

PARADIGMS

Utilization of Ayurveda in Health Care: An Approach for
Prevention, Health Promotion, and Treatment of Disease.
Part 1—Ayurveda, the Science of Life

HARI SHARMA, M.D., F.R.C.P.C.,¹ H.M. CHANDOLA, M.D.(Ay.), Ph.D.,²
GURDIP SINGH, D.Ay.M., Ph.D.,² and GOPAL BASISHT, M.D.³

ABSTRACT

Ayurveda is a natural health care system that originated in India more than 5000 years ago. Its main objective is to achieve optimal health and well-being through a comprehensive approach that addresses mind, body, behavior, and environment. Ayurveda emphasizes prevention and health promotion, and provides treatment for disease. It considers the development of consciousness to be essential for optimal health and meditation as the main technique for achieving this. Treatment of disease is highly individualized and depends on the psychophysiologic constitution of the patient. There are different dietary and lifestyle recommendations for each season of the year. Common spices are utilized in treatment, as well as herbs and herbal mixtures, and special preparations known as *Rasayanas* are used for rejuvenation, promotion of longevity, and slowing of the aging process. A group of purification procedures known as *Panchakarma* removes toxins from the physiology. Whereas Western allopathic medicine is excellent in handling acute medical crises, Ayurveda demonstrates an ability to manage chronic disorders that Western medicine has been unable to. It may be projected from Ayurveda's comprehensive approach, emphasis on prevention, and ability to manage chronic disorders that its widespread use would improve the health status of the world's population.

INTRODUCTION

Although remarkable technological advances have taken place in the fields of prevention, control, and cure of disease, the health status of people globally is far from satisfactory. An estimated 17 million people worldwide die of cardiovascular diseases each year.¹ More than 22 million people worldwide had cancer in the year 2000.² In that same year, 171 million people globally had diabetes.³ Western allopathic medicine has not achieved the objective of health for all, even for those who can afford its high costs. In some

instances, this system of medicine has even contributed to the ill health of those patients who utilize it, through toxic side-effects and other iatrogenic disorders.^{4–7} The forte of allopathic medicine is its ability to deal with acute medical crises such as trauma, myocardial infarction, infections, and so on. However, from the Ayurvedic point of view, its understanding of chronic diseases and their underlying pathology is superficial and incomplete, which renders it unable to effectively treat these disorders.^{8,9} Moreover, allopathic medicine has not yet reached the vast majority of people in rural and remote areas, especially in developing countries.

¹The Ohio State University Center for Integrative Medicine; College of Medicine, The Ohio State University, Columbus, OH.

²Institute of Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar, India.

³Orlando Regional Medical Center and Florida Hospitals, Orlando, FL; Full Circle Community Development, Orlando, FL.

For these groups, traditional medicine continues to be the main source of health care.¹⁰

In India, the traditional system of medicine known as Ayurveda is generally the only system of medicine available in villages and remote areas. This comprehensive, natural health care system has been utilized for more than 5000 years for prevention, health promotion, and treatment of disease.¹¹ After undergoing a period of suppression during colonial rule, Ayurveda has experienced a resurgence in the last several decades and interest in it is now growing worldwide.^{12,13} In India, a technological revolution is occurring in which the scientific techniques of modern medicine are being utilized to investigate and validate Ayurveda in a new light. This blending of the old and new is exemplified in what Mashelkar refers to as “a golden triangle between traditional medicine, modern medicine, and modern science.”¹⁴ This will hopefully lead to what Patwardhan refers to as “the dawn of a new age where modern medicine and traditional medicine will blend into a holistic synergy . . . to provide affordable, available and accessible health to every citizen of global human society. . . .”¹⁵

This paper on Ayurveda is comprised of two parts: Part 1 briefly covers the principles of Ayurveda and a few of its major methodologies. Part 2 discusses Ayurveda as a system of primary health care and presents research on treating chronic disorders related to the aging process.

