

Men's Health in Ayurveda
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Ayurveda may be the oldest continuing healing system on the planet. With a tradition going back thousands of years, Ayurveda offers everyone, from the clinician to the layperson a framework for understanding the body and how to best support its quest for balance. In the Ayurveda tradition of health care, mind, body and spirit are inextricably entwined.

Each of us is unique. But, as Yogi Berra (well, he was a yogi) might say, some of us are more unique than others. Men have simpler plumbing, and they don't go to the doctor as much, but they still need care and attention.

In Ayurveda, each man is viewed as an individual. Therapy in Ayurveda is based on an understanding of the underlying concepts of energetics inherent in the Ayurvedic world view. When Kapha dominates, he may be slow and lethargic. He likes a lot of sleep, and tends toward obesity. When Pitta dominates, men are hot, intense, aggressive, and demanding. When vata dominates, men are spaced-out, flighty, erratic, anxious and insomniac. Fortunately, we can adjust all these factors with careful lifestyle choices. A man's relationships, herbal medicines, choice of exercise- all can be calculated using Ayurveda.

Speaking of yogis, I have been apprenticing with one, Yogi Bhajan, for thirty years. I have seen these remedies transform men's lives, time and again.

Men's Digestive Health

As polite topics of conversation, constipation, diarrhea, heartburn and gas probably don't top your list. You're probably busier judging your job than you are considering your colon. But Ayurveda says you had better ruminate on your digestion. Not only is it the most essential system in your body, it's also the beginning point for a lifetime of good health or a generation of degeneration- your choice.

From the Ayurvedic point of view, it all starts in the digestive tract. Most of the total energy that comes into our bodies is from food, and it's critical that it be digested properly and completely. Every body function depends on it. To live a healthy life, enjoy great sex and avoid troublesome degenerative problems of aging, the digestive tract is the first step.

Fortunately, you can perfect your digestion and elimination by following a few basic lifestyle rules. And if you do have a few troubles along the way, some straightforward and effective natural Ayurvedic remedies can put you back in balance.

Twisting its way to link your mouth and your rectum, your digestive tract is a 15-foot-long tube with a pretty simple job. Food goes in one end, gets chomped up and then demolished by acid, enzymes, and bacteria. Finally, the nutrients are absorbed into the bloodstream. The remnants get eliminated at the far end- in the large intestine. Each section has its own job to do, and corresponding herbal remedies. Ayurvedic practitioners are as interested in what comes out of the human body as what goes in. If food doesn't get properly digested, or the waste products of digestion can't get out, it hardly matters what you put in your mouth.

Start at the Stomach

The stomach is where the first real action is. This first stopover in the digestive journey mixes powerful chemicals with the food mass. If these digestive juices, including hydrochloric acid and pepsin, are in short supply, the whole process gets off to a poor start. Dyspepsia, that Thanksgiving dinner feeling of eating a log that never moves on, is the result. Herbs with bitter taste promote digestive secretions and speed up digestion. Gentian root (*Gentiana lutea*) is a popular "digestive bitter" in Ayurvedic and Western herbalism. Other bitter digestants include barberry root, dandelion and chiretta.

Heat Up Agni, the Digestive Fire

Agni is the Ayurvedic term for the transformative force, or the heat of metabolism. It is a broad term that is used for several types of metabolic reactions in the human body. Agni, in its different manifestations, produces chemical reactions in the tissues, liver functions, sensory processes, and very importantly, gastrointestinal process- the “fire of digestion”. All energy from the outside of the organism must be transformed to be usable on the inside. That is the job of agni, in all its forms and subdivisions. Just about every quality of health a function of agni, the heat of life, and the metabolic force that creates the vital energy at every level. Agni is said to regulate, in addition to digestion, vision, body temperature, complexion, bravery and anger. Since all bodily functions depend on metabolism, agni is paramount in health and homeostasis. Fundamentally, Ayurveda says that all pathology is due to impairment of agni in some manner.¹

The stomach is the seat of kapha in the body, so this organ is a prime place to manifest kapha symptoms. Kapha is cold, so many stomach disorders involve these energetics- translate that as

Carminative herbs warm up the digestive tract, speed up and increase the thoroughness of digestion and reduce gas. Fennel, cardamom, dill, cumin and caraway seeds are carminative.

Contractions move the food contents slowly towards the large intestine, normally requiring about 90-120 minutes for the first part of a meal to reach the large intestine, although the last portion of the meal may not make it there for five hours.

Used by nearly every culture in the world, tasty, aromatic ginger root is a time-tested digestive remedy for stomach upset. Ginger's effect on motion sickness and nausea has been thoroughly proven, so it's not surprising that Ayurvedic practitioners use ginger for indigestion. It reduces spasm, absorbs and neutralizes toxins in the gastrointestinal tract and increases the secretion of digestive juices, including bile and saliva.² Ginger contains ingredients that soothe the gut and aid digestion by increasing peristalsis that moves food through the intestine. Use 1 tsp. chopped herb brewed as tea, 3 times a day.

Warming cinnamon bark is a mild but useful remedy for sluggish digestion. The German Commission E recommends cinnamon for loss of appetite, dyspeptic complaints, mild gastrointestinal spasm, bloating and flatulence. Use 1 tsp. chopped herb brewed as tea, 3 times a day.

The Ideal Bowel Movement

In case you're interested, Ayurveda says that the proper stool is like a peeled, fully ripe banana- size, shape and color. And it floats. Ayurveda says that, “if your stool is sinking, you're sinking!” Deviations signal problems. Light colored, large sized, mucus-filled stools herald increased kapha. Yellow, green, black or red stool is a harbinger of excess pitta, while vata is diagnosed when the stool is hard, impacted, dark colored or accompanied by copious gas.

Regular, bulky, soft and comfortable bowel movements are vital to good health. But something must be seriously wrong, since four and a half million Americans say they are constipated *most* or *all* of the time. Constipation is medically defined as passing stools less than 3 times a week, or in low quantity.

As you might expect, like most everything else in the health field, there are big disagreements as to how you should maintain bowel function. Conventional medicine generally recommends nothing beyond increasing fluids, a high-fiber diet, and more exercise.

Taming the Wily Bowel

Proper bowel timing includes the key concepts of transit time and regularity. The time it takes for a meal to go in the mouth and come out from other end is referred to as “transit time”. For a person who eats a healthy diet, free of refined, processed foods, 30 hours is an average transit time. Ayurveda says the ideal transit time is 18 to 24 hours. In our constipation-prone society, 48 hours, or considerably more, is commonplace.

The hitch with lengthy transit time is that the longer the end products of digestion stay in our system, the more chance they have of decomposing into unhealthy compounds. And, if bowel transit time is slow,

increasing the time that fecal matter spends within the colon leads to greater absorption of water from the feces. More water is absorbed, resulting in harder, smaller stools that have more difficulty moving forward. Increasingly, evidence implicates slow transit constipation in the development of gallstones.³

Measure your transit time by swallowing something that colors the stool. Mark the time that you see the color in the feces. Charcoal powder, beets and chlorophyll all work well.

A healthy bowel movement is created by a healthy balance of all three doshas, but constipation is a hallmark of elevated vata. This dosha is cold and dry, so it retards bowel function by reducing motility and lubrication.

Regularity is the interval between bowel movements. Depending on whom you ask, the gamut of recommendations runs from "two or three bowel movements a week is plenty" to "a bowel movement every day is essential." Mammals are designed so that each meal stimulates fecal movement and initiates a bowel movement. Most Ayurveda practitioners insist on at least one bowel movement per day, or up to one per meal.

A proper bowel movement depends mainly on three factors: peristalsis, fiber and moisture.

Peristalsis is the wave-like motion that propels feces out of the large intestine. When the bowel is functioning properly, muscles squeeze briefly every few seconds and then relax, propelling stool towards the rectum (*transit*). So called "stimulant" laxatives promote this wave. Among the best are senna leaf (rajavriksha, *Cassia acutifolia* or related species) and aloe leaf (kumari, *Aloe vera* or related species). They should be used only short term for brief episodes of acute constipation. Most peristalsis enhancing laxatives contain anthraquinones. These laxatives are rapid acting, and quite effective, but they can cause cramps if used in excessively high doses. They have a cold energy, so promote vata. Ayurveda uses them, sparingly, with warming carminatives, to avoid creating a vicious cycle of disrupted vata causing more constipation.

Fiber absorbs moisture, increasing stool size, giving the muscles in the intestinal walls something to grab onto, making the stool softer. Natural bulk laxatives provide soluble fiber to slow intestinal motility. These include pectin from fruit, flaxseed and grain brans. These can be taken daily as necessary to create a soft, spongy stool. Fiber also regulates transit time by absorbing excess moisture and firming stool, slowing passage. A basic directive is to increase fiber intake (fruits, vegetables, dried legumes) to up to thirty-five grams per day.

Psyllium seed (*Plantago ovata*), a bulk fiber laxative from Ayurveda, where it is called ispaghula, has become popular around the world. It balances bowel function and relieves pain in irritable bowels.⁴ Psyllium's capacity to absorb fluids means that it is useful for treating diarrhea. As it travels through the gut, the mucilage in psyllium creates a soothing benefit, which may relieve cramping. An English study revealed that constipation significantly improved in patients taking psyllium. Eighty-two percent of the subjects had irritable bowel symptom relief.⁵ A study to determine the optimum dose recommended 20 grams per day.⁶ Ayurveda sometimes recommends 2-4 teaspoons of psyllium seed husks in a glass of warm water at bedtime to control vata.

Proper moisture content is critical for good elimination. Including what we drink and digestive secretions, about 5 gallons of fluid is dumped into the large intestine every day. Most of this has to be reabsorbed, or we would quickly become dehydrated. Mucilages are herbs that create a healing slime that coats and soothes the gut wall and keeps the stool moist and slippery enough to exit smoothly. Ayurvedic examples? Shatavari root and Bala root (*Sida cordifolia*). Marshmallow root (*Althea officinalis*), a similar herb better known in Europe, closely related to the Ayurvedic bala, is used for inflammation of the stomach membranes.⁷ To use bala, marshmallow or a similar lubricating herb, take 1 Tbs. powdered bulk herb per meal (stir into a bite of food, like applesauce, to swallow).

The large intestine contains about three pounds of bacteria, including such inhabitants as *Escherichia coli*, *Acidophilus spp.*, and other bacteria, as well as *Candida* yeast. Surprisingly, these make up about 25-50% of the dry weight of the stool. Although, unlike they do in a bovine host, they don't participate much in actual digestion, these bacteria produce the familiar stinky methane, hydrogen sulfide and other intestinal gases as they ferment their food. As these bacteria digest our leftover food, they secrete needed nutrients, including vitamin K, vitamin B12, biotin and some amino acids.

A remedy that has been used by alternative practitioners for years is a vital addition to good digestion. Probiotics, the friendly bacteria in our gut, are key to maintaining or restoring a healthy intestinal tract environment. Ayurveda has been recommending homemade yogurt for centuries. Eating living culture yogurt or taking high-quality probiotic supplements fortifies the colony of good bugs, preventing constipation.

Studies link a lack of exercise with an increased colon cancer risk, so physicians customarily prescribe physical exercise for constipated patients. A study of lifestyle factors among 81,000 Norwegians indicated that those who walked or cycled at least four hours a week had an appreciably decreased colon cancer risk.⁸ A recent Harvard study showed that people with the highest physical activity levels had half the incidence of colon cancer compared to those who exercised the least.⁹

It's critical to assure the proper function of the large intestine. Constipation can reduce sexual performance and prostate health, according to Ayurveda, mainly by disrupting apana. Having clogged pipes can inhibit erectile capacity, ejaculation functions and semen production. I have successfully used a formula taught by my mentor for male urogenital health, containing fennel seed, turmeric root, senna leaf, ajwain seed and asafoetida gum. Fennel and ajwain, both Umbelliferae, are carminative and balance hormones, as they contain phytosterols. Turmeric tightens membrane tissue. Senna is laxative and asafoetida promotes libido and increases agni.

The usual fiber remedies, or dried fruit, will also help. Triphala, or its ingredient, haritaki, will gently promote bowel regularity. Daily oil massage balances vata, and will assist in a case of stubborn constipation.

Ruminate on These Digestive Herbs

Herbal medicine is quite effective in keeping digestion perking along, as shown in the results of one older study from Europe. Twenty-four patients received an herbal mixture containing dandelion, fennel and a few other digestive herbs, Ninety-five percent had total relief of colitis symptoms in 15 days.¹⁰

Triphala, the famous Ayurvedic combination of the fruits amlaki (*Emblica officinalis*), haritaki (*Terminalia chebula*) and bibitaki (*Terminalia bellerica*), is the classic herbal remedy for long term digestive benefit. It tones the intestinal walls, detoxifies the system and promotes evacuation. It has high tannin content, so it treats diarrhea in low doses (1 gram per day). In higher doses, it treats constipation in a very slow, gentle way, toning the walls of the gut while it works. Triphala is suitable for children and is ideal for older folks who need just a little help with regularity. For maintenance use, take 2 grams per day. As a short term laxative, use 6 grams. An easy bowel movement comes in about 8 hours.

Haritaki is the best single herb for generally controlling vata, and is considered by some to be the single most important Ayurvedic herb. Widely used in Tibetan medicine, it is called the "king of herbs" there. Since vata promotes constipation, the gentle laxative qualities of haritaki are perfect for balancing that dosha. It nourishes the brain and nerves. It is strongly astringent, contracting tissues, and is therefore used for various ulcers, prolapses, and fluid discharges. In Ayurveda, haritaki is called "the mother," and is thought to increase mental/spiritual awareness. It is given to children upon the premature loss of a parent.

Turmeric root, haldi, (*Curcuma longa*) (bitter, astringent, pungent, hot, K- PV+) keeps digestive inflammation under control. Historically, this medicine has been used to reduce gas, and turmeric stimulates gallbladder contractions, promoting better digestion.^{11,12} Curcumin is one of the diaryl heptanoids known collectively as curcuminoids that comprise about 5 % of turmeric. A polyphenol, curcumin (chemically termed "diferuloyl methane"), has actions similar to other polyphenols.

Another compound in this herb, *p-tolymethylcarbinol*, increases the production of several important secretions in the digestive tract. Turmeric is widely used to improve digestion, and there is some scientific evidence that curcumin treats dyspepsia. A double-blind placebo-controlled study with 106 patients measured the effects of 500 mg curcumin 4 times daily against placebo. Seven days into the study, 87% percent of the curcumin group experienced full or partial dyspepsia symptom relief, compared to 53% of the placebo group.¹³ With its ability to suppress inflammation, increase mucin content of the stomach, and stop bleeding, turmeric prevents ulcerations of all types, including gastritis, peptic ulcer,¹⁴ irritable bowel syndrome and colitis. Take 1-2 grams powdered herb in capsules, or as a spice, with each meal.

For the liver and gallbladder, curcumin has been shown to increase bile acid output by over 100%, and to increase the solubility of the bile, all qualities that lend turmeric to the treatment of gallstones. Curcumin protects the liver about as well as licorice root and milk thistle, well known herbs for that use. It also reduces liver enzymes, clinical signs of inflammatory liver disease.^{15 16}

In my personal experience, turmeric is a wonder for colitis, with its pain, inflammation, mucous membrane damage, and diarrhea. I suggest two heaping Tablespoons of turmeric powder, and two heaping tablespoons of slippery elm bark powder, mixed into a paste with water or maple syrup, per day.

Curcumin and other active ingredients are significant antioxidants. also active. This herb works about as well as vitamin C or E.¹⁷ Turmeric has broad effects against cancer during initiation, promotion, and progression of the tumors.¹⁸ Turmeric and curcumin have action against several potent carcinogens, including cigarette smoke.¹⁹

Turmeric inhibits a wide variety of microbes, including staph, strep, amoebas, and several disease-causing fungi. Curcumin even inhibits HIV.²⁰ Ayurveda recommends it as an antibacterial for those chronically weak or ill.²¹

Golden Milk- A traditional Ayurvedic drink for arthritis

(From *Herbal Defense*, Landis and Khalsa) (Thanks to Yogi Bhanjan for original recipe)

Part one, turmeric paste:

- 1) In saucepan, mix one-quarter cup of turmeric powder with one half cup water.
- 2) Bring to boil and cook until a thick paste is formed.
- 3) Store paste in refrigerator.

Part two, making the drink:

- 1) Mix 1 cup milk, one tsp. almond oil, one half tsp. turmeric paste, and honey to taste.
- 2) Stir on low heat. Bring just to boil.
- 3) Blend in blender to make a foamy drink. Serve.

Licorice root (Yashti madhu “the sweet stick”) (*Glycyrrhiza glabra*) (sweet, bitter VP- K+) guards digestive mucous membranes by increasing production of mucin, a secretion that protects against stomach acid and other digestive juices.²² Deglycyrrhizinated licorice root (DGL) has the glycyrrhizic acid removed. (Glycyrrhizic acid is the ingredient in licorice root associated with the possibility of occasionally increasing blood pressure and water retention.) The soothing part of the root, however, remains in DGL. One to two chewable wafers of DGL with a meal may soothe the tummy.²³ Use 1 tsp. chopped herb brewed as tea, 3 times a day, or one to two chewable wafers of DGL (250–500 mg) fifteen minutes before meals and one to two hours before bedtime.

Peppermint leaf is a well-known herb for tummy troubles. Enteric-coated peppermint oil works well to prevent dyspepsia. Peppermint oil is a relaxant for the muscles of the intestinal wall. Enteric coating the capsule delays the effect until the remedy is further down in the digestive tract, as well as reducing peppermint-tasting burps. In one double blind trial from Taiwan, four out of every five patients experienced reduced symptoms when given enteric-coated peppermint oil.²⁴ In 1999, a study from Germany used peppermint and caraway oils to test 223 people. The combination brought about a significant reduction in pain.²⁵ A German study from February 2000 again confirmed that a combination of peppermint and caraway oils effectively reduced the speed of intestinal movement.²⁶ Take 1 tsp. chopped herb brewed as tea, 3 times a day, or 0.2 to 0.4 ml 3 times a day of an enteric-coated capsule.

Peppermint has one drawback, compared to other mints. Its energetics are debated, but generally considered to be pungent in taste, with a cooling energy. Even the English name gives you a clue. Since it is hot, at least to an extent, the digestive effects can be contradictory. Pitta conditions can be aggravated by peppermint. You don’t want that gastritis to be made worse. Other mints, including spearmint (*Mentha spicata*) and horsemint (*Mentha arvensis*), have a more overtly cooling energy

Keeping your digestion in the pink is as easy as cooking with some delicious spices, sipping some tasty teas, and using a few effective herbal medicines. Keeping the digestive fires burning by nourishing agni is one of the most important things we can do to stay healthy.

Sex and Rejuvenation with Ayurveda

Who wouldn't love great sex, and great health, for the rest of his or her life? Ayurveda has thousand years of practical experience with real people to prove it. Ayurvedic medical practices are divided into eight branches. The first six are pretty typical - internal medicine; surgery; ear, nose, and throat; pediatrics; toxicology and psychiatry - but the last two separate this ancient system from the rest of the pack.

According to Indian philosophy, the goal of life is to experience and master four complementary areas, which, taken together, make up the totality of fulfillment.

Dharma, or the path of righteousness, is the complete collection of virtuous, religious works and practices. Artha is the accumulation and enjoyment of material possessions and earthly well-being. Moksha is spiritual liberation. The fourth area may be the most misunderstood. Kama is romantic and sexual love and all its associated pleasures of the senses. Everyone has heard about *The Kama Sutra*, which is an extensive treatise on the subject. (Incidentally, this tome was written by a celibate monk.)

According to the Kama Sutra, all of these aspects should be of equal importance, without any of these areas taking precedence over the others. For a fulfilled and meaningful life, the striving after one goal shouldn't inhibit striving after others. Neglect of any one of these spheres leads to a diminished stability and to imbalance in men. Practicing dharma, artha and kama makes it possible to lead a meaningful and joyous life in this world and to move on to spiritual freedom.

Sexuality and the erotic life are important, integrated elements of the human life, and are as important as eating. The sensual pleasures increase the joy of life and maintain psychological balance, and actually aid further mental and spiritual development. Sexuality and erotic practices contain the secret of life within them.

Ayurveda identifies three key areas that are, taken together, considered to be the base foundation of Ayurvedic lifestyle and therapeutics- balanced diet, balanced sleep and balanced sexual life. We should indulge in sex such away so as not to have any adverse effect on health. Ayurveda advises moderate sexual activity, according to personal constitution and other traits, during midlife. Being alert to avoid excess or deficiency in food, sleep or sex goes a long way toward keep the doshas in balance.

The companion sciences of rejuvenation ("rasayana"); and aphrodisiacs, or virilization, ("vajikarana") are well researched, practical areas of health maintenance that anyone can use to stay well and sexy throughout a long life. ("Vaji" is a stallion. You get the idea.)

Ayurveda places special emphasis on maintaining excellent health well into elderhood. Over time, practitioners have developed excellent therapies for keeping the mind and body young. Of course, sex is an important part of that life. Most people enjoy sex and would love for their romantic life to continue indefinitely. In our culture, though, there's a general sense that sexual desire, performance, and pleasure will unavoidably wane, much to our disappointment. While no one will literally be the same at eighty as they were at twenty, the physical degeneration can be much less than we might think.

Literally translated as "the path of juice," this branch of Ayurveda aims to nourish, restore and balance the body functions which have been taxed by the wear and tear of daily life. Signs of aging are all marks of lack of "juice," from arthritis with lack of joint fluids, to fatigue with lack of endocrine hormones, to menopause difficulties with vaginal dryness.

Ayurvedic rasayana practices are directed toward strengthening, purifying and nourishing body tissues to bring back the glow of youth - replacing that "juiciness." Rasayana "is meant to boost health, produce high quality tissues, eliminate senility and diseases of aging, lengthen life and increase memory, intelligence, youth, skin luster, voice quality, strength of body and senses, and beauty. Rasayana regimes act to increase tissue mass, digestive power, endocrine function, elimination of wastes, brain function, immunity and homeostasis.

Modern science tells us that calorie restriction and the reduction of body temperature will extend life span, at least in experimental animals. Ayurveda teaches that the body ages and dries out in proportion to the metabolic rate. Any practice that will slow down the metabolism and calm the body and mind will retard age-related degeneration and reduce the “loss of juice.” The loss of juice is closely related to increased vata dosha. Vata increases naturally with age. Ayurvedic antiaging remedies are essentially a fight to control the catabolic actions of vata for as long as possible.

Rejuvenation in Ayurveda comes in two forms - lifestyle and medicine. “Hot” activities, such as passion and anger, age the body more rapidly, so calming behavior is suggested. To live longer and have better sex, speak the truth, avoid becoming angry, practice meditation, avoid conflict, and steer away from drugs and alcohol.

Rasayana medicines include a large array of herbs and foods. Sweet taste, contained in carbohydrates and good quality fats, is the most rejuvenating, so sweet food, including milk, ghee, and especially honey, is recommended to rebuild body tissues and restore sexual juices.²⁷

Closely related to rasayana, virilization, including the use of aphrodisiacs and sexual rebuilding tonics, aims to support sexual pleasure, fertility, and performance. Sexual fluids, including semen, are the most important concentrated essence of all the body’s tissues. Ayurveda recommends retaining some of it to use in the rest of the body for renewing body and mind. Since sex depletes the body’s juices, vajikarana, like rasayana, also focuses on replacing tissue nutrients and fluids.²⁸ Vajikarana practices improve sexual activity, and can be used for such, but they also help direct sexual energy inward for renewal. Visualize the body as a tree, with the reproductive system as the roots. Vajikarana therapies start at the roots, but continue to feed the entire body with tonic energy over time. Producing more and better quality semen, if it is retained to a certain extent, regenerates the mind and the immune system. Vajikarana deals not only with increasing sexual vigor, but also psychosomatic disorders. Vajikarana is valuable for all around health. The influence of the mind is the origin of momentum for sexual desire, so virilization must consider mental health. Vajikarana therapies can be utilized for treating disorders of the mind, including depression.

Sex is an integral part of our daily habits, and should be given as much attention as diet or exercise. Ayurveda says that human sex is not simply physical mating but is the union of two bodies, minds and souls, and that it can be a transformative and healing experience if managed correctly. For people who want to rebuild sexually, Ayurveda proposes a one month interval of absolute sexual chastity, allowing the body to relax and balance. After this readjustment period, you may use detoxification remedies and diet to clean out old accumulated wastes, followed by the actual foods and herbs to enhance sexual function.

If extensive vajikarana therapy is necessary, the deep cleansing practices (panchakarma) of Ayurveda are usually employed as a preparatory measure. Interestingly, Charaka says that the female is the greatest of all vajikarana medicines!

The actual sex act is important in maintaining sexual pleasure and potency. The atmosphere should include sweet music, sweet fragrance and flowers. Wait a while after eating. Ideally, partners should be physically, emotionally and spiritually involved with the other.

An absolutely satisfying sexual union confers health and vitality upon you and your partner. It is essential that both partners are satisfied. Deviant or unsatisfying sex has adverse effects on mental and physical health. It aggravates the doshas and reduces immunity. Afterwards, urinate to balance the energy in the pelvis, and relax, perhaps with a warm bath. Finish with a special drink of hot milk or almond milk with ghee and honey or dates and saffron.

