

## Anti-aging, Regenerative and Functional Medicine

By Dr Craige Golding

### Introduction to anti-aging medicine

Anti-aging medicine is a clinical specialty founded on the application of advanced scientific and medical technologies for the early detection, prevention, treatment and reversal of age-related dysfunction, disorders and diseases. It is a healthcare model promoting innovative science and research to prolong the healthy lifespan in humans. As such, anti-aging medicine is based on principles of sound and responsible medical care that are consistent with those applied in other preventive health specialties. The phrase "anti-aging", as such, relates to the application of advanced biomedical technologies focused on the early detection, prevention and treatment of age-related disease.

**Anti-aging medicine complements regenerative medicine, as both specialties embrace cutting-edge biomedical technologies aimed at achieving benefits for both the quality and length of the human lifespan. Some of the most promising aspects of regenerative medicine, are most notably:**

- Stem cell therapy – technologies aiming to beneficially alter the very basic cellular sources of dysfunctions, disorders, disabilities, and diseases
- Therapeutic cloning – technologies to develop ample sources of human cells, tissues, and organs for use in acute emergency care as well as the treatment of chronic and debilitating diseases
- Genetic engineering and genomics – advancements that permit the identification and alteration of genetics to ameliorate dysfunctions, disorders, disabilities and diseases
- Nanotechnology – deploying micro- and molecular-sized tools to manipulate human tissue biology for microsurgical repair on a gross level, as well as microscopic nanobiology for repair at the most basic cellular level.

Taken collectively, the advancements offered by anti-aging and regenerative medicine to improve the quality, and/or extend the length, of the human lifespan, are the single most potent emerging biomedical technologies today.

Universally, those involved in health care, or those whose fields of expertise intersect with health care issues, support anti-aging medicine as a health care model promoting innovative science and research to prolong the healthy human lifespan. Public policy organisations and government agencies in a number of nations are now embracing anti-aging medicine as a viable solution to alleviate the mounting social, economic and medical woes otherwise anticipated to arrive with the trend of unprecedented global aging.

Anti-aging medicine is now practised by thousands of physicians in private medical offices, as well as at some of the most prestigious teaching hospitals around the world. Involving a patient base of hundreds of thousands worldwide, anti-aging medicine is achieving demonstrable and objective results that beneficially impact the degenerative diseases of aging.

### What is anti-aging medicine?

Anti-aging medicine is the pinnacle of biotechnology joined with advanced clinical preventive medicine. The specialty is founded on the application of advanced scientific and medical technologies for the early detection, prevention, treatment and reversal of age-related dysfunction, disorders and diseases. It is a health care model promoting innovative science and research to prolong the healthy lifespan in humans. As such, anti-aging medicine is based on principles of sound and responsible medical care that are consistent with those applied in other preventive health specialties. The anti-aging medical model aims to both extend lifespan as well as prolong health span – the length of time that we are able to live productively and independently.

### Anti-aging medicine is the following:

- **Scientific** Anti-aging diagnostic and treatment practices are supported by scientific evidence and therefore cannot be branded as anecdotal
- **Evidence-based** Anti-aging medicine is based on an orderly process for acquiring data in order to formulate a scientific and objective assessment upon which effective treatment is assigned
- **Well-documented by peer-reviewed journals** As of this writing, the National Library of Medicine hosts more than 3,000 peer-reviewed articles on the subject of anti-aging medicine.

Hundreds of scientific research studies clearly prove that modest interventions in diet, exercise, nutrition and single-gene modulation in the laboratory setting beneficially and significantly impact healthy function in old age. Many of these interventions also modify maximum lifespan by 20 to 800%. With near-daily advancements in biomedical technologies related to research specifically focused on elucidating treatments for age-related disorders and modulating the metabolic dysfunctions associated with old age, in the near-future, effective interventions will become widely available to modulate the aging process itself in humans.

