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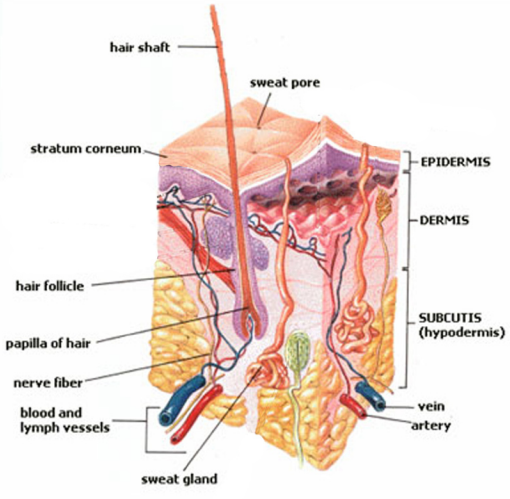
Save Your Skin - Part One

Dr Michael Colgan

Now is the time of year to protect your skin. And the cosmetics companies are geared up for a bumper season. Before you lay out those credit cards, we want to give you an inside look at skin and what you can really do to improve it.

Skin creams are one of the highest profit luxury industries. Not counting the packaging, a medium-priced skin cream that sells for $30-$40 for a 2-ounce jar at your local pharmacy, costs less than 30 cents to make. No matter what you see in the ads, even the highest price skin creams cost no more than 25 cents per ounce to make.

The most expensive part of what you are paying for when you buy the top beauty salon skin creams is definitely the jar and box. At a maximum of $2.00 for this packaging, the top price for cost of goods is about $2.50. Yet some of the elite companies, such as La Prairie and Revive charge $250 - $500 for a 2-ounce jar, a mark-up of 100 to 200 times the cost of goods. That is how they afford the trappings of luxury required to create the cosmetic illusion.



Even those prices would not be all bad if the creams worked as the makers claim. Unfortunately, most cosmetic creams have no supporting scientific evidence that they do anything at all, beyond adding water to your skin. Remember, even the word "cosmetic" means "serving an aesthetic rather than a useful purpose."

In this series, I will examine some of the most expensive and some of the least expensive skin creams and their ingredients, and tell you what works and what does not. We will also look at the basis of the continuing public compulsion to slather the dead epidermis outer layer of the skin, with ever more bizarre mixtures of chemicals, under the belief they will benefit the living dermis underneath.

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Cosmetic Smoke and Mirrors

Skin is an incredibly complex organ, much more complex than my simple diagram above. To discover mixtures of chemicals that truly inhibit skin aging, reduce wrinkles, remove blemishes, you have to examine the processes by which the body makes new skin, how it repairs wounds, how it removes blemishes, and the complex mixtures of chemicals it uses for each task. With a few rare exceptions, cosmetics companies have not done this research.

To answer in advance those who will write to us that skin creams must be proven to work or they would not be allowed, I want to note how the cosmetics industry operates. Here is a typical claim that I took from a TV skin cream ad a couple of days ago: "Clinically proven to reduce the signs of aging". It is blatantly false. In science, clinically proven means that a chemical has a measurable biological action, shown by well-controlled studies, by reputable researchers, published in peer-reviewed scientific journals. In the cosmetics industry, however, "clinically proven" has no defined meaning, because cosmetic companies are not permitted to claim that their products do anything biological, but only that some uncontrolled subjects report that skin appears to be improved. Of course the ads are always pushing the envelope, using words and phrases that fool the unwary into a belief that there is real science behind the products.

All the big cosmetic companies do have their own chemists. But the chemistry is trivial, although it provides nice jobs at salaries up to $250,000 per annum. The real focus, however, is on presentation and promotion, which is why their top models earn ten times as much.

Cosmetics executives rarely use their own chemists for "clinical trials" of their products. Instead, they commonly recruit groups of women who are then given free supplies of the creams and asked to judge the effects over a few weeks. Or they may pay beauty salon or spa personnel to judge the effects. The company then assembles the results to suit their advertising. To scientists, such a procedure is laughable because there is no control of anything. You will never see them published in any peer-reviewed medical or scientific journal.

Yet results of these cosmetics "clinical trials" appear on TV advertising every week. They have become so much a base of the industry that there are now numerous women, (and men) who troll the internet to participate in such trials. The smartest of them are known as "good responders", who praise everything they get, and thereby get masses of every cosmetic imaginable –free.

Cosmetics companies hardly ever hire real scientists to do the double-blind, randomized, placebo controlled, research studies, that are the standard of science today. There are four main reasons why. First, their own chemists know well from their in-house studies that their products have minimal effects when compared with water or other placebo. Second, real wrinkle reduction and skin improvement studies take at least a year and cost many millions of dollars. Some of the studies that proved the wrinkle reduction that occurs with Retin-A for example, continued for 2 years. Third, as happened to Retin-A, if a skin cream is proven to be biologically effective, it is deemed a drug, and quickly becomes medical and no longer permitted as a cosmetic.

The fourth and most important reason that cosmetic companies don't do real science is that they don't need real science. The industry focus is on fairy dust and hope. Exceptional models, trained to sell, sell, sell, by experts such as Tyra Banks and Mister Jay, sexily present the products in super luxury surroundings. For most of us, such smart promotion creates an irresistible illusion that everyone can achieve a bit of that youth and beauty with a touch of the magic cream. Move over Disneyworld. Cover Girl and Estee Lauder have you beaten hands down.

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Science of Skin

Before getting down to chemical ingredients, first we will look at the basics. From our 35 years of anti-aging research, and the successive skin programs that we have used with Assessment clients, our results and real skin research worldwide supports five external things you can do to improve your skin. I examine each in more detail below.

1. Wash. Use a non-acidic cleansing bar or lotion that will cleanse the skin of dirt and contaminants. (Most soaps are harmful to the skin, especially the thin, exposed skin of the face and neck.)

