

REPORT

Preventing Cardiovascular Disease Naturally

By Julius Goepf, MD

In our war against heart disease,¹ too many Americans sadly continue to rely purely on risky surgical treatments that can only be effective after the fact—after years of neglect and even abuse of their naturally resilient bodies.²⁻⁶ And while our pharmacopoeia of drugs is indeed large and powerful, it is only a small part of an integrated solution to this global problem.⁷⁻⁹

The good news is that experts are now increasingly recognizing the value of nutritional, dietary, and lifestyle therapies for cardiovascular disease prevention and management.¹ In particular, an apparently simple combination of nutrients (from a berry and vegetable sprouts) has shown remarkable clinical effectiveness in lowering dangerous low-density lipoprotein (LDL) and triglycerides, raising protective high-density lipoprotein (HDL), reducing inflammation, and reversing visible atherosclerotic changes in damaged blood vessels. This unique formulation offers a broad-spectrum nutritional approach to preventing and treating arterial occlusion as we age.



A POWERFUL NUTRITIONAL STRATEGY TARGETING OXIDATION AND INFLAMMATION

Basic research has provided essential clues, which, coupled with ancient traditional healing wisdom, has resulted in a practical **combination of nutrients** for cardiovascular disease prevention. Let's examine the elements of this simple cocktail in order to understand how the extract of an exotic berry, coupled with components found in vegetable sprouts, can address the inflammation and oxidant damage to our blood vessels.

AMLA BERRY EXTRACT OPTIMIZES LIPID PROFILES, BLOCKS ATHEROSCLEROTIC CHANGES

The Indian Gooseberry (*Emblica officinalis*) has been well known to practitioners of Ayurvedic medicine for more than 3,000 years.¹⁰ Long ignored by Western scientists in their quest for single "miracle molecules," the Indian Gooseberry, also known as amla, belongs to a group of herbal preparations that according to Ayurvedic texts promote longevity, induce nourishment, and prevent the effects of age.¹¹ Modern scientific research has found that the powers of many such herbal preparations stem from their potent antioxidant capabilities.^{10,12,13} There is growing evidence that the humble *amla berry* offers nearly legendary powers in healing and preventing atherosclerosis and related cardiovascular disease. In fact, it turns out that properly purified extracts of *amla* act in the following very precise ways to break the cycle of oxidation, inflammation, and plaque formation that underlies *atherosclerosis* and its disastrous consequences:

- Amla extracts rank near the top of the list of natural compounds most effective at preventing the atherosclerosis-triggering oxidation of LDL and other fats.¹⁴
- Amla extracts reduce oxidant damage and scavenge free radicals while reducing blood sugar in diabetic laboratory animals.¹⁵
- Amla extracts reduce total cholesterol and LDL in animal studies.¹⁶⁻¹⁹
- Amla extracts inhibit production of *advanced glycation end products* (AGEs),²⁰ damaged, "sugar-coated" proteins that contribute to endothelial dysfunction and atherosclerosis.²¹⁻²⁵
- Oxidant damage following experimentally induced heart attacks in rats is *entirely prevented* when animals are supplemented with amla for 14 days prior to interruption of cardiac blood flow.²⁶
- Amla extracts reduce both serum and tissue lipid levels in animals by mechanisms similar to those of the "statin" drugs—

- Amla prevents inflammatory blood cells from “sticking” to endothelial linings, and subsequently prevents oxidant-induced thickening of vessel walls^{29,30}—critical first steps in the production of atherosclerosis.^{31,32}

All of these laboratory studies explain how amla extracts achieve the effects long recognized by practitioners of ancient medicine. But where is the human clinical evidence to satisfy today’s critical Western scientists? As usual, human trials have lagged behind promising animal studies, but they are now catching up with compelling results. Here are just a few of the highlights of how amla is winning the hearts and minds of modern evidence-based medical providers.

Nutritionists in New Delhi provided amla supplements for 28 days to men aged 35-55 years, who had either normal or elevated cholesterol levels.³³ Both groups experienced decreases in total cholesterol levels, which rose back to nearly their original levels two weeks after stopping the supplement.