The evening, especially after two hours of dinner, is the ideal time for intimacy, as it is kapha time. The frequency of sex depends on constitution. Kapha types may engage in sex more frequently than vata & pitta types thanks to their innate extra stamina. Vata types may seek satisfaction in changing partners. Pitta types are usually on a quest for more sexual intensity.

Personalize Your Love Life with Ayurveda

Your relationship can improve if you understand the doshas. Ayurveda suggests a spouse of a different constitution. This helps you balance each other in the relationship, and prevents your offspring from being too extreme in anyone dosha. Two parents with vata dominant produce a child who is doubly vata, for example.

For Balancing Kapha	For Balancing Pitta	For Balancing Vata
Marry Vata	Marry Kapha or Vata	Marry Kapha
Active family life	Soothing conversations	Slow and Steady
Stimulating conversations	No confrontation	Less thinking, more acting
Encourage talking	Relaxing massages	Careful managing money
Go out and get interested	Take “cool off” breaks	Commitment
Encourage sexual interest	Slow down and cool off to take time and care for sex	Consistent and supportive behavior Caution with sexual experimentation
		Don't over talk and over analyze

Ojas

Central to the Ayurvedic idea of sexual rejuvenation is the concept of *ojas*, which is the most concentrated essence of nutritional substances in the body, roughly comparable to semen and/or cerebrospinal fluid. Ojas is conceptualized as a very fine biological substance that comprises the most concentrated essence of nutrients and energy in the body. It is the essence of all the types of tissues and the physical expression of consciousness in the body. The basic biological strength of the tissues depends on it. It is strongly correlated with vitality and our immunity.²⁹ Ayurveda maintains that food, once consumed, is progressively concentrated into ever more distilled categories of tissue building nutrients.³⁰ It is said that one hundred bites of food will produce one drop of blood, and that one hundred drops of blood will produce one drop of ojas.³¹ Modern scholars have linked the concept of ojas to the blood protein albumin. Others have hypothesized that it may parallel essential fatty acids. Ojas is especially concentrated in the heart (a total quantity of 8 drops worth), but it pervades the entire breadth of the body, as the essence of honey is present in a flower. So, as we can see, starting with good quality food is essential to maintaining good health, especially sexual health.

When ojas has become deficient, we see a syndrome consisting of a collection of clinical signs:

- Vibheti- Fear
- Durbalo abhikshanam- Physical and mental weakness
- Vyathit Indriya- Discomfort in sense organs
- Duschhaya- Abnormal colors
- Durmana- Impaired mental functions
- Ruksha- Dryness
- Kshama- Abnormal complexion

Precious ojas can be destroyed by pretty much any health defeating factor. In particular, these causes are identified:

- Abhighatat- Trauma
- Kshayat- Loss of other refined tissue essence (Dhatus)
- Negative Emotions - Anger (Kopat), Grief (Shokat)
- Dhyanat- Mental stress
- Shramat- Physical hard work
- Kshudha- Hunger

The diet that promotes ojas and sexual rejuvenation is a highly nutritive program, emphasizing whole grains like wheat and rice, seeds, nuts, milk products, and natural sugars, such as honey.³² Cooked, moist foods (soups) and meat juice will help. The diet should be balanced to contain a broad range of tastes - sweet, sour, salty, spicy, bitter, astringent. Generally, use food that is sweet, oily, cold, light and easily digestible. Use less dry or raw food, and include a good quality raw vegetable oil (almond, sesame) and ghee. Onion, garlic, ginger, eggplant, figs and dates are aphrodisiac.

Ojas is stored in muscles, fat and organs- throughout the body. Most of it is made at night during restorative sleep. The production of ojas comes after the production of sexual fluids (shukra). Thus depletion of shukra channels body resources toward shukra production and ojas production is curtailed. Ojas is used for immunity and procreation, so it is easily depleted by either use. With a thorough and disciplined program, it takes thirty days to replenish the ojas reserves in the body. Sexual abstinence during this time will help ojas accumulate.

Rejuvenate with Diet

Rice is a very basic, yet very effective rejuvenating food. Easily digestible, it increases ojas, moisturizing the tissues. Basmati (literally “queen of fragrance”) is the premier variety. An aromatic, nutty flavored rice, basmati has a scent that has been compared with jasmine mixed with walnut. This rice is used in Ayurveda as a cleanser and healer for all types of people.³³

Ayurvedic physicians promote honey to rejuvenate your body. Honey is made from pollen, the sperm of plants. Plant reproductive tissue (“shukra”) increases human reproductive function, according to the Ayurvedic principle of “like increases like.”

Honey is innately rejuvenating, with its sweet taste, and is considered predigested, allowing it to nourish all parts of the body with ease. For these reasons, honey is considered to be the best enhancer, or “vehicle” for all Ayurvedic rejuvenating medicines. Mixing raw, unfiltered honey into herbal tea allows the honey to act as a vehicle for the active principles of the herbs.

Other foods that promote reproductive tissues and fluids in the body are asparagus, broccoli, milk, dates, mango and rice. (The latter three are often blended in milk or made into milk pudding.) Ajwain seed, cumin (thought to purify the male genitourinary tract), turmeric and black cumin (kala jeera) are also beneficial.

Onion and garlic increase sexual energy, libido, and sexual secretions. They are good aphrodisiacs, but, since they promote sexual desire, they may lead to excessive sexual activity, which may offset the gains of the rejuvenation.

Since vata is dry, cold, light and unstable, we want to promote remedies that do the opposite. Tips for staying sexy include moderate lifestyle habits, including regular meals and elimination and sound sleep. Keep your digestion working well, and have regular massage with oil, including oiling your feet, scalp, and face daily. Bring positive emotions (love, compassion) into your life. Meditate.

Rejuvenating Drink (especially for after sex)

8-10 oz. milk

1-3 tsp. grated fresh ginger root

1-3 tsp. black sesame seed (or white sesame seed)

1-3 tsp. ghee

Cinnamon and clove to taste.

Honey to taste if desired.

Warm milk to comfortable drinking temperature. Blend ingredients in blender. Drink after sex, especially men, or daily as a restorative for sexual function.

Kicharee is the most famous nutritive and convalescent food of Ayurveda.

Rejuvenating Stew (Kicharee)

1/2 cup basmati rice
1/2 cup lentils or mung beans
6 cups water
2 Tbs. ginger root, peeled and grated
3 cloves garlic, chopped
1/4 cup onion, chopped
1/2 tsp. coriander seed, powder
1/2 tsp. turmeric powder
1/8 tsp. fennel seed
1/8 tsp. cumin seed
1 cup assorted vegetables (carrot, zucchini, broccoli, etc.), chopped.
1 Tbs. ghee
Salt to taste, if desired.

Place rice, lentils, water, and spices in soup pot. Bring to boil. Cook covered on medium heat. After 30 minutes, add vegetables. When very soft and mushy, stir in ghee and serve.

Impotence and Erectile Dysfunction

If you are getting along in years, as so many of us baby boomer herbalists are, would you like to have sex, say, weekly, and not, uh, weakly?

Impotence, also called erectile dysfunction (ED), is the inability of a man to achieve or maintain an erection long enough to engage in sexual intercourse. Although a man's plumbing is pretty simple, ED is not. Medical science tells us that it can occur from at least 15 possible underlying causes, from diabetes and pituitary tumors, to the side effects of drugs, hormonal imbalances and psychological issues. Injury to the nerves of the penis, from Parkinson's disease or multiple sclerosis, may also cause impotence. In men over 60, the primary cause is atherosclerosis, or narrowing of the arteries. Diabetic men are particularly at risk because of their high rate of atherosclerosis and diabetic neuropathy.

Physicians used to think impotence was mainly psychological in origin, but they are now aware that, at least in elderly men, physical causes probably play a primary role in more than 60% (some authorities say 80 to 90%) or of all cases. Ultimately, most impotence is caused by deadly serious vascular disease.

One in four men over the age of 50, or some 20 million American men, experience some form of impotence. It strikes up to half of all men between the ages of 40 and 70.³⁴

Some of these concerns can be treated with a targeted approach. If impotence is the result of a drug side effect, say, the best move is to adjust the drug. If a pituitary tumor is causing ED by over secreting the hormone prolactin, taking care of the tumor may help. In most cases, though, it's hard to tell what's causing the problem, and medical treatment is nonspecific.

With proper diagnosis and therapy, ED can almost always be treated successfully or improved substantially. Sadly, fewer than 10% of impotent men pursue treatment.

Traditional Ayurvedic practitioners have used powerful, effective natural medicines to benefit ED. Several of these remedies are now being confirmed by modern science.

Home remedies that Ayurveda promotes for ED include garlic, onion, asparagus spears, okra, ginger and raisin.

Garlic bulb (VK- P+)

I would have to rank garlic as the number one aphrodisiac herb. I use it consistently, and it produces consistently. It has all the qualities you would want in a sexual enhancer. It increases circulation and promotes erectile force, as well as increasing desire. Related onion has a similar, milder effect. Garlic is so good at increasing libido that celibate people don't use it.

Garlic is hot, so it can aggravate pitta and the sex organs. It increases semen. For Americans, deodorized garlic might be a better choice. Use a large dose- 10 grams per day. Expect to see sexy results in about a month, and then- watch out.

Ashwaganda root (Bitter, astringent, sweet, VK- P+)

Ashwaganda root (*Withania somnifera*) looks like another 5,000-year overnight sensation. This ancient herb is showing promise in yet another round of recent scientific investigations. Ashwaganda is little known here, but that is about to change. The scientific literature includes over 90 studies on this herb, with over 35 of them since 2000.

Often called “Indian ginseng”, this adaptogen is used in Ayurveda as a tonic and sedative. Though unrelated to the true ginsengs, it appears to share their many properties and actions. In fact, studies show ashwaganda to be superior to ginseng as an antistress adaptogen.³⁵

This long-term building herb, sometimes named “winter cherry”, is a nightshade plant- a relative of tomatoes and potatoes, and is the main tonic for men in Ayurveda, which considers ashwaganda to be a particularly powerful rejuvenative. The name ashwaganda technically means, “smells like a horse,” reflecting that its odor is supposedly reminiscent of horse urine. But the name also connotes its use as a premier sexual tonic.

And the sexual enhancement is not just in folk herbalism. An animal study from 2001 showed that extracts of ashwaganda increased production of sex hormones and sperm, presumably by exerting a testosterone-like effect.³⁶ In another double blind clinical trial, *Withania* (3 g/day for 1 year) was tested on the process of aging in 101 healthy male adults (50-59 years of age). Significant improvements in hemoglobin, red blood cells, hair pigment and seated stature were observed. Serum cholesterol decreased, nail calcium was preserved and 71.4% of those who received the herb reported improvement in sexual performance.³⁷

Jodi O’Neill, an herbalist colleague of mine, owns a retail herb apothecary in Kent, Washington. She relates a story that reflects ashwaganda’s benefits. Jodi consulted with a couple about the husband’s serious erectile dysfunction. After suggesting ashwaganda and cautioning not to expect results before the one month mark, Jodi went about her other tasks, until a dozen red roses arrived at the store two weeks later. The enclosed note told the story. I guess you can guess what had happened the night before.

In addition to its sexual action, Ayurvedic herbalism uses ashwaganda for general debility and exhaustion, emaciation, memory loss, nerve diseases, cough, anemia, and insomnia.³⁸ Ayurveda considers it a “grounding” herb- one that nourishes and regulates metabolic processes.³⁹ A rat study done in 2000 indicates these uses are correct. The researchers concluded, “The investigations support the use of *Withania somnifera* as a mood stabilizer in clinical conditions of anxiety and depression in Ayurveda.”⁴⁰ Ashwaganda is, in my experience as an herbalist, a superb herb for treating chronic anxiety. It takes about a week to work up to the proper dose, and about another week for the herb to reach maximum effectiveness. Since ashwaganda is a slow-acting herb, you may take your daily dose at any time during the day. Used this way, ashwaganda prevents the onset of the anxiety episode. The dose to abort anxiety is about 10 grams per day.

Walking down the sidewalk to pick up her mail so terrified Jody (a different Jody) that she would wind up collapsed and shaky. Only 22 years old, she had been trapped in her house for two years, petrified by panic. In total desperation, Jody came to me for a consultation. Her friends rolled her in a blanket, carried her out the back door into the car and swept her off to the clinic. After two months using ashwaganda, at 8 grams per day, Jody drove herself to her next appointment. Another two months, and this once cowering young woman spent the afternoon shopping at the mall on her way to the next session. Jody had conquered panic.

Modern clinicians are most likely to employ ashwaganda for chronic fatigue, anxiety, insomnia and chronic heart and vascular disorders, where it is often combined with the famous arjuna bark (*Terminalia arjuna*).

Ashwaganda is one of the most promising herbs for building overall health. Ayurveda says it has a special affinity for muscular tissue, especially the heart. Science is only beginning to confirm the encouraging signs for this valuable Ayurvedic herb. A scientific article published in 2000 by Los Angeles researchers

review a host of confirmed benefits: anti-inflammatory, antitumor, antistress, antioxidant, immunomodulatory, hemopoietic and rejuvenating properties. The scientists say that it also appears to exert a positive influence on the endocrine, cardiopulmonary, and central nervous systems.⁴¹

Study after study continues to confirm the stress tolerance, performance and endurance enhancing benefits of this herb.^{42,43} In fact, research shows ashwaganda to be superior to ginseng as an antistress remedy. A 2001 rat study indicated that the herb reduced brain damage caused by stress by 80%.⁴⁴

Tests of the pharmacological and metabolic effects of ashwaganda were performed in 2000. Ashwaganda was shown to increase swimming time in rats in a physical working capacity test (rat swimming endurance test). The herb also increased the size of the heart and the content of blood sugar fuel in the heart and liver.⁴⁵

An animal study done in 2000 demonstrated that an Ayurvedic formula containing ashwaganda was as effective as ginseng in a wide range of adaptogenic benefits.⁴⁶ The medicine was tested in rats against chronic unpredictable stress behavior, depression, glucose metabolism, suppressed male sexual behavior, suppressed immune function and cognitive dysfunction. Stomach ulcer, adrenal gland atrophy, vitamin C level and levels of stress hormones were also measured. Surprisingly, the herb benefited them all.

Ashwaganda, given in milk, significantly increased body weight, total plasma proteins, hemoglobin and hand grip in a double blind trial on 58 normal children aged 8-12 years old.⁴⁷

Recent research shows that, at least in rats, ashwaganda lives up to its reputation as a cognitive enhancer, suggesting promise for using this herb in the treatment of Alzheimer's disease.

Recent studies show ashwaganda to support and regulate the immune system.⁴⁸ and to aid in cases of anxiety and other psychological complaints.⁴⁹ New scientific discoveries also show that ashwaganda has substantial anti-tumor effects⁵⁰, as well as enhancing the effect of radiation therapy in cancer, while protecting healthy cells.⁵¹

Ashwaganda has antioxidant activity in the brain, which may explain, at least in part, a host of its effects, including the reported antistress, immune regulating, cognition-facilitating, anti-inflammatory and anti-aging benefits.⁵² Ashwaganda increases memory and maze test performance in animals.⁵³

As the scientific name indicates, ashwaganda aids sleep. Ayurvedic herbalists use the herb to reestablish long-term sleep rhythms. Rather than making you sleepy when you take the herb, this remedy seems to regulate sleep cycles over time, facilitating more refreshing sleep.

Ashwaganda is showing a variety of benefits for cardiovascular functions, including significant increase in coagulation time (blood thinning).⁵⁴ Since impotence is caused largely by vascular disease, this may be one of the reasons.

A typical dose of ashwaganda is about a gram per day, taken over long periods, up to many years, as a rejuvenator, but, since ashwaganda is very safe, larger quantities are often used in Ayurveda short term. In India, Withania is given with pungent, heating herbs (ginger, pepper, etc.) to increase its tonic effects. For impotence, it is often given in warm milk.

In the long run, in some individuals, it increases sadhaka pitta in the head and heart. To counteract this possibility, combine ashwaganda with cooling herbs or foods, such as licorice, ghee, raw sugar, milk and rice.

Bala rot (VPK=)

Next to ashwaganda, bala (*Sida cordifolia*) (the name means "strength") is probably the most widely used tonic in Ayurveda. It is a sweet, cold, heavy herb. Bala contains a mild ephedrine-like compound, so it is a little energizing when administered.⁵⁵ It is well tolerated. Since it is a mallow, it is soothing and mucilaginous, so it is tonic to vata. It is particularly used for nerve disorders, and it is combined with other tonics for specific organs, such as with arjuna for the heart. Externally, it sees wide use as a medicated oil for joint complaints, muscle cramps and nerve pain. Internally, use 1 gram or more as tolerated, per day, as powder, decoction or milk decoction.

Gokshura fruit

This well known Ayurvedic herb (Caltrops, *Tribulus terrestris*) is getting a reputation here. Often called something equivalent to “horny goat weed”, it is, in fact, an Ayurvedic standout for sexual building, and has a particular affinity for the urogenital tract. The name literally means “cow scratcher”, a reference to its fruit (a prickly seed case).

Gokshura is highly esteemed as a vajikarana and rasayana medicine. It is sweet and cold, so it is appropriate for pitta conditions. As a tonic, it balances vata. For spermatorrhea and impotence, use equal parts powdered gokshura, sesame seed, kapi kachu (*Mucana pruriens*) and ashwaganda. Take 6 grams of this mixture with honey, ghee or milk.

Gokshura is an exceptional remedy in urogenital conditions. It promotes urine flow and soothes the membranes. Gokshura pacifies vata and will not promote secondary excess dryness, as other diuretics do. Gokshura is renowned for prostate support. The plant and seeds are used in the treatment of spermatorrhea, impotence, dysuria, gonorrhoea, incontinence, gout and infertility. This herb is sometimes combined with guggul, triphala and trikatu in a traditional Ayurvedic tridoshic compound formula called gokshuradi guggul, used to support the proper function of the genitourinary tract

Gokshura promotes mental clarity, and in fact, I use it for depression with exceptional clinical effect. This herb contains harmine alkaloids, which may explain its sedative properties. It may be taken with ashwaganda as a tonic nervine in vata disorders.

Amla fruit

The famous Indian gooseberry, or amla fruit (*Emblica officinalis*) (the name means “sour”) is one of the most useful medicines in Asia, and is considered to be one of the strongest rejuvenatives. It is an exceptionally rich source of vitamin C. The vitamin C in amla is heat stable, so it survives cooking and drying. No wonder it is such a well know rejuvenator.

Amla is a rasayana for the blood, bones, liver, and heart. It enhances production of red blood cells and strengthens the teeth, hair, and nails, as well as improving eyesight and regulating blood sugar. Amla is the frontline anti-inflammatory herb, and is used for a wide variety of inflammatory conditions, including hemorrhoids, gastritis, and colitis. Scientists recently confirmed the potent anti-inflammatory action of amla in an animal study.⁵⁶

It is considered to be the prime general herb for the eyes, and is said to treat premature gray hair, for which it is taken internally and used externally as an infused oil or water rinse. As a long term, slow acting remedy for chronic inflammation, use 1-2 grams per day in capsules.

Ayurveda designates triphala, containing amla, as a rasayana remedy, a medicament that improves general health and prolongs life. For this purpose triphala is traditionally prescribed for up to a year in doses of twice daily 1 – 2 gram doses. It may even be taken throughout life on a semi-regular basis to cleanse the tissues, strengthen digestion, and sharpen the senses.⁵⁷

Indian gooseberry is the basis for “Chyavanprash,” the most famous Ayurvedic rejuvenating jelly. The formulator designed this medicinal food supplement to enhance sexual functions and fertility. As a mild all around health tonic, chyavanprash can be used by people of all ages for almost any weakness or as a general energy supplement, but is especially appropriate for men. It is also particularly recommended for cough, dyspnea, emaciation, loss of voice, diseases of the chest and heart, thirst and rheumatic disorders. As a supreme long term tonic, it aids intelligence, memory, luster, immunity from disease, longevity, increased sense power, heightened gastric fire and peristalsis.

Into a base of fresh amla fruit, over two dozen other herbal ingredients are added for their synergistic effects, including ghee, sugar cane juice, honey, clove, and cinnamon.

Modern research says that chyavanprash protects the liver from damage⁵⁸ and reduces blood sugar and cholesterol significantly.⁵⁹ For sexual rejuvenation, stir chyavanprash into warm milk or spread on toast, and consume 1-2 Tbs. every day.

Holy Basil

This unassuming little garden plant plays a central role in the folk medicine of South Asia. This mild medicinal herb and vegetable is cultivated near temples and private homes, where it is believed to purify the air and to sanctify the environs.⁶⁰ The name comes from the reverence with which it is regarded in Indian culture. Holy basil (“tulsi” in Sanskrit, *Ocimum sanctum*) is a member of the basil family (*Ocimum*), but this particular type of basil hardly resembles the culinary variety we are used to seeing in pesto here. Much more pungent, the plant has a bitter taste, and larger leaves. Though the seeds and root are used in medicine, the leaves are the main therapeutic part of the plant. In Ayurvedic herbalism, tulsi is used as an expectorant⁶¹ and anti-mucus herb, for respiratory diseases like cold and flu.⁶² It is quite warming to the body, so it acts as a diaphoretic, a characteristic that also lends itself to fever and flu treatment.⁶³ As a warming digestive aid, is given for indigestion from overeating.⁶⁴ Holy basil is a muscle relaxant, and kills intestinal parasites. Tulsi is considered to expand and sharpen awareness, aid meditation, and promote compassion when taken as a medicine.

Quite recently, tulsi is getting serious attention in the scientific literature for its exciting potential uses in several important conditions. Most important, tulsi treats diabetes, normalizing both blood sugar and blood fats,⁶⁵ including cholesterol and triglycerides, factors that are integral to diabetes, as well as to other cardiovascular diseases. A recent animal study led the researchers to conclude that, “The results indicated a significant reduction in fasting blood sugar, uronic acid, total amino acids, total cholesterol, triglyceride, phospholipids and total lipids. In the liver, total cholesterol, triglycerides and total lipids were significantly lowered. Total lipids were significantly reduced in the kidney. In the heart, a significant fall in total cholesterol and phospholipids was observed.”⁶⁶

Tulsi works for diabetes in humans. A significant, placebo controlled, crossover study showed a 17.6% reduction in blood sugar, and led the scientists to conclude that tulsi was of value in mild to moderate diabetes.⁶⁷

Ocimum sanctum seems to prevent cancer and to protect against radiation damage, at least in laboratory animals. A study earlier this year from Madras demonstrated that hamsters were protected from developing cancer of the mouth by taking holy basil.⁶⁸ Mice survived radiation exposure when they had been administered the herb^{69, 70} Tulsi helps shortness of breath and bronchiopasm in asthma and kills microbes, including bacteria⁷¹ and fungi. It has now been shown to stimulate the immune system, confirming the historical use.⁷²

This versatile herb also benefits ulcer. It has been shown to reduce acid production in the stomach and increase protective mucus secretion.⁷³ Tulsi is anti-inflammatory.⁷⁴ In addition, it is now presumed to have adaptogenic benefits. Traditionally, tulsi was thought to protect against damage from stress. Modern research now confirms it.⁷⁵ Finally, research reveals that tulsi is an antioxidant- not surprising, considering its high flavonoid content, and its clinical effects.⁷⁶

Traditionally, tulsi is given as a tea, in a dose of 3 tsp. of dry herb, brewed into water, per day. Tulsi is a very mild and safe herb, however, and some people have more success with higher doses. Gradually increase the amount of tea until you get the results you are looking for, or until you have any digestive distress, which is very unlikely. You may also drink the fresh juice, taking about one-half ounce three times a day. It has been historically combined with ginger and black pepper for asthma, or combined with honey for bronchitis for cough. The essential is inserted in the ear for ear infection.

Ginger root

Want to add a little zap to your tongue and your health? Zesty ginger may be just the thing. Ginger root, the tuberous root of *Zingiber officinale*, is one of the most popular spices throughout the world, and a treasure for home first aid, as well as some pretty serious medicine. In fact, this herb is called “the universal medicine” in Ayurveda. Herbs and spices are typically not significant sources of nutrients in the diet, but ginger has relatively high calcium and iron content.⁷⁷

Tasty, aromatic ginger is a time-tested remedy for stomach upset. It is used by nearly every culture in the world. Ginger's effect on motion sickness and nausea has been thoroughly proven⁷⁸, so it's not surprising

that Europeans practitioners use ginger in tea for indigestion. It reduces spasm, absorbs and neutralizes toxins in the gastrointestinal tract and increases the secretion of digestive juices, including bile and saliva.⁷⁹ Ginger contains ingredients that soothe the gut and aid digestion by increasing peristalsis that moves food through the intestine.⁸⁰ A new study from India demonstrated that ginger speeds up the time it takes the stomach to empty, a benefit for feelings of abdominal discomfort and bloating.⁸¹

Compounds in ginger have shown benefit in the prevention of cancer.^{82,83,84}

Widely used for arthritis, especially osteoarthritis, in Asian herbalism, ginger is especially appropriate for cold, non-lubricated joints. There is some preliminary scientific information on ginger for this purpose.^{85,86} Ginger increases peripheral circulation, so is used clinically for cold hands and feet. Being diaphoretic, it treats cold and flu.