2. Exfoliate. The right exfoliating product removes older skin cells and blemishes.

3. Remodel. A few remodelling creams help remove rough skin areas and damaged proteins, and stimulate the growth of new proteins.

4. Moisturise. Some emulsion moisturizers can add skin compatible oil and water to the skin.

5. Sunscreen. Limit direct skin exposure to the sun to 30 minutes per day, and use the right sunblock to protect it at other times.

Wash

Don't use soap on your face and neck. It destroys the natural protective coating of humectants and dries the skin, making it more prone to damage. Don't allow shampoo to get on your face, and don't play hot showers on your face for the same reasons. You don't want chlorine on your face and neck either. Use a filter on your shower if you live in an area where you can smell or taste the chlorine in your water. Use a water retaining skin cleanser once per day.

There is little difference between the chemistry of inexpensive and luxury skin cleansers. Any of the following are good. (By the way, we have no financial or other connection with these companies.):

For normal skin:

Cetaphil Daily Facial Cleanser, or Purpose Gentle Cleansing Wash, or Dr Hauschka Cleansing Cream

For dry skin: Boscia Soothing Cleansing Cream

For oily skin: Clinique Gel Cleanser

For sensitive skin: Olay Foaming Face Wash

Exfoliate

Regular exfoliation, about once per week for sensitive skin, twice per week for normal skin, removes loose skin flakes, smoothes the skin, makes it a more even thickness, and helps to produce an even skin tone. Smoothing the skin causes it to reflect more light and produces that coveted baby skin glow, especially as you age.

Don't use scrubs containing sand, or crushed nuts, or apricot pits. The particles have jagged edges that produce tiny scratches, and damage the skin of the face and neck. Put a drop of the cream on your palm and rub it in. If it feels rough or gritty, don't use it on your face or neck. Scrubs based on fruit enzymes from papaya or pineapple are better. They dissolve the dead skin cells.

Scrubs based on alpha hydroxy acids, usually glycolic acid from sugar cane, or lactic acid from milk, also

dissolve the dead cells and shine the skin. But these chemicals are stronger, and have other benefits, covered below. As an exfoliant alpha hydroxy acids are not ideal because there is a critical period between exfoliating skin flakes and peeling off the whole epidermis. You do not want to peel your epidermis. You run a high risk of destroying some of the delicate and complex structures in the dermis shown above, including hair follicles, sweat glands, nerves and micro-circulation. The following products work well and gently to exfoliate your skin:

Ole Henriksen New Beginning Scrub or Elemis Papaya Enzyme Peel

Remodel

Removing damaged proteins and stimulating the growth of new proteins and a thicker, more uniform skin, is a massive biological effect. When Retin-A, a derivative of vitamin A (retinol), reached this goal, it became a prescription drug. Cosmetic companies do not want their creams medically restricted, and thus do everything to avoid real evidence that they work, while carefully skirting the legal line with fulsome praise of their benefits.

It is a big subject that I will cover more deeply in later articles in this series. Suffice to say here that retinoin1 (Retin-A) works to destroy damaged proteins and stimulate the growth of new skin. But tretinoin it comes in a wide variety of makes of creams and gels and strengths for different medical treatments, and should be used with care preferably under the guidance of a dermatologist.

Hydroxy acids also work to stimulate new skin growth, but, so far, have escaped the grasp of the FDA. There are three hydroxy acids used for skin. Two are alpha-hydroxy acids, glycolic acid from sugar, and lactic acid from milk. The third is beta-hydroxy acid, which is salicylic acid, best known as aspirin. I did not recommend them as exfoliants because they can do more for your skin than that.

Alpha hydroxy acids are water-soluble only. Beta hydroxy acid is lipid soluble. Consequently, beta hydroxy acid is able to penetrate into the oily interior of skin pores and exfoliate the dead skin cells that accumulate inside the pore. Beta hydroxy acid is thus more effective on oily areas of skin. Both alpha hydroxy acids and beta-hydroxy acid are effective on sun-damaged skin.2-3

For skin blemishes, blackheads, whiteheads, and pimples, beta-hydroxy acid is superior. Although hailed as relatively new in skin care, it has been around for 50 years, and is still the medical treatment of choice for acne. There is also some evidence that beta-hydroxy acid improves wrinkling, and reduces roughness, and mottled pigmentation of photo damaged skin. But it takes at least 6 months of daily application to get these results. Because it is essentially aspirin, beta-hydroxy acid is anti-inflammatory, and is thus less irritating to the skin than alpha-hydroxy acids. Beta hydroxy acid works best in a concentration of 1% to 2% at a pH of 3 to 4. Use cautiously at first as it does not take much to burn sensitive skin.

As with Retin-A, the use of beta hydroxy acid can increase sun sensitivity up to 50%. So, although it can reverse some of the damage caused by photo aging, at the same time it makes skin more subject to new photo aging. Unfortunately, you cannot do the obvious and mix a beta-hydroxy skin cream with your favourite sunscreen. Sunscreen is not stable at the pH that allows beta-hydroxy acid to work. Reasonable products of 1-2% beta-hydroxy acid creams are Reviva and Paula's Choice.

Moisturize

Your skin is mainly composed of water. Multiple environmental stressors from sun to dust to wind try to pull this water out. The biggest market in skin creams is for products that effectively hold the water in, and even absorb more from the air. Here's the latest.

In one of the rare controlled studies of the cosmetics industry, Greg Hillebrand, chief chemist at cosmetic giant Olay, and his team, studied the progression of wrinkles in women for eight years. Their work has just been published in the British Journal of Dermatology (June 2010)4. They took standardized photos at the start and eight years later, of 122 women aged 10-72, with and without a smile. Severity of facial wrinkling was quantified using computer-based image analysis.

