# AGEING – HEALTH AND WELLBEING

## Biology of ageing

Most of us would like to live forever but unfortunately, it's just not possible. Due to a combination of genetics and the effects of the environment on our bodies, we gradually wear out.

But how does ageing happen? As cells and body tissues go about their business – reproducing, staying alive, doing whatever specialist jobs they are programmed to do – they undergo damage from a wide range of sources. The damage can come from outside or it can come from within, from the by-products of metabolism within the cell itself. The cell can fight back, using its own mechanisms to limit the damage, but these mechanisms aren't perfect.

Cells can only function within a very controlled environment. They need the right temperature, pH and chemical composition of fluids to survive. Over time the body has developed systems for maintaining this environment – kidneys to filter wastes, lungs to keep oxygen coming, skin to stop fluid loss by evaporation, and so on.

But it's an uphill battle. Skin is exposed to ultraviolet light, to chemicals, and to extremes of temperature. Lungs are exposed to toxins in the air like cigarette smoke and inhaled chemicals, and other organs are exposed to toxins that are ingested and absorbed into the bloodstream.

## Waste products of metabolism

At the same time, there are dangers from inside the body too. Inside the cells are billions of chemical reactions that carry on essential functions – like generating energy, making proteins and reproducing the cell itself. These processes are subject to wear and tear and to damage from waste products.

A lot of the damage comes from so-called 'free radicals'. These are by-products of metabolism, consisting of oxygen molecules that are missing an electron. These are very destructive because they take electrons from other molecules, destabilising them and damaging vital tissues like proteins, membranes and DNA.

Free radicals would do a whole lot more except that the body has evolved ways of dealing with them – enzymes that break them down, and other substances that 'mop' them up by donating the missing electron. These substances are called antioxidants. (Another name for the process of taking an electron from another molecule is 'oxidation', hence substances that stop this from happening are called antioxidants.)

Many antioxidants are vitamins found in fruit and vegetables, which is why vitamins help prevent degenerative diseases such as heart disease and cancer. But antioxidants don't stop the damage altogether. Free radicals can damage cell membranes, organelles like mitochondria (the tiny factories inside cells that produce energy) and important proteins like enzymes. They can also damage the cell's DNA, which is especially serious because DNA is the genetic blueprint of the cell that programs its functions. Knock out the DNA and the cells can't function or reproduce.

Fortunately the cell does have repair mechanisms that will help fix the damage. One of the reasons we do live a relatively long time compared to other animals is that we have very low rates of oxidation, plus powerful antioxidant enzymes, DNA-repair enzymes and an excellent immune system.

However, it's not perfect and the older we get, the more the cell damage accumulates.

## Programmed to destruct

Even if a cell could repair itself completely – and avoid damage from toxins, infections, heat and cold – it wouldn't last indefinitely. Cells are programmed at a certain stage to self-destruct.

At the end of every chromosome are specialised stretches of DNA called telomeres. After each cell division, the telomeres shorten, and when they get to a certain length (after about 50 divisions), they trigger cell death.

Why, you might ask – surely that's biological madness? It's thought that the telomeres are one inbuilt protection against a cell mutating and dividing uncontrollably – becoming cancerous, in other words. Programmed cell destruction is a safety valve against cancer. Without it we'd probably die of cancer before we reached reproductive age.

## Cell and tissue death

The process of self-destruction that occurs when a cell has sustained too much damage, or its telomeres have shortened to the critical point, is known as apoptosis. Over a 12 to 24-hour period, the cell's energy powerhouses, the mitochondria, shrink. Its genetic material fragments into pieces, and the remains of the cell are 'eaten' by scavenger cells called macrophages.

Organs and tissues vary as to how quickly dead cells within them are replaced. In skin and bowel tissue, for example, cell turnover is fast – cells die early and are replaced quickly. In others, like muscles and the brain, they last a long time but when they do die, they aren't replaced at all.

Over time, more and more dead cells are not replaced with new cells, but instead with fibrous tissue that causes organs to contract and shrink. Muscles for instance, lose their bulk. The brain shrinks. Bones become demineralised.

But it's not just cells that age – connective tissues outside the cells, such as elastin and collagen, also degenerate. Chemical cross-links form between strands of tissue, reducing their strength and elasticity. This process especially affects skin, lungs, muscles, and blood vessels. In our skin, we see the visible result of this process as wrinkles.

