Phytomedica

Volume I

Course Notes

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The Hippocratic Oath

"I swear by Apollo the physician, and Asclepius, Hygieia, Panacea and all the gods and goddesses as my witnesses, that, according to my ability and judgment, I will keep this Oath and contract:

To hold my teachers who taught me this art equally dear to me as my parents, to be a partner in life with them, and to fulfill their needs when required; to look upon their offspring as equals to my own siblings, and to teach them this art, if they shall wish to learn it, without fee or contract; and that by the set rules, lectures, and every other mode of instruction, I will impart a knowledge of the art to my own children, and those of my teachers, and to students bound by this contract and having sworn this Oath to the Law of Medicine, but to no others.

I will use those dietary regimens which will benefit my patients according to my greatest ability and judgment, and I will do no harm or injustice to them.

I will not give a lethal drug to anyone if I am asked, nor will I advise such a plan; and similarly I will not give a woman a pessary to cause an abortion.

In purity and according to divine law will I carry out my life and my art.

I will not use the knife, even upon those suffering from stones, but I will leave this to those who are trained in this craft.

Into whatever homes I go, I will enter them for the benefit of the sick, avoiding any voluntary act of impropriety or corruption, including the seduction of women or men, whether they are free men or slaves.

Whatever I see or hear in the lives of my patients, whether in connection with my professional practice or not, which ought not to be spoken of outside, I will keep secret, as considering all such things to be private.

So long as I maintain this Oath faithfully and without corruption, may it be granted to me to partake of life fully and the practice of my art, gaining the respect of all men for all time. However, should I transgress this Oath and violate it, may the opposite be my fate."

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Introduction

What is herbal medicine?

Herbal medicine refers to the use of plants to allay and prevent disease. It is easily argued as the oldest system of medicine on earth, extending millions of years into prehistory, playing a key role in the evolution and survival of the human species. Its importance, however, isn't limited only to humans. As the emerging field of zoopharmacognosy has demonstrated, many other species – from insects to mammals –seek out and use plants to elicit a therapeutic effect.[1] In this regard, it is clear that over millions of years of evolution humans have learned much about the use of medicinal plants, not only from trial and error, but from observing and learning from other animals.

Plants serve as the vital basis of all higher life forms on earth, and contain within their biological structure a blueprint for living that has evolved over millions of years. Most plant-based chemicals (or 'phytochemicals') synthesized by plants are homologous, or structurally similar with the chemicals produced in our own bodies. Due to this shared ancestry, many of these phytochemicals have the ability to modulate different aspects of our physiology, often serving as precursors or co-factors for the synthesis of important regulatory molecules such as hormones and neurotransmitters.

Medicinal herbs inhabit the spectrum that exists between domesticated plants and the untamed, natural environment. They have served as a kind of doorway into the natural world for ten of thousands of years, believed by shamans and traditional healers to mediate the imbalance created when humans live separate or apart from nature. All over the world, herbs were perceived by our ancient forebears as a natural intelligence that helps to restore balance, a trait related not only to the sum effect of their phytochemicals, but because medicinal herbs

[1] Shurkin J. 2014. Animals that self-medicate. *PNAS.* 111:49

are a direct link to our primeval nature. For this reason many plants have been venerated by different traditional peoples as their ancient ancestors, or as heavenly beings, perceived not only as material objects with physical effects, but as spiritual agencies that serve to teach us how to live in balance with nature.

While the primacy of medicinal plants in human evolution cannot be dismissed, some may take issue with the use of the word "system" when describing herbal medicine, figuring that a systemized approach to health and healing is a relatively recent phenomenon. Beyond the great antiquity of medical systems such as Ayurveda, which is at least 4000 years old, there is good evidence that humans were using medicinal plants in a systematic fashion more than 70,000 years ago.[2, 3] In comprehending just how far back our relationship with medicinal plants extends, we must be careful not to assume that a systematized approach to medicine is necessarily dependent upon the development of literature or a scientific tradition. We must realize that the knowledge and use of medicinal plants by humans is part of a long-held oral tradition that was interwoven with spirituality and culture.

The French internist Armand Trousseau (1869) stated that "the worst man of science is he who is never an artist, and the worst artist is he who is never a man of science."[4] The tension between these two poles has long been an issue in modern medicine, dissected and analyzed in numerous academic papers, but never really understood. In herbal medicine, however, there is definite marriage between these two modes of being. Here, the "art" of medicine relates to the development of intuition, a skill used by ancient healers to authentically connect to the plants and the natural world, including their own bodies and those of their patients. To understand the plants, and also our patients, requires that we patiently observe them, listening for that quiet inner voice, teaching us how to be calm, quiet, and receptive. In some herbal traditions, a young herbalist apprentice is made to sit with a particular plant for many hours, or even days, until it finally "speaks" to them. The capacity to hold this space of intuitive listening is inherently linked to the expression of empathy, which although apparently at odds with the practice of modern medicine, has been shown time and again to enhance patient satisfaction and promote better outcomes.[5]

In many respects, the ability to be still and listen to the plants is a form of meditation. Living alone in the forest or wandering the countryside in search of medicinal plants, herbalists in the ancient world were very often spiritual ascetics that lived apart from every day society. In northern Asia these were the shamans; in India the Vedic *bhishaj;* in ancient Greece the *rhizotomoki;* in Celtic Europe the druids; and in North America, the proverbial "medicine men" of the First Nations peoples. This profound connection between plants, healing, and meditation is especially important in the teachings of Ayurveda, which itself is allied with the practice of yoga. One of the most important and ancient of herbs described in Ayurveda is the *haritaki* fruit *(Terminalia chebula),* named after Lord Hari (Shiva), the supreme ascetic and

[2] Lietava J. 1992. Medicinal plants in a Middle Paleolithic grave Shanidar IV? *J Ethnopharmacol*. 35(3):263-6.
[3] Wadley L, et al. 2011. Middle Stone Age Bedding Construction and Settlement Patterns at Sibudu, South Africa. *Science*. 334 (6061): 1388-1391
[4] Trousseau A. 1869. *Lectures on Clinical Medicine* (vol 2). The New Sydenham Society
[5] Lorié Á, Reinero D, Phillips M, Zhang L, Riess H. 2017. Culture and nonverbal expressions of empathy in clinical settings: A systematic review. *Patient Educ Couns.*100(3):411-424.

The principle of systematic correspondence

During the Zhou dynasty, medical theories on the origin of disease were in large part based in the religious conception of demon spirits: unattached souls of the departed that would randomly attack the living. Medical treatment thus consisted of various rituals, incantations, and the use of talismans to ward off these influences. It is clear, however, that while demonology was important to Zhou medicine, a conception of homeopathic medicine was also important – especially in treatment.

The term "homeopathic" relates to the notion that two apparently unrelated phenomena can be conjoined because they share some feature or trait in common. In the Western world, the term "homeopathy" refers to a system of practice first taught by the late 18th century German physician, Samuel Hahnemann. The word itself is derivied from Greek term *homoios* (i.e. like, similar, of the same kind") and *patheia* (i.e. disease, feeling, emotion), articulated since ancient times as the axiom *similia similibus curentur*, or "likes are cured by likes." Although a somewhat foreign concept to the modern mind, this essentially magical conception of nature is found in all traditional societies, including Chinese culture. One can find mention of this homeopathic relationship in ancient an Chinese medical texts which recommends administering a potion prepared from the ash of crossbow strings to hasten stalled labor (Unschuld 1985, 53).

In the latter Zhou, and in particular the One Hundred Schools period, a number of developments occurred in Chinese thought that led to marked changes in the practice of medicine, as well as the function of Chinese society generally. Among the most important of these was the development of homeopathic notions into a broader theory in which all phenomena was incorporated into a single system of correspondence. The most prominent of these systems are the *yingyang* doctrine and the Five Element theory.