Each subject's unique pattern of facial wrinkling at year 8 was predicted by the pattern at the start. The drier the woman's skin at the start, the more wrinkled she was eight years later. This is the best evidence yet that moisturizers can save your skin.

The women were not confined to using Olay products. Those who used a moisturizer daily kept more water in their skins and developed less than half the wrinkles of those who allowed their skins to dry. We will cover the specific ingredients of a good moisturizer in the next article in this series.

Sunscreen

Photo aging by UV-A and UV-B is responsible for up to 80% of all skin aging.1,2

Beyond 30 minutes a day in moderate sun, one of the best ways to prevent skin aging is a light UV-A/UV-B sunscreen, especially on the face, including ears, neck, and backs of the hands.

All light skinned people benefit from this strategy. If you are using exfoliants, or skin remodelling creams, it is essential. Reasonable products are, Kiss My Face Face Factor, and Neutrogena Ultra Sheer Dry Touch.

Use the five strategies above, cleanse, exfoliate, remodel, moisturize, and sunscreen and give your skin a new beginning.

References
1. Stefanaki C, Stratigos A, Katsambas A. Topical retinoids in the treatment of photoaging. J Cosmet Dermatol 2005;4(2):130–134.
2. Yaar M, Gilchrest BA. Skin aging: postulated mechanisms and consequent changes in structure and function. Clin Geriatr Med. 2001;17(4):617-630.
3. U.S. Food and Drug Administration, - Beta hydroxy acids in cosmetics. FDA Consumer March 2000.
4. Hillebrand, G.G. et al New wrinkles on wrinkling: an 8-year longitudinal study on the progression of expression lines into persistent wrinkles Brit J Derm, 2010; 162:1233-1241.

In the next article we will cover the ingredients of a moisturiser that can keep the water in your skin for life.

Top Ten Tips for Fat Loss

Dr Michael Colgan

One big change in sports over the last 20 years is the disappearance of fatso. You used to see fat athletes everywhere, football, swimming, weightlifting, powerlifting, boxing, and track and field. Now, apart from Sumo wrestlers, the inertia of whose fat mass is a major part of their game, all the elite are uniformly lean.

The emphasis on lean really took off when science first impacted sports in the '70s. By the mid-'80s, sports medicine specialist, Jack Wilmore, of the University of Arizona, reviewed over 100 studies on bodyfat levels of athletes and concluded:

"There is a high negative correlation between percentage of bodyfat and performance".1

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It is pretty simple physics. All lifeforms, including humans, obey the laws of physics. The power of an athlete is his mass multiplied by the maximum velocity at which he can move it. For any given level of muscle strength, every ounce of fat mass reduces the maximum velocity, and thus reduces the athlete's power.

It applies to athletes and non-athletes alike. If you have any doubts, then run your best 400 meters. Now tie a couple of those 5 lb soft ankle weights firmly around you waist and run it again. You will immediately appreciate the meaning of, "Get the lead out".

Many of the up-and-coming athletes who appear on my doorstep are completely frustrated about their inability to get shredded, yet have no idea how to do it. Downing all sorts of expensive glop, from sports gels to perogies, diet pills to dowser's water, without science or focus or sense, it's no wonder they sport ample love handles. I have to conclude a very large proportion are simply brainwashed by the $60 billion a year fat-loss industry.

I've said it many times but it bears repeating in spades. The prime objective of the fat-loss industry is to keep folk coming back year after year to lose the same 20, 30, 40 lbs., over and over again, at the highest price the market will bear. No such nonsense will insult you here, because my job is to produce winning athletes, and the leaner they stay the more they win.

Myths of Fat Loss: Starvation

I have covered many myths of fat loss in detail in some of my books and recent articles.2-4 Here I will just list a few of the worst. Worst of all is the Starvation Myth, the notion that reducing calories below body maintenance level will get you lean. You do lose weight fast, as evidenced by the Biggest Loser TV show. In our instant gratification society, this explains why the method is still the mainstay of the weight-loss industry.

But, scientists have known for 30 years that the starving body goes immediately into defensive mode. It reduces available energy to exhaustion, increases appetite to ferocious, and excites the fat storage enzyme, lipoprotein lipase. Bingo, the minute you succumb to the munchies it sucks up every molecule and re-stuffs your fat cells to bursting, and then grows a lot more new fat cells to fill.5 The Biggest Loser show carefully conceals the long term results of their ministrations. Within two years, almost all the contestants who lost hundreds of pounds of flab on the show, have regained the bulk of it.

Reducing food below maintenance is even more deadly for athletes, because up to 45% of the weight lost is muscle, up to 6 lbs. of muscle loss per month.6 Real muscle is hard to gain. Three months on such a diet and you've lost all the gains you sweated for over the last two years.

Worse again, after such a diet you have less muscle to burn the fat. Muscle is the engine in which bodyfat is burned. Not only do you whack your athletic power with starvation diets, you also reduce your capacity to control bodyfat. Even the loss of one pound of muscle dramatically reduces your ability to burn fat.5

Mad Diets

Then there's the Mad Diet Myth. Countless books appear each year advocating this or that restricted food regimen. The grapefruit diet, the Hollywood diet, and the juicing diet spring to mind. As I document elsewhere, they are all woefully deficient in essential nutrients,4 which induces nutrient deficiency hungers that eventually raise appetite to uncontrollable.

Sport is rife with such diets, touting endless schedules of high protein/low carb days, low protein/high carb days, complex exclusion diets such as, carbs in the morning, protein at noon- and fat at suppertime. There's even a sports diet advocating high-fat intake all the time. Not a shred of scientific evidence supports them.

