Alternative remedies and lifestyle measures for longevity

The "science" of anti-ageing

The development and marketing of anti-ageing products is a multi-million dollar industry. There is no shortage of remedies and lifestyle measures, claimed to slow, stop or reverse the process of ageing. More often than not, these claims are not supported by scientific evidence. At the very least, people may be financially burdened by purchasing ineffective products. At worst, these products may be harmful or interact with standard therapies.

A group of 52 internationally recognised researchers have developed consensus statements on several of the main issues related to ageing.[1]

Life span is defined as the observed age at death of an individual. The maximum lifespan of humans is increasing with time. However it is not people that have changed. Longevity is related to the protected environments that we live in and advances in biomedical science, which enables more people to approach their life span potential. The overwhelming majority of the world's population will die long before they reach the maximum possible age of a human.

Life expectancy is the average number of years of life remaining. Historically, advances in life expectancy were a reflection of dramatic declines in mortality risks in childhood and early adult life. Because this mortality risk is now close to zero, further improvements would have little effect on life expectancy. Advances in life expectancy now are due to decreases in mortality in middle and older ages. The researchers' concluded that it is unlikely that life expectancy could increase significantly unless future technological advances allow modification of the underlying processes of ageing.

However some disagree with this assumption and believe that life expectancy will continue to rise at a steady rate of 2.5 years per decade, as it has done over the past century and a half, with no signs of slowing.[2]

Immortality is not possible. Eliminating all age-related causes of death would perhaps increase life expectancy by a few years but accidents, homicides, suicides and the biological process of ageing would continue to result in death.

Geriatric medicine manages the treatment of degenerative diseases associated with ageing. These interventions treat the manifestations of ageing, not ageing itself. The biomedical knowledge required to modify the process of ageing does not currently exist.

Anti-ageing medicine does not exist, despite many advocates claiming otherwise. There are many false, misleading, or dramatic claims made about these products for commercial purposes. Some products may relieve the symptoms of age-related illness and some may mask the manifestations of ageing, but there are no pills or remedies that can slow, stop or reverse ageing.

Special note on free-radicals and antioxidants:
It is scientifically accepted that free-radicals play an important role in the ageing process and that antioxidants can counteract their effect. Ingesting fruit and vegetables, which contain antioxidants, can reduce the risk of age related disease such as cancer, heart disease, macular degeneration and cataracts. There is however, very little evidence at present that supplements containing antioxidants can provide any benefit additional to dietary

consumption and there is no evidence that they have any effect on human ageing.

Hormones such as testosterone, progesterone, oestrogen and growth hormone have been shown in clinical trials to improve some of the physiological changes associated with ageing. Hormones may be beneficial to some people but they will not affect the ageing process overall. Many adverse effects are associated with hormone use and there is some evidence that growth hormone may actually shorten life span. Hormone supplements should not be used unless they are specifically indicated for a diagnosed medical condition.

Supplements may be used with some success to alleviate the symptoms of age-related illnesses such as arthritis and dementia, however there is little evidence supporting their clinical effect. Gingko biloba is thought to have a beneficial effect on memory preservation, however a recently published Cochrane review concluded that evidence is "inconsistent and unconvincing".[3] St Johns wort is often used to treat symptoms of depression, however it has the potential to interact with other antidepressants and medications.

It is important to note that supplements are not regulated in New Zealand and are therefore not subject to quality control. A review of supplements used to treat the symptoms of osteoarthritis can be found on page 34.

Lifestyle measures, including healthy nutrition, exercise and avoidance of smoking, alcohol and excessive sun exposure can increase the chance of living longer by delaying or preventing the occurrence of age related illness. However these lifestyle changes do not affect the ageing process itself. There is good evidence of effectiveness for exercise in the prevention and treatment of osteoporosis and for diet, weight loss and smoking cessation in cardiovascular disease.

Caloric restriction is believed to increase longevity, however it has progressively less effect the later in life it is begun. The evidence for this association is based on animal studies and to date there is no human study that proves it works long term. The level of caloric restriction needed to effect longevity is intolerable for most people and very few have tried this method. Older people do not gain weight again after being malnourished, and giving advice to severely restrict food intake, is likely to increase frailty and falls and therefore shorten lifespan.