A more detailed study comes from the All India Institute of Medical Sciences in New Delhi.³⁴ These researchers used amla in the form of an **amla-containing-vitamin C-rich** traditional Indian supplement. Ten healthy young men took either the amla/vitamin C supplement or vitamin C alone daily for eight weeks, then no supplement for another eight weeks. Lipid profiles and glucose tolerance tests were done before supplementation and throughout the study. The results were remarkable: compared with the vitamin C-only group after eight weeks, the amla-supplemented group experienced a nearly 11% increase in HDL levels, more than a 16% drop in LDL levels, and a drop in the LDL-to-HDL ratio of more than 33%.³⁴ These numbers are actually equal to or better than similar measurements in a recent study of the fibrate class of prescription drugs, in which significant safety concerns were raised!³⁵ Subjects in the supplemented group also experienced a reduction of nearly 14% in fasting blood glucose and other measures of glucose tolerance—another beneficial effect for vascular health.³⁴

Still more recent studies have been conducted but not yet published by the manufacturers of Amlamax™, a highly concentrated and purified form of the most active components of the amla berry. This extract is manufactured in strict adherence to the Ayurvedic principles of using a fresh fruit juice from a particular age of the berry, preserving the specific polyphenol content unique to amla.³⁶ It is important to recognize that these studies have not yet been fully reviewed by a panel of experts (the “peer review” process), but the results are impressive and deserve mention.

Researchers enrolled normal healthy human volunteers who took the supplement for six months—either 500 mg/day (22 subjects), or 1,000 mg/day (17 subjects).³⁶ Subjects’ average total cholesterol dropped from 215 mg/dL before supplementation to 185 mg/dL after three months, remaining below 190 mg/dL after six months of using the supplement. At the same time, *cardioprotective HDL levels actually rose* from 40 mg/dL before supplementation to just over 44 mg/dL by six months—a modest but statistically significant rise.

The same study demonstrated important effects of amla on other atherosclerosis risk factors as well. Levels of inflammatory C-reactive protein (CRP), which is associated with higher risk for atherosclerosis,¹² dropped by 40% in the supplemented patients at six months.³⁶ Finally, average blood sugar levels dropped from about 110 mg/dL (slightly elevated) to around 90 mg/dL (a level considered optimal by most doctors).³⁶

Another unpublished study from Amlamax™ capitalizes on amla’s ability to mimic the actions of the statin drugs (preventing production of cholesterol in the body by blocking an enzyme in the production cascade).³⁷ Fifteen patients were randomly assigned to receive the amla supplement 500 mg/day, while 15 others received only dietary restriction and exercise (the control group). No adverse effects were reported. Supplemented patients experienced a significant reduction in total cholesterol of 17%, in LDL of 21%, and a reduction in total triglycerides (non-cholesterol fats) of 24%. Significantly, this study also found a protective elevation of HDL—by a substantial 14% in the supplemented group.

Exciting data published in the *Indian Journal of Pharmaceutical Sciences*²⁷ now show how amla (in the same concentrated form, Amlamax™), has an additional beneficial effect recently shown in statin drugs as well: relieving endothelial dysfunction and vascular stiffness directly.³⁸ Researchers first induced disordered lipid profiles and atherosclerotic vascular changes in laboratory rabbits.²⁷ When the diseased animals received amla extracts for four months, they experienced *reversal of the blood vessel changes*. In fact, the researchers reported that “the lumen [inside] of the aorta became normal as in the control group.” Measurement of the activity of a key enzyme in cholesterol synthesis showed it to be markedly inhibited (just as with “statin” drugs). The researchers concluded that amla exerts its powerful anti-atherosclerosis activity by a variety of factors, including its strong antioxidant capacity which prevents oxidation of LDL (and hence inflammation), and its inhibition of the vital cholesterol-producing enzyme.



These studies provide compelling modern scientific support for wisdom that's already three millennia old: amla extracts, properly prepared and purified, affect virtually every phase in the cascade of events leading to atherosclerosis. Purified amla extracts can go head-to-head with existing pharmacological therapies in fighting cardiovascular diseases by lowering levels of dangerous LDL and raising those of protective HDL, inhibiting oxidant damage to endothelial cells and other tissues, reducing inflammatory changes that promote vascular damage, and now actually reversing significant visible atherosclerotic changes in damaged blood vessels.