Yinyang doctrine

In about the 4th century C.E., one school of Chinese philosophy began to promulgate the idea that all phenomena are dualistic in nature. This applied not only to natural cycles and the functioning of the human body, but to matters of the state and society at large. This dualist principle is called the *yin*yang doctrine. The origin of this dualistic concept is obscure: we have evidence from the venerable *I Ching* that the various solid and broken lines in the 64 hexagrams are founded upon the concept of *yin* and *yang*. There are also references to *yin* and *yang* that date back to the first millennium B.C.E. in a collection of ancient folk songs (Unschuld 1985, 55-56). But the dualism that *yin* and *yang* represent was well understood centuries before, for example, in the division between the living and the dead in Shang culture. In many ways the 4th century *yin*yang school was building upon concepts that were already extant, and fairly well understood.

Although not their earliest expression, the theory of *yin* and *yang* is perhaps best represented by the teachings of Lao Tzu, a mystical personality dating back, according to traditional Chinese history, to the 6th century B.C.E. In his *History of Chinese Philosophy* however, Fung Yu-lan states that Lao Tzu was a mythical personage, most probably based on the life of Li Erh who is said to have lived sometime during the Warring Period (1952, 171). In his biography of Li Erh, the old historian Ssu-ma Chien states that Li Erh was a recluse, practicing the doctrine of "self-

effacement and namelessness" (Yu-lan 1952, 171). Historian Yu-lan suggests that Li Erh allowed his teachings to become confused with an older literary figure named Lao Tan, releasing him from any obligation to identify himself with his teachings. Instead these were fused with a personage from antiquity, which intentionally or not, enhanced the reputation of the teaching. We do not know however, whether the book of poems called *Lao Tzu*, or the *Tao Te Ching*, was written by Li Erh or compiled later by his disciples.

In the *Tao Te Ching*, the terms *yin* and *yang* are used to describe the primary dynamics of a ceaseless cycle of change that forms the Tao, the sum total of all the functions of life, both seen and unseen. While not applied specifically to medicine, the role of the Tao was believed to be the most formative factor in the health of a patient, especially among those that practiced the teachings of Lao Tzu. These Taoists believed that one's attitude towards the Tao reflected upon one's state of health to such a degree that the realization of Tao was considered the prerequisite of good health, longevity, and ultimately, immortality.

The two principle units of the Tao, *yin* and *yang*, are the dual powers that are the instigators of all change. The third stanza of the first poem of the *Tao Te Ching* describes the significance of these dual principles:

> These two come paired but distinct
> By their names.
> Of all things profound,
> Say that their pairing is deepest,
> The gate to the root of the world (Blakney 1983, 53).

A literal translation of *yin* is the "shady side of the hill," whilst *yang* can be translated as the "sunny side of the hill." As penultimate characteristics of the dualistc nature of the Tao however, these terms represented a relative basis for the classification of all phenomena. In a social sphere, the qualities of *yin* and *yang* were considered analogous to the traditional familial roles of female and male respectively; *yin* being compliant, and downward moving, and *yang* being adamant and upward moving. While it might appear that *yang* and thus the father was the stronger of the two, this was as a ceremonial role only. According to the Tao Te Ching, *yin* is the source of both:

> The valley spirit is not dead;
> They say it is the mystic female.
> Her gateway is, they further say,
> The base of earth and heaven. (Blakney 1983, 58).

While representing spheres of function an interaction, no one object or thing could be considered purely *yang* or *yin*. All states of being are subject to change, and even if something could be classified as purely *yin* or *yang* it cannot remain so indefinitely;[11] and two, because *yin*

[11] This is the reason why minerals such as gold are so highly valued: its stable chemical properties and ability to resist oxidation have appealed to both philsophers and materialists alike for millennia.

and *yang* are purely relative terms. One cannot designate a particular food for example, such as a carrot, as *yang* or *yin*, unless this classification is given some context, such as how it is prepared, what other dietary articles are consumed along side it, the *yinyang* status of the person consuming it, and the *yinyang* affect of the climate. Even *yin* and *yang* were considered subject to *yin* and *yang*. Thus within the *yin* phase there is a greater *yin* (*yin-yin*) and a lesser *yang* (*yin-yang*) subphase. Similarly, within the *yang* phase, there is a greater *yang* (*yang-yang*) and a lesser *yin* (*yang-yin*) subphase. Mapping this subdivision with a view to the different seasons, winter is a manifestation of the greater *yin* (*yin-yin*) force, spring is lesser *yang* (*yin-yang*), summer is greater *yang* (*yang-yang*), and autumn is lesser *yin* (*yang-yin*). In this same way are the four phases of life, beginning as a *yin-yin* phase and ending as a *yang-yin* phase – essentially – "burning out" like a candle.

In the realm of medicine, the cosmic relationship of *yin* and *yang* as darkness and light respectively was carried over into the function and structure of the human body. The earliest reference to the inclusion of Taoist ideas occurs in the *Huang Ti Nei Ching Su Wen,* which states:

> *Yin* is active within and acts as the guardian of *yang*;
> *yang* is active on the outside and acts as the regulator of *yin* (Veith 1966, 17).

Yin corresponds to the interior of the body (i.e. the dark and unseen) whereas *yang* corresponds to the exterior of the body (i.e. the light and observable). Moreover, this concept was applied to individual subsystems, such as paired hollow *(yin)* and solid *(yang)* organs, with distinctly different functions:

Solid organs *(zang)*	**Hollow organs *(fu)***
produce and store essence *(qi)*	decompose food and convey waste
Liver - *gan*	Gallbladder - *dan*
Lung - *fei*	Large Intestine - *dachang*
Spleen - *pi*	Stomach - *wei*
Heart - *xin*	Small Intestine - *xiaochang*
Kidney - *shen*	Bladder - *pangguang*

Five phase theory

While the *yinyang* theory is central to Chinese medicine, there was another system of correspondences that would influence its practice, called the Five Phase Theory *(wu xing)*. According to traditional Chinese history this system was founded by a philosopher named Tsou Yen in the 4th century B.C.E., during the One Hundred Schools period. Unlike the dualism postulated by the *yinyang* theory, however, Tsou Yen used the number five as the basis of his theory of association, arranging phenomena along five lines of correspondence (Unschuld 1985, 58). The reason for five lines of correspondence, as opposed to the more intuitive duality of the *yinyang* school, is somewhat of a mystery. The ancient Chinese, however, considered five to be a sacred and special number, used in religious ceremonies and alchemical practices; a number of archaic importance, resonating in the five fingers, the five senses, and the five tastes. Some historians have speculated that the *wu xing* theory was in fact an import from India, as it bears strong resemblance to the more ancient concept of the *panchabuthas* found in the *Vedas*.

The Practice of Unani medicine

According to Unani medicine there are three states of the body: health, disease, and a neutral state between the two, when one is not truly healthy but the signs of disease are not fully manifest. This neutral state is further divided into three forms:

1. a condition in which the features of both health and disease exist in the same body, but are expressed in different areas (such as poor vision or a sprained wrist in an otherwise healthy individual);
2. a condition in which neither health nor disease are completely manifest, as is the case with the aging or convalescence;
3. a condition in which the body alternates between healthy and diseased states, as in persons with a cold temperament, who are generally well in the summer but typically unwell in the winter.

According to Unani medicine, disease arises when the functions associated with the vital, natural, and psychic forces of the body become obstructed or unbalanced. This is typically attributed to the aggravation of one or more of the temperaments, i.e. hot, cold, dry, or wet, which can then affect humoral activity. For example, if the influence of heat becomes excessive, it can adversely affect the blood humor by drying up its natural moisture (remember: the blood humor is hot and wet in temperament, and an excess of heat will destroy the quality of wet). Beyond the influence of the temperaments on humoral function however, diseases and dysfunction can have other causes, such as deformity or physical injury.

Once disease has become manifest, Unani medicine considers three stages:

1. the change in humoral proportions, caused either by internal or external influences
2. the crisis, or fever, and the physical signs and symptoms of the disease
3. the resolution, either through the elimination of the excess humor, or by death

Health is largely dependent upon the vital faculty, which in turn, is dependent upon pneuma and the essence of each of the humors. When the air is of poor quality, or the essence humors deranged in their function, the vital faculty is diminished. This sets up a viscous-cycle pattern whereby the vital capacity to absorb pneuma and control the influence of the temperaments on the humors is diminished. The solution thus is to ensure fresh air, good food and water, and treatments to balance the affected humor(s).