For most people, quality of life is preferable over quantity of life.

Life expectancy in New Zealand

The average life expectancy of New Zealanders continues to rise according to Statistics New Zealand. Figures from 2006 show that females can expect to live 81.9 years and males 77.9 years (from birth). Increases in life expectancy are largely due to reduced mortality rates in people over 50 years of age. Mortality rates among young adults (15–24 years) and infants also declined significantly between the periods 1995–1997 and 2000–2002.

Non-Māori have a significant longevity advantage over Māori. In 2000–2002 life expectancy for Māori females was 73.2 years, compared with 81.9 years for non-Māori females. For Māori males, life expectancy was 69.0 years and 77.2 years for non-Māori. This is an average difference between Māori and non-Māori of about 8.5 years, slightly less than the estimated difference of 9.1 years in 1995–1997. Lower non-Māori mortality rates at ages 50–74 years account for over 60 percent of the difference between Māori and non-Māori life expectancy at birth.[4]

As people get older their life expectancy increases. For example, a female aged 70 years can expect to live a further 16.5 years. If that person then reaches 85 years, they can expect to live a further 6.7 years and if they reach 90, a further 4.6 years.[5]

Alternative treatments for osteoarthritis

Do alternative treatments really work?

The simple answer to this question is that many alternative treatments do work, although whether this is due to an actual clinical effect or simply an investment in the hope that it will work, is debatable. It is difficult to apply usual scientific method to determine whether an intervention has made a difference. Few high quality trials of alternative therapies, involving large numbers of people, exist.

Questions to consider when assessing an alternative therapy for a patient may include:

- Is there clinical evidence of effect?
- Is it cost prohibitive?
- Are there adverse effects?
- Does it interact with other medications?
- Will it compromise conventional medical treatment?
- Will it reduce the need for conventional medications?

Evidence of effectiveness of commonly used supplements, herbal products or devices in the treatment of osteoarthritis

Osteoarthritis affects around 8% of the total population of New Zealand, and up to 50% of those over 65 years of age, with no difference between Māori and non-Māori in age-standardised prevalence rates.[6]

It is claimed that some supplements can modify the indication for surgery, time to disability or at the least, reduce the reliance on drugs such as NSAIDs.[7] While there is a lack of clinically significant evidence for many of these products, some hold promise.

Glucosamine and chondroitin for arthritis: some evidence of effect

The mainstay of current treatment for osteoarthritis is to reduce pain. Conventionally, NSAIDs, corticosteroids or simple analgesics are used but recently two alternative products, glucosamine and chondroitin, have been gaining favour.

Glucosamine is an amino sugar found in the body. The exact mechanism of its action is unclear but it is thought that it promotes the formation and repair of cartilage. The glucosamine in manufactured supplements is usually sourced from shellfish shells and is available in two different chemical forms.

Several trials have found an improved clinical outcome with a regimen of 1500 mg/day glucosamine sulphate. Evidence from a recent meta-analysis showed that glucosamine may be effective in preventing the long-term progression of osteoarthritis. This was assessed by measuring joint space narrowing associated with articular cartilage degeneration.[13] Glucosamine sulphate has an analgesic effect which may compare favourably to NSAIDs. In addition, its use results in improved joint mobility and functioning.[14] There is less evidence of effectiveness for glucosamine hydrochloride.

Glucosamine is generally well-tolerated and is not known to be associated with any serious adverse effects. The most common side effects are gastrointestinal disturbances including dyspepsia, abdominal discomfort and diarrhoea.[14] There have been some reports that glucosamine may exacerbate asthma, however there is no definitive evidence of this association. It has also been suggested that glucosamine may adversely affect insulin resistance, however this effect has not been observed in humans and requires further study.[7] As glucosamine is derived from shell fish, people with an allergy to seafood should use it with caution.

> Glucosamine sulphate, 1500 mg/day may lessen the progression of osteoarthritis and provide pain relief and improved mobility.