BASIC CONCEPTS OF AYURVEDA

Ayurveda originated in the ancient Vedic civilization of India. The *Vedas* are the knowledge and wisdom of this Vedic civilization. There are four main *Vedas*: *Rik Veda*, *Sama Veda*, *Yajur Veda*, and *Atharva Veda*. Ayurveda is one of the secondary *Vedas* or *Upavedas*. This ancient knowledge was long conveyed by oral tradition before being recorded in texts. The primary texts of Ayurveda are *Caraka Samhita*,¹⁶ *Susruta Samhita*,¹⁷ and *Ashtanga Hridayam* of Vagbhata.¹⁸

Ayurveda is translated as the “Science of Life” or “Science of Lifespan.” It is not merely a system of medicine; rather it is a way of life that aims to increase lifespan by preventing or delaying the aging process. Its objective is to create optimal health and well-being through a comprehensive approach that addresses mind, body, behavior, and environment.¹⁹ Ayurveda emphasizes prevention and health promotion, and provides treatment for disease. Research shows encouraging results for the Ayurvedic management of common ailments and many chronic and degenerative diseases, as well as iatrogenic conditions.^{13,20,21} This body of research covers a wide range of disorders, from common ailments such as indigestion^{22,23} and constipation^{24,25} to chronic disorders such as diabetes,^{26–31} arthritis,^{32–37} and hepatitis.^{38,39}

Health in Ayurveda is known as *Swastha* (*Swa* = Self, *Astha* = established), meaning a healthy person is one who

is established in the Self. The inner Self is characterized by the quality of bliss. Self represents totality and wholeness, and contact with the inner Self is achieved by the technique of meditation. In Ayurveda, health is not merely the absence of disease. According to *Susruta Samhita*, a healthy individual is one whose *doshas* are in balance, whose appetite is good, whose *dhatu*s are functioning normally, whose *malas* are in balance, and whose body, mind, and senses remain full of bliss.¹⁷

Several unique concepts of Ayurveda are mentioned in this definition of health. *Doshas* are the three principles that govern the physiology and are known as *Vata*, *Pitta*, and *Kapha*. *Vata* governs functions in the body that relate to movement (e.g., movement of food through the digestive tract, transportation of oxygen in the bloodstream, communication between cells via nerve impulses, etc.) *Pitta* governs functions that relate to transformation (e.g., digestion of food, processes of metabolism, etc.) *Kapha* governs the structure and cohesion of the body. Each individual has a certain ratio of *Vata*, *Pitta*, and *Kapha* at the time of birth; this ratio is known as their psychophysiological constitution or *Prakriti*. As long as the *Prakriti* is maintained, the person will be healthy. However, improper diet and lifestyle as well as other factors in day-to-day existence can lead to an imbalance in the ratio of *doshas*; this imbalanced ratio is known as *Vikriti*.

In Ayurveda, the three *doshas* are considered to be universal principles that function in all aspects of material creation, including the mineral, plant, and animal kingdoms, the time of day, the seasons of the year, even the planets and galaxies. In this way the human physiology is inexorably connected to the whole of existence. The *doshas* have been correlated with systems theory in the field of physics, providing a sound theoretical basis for this Ayurvedic concept,^{40,41} and research utilizing a biostatistical approach to quantify the *doshas* reveals a sound empirical basis as well.⁴² A pilot study revealed the possibility of utilizing *Prakriti* to correlate phenotypes with genotypes in the human population, which could have wide-ranging implications for health care.⁴³

The *dhatu*s mentioned in Ayurveda’s definition of health are often translated as “tissue elements”; however, they are better understood as fundamental principles that support the various bodily tissues.¹⁹ The *dhatu*s are known as *rasa* (plasma), *rakta* (blood), *mamsa* (muscle), *meda* (fat), *asthi* (bone), *majja* (bone marrow and nervous system), and *sukra* (sperm or ovum). *Malas* are the body’s excretory products (i.e., sweat, urine, and feces). The proper proportion of *dhatu*s and *malas* must be maintained within their respective groups, and between the two groups, to ensure optimal health.¹²

Ayurveda has a theory of health known as the land and seed theory.⁴⁴ The physiology is considered to be the land, and organisms or other factors that cause disease are considered to be the seed. If equilibrium of the *doshas* in the

physiology is maintained, then the land is infertile and the seed cannot grow (i.e., the disease process cannot occur even if there is an organism or other causative factor present in the body). If the equilibrium of the *doshas* is disturbed, then the *doshas* become vitiated and this imbalance provides fertile land for the seed to grow. In this situation, the disease process can begin and flourish. The main goal of Ayurveda is to prevent disease from occurring by maintaining balance in the physiology, as well as in the mind, behavior, and surrounding environment. There are multiple methodologies Ayurveda uses to achieve this balance, an important one being meditation.