In my personal experience, ginger works well for carpal tunnel wrist pain. Slice the fresh roots lengthwise in thin, flat strips. Wrap the wrist with the strips, cover with a bandage and leave overnight. A compress made from cooked, fresh grated ginger also works well.⁸⁷

Although there is, as yet, little science behind it, Asian medicine uses ginger for migraine.⁸⁸ In my observation, ginger is absolute best thing for treating a migraine at the time that it develops, one of the few things that will work at the time. Stir two tablespoons of ginger powder into water and drink it at the onset of visual disturbances—the “aura”—before the pain starts. Usually that will knock it cold. The migraine may try to restart in about four hours, in which case you have to do this again.

Ginger is very safe, so consume it as desired in food, or use up to 3 grams per day in capsules. Use 1 tsp. chopped fresh root, brewed as tea, 3 times a day.

Turmeric root

Turmeric is one of, if not the most widely used, herbs for arthritis in India where it is commonly combined with ginger for this condition. This action is probably due primarily to curcumin. The anti-inflammatory effects of curcumin are well documented. While typical anti-inflammatory drugs have grave side effects like ulcer formation and immune suppression, curcumin is exceedingly safe. Curcumin has been shown to be at least as effective as cortisone or phenylbutazone in acute inflammation. Like capsaicin, the active ingredient in cayenne, curcumin also depletes substance P, the neurotransmitter of pain, in the nerve endings. When used orally, curcumin has several direct anti-inflammatory effects, including inhibiting leukotriene formation, inhibiting platelet aggregation, promotion of fibrinolysis, and stabilizing lysosomal membranes.^{89,90,91,92,93} The herb is widely used in all joint conditions, and is said to have a general joint rebuilding capability. It is used in rheumatoid arthritis and gout (both internally and as a pack on the joint). It normalizes ligaments, and therefore facilitates stretching exercise, such as Yoga. Applied as a wash, it can be used for inflamed eye conditions (conjunctivitis, ophthalmia).

Turmeric is antibacterial, and has the capability of killing many types of bacteria. Ayurveda recommends it for those who are chronically weak, as it is thought to be supportive of intestinal flora.

Recently, it was shown that turmeric can destroy salmonella bacteria, a common cause of food poisoning, within 15 minutes. It is also active against staph bacteria.

While known to be generally immune supportive, turmeric has been shown to be a potent inhibitor of HIV. A recent study at Harvard Medical School, comparing curcumin with chemotherapy drugs, demonstrated that it was effective as an inhibitor of HIV replication.

Turmeric is used historically in Ayurveda, both internally and externally, for the treatment of boils. It is also antifungal and anthelmintic, acting especially against *Entamoeba histolytica*. Long used as a respiratory herb, turmeric excels in reducing cough, for which it is often mixed as a household remedy with coriander and cumin. As an astringent and anti-inflammatory herb, turmeric is effective as a gargle for sore throat. Bitter herbs, generally, are known to be cooling. Turmeric can be used for severe sore throat with fever. In Ayurveda it is often administered in combination with ghee for this condition.

External Preparations

To keep the body young, massage daily with a combination of the infused oils of ashwaganda, shatavari and bala. Leave on to absorb for 2 hours before bathing. This program is antiaging (vayasthapan), as it treats excess vata. A simple oil of ashwaganda infused in sesame is a basic penis massage oil.

Sri Gopal Oil is an external proprietary preparation in which herbs are infused into sesame oil. It is used for genital massage as a general treatment for impotence. Ingredients include ashwangandha, shatavari, karanj (*Pongamia glabra*), saffron (kesar) and sandalwood.⁹⁴ Many other similar formulas are used.

Other Sex Remedies

While not strictly an herb per se, shilajit is widely used in Ayurveda. It is a tarry black or brown substance that exudes from rock cliffs, primarily in the Himalayas. It is thought to be an aged form of a prehistoric herb which is seeping to the earth's surface, but its origin still remains obscure. The tar is purified, dried, and encapsulated or stirred into an appropriate liquid, such as milk. Many combination products include shilajit. One such is Shilajit Vati, which is a mixture of shilajit paste and triphala powder, processed in the juices of the fresh triphala fruits. My mentor recommends taking shilajit daily with equal parts black pepper, boiled in milk.⁹⁵

Shilajit is a general detoxifier and rejuvenate, and is particularly useful in diabetes. It is considered to be quite beneficial for the genitourinary tract in general, so is widely employed for impotence.

Licorice is used in Ayurveda to improve sexual potency, libido eyesight and physical strength. Licorice is considered, as adaptogens generally do, to enhance the effects of other herbs in a formula, so it is widely used.

Safed (white) musali tuber (*Asparagus adscendens*) is a potent aphrodisiac plant. According to the *Sarngadhar Samhita*, it has been used since the 11th century A.D. It contains various stigmasterol derivatives. It is nutritive and demulcent, so suits urinary disorders. It is also been shown significant effect in increasing semen volume and total sperm count. Clinical trails also showed it to enhance working capacity.⁹⁶ Similar to ashwaganda, it imparts strength.

Safed Musali is traditionally used for male lack of libido and impotence. It is also widely used as a general health promoting, anti-aging tonic, with an affinity for the pelvis and rectum. With its sweet taste, hot temperature and heavy quality, it pacifies vata and pitta.

For general sexual debility and impotence, it is cooked in milk. It is often used in combination with other similar herbs, in a dose of 1-2 grams per day.⁹⁷ For acute current sexual problem, use 10 or more grams per day.

Licorice root is probably the most extensively studied adrenal herb in the world. Rich in both saponins and flavonoids, licorice root is anti-inflammatory. The structure of the saponins resembles adrenal hormones. Many studies have proven its anti-inflammatory and anti-allergy properties. Licorice preserves the effect of the body's hormone, cortisol, allowing it to maintain longer anti-inflammatory action.

Black pepper (*Piper nigrum*) is one of the most respected alteratives in Ayurveda, and it is quite drying. Its warming nature balances the cold herbs in a formula. It is ideal for *kapha* conditions with ama and cold, wet, boggy tissues.

Pipali peppercorn (Long pepper, *Piper longum*) is a powerful, rejuvenating, warming alterative rasayana remedy, which moistens the tissues and offsets the drying action of the other herbs. It is often combined with black pepper to offset the opposite moisture characteristics.

Cloves are mildly aphrodisiac and stimulating. Saffron (kesar), a very powerful and expensive herb, is an acclaimed vajikarana.⁹⁸ Not a tonic in itself, it synergizes with other tonic herbs. It is often used in milk preparations. I learned a remedy from my mentor, Yogi Bhajan, that combined saffron with camphor.

Proprietary and classical impotence formulas often center on a combination of ashwaganda, shatavari and kapi kachu. Kapi kachu seed (Cowhage, *Mucuna pruriens*) is considered to be one of the best male reproductive tonics. It contains l-dopa. For impotence, powder 2 seeds and take with warm milk daily at bedtime. It increases libido and erectile function. A traditional aphrodisiac (Vanari Vatika) is made by boiling

the seeds in milk. Then the seeds are pounded, fried in ghee and mixed with raw sugar. This mass is soaked in honey and rolled into a bolus.

The Ageless Mind

As our population ages, losing one's mental faculties can take first place on the list of concerns. Alzheimer's disease and other forms of senile dementia affect some 25 percent of all people over 80.⁹⁹ Research, though, is revealing nutritional approaches in treating and preventing mental decline.

Some types of mental decline develop when we are exposed to toxins and to oxidizing chemicals in our environment. All of these appear to contribute to brain inflammation, scarring and mental decay. Your brain may inflame may result from toxins, allergies, stress or low tissues nutrients. The process of inflammation creates free radicals that cause damage, which may contribute to senile dementia. These free radicals can be particularly damaging when brain tissues are deficient in antioxidants and other nutrients that ease the effects of chronic inflammation. Antioxidants should top your list of brain nutrients.

To reduce inflammation, antioxidant remedies, such as amla, are important. In animal studies, antioxidant levels in the brain have been shown to decline with age -the lower the level, greater the damage to nerve cells.¹⁰⁰

Gotu kola (Bitter, cold, sweet, VPK=)

Thinking about thinking? Feel like you're about to max out your personal hard drive? Here's an herb with a long history of brain building.

Gotu kola (*Centella asiatica*) is a mainstay of herbal medicine in Ayurveda, although this herb has been around the fringes of European herbalism for many years. In fact, it was used in France in the 1880's. Widely considered a superior herb for the nervous system, gotu kola has a host of benefits.¹⁰¹ In Ayurvedic medicine, this herb is called "brahmi", which means "godlike", a reference to its anti-aging properties and to its use as an aid to meditation. It has a bitter taste and is cooling to the body. It is used to promote circulation, especially to the blood vessels of the skin and mucous membranes, and is a rejuvenator for the nerves and brain.

Ayurveda claims that gotu kola strengthens memory, concentration and intelligence, promotes longevity, improves the voice, physical strength and the complexion. This medicine is used to treat diseases as diverse as epilepsy, senility, hair loss and psoriasis.

Not to be confused with kola nut (*Cola nitida*), gotu kola is a jungle creeper that grows in hot moist climates. After all, it's the food of the elephants, and we all know about their memories! Fresh, it's a delicious salad vegetable. The juice of the fresh leaves is available at some juice bars.

A 1992 study in rats showed an impressive improvement in memory. The treated rats were able to retain learned behavior 3 to 60 times better than the control rats.¹⁰²

More recently, a new study out of Korea shows that components in gotu kola show potential for treating Alzheimer's disease, a very promising conclusion.¹⁰³

Since gotu kola is basically a mild salad vegetable, the dose can be very high. Try one to four teaspoonfuls of fresh juice every morning. Many people use a modest dose of 1 gram per day in capsules for daily rejuvenation. Try a cup of gotu kola tea with honey before meditation.

Sleep

Changing sleep patterns in midlife could be costing men as much as 75 percent of a hormone known to prevent aging.¹⁰⁴

Previous research has centered on growth hormone deficiencies in older men and women, a shortage associated with increased obesity, loss of muscle mass and reduced exercise capacity. Recent findings that the hormone decrease starts when men are in their 30s was unexpected.

A study in the *Journal of the American Medical Association* involved 149 healthy men, ages 16 to 83, none of whom had a history of sleep disorders or took drugs. Researchers mapped age-related changes in sleep and found that the first stage of waning sleep quality starts between the ages of 25 and 45.

Although total sleep time stayed the same as men moved into midlife, the proportion of time spent in deep sleep diminished from 20 percent for men under 25 to less than 5 percent for those over 35. Their amount of growth hormone, secreted primarily during deep sleep, declined by about 75 percent.

Researchers also studied the second stage of worsening of sleep due to aging, which occurs after age 50. Total sleep time begins to reduce by about 27 minutes for each decade into the 80s, and men experience a significant reduction in rapid eye movement (REM), or dream sleep. REM sleep decrease appears to be connected with elevated cortisol levels.

Sleep deficit is usually a condition of disordered vata. Ayurveda advocates using grounding herbs, nourishing, easily digestible foods, and a regular lifestyle routine to support healthy sleep. Ashwaganda is especially effective for stabilizing long term sleep cycles.

Shankpushpi (cold, astringent, VPK=)

When we need mental piece and sleep, we may call upon shankpushpi (*Evolvulus alsinoides*) to help restore clear quality of the mind and relaxation. Its flowers resemble the *shankha* or conch shell, thus the name. This herb is an outstanding rejuvenative tonic for the mind and nerve tissue. The plant is said to have profound mystical properties, with an affinity for the heart, throat, third eye and crown chakras. The herb is *tridoshic* but is especially effective for vata-induced mental disorders of anxiety and fear. Often taken with or prepared in ghee, it promotes tranquility without dulling the mind. In depression, it uplifts. In mania it is calming. Students may use it for exam phobia. For attention deficit disorders, it combines well with brahmi, jatamansi, calamus and licorice.

For sleep, use shankpushpi at a dose of about 6 grams at bedtime.

Ghee

The ancient Aryans, writers of the Vedas, were apparently nomads long before they settled, along with their cows, in what we know as modern India. They brought their affinity for, and knowledge of the use of, milk products with them. Various cow's milk preparations are widely used in the diet suggested for yoga practitioners. One of these, ghee, or clarified butter, stands out.

According to Ayurveda, ghee is the best of all oily foodstuffs, and is used to cure disturbances in the doshas *pitta and vata*. Ghee is thought to have the healing benefits of butter, with the impurities (saturated fat, milk solids) removed. The *Susruta Samhita*, an Ayurvedic classic, claims ghee is good for all parts of the body, and it is considered the ultimate overall remedy for pitta (inflammatory) problems, and is the medium of choice (*anupan*) for mixing medicines for these conditions.

Specifically, ghee is said to promote memory, intelligence, quantity and quality of semen, and to promoting digestion, enhancing ojas and liver health. While ghee is a fat, it is unique, according to Ayurveda, in supporting, rather than stressing the liver. Ghee is an important rasayana for the brain and intellect, bone marrow, and reproductive tissue. We do know from modern science that ghee is rich in phenolic antioxidants.¹⁰⁵

Dietary fats regulate a wide variety of T cell functions. A 1996 study in mice showed that a diet containing ghee prevented T cell mediated contact hypersensitivity in the skin.¹⁰⁶

Ghee's benefits increase with its age. Aged ghee (up to a hundred years) treats alcoholism, epilepsy, fever, and vaginal pain. Ghee is used for sexual vitality and for building nerve and brain tissue. Long a favorite of yoga practitioners, it lubricates the connective tissues and promotes flexibility.

A client of mine, an extreme *pitta* type, at age fifty, was a walking ball of inflammation from accumulated past athletic injuries. Every joint, every muscle was sore. He undertook to use ghee to treat his condition. After working up to one cup of ghee a day, his inflammation was completely under control. Much to my surprise, he gained not one pound, and his cholesterol went down, not up. Same for triglycerides.

Medicated ghee, clarified butter in which herbs have been dissolved (*ghrita* in Sanskrit), is a famous preparation method for treating *pitta* conditions. For example, the well-known *Brahmi Ghrita* contains the popular herb gotu kola, and is used for a broad variety of brain conditions in a dose of 1 Tbs. per day.

Ghee and butter have essentially the same healing properties, but ghee is more digestible. Where ghee is light, butter is said to be heavy.

Ghee is also used externally. It is used as a massage base to benefit sensitive (*pitta*) skin. Ayurveda recommends ghee, sometimes mixed with honey, as an application for wounds, inflammation, and blisters. A special preparation, *hundred-times-washed-ghee*, is applied topically for wound healing, and to calm *pitta*.

Ayurveda suggests that natural milk products are superior to margarine. A 1991 study by the Medical Research Council showed that eating butter created half the heart disease risk, compared to polyunsaturated margarine, which contains risky *trans* fats.¹⁰⁷ Ghee in actual diets also produced less heart disease than *trans* fat containing diets.¹⁰⁸ When all is said and done, though, ghee is fat, and only a certain amount of total fat is necessary in the diet. If you would like to switch to ghee, make sure you reduce your total fat intake proportionately.

Cardiovascular Conditions

Heart disease is the nation's top killer, and the biggest health threat to men. The American Heart Association says that 1.5 million Americans will suffer heart attacks this year.¹⁰⁹ The good news is that protective measures can dramatically reduce the threat.

Men and women of all ages get heart disease. Men, though, are particularly vulnerable at younger ages. Over 356,000 die from diseases of the heart each year.

Genetics plays a large role in this disease, but modern lifestyles are also laden with risk factors.

High blood pressure is a major cause of cardiovascular disease. One in five Americans adults has it.¹¹⁰ In the main, sufferers—those with blood pressure consistently above 150/90—can't feel when their blood pressure is running high. More than 90 percent of high blood pressure patients have no obvious damage or disease.

But what you don't know can hurt you.

The heart, of course, is the stuff of verse. But you may not feel so poetic if you have a heart attack. The evening news extols the virtues of the latest medical treatments for this plague of plaque. Honestly, many work quite well. Drugs and surgery are frequently lifesaving. But how about preventing the crisis before it gets to the stage that needs these emergency measures?

And the side effects? The foremost class of cholesterol reducing drugs, the “statins”, has been implicated as the cause of *rhabdomyolysis*, a condition in which the skeletal muscle degenerates, resulting in pain, spasm and weakness.¹¹¹

Ayurveda shines in the prevention and treatment of coronary artery and other heart diseases, especially a chronic problem that has not yet reached crisis proportions, like that blood pressure that has been slowly rising for a few years.

The heart, from the Ayurvedic perspective, is “the seat of the mind, and the source of life,” as well as the seat of “prana” and “ojas.” The heart is an organ that is primarily governed by *pitta* dosha, but pathology can extend to all three doshas. As is typical with conditions that manifest with aging, the patient is usually so generally degenerated by the time a heart condition becomes apparent that all three doshas are severely damaged.

Kapha dosha is responsible for maintaining solidity, stability, and lubrication. We can look to problems with kapha dosha when we see unstable tissues, and weakened connective tissue, in whatever form. Wet, goopy, sloppy tissues are caused by excess kapha. The folded, mushy lesions are caused by derangement in kapha dosha. Kapha heart symptoms include a feeling of heaviness, constriction of the chest, and sluggish digestion, as well as anorexia, stiffness with feeling of being overstuffed, and sweet taste in the mouth. Kapha heart disorders are mainly obstructions.

Pitta dosha is responsible for the energy of transformation, cellular metabolism, and the generation of heat in the body. Pitta symptoms relating to the heart include heat and burning sensations with thirst, anywhere in the body, quick fatigue of the heart, sweating, dry mouth, and faintness. In the heart area, we would include a sucking sensation. Aggravated pitta causes narrowing of the channels through inflammation. Sweet taste in diet and medicine is generally good for pitta heart disorders.

Valve disorders (“kapata vikriti”) are specifically related to vata. Vata dosha is responsible for regulating movement in the entire body, and the disordered movement of the heart pump is a classic vata derangement. Vata dosha predominates in ever-greater amounts in the geriatric body. Vata also regulates form and function. A classic indication in Ayurveda that vata dosha is involved is the evidence of dysfunctional or unusual form or shape. The loose, sloppy, “billowy” valve is typical vata etiology. When vata dosha is deranged, tissues become dry. Though we can’t see the heart directly, we can infer the degree of dryness in the heart tissue from the rest of the body. Dry tissue is treated with moisturizing anti-vata remedies.

Many of the symptoms of the aging heart are vata symptoms and point to treatment of vata dosha if they are present. These include anxiety, chest pain, weakness, especially on exertion, palpitations and dyspnea. Vata heart disorders, as a rule, are characterized by stretching, pinching, cracking, and tearing pain in the heart region. Disordered vata promotes spasms in the circulatory system.

Guggul gum (bitter, pungent, astringent, KV-P+)

“The results I got were phenomenal. I tell everybody I talk to about the great effect,” says Guruchander Singh Khalsa, D.C., a successful chiropractic physician practicing in Espanola, N.M.

Dr. Khalsa comes from a family with genetically high cholesterol and has been running total cholesterol of over 300 for 20 years. His mother’s brother died at age 42 of a massive heart attack, and all her remaining siblings have had quadruple bypass surgery, along with heart attacks. Dr. Khalsa has managed to avoid serious disease with diet and yoga, but he knew the risks of the numbers. His thyroid function was also depressed, with the thyroid stimulating hormone reading at triple the normal value. After a bit of professional consultation, we decided to have him try guggul gum (*Commiphora mukul*) at 6 grams per day, to quickly lower blood fats, and a combination of gotu kola leaf, saw palmetto berry, scullcap leaf, elder berry, and willow bark, for the thyroid issue. Four months later, he called me on the phone. “Are you sitting down? He asked.” Lab tests showed that his cholesterol had plummeted a gigantic 180 points, and that the thyroid values were precisely normal.

This resin is a mainstay in Ayurvedic medicine for the management of blood fats, where it rivals any natural substance. In studies, guggul has lowered total cholesterol by over 20 percent, while increasing good HDL cholesterol by 36 percent, without dietary adjustments.¹¹² Ayurveda says that guggul promotes healing in the chest area in particular. (It reduces kapha, which is centered in the chest), but it is effective throughout the body.

In 2002, researchers at the Baylor College of Medicine in Houston discovered that an active ingredient, guggulsterone, acts as an antagonist, binding to and inhibiting a protein that binds to bile acids and halts their production, leading to a reduction of cholesterol and triglycerides.¹¹³

Guggul can help to reduce overall body fat. It seems to exert its effect at least partially through the thyroid, which could account for its fat loss benefit.^{114,115,116} Take a dose of 1,500 mg, three times daily.

The combination of guggul and triphala recently showed a startling effect in controlling body fat. Forty eight obese subjects took these Ayurvedic combinations three times a day for three months, with no attempt to control their food intake. The ensuing weight loss averaged almost 18 pounds, and their total cholesterol reduced 18 points. The study used a dose of only 500 mg of the combination, three times per day.¹¹⁷

Another placebo-controlled study from 1999 combined guggul extract with *Garcinia cambogia* extract and tyrosine. Over six weeks, twenty obese persons had a significant decrease in body fat mass and average body weight. The subjects lost body fat, but not lean mass. Fatigue went down, and there were no adverse effects.¹¹⁸

Arjuna bark (VPK=)

When I began to see my patient, Mary, her heart problems were becoming excruciating. Her nearly uncontrollable tachycardia would bring her to the emergency room at least once a week. The digoxin and related drugs used to steady her heart rhythm left her feeling like she was wearing a lead blanket. Her choice: lie around like a beached whale or endure a heart that raced like a Ferrari. At 72 years of age, Mary was becoming hopeless. "I'll never have my life back," she complained.

I have had great success with the famed Ayurvedic heart herb, arjuna, for tachycardia, so I suggested it to Mary. She never made that trip to the ER again.

Though it is rather new to us here, arjuna is one of my favorite herbs. I've seen it provide benefit countless times, in just about any type of cardiovascular disease. Arjuna is a famous Ayurvedic medicine comprised of the bark of the *Terminalia arjuna*, a 60-90 foot deciduous tree found growing throughout India. Arjuna is a relative of the famous medicinal myrobalan trees *haritaki* and *bibitaki*, ingredients in the important medicine *triphala*. The thick, white-to-pinkish-gray bark is probably the most widely used cardiac herbal medicine in Ayurveda.

Ayurvedic practitioners use this medicine in a wide variety of cardiovascular conditions- it is virtually a panacea for the heart and circulation in Ayurveda, a cardiac "tonic." This herb holds a position in Ayurveda very similar to that of hawthorn in European herbalism. Among the diseases for which it is prescribed in India are cardiac failure, hypertension, angina, endocarditis, pericarditis and edema.¹¹⁹ Dr. Vasant Lad calls it a coronary vasodilator.

Herb McDonald, a veteran herbalist with a clinical practice in Albuquerque, New Mexico, shares this view. He calls arjuna "far and away the number one cardiovascular herb. It's the foundation of treatment for all cardiovascular diseases, especially arrhythmias. I use it with *guggul* for high cholesterol. Using arjuna in my practice has eliminated my use of hawthorn," says Herb.

McDonald mentions a case that he calls an "arjuna miracle." The patient was an 85 year-old woman with a history of circulatory disease, including two strokes. She was having regular episodes of rising heat sensations with palpitations, followed by a "crash" of felling limp and heavy. When nothing could be discovered medically, she was brought to McDonald and her daughter, a nurse, began taking hourly blood pressure readings. The blood pressure was alternating between 60/40 and 180/130! Herb gave arjuna at nine 730 mg capsules per day. Within 24 hours, the episodes ceased, never to return, and the blood pressure remained stable.

Modern clinicians here are beginning to use arjuna for coronary artery disease, heart failure and high cholesterol.^{120, 121}

Arjuna's components include a variety of polyphenols, which probably account for much of its activity, including tannins, ellagic acid, gallic acid, proanthocyanidinic oligomers (PCOs) and flavonoids (arjunone, arjunolone, luteolin). It also contains triterpenoid saponins (arjunic acid, arjunolic acid, arjungenin, arjunglycosides), phytosterols, calcium, magnesium, zinc and copper.

Arjuna seems to primarily improve cardiac muscle function and pumping activity of the heart. The saponin glycosides might be accountable for the heart contracting benefits of arjuna, while the flavonoids and PCOs afford antioxidant action and vascular strengthening.

Scientific information about arjuna is beginning to accumulate. Angina pectoris, in particular, benefits from this medicine. A 1999 study indicated that arjuna was more effective than a standard drug for angina. Arjuna was effective for 80% of the patients and the herb reduced the number of anginal attacks from 79 per week to 24 week.¹²² In a recent study from Delhi, India, patients with stable angina had a 50-percent reduction of angina after three months of therapy with arjuna alone. When looking at overall clinical condition, treadmill results and ejection fraction, 66 percent showed improvement.¹²³

This herb is particularly effective for congestive heart failure. A recent experiment bears this out. A double blind, placebo-controlled, two-phase trial of arjuna extract treatment in patients with severe refractory heart failure was conducted. Arjuna was added to the patients' regular drugs. In just two weeks, breathing difficulties, fatigue, edema, heart contraction, blood pressure and walking tolerance all improved. In the

second phase of the study, the subjects continued the arjuna for 2 years, and continued to improve for the next 2-3 months. Their improvements were sustained for the entire 2 years.¹²⁴

If that's not enough, arjuna also benefits cardiomyopathy and the treatment of myocardial infarction. A 1997 study of heart attack victims again demonstrated that arjuna was superior to drugs alone for a wide range of related symptoms (angina, pumping strength, enlarged heart).¹²⁵ Arjuna also protects the tissue of the heart from damage.¹²⁶

Clinically, I have seen arjuna reduce blood lipids countless times. Yet, the scientific literature includes only animal studies to confirm this action. Several studies over the last few years have shown that arjuna, at least in animals, reduces total cholesterol and increases HDL.^{127, 128} A study from February 2001 showed that this herb was as effective as an antioxidant as vitamin E, and that it reduced cholesterol in the human subjects quite substantially.¹²⁹ Herbalists use this herb to lower blood pressure. Considering its benefit for cholesterol, this is not surprising.

