percent of deaths occurred in patients who were not taking nitrates. That led investigators to speculate that there are significant numbers who are subject to other harmful effects from Viagra. More recently these effects have been linked to increased risk of stroke and other cardiovascular reactions which can lead to ruptured atherosclerotic plaques within blood vessels, thrombus formation, and headaches. The speed of the symptoms

☞ The Meschino Optimal Living Program ☞

leading to death and the fact that 88 percent of the fatalities were first-time users suggest that some individuals are highly susceptible.

Safe, Natural Herbal Remedies that Enhance Libido and Sexual Function in Men and Women

For many centuries cultures around the world have used natural herbal agents to enhance libido and sexual function. A number of them have shown impressive results in modern-day clinical trials of human subjects with known problems. Researchers have identified the active constituents or the mechanisms at work in these herbal products, and tests for toxicity, side effects and potential drug-nutrient interactions have been established for most to ensure that they can be used in a safe, effective, and responsible manner. A number of studies have shown that combining some of these herbal agents into one supplement product offers greater positive effects on sexual function than a single sexual-enhancement herb alone.

At the end of this section I'll outline the herbal combination product that I recommend. However, let's first get acquainted with these individual herbal agents.

Muira Puama (Potency Wood)

Muira puama extract is made from the root of a shrub native to Brazil, long used as a powerful aphrodisiac and nerve-stimulant in South American folk medicine. Early European explorers returned home with the muira puama plant, and it has been used in European herbal medicine for centuries since. In England, muira puama is listed in the British Herbal Pharmacopoeia as a treatment for impotence and dysentery.

Two clinical studies conducted at the Institute of Sexology in France in 1990 and 2000 showed that muira puama extract can reverse erectile dysfunction in a high percentage of men within a two-week period: 85 percent of subjects reported an enhanced

Step 5 | Anti-Aging Supplements After Age 40

libido; 100 percent, increased frequency of intercourse; and 90 percent, an improved ability to maintain an erection.

Results of a 2000 study, also conducted at the Institute of Sexology and involving 202 women with low sex drive, demonstrated that a combination supplement product containing muira puama and ginkgo biloba (Herbal vX), taken for one month, improved libido and other aspects of sexual function in 65 percent of the participants. The researchers stated that statistically significant improvements occurred in frequency of sexual desire, sexual intercourse and sexual fantasies, as well as in intensity of sexual desires, excitement of fantasies, ability to reach orgasm, and intensity of orgasm.

Its precise mechanism of action remains unknown, though it appears to enhance both the psychological and physical aspects of sexual function. The usual dosage is 1,000 to 1,500 mg per day. Muira puama has not been associated with any significant side effects or toxicity.

Tribulus Terrestris (Puncture Vine)

Tribulus terrestris is a natural herb, commonly known as puncture vine, that has been used for hundreds of years in Europe. In Ayurvedic medicine, it is known as a tonic for treating genito-urinary troubles and impotence. In China, tribulus is prescribed as a treatment for high blood pressure and angina and for a variety of liver and kidney conditions. In Bulgaria, it is taken by men and women as an antidote to infertility and by Olympic athletes who claim to have used high doses to increase muscle development. (The research data to support this claim has never been revealed to exercise physiologists in the West.)

One of the most consistent findings related to tribulus is its ability to enhance sexual performance in men and stimulate libido in men and women, thanks in part to its hormonal effects. In animal

☞ The Meschino Optimal Living Program ☞

and human male studies, tribulus supplementation can raise testosterone levels by 30 to 40 percent, the result of an increase in the release of luteinizing hormone (LH) from the pituitary gland, which in turn increases testosterone production in the testes. These hormonal alterations can also step up sperm production and motility, hence its application as a treatment for infertility. One human study showed that LH blood levels rose 72 percent after supplementation with 750 mg per day of tribulus terrestris (standardized to 45 percent saponin content) and that free testosterone rose by 41 percent in male subjects. (Free testosterone is not bound to a protein carrier in the bloodstream, making it more available for use by the cells and more potent than bound testosterone.)

A second beneficial feature of tribulus terrestris is its ability to increase the release of nitric oxide from the lining of blood vessels and nerves that supply blood flow to the penis. This results in a relaxation of the blood vessels, which in turn allows greater engorgement of blood within the erectile tissues and a firmer and longer lasting erection. Improvements in erectile dysfunction often occur on the first day of use or within the first few days of use, which is too soon to be the result of a rise in testosterone levels.

In general, human studies involving male subjects, as well as anecdotal evidence, indicate that tribulus terrestris supplementation can increase libido, frequency, and strength of erections; increase sperm count and motility; and shorten the time between erections. Its active ingredients have not been completely identified; however, much research indicates that its furostanol saponins are likely a principle ingredient. Studies yielding the best results for men have used tribulus terrestris supplements that are standardized to contain 40 to 45 percent steroidal saponins.

Among women, tribulus increases the concentration of hormones including estradiol, with testosterone being very slightly influenced, which is associated with improved sexual function and

Step 5 | Anti-Aging Supplements After Age 40

libido. It is also thought to increase clitoral blood flow, adding to sensitivity and sexual responsiveness. A 1988 study by Dr. P. Tabakova and fellow researchers in Bulgaria showed that tribulus terrestris supplementation in women improved libido and sexual function in 66 percent of subjects with reported low sex drive and sexual dysfunction problems.