Hormones and Drugs

Just as bad is the Hormone Fat Loss Myth, using expensive injections of anabolic hormones such as growth hormone, testosterone, DHEA and IGF-1. Though all are legal through high-priced medical clinics, this practice is simply hormone poisoning. The toxic side effects quickly curtail use, and fat piles on again.7 Similar is the Prescription Drug Fat Loss Myth, using drugs such as fenfluramine and dexfenfluramine. Unsuccessful for long-term fat control, all they accomplish is irreversible damage to the heart, liver and brain.8

Mo' Protein

The Mo' Protein Diet Myth is nearly as bad. Eating a diet of almost all protein, becomes the darling of many athletes, because it does take off fat. But its effects on prostaglandins, plus the toxic metabolites of excess protein, turn your body into a chronic inflammatory machine. The very high protein advocate is plagued with joint, tendon and ligament problems.9 It's a great way to a short and painful athletic career, and crippled later life.

Skipping Meals

My last don't is the apparently innocuous, Skip Meals Diet Myth. It must reduce calories - right,.-.so it must reduce bodyfat. Wrong! Skipping meals destabilizes your insulin. When you do eat, you get a big insulin burst. Insulin is a storage hormone. It causes your body to store everything. Not only do you store extra food, but your liver converts all the excess insulin into triglycerides – fat, - and stores that too.10 So you can cut calories by skipping meals, yet still increase your bodyfat. As you'll see ahead, keeping a stable balance between the storage action of insulin and the catabolic action of its opposing hormone glucagon is crucial for being lean.

Science for Fat Loss

You body has a whole clockwork of mechanisms that can make you eat, and can manufacture and store fat from any form of food. The other side of this clockwork can curb appetite, and use bodyfat and foods for fuel and, independently, use bodyfat for heat.11 If you intervene gently and correctly at each cog in the clockwork, your body will change its habitual tendencies, and permanently reset itself at a lower level of bodyfat.

At the Colgan Institute we have achieved this apparent miracle with hundreds of athletes, some of whom, including myself, have remained lean without effort for up to 28 years to date. I like to get males on my programs to 8-10% bodyfat, females to 10-15% bodyfat, measured accurately by underwater weighing, and keep them there all year round. It's a profound benefit for performance. Here's the guts of lean for life.

Colgan's Ten Top Tips for Fat Loss

1. Never Put Your Body Into Fat-Defensive Mode

Most folk fail to change their bodyfat permanently because, in their haste to lose fat, they force the body to defend its habitual level of fat. After a few tries they sigh in resignation and blame their parents. Obviously, people do differ in their inherited tendencies to accumulate fat. But blaming your pudge on your genes is just part of the old, flapdoodle, psychobabble of the '70s. We know now that neither the number of fat cells you carry, nor their size, is genetically fixed.12 For most of us, bodyfat is a reflection of what we eat and what we do.

Once you trigger fat defense with the usual methods, such as skipping meals or chopping calories, or eating weirdo diets, or special low-calorie packaged meals, you lose the ability to permanently change your bodyfat. There is no way because your body is on alert fat defense all the time. Leave the latest diet fads for the brainless.

If you have been gulled into fad dieting, and have used any of its multiple forms for more than six months, you have put your body into terrible shape to lose fat and maintain the loss. Don't despair. Follow these tips, and within one year you will be able to control your bodyfat for life

2. Stabilize Your Insulin

Dieting, skipping meals, no-fat foods, snacking on energy bars instead of eating, all trigger insulin bursts. Insulin stores everything. Aim for insulin stability and insulin efficiency. It's the only way to stabilize your fat loss ability.

First, eat six small meals per day, each containing some low-glycemic carbs, high biological value protein and essential fats. Athletes on my programs, which have included more than 100 Olympians, eat at 7 am, 10 am, 1 pm, 4 pm, 7 pm, and 10 pm. They never suffer low blood sugar. Nor do they suffer insulin bursts. Their blood shows a stable balance between insulin and its catabolic partner, glucagon.3

Second, make your insulin more efficient with the following daily supplement formula:
400 mcg chromium picolinate; 300 mg R+-lipoic acid; 25 mg DHEA; 40 grams of omega-3 fats.13

3. Eat The Right Fats

The only fats you need are the essential fats linoleic acid (omega-6) and alpha-linolenic acid (omega-3).14 Essential fats in amounts that you need will not put on bodyfat. Adequate amounts are, linoleic acid 10 grams (1 tablespoon), alpha-linolenic acid 40 grams. Use wild ocean fish and fish oil capsules, and use flax oil (4 tablespoons in your daily protein shake). Flax oil is 4:1, omega-3 to omega-6.

Other than essential fats, cut all the fat in your diet to a minimum. Fats put on more bodyfat than the same number of calories from other foods.15 Keep total fats to 15% of daily calories.

4. Eat Low Glycemic Carbs

I have documented elsewhere how carbohydrates are classified in terms of their capacity to raise blood sugar.2 Stick to those with a low glycemic index. The biggest error we see with dieters is the use of dry crackers, or worse, rice cakes These all have a glycemic index about the same as, or higher than, table sugar. They are all rapidly converted to sugar in the blood. They cause insulin to go berserk, turn the sugar into triglycerides, and store, store, store the fat.2

5. Fiber Up

Fiber absorbs food and slows the entry of sugar into the blood, so it helps stabilize insulin.3 It enables your body to better use the food for fuel rather than for storage as bodyfat. As a bonus it fills you up. I list high fiber foods – mainly whole grains and vegetables, in some of my books.2-4

6. Bracket Your Workout

The worst of rapidly cutting bodyfat – as many athletes know – is the loss of muscle and strength that accompanies it --- especially when you do it wrong! In addition to insulin efficiency, we use another little trick that works well to prevent muscle loss. Bracket your workout on both sides with a decent protein shakee. Mix the following:

- 60 grams good whey protein isolate
- 30 grams essential fats from organic flax oil
- 5 grams creatine monohydrate
- 3 grams l-glutamine
- 2 grams of ornithine-alpha -ketoglurarate (OKG) or arginine-alpha-ketoglutarate (AKG)
- 1 banana or other fruits to taste

Divide the shake in two. Take one-half on rising in the morning, before morning workout, together with your morning vitamins and minerals and insulin stabilizers. Take the other half immediately after workout. That bracket goes a long way to increase the anabolic drive of muscle gain.