MEDITATION

In Ayurveda, consciousness is considered to be of primary importance in maintaining optimal health and meditation techniques are emphasized to develop integrated holistic functioning of the nervous system. Discoveries by twentieth-century quantum physicists have now uncovered a fundamental role for consciousness in the physical world that correlates with this ancient knowledge of Ayurveda.⁴⁵ In the most recent superunified theories, physicists have described all the force and matter fields that make up the universe as modes of vibration of one underlying unified field. All the order and intelligence of the laws of nature arise from this one fundamental nonmaterial field, as does all matter. The *Vedas*—texts that were cognized and compiled in ancient India—discuss a unified field of pure, nonmaterial intelligence and consciousness whose modes of vibration manifest as the material universe. The Vedic description is strikingly similar to that of physics.

Ayurveda considers the ultimate basis of disease to be the loss of one’s connection to (or, one’s memory of) the unified field of pure consciousness, which is the innermost core of one’s own being. This loss is known as *pragya-aparadh*.¹⁹ The ultimate basis of prevention and cure is restoring one’s conscious connection to (or memory of) this pure consciousness. This reconnection is the basis of an integrated approach to health care; integration of the different layers of life begins with reconnecting one’s life to the source of inner intelligence. The foremost means for accomplishing this are the Vedic techniques for developing consciousness, chief among them being meditation. A large body of re-

TABLE 1. SOME COMMON EXAMPLES OF FOODS WITH THE SIX TASTES

Sweet:	Sugar, Milk, Butter, Rice, Breads
Sour:	Yogurt, Lemon, Cheese
Salty:	Salt
Pungent:	Spicy foods, Peppers, Ginger
Bitter:	Spinach, other green leafy vegetables
Astringent:	Beans, walnuts

TABLE 2. HOW FOODS WITH THE SIX TASTES AFFECT THE *DOSHAS*

Decrease <i>Vata</i> Sweet Sour Salty	Increase <i>Vata</i> Pungent Bitter Astringent
Decrease <i>Pitta</i> Sweet Bitter Astringent	Increase <i>Pitta</i> Pungent Sour Salty
Decrease <i>Kapha</i> Pungent Bitter Astringent	Increase <i>Kapha</i> Sweet Sour Salty

search documents the observable effects of meditation and validates the many health benefits derived from it.^{46–57}

DIETARY RECOMMENDATIONS

According to Ayurveda, diet is one of the main pillars of health. Foods are categorized in several ways, one being according to taste. Ayurveda describes six tastes: sweet, sour, salty, pungent, bitter, and astringent.¹⁶ Pungent foods are spicy hot and astringent foods have a drying effect. Table 1 gives examples of foods in each of the six categories. Foods affect the *doshas* in different ways (Table 2); therefore, one should eat foods that are suitable to his/her psychophysiological constitution or *Prakriti* to maintain balance in the system. If the system is out of balance, foods can be used in a therapeutic manner to restore balance to the *doshas*. For example, sweet, bitter, and astringent foods reduce or pacify *Pitta*. Foods that are pungent, salty, and sour increase *Pitta*. If a patient has vitiated *Pitta* that is causing a certain disorder, it is recommended that he/she favor foods that decrease *Pitta* and avoid foods that increase it.

Another factor to consider for dietary recommendations is the season. Different *doshas* predominate during different seasons. The *dosha* predominance varies depending on climatic conditions and geographic location, so it will not be the same in every region of the world. In the United States, *Vata* accumulates when the weather is cold, dry, and windy. *Pitta* accumulates when the weather is hot. *Kapha* accumulates when the weather is cold and wet. *Vata*, *Pitta*, and *Kapha* generally increase during the following seasons:

- *Vata* in late autumn and winter (mid-October to mid-March)
- *Pitta* in summer and early autumn (mid-June to mid-October)
- *Kapha* in spring (mid-March to mid-June).