WHAT YOU NEED TO KNOW: PREVENTING CARDIOVASCULAR DISEASE NATURALLY

- Cardiovascular disease remains the leading cause of death in the US, despite many known preventive interventions.
- Lowering total cholesterol is only part of the prevention picture—raising levels of HDL can bolster antioxidant protection and optimize endothelial health.
- Medications are effective at lowering total cholesterol and LDL, but offer little benefit in terms of raising HDL.
- New discoveries highlight the importance of additional cardiovascular health promotion strategies such as increasing activity of protective PON1 enzymes and reducing those of injurious CETP.
- A combination of a 3,000-year-old berry extract plus a modern scientifically validated vegetable sprout preparation has resulted in a dynamic combination that can optimize lipid profiles while maximizing cardiovascular prevention.
- These nutrients complement each other in scientifically credible ways that support age-old nutritional wisdom.

HDL: WHAT MAKES IT BENEFICIAL?

Educated readers already know that HDL is considered a helpful form of blood lipid that is known to be cardioprotective—but even medical scientists are only now learning exactly why. There are two main reasons: HDL proteins hasten the *reverse transport* of cholesterol away from the arterial wall for elimination in the liver,³⁹ and certain proteins in the HDL complex directly prevent the LDL oxidation that is an early trigger for atherosclerosis.^{40,41} For these reasons, pharmaceutical companies have been hot on the trail of drugs that not only lower LDL, but raise HDL levels—unfortunately with only mixed results.^{41,42}

In addition to HDL-raising efforts, therefore, scientists are pursuing ways to build on the cardioprotective effect of HDL-associated protein complexes. Enhancing HDL's ability to prevent LDL oxidation is one useful and effective approach. That is why we're getting so excited about other proteins found in and around the HDL complex itself—proteins that are turning out to have a dramatic impact on cardioprotection and longevity.

One of the most promising avenues under exploration is modulation of paraoxonase 1 (PON1). Paraoxonase 1 is a serum enzyme capable of detoxifying toxic compounds used as insecticides into relatively harmless compounds,⁴³⁻⁴⁵ and it has now been found as part of the HDL protein complex, where it directly contributes to HDL's antioxidant effects.^{40,41,46,47} Increased PON1 activity is associated with decreased risk of cardiovascular disease,^{48,49} while people with low PON1 levels are more likely to develop the metabolic syndrome and its deadly components.⁴¹ Promoting PON1 activity has become an important goal in the search for drug treatments to reduce cardiovascular risk.⁴²

Another protein with a vital role in cholesterol management is *cholesteryl ester transfer protein* (CETP), which helps transfer cholesteryl esters from beneficial HDL to detrimental very low-density lipoprotein (VLDL) and LDL. Individuals who are deficient in CETP have elevated levels of protective HDL.⁵⁰ This means that, in contrast to PON1, increased CETP activity is associated with *increased* cardiovascular risk, while inhibition of CETP may reduce risk and enhance health.⁵⁰ In fact, recent evidence shows that partial suppression of CETP activity in human plasma decreases lipid transfer to the dangerous LDL complexes⁵¹—making CETP inhibition a promising area for drug development.⁵⁰

CARDIOVASCULAR DISEASE—STATE-OF-THE-ART KNOWLEDGE

To easily grasp the promise of the modern nutrient-based approach to cardiovascular disease prevention, we'll need a quick update on what's known about this complex condition. *Cardiovascular* disease is actually a general term for an entire group of conditions ultimately caused by *atherosclerosis*, once known as “hardening of the arteries.” For centuries, just about all that Western science knew about atherosclerosis was that it arose in people who ate too much fat and got too little exercise; as medicine matured in the early 20th century, we learned that there might be genetic components as well.⁶⁵