7. Do The Right Exercise

Weight train and do your all out training in the mornings, when the circadian rhythm of your anabolic hormones best enable you to increase muscle and strength. Do aerobic exercise at least 45- minutes per day to encourage fat burning. Do your aerobics in the morning also, and it will raise your metabolic rate the whole day.3

8. Boost Your Anabolic Drive

As an athlete, anabolism is what you seek. It's a big subject, beyond the scope of this article. I covered it in detail in my book **Optimum Sports Nutrition** (out of print). All I can fit here is: use creatine, use l-glutamine, drink a lot of water, use OKG at night, We will cover this again in a future article.

9. Boost Your Body Heat Mechanism

You can induce the body to use fat directly for heat, without first being converted to ATP. This important mechanism involving what are called uncoupling proteins, was discovered independently in Swiss and American laboratories in 1997.17 One-third of your body heat is produced by uncoupling fat from the usual ATP process. It is termed thermogenesis.

One subtle and effective way to stimulate uncoupling proteins is a spicy diet. Cayenne, from the Greek "to bite", comes from capsicums, the hot, red peppers used for flavoring foods. The most important substance in cayenne is a group of chemicals collectively called capsaicin. The usual bell peppers you see in the supermarket come from cultivars that are so in-bred they no longer contain capsaicin. Only hot peppers are of any use.

By the 1990s, controlled studies were showing that red pepper in meals dramatically increases thermogenesis, and energy use.20 Specifically, in animal studies, red pepper increases the use of body fat as fuel to produce the extra heat.21 In the brain, it causes stimulation of catecholamines, and increased activity of the sympathetic nervous system that regulates heart rate, blood pressure, and breathing.22 That is, capsaicin energizes the body, but not in the same way as a stimulant, such as caffeine.

Probably the most important effect of capsaicin is that it activates an enzyme with a complicated name, 5' adenosine-monophosphate-activated-protein-kinase, (AMPK for short). It is a critical enzyme in energy homeostasis. AMPK is expressed mainly in your liver, muscles, and brain. Its function is to stimulate fatty acid oxidation, and ketogenesis (production of ketone bodies to make energy available from fatty acids). In simple terms, it releases fat for use as muscle fuel, and then excretion from the body.

At the same time, AMPK inhibits lipogenesis (formation of new body fat) and inhibits formation of new adipocytes (fat cells). As a bonus, it also inhibits formation of cholesterol and triglycerides. And, it regulates insulin secretion from the pancreas. First explained in 1999, AMPK is now considered the metabolic

master-switch of the human body.23,24

Using capsaicin is simple. Eat hot peppers in cooking and in meals out whenever you can. Change your diet to include hot salsas, curries and hot sauces. Make them a regular part of your food. In addition, use cayenne pepper, 1/4 - 1 tsp, in appropriate recipes. You can also take cayenne supplements of 500 mg-1000 mg with meals.

Start easy both in eating capsaicin and cayenne and in handling them. Remember, capsaisin is the main ingredient in pepper spray. If you are not used to hot peppers, be sure to use gloves when preparing them for cooking, and do not touch your face. Start with the milder types such as serranos: (Capsicum annuum). They have a heat factor of 5,000 to 15,000 Scoville Units. With its clean, biting flavor and high acidity, the serrano is a popular addition to salsas and sauces

10. Go Long-Term

Fat loss and a permanent low-fat body are not achieved overnight. If you follow these tips, you may think that nothing is happening to your body. But I'll pledge my 35 years of work with athletes that your body is slowly changing to a permanent leaner state. Look at one year minimum to do it, even if you are not fat now. Just altering from a habitual 12-15% fat to 8-10%, can take at least a year to accomplish if you follow everything perfectly.

The common question we get is, Do you have to deprive yourself for life? No you don't deprive yourself at all. Watching the fights last night I ate a whole packet of chocolate cookies. Today, without taking any extra supplements, my uncoupling thermogenesis is in overdrive, as I walk around in the cold Canadian weather, comfortably warm in a T-shirt. Done right, fat loss is a snip.

References:

1. Wilmore JH. Body composition in sport and exercise. Med Sci Sports Exer, 1983;15:21-23.
2. Colgan M. The New Nutrition: Medicine for the Millennium. Vancouver: Apple Publishing, 1995.
3. Colgan M. Optimum Sports Nutrition. New York: Advanced Research Press, 1993.
4. Colgan M. Nutrition for Champions. Vancouver: Science Books, 2007.
5. Enzi G, et al (eds). Obesity: pathogenesis and Treatment. New York: Academic Press, 1981.
6. Oskai LB. In Wilmore VH (ed). Exercise and Sports Science Reviews. New York: Academic Press, 1975:105-123.
7. Yarasheski KE, et al. Growth hormone therapy for the elderly. The fountain of youth proves toxic. JAMA, 1993;270:1694.
8. Mc Cann VD, et al. Brain serotonin neurotoxicity and primary pulmonary hypertension from fenfluramine and dexfenfluramine. JAMA, 1997;278:666-672.
9. Colgan M. Beat Arthritis. Vancouver; Apple Publishing, 1999.
10. Colgan M. Your Personal Vitamin Profile. New York: William Morrow, 1983
11. Fleury C, et al. Uncoupling protein-2: a novel gene linked to obesity and hyperinsulinemia. Nat Genetics, 1997;15:269-272.
12. Bennett W, Gurn J. The Dieters Dilemma. New York: Basic Books, 1982.
13. Colgan M. Creatine for Muscle and Strength. Vancouver: Apple Publications, 1997
14. Colgan M. Essential Fats for Athletes. Vancouver: Apple Publications, 1998.
15. Wade GN. Physiol and Behav, 1983;29:710.
16. Boss O, et al. Uncoupling protein-3 a new member of the mitochondrial carrier family with tissue specific expression. Febs Letters, 1997;408:39-42.
17. Vidal-Puig A, et al. UCP-3: an uncoupling protein expressed proferentially and abundantly in skeletal muscle and adipose tissue. Biochem Biophys Res Comm, 1997;235:79-82.
18. Ghorbam M, et al. Hypertrophy of brown adipocytes and white adipose tissues and reversal of diet-induced obesity in rats treated with a beta-3 adrenoceptor agonist. Biochem Pharmacol, 1997;54:121-131.
19. McCarty M, Gustin J. Pyruvate and hydroxycitrate carnitine may synergize to promote reverse electron transport in hepatocyte mitochondria, effectively uncoupling the oxidation of fatty acids. Submitted paper Med Hypoth-