In my clinical experience, arjuna especially excels in treating disorders of heart rate, especially tachycardia, as in the case of Mary, whose dose was a rather large 12 grams per day. When Mary reached the effective dose, her tachycardia disappeared like flipping a switch, with no side effects. Another patient, Mary Hale, began to have just a hint of tachycardia at age sixty. A dose of 730 mg per day was all it took to relieve her condition.

Ed Lane, a lifelong martial arts instructor and physical fitness proponent, had "idiopathic" (medically undetermined cause) high pulse. Again, arjuna filled the bill, but Ed's dose was a whopping ounce per day of the bark. Ed made arjuna bark tea, got great results and learned to like a new beverage. Arjuna, by the way, is used as a beverage tea in India, but most Americans find it too tart to enjoy that way. And arjuna is not just for the heart. Like other herbs that contain high amounts of antioxidant polyphenols, arjuna is a powerful antiaging tonic. Studies show that arjuna is a powerful antibacterial.¹³⁰ It has proven Antimutagenic and anticancer properties.^{131,132,133} Historically, arjuna has been used for liver disease, cirrhosis, urogenital disorders, hemorrhage, dysentery, diarrhea, irregular menstruation and as a diuretic.¹³⁴

For more than 1,500 years Ayurvedic doctors have boiled arjuna bark in milk or ghee to make medicine, having patients ingest it daily for up to a year. A typical dose of dried arjuna bark is 1-3 grams per day, in capsules. For congestive heart failure, 500 mg of extract four times per day has been used in studies. You may brew the bulk shredded bark into a tea with a pleasant red hue. It's a bit tart, so you may add other herbs, such as ginger, for flavor. "Arjunrisht," an alcoholic preparation of the bark, is a common remedy.

Garlic bulb

Ayurveda considers garlic to be a virtual panacea for the heart. It supports the pumping strength of the heart muscle and enhances general blood flow. At least 12 studies have looked at the benefits of garlic for hypertension.¹³⁵ According to published scientific literature, garlic (*Allium sativum*) seems to reduce blood pressure levels by about 5 to 10%. Every bit counts when you are treating the total damage from chronic high blood pressure. Clinical herbalists assert that higher doses produce larger reductions.

Perhaps the best of these trials looked at 47 subjects with mild hypertension. For 12 weeks, half were given placebo and the other half received a daily dose of 600 mg of garlic powder, standardized to 1.3% alliin. Garlic reduced systolic blood pressure by 6% and diastolic pressure by 9%.¹³⁶ Another study done in a Rhode Island hospital achieved a reduction of about 5.5% in systolic blood pressure.¹³⁷ Cholesterol was reduced by about 7%.

Garlic is essentially a food. Larger doses should not hurt, and you might experience better results if you are willing to include more in your diet or use a higher dose as a supplement.

Cinnamon bark (Pungent, sweet, astringent, hot VK- P+)

A man does not live by chocolate alone. At least, not if there's a little cinnamon around. And this agreeable spice is not just heating up oatmeal anymore. Cinnamon is valued as one of the world's most important spices. Recent discoveries have uncovered a host of uses for around the home.

This warming herb (*Cinnamomum zeylanicum*) strengthens the heart generally. Since it is almost a universal medicine, it is suitable for just about everyone. It is unlikely to aggravate pitta, which is important in complex heart conditions. Since cinnamon is a gentle warming herb for vata, it is used in vata syndromes. Medicinally, cinnamon is largely known for being a muscle relaxant, so it can be employed for cramps.¹³⁸

Cinnamon bark might control blood sugar levels in diabetics. United States Department of Agriculture (USDA) scientists discovered that cinnamon reduces the amount of insulin required for glucose metabolism. The spice made fat cells much more responsive to insulin. Researchers found that the most active compound -- methylhydroxy chalcone polymer (MHCP) -- upped glucose metabolism roughly 20-fold in a laboratory assay of fat cells. A dose of 1/8 to 1/4 tsp of ground cinnamon per meal for diabetic patients may help to regulate their blood sugar levels.¹³⁹

A recent study found that vegetarians have high blood levels of salicylic acid, the anti-inflammatory ingredient in aspirin. Scientists suggest that this may partly explain why people who eat a diet rich in fruits and vegetables generally have a lower incidence of heart disease and cancer.¹⁴⁰ Cinnamon has one of the highest concentrations of salicylic acid.

Cinnamaldehyde, one of the constituents, is sedative and analgesic. Eugenol, another compound in the essential oil, relieves pain. This herb excels in treating flu. It supports immune functions and cuts mucus.

The dose is typically 500mg to 1 gram per day, powder or infused, but since this herb is mild, the dose could be much higher if necessary.

Ginger (*Zingiber officinale*) (pungent, sweet- VK- P+) is similar in action to cinnamon, and is known as a general heart strengthening medicine. It can stimulate pitta, so care should be taken. The dose is 1 gram per day or more, as necessary. Among its many uses, ginger treats diabetes, lowering blood sugar and treats closely related cardiovascular conditions. Ginger lowers blood fats, including triglycerides, reduces oxidation of LDL and prevents arterial plaque.^{141, 142, 143} Research published in 2002 found that a higher dose of ginger (500 mg/kg, about an ounce for an average adult) produced a significant lowering of blood cholesterol.¹⁴⁴

Coleus (*Coleus forskohlii*) is an herb that has been used in India since ancient times, but has typically been used as an antispasmodic in such conditions as intestinal colic, asthma, and uterine cramps. In 1974, pharmacological screening undertaken by the Indian Central Drug Research Institute determined that coleus root was significant in lowering blood pressure and as an antispasmodic. The active constituent was isolated and named forskolin. Extracts of forskolin are now known to increase cyclic adenosine monophosphate (cAMP) in cells, resulting, in particular, in increased force of contraction of the heart muscle, which offsets the effect of the valve prolapse. Modern extract preparations of coleus are available. The dose of the 4:1 extract is 600-1200 mg per day.

Bala root (*Sida cordifolia*) (sweet, cold- VPK=) is one of the many mallow species used in Ayurveda. It is a general heart tonic. In fact its name means "strength," owing to its ability to strengthen and stabilize tissue generally. Since it is tridoshic, it is widely suitable for a variety of patients. In particular, it is used with vata disorders. The dose is up to 1 gram per day, but again, this is a mild herb, and could be used in larger amounts. It is often prepared as a milk decoction.

Turmeric is called a blood purifier, and has been compared to the herb chaparral in its action. It should be noted that the molecular structure of curcumin is very similar to that of NDGA, the active component of chaparral. Turmeric normalizes cholesterol. One component, dimethylbenzyl alcohol, reduces serum cholesterol, while curcumin removes accumulation of cholesterol in the liver. The anticholesterol action includes reducing intestinal cholesterol uptake, increasing the conversion of cholesterol into bile acids, and increasing the excretion of bile acids.

As a hemostatic, turmeric is effective at reducing bleeding. In one case, I observed an emergency oral dose of two heaping Tablespoons of turmeric powder control the crisis in a case of bright red blood pumping from the rectum.

Turmeric reduces arterial plaque. Since it inhibits platelet aggregation, it can benefit circulation in many ways, including reducing the accumulation of deposits on arterial walls. Turmeric would wisely be used in artery disease or in recovery from bypass surgery or angioplasty. Anemia benefits from turmeric, as it

facilitates the production of new blood cells. Its unique combination of characteristics makes it suitable in the treatment of varicose veins.

Punarnava (*Boerhaavia diffusa*) (cold, PK-V=) is a renowned diuretic in Ayurveda. Called “pigweed” in English, it is a common addition to arjuna preparations, especially for congestive heart failure. The typical dose is four grams per day.

For years, I have been clinically using an Ayurvedic formula that contains a few simple herbs. It’s one of the most consistent formulas for treating impotence that I know. My colleague, Siri Atma S. Khalsa, M.D., who practices in New Mexico, calls it the most dependable impotence remedy in his practice. He treats a lot of diabetic functional erectile complications in his practice, and finds to help in many cases. The formula contains encapsulated garlic bulb, cinnamon bark, onion bulb, turmeric root, ginger root and cardamom seed.

Treatment by Dosha

Remedies for balancing heart problems caused by kapha in general include vacha (*Acorus calamus*) (pungent, bitter, astringent, hot, VK-P+), neem (*Azadiracta indica*) (bitter, cold, PK-V+) and pipali (*Piper longum*) (pungent, hot, VK-P+).

Remedies for balancing heart problems caused by pitta in general include honey, raw sugar, ghee, *bala*, and licorice.

Remedies for balancing heart problems caused by vata in general include asafoetida, rock salt, cardamom, ginger, and triphala.

Premature Ejaculation

Premature ejaculation (PE) is generally treated with a long term strategy. Modest doses of medicines are given daily for several weeks or months, as opposed to shortly before intercourse.

Nutmeg gets my vote for the best remedy for this condition.¹⁴⁵ This calming pungent herb reduces vata in the large intestine.

Fresh medicine is essential. Nutmeg is sedating, but the relaxing effects don’t manifest until about 4 hours after ingestion. Small chronic doses for PE should not be problem in this regard. Use about 1 gram per day, and titrate the dose to tolerance of the sedating effects. Expect PE benefits in about 2-4 weeks. Continue a small daily dose as necessary.

Safed musali is well known for PE.

Amla fruit is used for this condition.¹⁴⁶ It tends to work slowly, so the effects will be cumulative over up to several months. The speed of effect can be hastened somewhat by using doses in the 5 gram range. Chyavanprash is a general remedy for enhancing and balancing sexual functions, and is used for slow but steady treatment of this condition.

Shilajit is used for long term treatment of PE. The dose is 1-2 grams per day, usually with milk. Kapi Kachu has general benefit for PE.¹⁴⁷

Various Ayurvedic combination formulas are used for PE. One such proprietary combination includes shatavari, gokshura, Trikatu, ashwaganda, and musali, along with an assortment of minor ingredients.

Benign Prostatic Hyperplasia (BPH)

BPH involves by a slow, continual enlargement of the prostate gland. As the gland swells, it compresses the urethra, obstructing urine flow, resulting in weakened urination, night urinary urging, urine retention and pain. About 90 percent of men older than 85 have some evidence of BPH, but only half of them will have painful prostate enlargement. One theory on BPH focuses on the levels of dihydrotestosterone (DHT) in the prostate.

The pelvic area is seen as a particularly critical area in which it is necessary to keep energy balanced to retain homeostasis. (The other critical body areas are the heart and the head.) Prostate problems, which occur with aging, happen during the time of life when vata is dominant. It’s not surprising that the aging prostate is connected to disordered vata. BPH is an *udavarta* disorder, one involving the reverse direction of vata. As

previously mentioned, apana in the large intestine and genitals rises upwards, leaving prostate energy diminished.

Ayurveda maintains that overindulgence in sex will downgrade prostate health.¹⁴⁸ (This will vary with each person.) Ayurveda says that we should never suppress natural urges (yawning, belching, gas, etc.). Doing so will aggravate vata and contribute to udavarta.¹⁴⁹ Habitually ignoring the urge to urinate can irritate the prostate. Other contributing factors include excesses in physical labor, fasting, pungent, bitter and astringent foods, wine and meat. Clinical observations show that BPH is becoming more common in Japan. Those who consume more meat and milk appear to be at greater risk.¹⁵⁰ A Finnish study from 2000 found that meat consumption increased lower urinary tract symptoms (hesitancy, incomplete emptying, incontinence, nocturia and daytime frequency) and vegetable intake decreased these symptoms.¹⁵¹ In fact, The American Dietetic Association and Dietitians of Canada say that vegetarians have lower rates of prostate cancer.¹⁵² Other studies confirm this.¹⁵³ (By definition, the cells in BPH are benign, not cancerous. BPH is not thought to be a risk factor for prostate cancer by some authorities in conventional medicine. Others reason that any unhealthy condition in the prostate is cause for future problems, and are convinced there is a link. Studies are equivocal.)

Ayurveda sees BPH not so much as a problem in itself (of course it can make a man miserable), but a sign of a much more serious syndrome. Vata reversal is a big problem, and will eventually bring all bodily processes to a grinding halt. It is the antecedent to a cascade of problems that flow in a predictable way. It goes like this. The apana vata ascends into the liver, creating an imbalance in the pitta of the liver. This draws ama from the gut into the liver, and later into the blood. This pitta disordered blood accumulates in areas of weakened areas, which can be anywhere, but can include the disordered apana. As the ama accumulates in the urogenital tract, it has no way out, as the apana that would normally assist it to exit is now reversed. Inflammation ensues. Certain men are more susceptible to the collected effects of this problem than others, but the sum total of these disruptions of the doshas often settles in the prostate and blooms as BPH.

In general, udavarta conditions are treated with remedies to assist vata back into its proper directions of movement. Medicated enemas promote bowel function. Barley, oil and meat soup in the diet nourish and balance disordered vata. Herbs that generally balance this condition include haritaki, asafoetida and calamus.¹⁵⁴ A rectal suppository made from asafoetida, honey and rock salt, smeared with ghee for insertion, can be used.

So any given case of BPH can involve any of the doshas in any proportion. The boggy, wet, swollen prostate is a kapha excess. The inflamed tissue is a manifestation of pitta. The blockages and reversed energy flow comes from vata. The diet appropriate to the offending dosha is indicated.

Ayurveda maintains that a multipronged approach is likely to be successful. Maintaining the quality and quantity of the reproductive fluid (shukra) will stabilize the testosterone level and sexual desire. Ayurveda will also focus on promoting the unobstructed flow of urine, easing the pressure on the genitourinary tract upping immune function and purifying the urine to avoid infections and preserving the normal size of the prostate.¹⁵⁵ The prostate is sensitive to the accumulation of ama, so detoxifying programs are necessary to prevent problems. Using herbs that purify the urine (turmeric, cumin, fennel) can help.

Punarnava (*Boerhavia diffusa*), the above ground, herbaceous portion, is a diuretic. A widely valuable herb, it ups the quality of six of the seven body tissue types, including nutrient plasma (Rasa Dhatu), blood (Rakta Dhatu), muscle (Mamsa Dhatu), fat (Meda Dhatu), bone marrow and nerves (Majja Dhatu), and reproductive fluids (Shukra Dhatu). Punarnava is used as an effective diuretic, anti-spasmodic and anti-inflammatory agent, with analgesic qualities, in urinary tract infections. Unlike most diuretics, which are catabolic by definition, Punarnava is a rasayana. This herb is perfectly designed for prostate problems. Use 4 grams per day with hot water.

Shatavari root (*Asparagus racemosus*) is the main sexual rejuvenating tonic for women, but men can use it as a soothing general remedy for the genitourinary system. Considered a builder and balancer for reproductive organs, as a rasayana, it increases semen and sexual juices in general. This cooling herb acts as a blood cleanser, supports the immune system, improves the intellect, and enhances digestion and physical strength. Shatavari as a soothing treatment for dry or inflamed membranes of the sex organs. As a mild

diuretic, with a tropism for the urinary tract, it can relieve the congestion of the boggy prostate. It can be prepared as a milk decoction (simmer in milk, strain) combined with ghee, raw sugar, and honey. Shatavari is related to the Western asparagus root, which has similar properties, but which is a stronger diuretic.

Zinc is critical for prostate function. Black pepper, cumin and coriander increase bioavailability of the zinc. Black pepper peppercorn is also a drying herb that will reduce the size of wet, boggy tissues in general. Radish is diuretic and detoxifying. Maintaining proper bowel volume and movement regularity is necessary to prevent aggravation of apana vata, the force that governs elimination. Testosterone enhancing foods, such as asparagus, bananas and dates will delay prostate swelling. A few other foods have general benefit for the urinary tract. Most are diuretic. Included are beets greens (try as a monodiet for two weeks), coconut, grapefruit and melon.¹⁵⁶

Banyan tree sap is a folk remedy for the prostate. Banyan trees, huge behemoths that dot north India, have spongy wood filled with milky sap. The sap is easily extracted. It is a sweet sticky liquid somewhat like honey. It is a general tonic remedy for the prostate. Use about a teaspoon per day, especially combined with yogurt. This is a favorite of my mentor.

One possible herbal combination for BPH is shilajit, purified zinc mineral ash, kachnar, guduchi, turmeric, Punarnava, sandalwood and sarsaparilla. Another proprietary mixture contains Mimosa pudica, Argyreia speciosa, Orchis mascula, Ocimum sanctum, Piper nigrum, Tribulus terrestris, Commiphora mukul and Asphaltum punjabinum.

Amla, turmeric, shilajit and guggul are anti-inflammatory, if inflammation is a paramount symptom.

Another formula would be equal parts of ashwaganda, gokshura and shatavari. Use 6-10 grams per day of this mixture, in a vehicle appropriate to the condition.

Castor oil to bowel tolerance will reverse the vata of the large intestine.

Since BPH results in nighttime urinary dribbling, using diuretics during the day, and then abstaining from water in the evening can reduce nocturnal pilgrimages to the bathroom. Use a tea of holy basil leaf and coriander seed.

Try a healing recipe for the prostate. This is basically a taste way to ingest a large dose of diuretic, detoxifying, anti-inflammatory parsley.

Parsley Prostate Rasayana

1 cup basmati rice

1 cup dried parsley, or fresh, chopped, to taste

2 cups chopped potato (skins on)

2 onions, chopped

2 tsp. ajwain seed

1 tsp. ground red pepper (or more to taste)

1 Tbs. turmeric

1 tsp. black pepper

2 crushed bay leaves

½ cup ghee

Sauté onions in ghee. Add spices. Cook until browned. Add rice, potato and parsley. Stir for a while. Add water (to steam rice), cover, and cook for another 15 minutes. Serves 4-6.

Can be eaten as a mono diet. Serve with yogurt for extra stamina.

Keeping Men Healthy

Men's health is actually a particularly challenging area. For a generation, clinicians in the United States have seen women as the vast majority of their practices, perhaps as high as 95%, even in a general practice setting. Men just don't present to alternative practitioners (or to any other practitioners, for that matter). But men's needs are just as serious. They die earlier. And while they are still alive, they are just as miserable, or perhaps more miserable, if they don't seek help.

Ayurveda offers a holistic approach to crisis care for men, and a scheme for managing health and welfare over a lifetime. After being involved with this system for over 30 years, I will testify to its effectiveness, and to the scope of its comprehensive approach. Now, if we could just entice some men into the clinic...

¹ Basic Principles of Ayurveda, India Mart, <http://www.indiamart.com/ayurveda/discover-ayurveda/agni.html>

² McCaleb, Robert S., Herb Research Foundation Encyclopedia of Popular Herbs, Prima, Roseville, California, 2000.

³ RH DOWLING, MJ VEYSEY, SP PEREIRA, SH HUSSAINI, LA THOMAS, JAH WASS, GM MURPHY. Role of intestinal transit in the pathogenesis of gallbladder stones. *Can J Gastroenterol* 1997;11(1):57-64. Increasing evidence implicates prolonged intestinal transit (slow transit constipation) in the pathogenesis of conventional gallbladder stones (GBS), and that of gallstones induced by long term octreotide (OT) treatment. Both groups of GBS patients have multiple abnormalities in the lipid composition and physical chemistry of their gallbladder bile – associated with, and possibly due to, an increased proportion of deoxycholic acid (DCA) (percentage of total bile acids). In turn, this increase in the percentage of DCA seems to be a consequence of prolonged colonic transit. Thus, in acromegalic patients OT treatment significantly prolongs large bowel transit time (LBTT) and leads to an associated increase of the percentage of DCA in fasting serum (and, by implication, in gallbladder bile). LBTT is linearly related to the percentage of DCA in fasting serum and correlates significantly with DCA input (into the enterohepatic circulation) and DCA pool size. However, these adverse effects of OT can be overcome by the concomitant use of the prokinetic drug cisapride, which normalizes LBTT and prevents the rise in the percentage of serum DCA. Therefore, in OT-treated patients and other groups at high risk of developing stones, it may be possible to prevent GBS formation with the use of intestinal prokinetic drugs.

⁴ Hotz J, Plein K [Effectiveness of plantago seed husks in comparison with wheat bran on stool frequency and manifestations of irritable colon syndrome with constipation]. *Med Klin* 1994 Dec 15;89(12):645-51

BACKGROUND AND AIM: The importance of dietary fibres in treatment of irritable bowel syndrome increased during the last years. Yet the results of clinical studies on the different dietary fibres are not consistent. Therefore we decided to perform a controlled trial with a well defined group of patients to compare the effectiveness of wheat bran to psyllium seeds. **PATIENTS AND METHODS:** Thirty patients each with irritable bowel syndrome group II to III were treated in an open, not controlled study design either with 3 times 3.25 g psyllium seeds or 3 times 7 g wheat bran daily. All patients entering the study had not been treated for at least 3 weeks before. The study comprised two treatment phases of two weeks each, separated by two weeks without any treatment, thus leading to a study duration of 6 weeks altogether. Parameters for evaluation were stool frequency and consistency and the symptoms pain and abdominal distention, measured by a score (1 to 4). **RESULTS:** In both treatments groups stool frequency and consistency improved apparently compared to the starting point or the two weeks treatment free time in between. The improvement of stool frequency was statistically significant ($p < 0.0001$) for both substances. Furthermore the effect of psyllium seeds exceeded that of wheat bran statistically significant in week 1, 2, 3, 5 and 6 ($p < 0.005$). Other symptoms such as abdominal pain improved too by therapy, psyllium seeds again tending to show better results. A significant difference between both substances could be observed on the symptom abdominal distension. Whereas abdominal distension decreased under treatment with psyllium seeds it increased with wheat bran. This led to discontinuation of the study in 5 cases, 3 of which could be changed successfully to psyllium seeds. The difference between psyllium seeds and wheat bran concerning the occurrence of abdominal distension was statistically significant ($p < 0.01$). **CONCLUSION:** The results of this study demonstrate the effectiveness of psyllium seeds and wheat bran on stool frequency and consistency of patients with irritable bowel syndrome. Psyllium seeds showed to be superior to wheat bran with respect to stool frequency and abdominal distension so that it should be preferred in treatment of irritable bowel syndrome and constipation.

⁵ Prior A, Whorwell PJ Double blind study of ispaghula in irritable bowel syndrome. *Gut* 1987 Nov;28(11):1510-3

A double blind placebo controlled trial of ispaghula husk in 80 patients with irritable bowel syndrome is reported. Global assessment judged treatment to be satisfactory in 82% of patients receiving ispaghula and 53% of the placebo group (p less than 0.02). Bowel habit was unchanged in the placebo group, while constipation significantly improved in patients taking ispaghula ($p = 0.026$). Transit time decreased significantly in those taking ispaghula compared with placebo ($p = 0.001$), especially in patients with initially high transit times. Abdominal pain and bloating improved in both groups, with no significant differences between ispaghula and placebo. Four of the eight withdrawals on ispaghula and 10 of the 15 withdrawals on placebo were because of treatment failure. Ispaghula significantly improves overall well being in patients with irritable bowel syndrome, and in those with constipation favourably affects bowel habit and transit time.

⁶ Kumar A, Kumar N, Vij JC, Sarin SK, Anand BS Optimum dosage of ispaghula husk in patients with irritable bowel syndrome: correlation of symptom relief with whole gut transit time and stool weight. *Gut* 1987 Feb;28(2):150-5

To determine the optimum dose of ispaghula husk in patients with irritable bowel syndrome (IBS) and to assess the correlation, if any between the relief in patients' symptoms and the whole gut transit time, and the increase in stool weight, a two part study was carried out. In part 1, 14 male patients were given ispaghula husk in increasing doses of 10 g, 20 g, and 30 g a day for a duration of 17 days each (14 days of study period + three days of stool collection). Ten patients completed the trial. The symptom score improved significantly with all the three doses of ispaghula. Both 20 g and 30 g doses of ispaghula were superior to the 10 g dose

but there was no significant difference between the 20 g and 30 g doses. There was a significant (p less than 0.001) increase in the daily stool weight with 10 g dose of fibre with further significant increases with the 20 g and 30 g doses. A positive correlation was seen between the improvement in the symptom score and the increase in stool weight with the 10 g dose of ispaghula but not with the 20 g and 30 g doses. Whole gut transit time remained fairly constant throughout the study period and there was no relationship with either the dose of ispaghula, the alteration in stool weight, or the improvement in the patients symptoms.

⁷ Blumenthal M, Busse WR, Goldberg A, et al, eds. *The Complete German Commission E Monographs: Therapeutic Guide to Herbal Medicines*. Austin: American Botanical Council and Boston: Integrative Medicine Communications, 1998, 167.

⁸ Thune I, Lund E. Physical activity and risk of colorectal cancer in men and women. *Br J Cancer*. 1996 May;73(9):1134-40. Institute of Community Medicine, University of Tromsø, Norway.