Humoral Constitution

In a perfect state of health the various functions of each of the humors will be balanced, and none will be dominant. In most cases however, a person is born with a genetic predisposition to one of the temperaments, i.e. hot, cold, dry, or wet. This predisposition will often result in the dominance of one or more of the humors, and this dominance is the basis of the concept of the humoral constitution.

There are four basic humoral types: *damwi mizaj* (sanguine, or blood humor), *balghami mizaj* (phlegmatic, or phlegm humor), *safrawi mizaj* (choleric, or yellow bile humor), and *saudawi*

mizaj (melancholic, or black bile humor). The temperamental influences of aging, the environment, lifestyle and diet can also reinforce these humoral tendencies, or over time, can change the humoral predisposition to something else. A child that lives in a damp and cold environment, and eats phlegmatic foods such as dairy and flour products, will have a tendency to express phlegmatic conditions. Thus, even though the genetic predisposition of the humors may be different, the child will be treated based upon what is currently expressed.

The four constitutional types are:

1. *damwi* (sanguine): belongs to the element of Air (hot and wet). Complexion is typically fair and ruddy, with good muscular development, large veins, and a full, broad pulse. Sanguine types tend to be prone to physical excesses and are more likely than other types to suffer from injuries. Imbalances are typically more frequent in spring.
2. *balghami* (phlegmatic): belongs to the element of Water (cold and wet). The complexion is fair, but pale, with a generalized softness and laxity of the tissues, with the veins hidden under the flesh, and the pulse feeling soft and wide. Phlegmatic types dislike the cold, and are more likely to suffer from sluggish digestion, poor metabolism, and apathy. Imbalances are typically more frequent in winter.
3. *safrawi* (choleric): belongs to the element of Fire (hot and dry). The complexion is yellowish and slightly rough, with a slim build and wiry musculature, large veins, and the pulse is sharp and fast. Choleric types tend to be quite passionate and express their emotions forcefully, although their feelings may dissipate quickly. Similar to the concept of an adrenal-stress type in modern herbal medicine, the tendency to emotional hyperactivity leads to the development of nervous disorders. Imbalances are typically more frequent in summer.
4. *saudawi* (melancholic): belongs to the element of Earth (cold and dry). The complexion is dark and rough, with a very slim, emaciated appearance, and the pulse thread-like and rapid. Melancholic types tend to have the poorest health of the four humoral temperaments, and are prone to pessimism, depression, and moroseness. Imbalances are typically more frequent in autumn.

While these four humoral temperaments are cardinal in Unani medicine, a patient will typically display a combination of two or more temperaments, called a compound temperament. This can form when a person is exposed to climactic extremes, or from contradictory influences between the genetic predisposition, lifestyle habits, the environment, and the diet.

Dystemperament

Dystemperament is a term used in Unani medicine to describe the negative influence of one or more of the cardinal temperaments (i.e. hot, cold, dry, and wet) on humoral function.

Temperament	Causes	Symptoms
Hot	-excess activity -excess anger -anxiety or worry -excessive environmental heat -improper elimination and putrefaction -excess heating foods (e.g. chilies, onions, meat, etc.)	-burning, flushing sensations -fatigue -bitter taste in mouth -perspiration -aversion to warming foods and attraction to cooling foods -symptoms worse in hot weather -fever
Moist	-excessive eating -excessive consumption of moistening foods and drinks (e.g. cheese, bread, butter, etc.) -excessive exposure to dampness and moisture -lack of activity	-oily skin -puffiness and congestion of tissues -weight gain -weak digestion -thick mucoid accumulations -loose stools, undigested food -chronic ulceration -sluggishness, apathy -symptoms worse in wet weather
Cold	-excessive consumption of cooling foods (e.g. ice water, raw vegetables, etc.) -fasting -inactivity and lack of exercise	-desire for warm environments -craving for warming foods -weak digestion - thick mucoid accumulations -constipation -weakness in joints -symptoms worse in cold weather
Dry	-fasting -insufficient water and moistening foods (e.g. fats and oils) -excessive exposure to dry environments -excessive intake of drying foods (e.g. toasted cereals, legumes, alcohol)	-rough, dry skin -emaciation -desire for moistening foods and drinks -dried and hardened phlegm -insomnia -fatigue, poor stamina -symptoms worse in dry weather

Unani physicians take great care to distinguish dystemper from purely humoral conditions. Dystemper typically represents the influence of environmental, lifestyle and dietary factors, in relation to the humoral constitution. Thus, someone who complains of heat and sweats profusely on a warm, sunny day is suffering from a hot dystemperament. Measures to restore balance are easily addressed by taking the appropriate counter measures (e.g. drinking a cooling beverage, sitting in the shade, moving to a cooler climate, etc.). Humoral conditions however tend to present themselves as a series of sequential signs and symptoms that exist independent of factors like diet and the environment. Thus, a person who complains of heat and perspires greatly in otherwise mild weather is likely suffering from an affliction of the *dam* (blood), or sanguis, humor.

Dystemperament is treated by utilizing medicine, foods and drinks that display qualities that are opposite in nature, as well as making the appropriate changes to the environment and lifestyle. For example, utilizing drying foods and herbal medicines that counteract moisture treats the influence of a wet temperament, such as a moist and productive cough. An example of Unani treatment for cough is the rather astringent herb *Bahera* fruit *(Terminalia belerica),* mixed with equal parts black pepper and honey.

Decoctions in Chinese medicine

In Chinese medicine a decoction is called a *tang*, and there are a number of different methods that are used, depending on the region in China and the specific tradition that is followed. Generally speaking, a decoction is prepared by adding the required dose of the crude herb(s) to the cooking vessel and placing enough water over the herbs to cover them by about one inch, roughly equivalent to the length of the distal phalange of the first finger. Using a ratio of herb to water, this is roughly equivalent to a 1:10. This preparation is allowed to soak in the water for some time before being brought to boil, simmered for about 30-60 minutes, and then strained for consumption. Very often a *tang* is double decocted, meaning that the same herbs are used to prepare second extract, which is then combined with first. A typical dose for *tang* is 200 mL bid-tid.

Decoctions in the Western herbal tradition

In Western herbal medicine a decoction is prepared with using a ratio of one part herb (by weight) to 20 parts water (by volume). The water is then brought to a boil, reduced to a medium heat, and decocted for 20-30 minutes. The decoction is then strained, and hot water is poured back through the strained herb into the decoction, returning the volume of the final extract back to its original 20 parts. A typical dose for such a decoction is 100-200 mL, bid-tid.

Powders, capsules, and pills

Powders are prepared by grinding the crude herb material into a finely sieved powder, traditionally prepared with a mortar and pestle. In modern times mortars and pestles Have in large part been supplanted by the use of electric grinders, using a 60 mesh to reduce the herb to a fine powder. A properly made powder is in effect a kind of extract, wherein tough plant fibers are filtered out, and the herb is ground to such a fine consistency that it increases the surface area of the herb for better absorption. This process also exposes the herb to increased levels of both heat (from grinding) and oxygen, however, and reduces the shelf life to only a few months. As such, a powder should only be prepared as needed, and then quickly vacuum-sealed, encapsulated, or prepared into pills. Powders are typically dosed between 2-5 g bid-tid, but for some restorative herbs such as ren shen (*Panax ginseng* root) and Ashwagandha (*Withania somnifera* root) can be taken in higher doses.

Powders are an important part of a herbalist's armamentarium. They are easier to administer than an infusion or decoction, and are a useful alternative to preparations such as tinctures made with alcohol that pose a problem for some patients, due to issues such as allergy or alcoholism. Powders also retain the constituents and character of the whole plant, including constituents including minerals and fiber usually absent in other preparations such as tinctures.