Tribulus terrestris is not only a safe, natural agent to improve and restore male and female sexual virility, but its daily use is associated with a number of significant anti-aging and disease-prevention effects. In China, large clinical trials with patients have shown it to be effective in the treatment of angina, with no adverse side effects or damage to the circulatory system, kidneys, or liver. Other researchers have found that it reduces high blood pressure, lowers blood cholesterol, and acts as a natural anti-inflammatory, performing in a similar fashion to drugs like Celebrex and Vioxx but without the intestinal tract irritation of aspirin or ibuprofen.

In addition, tribulus terrestris contains beta-sitosterol, which, as we've seen, promotes male prostate health by reducing the production of inflammatory prostaglandin hormones and by inhibiting the enzyme that converts testosterone into DHT, a known contributor to prostate enlargement and prostate cancer. Its steroidal compounds can improve immune function due to their antibacterial and antiviral properties, which has led to its use as a treatment for herpes and other viral infections such as flus and the common cold.

For all of these reasons, tribulus terrestris an attractive supplement for men and women over the age of 50. No adverse effects to the central nervous or cardiovascular systems were noted in any of the clinical studies using tribulus terrestris and no toxicity or deviations in blood count were observed. There are no known negative effects when tribulus is used as a dietary supplement. The usual dosage to preserve or restore sexual virility is 750 to 1,500 mg per day.

☞ The Meschino Optimal Living Program ☞

Damiana (Tunera aphrodisiaca)

Damiana is found throughout Mexico, Central America, and the Caribbean. Its Latin name, *Tunera aphrodisiaca*, advertises its reputation. In the Netherlands it is renowned for its sexual enhancing qualities and positive effect on the reproductive organs, and it has been used as an aphrodisiac in North America since 1874.

The pharmacology of the plant suggests that its alkaloids may have hormone-like effects, plus it increases the sensitivity of the genital organs by very slightly irritating the urethra and possibly other tissues that line the reproductive tract.

It is usually included in sex-enhancement supplements along with other virility herbs. A typical capsule contains 200 to 300 mg of damiana in formulations that are usually taken three times per day or three capsules all at once.

Epimedium (Horny Goat Weed)

Epimedium is a plant common to the grazing and farming regions of China. Many years ago, Chinese farmers noticed that their goats became much friskier and copulated much more frequently after grazing on this plant (hence its common name, “horny goat weed”). Epimedium is an important supplement in traditional Chinese medicine, where it is considered a powerful sex stimulant, and it’s now gaining popularity in the western world.

Epimedium’s leaves contain a variety of healthful flavonoids, polysaccharides, and sterols, as well as an alkaloid called magnafloine. Its exact mechanism of action is still something of a mystery, but it has been successful in boosting sexual desire, aiding erectile function, and fighting fatigue.

As a sexual-enhancement herb, the standardized grade of epimedium should contain 10 percent icariin flavonoids, usually providing 100 mg of epimedium per capsule. Epimedium is often included as an ingredient in a multi-herbal sexual enhancement

Step 5 | Anti-Aging Supplements After Age 40

formulation. There have been no reports of adverse side effects associated with the use of epimedium at recommended dosages.

Avena Sativa (Wild Oat)

Avena sativa, or wild oat, is a grass which is cultivated as an edible grain. The parts of the herb typically used for supplementation purposes—the seeds and the stem—contain many active constituents, including saponins, flavonoids, and alkaloids, as well as vitamins, minerals, and other nutrients. *Avena sativa* supplementation nourishes the nerves, increasing tactile sensations in the genital area. In a 1986 study conducted at the Institute for Advanced Study of Human Sexuality in San Francisco, California, subjects took 300 mg of *avena sativa* three days per week for six weeks. The 20 men and 20 women in the study ranged from 22 to 64 years of age. The men reported a 22 percent increase in genital sensation and a 36 percent increase in frequency of orgasms, while the women experienced a 15 percent increase in genital sensation and a 29 percent increase in the frequency of orgasms.

Avena sativa is nontoxic and not associated with any adverse side effects or drug-nutrient interactions. Like the others, it is often included with several herbal sexual-enhancement agents in a single supplement product.

Virility Herbs with Questionable Safety Profiles

There are other natural agents that are acknowledged to be effective in cases of erectile and sexual dysfunction, but their potential side effects require care and informed caution if they are to be consumed safely. I strongly advise against the casual use of any of the following herbal agents and support their prescribed use only in special circumstances where their administration and effects can be monitored by a physician.

☞ The Meschino Optimal Living Program ☞

Yohimbe

Yohimbine, an alkaloid compound derived from the yohimbe plant, increases blood flow to erectile tissue through its direct effects on the nervous system. However, yohimbine produces several undesirable and dangerous side effects, among them anxiety, panic attacks, hallucinations, high blood pressure, rapid heart rate, dizziness, headaches, and skin flushing, and it can aggravate kidney problems and existing psychological disturbances.