We examined the association between self-reported occupational and recreational physical activity and the subsequent risk of colorectal cancer in a population-based cohort in Norway. During a mean follow-up time of 16.3 years for males and 15.5 years for females, 236 and 99 colon cancers and 170 and 58 rectal cancers were observed in males and females, respectively, among 53,242 males and 28,274 females who attended the screening between 1972 and 1978. Physical activity at a level equivalent to walking or bicycling for at least four hours a week during leisure-time was associated with decreased risk of colon cancer among females when compared with the sedentary group (RR = 0.62, 95% CI 0.40-0.97). Reduced risk of colon cancer was particularly marked in the proximal colon (RR = 0.51, 95% CI 0.28-0.93). This effect was not observed for occupational physical activity alone, probably due to a narrow range of self-reported physical activity at work among females. However, by combining occupational and recreational physical activity we observed an inverse dose-response effect as increasing total activity significantly reduced colon cancer risk (P for trend = 0.04). Among males 45 years or older at entry to the study, an inverse dose-response effect was observed between total physical activity and colon cancer risk (P for trend = 0.04). We also found in males a stronger preventive effect for physical activity in the proximal as compared to distal colon. In addition, we found a borderline significant decrease in colon cancer risk for occupational physical activity in males 45 years or older when compared to the sedentary group (RR = 0.74, 95% CI 0.53-1.04). All results were adjusted for age, body mass index, serum cholesterol and geographic region. No association between physical activity and rectal cancer was observed in males or females. The protective effect of physical activity on colon cancer risk is discussed in regard to energy balance, dietary factors, age, social class, body mass index and gastrointestinal transit time.

⁹ Colditz GA, Cannuscio CC, Frazier AL. Physical activity and reduced risk of colon cancer: implications for prevention. *Cancer Causes Control*. 1997 Jul;8(4):649-67.

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This paper reviews the consistency of the relation between increased physical activity and reduced risk of colon cancer, estimates the potential prevention benefit from increasing population levels of physical activity, and considers social strategies to increase activity levels. The published literature was reviewed systematically and supplemented by MEDLINE searches through March 1997. Studies that reported a measure of physical activity and outcomes of colon cancer or colorectal cancer were included. We excluded the first report of a study that was expanded subsequently by extended follow-up, and any study that did not report the methods for measurement of physical activity. Data were extracted including details on study size, methods of classifying physical activity, and outcomes. A consistent inverse relation was observed such that increased physical activity was associated with reduced risk of colon cancer. About a 50 percent reduction in incidence was observed among those with the highest level of activity across numerous studies that used different measures of activity (occupational or leisure-time activity). This association persisted in studies using multivariate analyses to control for diet and other known or suspected risk factors for colon cancer. Risk reduction was attenuated in those studies that combined colon and rectal cancer. This review indicates that greater attention should be placed on social strategies to increase physical activity as a means of preventing colon cancer.

¹⁰ Chakurski I, Matev M, Koichev A, Angelova I, Stefanov G [Treatment of chronic colitis with an herbal combination of *Taraxacum officinale*, *Hipericum perforatum*, *Melissa officinalis*, *Calendula officinalis* and *Foeniculum vulgare*]. *Vutr Boles* 1981;20(6):51-4. Twenty four patients with chronic non-specific colitis were treated with a herb combination. As a result from the treatment, the spontaneous and palpable pains along the large intestine disappeared in 95.83 per cent of the patients by the 15th day of their admission to the clinic. Defecation became daily in the patients with obstipation syndrome, but a combination of *Rhamnus frangula*, *Citrus aurantium*, *C. carvi* was added to the herb combination already indicated. Defecation was normalized in patients with diarrhea syndrome. The pathological admixtures in feces disappeared.

¹¹ Rasyid A, Lelo A. The effect of curcumin and placebo on human gall-bladder function: an ultrasound study. *Aliment Pharmacol Ther*. 1999;13:245-249.

¹² Ammon HP, Wahl MA. Pharmacology of *Curcuma longa*. *Planta Med*. 1991;57:1-7.

¹³ Thamlikitkul V, Bunyapraphatsara N, Dechatiwongse T, et al. Randomized double blind study of *Curcuma domestica* Val. for dyspepsia. *J Med Assoc Thai*. 1989;72:613-620.

¹⁴ World Health Organization, WHO Monographs on Selected Medicinal Plants, Geneva, 1999.

¹⁵ Lin SC, Lin CC, Lin YH, Supriyatna S, Teng CW. Protective and therapeutic effects of *Curcuma xanthorrhiza* on hepatotoxin-induced liver damage. *Am J Chin Med* 1995;23(3-4):243-54

Department of Pharmacology, Taipei Medical College, Taiwan.

Curcuma xanthorrhiza Roxb. (Zingiberaceae family, commonly known as temu lawak or Javanese turmeric in Indonesia), which is

found both wild and cultivated in Indonesia, has been traditionally used for medicinal purposes. *C. xanthorrhiza* is also used as a tonic in Indonesia. The aim of the present study is to clarify whether *C. xanthorrhiza* treatment may prevent acute liver damage induced by acetaminophen and carbon tetrachloride in mice. The results clearly indicated that extract of *C. xanthorrhiza* could reduce significantly the acute elevation of serum transaminases levels induced by the two kinds of hepatotoxins, and alleviated the degree of liver damage at 24 hours after the intraperitoneal administration of two hepatotoxins. It may be concluded that *C. xanthorrhiza* can protect the liver from various hepatotoxins, hence *C. xanthorrhiza* could be useful in the treatment of liver injuries and has promise as a kind of broad spectrum hepatoprotective agent.

¹⁶ Deshpande UR, Gadre SG, Raste AS, Pillai D, Bhide SV, Samuel AM. Protective effect of turmeric (*Curcuma longa* L.) extract on carbon tetrachloride-induced liver damage in rats. *Indian J Exp Biol* 1998 Jun;36(6):573-7

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The protective effect of tumeric extract (TE) in diet on CCl₄-treated rats was studied. Rats were divided into 5 groups: (1) untreated, (2) CCl₄ treated, (3) pre-TE for 2 weeks followed by CCl₄, (4) TE + CCl₄ given concurrently and (5) 5% TE as positive control. The serum levels of bilirubin, cholesterol, aspartate aminotransferase, (AST), alanine amino transferase (AST), (ALT) and alkaline phosphatase were estimated after 1, 2 and 3 months. CCl₄ caused a maximum increase (2-3-fold in all the above parameters). As compared to CCl₄ group, a short pre-treatment of TE showed reduction in cholesterol, bilirubin, AST, ALT and alkaline phosphatase activity whereas concurrent treatment of TE + CCl₄ reduced to a greater extent the levels of all parameters except ALT.

To conclude, concurrent treatment of TE gave significant protection against CCl₄ though the values did not reach the normal levels.

¹⁷ Srinivas L, Shalini VK, Shylaja M. Turmerin: a water soluble antioxidant peptide from turmeric [*Curcuma longa*] *Arch Biochem Biophys* 1992 Feb 1;292(2):617-23

Department of Nutrition and Food Safety, Central Food Technological Research Institute, Karnataka State, India.

Dietary spice components have been screened for their protective effect against reactive oxygen species (ROS)-induced, lipid peroxide-mediated membrane and DNA damage and mutagenicity. A new, water soluble, 5-kDa peptide--Turmerin--from turmeric (*Curcuma longa*) has been found to be an efficient antioxidant/DNA-protectant/antimutagen. Turmerin forms 0.1% of the dry weight of turmeric and is obtained in a crystalline form. It is a heat stable, noncyclic peptide containing 40 amino acid residues, with a blocked N-terminal and leucine at the C-terminal. It is insensitive to trypsin and pepsin, heat, and uv radiation. Turmerin contains three residues of methionine which are partly responsible for the antioxidant activity. Turmerin at 183 nM offers 80% protection to membranes and DNA against oxidative injury. ROS-induced arachidonate release and the mutagenic activity of t-butyl hydroperoxide are substantially inhibited by Turmerin. Turmerin is noncytotoxic up to milligram concentrations, as tested by Ames assay and in human lymphocytes.

¹⁸ Aggarwal BB, Kumar A, Bharti AC. Anticancer potential of curcumin: preclinical and clinical studies. *Anticancer Res* 2003 Jan-Feb;23(1A):363-98

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Curcumin (diferuloylmethane) is a polyphenol derived from the plant *Curcuma longa*, commonly called turmeric. Extensive research over the last 50 years has indicated this polyphenol can both prevent and treat cancer. The anticancer potential of curcumin stems from its ability to suppress proliferation of a wide variety of tumor cells, down-regulate transcription factors NF-kappa B, AP-1 and Egr-1; down-regulate the expression of COX2, LOX, NOS, MMP-9, uPA, TNF, chemokines, cell surface adhesion molecules and cyclin D1; down-regulate growth factor receptors (such as EGFR and HER2); and inhibit the activity of c-Jun N-terminal kinase, protein tyrosine kinases and protein serine/threonine kinases. In several systems, curcumin has been described as a potent antioxidant and anti-inflammatory agent. Evidence has also been presented to suggest that curcumin can suppress tumor initiation, promotion and metastasis. Pharmacologically, curcumin has been found to be safe. Human clinical trials indicated no dose-limiting toxicity when administered at doses up to 10 g/day. All of these studies suggest that curcumin has enormous potential in the prevention and therapy of cancer. The current review describes in detail the data supporting these studies.

¹⁹ Nagabhushan M, Amonkar AJ, Bhide SV. In vitro antimutagenicity of curcumin against environmental mutagens. *Food Chem Toxicol* 1987 Jul;25(7):545-7

The effects of curcumin, the yellow pigment of the spice, turmeric (*Curcuma longa*) on the mutagenicity of several environmental mutagens were investigated in the Salmonella/microsome test with or without Aroclor 1254-induced rat-liver homogenate (S-9 mix). With Salmonella typhimurium strain TA98 in the presence of S-9 mix, curcumin inhibited the mutagenicity of bidi and cigarette smoke condensates, tobacco and masheri extracts, benzo[a]pyrene and dimethyl benzo[a]anthracene in a dose-dependent manner. Curcumin did not influence the mutagenicity without S-9 mix of sodium azide, monoacetylhydrazine and streptozocin in strain TA100 nor of 4-nitrophenylenediamine in strain TA98. Our observations indicate that curcumin may alter the metabolic activation and detoxification of mutagens.

²⁰ Mazumder A, Raghavan K, Weinstein J, Kohn KW, Pommier Y. Inhibition of human immunodeficiency virus type-1 integrase by curcumin. *Biochem Pharmacol* 1995 Apr 18;49(8):1165-70

Laboratory of Molecular Pharmacology, National Cancer Institute, Bethesda, MD 20892-4255, USA.

Curcumin (diferuloylmethane) is the yellow pigment in turmeric (*Curcuma longa* L.) that is widely used as a spice, food coloring (curry) and preservative. Curcumin exhibits a variety of pharmacological effects including antitumor, anti-inflammatory, and anti-infectious activities and is currently in clinical trials for AIDS patients. The effects of curcumin have been determined on purified

human immunodeficiency virus type 1 (HIV-1) integrase. Curcumin has an inhibitory concentration₅₀ (IC₅₀) for strand transfer of 40 microM. Inhibition of an integrase deletion mutant containing only amino acids 50-212 suggests that curcumin interacts with the integrase catalytic core. Two structural analogs, methyl cinnamate and chlorogenic acid, were inactive. Energy minimization studies suggest that the anti-integrase activity of curcumin could be due to an intramolecular stacking of two phenyl rings that brings the hydroxyl groups into close proximity. The present data suggest that HIV-1 integrase inhibition may contribute to the antiviral activity of curcumin. These observations suggest new strategies for antiviral drug development that could be based upon curcumin as a lead compound for the development of inhibitors of HIV-1 integrase.

²¹ Lad, Vasant, and Frawley, David, *The Yoga of Herbs*, Lotus Press, Santa Fe, 1986

²² Goso Y, Ogata Y, Ishihara K, Hotta K. Effects of traditional herbal medicine on gastric acid. *Biochem Physiol* 1996;113C:17–21.

²³ Reed PI, Davies WA. Controlled trial of a carbenoxolone/alginate antacid combination in reflux oesophagitis. *Curr Med Res Opin* 1978;5:637–44.

²⁴ Liu JH, Chen GH, Yeh HZ, Huang CK, Poon SK Enteric-coated peppermint-oil capsules in the treatment of irritable bowel syndrome: a prospective, randomized trial. *J Gastroenterol* 1997 Dec;32(6):765-8

²⁵ Freise J, Kohler S [Peppermint oil-caraway oil fixed combination in non-ulcer dyspepsia--comparison of the effects of enteric preparations]. *Pharmazie* 1999 Mar;54(3):210-5

223 patients with non-ulcer dyspepsia (dysmotility type dyspepsia or essential/idiopathic dyspepsia, also in combination with irritable bowel syndrome) were included in a prospective, randomised, reference- and double-blind controlled multicentre trial to compare two different preparations of a fixed combination of peppermint oil and caraway oil. The aim of the trial was to evaluate the equivalence of the efficacy and tolerability of these two preparations. The test formulation consisted of the drug combination in an enteric coated capsule containing 90 mg peppermint oil and 50 mg caraway oil, while an enteric soluble formulation containing 36 mg peppermint oil and 20 mg caraway oil was used as the reference. The main target item defined was the "difference in pain intensity between the beginning and the end of therapy", measured by the patient on a visual analogue scale (0 = no pain, 10 = extremely strong pain). In 213 patients (n = 108 on the test preparation, n = 105 on the reference preparation) with mean pain intensity baseline measurements of 6.1 points in the test preparation group and 5.9 points in the reference group a statistically significant decline in pain intensity was observed in the two groups (-3.6 resP. -3.3 points; p < 0.001; two-sided one-sample t-test). Equivalent efficacy of both preparations was demonstrated (p < 0.001; one-sided t-test for equivalence). With respect to concomitant variables, the results in both groups were also similar. Regarding "pain frequency", the efficacy of the test preparation was significantly better (p = 0.04; two-sided t-test for difference). Both preparations were well tolerated. Despite the higher dose, the adverse event "eructation with peppermint taste" was less frequent in the group treated with the test formulation, due to the enteric coated capsule preparation.

²⁶ Micklefield GH, Greving I, May B Effects of peppermint oil and caraway oil on gastroduodenal motility. *Phytother Res* 2000 Feb;14(1):20-3

The effect of enteric-coated (Enteroplant) and non-enteric-coated preparations containing a peppermint-caraway oil combination with 90 mg peppermint oil and 50 mg caraway oil was studied on gastroduodenal motility with stationary manometry in six healthy volunteers. The results showed that: (1) both enteric-coated and non-enteric-coated preparations have effects on the migrating motor complex (MMC); (2) mainly a decrease in the number of contractions and contraction amplitudes is seen during the various phases of the MMC; (3) non-enteric-coated preparations have their effects mainly during the first MMC after administration; (4) enteric-coated preparations have their effects temporally delayed during the second MMC after administration. In conclusion, enteric-coated and non-enteric-coated peppermint-caraway oil combinations are safe preparations, acting locally to cause smooth muscle relaxation.

²⁷ Sharma, Ram, and Dash, Bhagwan, *Caraka Samhita*, Chowkhamba, Varanasi, 1992

²⁸ Anselmo, Peter, with Brooks, James, *Ayurvedic Secrets to Longevity and Total Health*, Prentice Hall, Englewood Cliffs, 1996

²⁹ Lad, Vasant, *Ayurveda Today*, Spring, 1995, p.3

³⁰ Ranade, Subash, *Natural Healing through Ayurveda*, Passage Press, Salt Lake City, 1993

³¹ Yogi Bhajan, *The Ancient Art of Self Healing*, West Anandpur, 1982

³² Frawley, David, *Yoga International*, January/February 1996

³³ Tiwari, Maya, *A Life of Balance*, Healing Arts, 1995

³⁴ Dinsmoor, Robert Scott, *Impotence*, Gale Encyclopedia of Medicine, www.gale.com

³⁵ Grandhi A, Mujumdar AM, Patwardhan B. A comparative pharmacological investigation of Ashwagandha and Ginseng. *J-Ethnopharmacol*. 1994 Dec; 44(3): 131-5 1994.

³⁶ Abdel-Magied EM, Abdel-Rahman HA, Harraz FM. The effect of aqueous extracts of *Cynomorium coccineum* and *Withania somnifera* on testicular development in immature Wistar rats. *J Ethnopharmacol* 2001 Apr;75(1):1-4

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The effect of lyophilized aqueous extract of *Cynomorium coccineum* and *Withania somnifera* on testicular development and on serum levels of testosterone, ICSH and FSH was studied in immature male Wistar rats. There was a notable increase in testicular weight of animals treated with both extracts. Histological examination revealed an apparent increase in the diameter of seminiferous tubules and the number of seminiferous tubular cell layers in the testes of treated rats as compared with control ones. Extracts of

both plants elicited notable spermatogenesis in immature rats but *C. coccineum* was more effective than *W. somnifera* in that respect. Serum testosterone and FSH levels were lower in animals treated with plants extracts than controls, whereas ICSH levels was higher in treated animals, specially in those treated with *C. coccineum*. It was concluded that extracts of both plants have a direct spermatogenic influence on the seminiferous tubules of immature rats presumably by exerting a testosterone-like effect.

³⁷ Kuppurajan K, et al, *J Res Ayu Sid*, 1, 1980:247. [from: Bone K, "Withania somnifera", *Clinical Applications of Ayurvedic and Chinese Herbs*, (Queensland, Australia: Phytotherapy Press), 1996:137-41.]

³⁸ Nadkarni, K.M., *Indian Materia Medica*, Popular Prakashan, Bombay, 1976

³⁹ Douillard J. Revitalize with Ashwagandha.

www.nutritionsciencenews.com/NSN_backs/Oct_98/index.html. 1998

⁴⁰ Bhattacharya SK, Bhattacharya A, Sairam K, Ghosal S. Anxiolytic-antidepressant activity of *Withania somnifera* glycowithanolides: an experimental study. *Phytomedicine* 2000 Dec;7(6):463-9

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The roots of *Withania somnifera* (WS) are used extensively in Ayurveda, the classical Indian system of medicine, and WS is categorized as a rasayana, which are used to promote physical and mental health, to provide defence against disease and adverse environmental factors and to arrest the aging process. WS has been used to stabilize mood in patients with behavioural disturbances. The present study investigated the anxiolytic and antidepressant actions of the bioactive glycowithanolides (WSG), isolated from WS roots, in rats. WSG (20 and 50 mg/kg) was administered orally once daily for 5 days and the results were compared by those elicited by the benzodiazepine lorazepam (0.5 mg/kg, i.p.) for anxiolytic studies, and by the tricyclic anti-depressant, imipramine (10 mg/kg, i.p.), for the antidepressant investigations. Both these standard drugs were administered once, 30 min prior to the tests. WSG induced an anxiolytic effect, comparable to that produced by lorazepam, in the elevated plus-maze, social interaction and feeding latency in an unfamiliar environment, tests. Further, both WSG and lorazepam, reduced rat brain levels of tribulin, an endocoid marker of clinical anxiety, when the levels were increased following administration of the anxiogenic agent, pentylenetetrazole. WSG also exhibited an antidepressant effect, comparable with that induced by imipramine, in the forced swim-induced 'behavioural despair' and 'learned helplessness' tests. The investigations support the use of WS as a mood stabilizer in clinical conditions of anxiety and depression in Ayurveda.

⁴¹ Mishra LC, Singh BB, Dagenais S. Scientific basis for the therapeutic use of *Withania somnifera* (ashwagandha): a review. *Altern Med Rev* 2000 Aug;5(4):334-46

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OBJECTIVE: The objective of this paper is to review the literature regarding *Withania somnifera* (ashwagandha, WS) a commonly used herb in Ayurvedic medicine. Specifically, the literature was reviewed for articles pertaining to chemical properties, therapeutic benefits, and toxicity. DESIGN: This review is in a narrative format and consists of all publications relevant to ashwagandha that were identified by the authors through a systematic search of major computerized medical databases; no statistical pooling of results or evaluation of the quality of the studies was performed due to the widely different methods employed by each study. RESULTS: Studies indicate ashwagandha possesses anti-inflammatory, antitumor, antistress, antioxidant, immunomodulatory, hemopoietic, and rejuvenating properties. It also appears to exert a positive influence on the endocrine, cardiopulmonary, and central nervous systems. The mechanisms of action for these properties are not fully understood. Toxicity studies reveal that ashwagandha appears to be a safe compound. CONCLUSION: Preliminary studies have found various constituents of ashwagandha exhibit a variety of therapeutic effects with little or no associated toxicity. These results are very encouraging and indicate this herb should be studied more extensively to confirm these results and reveal other potential therapeutic effects. Clinical trials using ashwagandha for a variety of conditions should also be conducted.

⁴² Archana R, Namasivayam A. Antistressor effect of *Withania somnifera*. *J Ethnopharmacol* 1999 Jan;64(1):91-3

Department of Physiology, Dr ALM PG. Institute of Basic Medical Sciences, University of Madras, Taramani, India.

Withania somnifera is an Indian medicinal plant used widely in the treatment of many clinical conditions in India. Its antistressor properties have been investigated in this study using adult Wistar strain albino rats and cold water swimming stress test. The results indicate that the drug treated animals show better stress tolerance.

⁴³ Singh B, Saxena AK, Chandan BK, Gupta DK, Bhutani KK, Anand KK. Adaptogenic activity of a novel, withanolide-free aqueous fraction from the roots of *Withania somnifera* Dun. *Phytother Res* 2001 Jun;15(4):311-318

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The practitioners of the traditional Indian system of medicine regard *Withania somnifera* Dun. as the 'Indian ginseng'. A new withanolide-free aqueous fraction was isolated from the roots of this plant and was evaluated for putative antistress activity against a battery of tests such as hypoxia time, antifatigue effect, swimming performance time, swimming induced gastric ulceration and hypothermia, immobilization induced gastric ulceration, autoanalgesia and biochemical changes in the adrenal glands. This bioactive fraction exhibited significant antistress activity in a dose-related manner in all the parameters studied. The extract of *Withania somnifera* root (a commercial preparation available locally) was used to compare the results. A preliminary acute toxicity study in mice showed a good margin of safety.

⁴⁴ Jain S, Shukla SD, Sharma K, Bhatnagar M. Neuroprotective Effects of *Withania somnifera* Dunn. in Hippocampal Sub-regions of Female Albino Rat. *Phytother Res* 2001 Sep;15(6):544-548

Department of Zoology, University College of Science, M.L. Sukhadia University, Udaipur 313001, India.

The neuroprotective effects of *W. somnifera* were studied on stressed adult female Swiss albino rats. Experimental rats were subjected to immobilization stress for 14 h and were treated with a root powder extract of *W. somnifera* available as Stresscom capsules (Dabur India Ltd). Control rats were maintained in completely, non stressed conditions. Thionin stained serial coronal sections (7 &mgr;m) of brain passing through the hippocampal region of stressed rats (E(1) group) demonstrated 85% degenerating cells (dark cells and pyknotic cells) in the CA(2) and CA(3) sub-areas. Treatment with *W. somnifera* root powder extract significantly reduced (80%) the number of degenerating cells in both the areas. The study thus demonstrates the antistress neuroprotective effects of *W. somnifera*.

⁴⁵ Dhuley JN. Adaptogenic and cardioprotective action of ashwagandha in rats and frogs. *J Ethnopharmacol* 2000 Apr;70(1):57-63
Pharmacology and Toxicology Section, Research Centre, Hindustan Antibiotics Limited, Pimpri, Pune, India.

Pharmacological and metabolic effects of ashwagandha (*Withania somnifera* L. (Solanaceae)) used in Ayurveda as a herbal tonic and health food were studied. Ashwagandha was shown to increase swimming time in rats in physical working capacity test, i.e. rats swimming endurance test. Significant increase in relative heart weight and glycogen content in myocardium and liver was also observed in ashwagandha treated group. Ashwagandha treatment increased the duration of contractility in functional test for the resistance of frog heart muscle towards the toxic action of strophanthin-K. Ashwagandha treatment also resulted in significant increase in coagulation time which attains normalcy 7 days after cessation of treatment. Ashwagandha possesses no toxicity up to a dose of (100 mg/kg; p.o. for 180 days) and does not cause significant changes in biochemical parameters in the blood serum of rats. Increase in catecholamine content in the heart and aortic tissues and their decrease in adrenal glands are unfavourable effects of high doses of ashwagandha. On the basis of these observations, it was concluded that ashwagandha possesses adaptogenic, cardiotropic, cardioprotective and anticoagulant properties.

⁴⁶ Bhattacharya SK, Bhattacharya A, Chakrabarti A. Adaptogenic activity of Siotone, a polyherbal formulation of Ayurvedic rasayanas. *Indian J Exp Biol* 2000 Feb;38(2):119-28

Department of Pharmacology, Institute of Medical Sciences, Banaras Hindu University, Varanasi 221 005, India.

