



# Dr Paul Clayton's Health Newsletter

## The Best Medicine—Supplements

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### The Paul Clayton Health Newsletter

- Easy to read
- All references on the back page
- Up-to-date news and design
- Pioneering and insightful approach
- Inimitable no-holds-barred style

Regular readers of this newsletter know our position on supplements by now. Unlike the nutritionists and medics who insist, against all the facts, that we can obtain all the micro- and phyto-nutrients we need in a well-balanced diet, our position is science-based. There is a wealth of evidence that *most* people are depleted in *most* nutrients<sup>(1-3)</sup> and that this is a cause of widespread ill health, and health care costs of €70 billion a year in Europe alone.<sup>(4)</sup>

A tragedy – but utterly predictable *and* easily avoidable. Today's low-energy lifestyles mean that most folk do not consume more than 2,000-2,500 calories a day, but we were not 'designed' to live at such low energy levels. New calculations show it takes 3,000-3,500 calories of a nutrient-dense and well-balanced diet (full of chicken liver, oily fish, wheatgerm and 7 or more portions of fruit and vegetables every day) to get everything needed for sustained good health<sup>(5)</sup>. This is manageable if you are an athlete or a manual worker with a healthy appetite and a strong stomach! But for the great majority of us whose occupations and lifestyle make such a diet unsustainable, the case for supplements is overwhelming.

The basic arguments were laid out in a series of three papers, published in the Journal of the Royal Society of Medicine back in 2008,<sup>(6-8)</sup> which indicated that improved diet could cut the burden of chronic degenerative disease by up to 90%. The authors are currently working with a team of med-economists on a fourth paper which derives the public health savings that would be made by improving our diet; the preliminary findings indicate that public health costs could be cut by over 50%.<sup>(9)</sup>

These figures are staggering, but a new report from industry experts Frost & Sullivan goes a long way to substantiating them.<sup>(10)</sup> This focuses mostly on North America but its implications are almost universal. The research team conducted a systematic review of hundreds of scientific studies on eight dietary supplement regimens across four diseases to

determine the reduction in disease risk from these preventive practices. The group then projected the rates of medical events across the high-risk populations and applied cost benefit analyses to determine the cost savings if people at high risk took supplements at preventive intake levels.

The supplement regimes they screened are outlined in the table below.

FROST & SULLIVAN TABLE OF POTENTIAL SAVINGS BY SUPPLEMENT USE		
Supplement	For disease:	Savings per year
Calcium + Vitamin D	Osteoporosis	\$ 1.08 billion
Magnesium	Osteoporosis	\$ 530 million
Lutein + Zeaxanthin	Age-related eye disease eg. AMD, cataract	\$ 930 million
Omega 3	Coronary Heart Disease (CHD)	\$ 930 million
B vitamins B6, B12, Folic Acid	Heart disease	\$ 560 million
Dietary fibre eg. psyllium	Heart disease	\$ 2.3 billion
Phyto-sterols	Heart disease	\$ 3.3 billion
Chromium picolinate	Diabetes-induced Heart disease	\$ 970 million

These items alone amount to total annual savings of \$12.5 billion – a considerable sum, even in these inflationary times. How accurate is this accounting? There is a good deal of uncertainty with the figures, but I submit that they are actually a gross under-estimate of the savings that could be made.

To begin with, most micro- and phytonutrients exert multiple protective effects. Omega-3, for example, not only reduces cardiovascular deaths but also depressive illness and self-harm, up to and including suicide.

More seriously, the above supplement regimes are out of date and sub-optimal. Please turn over for my updated recommendations.

**“The case for supplements is overwhelming when we no longer eat the high-calorie nutrient-dense diet our bodies were designed for.”**

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If you really wanted to reduce coronary heart disease, you would be foolish indeed to rely on just Omega-3s, B vitamins, psyllium and phytosterols. If you based your cardio-protective regime on up-to-date science you would replace the phytosterols and psyllium and extend your supplements to the following.