Therefore, foods that pacify *Vata* are recommended during winter, those that pacify *Pitta* are recommended during

summer, and those that pacify *Kapha* are recommended during spring. These are general recommendations that should be taken into consideration along with the patient's *dosha* imbalance.

In contrast to the above, the Indian subcontinent has six seasons: spring, summer, rainy season, autumn, early winter, and late winter. *Vata* accumulates during summer and is vitiated during the rainy season. *Pitta* accumulates during the rainy season and is vitiated during autumn. *Kapha* accumulates during late winter and is vitiated during spring. The diet should be adjusted accordingly.

In general, Ayurveda recommends including lots of fruits and vegetables in the daily diet. These foods contain phytochemicals (plant chemicals) that have an abundance of health-promoting properties. Polyphenols and bioflavonoids are phytochemicals that are powerful antioxidants. They have anticarcinogenic effects, protect against heart disease, and increase immunity.⁵⁸

ROLE OF HERBS AND SPICES IN HEALTH CARE

Spices

Common spices such as turmeric, coriander, cumin, ginger, garlic, and cinnamon have significant therapeutic utility. Scientific studies have shown that turmeric (*Curcuma longa* Linn.) has anticancer properties—it protects DNA and stimulates detoxifying enzymes.^{59–64} Turmeric has anti-inflammatory properties⁶⁵ and is hepatoprotective.⁶⁶ It is antibacterial,⁶⁷ antifungal,⁶⁸ and promotes wound healing.⁶⁹ Turmeric protects against heart disease: it decreases low-density lipoprotein (LDL) and triglyceride levels,⁷⁰ is antithrombotic,⁷¹ and prevents lipid peroxidation and aortic fatty streak formation.⁷² Turmeric may protect against Alzheimer's disease: it protects cells from β -amyloid injury^{73,74} and improves several aspects of Alzheimer's disease in animal models.^{75,76}

Coriander (*Coriandrum sativum* Linn.) protects against heart disease: it decreases levels of lipid peroxide, increases activity of antioxidant enzymes,⁷⁷ decreases total cholesterol, LDL and triglycerides, and increases high-density lipoprotein (HDL).⁷⁸ Coriander has traditionally been used as a treatment for diabetes. It has antihyperglycemic, insulin-releasing, and insulin-like activity.⁷⁹ Coriander also has antimicrobial activity.⁸⁰

Cumin (*Cuminum cyminum* Linn.) is antidiabetic; it reduces blood sugar, glycosylated hemoglobin, plasma cholesterol, tissue cholesterol, phospholipids, free fatty acids, and triglycerides. Cumin was more effective in treating diabetes than the drug glibenclamide in an animal model.⁸¹ Cumin is antibacterial,⁸² hepatoprotective,⁸³ and improves irritable bowel syndrome.⁸⁴

Ginger (*Zingiber officinale* Rosc.) has various beneficial effects. It reduces lipids, atherosclerotic lesions and lipid

peroxide, and increases glutathione peroxidase.⁸⁵ These findings indicate that it would be beneficial in preventing and treating heart disease. It has anticancer properties⁸⁶ and anti-inflammatory effects.⁸⁷ It is antifungal,⁸⁸ antiemetic, and anxiolytic.⁸⁹ Ginger protects cells from β -amyloid injury, which indicates it may protect against Alzheimer's disease.^{90,91}

Garlic (*Allium sativum* Linn.) has been heavily researched and found to be beneficial in many different areas. It provides protection against heart disease in several ways. In clinical trials, garlic halted progression of arteriosclerotic plaque volume and in some cases even regressed it.⁹² It reduced total serum cholesterol and triglycerides, increased HDL, and had antiplatelet activity.⁹³ Garlic is antihypertensive,⁹⁴ anticancer,⁹⁵ immunomodulatory,⁹⁶ anti-inflammatory,⁹⁷ and antimicrobial.⁹⁸ It mitigates thyroxine-induced hyperglycemia⁹⁹ and may be helpful in preventing the progression of Alzheimer's disease.¹⁰⁰