Siotone (ST) is a herbal formulation comprising of *Withania somnifera*, *Ocimum sanctum*, *Asparagus racemosus*, *Tribulus terrestris* and shilajit, all of which are classified in Ayurveda as rasayanas which are reputed to promote physical and mental health, improve defence mechanisms of the body and enhance longevity. These attributes are similar to the modern concept of adaptogenic agents, which are, known to afford protection of the human physiological system against diverse stressors. The present study was undertaken to investigate the adaptogenic activity of ST against chronic unpredictable, but mild, footshock stress induced perturbations in behaviour (depression), glucose metabolism, suppressed male sexual behaviour, immunosuppression and cognitive dysfunction in CF strain albino rats. Gastric ulceration, adrenal gland and spleen weights, ascorbic acid and corticosterone concentrations of adrenal cortex, and plasma corticosterone levels, were used as the stress indices. Panax ginseng (PG) was used as the standard adaptogenic agent for comparison. Additionally, rat brain levels of tribulin, an endogenous endocoid postulated to be involved in stress, were also assessed in terms of endogenous monoamine oxidase (MAO) A and MAOB inhibitory activity. Chronic unpredictable footshock induced marked gastric ulceration, significant increase in adrenal gland weight and plasma corticosterone levels, with concomitant decreases in spleen weight, and concentrations of adrenal gland ascorbic acid and corticosterone. These effects were attenuated by ST (50 and 100 mg/kg, p.o.) and PG (100 mg/kg, p.o.), administered once daily over a period of 14 days, the period of stress induction. Chronic stress also induced glucose intolerance, suppressed male sexual behaviour, induced behavioural depression (Porsolt's swim despair test and learned helplessness test) and cognitive dysfunction (attenuated retention of learning in active and passive avoidance tests), and immunosuppression (leucocyte migration inhibition and sheep RBC challenged increase in paw oedema in sensitized rats). All these chronic stress-induced perturbations were attenuated, dose-dependently by ST (50 and 100 mg/kg, p.o.) and PG (100 mg/kg, p.o.). Chronic stress-induced increase in rat brain tribulin activity was also reversed by these doses of ST and by PG. The results indicate that ST has significant adaptogenic activity, qualitatively comparable to PG, against a variety of behavioural, biochemical and physiological perturbations induced by unpredictable stress, which has been proposed to be a better indicator of clinical stress than acute stress parameters. The likely contribution of the individual constituents of ST in the observed adaptogenic action of the polyherbal formulation, have been discussed.

⁴⁷ Venkatraghavan S, et al, *J Res Ayu Sid*, 1, 1980:370. [from: Bone K, "Withania somnifera", *Clinical Applications of Ayurvedic and Chinese Herbs*, (Queensland, Australia: Phytotherapy Press), 1996:137-41.]

⁴⁸ Davis L, Kuttan G. Immunomodulatory activity of *Withania somnifera*. *J Ethnopharmacol* 2000 Jul;71(1-2):193-200

Amala Cancer Research Centre, Amala Nagar P.O., 630 553, Kerala, Thrissur, India.

Administration of an extract from the powdered root of the plant *Withania somnifera* was found to stimulate immunological activity in Babl/c mice. Treatment with five doses of *Withania* root extract (20 mg/dose/animal; i.p.) was found to enhance the total WBC count (17125 cells/mm³) on 10th day. Bone marrow cellularity (27x10⁶ cells/femur) as well as alpha-esterase positive cell number (1800/4000 cells) also increased significantly (P<0.001) after the administration of *Withania* extract. Treatment with *Withania* extract along with the antigen (SRBC) produced an enhancement in the circulating antibody titre and the number of plaque forming cells (PFC) in the spleen. Maximum number of PFC (985 PFC/10⁶ spleen cells) was obtained on the fourth day. *Withania*

extract inhibited delayed type hypersensitivity reaction in mice (Mantoux test). Administration of Withania extract also showed an enhancement in phagocytic activity of peritoneal macrophages (76.5 pigmented cells/200) when compared to control (31.5/200 cells) in mice. These results confirm the immunomodulatory activity of *W. somnifera* extract, which is a known immunomodulator in indigenous medicine.

⁴⁹ Schliebs R Liebmann A Bhattacharya SK Kumar A Ghosal S Bigl V. Systemic administration of defined extracts from *Withania somnifera* (Indian Ginseng) and *Shilajit* differentially affects cholinergic but not glutamatergic and GABAergic markers in rat brain. *Neurochem-Int.* 1997 Feb; 30(2): 181-90

⁵⁰ Prakash J, Gupta SK, Kochupillai V, Singh N, Gupta YK, Joshi S. Chemopreventive activity of *Withania somnifera* in experimentally induced fibrosarcoma tumours in Swiss albino mice. *Phytother Res* 2001 May;15(3):240-244
Department of Pharmacology, All India Institute of Medical Sciences, New Delhi - 110029, India.

The current experimental work deals with the chemopreventive studies of a hydroalcoholic extract of *Withania somnifera* roots, against 20-methylcholanthrene induced fibrosarcoma tumours in Swiss albino mice. A single subcutaneous injection of 200 microg 20-methylcholanthrene in 0.1 mL of dimethylsulphoxide into the thigh region of mice produced a high incidence (96%) of tumours. Oral treatment of animals with 400 mg/kg body weight of *Withania somnifera* extract (one week before injecting 20-methylcholanthrene and continued until 15 weeks thereafter) significantly reduced the tumour incidence, tumour volume and enhanced the survival of the mice, compared with 20-methylcholanthrene injected mice. The tumour incidence was also delayed in the treatment group when compared with 20-methylcholanthrene injected mice. Liver biochemical parameters revealed a significant modulation of reduced glutathione, lipid peroxides, glutathione-S-transferase, catalase and superoxide dismutase in extract treated mice compared with 20-methylcholanthrene injected mice. The mechanism of chemopreventive activity of *Withania somnifera* extract may be due to its antioxidant and detoxifying properties.

⁵¹ Devi PU *Withania somnifera* Dunal (*Ashwagandha*): potential plant source of a promising drug for cancer chemotherapy and radiosensitization. *Indian-J-Exp-Biol.* 1996 Oct; 34(10): 927-32

⁵² Bhattacharya SK Satyan KS Ghosal S Antioxidant activity of glycowithanolides from *Withania somnifera*. *Indian-J-Exp-Biol.* 1997 Mar; 35(3): 236-9

⁵³ Dhuley JN. Nootropic-like effect of *ashwagandha* (*Withania somnifera* L.) in mice. *Phytother Res* 2001 Sep;15(6):524-528
Laboratory Pharmacology and Toxicology, Research Centre, Hindustan Antibiotics Ltd, Pimpri, Pune 411 018, India.

Ashwagandha (*Withania somnifera* L.) root extract (50, 100 and 200 mg/kg; orally) improved retention of a passive avoidance task in a step-down paradigm in mice. *Ashwagandha* (50, 100 and 200 mg/kg; orally) also reversed the scopolamine (0.3 mg/kg)-induced disruption of acquisition and retention and attenuated the amnesia produced by acute treatment with electroconvulsive shock (ECS), immediately after training. Chronic treatment with ECS, for 6 successive days at 24 h intervals, disrupted memory consolidation on day 7. Daily administration of *ashwagandha* for 6 days significantly improved memory consolidation in mice receiving chronic ECS treatment. *Ashwagandha*, administered on day 7, also attenuated the disruption of memory consolidation produced by chronic treatment with ECS. On the elevated plus-maze, *ashwagandha* reversed the scopolamine (0.3 mg/kg)-induced delay in transfer latency on day 1. On the basis of these findings, it is suggested that *ashwagandha* exhibits a nootropic-like effect in naive and amnesic mice.

⁵⁴ Dhuley JN. Adaptogenic and cardioprotective action of *ashwagandha* in rats and frogs. *J Ethnopharmacol* 2000 Apr;70(1):57-63
Pharmacology and Toxicology Section, Research Centre, Hindustan Antibiotics Limited, Pimpri, Pune, India.

Pharmacological and metabolic effects of *ashwagandha* (*Withania somnifera* L. (Solanaceae)) used in Ayurveda as a herbal tonic and health food were studied. *Ashwagandha* was shown to increase swimming time in rats in physical working capacity test, i.e. rats swimming endurance test. Significant increase in relative heart weight and glycogen content in myocardium and liver was also observed in *ashwagandha* treated group. *Ashwagandha* treatment increased the duration of contractility in functional test for the resistance of frog heart muscle towards the toxic action of strophanthin-K. *Ashwagandha* treatment also resulted in significant increase in coagulation time which attains normalcy 7 days after cessation of treatment. *Ashwagandha* possesses no toxicity up to a dose of (100 mg/kg; p.o. for 180 days) and does not cause significant changes in biochemical parameters in the blood serum of rats. Increase in catecholamine content in the heart and aortic tissues and their decrease in adrenal glands are unfavourable effects of high doses of *ashwagandha*. On the basis of these observations, it was concluded that *ashwagandha* possesses adaptogenic, cardiotropic, cardioprotective and anticoagulant properties.

⁵⁵ Nadkarni, Dr. K.M. 1976. *The Indian Materia Medica, with Ayurvedic, Unani and Home Remedies*. Revised and enlarged by A.K. Nadkarni. 1954. Reprint. Bombay: Bombay Popular Prakashan PVP., p.1135.

⁵⁶ Asmawi MZ Kankaanranta H Moilanen E Vapaatalo H Anti-inflammatory activities of *Embllica officinalis* Gaertn leaf extracts. *J-Pharm-Pharmacol.* 1993 Jun; 45(6): 581-4

⁵⁷ Khalsa, KP, Tillotson, A, Caldecott, T, Triphala. *Canadian Journal of Herbalism*, 2001, Vol. XXII.

⁵⁸ Jose JK, Kuttan R. Hepatoprotective activity of *Embllica officinalis* and *Chyavanaprash*. *J Ethnopharmacol* 2000 Sep;72(1-2):135-40

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Hepatoprotective activity of *Embllica officinalis* (EO) and *Chyavanaprash* (CHY) extracts were studied using carbon tetrachloride (CCl₄) induced liver injury model in rats. EO and CHY extracts were found to inhibit the hepatotoxicity produced by acute and

chronic CCl₄ administration as seen from the decreased levels of serum and liver lipid peroxides (LPO), glutamate-pyruvate transaminase (GPT), and alkaline phosphatase (ALP). Chronic CCl₄ administration was also found to produce liver fibrosis as seen from the increased levels of collagen-hydroxyproline and pathological analysis. EO and CHY extracts were found to reduce these elevated levels significantly, indicating that the extract could inhibit the induction of fibrosis in rats.

⁵⁹ Manjunatha S, Jaryal AK, Bijlani RL, Sachdeva U, Gupta SK. Effect of Chyawanprash and vitamin C on glucose tolerance and lipoprotein profile. *Indian J Physiol Pharmacol* 2001 Jan;45(1):71-9

Department of Physiology, All India Institute of Medical Sciences, New Delhi-110 029.

Chyawanprash is an ancient Indian dietary supplement containing vitamin C (34 mg/100 g) derived from amla (*Embllica officinalis*). In addition, Chyawanprash also contains several other herbal products. The present study was designed to compare the effects of vitamin C with those of Chyawanprash. Ten normal healthy adult male volunteers (age 20-32 years) participated in the 16-week study. They were placed randomly in either the Chyawanprash group (n = 5) or vitamin C group (n = 5). Those in the former received 15 g/d of Chyawanprash while those in the latter received 500 mg/d vitamin C during the first 8 weeks of the study. For the next 8 weeks, no supplement was given. For each individual, an oral glucose tolerance test was performed, and lipoprotein profile in peripheral serum samples was determined at 0 weeks, 4 weeks, 8 weeks, 12 weeks and 16 weeks. In the Chyawanprash group, the 8 weeks Vs 0 weeks value (mean +/- S.D.) respectively for various indices which were significantly different were fasting plasma glucose (100.2 +/- 5.58 mg/dl vs 116.2 +/- 11.6 mg/dl), area under 2-h plasma glucose curve (245.9 +/- 15.13 mg.dl-1.h vs 280.8 +/- 37.09 mg.dl-1.h), HDL cholesterol (53.2 +/- 4.56 mg/dl vs 42.7 +/- 7.17 mg/dl), LDL cholesterol (82.4 +/- 8.80 mg/dl vs 98.26 +/- 12.07 mg/dl), LDL/HDL ratio (1.56 +/- 0.28 vs 2.38 +/- 0.63). In the Vitamin C group, only the LDL/HDL ratio was significantly lower at 8 weeks than at 0 weeks (1.99 +/- 0.44 vs 2.29 +/- 0.43). All the variables that changed significantly were no longer significantly different from the 0 weeks value at 16 weeks. Chyawanprash reduces postprandial glycemia in the oral glucose tolerance test and reduces blood cholesterol level to a significantly greater extent than vitamin C.

⁶⁰ Tirtha, Sada Shiva, Swami, *The Ayurveda Encyclopedia*, Ayurveda Holistic Center Press, Bayville, New York, 1998, p. 106.

⁶¹ Jain, S.K., and DeFillips, Robert A., *Medicinal Plants of India*, Reference Publications, Algonac, Michigan, 1991, p.372

⁶² Nadkarni, K.M., *Indian Materia Medica*, Popular Prakashan, Bombay, 1976, p.863.

⁶³ Kapoor, L.D., *The CRC Handbook of Ayurvedic Medicinal Plants*, CRC Press, Baton Rouge, 1990, p. 249.

⁶⁴ National Institute of Ayurvedic Medicine, 584 Milltown Road Brewster, New York 10509 USA <http://www.niam.com>

⁶⁵ Sarkar A, Lavania SC, Pandey DN, Pant MC Changes in the blood lipid profile after administration of *Ocimum sanctum* (Tulsi) leaves in the normal albino rabbits. *Indian J Physiol Pharmacol* 1994 Oct;38(4):311-2

⁶⁶ Rai V, Iyer U, Mani UV Effect of Tulasi (*Ocimum sanctum*) leaf powder supplementation on blood sugar levels, serum lipids and tissue lipids in diabetic rats. *Plant Foods Hum Nutr* 1997;50(1):9-16

⁶⁷ Agrawal P, Rai V, Singh RB Randomized placebo-controlled, single blind trial of holy basil leaves in patients with noninsulin-dependent diabetes mellitus. *Int J Clin Pharmacol Ther* 1996 Sep;34(9):406-9

⁶⁸ Karthikeyan K, Ravichandran P, Govindasamy S, Chemopreventive effect of *Ocimum sanctum* on DMBA-induced hamster buccal pouch carcinogenesis. *Oral Oncol* 1999 Jan;35(1):112-9

⁶⁹ Uma Devi P, Ganasoundari A, Rao BS, Srinivasan KK In vivo radioprotection by ocimum flavonoids: survival of mice. *Radiat Res* 1999 Jan;151(1):74-8

⁷⁰ Devi PU, Bisht KS, Vinitha M A comparative study of radioprotection by *Ocimum flavonoids* and synthetic aminothiols protectors in the mouse. *Br J Radiol* 1998 Jul;71(847):782-4

⁷¹ Phadke SA, Kulkarni SD Screening of in vitro antibacterial activity of *Terminalia chebula*, *Eclapta alba* and *Ocimum sanctum*. *Indian J Med Sci* 1989 May;43(5):113-7

⁷² Godhwani S, Godhwani JL, Vyas DS *Ocimum sanctum*—a preliminary study evaluating its immunoregulatory profile in albino rats. *J Ethnopharmacol* 1988 Dec;24(2-3):193-8

⁷³ Mandal S, Das DN, De K, Ray K, Roy G, Chaudhuri SB, Sahana CC, Chowdhuri MK *Ocimum sanctum* Linn--a study on gastric ulceration and gastric secretion in rats. *Indian J Physiol Pharmacol* 1993 Jan;37(1):91-2

⁷⁴ Singh S, Majumdar DK Evaluation of antiinflammatory activity of fatty acids of *Ocimum sanctum* fixed oil. *Indian J Exp Biol* 1997 Apr;35(4):380-3

⁷⁵ Sembulingam K, Sembulingam P, Namasivayam A Effect of *Ocimum sanctum* Linn on noise induced changes in plasma corticosterone level. *Indian J Physiol Pharmacol* 1997 Apr;41(2):139-43

⁷⁶ Maulik G, Maulik N, Bhandari V, Kagan VE, Pakrashi S, Das DK Evaluation of antioxidant effectiveness of a few herbal plants. *Free Radic Res* 1997 Aug;27(2):221-8

⁷⁷ Uma Pradeep K, Geervani P, Eggum BO. Common Indian spices: nutrient composition, consumption and contribution to dietary value. *Plant Foods Hum Nutr* 1993 Sep;44(2):137-48

Foods and Nutrition Department, Postgraduate & Research Centre (Home Science) A.P. Agricultural University, Hyderabad, India. Nutrient composition of eight commonly consumed spices of South India was analysed. Spices analysed were red chillies (*Capsicum annum*), black pepper (*Piper nigrum*), coriander seeds (*Coriandrum sativum*), cumin seeds (*Cuminum cyminum*), garlic (*Allium sativum*), asafoetida (*Ferula foetida*), dry ginger (*Zingiber officinale*) and ajowan (*Carum copticum*). The nutrients analysed were proximate principles, minerals, starch, sugars, dietary fibre components, tannins, phytic acid, enzyme inhibitors and amino acids.

Dry ginger, ajowan and asafoetida had high calcium (1.0-1.5%) and iron (54-62 mg/100 g) levels. The tannin content of spices was also high (0.9-1.3% DM). Dietary fibre ranged from 14-53%. Spices had appreciable amounts of essential amino acids like lysine and threonine. A survey revealed the average per capita consumption of spices to be 9.54 g and at that level, the nutrient contribution from spices ranged from 1.2 to 7.9% of an average adult Indian male's requirement for different nutrients.

⁷⁸ Ernst E, Pittler MH. Efficacy of ginger for nausea and vomiting: a systematic review of randomized clinical trials. *Br J Anaesth* 2000 Mar;84(3):367-71

Department of Complementary Medicine, School of Postgraduate Medicine and Health Sciences, University of Exeter, UK. Ginger (*Zingiber officinale*) is often advocated as beneficial for nausea and vomiting. Whether the herb is truly efficacious for this condition is, however, still a matter of debate. We have performed a systematic review of the evidence from randomized controlled trials for or against the efficacy of ginger for nausea and vomiting. Six studies met all inclusion criteria and were reviewed. Three on postoperative nausea and vomiting were identified and two of these suggested that ginger was superior to placebo and equally effective as metoclopramide. The pooled absolute risk reduction for the incidence of postoperative nausea, however, indicated a non-significant difference between the ginger and placebo groups for ginger 1 g taken before operation (absolute risk reduction 0.052 (95% confidence interval -0.082 to 0.186)). One study was found for each of the following conditions: seasickness, morning sickness and chemotherapy-induced nausea. These studies collectively favoured ginger over placebo.

⁷⁹ McCaleb, Robert S., Herb Research Foundation Encyclopedia of Popular Herbs, Prima, Roseville, California, 2000.

⁸⁰ M, Busse WR, Goldberg A, et al, eds. *The Complete German Commission E Monographs: Therapeutic Guide to Herbal Medicines*. Austin: American Botanical Council and Boston: Integrative Medicine Communications, 1998, 167.

⁸¹ Gupta YK, Sharma M. Reversal of pyrogallol-induced delay in gastric emptying in rats by ginger (*Zingiber officinale*). *Methods Find Exp Clin Pharmacol* 2001 Nov;23(9):501-3. Neuropharmacology Laboratory, Department of Pharmacology, All India Institute of Medical Sciences, New Delhi, India. ykg@hotmail.com

Abstract: The effects of the acetone extract of ginger (*Zingiber officinale*) was studied against pyrogallol-induced delay in gastric emptying in rats. Wistar rats of either sex, weighing between 200-250 g, were used. Pyrogallol, at a dose of 100 mg/kg i.p., significantly delayed the gastric emptying of a methyl cellulose meal. One-hour pretreatment with ginger acetone extracts (100, 250 and 500 mg/kg p.o.) reversed the pyrogallol-induced delay in gastric emptying. The effect was significant at doses of 250 and 500 mg/kg. When the low dose of ginger (100 mg/kg p.o.) was given with vitamin C and vitamin E (100 mg/kg p.o., each), the reversal of gastric emptying was more pronounced than when only two vitamins or ginger (100 mg/kg and 500 mg/kg) were given alone. The present study indicates the potential of ginger in improving symptoms such as abdominal discomfort and bloating, which may accompany several gastrointestinal illnesses.

⁸² Vimala S, Norhanom AW, Yadav M Anti-tumour promoter activity in Malaysian ginger rhizobia used in traditional medicine. *Br J Cancer* 1999 Apr;80(1-2):110-6

Zingiberaceae rhizomes commonly used in the Malaysian traditional medicine were screened for anti-tumour promoter activity using the short-term assay of inhibition of 12-O-tetradecanoyl phorbol-13-acetate (TPA)-induced Epstein-Barr virus early antigen (EBV-EA) in Raji cells. The inhibition of TPA-induced EBV-EA was detected using the indirect immunofluorescence assay (IFA) and Western blot technique. The indirect IFA detected the expression/inhibition of EBV-EA-D (diffused EA antigen), whereas the Western blot technique detected the expression/inhibition of both EBV-EA-D and EA-R (restricted EA antigen). Seven rhizomes were found to possess inhibitory activity towards EBV activation, induced by TPA; they are: *Curcuma domestica*, *C. xanthorrhiza*, *Kaempferia galanga*, *Zingiber cassumunar*, *Z. officinale*, *Z. officinale* (red variety), and *Z. zerumbet*. A cytotoxicity assay was carried out to determine the toxicity of the Zingiberaceae rhizome extracts. The rhizome extracts that exhibited EBV activation inhibitory activity had no cytotoxicity effect in Raji cells. Therefore, the present study shows that several Zingiberaceae species used in Malaysian traditional medicine contain naturally occurring non-toxic compounds that inhibit the EBV activation, which, if further investigated, could contribute in the development of cancer prevention methods at the tumour-promoting stage.

⁸³ Lee E, Park KK, Lee JM, Chun KS, Kang JY, Lee SS, Surh YJ Suppression of mouse skin tumor promotion and induction of apoptosis in HL-60 cells by *Alpinia oxyphylla* Miquel (Zingiberaceae). *Carcinogenesis* 1998 Aug;19(8):1377-81

There have been considerable efforts to search for naturally occurring substances for the intervention of carcinogenesis. Many components from dietary or medicinal plants have been identified that possess substantial chemopreventive properties. An example is curcumin (*Curcuma longa* Linn., Zingiberaceae), which has been shown to inhibit tumor promotion in experimental carcinogenesis. *Alpinia oxyphylla* Miquel, another plant of the ginger family used in oriental herbal medicine, contains diarylheptanoids whose structures are analogous to that of curcumin. In the present study, we have tested *A. oxyphylla* for its ability to suppress tumor promotion. Thus, topical application of the methanolic extract of dried fruits of *A. oxyphylla* significantly ameliorated 12-O-tetradecanoylphorbol-13-acetate (TPA)-induced skin tumor promotion as well as ear edema in female ICR mice. In another study, treatment of HL-60 cells with the methanolic extract of *A. oxyphylla* significantly reduced the viability of the cells and also inhibited DNA synthesis. Microscopic examination of the treated cells showed characteristic morphology of apoptosis. Furthermore, cells treated with the extract of *A. oxyphylla* exhibited internucleosomal DNA fragmentation in time- and concentration-dependent manners. TPA-stimulated generation of superoxide anion in differentiated HL-60 cells was also blunted by *A. oxyphylla*. Taken together, these findings suggest that *A. oxyphylla* possesses potential chemopreventive and antitumorigenic activities.

⁸⁴ Park KK, Chun KS, Lee JM, Lee SS, Surh YJ Inhibitory effects of [6]-gingerol, a major pungent principle of ginger, on phorbol ester-induced inflammation, epidermal ornithine decarboxylase activity and skin tumor promotion in ICR mice. *Cancer Lett* 1998 Jul 17;129(2):139-44

A wide array of phytochemicals have been shown to possess potential cancer chemopreventive properties. Ginger contains pungent phenolic substances with pronounced antioxidative and antiinflammatory activities. In the present study, we have determined the antitumor promotional activity of [6]-gingerol, a major pungent principle of ginger, using a two-stage mouse skin carcinogenesis model. Topical application of [6]-gingerol onto shaven backs of female ICR mice prior to each topical dose of 12-O-tetradecanoylphorbol-13-acetate (TPA) significantly inhibited 7,12-dimethylbenz[a]anthracene-induced skin papillomagenesis. The compound also suppressed TPA-induced epidermal ornithine decarboxylase activity and inflammation.

⁸⁵ Sharma JN, Srivastava KC, Gan EK Suppressive effects of eugenol and ginger oil on arthritic rats. *Pharmacology* 1994 Nov;49(5):314-8

This study examined the effect of eugenol and ginger oil on severe chronic adjuvant arthritis in rats. Severe arthritis was induced in the right knee and right paw of male Sprague-Dawley rats by injecting 0.05 ml of a fine suspension of dead Mycobacterium tuberculosis bacilli in liquid paraffin (5 mg/ml). Eugenol (33 mg/kg) and ginger oil (33 mg/kg), given orally for 26 days, caused a significant suppression of both paw and joint swelling. These findings suggest that eugenol and ginger oil have potent antiinflammatory and/or antirheumatic properties.