Researchers from the Harvard School of Public Health have found that the anti-aging lifestyle can add 24.6 more years of productive lifespan. The research team found that the longest-living Americans are Asian-American women residing in Bergen County, New Jersey, USA. They live longer than any other ethnic group in the United States, to an average lifespan of 91.1 years. In contrast, the Harvard team found that the shortest-living Americans are Native American populations in South Dakota, despite receiving free or low-cost government provided medical care, living an average lifespan of 66.5 years. A distinguishing characteristic of the Bergen County women's longevity is that they are availing themselves of the armament of state-of-the-art biomedical technologies in advanced preventive care, including preventive screenings, early disease detection, aggressive intervention and optimal nutrition – all of which are cornerstones of the anti-aging medical model. ["Bergen County, NJ is long in longevity". New York Times. 12 Sep 2006. "Asian women in Bergen have nation's top life expectancy". Free Republic. 12 Sep 2006.]

A first-ever study reveals the secrets of exceptional health in old age. Mark Kaplan, from Portland State University (Oregon, USA), and colleagues utilised the Health Utilities Index Mark 3 (HUI3), a multidimensional measure of health status, to examine the maintenance of exceptionally good health among 2,432 elder Canadians enrolled in the Canadian National Population Health Survey, which tracked participants' health for 10 years, from 1994 to 2004.

**The researchers found that the most important predictors of excellent health over the entire decade were:**

- Absence of chronic illness
- Income over US \$30,000
- Having never smoked
- Drinking alcohol in moderation
- Maintaining a positive outlook
- Managing stress levels.

The team comments: "Many of these factors can be modified when you are young or middle-aged. While these findings may seem like common sense, now we have evidence of which factors contribute to exceptional health [as we age]." [Kaplan MS, Huguette N, et al. "Prevalence and factors associated with thriving in older adulthood: a 10-year population-based study." J Gerontol A Biol Sci Med Sci. Oct 2008;63(10):1097-104.]

Around the world, people are seeking medical guidance for ways to stay healthy, active and vital well into their older years. As a result, the principles of the anti-aging lifestyle are gaining rapid and widespread acceptance as a framework for lifelong habits for healthy living.

**What is regenerative medicine?**

Regenerative medicine optimises the body's endogenous mechanisms of self-repair and adds proven and near future exogenous treatments and technologies. Adult stem cells appear to be our most powerful tool at this time. Previous dogma concerning adult stem cells taught that neurons and myocytes did not have stem cells and the cells present at birth just declined in quantity and quality. It was also believed that hematopoietic stem cells in the bone marrow lacked plasticity and could not transform to other tissues. Current medical literature proves that adult stem cells exist in most tissues including brain, heart, muscles and liver. Hematopoietic stem cells (HSC) and endothelial progenitor cells (EPC) in the bone marrow have plasticity to potentially transform and repair all tissues and organs.

- In the hormone optimisation component of anti-aging medicine, we are already optimising stem cells. Progesterone via its metabolite allopregnenolone stimulates neural stem cells; testosterone stimulates muscle stem cells and EPCs, which can improve erectile function; and growth hormone treatment for adult growth hormone deficiency improves the quantity and quality of EPCs. Estradiol improves incorporation and mobilisation of EPCs
- In the lifestyle component of anti-aging medicine, we are optimising our adult stem cells with exercise and control of glucose and insulin
- In the nutraceutical component of anti-aging medicine, we are optimising our adult stem cells with resveratrol, as we turn on genes such as SIRT1, and with blueberry, green tea and vitamin D<sub>3</sub>. DHA in omega-3 fish oil promotes neurogenesis from neuronal stem cells.

**What is functional medicine?**

Functional medicine is an integrative, science-based health care approach that treats illness and promotes wellness by focusing on the biochemically unique aspects of each patient, and then individually tailoring interventions to restore physiological, psychological and structural balance.

Functional medicine focuses on understanding the fundamental physiological processes, the environmental inputs and the genetic predispositions that influence health and disease, so that interventions are focused on treating the cause of the problem, not just masking the symptoms.

**There are seven basic principles underlying functional medicine, which include the following:**

- Science-based medicine that connects the emerging research base to clinical practice
- Biochemical individuality based on genetic and environmental uniqueness
- Patient-centred care rather than disease-focused treatment
- Dynamic balance of internal and external factors that affect total functioning
- Web-like interconnections among the body's physiological processes also affect every aspect of functionality
- Health as a positive vitality, not merely the absence of disease
- Promotion of organ reserve.