<b>SUPPLEMENTS FOR CORONARY HEART DISEASE updated</b>	
<b>Omega 3</b>	<b>From fish oil. Helps lower blood pressure, reduce blood fat levels, cut risk of heart attacks.</b>
<b>B vitamins B6, B12, Folic Acid</b>	<b>B-complex vitamins are essential to produce energy and repair DNA</b>
<b>Polyphenols</b>	<b>Plant-derived compounds in fruit and vegetables, such as green tea, grapeseed, curcumin</b>
<b>Mixed tocopherols and tocotrienols</b>	<b>Compounds with powerful vitamin-E activity, but each with a different biological action</b>
<b>Carotenoids and xanthophylls</b>	<b>Anti-inflammatory and anti-oxidant eg. beta carotene, lutein, lycopene</b>
<b>Soy isoflavones</b>	<b>Associated with improved glucose metabolism</b>
<b>Vitamins C, D, K2 Selenium</b>	<b>K2 is especially important for cardiovascular health</b>

Such a regime would cost more, but the overall savings would likely be an order of magnitude greater.

And if you were to cut out fast foods—cooked at high temperatures, which produces higher levels of pro-inflammatory toxins—your level of protection would be even higher.

Similarly, a supplement to reduce the risk or impact of diabetes would include not just chromium, but also many of the above, as they all have powerful anti-inflammatory benefits, and we know that diabetes is driven by chronic inflammation.

It's noticeable that the Frost & Sullivan report does not mention or calculate the potential impact of supplements on cancer health care costs. While this is possibly to avoid being contentious, recent research indicates that chronic inflammation in tissues creates the conditions in which cancer is far more likely to spread. So—again—a truly comprehensive supplement should produce significant reductions in cancer care costs too.

**“Industry experts conducted a review of hundreds of studies and applied cost-benefit analyses to determine the cost savings if people at high risk of four diseases took certain supplements at preventive intake levels—a total saving of \$12.5 billion per year was projected.”**

## Days of the Weak—the little

Sarcopenia – loss of muscle mass – is a very common but surprisingly little-known condition related to bad nutrition and an inactive lifestyle.

From early middle age on, most of us lose muscle mass. It's not inevitable – a very physically active lifestyle can delay or prevent it – but people who are physically inactive lose up to 5% of their muscle mass per decade from age 30! Some estimates are as high as 1% a year. As the urban lifestyle tends to be very inactive, this age-related loss of muscle mass (sarcopenia) affects very large numbers of people: over 20% of 60 to 70 year-olds, rising to 50% of the over 75s.

And as numbers of elderly folk increase, the socio-economic costs of ill health caused by sarcopenia have become very significant. The most recent (2004) survey of US costs put them as high as \$26 billion a year<sup>(1)</sup> and in 2008 the Centres for Disease Control named sarcopenia as one of the top five health risks facing the US population. The EU has adopted a similar position.

Patients whose lifestyles have left them with sarcopenia generally also have symptoms of a number of related medical conditions. When the loss of muscle mass has led to a loss of mobility and appetite, osteoporosis and general wasting often co-present as the so-called 'frailty syndrome'. If calorie intake has been preserved, sarcopenia generally presents with obesity ('sarcobesity') and with diabetes ('metobesity').

### Not just an issue of fracture risk

This explains why sarcopenia is not only associated with the falls that cause fractures, but also with all the complications of diabetes including a raised risk of vascular disease, heart attacks, strokes, blindness, liver and kidney disease and a range of gastrointestinal cancers. In short, sarcopenia contributes to the entire ageing process and in the process inflicts a substantial burden of morbidity and mortality.<sup>(2)</sup>

### Muscle is an important metabolic organ

Sarcopenia is at the centre of all these diseases because muscle is not just a way of moving our bodies; it is also a highly important metabolic organ, and is critically involved in blood glucose control and plasma lipid (blood fat) profiles. When we consume carbohydrates, for example, and insulin kicks in, some glucose is

## Well-known Sarcopenia is a top-5 health risk

taken up by the liver and stored as glycogen – but in a fit and physically active person, the bulk of blood glucose is taken up and used as fuel in the skeletal muscles.