Powders can be taken in a variety of ways. Most simply, the required dosage can be spooned into a small glass, mixed with warm water and quickly ingested. In Ayurveda, powders are called *churna*, and usually administered with water, honey, or ghee. In Chinese medicine powders are called *san,* usually prepared with hot water and taken as filtered infusion. In the Unani tradition powders are called *safoof* and are taken with water, juice, or milk. For patients

that are especially sensitive to biter, pungent or otherwise exotic flavors powders can be filled into "veggi-caps" (hydroxypropylmethylcellulose) with the use of an encapsulation device. While this might appear to be a good solution, however, the vegetable cellulose capsules may get stuck to the sides of the esophagus or stomach, or can take a long time to break down in certain people.

Powders can also be made into pills, called *vati* or *gutika* in Ayurveda, *wan* in Chinese medicine, and *habb* in Unani medicine. Powders are fashioned into pills with the use of some kind of excipient, such as water, honey, glycerin, cacao butter, guggulu resin, or acacia gum, formed into small spherical structures for oral administration. A large pill is called a bolus, and is typically used for topical administration, or shaped into suppositories and administered into an orifice, such as the rectum or vagina. Sometimes confused for pills, tablets are made through an automated process and usually contain a significant proportion of inert excipient materials that bind the tablet together, including magnesium stearate, talc, lactose, and titanium dioxide, all of which pose some potential health issues, especially in sensitive individuals. A handmade pill is thus a much simpler and more natural preparation that should preferred over tablets. The dose for a pill depends on its size and the ingredients it is prepared with, but generally a dose of 2-3 pills is prescribed, taken two to three times daily.

In some people the administration of pill may cause it to become stuck in the throat, and thus they are best consumed standing up, taken with a glass of water. It is also recommended to chew the pills to break them down before swallowing with a sip of water.

Tea pills and granules

In Chinese medicine, the traditional method to administer most herbal medicines is by decoction, but it has long been argued that this process is both time-consuming and wasteful. To address this issue, manufacturers have developed herb concentrates referred to as tea pills *(nong suo wan)* and granules *(chong fu ji)*. These extracts have the convenience of powders but are more potent in their effects. There are many different types of tea pills and granules but most are prepared by decocting the ingredients until a thick, dark-colored concentrate remains. A carrier is then added to the extract, such as rice, corn or potato starch, a herbal powder such as shan yao (*Dioscorea opposita* root), or maltodextrine. Tea pills are then mechanically rolled into pills and often coated with sugar-based enamel. To make granules this mixture is combined with a small portion of methylcellulose, spray-dried, and then collected as a granular powder. Prepared in this way, tea pills and granules generally have a strength of between 3:1 and 5:1, indicating the extract is between three and five times stronger than a simple (1:1) powder. The typical dose for tea pills is between 3-10 pills bid-tid, whereas for granules the dose tends to range between 2-4 g, bid-tid.

Tinctures

Tinctures have become an exceptionally common way to administer herbal medicines, and in particular, are used extensively in the Western herbal tradition. The reasons for their popularity are twofold. First, ethyl alcohol is a much better solvent than water for many plant constituents, including glycosides, polyphenols, alkaloids, and lipids, meaning that the resultant extract will be more potent than an influsion or a decoction. Secondly, the ethyl alcohol used as a solvent also serves as a preservative, provided that the percentage of alcohol in the final preparation is at least 20-25%. As such, a tincture has an indefinite shelf life, and if kept in a cool, dark location, may last many years depending on the herb. Tinctures also have the advantage of being a liquid extract, and due to the high alcohol concentration, are rapidly absorbed through the buccal and gastric mucosa, meaning that tinctures can have a much more rapid onset of action compared to other preparations.

Given the benefits of tinctures it is easy to see why they are popular, but there are some problems with them. Alcohol is not an effective solvent for all constituents, such as the mucopolysaccharides found in demulcent herbs such as marshmallow *(Althaea officinalis* root), precipitating them into an insoluble gooey complex that renders the herb inert. Other constituents that are generally absent from tinctures, but found in powders and pills include minerals and plant fibers, which are usually filtered out of a tincture or are discarded in the the exhausted herb after expression. Alcohol also has pronounced physical effects in the body, and according to Ayurveda, adds heating and drying qualities to a medicinal preparation, which in turn, promotes these qualities in the body. Many people also have sensitivities to alcohol, or due to religious (e.g. muslims) or health reasons (e.g. alcoholism), prefer not to consume alcoholic preparations.

Tinctures are prepared according to a given ratio of herb (called the marc) to alcohol (called the menstruum), with the percentage of alcohol in the menstruum adjusted to the solubility requirements of the herbal constituents. Many herbs with constituents that are otherwise soluble in water can be prepared with a relatively low percentage of alcohol, between 25-50%, but other herbs with lipids, alkaloids, and resinous constituents such as cannabis *(Cannabis indica/sativa* flower) or old man's beard *(Usnea spp.* thallus) require the highest percentage of alcohol (95%) available to fully extract the constituents.

A tincture can be prepared with both dry and fresh herbs, most commonly in a process called maceration, in which the herb is mixed with a specified ratio of menstruum and allowed to sit for a specified period of time – usually 2-4 weeks. Most dry plant macerations are made at a ratio of between 1:3 and 1:5, marc to menstruum, using a percentage of alcohol in the menstruum that in most cases is between 25-75%. Fresh plant macerations are made with fresh plant materials after wilting the plants to reduce the moisture content, using a ratio of 1:2 and 95% alcohol.

Fluid extracts are made by evaporating a finished maceration at low heat such that the final ratio of herb to solvent is 1:1, resulting in a more concentrated product. Another common method to prepare tinctures is by percolation, packing the pre-soaked, coarsely ground herb material in a percolation cone, allowing the menstruum to slowly percolate through the herb

Lower digestive tract: deficiency symptoms and treatment

The symptoms of a lower GIT deficiency are characterized by constipation, with poor stimulation of colonic reflexes, prolonged transit time, and the excessive dehydration of the feces. Very often examination of the tongue will show a creamy yellow or brown-colored region at its root. In almost all cases a lower GIT deficiencies originates with an upper GIT deficiency. The improper digestion of protein by the stomach favors the growth of potentially pathogenic bacteria that putrefy it, resulting in the production of neurotoxic metabolites including skatole and indole that are absorbed into the bloodstream. Likewise, excess sugar as well as flour product consumption promotes ecological changes that favor the pathogenic growth of opportunistic organisms such as *Candida albicans*. Any kind of alteration of the normal colonic flora also causes a disruption of toll-like receptor signaling, compromising the ability of the intestinal surface to withstand insult and repair damage. Dysbiotic changes that arise in the colon results in moderate inflammation of the cecum and appendix, comprising the ileocecal sphincter, leading to the retrograde flow of bacteria into the ileum, i.e. small intestine bacterial overgrowth (SIBO).

Impaired hepatic function also plays a role in lower GIT deficiency. A liver that is relatively overwhelmed by toxic metabolites (of endogenous or xenobiotic origin) or that is under stimulated (e.g. from a lack of bitter taste) will tend to produce a backlog in portal circulation. As a result blood tends to pool in the lower pelvic cavity, congesting the veins and especially the hemorrhoidal tissues. Thus in the treatment of a lower GIT deficiency liver function must also be simultaneously stimulated. In some cases a GIT deficiency state is reflective of a relative thyroid deficiency, and a symptom of generalized coldness (e.g. hypothyroidism). A lower GIT deficiency can also be a manifestation of intense feelings of fear and anxiety that been internalized, e.g. post-traumatic stress disorder.

Herbs to stimulate

The primary treatment in lower GIT deficiency is to enhance the digestive secretions of the upper GIT, liver and pancreas, support fecal lubrication, and correct the colonic flora. In acute cases it may be necessary to provide direct stimulus with the use of aperients and laxatives, but these are short term measures only. Given the connection between emotions such as fear and anxiety and deficient colonic function, nervine trophorestoratives should also be considered.