We do have powerful enzymes to break these cross-links as they form, but again, they're not perfect. So tissues designed to give elasticity (as in the artery wall) or transparency (as in the lens of the eye) or high tensile strength (as in ligaments) all degenerate. Muscles lose their strength, the heart doesn't pump as hard when challenged by exercise, arteries don't deliver as much blood as they used to, and lungs lose their elasticity. Bones grow brittle.

## Hormone levels fall

As they age, the glands that produce hormones also don't function as well. Hormones are chemicals that have specialised functions in the body – sex hormones, for example, are responsible for sexual characteristics and muscle and bone health. Other hormones, like growth hormones and thyroid hormones, are also responsible for keeping the body's regular functions 'ticking over'.

Levels of hormones fall as we age, as do our organs' abilities to be influenced by them – another reason why some organs lose their function as we age. In women, levels of sex hormones fall off sharply around the age of 50 (give or take 10 years). Ovulation ceases and the uterus and ovaries shrink – the process known as the menopause.

The only people who are spared the process of ageing are those who die before it gets advanced – those of us who die young or in middle age.

For the rest of us, the process is relentless. As our cells, tissues and organs become progressively damaged, we gradually lose our ability to respond to external shocks. We get more and more susceptible to extremes of temperature, infectious diseases, or mutations in our DNA that can give rise to tumours within our body.

Eventually, one or more of these events overwhelms us and we die. The maximum age we can get to before this happens is about 120 – the limit of human longevity.

# Health

As we age, we have to come to terms with the fact that our bodies don't function as well as in early adulthood, when we're at our peak. Little by little, so slowly that we barely notice it, our major organs – heart, lungs, skin and muscles – become less effective.
Some of the signs are obvious and we're fully aware of them. For example:

- **Hearing loss**– we lose our hearing ability, particularly for higher frequencies;
- **Bones, joint and teeth** – our joints wear out – a third of men and half of women over 65 have arthritis; we lose height (due to the bones in our spine losing calcium and shortening); and we may lose our teeth (about half of those aged 65 have lost all teeth);
- **Body shape and size** – we lose weight (due to loss of muscle and bone)and we lose muscle bulk, strength and power; fat becomes redistributed from below the skin to deeper parts of the body. Women are more likely to store it in the lower body (hips and thighs), men in the abdominal area.
- **Vision** – we have vision difficulties. We get short sighted, with reduced ability to focus on close-up objects. This condition, called presbyopia, may begin in the forties; the ability to distinguish fine details may begin to decline in the seventies. From 50 on, we have increasing difficulty in seeing at low levels of illumination;
- **Sleep disturbances** – we sleep more lightly, more frequently and for shorter periods;
- **Sexual function** – men lose their ability to get and sustain an erection; women stop ovulating around the age of 50. Their levels of sex hormones fall away drastically, and the changes of menopause set in;
- **Continence**– our bladder capacity declines. We urinate more frequently, and there may be other urinary symptoms such as incontinence. Men may having trouble passing urine because of benign prostatic hypertrophy (enlargement of the prostate)

Then there are the changes we don't notice, or we're only dimly aware of them. For example:

- our blood pressure rises because of narrowing of the arteries;
- the heart grows slightly larger (because it has to pump against higher blood pressure caused by narrowing arteries);
- lung capacity decreases because of loss of elasticity of lung tissue, so we get puffed more easily on exertion;
- we lose brain cells. Our reaction times slow and our short-term memory may deteriorate. We may have difficulty concentrating or become confused more easily;
- our kidneys don't function as well, becoming less efficient at clearing wastes from the body;
- our immune system declines – we're more likely to get ill;
- our metabolism slows, so we notice the cold more.

What is surprising is that the age at which these changes begin varies so much. In some people they begin in the late forties, while others can reach their seventies without noticing the effects of ageing. This variation has a lot to do with your genes – if your parents aged well, then the chances are that you will too.

Loss of mobility can be another troublesome development. We can't play sports as well. We're prone to falls, and when we do, the consequences are more serious (our bones are more brittle and more prone to fracture).

We lose our youthful good looks (assuming we had any in the first place) and we aren't as attractive to the opposite sex.

Our minds aren't as sharp. It's normal to experience some loss of concentration, and of our capacity to retain memories. Depression becomes more common.