eses, 1997.
20. Kawada T, Watanabe T, Takaishi T, Tanaka T, and Iwai K. Capsaicin-induced beta-adrenergic action on energy metabolism in rats: influence of capsaicin on oxygen consumption, the respiratory quotient, and substrate utilization. Proc Soc Exp Biol Med 183: 250–256, 1986.
21. Yoshioka M, St-Pierre S, Suzuki M, Tremblay A. Effects of red pepper added to high-fat and high-carbohydrate meals on energy metabolism and substrate utilization in Japanese women. Br J Nutr, 1998;80(6):503-510.
22. Watanabe T, Kawada T, Kurosawa M, Sato A, and Iwai K. Adrenal sympathetic efferent nerve and catecholamine secretion excitation caused by capsaicin in rats. Am J Physiol Endocrinol Metab 1988;255:E23–E27.
23. Bloomer RJ, Canale RE, Fisher-Wellman KH. The potential role of capsaicinoids in weight management. Agro-Food, 2009;20(4):60-62.
24. Winder WW, Hardie DG. "AMP-activated protein kinase, a metabolic master switch: possible roles in type 2 diabetes". Am. J. Physiol. 277 (1 Pt 1): E1–E10.

Know Your Aging Status

Part 1: Time for a Check Up

Dr Michael Colgan

Numerous people have a consult or take a program with us, and then we don't hear from them for as much as a decade. When they do get in contact again, one of my first questions is "What date was your last health check-up." Often the answer is, "Don't go to the doctor," or, "Haven't been ill". Then I ask how often they have a dental check-up. The common answer is, "Once a year", or at most, "Once every two years".

Because of great advances in dentistry, a lot of folk die today with beautiful teeth. Yet you do not even need teeth to live a long and healthy life. But you do need a healthy heart, arteries, liver, kidneys, and brain. Strange. Our culture seems to place more importance on keeping a good set of choppers, than a good set of vital organs. Or perhaps it's just those little postcards we get every year from the dental office, jogging our conscience.

If you are to succeed in delaying aging, you need to check on all your vitals at least as often as you check on your teeth. So I want to jog your conscience about regular check-ups for the rest of your body. It is not a huge thing, certainly not the cost of one ceramic crown. Yet it could save your health. We get so many people referred to us too late. They have waited until illness has become serious, and painful, and debilitating, and often irreversible, before doing anything about it, beyond a few painkillers or antibiotics from their local doctor.

As I have written many times, if you are past the growth period of your life (up to age 25) then the time to inhibit aging is now, whatever age you may be. Every year after age 25, aging becomes progressively more difficult to stop. Surgery, for example, such as correction of trauma, limb replacement, heart surgery, becomes more risky and less successful with every passing year. A 25-year-old will usually bounce back from a compound fracture, a 35-year old, not so easily. By age 45, the healing is often complicated by the beginnings of arthritis, bone loss, or other degenerative disorders. After age 55, full recovery may never occur again.

The same goes for strategies to inhibit aging. Put in place early, in a healthy person, they are very effective. But there are literally thousands of folk who have been referred to me over the years, who have waited until they have already swollen into a Body Mass Index of 30+ (obese). Or they have blood pressure over 140/90 mm/Hg, (hypertension). Or they have developed fasting blood sugar over 120 mg/dL (adult-onset diabetes). Or they have cholesterol, triglycerides, and other blood lipid counts that read like a cardiovas-

cular death sentence. All these disorders come replete with damage to the heart, vascular system, liver, kidneys, and brain.

In a young person, reversal of these and many other conditions is usually a snip. As age progresses, however, they become more and more difficult to change, and may result in a sudden drop-off over the cliff into irreversible disease. So, if you are concerned to inhibit aging, start when it is easy. I will stress it again, the time for a check-up is now, and every two years hereafter. It is about what the average person does to maintain their teeth. As with teeth, many blood tests today can spot the beginning of disorders in plenty of time to reverse them. To assist you, I will outline some of the common tests we use and what they may mean for your future health.

High in Reference to What?

One big problem with blood tests is the reference ranges, also called "normal ranges", that are used by your doctor for interpretation. Medical laboratories use reference ranges based primarily on representative random samples from the public who are not manifestly under medical treatment for a serious disease. Obviously, they exclude people who are deathly ill, but, in order to maintain the random sampling, these ranges have to include many sick people as normal. Why? Because, otherwise there would be very few people left to sample, and the ranges would be so skewed towards good health that the blood results of most people would be abnormal. So, the reference ranges are a compromise. They include enough sick people to set the range wide enough so that most people who are not obviously ill will come out as normal.