- bitter cholagogues, e.g. gentian *(Gentiana lutea* root), yellowdock *(Rumex crispus* root), barberry *(Berberis/Mahonia spp.* root)
- vasodilators, e.g. ginger (*Zingiber officinalis* rhizome), prickly ash *(Zanthoxylum americanum* bark), cayenne *(Capsicum annuum* fruit)
- demulcents, e.g. slippery elm *(Ulmus fulva* inner bark), marshmallow *(Althaea officinalis* root), licorice *(Glycyrrhiza glabra* root)
- laxatives, e.g. cascara *(Rhamnus purshianus* wood), senna *(Cassia angustifolia* pod), turkey rhubarb *(Rheum palmatum* root)

- thyrostimulants, e.g. barberry *(Berberis vulgaris* root), seaweed (e.g. *Fucus vesiculosus*, *Nereocystis luetkeana*, *Palmaria palmata)* cayenne *(Capsicum annuum* pods) blue flag rhizome (*Acorus calamus* rhizome)
- prebioitcs, e.g. beet root, chicory root, psyllium husk, inulin powder
- probiotics, e.g. live culture foods, *Lactobacillus, Bifidobacterium*
- nervine trophorestoratives, e.g. American ginseng *(Panax quinquefolium* root), skullcap *(Scutellaria lateriflora* leaf), milky oat *(Avena sativa* seed), passionflower *(Passiflora incarnata* herb)

Lower digestive tract: excess symptoms and treatment

The symptoms of a lower GIT excess are seen as the rapid transit of chyme through the digestive tract, a heightened gastric reflex, and frequent loose motions. There may be symptoms of colon spas and rectal irritability. The bowel movement appears more fully formed in the first portions of the material, but becomes progressively moist and liquid towards the end (Moore 2002, 12). The color of the bowel movement in excess states will range from normal to dark brown, and can even be greenish in color from excess gastric acid production (excluding vegetable fiber).

Herbs to relax

The primary approach to a lower GIT excess is to down-regulate the parasympathetic activities of the gut. As a result of this transit time will be slowed, and the smooth muscles in the colon, bile and pancreatic ducts will begin to relax. Astringents may also be indicated, especially where there is diarrhea or excessive mucus secretions. In many cases a GIT excess state is reflective of a relative thyroid excess (Moore 2002, 12), requiring the use of thyrodepressant herbs. In a similar vein, lower GIT excess can be related to the internalization of feelings related to aggression and anger, which benefit from the use of relaxing nervines.

- antispasmodics, e.g. wild yam *(Dioscorea villosa* root), fennel *(Foeniculum vulgare* seed), hops *(Humulus lupus* strobile)
- astringents, e.g. cranesbill geranium *(Geranium maculatum* root), oak *(Quercus alba* bark), goldenseal *(Hydrastis canadensis* root/rhizome)
- thyrodepressants, e.g. bugleweed *(Lycopus virginicus* herb), motherwort *(Leonurus cardiaca* herb)
- relaxing nervines, e.g. linden *(Tilia cordata* flower), skullcap *(Scutellaria lateriflora* leaf), passionflower *(Passiflora incarnata* herb)

Gastrointestinal infection and ecological status

As we have established, colon function is largely dependent upon the proper health of the microbiome. In addition, we have learned that diet is among the most important factors in the maintenance of this ecology, and thus where dysbiosis exists, dietary measures are always a key to restore ecological health. Apart from the diet itself, the microbiome is affected by other factors such as seasonal change, travel, hygiene, and contamination, exposing our GIT to an array of pathogenic organisms including helminths (worms), protozoans, bacteria, fungi, and viruses. The primary defense against these incursions is the strength of digestion, including the secretion of gastric HCl that can effectively denature these organisms before they can influence the microbiome. As a result, there will be a greater tendency to intestinal infection in any kind of GIT deficiency state, and prophylactic measures should be taken when these stressors arise. This includes measures to restore proper digestion and the use of small doses of antimicrobial herbs. For active infection, and depending on the pathogenic involved, specific classes of herbs can be chosen to limit the growth of these organisms, including:

- antibacterials, e.g. wild indigo *(Baptisia tinctoria* root), echinacea *(Echinacea angustifolia* root), goldenseal *(Hydrastis canadensis* root/rhizome)
- antifungals, e.g. pau d'arco *(Tabebuia spp.* bark), barberry *(Berberis spp.* root), western red cedar *(Thuja plicata* leaf), sweet annie *(Artemisia annua* herb)
- antihelminthics, e.g. sweet annie (*Artemisia annua* herb), black walnut *(Juglans nigra* green hull), quassia *(Quassia amara* wood)
- antivirals, e.g. St. John's wort flower *(Hypericum perforatm* flower), osha *(Ligusticum porteri/grayi.* root), yerba mansa *(Anemopsis californica* leaf)
- pre/probiotics, e.g. beet root, chicory root, inulin, *Lactobacillus, Bifidobacterium, Saccharomyces boulardii*

Qualities and characteristics of a wholesome diet

In Ayurveda there is a clear distinction between a wholesome diet *(hita ahara)* and an unwholesome diet *(ahita ahara),* and the impact that each has upon health. As is retold in the *Charaka samhita*, during the first great medical conference held thousands of years ago in the Himalayas, there was a debate amongst the assembled sages as to the fundamental cause of disease. After each in attendance had expressed their own theories, one sage named Punarvasu Atreya gently chided his colleagues for not comprehending the importance of complete view of the subject. "It is the wholesome use of food that promotes the health of a person", says Atreya, "and that which is unwholesome is the cause of disease."

Some foods in Ayurveda are generally regarded as more or less wholesome when compared to others, but this determination is usually made in context with the needs of the patient. This takes into account factors such as climate *(deha),* the time of day and the local season *(kala),* the quantity of food *(rashi),* the quality of food *(prakriti),* the preparation of food *(karana),* food combinations *(samyoga),* the method of consumption *(upayoga),* and the health status of the recipient *(upayukta).* The underlying algorithm to understand most of these relationships is based upon the *tridosha* model, which seeks to resolve imbalances by pacifying the affected *dosha(s)* and restoring balance. For example, a diet comprised of mostly *vata*-reducing foods *(prakriti)* is generally followed when living in a dry climate *(deha)*, when transitioning through autumn and winter *(kala)*, and in patients with a *vata* imbalance *(upayukta).*

The other aspects of diet described in Ayurveda, such as the quantity of food consumed at each meal *(rashi)*, how it is prepared *(karana)*, the various food combinations *(samyoga)*, and the method of its consumption *(upayoga),* all appear to have separate considerations, but at their core, each is based on the principles of *tridosha*. With regard to quantity *(rashi),* this is in large part a subjective determination based on how the patient feels after eating. Proper digestion requires some space in order for the food to mixed, and so it is generally advised to leave the stomach at least ¼ part empty after meals.

The subject of food preparation *(karana)* is exceptionally vast, and involves a huge variety of techniques, including steaming, boiling, stewing, frying, grilling, smoking, and fermentation. Each method of preparation has a particular influence on the *doshas,* and can be used intentionally to modulate the qualities of different food items. For example, grilling or roasting meat dehydrates the tissues, making it hard, dense, and more difficult to digest. For *mandagni* and especially in *vata* conditions it is always better to stew the meat, which serves to hydrate the tissues, making it tender, soft, and easier to digest. Likewise, fresh milk is cooling and nourishing, and helps to reduce *pitta,* but when it is fermented into yogurt serves to increase *pitta.*

Ayurveda also describes how different foods affect each other in combination *(samyoga)*. For example, meat is generally not eaten with legumes in Ayurveda because it weakens digestion. In this case, the dry, light nature of the legumes is opposite in nature to the moist, dense nature of the meat, and instead of counter-balancing each other as some combinations do, creates a state of disharmony. This observation has been validated by the relatively recent discovery of naturally occurring protease inhibitors found in legumes that impair the digestion of animal proteins. Likewise, there are recommendations in Ayurveda to avoid

combinations of milk with foods such as fish, garlic, sour-tasting fruits (e.g. lime), certain legumes such as *kulattha* (horsegram), and coconut. For a more complete rendering of the concept of *samyoga* please refer to Lesson Eight of the Inside Ayurveda program.