If muscle mass has fallen, the capacity of muscle to take up and 'burn' glucose is dramatically compromised. This contributes to insulin resistance, glycaemic stress (where sugar molecules bind to protein in the body), chronic inflammation, widespread tissue damage and accelerated ageing. Similarly, loss of muscle bulk and functionality impairs the muscles' ability to remove LDL cholesterol from the circulation – creating a situation where the danger of atheroma (hardening and furring of the arteries) is heightened.

### Causes of sarcopenia

By examining the causes of sarcopenia we can begin to design programmes that will delay or even prevent this core element of the ageing process. This will improve quality of life as we age, increase the independence of the elderly, reduce their needs for health care and cut healthcare costs. The causes include:

- **Endocrine shift:** the menopause and viropause or andropause trigger hormone shifts that degrade muscle in women and men
- **Sedentary lifestyle:** a risk factor for sarcopenia and many other disorders.<sup>(9)</sup> Being bed-bound is even worse; if a relatively healthy person in their 70s is bed-bound for 10 days, they can lose 10 percent of their total lean leg mass.
- **Chronic inflammation:** a vicious cycle, whereby chronic inflammation drives muscle breakdown and the build-up of fat drives further inflammation.
- **Dysnutrition<sup>(4)</sup>:** insufficient protein and the co-factors required to build muscle protein. Fast foods—foods cooked at high temperatures contain high levels of pro-inflammatory compounds.
- **Smoking:** worsens chronic inflammation

### Countering the risk factors

Removing or countering the above risk factors is the key to reducing the incidence and severity of sarcopenia, and all the related pathologies. The optimal protective strategy includes **exercise, enhanced nutrition** and of course **smoking cessation**.

When fully implemented, this strategy triggers an energy switch called *AMP-Kinase* (AMP-K) and creates a favourable environment in which

the body can start to burn more energy as fuel for movement and to stop storing it as fat and cholesterol. [See refs 5-9 for AMP-K mode of action.]

If the combination of exercise and optimum nutrition were integrated into a pill, it would be regarded as a wonder drug – perhaps the wonder drug of our age. It replaces two of the most lucrative pharmaceutical drug sectors (anti-glycaemic agents and statins), providing greater benefits than both of them without any of the adverse effects.

The supplement industry is selling high protein shakes and other foods for sarcopenia, with limited success. There is little point in pouring amino acids into the body if it is suffering from chronic inflammation, and if the muscles are not being 'instructed' to grow. It is essential to put out the fires first, which easily can be achieved with a comprehensive anti-inflammatory regime as outlined in my recent e-book *Inflamm-ageing*. It is slightly more difficult to generate the muscle growth signals.

### Exercise doesn't have to mean pumping iron

The most familiar way of growing and strengthening muscle is via exercise, but many elderly people are not willing to exercise to the level needed, and for those with disability or disease this may be impossible. Luckily, it is not necessary to run marathons or to pump iron. These classical forms of exercise are aerobic and isotonic (ie you gasp for breath and move your limbs), but we now know that equal gains can be made via *anaerobic* and *isometric* exercise, where you do not become breathless and indeed hardly have to move.

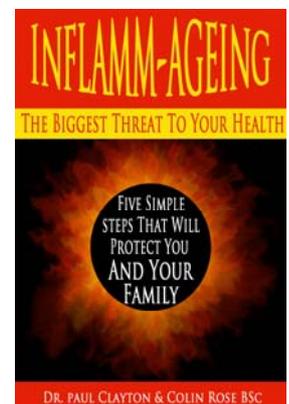
Aerobic exercise lowers levels of oxygen (and cAMP) in muscle, and this is one way of activating the AMP-K enzyme. However, the latest research shows that AMP-K can also be activated by putting tension on muscle fibres, and this can be achieved in practical terms by any form of resistance exercise, which can even be semi-passive eg. standing on a vibrating plate<sup>(10)</sup>. But if even this is too much, work is well advanced on a supplement ...