Medical reference ranges cannot avoid derivation in this way because more than half the US and Canadian populations are sick. Any random sample, for example, will include more overweight people than lean people, because approximately 70% of the American and Canadian populations are medically overweight.1 The random samples will also include a big chunk of the 26 million folk who have fasting blood sugar so high that it signals insulin resistance and adult-onset diabetes down the road.1 The samples will also include many of the 40 million who carry too much cholesterol in their blood, signalling impending cardiovascular disease.1 The samples also cannot avoid a large proportion of the 74 million who suffer from hypertension, and a large proportion of the over 80 million in the US and Canada who have arthritis.2 And about half of the people in every sample are also using prescribed medication every day. Thus, "normal ranges", derived from these samples, do not represent people who are in the best of health, and are of little value in assessing individuals who aim to improve their health and longevity.

Recognising these problems more than 25 years ago, the Colgan Institute began to compile a set of reference range based on athletes and regular exercisers in our programs. We included only those who had no signs of the above disorders, or numerous other degenerative conditions, who were not taking prescribed medication, and who were shown by our tests to be in very good health and physically fit. To date we have included the blood tests of more than 20,000 male and female athletes/exercisers in our reference range calculations, ranging from ages 15 -89.

Over the years, we have also included criteria of healthy aging from the 14 long-term, large-scale studies of aging currently ongoing throughout the world, and from large research studies of the prediction of disease. We have also developed a computer algorithm that analyses more than 40,000 predictive patterns and probabilities among the blood tests, to produce a more complete picture of the individual.

Our reference ranges and algorithm are thus very different from the medical "normal ranges" derived from random samples of the US and Canadian populations, more than half of whom are ill. We believe that our system, which some practitioners call "ideal ranges," is the best available for indicating the beginnings of disorder and for predicting future health and longevity. Some of our predictors are included in the Colgan Longevity Scale, a simple questionnaire that you can do at home to derive your personal estimate of healthy

life. 3

Holy Cholesterol

A couple of examples will clarify the differences between Colgan Institute reference ranges and usual medical reference ranges. I will take examples of disease processes that are silent. That is, you do not feel anything until they hit you as full-blown disease. That is why it is so important to get regular check-ups. Otherwise, you will not know. So many times I have to face the gloomy prospect of telling people they have come to me too late, and the best they can do is to try to manage an incurable progressive disease for the rest of their life.

The bulk of these silent disease processes are environmentally caused, That is, you. by your choice of nutrition, lifestyle, and living environment, cause them yourself. Therefore, they are highly amenable to cure, but only if they are caught before the body lapses into irreversible degeneration. To cure them, you have to know they are happening to you.

One well-known variable is total serum cholesterol. The relationship between total cholesterol level and coronary heart disease is terrifyingly accurate. The Colgan Institute Reference Range for total cholesterol is 120-185 mg/dL (3.1-4.8 mmol/L). We first established this range in1987 from our athlete clients and from worldwide research, especially the research led by world cholesterol expert Dr Jeremiah Stamler and his team at Northwestern University in Chicago. At that time, the medically acceptable "normal range" was 150-225 mg/dl (3.9-5.8 mmol/L).

Stamler and his colleagues at various universities followed a massive sample of 356,222 apparently healthy men for six years, the largest study ever done on cholesterol. It cost tens of millions of $$$, but was considered most important by the US government, because it set the gold standard for interpretation of cholesterol levels as predictive of coronary heart disease. Coronary disease is still the biggest killer in the US today and the first symptom, a heart attack or stroke, is often the last and only symptom, swiftly followed by death. Cholesterol, the silent indicator of the coronary disease process, is predictive of the mounting disease for up to 25 years before it occurs.

Stamler and colleagues first published the results in 1986, in the Journal of the American Medical Association.4 Men with total cholesterol below 181 mg/dL (4.7 mmol/L) had a very low risk of developing coronary disease. Those with total cholesterol of 181-202 mg/dL (4.8-5.2 mmol/L) had progressively increased risk. Those with total cholesterol above 202 mg/dL (5.2 mmol/L) proved to have a high risk of future coronary disease. In 2008, Stamler published the 25 year continuation of this study. The effects of cholesterol levels were exactly confirmed for all the deaths from coronary disease in the cohort that have occurred since 1986.5 Approximately half of the deaths were directly attributable to the artery-blocking effects of high cholesterol in the blood. This is medical science at its best.

Yes, the research did impact the acceptable (i.e. "healthy") medical range for cholesterol, which today is 150-202mg/dL (3.9-5.2 mmol/L), a drop of 23 points. But it is far from enough. As Stamler has noted in numerous papers, this range includes the great majority of middle-aged American men, who are at considerable risk of premature death from coronary heart disease, yet are deemed "normal" by their physicians.

Even those within the old acceptable range of 202-225 mg/dL (5.2-5.8 mmol/L) are now treated routinely only with a statin drug. Statins hold the lid on cholesterol levels, but do nothing to alter the disease process that is raising them in the first place.

At the Colgan Institute, from our reference range of 120-185 mg/dl (3.1-4.8 mmol/L) derived only from the healthiest of people, we know that anyone with a serum cholesterol over 185 mg/dL (4.8 mmol/L) is at considerable risk of future coronary disease, and we advise strong interventions to reverse the disease

process that is raising cholesterol levels.

The Homocysteine Debacle

A second good example of the difference between Colgan Institute reference ranges and usual medical reference ranges is homocysteine, another silent and insidious disease process. After 30 years of superb research, the work of Dr Kilmer McCuddy and colleagues was finally applauded by the American Medical Association in 1998.6 Since then, high homocysteine levels have been accepted as a strong medical risk for cardiovascular disease. We know from recent research, that they are a lot more than that, High homocysteine is also a predictor of osteoarthritis, rheumatoid arthritis, depression, and Alzheimer's disease.7 Usual medical reference ranges and indications for homocysteine do not yet allow for these possibilities, and certainly do not have the means to cross reference to other patterns in an individual's blood tests that would confirm the evidence.