Lastly, the concept of *upayoga* or the method of food consumption refers to a set of practices recommended by Ayurveda to support good digestion. This includes following a proper 'order' *(krama)* for the consumption of each of the six flavors *(rasa)*. Generally, sweet, sour and salty flavored foods and beverages are consumed first, followed by pungent, bitter and astringent flavors. The concept of *upayoga* also refers to the proper 'procedure' *(vidhi)* for eating food, and elaborates many considerations, including proper hygiene, the temperature of the food and its relative moistness, whether or not the previous meal has been digested, and the setting in which the food is consumed. With regard to the latter, and referencing the notion described earlier that eating is a *yagya* or spiritual ritual, Ayurveda suggests that the eating environment be free of distractions, strong emotions, and other disturbances to mindful eating.

Botanicals for digestive health in Ayurveda

Similar to the approach of Physiomedicalism, Ayurveda describes a large number of therapeutic actions *(karma)*, and among those that affect digestion there are many different categories. Described earlier, the fundamental measure to restore digestion in Ayurveda is encompassed by the terms *dipana* and *pachana*, referring to an ability to enkindle the digestive fire and cook the ingested food, respectively. A great many herbs combine this activity and so are called *dipanapachana,* such as Trikatu, or the 'three pungents' formulation comprised of equal parts long pepper fruit, ginger rhizome, and black pepper fruit. Likewise there are categories for other therapeutic aspects of digestive function, including sialagogues *(asyasravana,* e.g. tumburu bark), emetics *(vamana,* e.g. madana fruit), antiemetics *(chardinigrahana*, e.g. ginger rhizome), carminatives *(shulaprashamana,* e.g. ajwain seed), laxatives *(rechana,* e.g. trivrit root), astringents *(purishasangrahaniya,* e.g. kutaja root), and antihelminthics *(krimighna,* e.g. vidanga fruit).

Despite using these different categories of therapeutic action, the primary approach of using herbal medication to support digestive health is based upon the *tridosha* model. Recalling the earlier discussion of how each of *dosha* impacts digestion, there are three fundamental states of disturbance to *agni* called *mandagni* (slow digestion), *tikshnagni* (fast digestion), and *vishamagni* (irregular digestion). Understanding the *dosha(s)* for each type of disturbance, specific herbs and formulas can be chosen address these fundamental imbalances:

1. *mandagni*, i.e. heavy, slow, sluggish digestion *(kapha)*
    - symptoms: sweet taste, epigastric heaviness, nausea, orbital puffiness, burping with sweet taste and/or taste of previous meal
    - treatment: appetizing and digestive *(dipanapachana)* remedies that are bitter, pungent, and astringent in flavour; emetic therapy *(vamana karma)*
    - herbs, e.g. yavani *(Trachyspermum ammi* fruit), chavya *(Piper chaba* fruit/stem), chitraka *(Plumbago zeylanica* root), shunthi *(Zingiber officinalis* rhizome), pippali *(Piper longum* fruit), maricha *(Piper nigrum* fruit), ela *(Elettaria cardamomum* fruit), hingu *(Ferula narthex* gum), tumburu fruit *(Zanthoxylum alatum* pericarp/bark)
    - Trikatu churna

- 1 part – shunthi *(Zingiber officinalis* rhizome)
- 1 part – maricha *(Piper nigrum* fruit)
- 1 part – pippali *(Piper longum* fruit)
  - Rx: 2-3 g bid-tid

- Amalakyadi churna
  - 1 part – amalaki *(Phyllanthus emblica* fruit)
  - 1 part – chitraka *(Plumbago zeylanica* root)
  - 1 part – haritaki *(Terminalia chebula* fruit)
  - 1 part – pippali *(Piper longum* fruit)
  - 1 part – saindhava (rock salt)
    - Rx: 2-3 g bid-tid
- Chitrakadi vati
  - 1 part – chitraka *(Plumbago zeylanica* root)
  - 1 part – pippalimula *(Piper longum* root)
  - 1 part – yavakshara *(Hordeum vulgare*, purified ash of grass)
  - 1 part – swarjikshara (sodium bicarbonate)
  - 1 part – sauvarchala (black salt)
  - 1 part – saindhava (pink salt)
  - 1 part – vida lavana (salt made from *Phyllanthus emblica* fruit)
  - 1 part – samudra lavana (sea salt)
  - 1 part – audbhida lavana (earthen salt)
  - 1 part – shunthi *(Zingiber officinalis* rhizome)
  - 1 part – maricha *(Piper nigrum* fruit)
  - 1 part – pippali *(Piper longum* fruit)
  - 1 part – hing *(Ferula narthex* gum)
  - 1 part – ajamoda *(Trachyspermum roxburghianum* seed)
  - 1 part – chavya *(Piper chaba* fruit/stem)
  - 1 part – dadima *(Punica granatum* juice)
    - Rx: 2 pills bid-tid

2. *tikshnagni*, i.e. hot, sharp, fast digestion *(pitta)*

- symptoms: strong appetite, bitter taste, burning sensation in stomach, sour-tasting reflux, dizziness, thirst
- treatment: appetizing *(dipana)* remedies that are sweet, bitter, and astringent in flavour; purgative/choleretic therapy *(virechana karma)*
- herbs, e.g. dhaniya *(Coriandrum sativum* seed), daruharidra (*Berberis nepalensis* root), kumari (*Aloe vera* leaf), kutki *(Picrorhiza kurroa* rhizome), bhunimba *(Andrographis panniculatus* leaf), lavanga bud *(Syzigium aromaticum* flower bud), musta (*Cyperus rotundus* tuber/rhizome)
- Avipattikara churna
  - 44 parts – trivrit *(Operculina turpethum* root)
  - 11 parts – lavanga *(Syzigium aromaticum* flower bud)
  - 1 part – musta (*Cyperus rotundus* tuber/rhizome)
  - 1 part – vidanga *(Embelia ribes* seed)
  - 1 part – sthula ela *(Amomum subulatum* fruit)

  - 1 part – patra *(Cinnamomum tamala* leaf)
  - 1 part – pippali *(Piper longum* seed)
  - 1 part – maricha *(Piper nigrum* seed)
  - 1 part – shunthi *(Zingiber officinalis* rhizome)
  - 1 part – amalaki *(Phyllanthus emblica* fruit)
  - 1 part – bibhitaki *(Terminalia belerica* fruit)
  - 1 part – haritaki *(Terminalia chebula* fruit)
  - 1 part – vida lavana (salt made from amalaki fruit)
  - 66 parts – sugar
    - Rx: 2-3 g bid-tid
- Punarnava asava
  - 16 g – shunthi *(Zingiber officinalis* rhizome)
  - 16 g – pippali *(Piper longum* fruit)
  - 16 g – maricha *(Piper nigrum* fruit)
  - 16 g – haritaki (*Terminalia chebula* fruit rind)
  - 16 g – darvi (*Berberis aristata* stem)
  - 16 g – vibhitaki (*Terminalia belerica* fruit rind)
  - 16 g – amalaki **(***Phyllanthus emblica* fruit)
  - 16 g – gokshura *(Tribulus terrestris* root/plant)
  - 16 g – kantakari *(Solanum xanthocarpum* root/plant)
  - 16 g – brihati *(Solanum indicum* root/plant)
  - 16 g – vasaka *(Adhatoda vasica* root)
  - 16 g – erandamula *(Ricinus communis* root)
  - 16 g – katuki *(Picrorhiza kurroa* root)
  - 16 g – punarnava *(Boerhaavia diffusa* root)
  - 16 g – gajapippali *(Scindapsus officinalis* fruit)
  - 16 g – pichumarda neem *(Azadirachta indica* stem bark)
  - 16 g – guduchi *(Tinospora cordifolia* stem)
  - 16 g – patola *(Trichosanthes dioica* leaf)
  - 16 g – shushka mulaka *(Raphanus sativus* root)
  - 16 g – duralabha *(Fagonia cretica* root)
  - 256 g – dhataki *(Woodfordia fruticosa* flower)
  - 1.6 kg – sita (sugar)
  - 320 g – draksha **(***Vitis vinifera* fruit)
  - 800 g – madhu (honey)
    - for *amlapitta* (gastric ulcer)
    - Rx: 12 – 24 mL
- Mahatiktaka ghrita
  - 192 g – saptaparna *(Alstonia scholaris* stem bark)
  - 192 g – ativisha (*Aconitum heterophyllum*, purified root)
  - 192 g – shampaka *(Cassia fistula* fruit pulp)
  - 192 g – katuka *(Picrorhiza kurroa* rhizome)
  - 192 g – patha *(Cyclea peltata / Cissampelos pariera* root)
  - 192 g – musta *(Cyperus rotundus* rhizome/tuber)
  - 192 g – ushira *(Vetiveria zizanioides* rhizome)