Currently we understand that *oxidant damage* to vulnerable fat molecules is among the earliest triggers for atherosclerosis.⁶⁶ These damaged molecules attract the attention of normal immune system cells that then produce *inflammation*, which in turn damages the delicate cells lining blood vessels (*endothelial cells*).⁶⁷ Damaged endothelial cells in their turn are impaired in their vital ability to signal and respond to changes in blood flow and pressure, resulting in overgrowth of the blood vessels' muscular layer.⁶⁸ Endothelial damage also triggers accumulation of serum proteins and platelets (clot-forming cells), resulting in the familiar *plaque* that bulges into blood vessels, reducing blood flow to extremities and vital organs.⁶⁹ But plaque itself can stimulate even more inflammation, and can even develop tiny blood vessels of its own, destabilizing the plaque and actually causing it to grow.⁷⁰ Ultimately, plaque deposits can rupture, often producing catastrophic consequences such as heart attacks and stroke, while less dramatic consequences include chronically reduced blood flow that can produce impaired cognition and decreased exercise tolerance.

Sounds like a pretty bleak picture, but of course that's less than half of the story. We've made tremendous progress in understanding more details about each step in the cascade of events leading to atherosclerosis. In particular, strategies aimed at increasing levels of beneficial high-density lipoprotein (HDL)^{71,72} and lowering detrimental low-density lipoprotein (LDL) and triglycerides^{73,74} have had good success. These strategies include dietary modifications, exercise plans, and of course a host of new drugs. Unfortunately, many people, particularly those who already suffer from obesity and the exercise limitations caused by vascular disease, have difficulty making the substantial lifestyle changes that are called for.⁷⁵ And most prescription drugs, such as the statins (simvastatin and others) and fibrates (gemfibrozil and others) currently in use have had mixed success and produce side effects in some people.^{69,76-80} For all of these reasons, open-minded and creative health care providers are constantly in search of other approaches that can reduce the consequences of fat oxidation, inflammation, and the catastrophic cascade of events that result.

In fact, according to Dr. Deepak Bhatt, of the Department of Cardiovascular Medicine at the prestigious Cleveland Clinic, *anti-inflammatory agents and antioxidants represent a revolutionary "third great wave" in cardiovascular disease prevention*.⁸¹ As Bhatt observed in a recent review in the American Journal of Cardiology, "the importance of inflammation, a potentially critical element in the initiation, progression, and rupture of plaque, has become increasingly evident... the role of inflammation and its principal cause, oxidative stress, are [being] analyzed as potential targets" for prevention and therapy.⁸¹

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MAXIMIZING THE BENEFITS OF HDL

So let's put this all together—for optimal cardiovascular health, we need to lower LDL and raise HDL levels, protect LDL from oxidation, raise activity of protective enzyme systems like PON1, and lower activity of risk-inducing systems such as CETP—not to mention reducing inflammatory stimuli and keeping endothelial cells' health at a peak. That's a tall order—but we can fill it readily by combining the strengths of supplements we already know about. Here's how.

We've already seen that amla extracts, purified and processed to keep their vital polyphenol content intact, prevent oxidation, keep endothelial linings “slippery,” and optimize lipid profiles. By *combining* amla with extracts from a much less exotic plant family, we can further enhance antioxidant protection and add modulation of the powerful systems exemplified by PON1 and CETP. The so-called cruciferous vegetables (including cabbage, broccoli, Brussels sprouts, mustard greens, kale, and others) have long been associated with improved health and reduced vulnerability to cancers and *cardiovascular diseases*.^{52,53} These vegetables, and especially their properly grown and harvested sprouts, are rich in a number of polyphenols and sulfur-containing compounds with powerful antioxidant capabilities.⁵⁴⁻⁵⁶ Specific cruciferous vegetable-derived phytochemicals also have the surprising ability to stimulate activity of many of the phase 2 detoxification enzymes.⁵⁷ In the words of cell biologist and cardiovascular researcher Lingyun Wu of the University of Saskatchewan, “*a diet containing phase 2 protein inducers [such as those derived from cruciferous sprouts] also reduces the risk of developing cardiovascular problems of hypertension and atherosclerosis.*”⁵⁸



FDA WARNS OF CONSEQUENCES FROM STATIN COMBINATIONS

The mainstays of standard drug-based approaches to cardiovascular health are the “statins” such as simvastatin, which block the enzymes used in manufacturing LDL in the liver,⁸² and the inhibitors of cholesterol absorption from the intestine, such as ezetimibe.⁸³ Drug companies now market some of these drugs in combination, touting their ease of use and potential benefits over individual drug therapy. One such combination is Vytorin®, which contains both simvastatin and ezetimibe⁸⁴— but these powerful drugs are beginning to show some unintended consequences.⁸⁵ In a Safety Alert Bulletin issued on August 21, 2008, the FDA warned healthcare professionals about a possible association between the use of Vytorin® and a potentially increased incidence of cancer.⁸⁶ Preliminary results from a trial of the drug in reducing the risk of cardiovascular events found that “a larger percentage of subjects treated with the drug were diagnosed with and died from all types of cancer combined when compared with placebo during the five-year study.”