Although it is an FDA-approved treatment for impotence, it is classified as an unsafe herb that should be taken only under medical supervision. Many yohimbe products sold over the counter do not contain sufficient yohimbine content to be effective: authentic yohimbe bark contains six percent yohimbine content, and this is the effective standardized grade. Yohimbe supplementation should not be used unless prescribed by a physician.

Ginkgo Biloba Extract

Ginkgo biloba extract (GBE) has a very high success rate in the treatment of erectile dysfunction attributed to poor blood flow as a result of atherosclerosis or diabetes. In two major studies, men with erectile dysfunction who failed to respond to papavernine (a drug injected to produce an erection) or other drugs that improve blood flow demonstrated a marked positive response to the oral ingestion of GBE at 60 or 80 mg, three times per day, in trials lasting six to 18 months. GBE is known to open up blood vessels and inhibit the coagulation of the blood, hence its ability to increase blood flow to the erectile tissues of the penis. Women who used the herbal sexual-enhancement product Herbal vX in an open trial reported significant increases in sexual desire, sexual intercourse, and sexual fantasies, as well improved ability to reach orgasm and intensity of orgasm. Herbal vX contains muira puama and ginkgo biloba.

Step 5 | Anti-Aging Supplements After Age 40

However, a daily dosage of 180 to 240 mg of GBE, which were the dosages used in the studies on male subjects with erectile dysfunction problems, acts as a powerful anti-coagulant. There have been several reported cases of bleeding into the brain in patients who have used GBE either alone or in combination with other anti-coagulant agents—such as aspirin, NSAIDs, coumadin, warfarin, or Plavix—at doses as low as 40 mg, once to three times per day. I do not recommend that GBE be included as a standard ingredient in an anti-aging sexual virility supplement for men or women. In more extreme cases of sexual impotence or low sex drive, GBE may be used as an additional supplement, provided a physician is consulted to monitor bleeding time as a precaution against potential bleeding disorders. To be effective, GBE extracts must be standardized to contain 24 percent flavone glycosides and six percent terpenes.

Ginseng

In men, panax ginseng increases sperm count and motility, plasma total and free testosterone, dihydrotestosterone, follicle stimulating hormone, and leutinizing hormone. An in vitro study suggests that ginseng may relax the corpus cavernosum by releasing nitric oxide, which improves blood flow and facilitates an erection. A double-blind clinical study showed that ginseng extract supplementation at a daily dosage of 1,800 mg per day for three months helped improve libido and the ability to maintain and erection in men with erectile dysfunction.

Ginseng is an ingredient in a sex-enhancing product known as Argimax for Women, which also contains ginkgo biloba extract, damiana, L-arginine, and multivitamins and minerals. In a four-week clinical trial of 77 females over age 21, subjects reported improved overall satisfaction with sex life in 73.5 percent of users, compared to 37.2 percent in the placebo group. Notable improvements were identified in sexual desire, reduction of vaginal dryness, frequency

☞ The Meschino Optimal Living Program ☞

of sexual intercourse and orgasm, and clitoral sensation. No significant side effects were noted.

To what degree ginseng contributed to these results is unknown. It has been reported to interfere with medications that affect mood disorders (antidepressant drugs, for example), causing symptoms of mania. It may also interact with anti-coagulant drugs and digoxin. On its own, ginseng has been known to cause breast tenderness, postmenopausal vaginal bleeding, and menstrual disorders, due to its hormone-like effects.

In my view ginseng should not be a standard ingredient in libido and sexual-enhancement supplement products, but as is the case with ginkgo biloba, it may be added as a supplement in specific circumstances where there are no drug-nutrient interactions of concern and proper monitoring of potential side effects is in place.

Cordyceps

Cordyceps is a rare mushroom that grows on caterpillars found at high altitudes in Tibet and China and is one of the most valued medicinal agents in traditional Chinese medicine. It is used as a general longevity tonic, to enhance vitality and endurance, and as a treatment for asthma, bronchitis, and kidney disease. Some sex-enhancement supplements include cordyceps for its enhancement of blood flow to the body's extremities, including the sex organs. Cordyceps is one of three ingredients in a product called Venix, a combination of ginkgo biloba extract, cordyceps, and L-arginine. In a randomized, placebo-controlled clinical trial, Venix was taken by 46 male and female participants for 12 weeks. Overall, male subjects reported a 34 percent improvement in sexual function and libido enhancement. There was no notable change in women.

Step 5 | Anti-Aging Supplements After Age 40

In my view, cordyceps should not be included in a standard anti-aging sexual-enhancement supplement due to its anti-coagulant properties, which may increase the risk of a bleeding disorder. It may also interfere with the function of certain antidepressant medications. Its use requires proper monitoring of bleeding time; it should not be taken by individuals who are using antidepressant or mood-altering medications. Like ginkgo biloba, ginseng, and L-arginine, cordyceps may be used by certain individuals in exceptional cases, provided proper monitoring is in place.