- 192 g – Triphala (equal parts *Terminalia chebula* fruit, *Terminalia belerica* fruit, *Phyllanthus emblica* fruit)
- 192 g – patola (*Trichosanthes dioica* leaf)
- 192 g – nimba (*Azadirachta indica* stem bark)
- 192 g – parpataka (*Fumaria indica* herb)
- 192 g – dhanvayasa (*Alhagi pseudalhagi* herb)
- 192 g – chandana (*Santalum album* heartwood)
- 192 g – pippali (*Piper longum* fruit)
- 192 g – gajapippali (*Piper chaba* fruit)
- 192 g – padmaka (*Prunus poddum* heartwood)
- 192 g – haridra (*Curcuma longa* rhizome)
- 192 g – daruharidra (*Berberis aristata* stem)
- 192 g – ugragandha (*Acorus calamus* rhizome)
- 192 g – vishaka (*Citrulus cholocynthis* herb)
- 192 g – shatavari (*Asparagus racemosus* root)
- 192 g – sariva (*Hemidsemus indicus* root)
- 192 g – vatsakabija (*Holarrhena antidysenterica* root)
- 192 g – vasa (*Adhatoda vasica* root)
- 192 g – murva (*Marsdenia tinescsima* root)
- 192 g – amruta (*Tinospora cordifolia* stem)
- 192 g – kiratatikta (*Swertia chiraita* herb)
- 192 g – yashtimadhu (*Glycyrrhiza glabra* root)
- 192 g – trayamana (*Gentiana kurroo* herb)
- 1.536 liters – amalaki (*Phyllanthus emblica* juice)
- 768 ml – ghrita (clarified butter)
  - Rx: 3-6 g bid

3. *vishamagni*, i.e. irregular, unstable, dry digestion *(vata)*
   - symptoms: irregular appetite, astringent taste, bloating, colic, constipation
   - treated with digestive and appetizing *(dipanapachana)* remedies that are sweet, sour, and salty in flavor; enema therapy *(vasti karma)*
   - herbs, e.g. yavani seed, ajamoda seed, adraka rhizome, twak bark, fennel seed, hingu gum, jirakam seed, shatapushpa seed, rock salt
   - Hingwastak churna
     - 1 part – shweta jiraka (*Cuminum cyminum* seed)
     - 1 part – krishna jiraka (*Nigella sativa* seed)
     - 1 part – saindhava (mineral salt)
     - 1 part – hingu (*Ferula narthex* gum)
     - 1 part – ajamoda seed (*Trachyspermum roxburghianum)*
     - 1 part – pippali (*Piper longum* seed)
     - 1 part – maricha (*Piper nigrum* seed)
     - 1 part – shunthi (*Zingiber officinalis* rhizome)
       - Rx: 2-3 g bid-tid

- Trikatu rasayana vati
  - gandhaka (purified sulfur)
  - jiraka *(Cuminum cyminum* seed)
  - saindhava (pink salt)
  - Trikatu *(Piper longum* fruit, *Piper nigrum* fruit, *Zingiber officinalis* rhizome)
  - hingu *(Ferula narthex* gum)
  - lashuna *(Allium sativum* bulb)
  - nimbu *(Citrus limonium* juice)
    - Rx: 2 pills bid-tid
- Chandraprabha vati
  - 3 g – karpura *(Cinnamomum camphora* leaf)
  - 3 g – vacha *(Acorus calamus* rhizome)
  - 3 g – mustaka *(Cyperus rotundus* rhizome)
  - 3 g – bhunimba *(Andrographis paniculata* herb)
  - 3 g – guduchi *(Tinospora cordifolia* stem)
  - 3 g – devadaru *(Cedrus deodara* wood)
  - 3 g – haridra *(Curcuma longa* rhizome)
  - 3 g – ativisha *(Aconitum heterophyllum* purified root)
  - 3 g – daruharidra *(Berberis nepalensis* root bark)
  - 3 g – pippalimula *(Piper longum* root)
  - 3 g – chitraka *(Plumbago zeylanica* root)
  - 3 g – dhaniya *(Coriandrum sativum* fruit)
  - 3 g – haritaki *(Terminalia chebula* fruit)
  - 3 g – amalaki *(Pyllanthus emblica* fruit)
  - 3 g – bibhitaki *(Terminalia belerica* fruit)
  - 3 g – chavya *(Piper retrofractum* stem)
  - 3 g – vidanga *(Embelia ribes* fruit)
  - 3 g – gajapippali *(Scindapsus officinalis* fruit)
  - 3 g – pippali *(Piper longum* seed)
  - 3 g – maricha *(Piper nigrum* seed)
  - 3 g – shunthi *(Zingiber officinalis* rhizome)
  - 3 g – swarna makshika (purified copper/iron pyrite)
  - 3 g – yava kshara *(Hordeum vulgare,* calcinated grass)
  - 3 g – sarjika kshara (sodium bicarbonate)
  - 3 g – saindhava (pink salt)
  - 3 g – sauvarchala (black salt)
  - 3 g – vida lavana (salt made from *Phyllanthus emblica* fruit)
  - 12 g – trivrit *(Operculina turpethum* root)
  - 12 g – danti *(Baliospermum montanum* root)
  - 12 g – twak *(Cinnamomum zeylanicum* bark)
  - 12 g – patra *(Cinnamomum tamala* leaf)
  - 12 g – ela *(Elettaria cardamomum* seed)
  - 12 g – vamshalochana *(Bambusa arundinacea* inner bark)
  - 24 g – lauha bhasma (calcinated iron)
  - 48 g – sita (sugar)
  - 96 g – shilajatu (purified shilajit)

- 96 g – guggulu (*Commiphora wightii* resin)
  - Rx: 2 pills bid-tid

Traditional Chinese medicine

Digestive function in Traditional Chinese medicine is largely ruled by the Stomach *(wei)* and Spleen *(pi)*, which are responsible for generating the Food Essence *(gu qi)* that forms the basis of the Post-Natal Essence *(hou tian zhi qi).* Like *apara ojas* in Ayurveda, the Post-Natal Essence is responsible for sustaining the energy of the body. Traditional Chinese medical theory states that the Stomach is a *yang* organ, whereas the Spleen is a *yin* organ. Based on this dichotomy, *yin* is thus an important element to counter-balance the function of the Stomach, whereas *yang* is a vital component to counter-balance the Spleen.

Stomach

The function of the Stomach in Chinese medicine is to denature the ingested food, analogous to the way a compost pile breaks down plant material, only requiring moisture and heat in the process. After this rotting and ripening process the Stomach propels the ingested food downwards into the Small Intestine *(xiaochang),* which separates out the nutrient portion of the food. After this, the nutrient portion is the transported to the Spleen for further processing, and the wastes are sent to the Large Intestine *(dachang)* to be eliminated. Similar again to Ayurveda, the Stomach is the root of health in Chinese medicine, and the first step in transforming the ingested food into the energy that feeds the body. Thus if the Stomach is in a weakened state, the *qi* cannot be maintained and will eventually be lost.

The Stomach is particularly sensitive to any irregularities in diet, and if excessively cold foods are consumed, such as raw vegetables and cold water, this has the effect of weakening *yang*, promoting symptoms such as poor appetite, loose motions, and generalized coldness. Conversely, when excessively spicy or drying foods are consumed this can promote a deficiency of *yin* within the Stomach, with symptoms such as afternoon fever, thirst, and constipation. If excessively spicy and greasy foods are consumed the result may be excess heat within the Stomach, which similarly weakens the *yin* component, but leads to specific symptoms such as epigastric burning, thirst, constant hunger, nausea, and bad breath.