**Commonly asked questions:**

Anti-aging medicine encompasses a wide diversity of ideas for different people. To some, it's about looking younger and more radiant, for others it's about escaping various debilitating conditions and to remain lucid, agile and independent as long as possible. Some may only be interested in specific areas of physical or mental improvement. And then there are those whose goal is longevity and life extension itself.

**\*What are the key ingredients that you should look for in both your supplements and skin care products that are most beneficial to protecting your youth and promoting anti-aging?**

- a) Products should be researched
- b) Products should contain standardised extracts
- c) Products should contain the safest, most absorbable (bio-available) and effective forms of vitamins, minerals and herbs
- d) Fillers should preferably be free of lactose, calcium, preservatives, colourants, gluten, wheat, yeast, sugar and salt
- e) Formulations should be science-based, providing effective, synergistic combinations and ratios of components
- f) Potency/strength: product should contain optimal, therapeutic and scientifically proven doses
- g) When it comes to herbs, standardised extracts should be used, which are many times the concentration of herbal powders
- h) Products should be manufactured under GMP (good manufacturing practice) conditions, ensuring pure, clean and uncontaminated products of the highest quality
- i) Capsules should be made from vegetable material not animal gelatine.

**\*What really works?**

- a) Lifestyle change remains a fundamentally part of anti-aging and regenerative medicine
- b) Adequate rest, sleep, exercise and a healthy diet are essential
- c) Taking **OPTIMAL VITAMIN** doses (not recommended daily doses ... these are to prevent deficiency states). See attached article on ODI (optimal daily intake) vs. RDI (recommended daily doses)
- d) Minerals, amino acids, essential fats, sophisticated antioxidants, bioidentical hormones, smart drugs and other nutraceuticals (such as spin traps, ubiquinol, resveratrol, carnosine, melatonin, human growth hormone precursors and more).

I would suggest a full assessment by an anti-aging physician to decide on the correct vitamin regime to meet your needs. Each person is unique and has their own requirements regarding supplements.

### \*What are the myths that surround anti-aging?

1. **Myth: You do not need to take supplements if you eat a healthy diet.**

**Truth:** Medications deplete nutrients. Examples include: statins deplete Coenzyme Q<sub>10</sub>; birth control pills deplete B vitamins and metformin depletes Vitamin B<sub>12</sub> and folic acid. Soil erosion and modern farming methods have led to much of today's food containing less vitamins, minerals and antioxidants. As we age, nutrient requirements increase. Lifestyle stresses can also cause extra nutrient needs due to faster depletion in the body. Genetic variability in individuals leads to different supplementation requirements.

**You cannot, in today's world, get all the nutrients you need from the food you eat for the following reasons :**

- The soil is depleted of many minerals such as zinc and magnesium. Selenium may be depleted or in overabundance in the ground, depending on where you live. If the soil is not rich in nutrients, then the food we eat does not contain an adequate supply of minerals
- Fruits and vegetables begin to lose their nutritional value immediately after picking. Cold storage causes destruction of nutrients. Stored grapes lose up to 30% of their B vitamins; tangerines stored for 8 weeks can lose almost half their vitamin C. Asparagus stored for 1-week, loses up to 90% of its vitamin C
- The nutrients in food may not be in a form that is bioavailable. In other words, it will not be easily absorbed into your body. Orange juice is an example where 40% of the vitamin C is biologically inactive
- Processing (blanching, sterilising, canning and freezing) all decrease the nutritional value of the food we eat
- The longer we cook fruits and vegetables, the less nutrients remain. It is better to eat them raw or slightly steamed
- The milling of grains removes 26 essential nutrients and much of the fibre.

2. **Myth: There is no science behind anti-aging medicine**

**Truth:** This is nonsense, there are many studies on natural medicines, many published in peer-reviewed journals.

**Explanation:** The Fellowship in Anti-Aging Regenerative & Functional Medicine (completed by myself) offered by the American Academy of Anti-Aging Medicine is entirely science-based and only scientifically proven recommendations are given. There are, in truth, more studies done on vitamins, antioxidants and natural medicine than on conventional medicines.