Our vices catch up with us. Those bad habits (smoking, drinking too much, eating the wrong foods) that our bodies shrugged off so easily in the past now come back to haunt us. Damage from them accumulates over the years and depending how much we're at risk from our family history, we're more prone to cardiovascular disease (heart attack and stroke), cancer and diabetes.
And to make matters worse, we're also more likely to get degenerative diseases like osteoarthritis, osteoporosis, Alzheimer's disease, Parkinson's disease and retinal degenerative diseases.

## Slowing the decline

But there is some good news – we can do certain things that will help protect ourselves from the ravages of ageing.

- **Exercising** – one of the best things we can do is stay active. Exercising slows the rate at which we lose muscle mass and bone mineral, so we stay healthier and live longer. Studies have consistently demonstrated that people who are fit and keep physically active – engaging in pursuits like walking, dancing, gardening, swimming or aerobics – live longer and have reduced rates of diseases like cancer and heart disease. It also protects against dementia. At least 30 minutes of moderate exercise every day – in three 10-minute blocks if you like – is enough.
- **Keep the mind active** – again, it's a case of use it or lose it. Research shows that keeping mentally active reduces the onset of dementia and improves brain functioning in old age. Read newspapers, magazines and books, play 'thinking' games like Scrabble and Trivial Pursuit, take up a hobby, do a course or learn a language. Researchers at Stanford University in USA have found that memory loss can be improved by 30 to 50 per cent simply by doing mental exercises.
- **Socialise** – another way to ward off the effects of ageing is to maintain good social contacts. Studies have shown that people who are healthy in old age have more established networks of family and friends than those who don't, and it's because they keep these networks going that their mental and physical health is better.
- **Eat well** – elderly people are often undernourished. Studies have shown that adding protein and energy supplements to the diet reduces the chance of early death in the elderly and improves their health. So it's important that elderly people eat an adequate, balanced diet – low in saturated fat, with plenty of carbohydrates for energy.
- **Don't take unnecessary medicines** – as we age, and we become susceptible to degenerative illness, the number of medications we take will increase. Sometimes these may interact with each other and contribute to symptoms like mental confusion and feeling weak and faint. So check with your doctor regularly about possible side effects and whether you are able to stop taking some medications.

## Ageing gracefully

Even if we do all these things, we're bound to lose some of our capacity eventually. There may have to be changes in our circumstances. This may mean altering our environment – for example in the home (adding railings, non-slip surfaces, ramps, or additional lighting), or

with walking aids. It might mean calling on community services for help – home help agencies, home nursing, and meals on wheels, for example, can ease the burden. Or our accommodation may need to be changed – we may need to move to a smaller villa, or a retirement village that provides services such as meals, nursing and medical care.
The good news is that with age comes dignity, and a greater understanding of life and the human condition.
As people age they tend to become happier and more content with their lives. Over the years, people may lower or change their expectations, making success and happiness more likely. They become more adaptable; they're more likely to accentuate the positive and play down the negative in any given situation. Older people often have more time for relationships, for hobbies and lifestyle pursuits, and for helping others.

# Healthy Aging with Herbalife

Getting older isn't what it used to be. How can you look and feel as young as you can? By making your health and well-being a top priority. Here are 7 steps to healthy aging.

Remember what your parents looked like when they were your age? Looking back, they seemed so much older. And in many ways, they were. Average life expectancy is currently on the rise, which means that men and women approaching age 50 don't look and feel like the stereotyped middle-age person of the 1950s.

So how can you look and feel as young as you can? By making your health and well-being a top priority. Use the following Herbalife products to help you improve your overall health and well-being while making you feel younger as you get older.

## 7 Steps to Healthy Aging

1. Build a solid foundation for good health with our Cellular Nutrition products, including Formulas 1, 2 and 3.
2. Use CoreComplex fortified with powerful antioxidants, to help support a healthy cardiovascular system.*
3. Activate your skin's youthfulness with Skin Activator® Daily Replenishing Cream, which can help diminish the appearance of fine lines and wrinkles.
4. Slow the effects of joint aging and help reduce discomfort and swelling with Joint Support-Glucosamine with Herbs.
5. Keep your eyes in good shape with our antioxidant-rich Ocular Defense Formula.
6. Formulated with saw palmetto, Ultimate Prostate Formula can help make a man's mid-life transition a little easier, in addition to supporting prostate health.
7. Niteworks™ keeps blood vessels toned, flexible and youthful for improved circulation

## Staying Young

Throughout history humanity has sought ways to stop ageing and the idea of an elixir of youth is as old as recorded history. But is it really possible to slow or stop ageing – or even reverse it?