L-Arginine

L-arginine is an amino acid that serves many purposes in the body. At high dosages it can be converted into nitric oxide, which dilates certain blood vessels and improves blood flow. In a preliminary trial, men with erectile dysfunction were given 2,800 mg of arginine, per day, for two weeks. Six of the 15 men noted improvement in erection and sexual performance ability. In a larger, double-blind clinical trial, men with erectile dysfunction were given 1,670 mg of arginine per day, with a significant success rate compared to the placebo group.

Arginine is an ingredient in the sexual-enhancement supplements Argimax for Women and Venix, both of which have shown impressive results in the improvement of female and male sexual performance and libido. The cautionary note is that taken in high doses, arginine too appears to act as a blood thinner and may increase the risk of a bleeding disorder. Here again, I don't recommend its use without appropriate monitoring, and it should not be taken in conjunction with anti-coagulant drugs. Arginine supplementation has also been known to promote outbreaks of herpes lesions such as cold sores and genital herpes in afflicted individuals.

☞ The Meschino Optimal Living Program ☞

The Standard Anti-Aging Libido and Sex-Enhancement Supplement for Men and Women

For men and women who experience reduced sex drive or compromised sexual function as they age—usually beginning between ages 40 and 50—I recommend a standard herbal combination libido and sexual-enhancement supplement that contains the following ingredients in a single capsule:

- Tribulus terrestris – 500 mg (standardized to 40 to 45 percent saponin content)
- Muira puama – 125 mg
- Epimedium (horny goat weed) – 5 mg
- Damiana – 12.5 mg
- Avena sativa (wild oat) – 10 mg
- Maca Root – 375mg

Take one capsule three times per day with meals, or all three capsules at once with a meal. In some cases individuals may need to double this dosage at the beginning, cutting back to the standard daily dosage once the product begins to work for them. In addition, the use of melatonin or a growth hormone secretagogue (for example, Meditropin), one hour before bedtime, may also be beneficial.

9. Melatonin: A Versatile and Powerful Anti-Aging and Disease-Prevention Hormone

Melatonin molecules have been found in every animal and plant species, from the most primitive one-celled algae to complex *homo sapiens*. In every organism, melatonin's molecular structure is identical—a rare occurrence in nature—and its production pattern is the same: a secretion cycle that repeats itself roughly every 24 hours, with output higher at night than during the day. In humans,

Step 5 | Anti-Aging Supplements After Age 40

it acts as a hormone, a neurotransmitter, an antioxidant, and an immune system stimulator. This versatility accounts for its many profound effects on our health.

Melatonin is made in the brain's pineal gland from serotonin, a mood-enhancing, appetite-suppressing brain chemical. Daylight stimulates the production of serotonin: the more sunlight entering the pupil of the eye, the greater the synthesis of serotonin and the better we feel. Darkness allows serotonin to be converted into melatonin. At night, the body produces up to ten times more melatonin than in daytime, with levels peaking around two or three o'clock in the morning. The darker the room, the more melatonin secreted. In the morning, exposure to light shuts down melatonin production.

The body's production of melatonin begins to decline after puberty. A 40-year-old generates approximately 60 percent less melatonin than a 10-year-old; by age 70, melatonin levels may be undetectable. The regular use of certain drugs such as aspirin, ibuprofen, and beta-blockers (drugs designed to control high blood pressure) also contributes to lower melatonin levels. This decline in melatonin synthesis and secretion is considered to be a significant factor in accelerated aging, increased risk of certain cancers, dementia, Alzheimer's disease, and weakened immune systems. Many anti-aging experts recommend the ingestion of a melatonin supplement by age 50 to help combat aging, boost immune system function, reduce cancer and heart disease risk—and enjoy better-quality sleep.

Melatonin for a Good Night's Sleep

As a neurotransmitter, melatonin is best known for its ability to elevate mood, similar to serotonin, and to induce sleep in persons with insomnia or interrupted sleep. We sleep roughly 16 hours a day as infants, eight hours in adolescence, seven hours as adults, and less than six hours in our geriatric years. As reported in the

☞ The Meschino Optimal Living Program ☞

British Medical Journal in 1994, the quality of sleep in elderly individuals is proportional to the amount of melatonin secreted by their pineal glands. A lower output is strongly associated with shortened sleep duration and less deep-level sleep. Delta sleep, the deepest and most restorative, is prevalent in childhood, decreases at puberty, and declines progressively after age 30. As we get older we often feel the need to rest more, but we rarely wake completely rejuvenated and re-energized in the morning as we did in our youth.

As a sleep aid, melatonin is safer than traditional sleeping pills, which come with a host of side effects and toxicity problems. Research shows that, taken at the right dosage one hour before bedtime, it helps individuals fall asleep more quickly and remain in the deeper levels of sleep for longer periods. (This is one of the ways that melatonin strengthens the immune system, which is known to be most active during delta sleep.) There is no morning drowsiness; instead, subjects report feelings of wellbeing throughout the day. It is nontoxic, and leading melatonin researchers, such as Dr. Russell Reiter, have established that it can be used with a high degree of safety.

Melatonin and Breast and Prostate Cancer Prevention

The age-related decline in melatonin secretion may allow breast cancer and prostate cancer to develop more easily. Conversely, the presence of melatonin may help ward off these cancers.