3. **Myth: Anti-aging medicine does not work**

**Truth:** Anti-aging medicine does work. The American Academy of Anti-aging medicine was established in 1997 and is an entirely scientific organisation. As people age, with more people living longer all around the world, anti-aging medicine is improving how long people live and the quality of their lives. The conventional medical model is based on a disease-based approach. In other words, a disease is diagnosed and the symptoms of the disease are then "band-aided" with chronic medicines. This may relieve symptoms, but it does NOT cure the underlying problem. In anti-aging medicine, we treat the cause and not merely the symptoms. Anti-aging medicine is thus a wellness-based model and is truly the medicine of the future.

### \*What are your top tips to maintaining longevity?

Some tips to ensure longevity and healthy aging:

- Avoid stress and depression. They are major causes for premature aging
- Exercise at least 30 minutes a day. It is your first defence against the infirmities of old age
- Limit harmful fats, such as trans fats or saturated fats, in your diet. They increase your risk for heart disease and cancer. Include good omega 3,6,9 fats in your diet
- Sleep 7 to 8 hours a night. Quality sleep is essential for rejuvenation and repair
- Consume little or no alcohol, it is a neurotoxin
- Do not smoke
- Try keep your weight at, or 5% below, your ideal body weight. Mortality increases significantly at 20% or more above ideal body weight, and 10% below
- Maintain optimum antioxidant blood levels
- Early detection is the key to a cure for both heart disease and cancer. Get blood tests and comprehensive anti-aging yearly exams
- If age 55 or older; consider hormone replenishment therapy with a knowledgeable anti-aging physician.
- Drink 8 glasses of purified or bottled water daily
- Think young. Aging is as much a state of mind as it is a state of physiology. Lie about your age (especially to yourself). Keep young-feeling friends around
- Do not just accept getting old. Fight to remain youthful and vigorous.

### \*What are the top health concerns of those over the age of 50?

Hormone decline hastens the degenerative processes of aging. We age because our hormones decline, our hormones don't decline because we age. Most women at the age of 50 are either perimenopausal or menopausal and the loss of ovarian function results in a number of health concerns. For example, a decrease in progesterone in perimenopause results in an increase in the incidence of breast cancer; anxiety and insomnia. A decrease in estrogen results in bone mineral loss with osteopenia and osteoporosis eventually developing. A decrease in estrogen also results in decreased collagen production in the skin, with skin aging being a consequence. In addition, an estrogen decline is associated with an increase in heart disease risk, memory loss, mood disturbances and vascular aging.

Other endocrine pauses also occur during one's life and often become apparent at this age; among others, these include adrenopause where there is loss of adrenal gland function and a drop in steroid hormone production. This can result in weight gain, immune system function decline, fatigue and accelerated aging. Another pause is hypothyroidism where thyroid gland function begins to decrease. Immunopause is another pause where immune system function declines with a decrease in the number of immune fighting cells like natural killer cells. The consequence is an increase in autoimmune diseases and an increase in cancer incidence. Testosterone decline in women at the time of menopause can also result in less well-being, muscle mass loss, loss of libido and weight gain. Often neglected is the male equivalent of menopause (andropause), where there is a decline in male hormone production. The symptoms of this are more subtle and often not diagnosed before disease manifests. The health consequences of testosterone decline in a man are frailty, increase in prostate cancer risk, heart disease, adult onset diabetes, weight gain, bone mineral loss with osteopenia and anaemia.

### \* If you are moving into a retirement village, what are your top health priorities?

Remember, maintaining health is largely dependent on sound nutrition, lifestyle and hormone balancing. So, in order to spend a long time living healthily and a shorter time dying, these aspects of maintaining health need to be addressed.

As one ages, one's antioxidant defenses decline, so in a retirement situation one needs to be aware of this and consider the basic essential supplementations required. It is not possible to obtain all your nutrients from your diet alone (this was proven in a study published in JAMA 6/2002 by Harvard University). So, the following supplements should be considered: omega-3, vitamin D<sub>3</sub>, antioxidants or a good multivitamin.