You need go no further that the shelves of a pharmacy, health food or department store to see that we're trying to. There you will find pills, creams, ointments, tonics, infusions – all containing combinations of vitamins, herbal extracts, minerals and antioxidants, all with the same promise: health and longevity.

## Dietary supplements

Many of the so-called anti-ageing products on the market contain antioxidants. These are compounds that 'mop up' free radicals – those unstable by-products of metabolism that cause damage to skin and connective tissue in the body.

## Popular antioxidants available as supplements:

- Vitamin B
- Vitamin C
- Vitamin E
- Selenium
- Flavonoids
- Carotenes
- Acetyl-L-carnitine
- Alpha-lipoic acid

But the question is – do they work? There is some evidence they may be effective in a limited number of degenerative conditions. Antioxidant supplements (tablets) have been shown to slow the loss of vision in people with a degenerative disease of the retina called macular degeneration.

Unfortunately, there's no solid evidence that antioxidant supplements prolong life or prevent normal ageing.

Antioxidants in our diet, however, have been shown to have beneficial effects in preventing some diseases. For example, studies have shown that green tea, red wine, fruits and vegetables and garlic help prevent heart disease – the effect is thought to be from the antioxidants they contain. They may prevent us from dying prematurely.

But they need to be taken as part of a balanced diet, not as tablets or pills. Usually (with macular degeneration as an exception), pills or tablets don't work. Either the antioxidant is destroyed in the extraction process, or it may be that in concentrated form it's not biologically active.

## Creams and ointments

Applied to the skin (mainly to the face), lotions, creams and ointments promise to 'erase the first signs of ageing', 'help minimise visible lines and wrinkles' and 'produce visible results after just eight days' – etcetera, etcetera.

Most are marketed at women and are manufactured by cosmetics companies.

Some of the products contain moisturisers (which make the skin look smoother and more supple) while others contain antioxidants (which are supposed to reverse the effects of free radicals in the skin). They're often marketed as having specific functions – for example as moisturisers, toners, collagen activators, body and cellulite treatments – often in combinations.

The magazine of the Australian Consumers' Association, *Choice*, recently reviewed a range of anti-ageing creams. It found they do smooth the skin, though only half the anti-ageing products tested did a better job of smoothing the skin than a standard moisturising lotion.

However, none made a visible difference, even though about a third of users claimed they did work (this is probably a placebo effect). One thing they have in common is that they're expensive.

## Fasting and caloric restriction

Research on animals going back to the 1930s suggests that drastically reducing our energy intake might make us live longer. The lifespans of worms, spiders, rodents, dogs, cows and monkeys have been shown to increase by about 30 per cent by restricting the kilojoules they eat.

The reason is thought to be that with fewer kilojoules to burn, the animal's metabolism slows down, producing fewer free radicals and causing less destruction to cells and body tissues.

In humans, reducing energy intake has been shown to lower blood pressure, fats, and glucose – which in turn reduces the risk of cardiovascular disease, our major killer.

The problem is that energy restriction in effect means slow starvation – kilojoule intake has to drop by roughly 30 per cent to achieve the longevity effect. This is equivalent to dropping from a typical diet of 2,500 kilojoules a day a day to 1,750 – which isn't enough to meet our needs and stave off hunger. So for most people it's not really an option over the longer term.

## Anti-ageing drugs

These are marketed as drugs rather than dietary supplements, though some also contain antioxidants. Others contain compounds like amino acids, drugs like statins (which lower blood fats), corticosteroids like dehydroepiandosterone (DHEA), or hormones like growth hormone, oestrogen or melatonin, or combinations of these substances.

Despite what the manufacturers claim, there's no evidence that they prolong life or slow ageing, and they may be harmful. Some, especially hormones and steroids, may be dangerous. They may interact with each other, or with other compounds or prescribed medications a person is taking. At best these are a waste of money.

## Future promises

The good news is that while we're getting older, we're also living longer in old age, thanks to medical advances, improved education, better nutrition, and increased prosperity.