A review of human studies published in 2003 in *Critical Reviews in Oncology/Hematology* pointed to the number of investigations that showed an increased risk of breast cancer in women who are regularly deprived of darkness at night, such as night shift workers, flight attendants, and radio and telegraph operators. There was a decreased risk of breast cancer reported in women who were blind

Step 5 | Anti-Aging Supplements After Age 40

and who routinely had higher circulating levels of melatonin. (Light does not suppress melatonin secretion in the blind to the degree that it does in sighted individuals.) The review noted that this evidence is consistent with the findings of studies in rodents whereby exposure to constant light or removal of the pineal gland, both of which suppress melatonin levels, stimulates the development of breast cancer. Treatment of these animals with melatonin under the same circumstances inhibited breast cancer development.

Experimental studies show that melatonin has an anti-estrogen effect on reproductive tissues, toning down the overstimulation and rapid replication of breast cells caused by estrogen. Others have demonstrated that melatonin can reduce the replication rate of human breast cancer cells by 50 to 75 percent when those cells are exposed to alternating levels of melatonin, mimicking day and night secretion patterns.

It appears to work in a similar fashion as tamoxifen, the widely used drug that prevents the recurrence of breast cancer and its metastases in women who have estrogen-receptor-positive breast cancer. In fact, experimental and human studies have demonstrated that melatonin can enhance the ability of tamoxifen to inhibit breast cancer cell replication. In one trial, Dr. Paolo Lissoni of the division of oncological radiotherapy at Gerardo Hospital in Milan, Italy, combined tamoxifen therapy and melatonin supplementation (20 mg twice per day) in the treatment of his breast cancer patients. Four out of the fourteen women experienced a 50 percent or greater reduction in the size of their tumors. Eight showed no further progression in tumor size, and only two failed to respond to the treatment. These were better results than the typical outcomes associated with tamoxifen use alone. Larger studies of this kind are currently underway to better understand the usefulness of melatonin as a cancer therapy agent.

☞ The Meschino Optimal Living Program ☞

From the standpoint of prevention, the evidence suggests that melatonin may protect against breast cancer in several ways. First, as mentioned, it counters the effects of estrogen on breast cells, slowing the rate of cell division and reducing the chances that a cancer cell will develop. Second, should a cancer cell develop in the breast, melatonin will inhibit its ability to divide and spread. And third, melatonin enhances the effectiveness of the immune system's natural killer cells to seek out and destroy cancer cells before they can take hold. As a bonus, melatonin is a powerful antioxidant that helps prevent free radical damage to all body tissues, including the DNA of breast cells.

Like breast cancer patients, males with diagnosed prostate cancer exhibit low blood levels of melatonin. It's not yet been determined if these low levels increase the risk of prostate and breast cancer development or if the cancers cause the reduction in melatonin. However, with respect to prostate cancer, the results of studies published between 2000 and 2002 by Drs. A. Rimler, S.W. Siu, S.C Xi, and M.M. Marelli showed that melatonin inhibits the growth and replication of the most commonly encountered human prostate cancer cells in experimental conditions.

These findings may explain the outcome of an important case study reported in 1987 by Dr. Lissoni, an Italian researcher who has used melatonin in some clinical trials. In a confirmed case of localized prostate cancer, melatonin supplementation at six mg per day reduced the prostate specific antigen blood level (PSA) from 30 to four within six months. PSA is an indirect marker of the activity of a prostate tumor. A normal PSA range is between zero and four. In 2003, a similar case study was reported by Dr. S.Y. Shiu in the *Journal of Pineal Research*. It showed that the administration of five mg of melatonin per day blocked the further rise in PSA levels in a patient with prostate cancer and stabilized the progression of his disease after standard medical interventions (castration and hormone therapy) had failed to prevent its recurrence.

Step 5 | Anti-Aging Supplements After Age 40

The Lissoni and Shiu results suggest that it may be advantageous for men who are in the watchful waiting stage of prostate cancer to take five to 10 mg of melatonin one hour before bedtime every night, in addition to doubling or tripling the dosage of the prostate supplement formula, described in Step 3 of this book, on protecting the prostate. These two interventions may help reverse or better control prostate cancer cell activity and help bolster concurrent or future medical treatment.

Dr. Paolo Lissoni and his colleagues in Milan have been in the forefront of melatonin research as it applies to cancer prevention and treatment. In addition to work with breast cancer patients, they have administered melatonin in daily doses of 20 mg per day along with standard drugs and cancer treatments in cases of advanced lung, colon, and metastatic brain cancer. Their preliminary studies have shown that melatonin can improve outcomes in a significant number of cases; their research continues.

Melatonin Boosts Immune Function

There is considerable research evidence that melatonin boosts immune function; hence, the decline in melatonin levels as we age may be a significant contributing factor to the parallel decline in immune function. Receptors for melatonin have been found in lymphoid organs (such as the thymus gland and spleen) and on certain white blood cells. Some studies suggest that melatonin can help restore thymus gland function and prevent age-related thymus gland degeneration. In studies on mice, melatonin enhanced immune function even when the mice were given cortisol, a drug known to suppress the immune system. Melatonin supplementation also proved protective when the mice were subjected to various types of stress.