⁸⁶ Srivastava KC, Mustafa T Ginger (*Zingiber officinale*) and rheumatic disorders. *Med Hypotheses* 1989 May;29(1):25-8
Oxygenation of arachidonic acid is increased in inflamed tissues. In this condition products of two enzymic pathways--the cyclooxygenase and the 5-lipoxygenase producing respectively prostaglandins and leukotrienes--are elevated. Of the cyclooxygenase products, PGE2 and of the lipoxygenase products, LTB4 are the strongest candidates for mediating inflammation. Non-steroidal anti-inflammatory drugs which inhibit the cyclooxygenase, and corticosteroids are used to treat such disorders. Both types of drugs produce adverse side-effects on prolonged use. Ginger is reported in Ayurvedic and Tibb systems of medicine to be useful in rheumatic disorders. Seven patients suffering from such disorders reported relief in pain and associated symptoms on ginger administration.

⁸⁷ Pasekoff Weinberg, Norma, in *Natural and Herbal Remedies for Carpal Tunnel Syndrome* (Storey Books, Pownal Vermont, 2000)

⁸⁸ J Ethnopharmacol 1990 Jul;29(3):267-73. Ginger (*Zingiber officinale*) in migraine headache. Mustafa T, Srivastava KC. Institute of Biology, Odense University, Denmark.

Abstract: Migraine is considered as a neurological disorder with little convincing evidence of the involvement of some vascular phenomenon. Recent understanding of the mechanisms behind migraine pain generation and perception have considerably helped the development of modern migraine drugs. Most migraine drugs in use, i.e., ergotamine and dihydroergotamine, iprazochrome, pizotifen and diazepam; and non-steroidal antiinflammatory drugs (i.e. aspirin, paracetamol, persantin, etc.) have side-effects and are prescribed with caution for a limited duration. Ginger is reported in Ayurvedic and Tibb systems of medicine to be useful in neurological disorders. It is proposed that administration of ginger may exert abortive and prophylactic effects in migraine headache without any side-effects.

⁸⁹ Ammon, HRT, H. Safayhi, et al. 1993. Mechanisms of anti-inflammatory actions of curcumin and boswellic acids. *J Ethnopharmacol* 38:113-9.

⁹⁰ Ammon, HRT, and M.A. Wahl. 1991. Pharmacology of *Curcuma longa*. *Planta Medica* 57:1-7.

⁹¹ Arom, R., N. Basu, V. Kapour, and A. Jain. 1971 Anti-inflammatory studies on curcumin longa (turmeric). *Ind J Med Res* 59:1299-95.

⁹² Chakravarti, Sree. 1991. *A Healers Journey*. Cambridge: Rudm. Chandra, D., and S. Gupta. 1972.

⁹³ Anti-inflammatory and anti-arthritis activity of volatile oil of curcumin longa (Haldi). *Ind J Med Res* 60:138-42.

⁹⁴ Baidyanath Ayurveda <http://www.baidyanath.com/messageoil.htm>

⁹⁵ Bhajan, Yogi, *Ancient Art of Self Healing*, West Anandpur (publisher), Eugene, Oregon, 1982., p. 15.

⁹⁶ Nandan Musli, <http://www.nandanmusli.com/safeaphrodisiac.htm>

⁹⁷ Nadkarni, K.M., *Indian Materia Medica*, Popular Prakashan, Bombay, 1976, p. 151

⁹⁸ Lad, Vasant, and Frawley, David, *The Yoga of Herbs*, Lotus Press, Santa Fe, 1986, p. 142

⁹⁹ Jill Stansbury, N.D., *Sustain the Brain*, Nutrition Science News, February, 2001, <http://www.healthwellexchange.com/>

¹⁰⁰ Fariello RG. Peroxidative stress and cerebral aging. *Int J Clin Pharmacol Res* 1990;10(1-2):49-51.

¹⁰¹ Vaidya, Ashok D.B. The Status And Scope Of Indian Medicinal Plants Acting On Central Nervous System. *Indian J Pharmacol* 1997; 29: S340-S343

¹⁰² Nalini K, et al. Effect of *Centella asiatica* fresh leaf aqueous extract on learning and memory and biogenic amine turnover in albino rats. *Fitoterapia* 1992; 63(3): 232-7

¹⁰³ Mook-Jung I, Shin JE, Yun SH, Huh K, Koh JY, Park HK, Jew SS, Jung MW. Protective effects of asiaticoside derivatives against beta-amyloid neurotoxicity. *J Neurosci Res* 1999; Nov 1;58(3):417-25

¹⁰⁴ Billingsley, Janice, *Decline in Deep Sleep Ages Men Faster*, Health Scout, www.healthscout.com/cgi-bin/WebObjects/Af.woa/wa/article?ap=1&id=101097

¹⁰⁵ Page BD Liquid chromatographic method for the determination of nine phenolic antioxidants in butter oil: collaborative study. J- AOAC-Int. 1993 Jul-Aug; 76(4): 765-79

Abstract: Ten laboratories collaboratively studied a liquid chromatographic (LC) method for the determination of propyl, octyl, and dodecyl gallate (PG, OG, and DG, respectively), 2,4,5-trihydroxybutyrophenone (THBP), tert-butylhydroquinone (TBHQ), nordihydroguaiaretic acid (NDGA), 2- and 3-tert-butyl-4-hydroxyanisole (BHA), 2,6-di-tert-butyl-4-hydroxy-methylphenol (Ionox-100), and 3,5-di-tert-butyl-4-hydroxytoluene (BHT) in butter oil. The 10 samples analyzed were spiked in matched pairs at about 100, 50, and 10 micrograms/g. In the method studied, antioxidants are extracted as in AOAC LC method 983.15, but different LC eluants are used to separate the 9 antioxidants. Results from 1 laboratory were rejected as not valid and were not included in any calculations. For the remaining 9 laboratories, the overall mean recoveries for PG, THBP, TBHQ, NDGA, BHA, OG, Ionox, BHT, and DG were 100.9, 97.8, 103.4, 95.4, 97.4, 93.6, 95.5, 79.0, and 96.2%, respectively. The overall reproducibility relative standard deviations were 8.55, 17.4, 25.6, 14.5, 6.60, 9.64, 10.8, 11.4, and 7.35%, respectively. The method was adopted first action by AOAC International as a modification of AOAC method 983.15.

¹⁰⁶ Schalinske, K.L. Steele, R.D. Dietary butter protects against ultraviolet radiation-induced suppression of contact hypersensitivity in Skh:HR-1 hairless mice. J-nutr. Bethesda, Md. : American Institute of Nutrition. Mar 1996. v. 126 (3) p. 681-692.

Abstract: Dietary fats modulate a wide variety of T cell functions in mice and humans. This study examined the effects of four different dietary fats, predominantly polyunsaturated sunflower oil, margarine, and predominantly saturated butter, clarified butter, on the T cell-mediated, systemic suppression of contact hypersensitivity by ultraviolet radiation in the Skh:HR-1 hairless mouse. Diets containing either 200 g/kg or 50 g/kg butter or clarified butter as the sole fat source protected against systemic photoimmunosuppression, whether the radiation source was unfiltered ultraviolet B (280-320 nm) or filtered solar simulated ultraviolet radiation (290-400 nm), in comparison with diets containing either 200 or 50 g/kg margarine or sunflower oil. There was a linear relationship ($r > 0.9$) between protection against photoimmunosuppression and the proportion of clarified butter in mice fed a series of 200 g/kg mixed fat diets that provided varying proportions of clarified butter and sunflower oil. The dietary fats did not modulate the contact hypersensitivity reaction in unirradiated animals. The observed phenomena were not primarily due to the carotene, tocopherol, cholecalciferol, retinol, lipid hydroperoxide or the nonfat solid content of the dietary fats used and appeared to be a result of the different fatty acid composition of the fats.

¹⁰⁷ Report on butter prompts research policy changes. Nutrition-week (USA). (22 Mar 1991). v. 21(12) p. 2-3.

Abstract: A study by the Medical Research Council showed that men eating butter ran half the risk of developing heart disease as those using polyunsaturated margarine. Trans fatty acids are thought to be responsible. This article discusses these findings.

¹⁰⁸ Singh RB Niaz MA Ghosh S Beegom R Rastogi V Sharma JP Dube GK Association of trans fatty acids (vegetable ghee) and clarified butter (Indian ghee) intake with higher risk of coronary artery disease in rural and urban populations with low fat consumption. Int-J-Cardiol. 1996 Oct 25; 56(3): 289-98 Abstract: These cross-sectional surveys included 1769 rural (894 men and 875 women) and 1806 urban (904 men and 902 women) randomly selected subjects between 25-64 years of age from Moradabad in North India. The total prevalence of coronary artery disease based on clinical history and electrocardiogram was significantly higher in urban compared to rural men (11.0 vs. 3.9%) and women (6.9 vs. 2.6%), respectively. Food consumption patterns showed that important differences in relation to coronary artery disease were higher intake of total visible fat, milk and milk products, meat, eggs, sugar and jaggery in urban compared to rural subjects. Prevalence of coronary artery disease in relation to visible fat intake showed a higher prevalence rate with higher visible fat intake in both sexes and the trend was significant for total prevalence rates both for rural and urban men and women. Subgroup analysis among urban (694 men and 694 women) and rural (442 men and 435 women) subjects consuming moderate to high fat diets showed that subjects eating trans fatty acids plus clarified butter or those consuming clarified butter as total visible fat had a significantly higher prevalence of coronary artery disease compared to those consuming clarified butter plus vegetable oils in both rural (9.8, 7.1 vs. 3.0%) and urban (16.2, 13.5 vs. 11.0%) men as well as in rural (9.2, 4.5 vs. 1.5%) and urban (10.7, 8.8 vs. 6.4%) women. Univariate and multivariate regression analysis with adjustment for age showed that sedentariness in women, body mass index in urban men and women, milk and clarified butter plus trans fatty acids in both rural and urban in both sexes were significantly associated with coronary artery disease. It is possible that lower intake of total visible fat (20 g/day), decreased intake of milk, increased physical activity and cessation of smoking may benefit some populations in the prevention of coronary artery disease.

¹⁰⁹ Linda B. White, M.D. *Pathway To A Healthy Heart*
http://www.healthwell.com/delicious-online/D_Backs/Feb_97/heart.cfm?path=hw

¹¹⁰ Jill Stansbury, N.D., *Change of Heart*,
<http://www.healthwell.com/hnbreakthroughs/may99/changeofheart.cfm?path=hw&cond=25&mcat=58>

¹¹¹ Reuters Health Consumer Group Urges Warning Labels for Cholesterol Drugs, 8/20/01,
<http://www.drkoop.com/dyncon/article.asp?at=N&id=13115>

¹¹² Verma SK, Bordia A. Effect of Commiphora mukul (gum guggulu) in patients of hyperlipidemia with special reference to HDL-cholesterol. Indian J Med Res 1988 Apr;87:356-60

¹¹³ Guggul Tree Resin May Lower Cholesterol

Posted on: 05/03/2002

DALLAS--Research involving an extract from the guggul tree (*Commiphora mukul*) has demonstrated that the resin compound guggulsterone may be effective for reducing total cholesterol and triglyceride levels. The study, which was published online on May 2 in Science Express (www.sciencemag.org), was picked up by the national media, including a story that appeared on the Associated Press (AP) newswire.

Researchers, led by David Moore at the Baylor College of Medicine in Houston, discovered that guggulsterone acts as an antagonist, binding to and inhibiting the farnesoid X receptor (FXR), a protein that binds to bile acids and halts their production. Moore hypothesized that the binding property of guggulsterone would inhibit FXR, thereby lowering cholesterol.

To test this theory in vivo, Moore passed his work on to David J. Mangelsdorf, Ph.D., and his colleagues at the University of Texas Southwestern Medical Center, whose research is funded by the Howard Hughes Medical Institute, a nonprofit research institute based in Chevy Chase, Md., that funds scientists throughout universities in the United States. They administered guggulsterone to two types of mice--wild-type mice with normal FXR function and FXR-knockout mice with no FXR protein--to determine whether FXR was involved in the cholesterol-lowering effect of guggulsterone.

"When you give guggulsterone to the wild-type animal, it should lower its cholesterol. If this compound is working through FXR, when you give it to the FXR-knockout, it should have no effect," Mangelsdorf said. "And that was exactly what we saw. We demonstrated definitively in our laboratory that FXR was involved in the process, which is a key point to the paper, because it showed, in vivo, that the mechanism of action was as Dr. Moore's laboratory had suggested." In addition, researchers found that the compound lowered triglyceride levels, although this occurrence was unexplained.

"[Guggulsterone] is basically an antagonist--it interrupts what a normal protein in the body is doing by blocking its normal action," Mangelsdorf said. "Normally, that action would be good, but blocking [FXR] in this way with people who are hypercholesterolemic or hyperlipidemic may be beneficial because it lowers triglycerides and cholesterol."

¹¹⁴ Satyavati GV. Gum guggul (*Commiphora mukul*)--the success story of an ancient insight leading to a modern discovery. *Indian J Med Res* 1988 Apr;87:327-35

¹¹⁵ Tripathi YB, Malhotra OP, Tripathi SN. Thyroid stimulating action of Z-guggulsterone obtained from *Commiphora mukul*. *Planta Med* 1984 Feb;(1):78-80

¹¹⁶ Satyavati GV, Dwarakanath C, Tripathi SN. Experimental studies on the hypocholesterolemic effect of *Commiphora mukul*. *Engl. (Guggul)*. *Indian J Med Res* 1969 Oct;57(10):1950-62

¹¹⁷ Paranjpe P, Patki P, Patwardhan B. Ayurvedic treatment of obesity: a randomised double-blind, placebo-controlled clinical trial. *J Ethnopharmacol* 1990 Apr;29(1):1-11

Interdisciplinary School of Ayurvedic Medicine, University of Poona, Pune, India.

Seventy obese subjects were randomised into four groups. Ayurvedic drug treatments were given for three months while one group received a placebo. Physical, clinical and pathological investigations were carried out at regular intervals. A significant weight loss was observed in drug therapy groups when compared with the placebo. Body measurements such as skin fold thickness and hip and waist circumferences were significantly decreased. Decreases in serum cholesterol and triglyceride levels were observed. No side effects of any kind were observed during the treatment period.

¹¹⁸ Antonio J, Colker CM, Torina GC, et al. Effects of a standardized guggulsterone phosphate supplement on body composition in overweight adults: A pilot study. *Curr Ther Res* 1999;60:220-7.

¹¹⁹ Kapoor LD. *Handbook of Ayurvedic Medicinal Plants*. Boca Raton, FL. CRC Press; 1990:319-320

¹²⁰ Terminalia arjuna. *Altern Med Rev* 1999 Dec;4(6):436-7

Terminalia arjuna is a deciduous tree found throughout India growing to a height of 60-90 feet. The thick, white-to-pinkish-gray bark has been used in India's native Ayurvedic medicine for over three centuries, primarily as a cardiac tonic. Clinical evaluation of this botanical medicine indicates it can be of benefit in the treatment of coronary artery disease, heart failure, and possibly hypercholesterolemia. It has also been found to be antibacterial and antimutagenic. Terminalia's active constituents include tannins, triterpenoid saponins (arjunic acid, arjunolic acid, arjungenin, arjunglycosides), flavonoids (arjunone, arjunolone, luteolin), gallic acid, ellagic acid, oligomeric proanthocyanidins (OPCs), phytosterols, calcium, magnesium, zinc, and copper.

¹²¹ Miller AL Botanical influences on cardiovascular disease. *Altern Med Rev* 1998 Dec;3(6):422-31

¹²² Kumar PU, Adhikari P, Pereira P, Bhat P Safety and efficacy of Hartone in stable angina pectoris--an open comparative trial. *J Assoc Physicians India* 1999 Jul;47(7):685-9

OBJECTIVES: To evaluate the safety and efficacy of 'Hartone'--a proprietary herbal product primarily containing Terminalia arjuna in stable angina pectoris patients. **PATIENTS AND METHODS:** Ten patients with stable angina pectoris were given Hartone 2 caps twice daily for 6 weeks and 1 cap twice daily for the next 6 weeks. Haematological and biochemical investigations to assess safety were carried out on day 0, day 42 and day 84. Serum lipid profile was done before and after therapy. Efficacy was assessed by considering the reduction in the number of anginal episodes and improvement in stress test. The results were compared with 10 patients of stable angina pectoris on isosorbide mononitrate (ISMN) 20 mg twice daily. **RESULTS:** Hartone afforded symptomatic relief in 80% of patients and ISMN in 70%. The number of anginal attacks were reduced from 79/wk to 24/wk by Hartone and from 26/wk to 7/wk by ISMN. Although patients of both groups showed improvement in several stress test parameters compared to base line, the difference was not statistically significant. Hartone improved BP response to stress test in two patients and ejection fraction

in one. Hartone was better tolerated than ISMN and showed no evidence of hepatic or renal impairment. Its effects on lipid profile was not consistent. CONCLUSION: Hartone is a safe and effective anti-anginal agent comparable to ISMN and is better tolerated. Large scale, randomised, double blind trials are needed to prove its efficacy.

¹²³ Dwivedi S, Agarwal MP Antianginal and cardioprotective effects of Terminalia arjuna, an indigenous drug, in coronary artery disease. *J Assoc Physicians India* 1994 Apr;42(4):287-9

The effect of bark powder of Terminalia arjuna, an indigenous drug, on anginal frequency, blood pressure, body mass index, blood sugar, cholesterol and HDL-cholesterol was studied in 15 stable (Group A) and 5 unstable (Group B) angina patients before and 3 months after T. arjuna therapy. Tread mill test (TMT) and echocardiographic left ventricular ejection fraction was evaluated in some cases. There was 50% reduction in anginal episodes in Group A cases ($P < 0.01$). TMT performance improved from moderate to mild changes in 5 patients and one with mild changes became negative for ischemia. The time to the onset of angina and appearance of ST-T changes on TMT after T. arjuna was delayed significantly. However, in patients with unstable angina there was an insignificant reduction in anginal frequency. These patients also needed diltiazem, B-blockers and nitroglycerine in addition to T. arjuna. The drug lowered systolic blood pressure and body mass index to a significant level ($p < 0.05$) and increased HDL-cholesterol only slightly along with marginal improvement in left ventricular ejection fraction in stable angina patients. There were no deleterious effects on liver or kidney functions. Our results suggest that monotherapy with T. arjuna is fairly effective in patients with symptoms of stable angina pectoris. However, it has a limited role in unstable angina.

¹²⁴ Bharani A, Ganguly A, Bhargava KD Salutory effect of Terminalia Arjuna in patients with severe refractory heart failure. *Int J Cardiol* 1995 May;49(3):191-9

Twelve patients with refractory chronic congestive heart failure (Class IV NYHA), related to idiopathic dilated cardiomyopathy (10 patients); previous myocardial infarction (one patient) and peripartum cardiomyopathy (one patient), received Terminalia Arjuna, an Indian medicinal plant, as bark extract (500 mg 8-hourly) or matching placebo for 2 weeks each, separated by 2 weeks washout period, in a double blind cross over design as an adjunct to maximally tolerable conventional therapy (Phase I). The clinical, laboratory and echocardiographic evaluation was carried out at baseline and at the end of Terminalia Arjuna and placebo therapy and results were compared. Terminalia Arjuna, compared to placebo, was associated with improvement in symptoms and signs of heart failure, improvement in NYHA Class (Class III vs. Class IV), decrease in echo-left ventricular enddiastolic (125.28 ± 27.91 vs. 134.56 ± 29.71 ml/m²; $P < 0.005$) and endsystolic volume (81.06 ± 24.60 vs. 94.10 ± 26.42 ml/m²; $P < 0.005$) indices, increase in left ventricular stroke volume index (44.21 ± 11.92 vs. 40.45 ± 11.56 ml/m²; $P < 0.05$) and increase in left ventricular ejection fractions (35.33 ± 7.85 vs. $30.24 \pm 7.13\%$; $P < 0.005$). On long term evaluation in an open design (Phase II), wherein Phase I participants continued Terminalia Arjuna in fixed dosage (500 mg 8-hourly) in addition to flexible diuretic, vasodilator and digitalis dosage for 20-28 months (mean 24 months) on outpatient basis, patients showed continued improvement in symptoms, signs, effort tolerance and NYHA Class, with improvement in quality of life.

¹²⁵ Dwivedi S, Jauhari R Beneficial effects of Terminalia arjuna in coronary artery disease. *Indian Heart J* 1997 Sep-Oct;49(5):507-10

Effect of Terminalia arjuna on angina pectoris, congestive heart failure and left ventricular mass was studied in patients of myocardial infarction with angina and/or ischaemic cardiomyopathy. Bark stem powder of T. arjuna, 500 mg 8 hourly was administered to 10 patients of postmyocardial infarction angina and two patients of ischaemic cardiomyopathy, in a dose of 500 mg 8 hourly postoperatively, for a period of three months (Group A). These patients were also on conventional treatment comprising of nitrates, aspirin and/or calcium channel blockers. Twelve age-, sex-, body mass index- and ECG-matched patients of postmyocardial infarction angina receiving only conventional treatment served as controls (Group B). Significant reduction in anginal frequency was noted in both groups (3.5 ± 1.98 to 1.08 ± 1.08 per day vs 3.10 ± 0.72 to 1.17 ± 0.84 per day). However, only Group A patients showed significant improvement in left ventricular ejection fraction (42.25 ± 9.96 to $52.67 \pm 12.32\%$ vs 51.83 ± 5.99 to $49.83 \pm 2.52\%$) and reduction in left ventricular mass (159.18 ± 51.11 to 127.47 ± 52.40 gm/m² vs 159.11 ± 38.92 to 160.78 ± 54.23 gm/m²) on echocardiography following three months of therapy. Both patients with ischaemic cardiomyopathy showed significant symptomatic relief in coronary heart failure from NYHA class III to NYHA class I. Prolonged administration of T. arjuna did not show any adverse effects on renal, hepatic and haematological parameters. The potential of T. arjuna to improve left ventricular ejection fraction and reduce left ventricular mass in coronary artery disease needs to be harnessed.

126 Seth SD, Maulik M, Katiyar CK, Maulik SK Role of Lipistat in protection against isoproterenol induced myocardial necrosis in rats: a biochemical and histopathological study. *Indian J Physiol Pharmacol* 1998 Jan;42(1):101-6

A test drug (Lipistat) comprising of equal-proportions of extracts of Terminalia arjuna, Inula racemosa Hook, latex of Commiphora mukul, in three different doses (225 mg/kg; 350 mg/kg; 450 mg/kg) were administered orally daily for 6 days a week for 60 days in rats. Thereafter, the rats were subjected to isoproterenol (ISO) induced (85 mg/kg, s.c. for 2 days) myocardial necrosis. Gross and microscopic examinations (histopathology) were done along with estimations of myocardial tissue high energy phosphates (HEP) stores and lactate content. Gross examination showed significant ($P < 0.05$) cardioprotection in Lipistat treated animals. On microscopic examination no statistically significant reduction in myocardial damage by 350 and 450 mg/kg of Lipistat were observed although loss of myocardial HEP stores and accumulation of lactate were significantly prevented. The results of the present study suggest the potential usefulness of Lipistat in the prevention of ischemic heart disease.

127 Shaila HP, Udupa SL, Udupa AL Hypolipidemic activity of three indigenous drugs in experimentally induced atherosclerosis. *Int J Cardiol* 1998 Dec 1;67(2):119-24

The effect of orally administered indigenous drugs Terminalia arjuna, T. belerica and T. chebula were investigated on experimental atherosclerosis. Rabbits were fed a cholesterol-rich diet to induce atherosclerosis. The three drugs were fed along with cholesterol. At the end of the experimental period the animals were killed and their plasma and tissue lipid components estimated.

Atherosclerotic lesions of the aorta were examined histologically. T. arjuna was found to be the most potent hypolipidemic agent and induced partial inhibition of rabbit atheroma. The results indicate that T. arjuna may play an anti-atherogenic role.

¹²⁸ Ram A, Lauria P, Gupta R, Kumar P, Sharma VN Hypocholesterolaemic effects of Terminalia arjuna tree bark. *J Ethnopharmacol* 1997 Feb;55(3):165-9

Diet-induced hyperlipidaemic rabbits were given 50% ethanolic extract of Terminalia arjuna tree bark in doses of 100 mg/kg (Group B, n = 6) and 500 mg/kg (Group C, n = 6) and compared with controls (Group A). At 60 days of intervention in Groups A, B and C mean +/- S.E.M. total cholesterol was 574 +/- 61, 320 +/- 29 and 217 +/- 44 mg/dl, respectively (P < 0.01); LDL cholesterol was 493 +/- 57, 271 +/- 30 and 162 +/- 44 mg/dl (P < 0.01); HDL cholesterol was 59 +/- 7, 36 +/- 3 and 35 +/- 4 mg/dl (P = n.s.); triglyceride was 108 +/- 13, 67 +/- 6 and 101 +/- 26 mg/dl (P = n.s.); cholesterol/HDL ratio was 10.1 +/- 1.3, 9.2 +/- 1.1 and 6.1 +/- 1.0 (P = n.s.); and LDL/HDL ratio was 8.7 +/- 1.3, 7.8 +/- 1.1 and 4.5 +/- 1.0 (P < 0.01). The extract did not adversely affect biochemical tests of liver and renal function and haematological parameters.