### Exercise Chinese-style?

Ethno-botanical screening in South Korea, identified the herb *Gymnastemma pentaphyllum* as a candidate for research. Traditionally made into a tonic to revitalise the frail and elderly, its popularity and its Chinese name *Jiaogulan* ('little herb of immortality') sparked the researchers' interest.

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**Anaerobic and isometric exercise can be as effective as the traditional aerobic and isotonic forms.**



The free e-book *Inflamm-ageing* contains advice on a comprehensive anti-inflammatory regime. Download it at [inflamm-ageing.com](http://inflamm-ageing.com)

**"Sarcopenia is not only associated with risk of fractures, but with all the complications of diabetes, contributing to the entire ageing process."**

The Dr Paul Clayton Health Newsletter describes developments in the new field of pharmaco-nutrition, where nature and science are combined to offer non-drug solutions to degenerative disease.

The newsletters are intended to increase knowledge and awareness of health issues and are for information only. No health claims for specific products are made or intended and the information should not be used as a substitute for medical advice.

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Initial studies showed that Jiaogulan extracts activated AMP-K. Later work proved that the saponins Damulin A and B were the actives—very active in fact, far more so than the synthetic compound AICAR that activates AMP-K so effectively that it is thought to have won the Tour de France in 2009 and 2010 (before it was banned!).

More research showed that the standardised extract produced all the metabolic benefits of exercise; including improved insulin sensitivity and improved blood fat (plasma lipid) profiles and fat loss, in both pre-clinical models<sup>(11)</sup> and an initial clinical trial<sup>(12)</sup> recently published in the prestigious journal *Obesity*, reflecting the robust nature of the study. The fat loss was preferentially from the hard-to-shift visceral fat depots – exactly the same ones that are targeted by exercise.

So is this supplement a weight loss product? Yes and no. It has traditionally been used to improve blood glucose control and plasma lipid profiles. It has a role in sport and is useful in improving muscle fitness and restoring insulin sensitivity not only in sedentary types but also in those with disabilities which make physical activity difficult or impossible.

The spectrum of effects of Jiaogulan will undoubtedly give it an invaluable role in the management of sarcopenia through its ability to activate AMP-K, combined with its anti-inflammatory effect *and* its down-regulation of MTOR (which slows muscle wasting).

The standardised extract will be available in 2014 (Jiaogulan teas are already around) and great things are expected. I believe this type of supplementation could save £4 billion in the UK alone if widely implemented.<sup>(13)</sup>

## Berry good brain food

I'm sure you've all enjoyed the bumper harvest of berry fruits this year, and I hope you've managed to freeze or preserve some for the winter too.

Berries offer much more than a great taste. Recent research suggests that nutrients in berries may protect your brain from age-related decline and enhance heart health.

In animal studies conducted by Tufts' Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA), nutritional antioxidants—such as the polyphenols found in blueberries—have been shown to reverse age-related declines in the brain's ability to process information, as well as cognitive and motor deficits.

The journal *Neurobiology of Aging* reported that laboratory rats fed blueberry extract equivalent to one cup daily in humans, or strawberry extract equivalent to one pint daily in humans, outperformed other aged rats.<sup>(1)</sup>

It's not just blueberries and strawberries. In a study published in *Nutritional Neuroscience*, Tufts researchers fed aged rats a 2% blackberry-supplemented diet for eight weeks. The blackberry diet improved motor performance on tasks that rely on balance and coordination, and the blackberry-fed rats had significantly greater short-term memory performance than the control rats.<sup>(2)</sup>

Several epidemiological studies corroborate the animal research.



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