Table 1: Supplements, herbal products and devices used for the treatment of osteoarthritis in New Zealand

Product	Evidence of clinical effect for OA?	What is the evidence?
Acupuncture	Inconclusive	A review of 10 randomised controlled trials (RCT) found mixed evidence of effectiveness for pain reduction. Acupuncture did not provide results superior to physical therapy. The placebo effect may play a major role.[8]
ASU (avocado soybean unsaponifiables)*	Yes (medium term)	Results from four trials show that ASU has a beneficial effect in reducing pain and NSAID use and increasing joint mobility. Ongoing benefit has been observed but evidence is for benefit in the medium-term (several months).[7, 9]
Boswellia (guggulu)	No	Only a few quality trials exist, but it has been observed that boswellia decreases severity of pain and swelling and increases joint mobility. No significant adverse effects are known.[7] A systematic review concluded that there is no current evidence of efficacy.[9]
Chondroitin sulphate	Inconclusive	There is evidence of effectiveness in reducing pain, improving function and reducing NSAID and analgesic use.[7] However a recent meta-analysis concluded that the benefit was minimal and only seen in mild cases.[10]
Collagen	No	Decreased pain compared to placebo has been observed.[7] Although promising, there is currently a lack of clinical evidence of efficacy.[9]
Deer Velvet	No	No clinical evidence of effect. A clinical trial found no significant difference between elk velvet and placebo for pain decrease in rheumatoid arthritis.[11]
Devils Claw (*Harpagophytum procumbens*)	No	Decreased pain compared to placebo has been observed with higher doses of the extract (60 mg), however a systematic review concluded that there is limited evidence of efficacy at present.[9]
Electromagnetic energy (pulsed electromagnetic field therapy)	No	Of five quality studies, none showed any benefit of this therapy over placebo for pain in osteoarthritis of the knee.[12]
Glucosamine sulphate	Yes	There is evidence supporting the efficacy of glucosamine in reducing pain and improving joint mobility and possibly in slowing disease progression.[13, 14]
Green lipped mussel	No	Decreased pain compared to placebo has been observed, however a systematic review concluded that there is limited evidence of efficacy.[9]
Homeopathy	No	Authors of meta-analysis of trials concluded that there was insufficient evidence that homeopathy is efficacious for any clinical condition.[15]

*Extract derived from one-third avocado oil and two-thirds soybean oil after hydrolysis

Table 1: (Continued from previous page). Supplements, herbal products and devices used for the treatment of osteoarthritis in New Zealand.

Product	Evidence of clinical effect for OA?	What is the evidence?
Ionised wrist band	No	A study found no difference in the reduction in pain for people wearing ionised bands compared to those wearing placebo bands. There was an overall decrease in pain for both groups.[16]
Laser therapy*	No	Four RCTs compared laser therapy with placebo and found no significant difference in pain outcomes.[17]
Methylsulphonylmethane (MSM)	Inconclusive	Based on two RCTs, 500mg of MSM significantly improved pain and joint mobility. There is moderate evidence of efficacy.[9] More evidence is needed.
S-Adenosylmethionine (SAMe)	Inconclusive	Clinical trials demonstrated a reduction in pain and functional limitation which was greater than placebo and comparable to NSAIDs. However, it is thought that SAMe may act by decreasing the perception of pain and therefore the effect may diminish over time. Onset of action is slower than with NSAIDs. Some documented cases of agitation and manic reactions in people with bipolar disorder.[7]
Shark cartilage	No	A reduction of pain has been demonstrated in vitro, however evidence of clinical effect is lacking.[18]
Withania/Ashwagandha	No	Only one RCT exists of this extract in combination with boswellia and zinc. There is a lack of evidence of efficacy.[9]

* Low level laser therapy uses a light source to generate "photochemical reactions in cells"

Chondroitin sulphate is also widely promoted for use in osteoarthritis. It is a carbohydrate component of cartilage, usually derived from cows and often combined with glucosamine in supplements. The dose most often used in clinical trials is 1200 mg/day.