Cinnamon is effective in the treatment of diabetes. *Cinnamomum cassia* auct. reduces serum glucose, triglycerides, LDL, and total cholesterol in patients with type 2 diabetes.³⁰ In patients with poor glycemic control of type 2 diabetes, aqueous cinnamon extract reduced the fasting plasma glucose concentration.¹⁰¹ In healthy subjects, cinnamon taken with rice pudding reduced the postprandial blood glucose concentration.¹⁰²

Cinnamomum zeylanicum Blume contains cinnamaldehyde, which lowers plasma glucose, glycosylated hemoglobin, total cholesterol and triglycerides, and increases plasma insulin and HDL.¹⁰³ Cinnamon is also antioxidant,^{104,105} antimicrobial,¹⁰⁶ and enhances wound healing.¹⁰⁷

Common spices such as these are readily available, cost-effective ways to prevent disease and in some cases provide treatment. They can be used on a daily basis in preparing healthy meals.

Herbs

Ayurveda's materia medica is extensive, with more than 700 herbs described in detail in the ancient texts.¹⁰⁸ The herbs and herbal mixtures utilized in Ayurveda are prepared by using the various parts of the plant (e.g., the root, leaves, fruits, bark, seeds, etc.). Herbs are sometimes used singly but more often in combination to provide synergistic effects and mitigate toxic side-effects.¹³ Ayurveda does not recommend isolating the active ingredient because toxic side-effects can occur and the synergistic benefits are lost.¹⁰⁹ Extensive research has been conducted on Ayurvedic herbs over the past 100 years.^{13,20,21} For example, Neem (*Azadirachta indica* A. Juss.) has historically been used for treating a wide array of disorders and research is confirming a broad range of therapeutic properties. Neem is antifungal, antibacterial, antiviral, antimalarial, antifertility, antipyretic, antiulcerogenic, anti-inflammatory, antiarthritic, antipsoriasis, anticancer, antioxidant, antihypertensive, an-

ti hyperglycemic, analgesic, hepatoprotective, immune-enhancing, and diuretic.¹¹⁰⁻¹¹² Clinical investigation of Neem includes studies that show it has significant hypoglycemic activity in patients with type 2 non-insulin-dependent diabetes mellitus²⁹ and is highly effective in controlling gastric hypersecretion and treating gastroduodenal ulcers.¹¹³

Rasayanas

Rasayana (rejuvenation therapy) is a section of Ayurveda that deals with promotion of longevity and prevention or delay of the aging process.^{20,21} There are behavioral *Rasayanas* that recommend certain behaviors that increase health and well-being; however, *Rasayanas* are usually herbs or herbal mixtures. *Rasayanas* are said to promote general health by increasing resistance to disease, activating tissue repair mechanisms, and arresting or reversing the deterioration associated with aging. They promote vitality and stamina and stimulate overall health.¹¹⁴ *Rasayanas* achieve these effects by maintaining proper balance in the three *doshas*—*Vata*, *Pitta*, and *Kapha*. According to Ayurveda, if *Rasayanas* are administered early in life, genetic predispositions for certain diseases can be avoided. When diseases do occur, the intensity of the disease is decreased by improving the resistance of the body.

LIFESTYLE RECOMMENDATIONS TO OPTIMIZE HEALTH

Ayurveda has many simple lifestyle recommendations for maintaining one’s health. *Dinacharya* is the section of Ayurveda that addresses daily routine. According to Ayurveda, the three pillars of health are diet and digestion, elimination, and sleep. One’s daily routine can have a profound effect in these areas. Different *doshas* are predominant during different hours of the day and night (Table 3) and this factors into the recommendations for daily routine. For example, the main meal of the day should be eaten around noontime since *Pitta* is predominant at this time and digestion will be strongest. The evening meal should be light. One should go to bed by 10 PM since *Pitta* is once again predominant from 10 PM to 2 AM. During this time, *Pitta* works to digest any intermediate metabolites in the physiology and break down toxic wastes. If one stays awake during this time, the clean-up mode will not function as effectively. Also, hunger will set in and eating more food at

this time will overload the system and result in more toxic wastes being produced.