The Colgan Institute Reference Range for blood homocysteine levels is 0.0-6.0 umol/L. We established this range in 1988 from research showing that the risk of developing heart disease, arthritis, depression, and Alzheimer's rises as levels of homocysteine go above 6.0 umol/L. The usual acceptable medical range is 0.0-12.0 umol/L. Yet, from voluminous research, we, and physicians everywhere, know that people in the range 6.0-12.0 umol/L are at progressively increased risk. Why then is the medical range so wide? Simple. More than half the American population have homocysteine levels above 6.0 umol/L. If the medical range was to follow the research, then half the total American population would be considered candidates for treatment for high homocysteine levels. To reduce the acceptable range today would create over 100 million potential new patients.

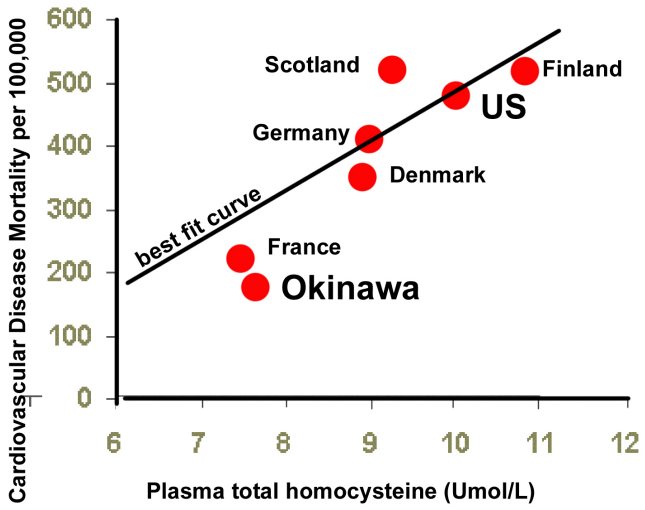
The current acceptable medical range for homocysteine is a bad compromise to allow for the high levels of homocysteine that have developed in the US population over the last 50 years. Here is a potent example of the evidence that every second person you pass in the mall is a walking homocysteine disease risk. The longest lived people and some of the healthiest in the world are the Okinawan Islanders of Japan.8 On average they live about 5 years longer than Americans, spend almost nothing on medical treatment, suffer very little of the host of degenerative diseases that plague North America, and have almost no Alzheimer's. We and numerous other researchers have been studying them for the last 20 years.

Here is just one of the reasons they live so long and healthy. It was confirmed solidly in1997. The graph below shows blood homocysteine levels in a sample of different countries. You can see that the average level of homocysteine in Americans is about 10.0 umol/L. And, as the graph shows, the US level of cardiovascular mortality is one of the highest in the developed world. In Okinawa, however, the average level of homocysteine is 7.6 umol/L, and their level of cardiovascular mortality is the lowest, beating even France and the fabled Mediterranean diet

You can see also from the graph that the researchers took the range of homocysteine of 6.0-12.0 umol/L as the most important. And you can see from their best fit curve, that the risk of cardiovascular mortality rises sharply from 6.0 umol/L. That is exactly the level that our research in 1987 showed to be the significant beginning of disease. Yet it is ignored in current medicine, even though it is easy and inexpensive to lower homocysteine levels. That many people choose to wait until it is too late, and suffer a heart attack, or the onset of arthritis, or Alzheimer's, before trying to do anything, seems incomprehensible. The best explanation we can muster, is that they hesitate to investigate their health for fear of what might be found. The answer to that is, a fear faced is a fear known, and capable of defeat.

Of course there are many other factors involved as well as cholesterol and homocysteine. But they are big risks for multiple diseases that are glossed over in current medical practice. That is why it is so important to have an anti-aging check-up every couple of years, and take direct action to fix indicators of disease. There

are some 30 more silent indicators of impending disease, that can be discovered and reversed, but only if you have the appropriate blood tests every two years or so to spot them. Do not allow yourself to get into the position that I hear so often:



From, Alfthan G, et al. Lancet, 1997;349:397.

Homocysteine levels and cardiovascular mortality.

"I took my health for granted. I did not realize what bounty I had, until I lost it".

Give your vital organs a break, and look after them at least as well as you look after your teeth.

In the next article in this series, I will discuss further readily available blood tests that, with the right interpretation, can help you inhibit aging and maintain your health lifelong.

1. Colgan M. Nutrition for Champions. Vancouver: Science Books, 2007.
2. Centers for Disease Control, National Arthritis Data Workgroup .http://www.cdc.gov/arthritis/data_statistics/faqs/case_definition.htm.
3. Colgan Longevity Scale. Vancouver: Science Books,
4. Stamler J, et al. Is the relationship between serum cholesterol and risk of premature death from coronary disease continuous and graded? Findings in 356,222 primary screenees of the Multiple Risk Factor Intervention Trial. JAMA, 1986; 256:2823-2828.
5. Stamler J, et al. The Multiple Risk Factor Intervention Trial (MRFIT)—Importance then and now JAMA. 2008;300(11):1343-1345.
6. McCully K. Homocysteine, folate, vitamin B6 and cardiovascular disease. JAMA, 1998; 279:372-373.
7. Colgan M. Beat Arthritis. Vancouver:Apple Publishing, 2000.
8. Okinawa Centenarian Study. http://www.okicent.org/

The World's Oldest People

Walter Breuning

Up to June 2009,the world's oldest living man was Tomoji Tanabe of Japan. He died at his home at age 113. Henry Allingham of England, born in Clapham, London, on 6 June 1896 inherited the title until he died on 18 July 2009 at age 113. As of 10 June 2010, the oldest living man is 113 year old Walter Breuning of the United States, who was born on 21 September 1896. Oldest living woman is 114 year old Eugénie Blanchard of Saint Barthélemy, France, who was born on 16 February 1896.1

1. http://www.grg.org/calment.html. Accessed 10 June 2010

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