In vitro and animal studies have found that chondroitin contributes to the cartilage matrix, inhibits proteolytic enzymes (that break down cartilage) and stimulates synthesis of collagen and glycosaminoglycan. Chondroitin has been shown to work in synergy with glucosamine.[7] There is a lack of evidence of an effect on joint space narrowing, but several trials concluded that chondroitin has significant analgesic properties when compared with placebo, as well as demonstrated improvements in joint mobility.[7] However, the authors of a recent meta-analysis of large-scale clinical trials, concluded that the symptomatic benefit of chondroitin is minimal, and likely to only be seen in mild cases of osteoarthritis.[10]

Chondroitin does not appear to be associated with any significant adverse effects, however it has a mild anticoagulant effect and may interact with drugs such as warfarin and heparin. The long-term safety profile of chondroitin remains uncertain.[7]

> Chondroitin sulphate at 1200 mg/day may have some analgesic benefit, especially when combined with glucosamine.

Bottom Line: It is likely that glucosamine sulphate has some benefit in reducing pain, improving joint mobility

and perhaps in slowing the progression of osteoarthritis. The evidence for chondroitin is conflicting. Both products have fewer (or less severe) side effects than NSAIDs, but it is unknown what the long-term effects of using these supplements are. In addition, it is perhaps unwise to promote widespread, long-term use of products that are not regulated or subject to quality control. A cautious approach is indicated.

ASU – the new kid on the block

Avocado soybean unsaponifiables (ASU) is a lipid mixture that has been gaining recent interest for its apparent beneficial effect on pain in osteoarthritis. It is an extract derived from the hydrolysis of one-third avocado oil and two-thirds soybean oil. The main component of the resulting mixture is plant sterols, therefore any adverse effects on lipid profile with use of ASU is unlikely - in fact plant sterols are known to be beneficial in lowering cholesterol.

Results from several randomised controlled trials were assessed in a systematic review and it was found that ASU 300 mg/day decreased NSAID use and resulted in improved joint mobility. In short-term (three to six month) studies, there was a two month delayed onset of action and residual effects persisted for two months after treatment ceased. In a long-term (two year) study, pain scores, mobility and concurrent NSAID intake were not different from placebo after one year. There is no evidence that ASU slows the narrowing of joint space, but there have been some observations of beneficial disease modifying effects in severe osteoarthritis.[9]

Bottom Line: There is good evidence that ASU has medium term (several months) symptomatic benefit in osteoarthritis, including reducing NSAID use, but there is currently a lack of evidence for its long term benefit. Further investigation is required.

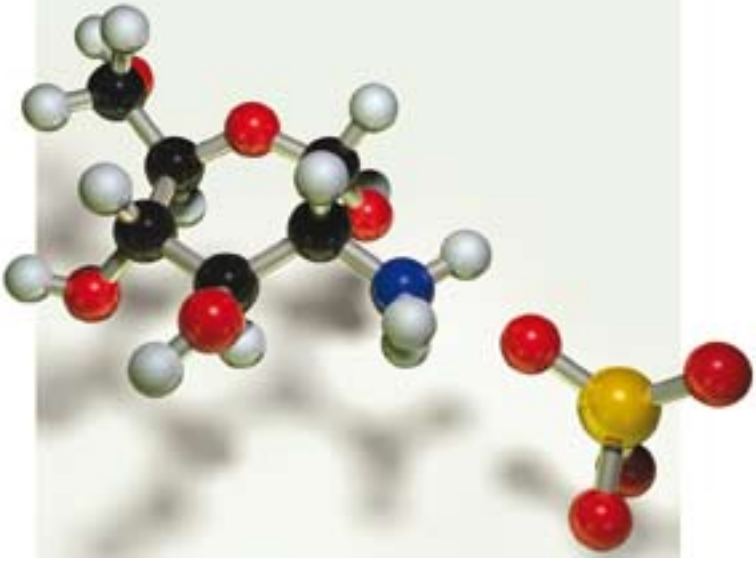
A special note on magnetic devices to treat pain

To date, over $5 billion has been spent worldwide on magnetic devices to treat pain.[19] However there is currently

Sulphur amino acids

Many supplements used in the treatment of osteoarthritis also contain large quantities of sulphur (e.g. chondroitin, glucosamine, SAMe). We require a certain amount of sulphur in our diet and this is usually ingested in the form of cysteine or methionine (amino acids). Protein-rich foods are a good source of sulphur, as are vegetables such as asparagus, onions, beans and cabbage. Sulphur deficiencies are rare.