This Safety Alert Bulletin is not the first involving a statin drug in combination. On August 8, 2008, the FDA warned of the risk of muscle injury called rhabdomyolysis, which can lead to kidney failure or death, when simvastatin is used with amiodarone, a drug commonly used in managing heart rhythm disturbances.⁸⁷ The risk of this condition is related directly to increasing doses of simvastatin (greater than 20 mg/day).

In both cases, FDA stopped well short of withdrawing these drugs from the market, instead simply warning healthcare professionals to be aware of the increased risks, and reminding them to monitor their patients closely. There's no question that many pharmaceutical agents have a valid role in managing known cardiovascular disease and in preventing it—but responsible consumers will also do everything possible to remain educated about medication risks and side effects, and to minimize the need for such medications through careful attention to nutritional and lifestyle habits that promote cardiovascular health.

Nutritional scientists at FutureCeuticals in Illinois have recently issued a series of research reports in which they summarize their work with two proprietary sprout preparations known as “SproutGarden® 1” and “SproutGarden®-C.” Though these reports are preliminary and as yet unpublished, they are dramatic enough to merit inclusion in this discussion, and will certainly stimulate further large-scale research efforts. Here's what they found:

Increased HDL Levels: SproutGarden® 1 (SPG1) was orally administered as a “shake” at 5 grams per dose twice daily to people with low HDL levels (below 40 mg/dL). Participants were advised to maintain typical diet, medicines, and habits during the study. HDL levels increased by an average of 29%, while other parameters such as LDL, fasting glucose, and liver function tests

remained within normal ranges.⁵⁹

Reduced LDL Oxidation: When SPG1 was added to serum from a young, healthy human, it reduced the chemically induced formation of oxidized LDL in the laboratory.⁶⁰ When human subjects with elevated levels of oxidized LDL consumed SPG1 for three weeks, they experienced an average 69% decrease in levels of these dangerous complexes. Levels of other chemical markers of lipid oxidation associated with atherosclerosis also fell by 20-25%.⁶¹

Increased Protective PON1 Activity: When healthy, fasting human volunteers were tested before and after ingesting SPG1 as a single dose of 3 grams, activity of the cardioprotective enzyme PON1 in blood rose rapidly and dramatically (an average of 18% in the first 30 minutes).⁶²

Reduction in Destructive CETP Activity: When SproutGarden®-C (SPG-C), a blend of sprouted seeds specifically selected for inhibition of LDL-enhancing CETP, was added in the laboratory to serum from healthy humans, a dramatic reduction in CETP activity of up to 50% was shown.⁶³ A subsequent study in human volunteers showed that consumption of a single dose of 3 grams of SPG-C acutely inhibited activity of CETP in circulating blood.⁶⁴ The researchers concluded that their results support the use of SPG-C as food material for modulating activity of CETP in humans, citing another recent study showing that even partial suppression of CETP activity positively affects the blood lipid profile.⁵¹



SUMMARY

Maintaining a responsible diet and lifestyle are still the most effective means of optimizing cardiovascular health. Conventional medicine too often focuses on “after-the-fact” treatment interventions. Choosing an effective combination of nutritional supplements can be an important part of maintaining cardiovascular fitness through prevention. There is a solid scientific basis for including the combination of properly prepared amla extracts and carefully selected cruciferous sprout mixtures in an overall cardiovascular health regimen—their effects enhance and complement one another at the most fundamental molecular levels, and they boast a 3,000-year-long record of safe, effective, quality-of-life improvement.

If you have any questions on the scientific content of this article, please call a Life Extension Health Advisor at 1-800-226-2370.

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