There are now 12 times as many centenarians in Australia than there were in the 1970s, according to the Australian Bureau of Statistics. Around one in every three children born in the developed world today can expect to live to 100. And the average age will continue to increase, thanks to new technologies that are now in their infancy but one day may become commonplace. Things like:

- Replacing aged and damaged organs with new tissues grown from unspecialised cells known as stem cells;
- Nanotechnology – tiny molecular-sized machines to repair damaged DNA and/or remove cellular waste products;
- Inserting genes that code for enzymes that break the cross-links between connective tissues.

## Slowing ageing

But these are years off into the future. For now, we can't reverse or stop ageing – though there are some things we can do to make sure we don't age faster than we should, allowing us to stay fit and healthy into our eighties and beyond.

Much of what determines how fast we age is in our genes – about 30 per cent of ageing is hereditary, experts think. But the rest is due to the environment – the two worst offenders being ultraviolet (UV) radiation from the sun, and smoking.

Repeated exposure to UV in sunlight causes wrinkles, mottled pigmentation (including freckles and liver spots) and dry, rough and dull skin. Smoking also ages the skin (and other organs), probably by constricting tiny blood vessels and hence reducing blood flow.

So, to give your body the best chance of ageing slowly we recommend you:

- Don't smoke
- Eat a balanced diet with plenty of fruit and vegetables
- Get seven or eight hours of sleep a night
- Drink lots of water
- Moisturise your skin regularly (especially if you have dry skin)
- Avoid sun exposure – wear a hat, protective clothing and sunscreen
- Don't overdo the booze

# 10 Tips to Maintain, Don't Gain Weight During Holiday Season

**By Dr. Luigi Gratton**

Trying to lose weight around the holidays and maintaining your weight doesn't have to be tough. It is possible to fit even traditional holiday treats into a healthy eating plan. The secret is moderation and balance.

Here are some tips to keep you on track from Luigi Gratton, M.D., vice president of medical affairs at Herbalife:

-- Activity compensates for extra calories - Give yourself the gift of 30 minutes of exercise a day. In addition to burning calories, exercise also helps to relieve tension - so you are less likely to eat to control holiday stress.

-- H20, H20, H20 - A little water goes a long way - small sips throughout the day are a smart way to keep well hydrated. It acts as a shock absorber and joint lubricant, helps to transport nutrients and eliminate waste, and works in regulating body temperature. Even better, water has no fat, no calories and no cholesterol.

-- Be a food snob - Don't waste precious calories on everyday chips or crackers. Be selective and choose only the foods you really love, or that you associate with the season.

-- Bundle flavors - Variety might be the spice of life, but it is also a recipe for overeating. Bundle together similar flavors. For instance, put only salty (or meaty) foods on your plate at once. You will grow tired of that specific flavor more quickly and end up feeling satisfied on fewer calories.

-- Pare down those portions - Try to keep your portions small and make only one visit to the buffet. Choose the smallest plate possible. Pile greens and other tasty veggies on your plate first, leaving just a little room for those high-calorie treats like sweets and cheeses. Eat small, lower-calorie meals during the day so you can enjoy a special treat later - just make sure you do not starve yourself for the party and overeat later.

-- Step away from the table - If you don't put your choices on a plate, you have no idea how much you are really eating. The worst thing you can do at a party is stand around the table dipping into the bowl.

-- Drink slimmer - Alcohol is a double whammy during the holidays. It tends to weaken your resistance when it comes to eating, and the calories in drinks add up quickly. Sip on a glass of water between cocktails.

-- "I paid for it, so I'm going to eat it" - Don't feel as if you need to clean your plate just because you paid for it. Put part of your meal right away into a take-home container. Portion sizes in restaurants can be two to three times the amount you need. Instead of the usual starch and vegetable sides, skip the starch and double the veggies instead. Stop eating as soon as you begin to feel full.

-- Zen Yourself - Holidays can be stressful. Keep expectations for the holiday season manageable. Organize your time and make a list and prioritize the important activities. Be realistic about what you can and cannot do. And don't forget to schedule some down time to relax.

-- Slip, don't slide - If you eat three helpings of mashed potatoes and half a pumpkin pie, all is not lost. Rather than polishing off the rest, learn from your slip-up. Next time, eat a salad first, start a conversation, and park yourself far from the danger zone. The next time starts today.