Another reason to go to bed by 10 PM is because *Kapha* is predominant from 6 to 10 PM. This *dosha* is associated with qualities of heaviness, so this is naturally a time when drowsiness and sleep will come more easily. It is recommended that one get up in the morning by sunrise, which is during *Vata*-predominant time. This *dosha* is associated with movement and lightness, so arising around this time will facilitate feeling energetic and refreshed. *Kapha* is predominant from 6 to 10 AM; rising during this time will create a feeling of heaviness and lethargy.

The quality of sleep is very important to one’s health for both physical and psychologic reasons. Deep sleep is rejuvenating to the body, and during this time health-promoting chemicals are manufactured. One of these chemicals is interleukin-2, which has anticancer activity.⁴⁴

Ritucharya is the section of Ayurveda that covers seasonal routines. Changes in the environment during the various seasons cause physiologic changes in the body. At the change of seasons there is increased susceptibility to disease. If one is able to adapt at this time, he/she remains healthy; otherwise disease can develop. Therefore, one should follow lifestyle recommendations that are in tune with the *dosha* variations of the different seasons. For example, in spring *Kapha* accumulates and since this *dosha* is associated with qualities of heaviness, physical exercise is suggested and daytime sleep should be avoided. In summer *Pitta* accumulates; this *dosha* is associated with qualities of heat, so exposure to the sun should be avoided, physical overexertion should be avoided, and light clothing should be worn. In winter *Vata* accumulates; this *dosha* is associated with qualities of coldness and dryness, so recommendations include oil massage, exposure to the sun, and heavy, warm clothing.

PANCHAKARMA: PURIFICATION THERAPY

Ayurveda recommends purification therapy at the change of seasons to rid the body of toxins and prevent the onset of disease. This therapy is known as *Panchakarma*. Various modifications of this procedure are in vogue today. Traditionally, *Panchakarma* involves two preliminary practices to initiate the toxin removal process, five main techniques to complete toxin removal from the body, and follow-up practices for rejuvenation and maintenance of the benefits *Panchakarma* provides.^{115,116}

The two preliminary practices are *Snehana* and *Swedana*. *Snehana* involves internal and external oleation of the body, and *Swedana* is heat therapy. The five main techniques are *Vamana* (therapeutic emesis), *Virechana* (purgation), *Basti* (herbal and oil enemas), *Nasya* (nasal administration of medicated oils and powders), and *Raktamokshana* (therapeutic bloodletting). *Vamana* expels excess mucus and toxins from

TABLE 3. TIME OF DAY CLASSIFIED ACCORDING TO THE *DOSHAS*

Kapha	Approx. 6 AM (sunrise) to 10 AM and 6 PM to 10 PM
Pitta	Approx. 10 AM to 2 PM and 10 PM to 2 AM
Vata	Approx. 2 AM to 6 AM (sunrise) and 2 PM to 6 PM

the stomach and respiratory system. *Virechana* expels bile and *Pitta* toxins from the small intestine and liver. *Basti* purifies and nourishes the large intestine. *Nasya* strengthens the cranial region, and *Raktamokshana* cleanses the bloodstream and stimulates the production of healthy new blood. Other therapies are available, depending on the patient's individual needs.

The follow-up practices include herbal preparations and guidelines for everyday regimens. *Panchakarma* is helpful in the prevention of disease and the preservation and promotion of health. Research has shown that it reduces risk factors for heart disease¹¹⁷ and decreases blood levels of fat-soluble toxins such as polychlorinated biphenyls and agrochemicals by about 50%.¹¹⁸

Part 2 of this paper will focus on Ayurveda as a system of primary health care and introduce research on the use of Ayurvedic methodologies in the management of chronic disorders associated with aging. These chronic disorders include depression, anxiety, sleep disorders, hypertension, diabetes mellitus, Parkinson's disease, and Alzheimer's disease.

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Address reprint requests to:
Hari Sharma, M.D., F.R.C.P.C.
The Ohio State University
College of Medicine
Room 129 Hamilton Hall
1645 Neil Avenue
Columbus, OH 43210

E-mail: sharma.2@osu.edu