Regular exercise is crucial to maintain a healthy frame and keeping the risks of muscle mass loss, fat gain, heart disease, cancer and osteoporosis down. With declining immune system function, aging people become more prone to infections and cancer. Vitamin C and a healthy nutritional status, with exercise and hormone balancing, can help reduce these risks.

#### **\*How do you stay fit and healthy over the age of 50?**

Exercise: 10 minutes a day of some form of cardio aerobic exercise to get the heart rate up. Followed by 10 minutes a day of weight-bearing exercise (particularly upper body) to decrease muscle mass loss and osteopenia. Then 10 minutes a day of trunk/core stability exercises. Nutritional choices: 80% plant origin (fruit and vegetables) and oily fish, <20% animal products. Consider supplementation since nutrient requirements increase with aging. Hormone balancing is key to maintaining and sustaining health.

#### **\*What are the top five prevention tips that those over 50 need to consider?**

Here are some strategies to maintain a healthy mind, body and spirit :

1. Nutrition, lifestyle inclusive of moderate exercise, and hormone balancing mentioned above
2. Drink enough water. Essential to maintain health and for detoxifying. Consume 6-8 glasses a day
3. Work on keeping stress levels down: take short naps, spend quality time with friends, develop hobbies and interests, think outside the box, keep a check on your finances, meditate, time-management techniques, get moving, change your diet, smile, think positive, stop smoking, communicate clearly, learn to assert yourself positively, have lots of sex, feel good about yourself, learn to express your anger positively and respectfully, don't second guess past mistakes and failures.
4. Get adequate amounts of sleep. Body restorative functions occur during sleep.
5. Include spiritual practice in your life.

#### **\*Examples of how nutrients/nutraceuticals can help treat health conditions:**

- a) If insulin resistance is diagnosed, often seen in metabolic syndrome, nutraceuticals such as chromium, alpha lipoic acid, EGCG and bitter melon can be used to restore insulin sensitivity and prevent the diabetes mellitus with all its devastating consequences
- b) Enlargement of the prostate and prostate cancer are caused by metabolites of testosterone (estradiol/estrogen by aromatisation of testosterone) and DHT (dihydrotestosterone) by 5-alpha reductase metabolism of testosterone. Using nutraceuticals like chrysin, betasitosterol and indole-3-carbinol (I3C), one can reduce these dangerous metabolites and protect yourself from disease
- c) Neurotransmitter abnormalities such as depression (norepinephrine, serotonin and dopamine deficiency) can be corrected by phenylalanine, 5-HTP, acetyl L carnitine, S-adenosylmethionine and tyrosine respectively, as well as cofactor supplementation, without the necessity for prescription medications
- d) Other neurotransmitter abnormalities like attention deficit, anxiety, insomnia and behavioural disorders can be addressed
- e) Heavy metal toxicity and neurotoxicity can be treated with chelation therapy
- f) One of the major reasons we age is due to hormone decline (hormones such as DHEA, growth hormone, sex hormones, thyroid hormones, melatonin, etc.) Restoring these hormones to more youthful levels retards the aging process and all the diseases associated with aging like cancer, diabetes, heart disease, dementia, osteoarthritis, osteoporosis, etc
- g) Using nutraceuticals such as I3C and DIM can help one metabolise estrogen to 2 OH estrone rather than the more dangerous 16 OH estrone, lowering the risk for breast and prostate cancer
- h) Nutraceuticals can be used with pharmaceuticals, and may often be required to replenish the micronutrient deficiencies that pharmaceuticals cause. To give an example, statin drugs deplete the body of CoQ<sub>10</sub>, and this can result in muscular pains and even rhabdomyolysis and heart failure later on. All people on statins should be supplementing with CoQ<sub>10</sub>.



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Dr Golding practises at the Integrative Medical Centre. His interest in preventive medicine and addressing the causes of illness, resulted in him gaining further qualifications in the US. In 2007, he completed his Fellowship in Anti-Aging Medicine (FAARM) and obtained Board Certification in Anti-Aging Medicine (ABAARM) from the American Board of Anti-Aging Medicine. Dr Golding is the first certified anti-aging physician in Africa.