129 Gupta R, Singhal S, Goyle A, Sharma VN. Antioxidant and hypocholesterolaemic effects of Terminalia arjuna tree-bark powder: a randomised placebo-controlled trial. *J Assoc Physicians India* 2001 Feb;49:231-5

Department of Medicine, Monilek Hospital and Research Centre, Jaipur.

OBJECTIVE: To evaluate the antioxidant and hypocholesterolaemic effects of Terminalia arjuna tree bark (a popular cardiogenic substance in Indian pharmacopoeia) and to compare it with a known antioxidant, vitamin E, we performed a randomized controlled trial. METHODS: One hundred and five successive patients with coronary heart disease (CHD) presenting to our centre were recruited and using a Latin-square design divided into 3 groups of 35 each. The groups were matched for age, lifestyle and dietary variables, clinical diagnosis and drug treatment status. None of the patients was on lipid-lowering drugs. Supplemental vitamins were stopped for one month before study began and American Heart Association Step II dietary advice was given to all. At baseline, total cholesterol, triglycerides, HDL and LDL cholesterol and lipid peroxide estimated as thiobarbituric acid reactive substances (TBARS) were determined. Group I received placebo capsules; Group II vitamin E capsules 400 units/day; and Group III received finely pulverized T. arjuna tree bark-powder (500 mg) in capsules daily. Lipids and lipid peroxide levels were determined at 30 days follow-up. RESULTS: Response rate in various groups varied from 86% to 91%. No significant changes in total, HDL, LDL cholesterol and triglycerides levels were seen in Groups I and II (paired t-test p > 0.05). In Group III there was a significant decrease in total cholesterol (-9.7 +/- 12.7%), and LDL cholesterol (-15.8 +/- 25.6%) (paired t-test p < 0.01). Lipid peroxide levels decreased significantly in both the treatment groups (p < 0.01). This decrease was more in vitamin E group (-36.4 +/- 17.7%) as compared to the T. arjuna group (-29.3 +/- 18.9%). CONCLUSIONS: Terminalia arjuna tree bark powder has significant antioxidant action that is comparable to vitamin E. In addition, it also has a significant hypocholesterolaemic effect.

¹³⁰ Perumal Samy R, Ignacimuthu S, Sen A Screening of 34 Indian medicinal plants for antibacterial properties. *J Ethnopharmacol* 1998 Sep;62(2):173-82

A total of 34 plant species belonging to 18 different families, selected on the basis of folklore medicinal reports practised by the tribal people of Western Ghats, India, were assayed for antibacterial activity against Escherichia coli, Klebsiella aerogenes, Proteus vulgaris, and Pseudomonas aerogenes (gram-negative bacteria) at 1000-5000 ppm using the disc diffusion method. Of these 16 plants showed activity; among them Cassia fistula, Terminalia arjuna and Vitex negundo showed significant antibacterial activity against the tested bacteria. Our findings confirm the traditional therapeutic claims for these herbs.

¹³¹ Kandil FE, Nassar MI A tannin anti-cancer promotor from Terminalia arjuna. *Phytochemistry* 1998 Apr;47(8):1567-8

A new ellagitannin named; arjunin, four known tannins and two phenolic acids were isolated from Terminalia arjuna. The structures were elucidated by spectroscopic analyses.

¹³² Kaur S, Grover IS, Kumar S Antimutagenic potential of ellagic acid isolated from Terminalia arjuna. *Indian J Exp Biol* 1997 May;35(5):478-82

Antimutagenic potential of a fraction isolated from Terminalia arjuna has been evaluated in TA98 and TA100 strains of Salmonella typhimurium against direct and indirect-acting mutagens. The fraction was quite effective against S9-dependent 2AF while it showed moderate effect against NPD. The fraction was analyzed to be ellagic acid.

¹³³ Pettit GR, Hoard MS, Doubek DL, Schmidt JM, Pettit RK, Tackett LP, Chapuis JC Antineoplastic agents 338. The cancer cell growth inhibitory. Constituents of Terminalia arjuna (Combretaceae). *J Ethnopharmacol* 1996 Aug;53(2):57-63

By means of bioassay-guided separation methods, the cancer cell growth inhibitory constituents residing in the bark, stem and leaves of the Mauritius medicinal plant Terminalia arjuna (Combretaceae) were examined. The cancer cell line active components were found to be gallic acid, ethyl gallate, and the flavone luteolin. Only gallic acid was previously known to occur in this plant. Luteolin has a well established record of inhibiting various cancer cell lines and may account for most of the rationale underlying the use of

T. arjuna in traditional cancer treatments. Luteolin was also found to exhibit specific activity against the pathogenic bacterium *Neisseria gonorrhoeae*.

¹³⁴ Kumar DS, Prabhakar YS On the ethnomedical significance of the Arjun tree, *Terminalia arjuna* (Roxb.) Wight & Arnot. *J Ethnopharmacol* 1987 Jul;20(2):173-90

Terminalia arjuna is an important cardiogenic plant described in the Ayurveda, the ancient Indian medical science. It is also believed to have the ability to cure hepatic, urogenital, venereal and viral diseases. An attempt is made here to analyse the available drug recipes using this plant from Sanskrit literature in the light of modern scientific knowledge. The chemistry and pharmacology of T. arjuna are also discussed, and areas of future investigations are identified.

¹³⁵ Silagy CA, Neil HA. A meta-analysis of the effect of garlic on blood pressure. *J Hypertens* 1994 Apr;12(4):463-8
Department of General Practice, Flinders University of South Australia, Adelaide.

OBJECTIVE: To undertake a systematic review, including meta-analysis, of published and unpublished randomized controlled trials of garlic preparations to determine the effect of garlic on blood pressure relative to placebo and other antihypertensive agents.

DATA IDENTIFICATION: Studies were identified by a search of Medline and the Alternative Medicine electronic databases, from references listed in primary and review articles, and through direct contact with garlic manufacturers.

STUDY SELECTION: Only randomized controlled trials of garlic preparations that were at least 4 weeks in duration were deemed eligible for inclusion in the review.

DATA EXTRACTION: Data were extracted from the published reports by the two authors independently, with disagreements resolved by discussion. **RESULTS:** Eight trials were identified (all using the same dried garlic powder preparation (Kwai) with data from 415 subjects included in the analyses. Only three of the trials were specifically conducted in hypertensive subjects, and many had other methodological shortcomings. Of the seven trials that compared the effect of garlic with that of placebo, three showed a significant reduction in systolic blood pressure (SBP) and four in diastolic blood pressure (DBP). The overall pooled mean difference in the absolute change (from baseline to final measurement) of SBP was greater in the subjects who were treated with garlic than in those treated with placebo. For DBP the corresponding reduction in the garlic-treated subjects was slightly smaller. **CONCLUSIONS:** The results suggest that this garlic powder preparation may be of some clinical use in subjects with mild hypertension. However, there is still insufficient evidence to recommend it as a routine clinical therapy for the treatment of hypertensive subjects. More-rigorously designed and analysed trials are needed.

¹³⁶ Auer W, Eiber A, Hertkorn E, Hoehfeld E, Koehrl U, Lorenz A, Mader F, Merx W, Otto G, Schmid-Otto B, et al. Hypertension and hyperlipidaemia: garlic helps in mild cases. *Br J Clin Pract Suppl* 1990 Aug;69:3-6
Incorporated Society, Nittendorf, West Germany.

Forty-seven non-hospitalised patients with mild hypertension took part in a randomised, placebo-controlled, double-blind trial conducted by 11 general practitioners. The patients who were admitted had diastolic blood pressures between 95 and 104 mmHg after a two-week acclimatization phase. The patients then took either a preparation of garlic powder (Kwai) or a placebo of identical appearance for 12 weeks. Blood pressure and plasma lipids were monitored during treatment after four, eight and 12 weeks.

Significant differences between the placebo and the drug group were found during the course of therapy. For example, the supine diastolic blood pressure in the group having garlic treatment fell from 102 to 91 mmHg after eight weeks (p less than 0.05) and to 89 mmHg after 12 weeks (p less than 0.01). The serum cholesterol and triglycerides were also significantly reduced after eight and 12 weeks of treatment. In the placebo group, on the other hand, no significant changes occurred.

¹³⁷ Steiner M, Khan AH, Holbert D, Lin RI. A double-blind crossover study in moderately hypercholesterolemic men that compared the effect of aged garlic extract and placebo administration on blood lipids. *Am J Clin Nutr* 1996 Dec;64(6):866-70
Memorial Hospital of Rhode Island, Pawtucket, USA. Steiner@Brody.med.ecu.edu

A double-blind crossover study comparing the effect of aged garlic extract with a placebo on blood lipids was performed in a group of 41 moderately hypercholesterolemic men [cholesterol concentrations 5.7-7.5 mmol/L (220-290 mg/dL)]. After a 4-wk baseline period, during which the subjects were advised to adhere to a National Cholesterol Education Program Step I diet, they were started on 7.2 g aged garlic extract per day or an equivalent amount of placebo as a dietary supplement for a period of 6 mo, then switched to the other supplement for an additional 4 mo. Blood lipids, blood counts, thyroid and liver function measures, body weight, and blood pressure were followed over the entire study period. The major findings were a maximal reduction in total serum cholesterol of 6.1% or 7.0% in comparison with the average concentration during the placebo administration or baseline evaluation period, respectively. Low-density-lipoprotein cholesterol was also decreased by aged garlic extract, 4% when compared with average baseline values and 4.6% in comparison with placebo period concentrations. In addition, there was a 5.5% decrease in systolic blood pressure and a modest reduction of diastolic blood pressure in response to aged garlic extract. We conclude that dietary supplementation with aged garlic extract has beneficial effects on the lipid profile and blood pressure of moderately hypercholesterolemic subjects.

¹³⁸ Monograph- Cinnamon, Bastyr University Department of Botanical Medicine

¹³⁹ Judy McBride, Cinnamon Extracts Boost Insulin Sensitivity. (Agricultural Research Service) July, 2000
http://www.findarticles.com/cf_0/m3741/7_48/63986959/p1/article.jhtml

¹⁴⁰ Lee Scheier, *Salicylic acid: One more reason to eat your fruits and vegetables*. (For Your Information). Journal of the American Dietetic Association Dec, 2001 http://www.findarticles.com/cf_0/m0822/12_101/80949235/p1/article.jhtml

¹⁴¹ Fuhrman B, Rosenblat M, Hayek T, Coleman R, Aviram M Ginger extract consumption reduces plasma cholesterol, inhibits LDL oxidation and attenuates development of atherosclerosis in atherosclerotic, apolipoprotein E-deficient mice. *J Nutr* 2000 May;130(5):1124-31

Oxidative modification of LDL is thought to play a key role in the pathogenesis of atherosclerosis. Consumption of nutrients rich in phenolic antioxidants has been shown to be associated with attenuation of development of atherosclerosis. This study was undertaken to investigate the ex vivo effect of standardized ginger extract on the development of atherosclerosis in apolipoprotein E-deficient (E(0)) mice, in relation to plasma cholesterol levels and the resistance of their LDL to oxidation and aggregation. E(0) mice (n = 60; 6-wk-old) were divided into three groups of 20 and fed for 10 wk via their drinking water with the following: group i) placebo (control group), 1.1% alcohol and water (11 mL of alcohol in 1 L of water); group ii) 25 &mgr;g of ginger extract/d in 1.1% alcohol and water and group iii) 250 &mgr;g of ginger extract/day in 1.1% alcohol and water. Aortic atherosclerotic lesion areas were reduced 44% (P < 0.01) in mice that consumed 250 &mgr;g of ginger extract/day. Consumption of 250 &mgr;g of ginger extract/day resulted in reductions (P < 0.01) in plasma triglycerides and cholesterol (by 27 and 29%, respectively), in VLDL (by 36 and 53%, respectively) and in LDL (by 58 and 33%, respectively). These results were associated with a 76% reduction in cellular cholesterol biosynthesis rate in peritoneal macrophages derived from the E(0) mice that consumed the high dose of ginger extract for 10 wk (P < 0.01). Furthermore, peritoneal macrophages harvested from E(0) mice after consumption of 25 or 250 &mgr;g of ginger extract/day had a lower (P < 0.01) capacity to oxidize LDL (by 45 and by 60%, respectively), and to take up and degrade oxidized LDL (by 43 and 47%, respectively). Consumption of 250 &mgr;g of ginger extract/day also reduced (P < 0.01) the basal level of LDL-associated lipid peroxides by 62%. In parallel, a 33% inhibition (P < 0.01) in LDL aggregation (induced by vortexing) was obtained in mice fed ginger extract. We conclude that dietary consumption of ginger extract by E(0) mice significantly attenuates the development of atherosclerotic lesions. This antiatherogenic effect is associated with a significant reduction in plasma and LDL cholesterol levels and a significant reduction in the LDL basal oxidative state, as well as their susceptibility to oxidation and aggregation.

¹⁴² Bhandari U, Sharma JN, Zafar R The protective action of ethanolic ginger (*Zingiber officinale*) extract in cholesterol fed rabbits. *J Ethnopharmacol* 1998 Jun;61(2):167-71

The effects of ethanolic extract of ginger (200 mg/kg, p.o.) were studied in cholesterol fed rabbits. The marked rise in serum and tissue cholesterol, serum triglycerides, serum lipoproteins and phospholipids that followed 10 weeks of cholesterol feeding, was significantly reduced by the ethanolic ginger extract and results were compared with gemfibrozil, a standard orally effective hypolipidaemic drug. The severity of aortic atherosclerosis as judged by gross grading was more marked in pathogenic, i.e. the hypercholesterolemic group, while animals receiving ginger extract along with cholesterol showed a lower degree of atherosclerosis. The results indicate that ginger is definitely an antihyperlipidaemic agent.

¹⁴³ Bordia A, Verma SK, Srivastava KC Effect of ginger (*Zingiber officinale* Rosc.) and fenugreek (*Trigonella foenumgraecum* L.) on blood lipids, blood sugar and platelet aggregation in patients with coronary artery disease. *Prostaglandins Leukot Essent Fatty Acids* 1997 May;56(5):379-84

In a placebo-controlled study the effect of ginger and fenugreek was examined on blood lipids, blood sugar, platelet aggregation, fibrinogen and fibrinolytic activity. The subjects included in this study were healthy individuals, patients with coronary artery disease (CAD), and patients with non-insulin-dependent diabetes mellitus (NIDDM) who either had CAD or were without CAD. In patients with CAD powdered ginger administered in a dose of 4 g daily for 3 months did not affect ADP- and epinephrine-induced platelet aggregation. Also, no change in the fibrinolytic activity and fibrinogen level was observed. However, a single dose of 10 g powdered ginger administered to CAD patients produced a significant reduction in platelet aggregation induced by the two agonists. Ginger did not affect the blood lipids and blood sugar. Fenugreek given in a dose of 2.5 g twice daily for 3 months to healthy individuals did not affect the blood lipids and blood sugar (fasting and post prandial). However, administered in the same daily dose for the same duration to CAD patients also with NIDDM, fenugreek decreased significantly the blood lipids (total cholesterol and triglycerides) without affecting the HDL-c. When administered in the same daily dose to NIDDM (non-CAD) patients (mild cases), fenugreek reduced significantly the blood sugar (fasting and post prandial). In severe NIDDM cases, blood sugar (both fasting and post prandial) was only slightly reduced. The changes were not significant. Fenugreek administration did not affect platelet aggregation, fibrinolytic activity and fibrinogen.

¹⁴⁴ Thomson M, Al-Qattan KK, Al-Sawan SM, Alnaqeeb MA, Khan I, Ali M. The use of ginger (*Zingiber officinale* Rosc.) as a potential anti-inflammatory and antithrombotic agent. *Prostaglandins Leukot Essent Fatty Acids* 2002 Dec;67(6):475-8. Department of Biological Sciences, Faculty of Science, Safat, Kuwait

Abstract: The effect of an aqueous extract of ginger (*Zingiber officinale*) on serum cholesterol and triglyceride levels as well as platelet thromboxane-B(2) and prostaglandin-E(2) production was examined. A raw aqueous extract of ginger was administered daily for a period of 4 weeks, either orally or intraperitoneally (IP) to rats. Fasting blood serum was investigated for thromboxane-B(2), prostaglandin-E(2), cholesterol and triglycerides. A low dose of ginger (50 mg/kg) administered either orally or IP did not produce any significant reduction in the serum thromboxane-B(2) levels when compared to saline-treated animals. However, ginger administered orally caused significant changes in the serum PGE(2) at this dose. High doses of ginger (500 mg/kg) were significantly effective in lowering serum PGE(2) when given either orally or IP. However, TXB(2) levels were significantly lower in rats given 500 mg/kg ginger orally but not IP. A significant reduction in serum cholesterol was observed when a higher dose of

ginger (500 mg/kg) was administered. At a low dose of ginger (50 mg/kg), a significant reduction in the serum cholesterol was observed only when ginger was administered IP. No significant changes in serum triglyceride levels were observed upon administration of either the low or high dose of ginger. These results suggest that ginger could be used as an cholesterol-lowering, antithrombotic and anti-inflammatory agent.

¹⁴⁵ Lad, Vasant, and Frawley, David, *The Yoga of Herbs*, Lotus Press, Santa Fe, 1986, p. 133

¹⁴⁶ Modi, Ramesh, *Amla, An Important Ayurvedic Medicine*, Ayurved Centre, Toronto, Canada,

<http://www.ayurvedtoronto.netfirms.com/aamla.htm>

¹⁴⁷ Williamson, Elizabeth M. (editor), *Major Herbs of Ayurveda*, Churchill Livingstone, London, 2002, p.193.

¹⁴⁸ *Prostate Protection System*, Your Ayurvedic Guide to Self-Care, http://www.mapi.com/catalog/index-prostate.html?session_id=741243_8872956_1058394939&affil=&prod_page=catalog/index-prostate.html

¹⁴⁹ Dash, Bhagwan and Kashyap, Lalitesh, *Diagnosis and Treatment of Diseases in Ayurveda : Based on Ayurveda Saukhyam of Todaranda*, New Delhi, Concept, 1987, part four, page 89.

¹⁵⁰ McCarty MF. Up-regulation of hepatic IGFBP-1 production as a strategy for preventing benign prostatic hyperplasia. *Med Hypotheses*. 2001 Jan;56(1):1-4.

Pantox Laboratories, San Diego, California 92109, USA.

Many lines of evidence point to a prominent role for excess production and activity of stroma-derived, androgen-induced IGF-II in the stromal and epithelial hyperplasia characteristic of benign prostatic hyperplasia (BPH). Increased stromal expression of the type I IGF receptor, as well as altered local production of IGF binding proteins, appear to contribute to this increase in IGF activity. Systemic IGFBP-1, primarily of hepatic origin, is a functional antagonist of IGF-II; thus, boosting IGFBP-1 production might be expected to lessen risk for BPH. Minimizing diurnal insulin secretion, and possibly avoiding intake of animal proteins over-rich in essential amino acids, are practical strategies for increasing hepatic IGFBP-1 synthesis. This hypothesis may rationalize recent evidence that exercise and moderate alcohol consumption decrease risk for BPH, whereas heavy smoking increases this risk. A clinical impression that BPH is becoming more common in Japan, and evidence that Japanese making frequent use of meat and dairy products are at increased risk for this disorder, also appear consistent with this view.

¹⁵¹ Koskimaki J, Hakama M, Huhtala H, Tammela TL. Association of dietary elements and lower urinary tract symptoms. *Scand J Urol Nephrol*. 2000 Feb;34(1):46-50.

Department of Surgery, Tampere University Hospital, Finland. jkoskimaki@koti.tpo.fi

OBJECTIVE: The purpose of the study was to establish whether dietary elements are related to lower urinary tract symptoms (LUTS) and thus to diseases causing LUTS. **MATERIALS AND METHODS:** This population-based study was carried out in 1994; a questionnaire was mailed to all men born in 1924, 1934 or 1944 living in Tampere or 11 rural or semi-rural municipalities in the same county, altogether 3143 men. Of this population, 68% were ultimately included in the study. A modified version of the DAN-PSS-1 questionnaire (10 of the questions) was used to assess urinary symptoms and problems arising from them. A symptom index was formed by multiplying the symptom and problem scores for hesitancy, incomplete emptying, urge, urge incontinence, nocturia and daytime frequency, and totalling the products. The men were also asked to report on their medical history, how often they ate vegetables and meat, whether they used butter, margarine or vegetable oil in food, how much alcohol and coffee they consumed, their smoking history and their weight and height. The risk of LUTS was estimated according to the frequency of meat and vegetable intake and the kind of fat used. **RESULTS:** The confounder-adjusted risk of LUTS was 0.68 (95% CI 0.54-0.86) among men consuming vegetables daily compared with men consuming vegetables less frequently. Compared with men who eat meat less frequently, the confounder-adjusted risk of LUTS was 2.08 (95% CI 1.00-4.10) among men consuming meat weekly, and 2.56 (95% CI 1.30-5.02) among men consuming meat daily. The confounder-adjusted risk of LUTS was 0.73 (95% CI 0.58-0.93) among men who consumed butter compared to those who did not. **CONCLUSIONS:** Dietary elements may also have an important role in the development of diseases causing LUTS. Direct effects of food components may likewise influence the occurrence of LUTS.

¹⁵² American Dietetic Association; Dietitians of Canada. Position of the American Dietetic Association and Dietitians of Canada: vegetarian diets. *Can J Diet Pract Res*. 2003 Summer;64(2):62-81.

It is the position of the American Dietetic Association and Dietitians of Canada that appropriately planned vegetarian diets are healthful, nutritionally adequate, and provide health benefits in the prevention and treatment of certain diseases. Approximately 2.5% of adults in the United States and 4% of adults in Canada follow vegetarian diets. A vegetarian diet is defined as one that does not include meat, fish, or fowl. Interest in vegetarianism appears to be increasing, with many restaurants and college foodservices offering vegetarian meals routinely. Substantial growth in sales of foods attractive to vegetarians has occurred and these foods appear in many supermarkets. This position paper reviews the current scientific data related to key nutrients for vegetarians including protein, iron, zinc, calcium, vitamin D, riboflavin, vitamin B-12, vitamin A, n-3 fatty acids, and iodine. A vegetarian, including vegan, diet can meet current recommendations for all of these nutrients. In some cases, use of fortified foods or supplements can be helpful in meeting recommendations for individual nutrients. Well-planned vegan and other types of vegetarian diets are appropriate for all stages of the life-cycle including during pregnancy, lactation, infancy, childhood, and adolescence. Vegetarian diets offer a number of nutritional benefits including lower levels of saturated fat, cholesterol, and animal protein as well as higher levels of carbohydrates, fibre, magnesium, potassium, folate, antioxidants such as vitamins C and E, and phytochemicals. Vegetarians have been reported to have lower body mass indices than non-vegetarians, as well as lower rates of death from ischemic

heart disease, lower blood cholesterol levels, lower blood pressure, and lower rates of hypertension, type 2 diabetes, and prostate and colon cancer. While a number of federally funded and institutional feeding programs can accommodate vegetarians, few have foods suitable for vegans at this time. Because of the variability of dietary practices among vegetarians, individual assessment of dietary intakes of vegetarians is required. Dietetics professionals have a responsibility to support and encourage those who express an interest in consuming a vegetarian diet. They can play key roles in educating vegetarian clients about food sources of specific nutrients, food purchase and preparation, and any dietary modifications that may be necessary to meet individual needs. Menu planning for vegetarians can be simplified by use of a food guide that specifies food groups and serving sizes.

¹⁵³ Deneo-Pellegrini, H., et al. *Foods, nutrients and prostate cancer: a case-control study in Uruguay*. *British Journal of Cancer*, Vol. 80, No. 3/4, May 1999, pp. 591-97

MONTEVIDEO, URUGUAY. Prostate cancer is the second most common cancer in Uruguay and mortality rate has increased by 77 per cent between 1953 and 1991. Researchers at the National Cancer Institute in Montevideo believe that diet and other environmental factors may be linked to prostate cancer risk and have just released the results of a study that strongly supports this contention. Their study involved 175 patients with prostate cancer and 233 controls. Both patients and controls had face-to-face interviews with researchers and also filled out detailed questionnaires which covered family history of cancer, sociodemographic variables, height and weight, alcohol and tobacco consumption, and usual diet. Analysis of the collected data showed that a high total energy intake, and a high intake of total fat, red meat (beef and lamb) and desserts (rice pudding, custard, cake, marmalade and jam) were associated with an increased risk of prostate cancer. A high intake of vegetables, fruits, and vitamins C and E was found to significantly decrease the risk. After adjusting for other risk factors the researchers conclude that men with a high intake of vitamin C (greater than 162 mg/day) reduce their risk of prostate cancer by 60 per cent as compared to men with a low intake (less than 86 mg/day).

¹⁵⁴ Dash, Bhagwan and Kashyap, Lalitesh, *Diagnosis and Treatment of Diseases in Ayurveda : Based on Ayurveda Saukhyam of Tadarananda*, New Delhi, Concept, 1987, part four, page 96.

¹⁵⁵ *Prostate Health- Focus on Prevention*, Ayurvedic News, Health and Wholeness,

<http://www.yourayurvedastore.com/newsletter/articles/a-prostatehealth.html>

¹⁵⁶ Bhajan, Yogi, *Ancient Art of Self Healing*, West Anandpur (publisher), Eugene, Oregon, 1982., p. 86