The research efforts of Drs. G.J. Maestroni and A. Contri and their colleagues have provided us with a glimpse into the workings

☞ The Meschino Optimal Living Program ☞

of melatonin on the immune system. They have shown that the system's T-helper cells have receptors for melatonin and once stimulated by melatonin these immune cells provide a higher level of protection against infection and cancer development

Other investigations by Dr. Maestoni and Dr. Lissoni have shown that melatonin supplementation can produce a number of favorable benefits in HIV and AIDS patients when administered in conjunction with standard HIV drugs. Their studies provide definitive evidence that melatonin enhances immune function, even in individuals with very serious immune system diseases.

Melatonin and Alzheimer's Disease and Age-Related Cognitive Impairment

As an antioxidant, melatonin is unique in that it is both water- and fat-soluble. This means that it can intercept and suppress dangerous free radicals in every part of every cell in the body.

Melatonin may be the brain's most powerful antioxidant against free radical damage to its cells, damage that can contribute to the development of Alzheimer's disease and age-related cognitive dysfunction and can lead to neurodegenerative diseases such as multiple sclerosis, Parkinson's disease, and Lou Gehrig's disease.

In their quest to identify which elderly individuals are most at risk for memory loss or Alzheimer's disease, Italian gerontologists discovered that older individuals with higher melatonin levels showed better mental acuity than those with low levels. Japanese researchers made a similar finding, in that healthy functioning elderly subjects were shown to produce twice as much melatonin as Alzheimer's disease patients of like age.

Thus far, it's been established that melatonin can block some of the processes in the development of Alzheimer's disease in animals. The results of a landmark study published in the

Step 5 | Anti-Aging Supplements After Age 40

December 11, 2001 issue of *Biochemistry* showed that in experiments with animals and human brain cell cultures, melatonin inhibited the formation of the amyloid protein that is the hallmark of Alzheimer's disease.

More research is required before any definitive statements can be made about melatonin and the prevention of Alzheimer's disease; however, it appears that the risk of excessive damage to our brain cells by oxygen free radicals may be another reason to consider the use of melatonin supplementation after age 40.

Dosage Ranges for Melatonin

For anti-aging, breast and prostate cancer prevention, an immune-system boost, or improved sleep quality, a night-time dosage of 200 mcg (.2 mg) to 3,000 mcg (3 mg) is typically used. This range may seem a large one, but individuals will respond differently. It's best to start with a small dose, in the range of 200 to 300 mcg, and work up, based on results. Doses that are too high can produce vivid dreams that may waken you in the night, morning grogginess, headaches, or abdominal cramps.

Always take melatonin at night, to correspond with the body's natural melatonin release cycle and to optimize its benefits: sleep quality will be enhanced, the immune system will be strengthened, and there will be sufficient clearance time to avoid any morning drowsiness.

Therapeutic doses as an adjunct to the treatment of a particular disease or condition, often in the range of 5 to 75 mg per day, should be undertaken only with the knowledge of a physician who is able to monitor blood levels and other parameters. These applications and dosages are still experimental; their long-term safety is unknown. However, melatonin testing in humans and animals indicates that it is nontoxic.

☞ The Meschino Optimal Living Program ☞

Contraindications and Drug-Nutrient Interactions

Some cases of depression can be aggravated by melatonin supplementation. A few antidepressant drugs stimulate the production of melatonin, while others, such as fluoxetine (Prozac), may lower melatonin levels. The prudent course is not to combine melatonin with any drug that targets brain chemistry or neurotransmitter levels (such as antidepressants or drugs designed to manage bipolar disease, schizophrenia, and related conditions).

10. Growth Hormone: A New and Promising Intervention

Growth hormone is a protein hormone (not a steroid) that is produced and secreted by the pituitary gland in the brain. Like estrogen, progesterone, testosterone, and melatonin, growth hormone secretions and blood levels decline as we age. The daily release of growth hormone averages about 500 mcg at age 20, then falls to 200 mcg at 40 and to 25 mcg by age 80. This drop in growth hormone secretion directly affects the release of Insulin-like Growth Factor-I (IGF-1) from the liver, the hormone-like substance that elicits powerful anti-aging effects on most body tissues. Because IGF-1 will be secreted only when influenced by growth hormone, lower blood levels of growth hormone mean lower levels of IGF-1.

A startling recent discovery is that the pituitary gland itself is not responsible for this fall-off in growth hormone secretion and blood level. It will continue to produce abundant amounts well into our 70s and 80s—unlike estrogen, progesterone, or testosterone whose actual synthesis declines with age. Growth hormone levels in the blood are affected by a decline in the hormone that stimulates its release, the so-called growth hormone releasing factors (GHRH) that are secreted by the hypothalamus gland, which sits above the pituitary gland in the brain.

Step 5 | Anti-Aging Supplements After Age 40

Most of the release of growth hormone occurs in bursts at night during slow wave sleep, with the remainder secreted in smaller bursts during the day. Exercise, especially intensive weight training, and a low glycemic diet will enhance growth hormone secretion. (The secretions are suppressed when insulin levels are high.). Ultimately, the liver secretes less IGF-1, all of which results in an acceleration of the aging process.