Sulphur is used in our body for the synthesis of glycosaminoglycans which form the cartilage matrix. In osteoarthritis, the turn-over of glycosaminoglycans is greatly enhanced, and as a result sulphate levels in the body are rapidly depleted. Therefore, dietary sulphur may play an important role in the treatment of osteoarthritis. It is possible that at least some of the therapeutic value attributed to these supplements is due to their sulphur content. It is known that glucosamine hydrochloride has less therapeutic value than glucosamine sulphate. Increasing intake of dietary sulphates may have a similar effect to taking these products.[7]



no definitive evidence to support an association between magnets and pain reduction. It is claimed that magnetic fields increase circulation and therefore enhance healing of tissue, however this has not been proven. Magnetic underlays in New Zealand cost around $200 to $500.

Authors of a recent study concluded that exposure to a static magnetic field (magnets in a mattress) does not alter pain perception, sympathetic nerve function, blood pressure or heart rate. Study participants were tested once on a regular mattress and once on a mattress with imbedded magnets – participants were not aware which treatment they were receiving. Subjects first rested on the mattress for one hour, and then performed three interventions (isometric handgrip, muscle ischaemia induced by a blood pressure cuff and immersion of their hand in ice water). Exposure to the magnetic field did not alter pain perception during the three interventions and was not associated with increased muscle sympathetic nerve activity, heart rate or blood pressure at rest.[20]

It is interesting to note that the study most often quoted by companies selling magnetic mattresses did not actually involve the use of a magnetic mattress. Pain response was tested in people with post-polio syndrome with pre-existing knee pain. The 29 people assigned to receive the treatment had a credit card sized magnetic device applied directly to the site of their pain. These participants reported a greater reduction in their pain than the 21 participants assigned to the inactive device. Pain relief was achieved within 45 minutes and was assessed subjectively using a questionnaire. No physiological measurements were taken.[21] As the pain experienced by people with post-polio syndrome is unique, the results of this study cannot be extrapolated to other causes of pain.

Bottom line: It seems unlikely that magnetic mattresses have any clinically significant effect.

The placebo effect

Sometimes something which shouldn't work, according to science, does work. Belief in the value of alternative therapies is often very strong and this accounts for much of the success of otherwise ineffective treatments.[22]

- People may get better due to the natural course of an illness and attribute this "cure" to their coinciding alternative therapy.
- Many illnesses are cyclical and people often seek alternative therapy when symptoms are at their worst. When symptoms are better, this is attributed to the therapy, when it is the upwards side of the cycle.
- An alternative therapy may be tried after months of conventional medical treatment and when symptoms improve, it is attributed to the new therapy rather than the prior intensive medical treatment.
- If the original diagnosis is wrong, then claims of a cure are meaningless.
- Often the time and attention given by the provider of alternative therapy accounts for more improvement in wellbeing than the therapy itself.
- The psychological investment that people and their families put into believing that something will work may account for much of the perceived benefit of the treatment.[22]
- Alternative therapies may help to maintain hope.

Bottom line: If a person finds something to alleviate their symptoms and it does not cause financial burden, adverse effects or interact with or compromise their conventional therapy, then it is of benefit, whether or not a peer-reviewed meta-analysis proves that it works.

Further reading:

Bandolier knowledge library: a "down to earth" approach to assessing the evidence on many alternative therapies. Search by key word. Available from:

http://www.jr2.ox.ac.uk/bandolier

Mayo Clinic: Up to date information about developments in anti-ageing medicine (search by topic). Available from:

http://www.mayoclinic.com

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