Reversing the Aging Process with Growth Hormone

Growth hormone replacement or supplementation with natural agents that stimulate the release of growth hormone have reversed signs of aging in both human and animal studies. By returning IGF-1 blood levels to more youthful levels, subjects have experienced a multitude of anti-aging benefits, among them

- improved immune function;
- increased sexual potency and function;
- increased muscle strength, muscle mass and energy;
- decreased body fat;
- elevated mood;
- improved sleep patterns;
- improved memory;
- improved skin thickness, texture, and reduced wrinkle lines;
- restoration of hair color;
- improved vision.

The most pronounced of these effects have been observed in patients whose IGF-1 blood levels are at 350 ng/ml or greater, a level which some anti-aging doctors claim can reverse these features of aging by up to 20 years in older subjects. Blood levels in this

☞ The Meschino Optimal Living Program ☞

range can be achieved only by regular injections of growth hormone administered by a physician who is trained in anti-aging medicine. Experimental data shows that growth hormone replacement not only enhances immune function to a marked degree, but it can regenerate the thymus gland, which is typically quite shriveled by age 40 and is almost undetectable by age 60.

Growth hormone injections are expensive, however, and have been known to cause side effects, especially in subjects where IGF-1 levels approached 400 ng/ml. The most common include swelling of the feet, fluid retention, joint pains, carpal tunnel syndrome and, more rarely, allergic responses. Because they are a relatively new intervention, their long-term safety has not been established.

Boosting IGF-1 blood levels above 290-300 ng/ml is cause for concern, in my view, as a number of research papers have correlated higher IGF-1 levels with an increased risk of breast and prostate cancer. We do know that IGF-1 increases the replication rate of certain cells in the body by virtue of its anabolic properties. There is evidence that individuals who have received growth hormone injections during their lifetimes to address a deficiency that would otherwise result in dwarfism or growth failure experience slightly higher rates of certain cancers than those who were not given injections to address the same conditions. For these reasons, patients with a previous history of cancer are advised against growth hormone injections, although to this point, older subjects receiving growth hormone injections for anti-aging purposes have not exhibited increased incidences of any type of cancer according to the published data.

Some evidence suggests that growth hormone replacement may actually help prevent cancer due to its rejuvenating effect on the immune system. In his book, *Grow Young with HGH*, Ronald Klatz reports a case of a significant drop in a patient's prostate specific antigen (PSA) level following growth hormone injections. The patient had a very high initial PSA level, between 50 and 60, and a

Step 5 | Anti-Aging Supplements After Age 40

needle biopsy confirmed adenocarcinoma in the prostate gland. He refused surgery and instead was treated with growth hormone injections, along with melatonin and DHEA supplementation. The patient's PSA level subsequently fell back within the normal range.

More research must be undertaken on growth hormone injections and cancer risk before we will know for certain whether the blood levels of IGF-1 achieved by this method are entirely safe for everyone. In the meantime, many anti-aging experts favor natural ingestible supplements as an alternative to injections.

Growth Hormone Secretagogues

A combination of certain amino acids, taken orally at specific dosages, can stimulate the pituitary gland to release greater quantities of growth hormone and elevate IGF-1 blood levels to match those we experienced in our mid-thirties. Studies show that supplementation with these amino acid combinations, collectively known as a growth hormone secretagogue (pronounced se-kre-ta-gog) can raise IGF-1 blood levels to 275 ng/ml, which may be safer than the 350 to 400 ng/ml that occur with growth hormone injections.

In one three-month study with a proven growth hormone secretagogue supplement, blood levels of IGF-1 increased by 30 percent on average over a twelve-week period. Thirty-six participants, men and women over the age of 40, reported a range of effects in self-assessment scores, including:

- improvement in muscular strength: reported by 58 percent of participants
- increase in muscle size: 42 percent
- body fat reduction: 68 percent
- increase in energy: 74 percent
- improvements in skin texture: 47 percent

☞ The Meschino Optimal Living Program ☞

- improved skin thickness: 32 percent
- reduction in wrinkles (disappearance or reversal): 37 percent
- improvement in general healing capacity: 21 percent
- improvement in joint and back flexibility: 37 percent
- felt their immune system was stronger: 47 percent
- improved sexual potency: 32 percent
- better sexual stamina (penile erection): 44 percent
- less frequent nighttime urination (in men): 66 percent
- improved mental energy and clarity: 53 percent
- improved attitude and mood elevation: 37 percent
- improvement in memory: 47 percent

In male subjects there was a reduction in PSA blood levels, which signifies that this intervention did not trigger prostate malignancy or enlargement. As well, blood sugar levels in diabetic subjects were shown to normalize and there was an improvement in both cardiac and pulmonary function during the course of the three-month trial. The author of the study, Dr D.M. Ladley, also noted that blood pressure was better controlled and an improvement in menopausal symptoms among affected women was seen in this test group.

Ladley, an authority on the use of growth hormone secretagogues, stated that improved energy, endurance, muscle mass and strength, and reduced body fat were among the most frequently reported benefits in the first four weeks of supplementation. New hair growth, restoration of hair color, thickening of the skin, and the disappearance of skin discoloration generally occurred between the eighth and the twelfth weeks, with continued improvement beyond the twelve-week term. There were no side effects reported from the use of growth hormone secretagogues by any of the participants in this study. They are generally well tolerated and no consistent incidences of adverse side effects have been reported.

Step 5 | Anti-Aging Supplements After Age 40

Raising IGF-1 Blood Levels with Growth Hormone Secretagogues

The extent to which IGF-1 blood levels can be raised with the use of a growth hormone secretagogue supplement depends largely on initial IGF-1 blood levels. In the study by Ladley, pre-supplementation measures ranged from 21 to 276 ng/ml. Those with the lowest values experienced the greatest increases in IGF-1 blood levels.

As a rule, growth hormone secretagogue supplementation cannot elevate blood levels of IGF-1 beyond 275 ng/ml. So before beginning a supplementation program, have your blood levels of IGF-1 evaluated by your physician. (The cost of this test is not usually covered by universal health care or private insurance plans.) If you are over 40 years of age and your current blood levels of IGF-1 are below 275 ng/ml, then it is likely you will see positive results if you add a growth hormone secretagogue to your overall anti-aging wellness program. I recommend that you have your IGF-1 blood levels re-evaluated after twelve weeks to note the level of change. If your blood levels are already above 275 ng/ml, then it is unlikely that you will see dramatic reversals in your body's signs of aging by taking this supplement, although some experts claim that anti-aging benefits still occur.

How to Choose and Use a Growth Hormone Secretagogue Supplement

The growth hormone business is rife with unproven, ineffective, or bogus products that are not worth your time or money. However, the most respected anti-aging medical professionals in the field frequently recommend a growth hormone secretagogue supplement formula to their patients and colleagues that is available under two trade names: PRO hGH Symbiotropin and Meditropin. With either, you drop two of the effervescent tablets into a glass of water before bedtime, allowing them to dissolve fully before drinking it down.

☞ The Meschino Optimal Living Program ☞

They are best taken on an empty stomach to eliminate the risk of other amino acids competing for entry into the brain at the same time, so it's advisable not to eat anything for a couple hours before retiring. The supplement is used for five consecutive days, followed by two days with no supplementation; then the cycle repeats. For simplicity, many people take this supplement Monday to Friday, skip Saturday and Sunday, and begin again on Monday.

Experts suggest that if your initial IGF-1 blood level is below 100 ng/ml, you should double the dosage (four tablets dissolved in water before bedtime) until your levels reach at least 200 ng/ml, at which point you can assume the normal dosage of two tablets per day. If you do not see a change in your blood levels of IGF-1 after ingesting two tablets a day for three months and your levels are below 275 ng/ml, then experts advise that you may be one of the rare cases where a doubling of the dosage is justified.

To me, the use of growth hormone secretagogues represents a breakthrough in anti-aging research. Thus far, only a few well-designed trials have been published or presented at major conferences that demonstrate their benefits, but these preliminary studies have been most impressive and many physicians trained in anti-aging medicine regularly recommend these supplements to patients over the age of 40. Investigations in the next few years should provide more definitive evidence of their ability to counter the aging process and are likely to better identify any adverse side effects that may result from their use.

Conclusion: When to Incorporate Anti-Aging Supplements into Your Program

Based on the available research, I believe that after age 40 your body requires additional supplements to slow, and in some instances reverse, the signs of aging and to increase your protection against

Step 5 | Anti-Aging Supplements After Age 40

cancer, heart disease, dementia, infections, sexual dysfunction, and a host of other age-related problems. I have outlined what I consider to be the most scientifically sound anti-aging supplement formulations. The following chart provides a rough timetable for the introduction of each. Some may be initiated sooner; refer to Step 7 for the appropriate age ranges.

Women—Age	Anti-Aging Supplements to Add
40	<ul style="list-style-type: none"> • Glucosamine Sulfate With Anti-inflammatry herbs
45	<ul style="list-style-type: none"> • Coenzyme Q10 and Hawthorn • Extra Vitamin D, Calcium - bone support nutrients (optional) • Growth hormone secretagogue (optional)
50	<ul style="list-style-type: none"> • Immune and Detoxification Formula • Menopausal herbal formula • Melatonin (optional) • Libido enhancer (optional)
55	<ul style="list-style-type: none"> • Brain support formula
Men—Age	Anti-Aging Supplements to Add
40	<ul style="list-style-type: none"> • Prostate support nutrients • Glucosamine sulfate and anti-inflammatory herbs
45	<ul style="list-style-type: none"> • CoQ10 and hawthorn • Growth hormone secretagogue (optional)
50	<ul style="list-style-type: none"> • Immune and detoxification formula • Extra Vitamin D, Calcium - bone support nutrients (optional) • Libido enhancer (optional) • Melatonin (optional)
55	<ul style="list-style-type: none"> • Brain support formula

For access to the references to Step 5 and additional education on wellness please visit the author's web site at www.meschinohealth.com