If the Stomach lacks the *qi* to properly ripen the ingested food, this manifests as a Stomach *qi* deficiency, leading to a general weakening of *qi* in the body, manifesting symptoms such as poor appetite, epigastric discomfort after eating, loose motions, and weakness of the limbs. This latter syndrome is often referred to as 'food stagnation', in which the ingested food cannot be ripened, leading to symptoms such as burping, epigastric heaviness, and poor appetite. When the Stomach *qi* is 'rebellious' and flows upwards instead of downwards, usually in association with excess Stomach heat, there may be symptoms of gastric reflux, burping, hiccoughs, and vomiting.

Based on the correct identification of these various patterns, herbs and formulas can be chosen to restore balance to the Stomach, including:

1. Stomach *yang* deficiency:
   - herbs, e.g. gan jiang *(Zingiber officinalis* rhizome), wu zhu yu *(Evodia rutaecarpa* fruit), chuan jiao *(Zanthoxylum bungeanum* pericarp), ding xiang *(Syzigium aromaticum* flower bud), gao liang jiang *(Alpinia officinarium* rhizome), bi ba *(Piper longum* fruit), hu jiao *(Piper nigrum* fruit)
   - Li Zhong Wan (Regulate Middle Pill)
     - 9 g – gan jiang *(Zingiber officinalis* rhizome)
     - 9 g – ren shen *(Panax ginseng* root)
     - 9 g – bai zhu (*Atractylodes macrocephala* root)
     - 9 g – zhi gan cao (*Glycyrrhiza uralensis,* prepared root)
       - granules, Rx: 2-4 g bid
   - Wu Zhu Yu Tang (Evodia Decoction)
     - 9-12 g – wu zhu yu *(Evodia rutaecarpa* seed)
     - 18 g – gan jiang *(Zingiber officinalis* rhizome, recently dried)
     - 9 g – ren shen *(Panax ginseng* root)
     - 12 pieces – da zao *(Ziziphus jujuba* fruit)
       - decoction, Rx: 200 mL bid

2. Stomach *yin* deficiency
   - herbs, e.g. sa shen *(Adenophora verticillata* root), mai men dong *(Ophiopogon japonicus* root), shi hu *(Dendrobium nobile)*, yu zhu *(Polygonatum odoratum* root)
   - Yi Wei Tang (Benefit Stomach Decoction)
     - 9 g – sha shen (*Adenophora verticillata* root)
     - 15 g – mai men dong *(Ophiopogon japonicus* root)
     - 15 g – sheng di huang *(Rehmannia glutinosa* root)
     - 4.5 g – chao yu zhu (*Polygonatum odoratum*, dry-fried root)
     - 3 g – bing tang (rock sugar)
       - Rx: 200 mL bid-tid
   - Mai Men Dong Tang (Ophiopogon Decoction)
     - 15-64 g – mai men dong *(Ophiopogon japonicus* root)
     - 9 g – ren shen *(Panax ginseng* root)
     - 6-15 g – jing mi (non-glutinous rice)
     - 12 piece – da zao (*Ziziphus jujuba* fruit)
     - 6 g – gan cao (*Glycyrrhiza uralensis* root)
     - 6-9 g – zhi ban xia *(Pinellia ternata*, prepared rhizome)
       - decoction, Rx: 200 mL qid
       - granules, Rx: 2-4 g bid-tid

3. Stomach Fire
   - herbs, e.g. ge gen *(Pueraria lobata* root), sheng di huang *(Rehmannia glutinosa* root), zhi mu (*Anemarrhena asphodeloides* rhizome), gua lou ren *(Trichosanthes kirilowii* seed), huang lian *(Coptis chinensis* rhizome), tian hua fen *(Trichosanthes kirilowii* root)
   - Ban Xia Xie Xin Tang (Pinellia Decoction to Drain the Epigastrum)
     - 9-12 g – zhi ban xia *(Pinellia ternata* rhizome, fried with ginger, vinegar, or alum)
     - 9 g – gan jiang *(Zingiber officinalis* rhizome, recently dried)

Etiology, Pathology and Treatment of Digestive Disorders

Indigestion, nausea and vomiting

In traditional systems of medicine such as Ayurveda, Chinese medicine, and the Western herbal tradition, indigestion represents a fundamental disruption of balance that brings about ill-health. According to Ayurveda, the qualities of *agni* (digestive fire) are hot, light, dry, sharp, and penetrating, and thus opposite qualities, i.e. cold, heavy, moist, dull, and dull, represent an obstructing or diminishing influence upon digestion. In Ayurveda this syndrome is called *mandagni*, or 'slow digestion', which arises from an increase of *kapha dosha*. If a food is eaten that increases *kapha*, and the *agni* remains too weak to properly digest it, the result is the formation of *ama*, or 'undigested food'. Like wet leaves that smother a burn pile, the formation and presence of *ama* further impairs digestion, as well as the ability to generate *ojas* ('vitality') from the ingested food, which in a vicious cycle pattern, further diminishes the strength of the digestive fire.

In Chinese medicine lack of appetite is primarily caused by an impairment of the Stomach and Spleen, and similar to Ayurveda, is usually caused by eating difficult to digest or otherwise cold, heavy, moist foods. This results in an impairment to the *yang* energy of both the Stomach and Spleen, promoting symptoms such as weak appetite, mucus congestion, and generalized coldness. As the body becomes deprived of its ability to properly harness the energy contained within the food, the status of *qi* weakens leading to a diminishment of the Stomach and Spleen *qi.* This causes additional symptoms such as epigastric discomfort and generalized fatigue. Eventually this leads to the accumulation of dampness and the syndrome known as Food Stagnation, leading to further symptoms such as burping and abdominal distension after meals.

In the Western herbal tradition the concept of weak digestion is essentially the same as is described in both Chinese medicine and Ayurveda. The early 19th century American herbalist Samuel Thomson visualized all disease as fundamentally related to the pathogenic quality of cold. Similar to the idea of *ama* in Ayurveda, or Food Stagnation in Chinese medicine, Thomson called this fundamental affliction "canker", noted by physical symptoms of cold, weak digestion, and the accumulation of mucus, that eventually leads to a state of "putrefaction." According to Thomson, canker is "... caused by cold, or want of heat, for whenever any part of the body is so affected with the cold so as to overpower the natural heat, putrefaction commences; and if not strong enough to overcome its progress, it will communicate with the blood, when death will end the contest between heat and cold, or the powers of life and death by deciding in favor of the latter" (Thomson 507, 1841).

Lack of appetite

One of the earliest expressions of weak digestion in Ayurveda is *aruchi*, or lack of appetite. There are three primary subtypes of *aruchi* based on each one of the *doshas*, as well as a fourth type *(aghantuja)* that relates to emotional factors such as fear, shock, and anger. Simple measures are undertaken at the outset to address *aruchi*, and among the simplest is to not eat, engaging in a short period of fasting or following a graduated diet until the appetite returns.

The graduated diet, or *sansarjana krama*, is an approach to eating recommended by Ayurveda to restore the digestive fire, feeding it small amounts of food in increasingly larger amounts over a period of three to seven days, until proper digestion is established. The first food given on the first day of the graduated diet is a thin rice soup called *peya*, prepared by cooking basmati or partially-milled red rice in eight times its volume of water. If the *peya* is properly digested, a thicker rice porridge called *vilepi* can be introduced next, prepared by cooking rice in four times its volume of water. If this is well digested, the next meal is *yusha* or *kitchari*, first prepared without spices and salt *(akrita yusha),* followed the use of spices, salt, and fermented vegetables *(krita yusha).* Following this, the last meal during the graduated diet is a meat soup called *mansa rasa.* At this stage, proper digestion should be re-established, and a normal diet can followed, but with an emphasis on soups and stews, prepared with herbs and spices to augment digestion.

Strength of therapy	*Peya*	*Vilepi*	*Akrita yusha*	*Krita yusha*	*Mamsa rasa*
mild	Day 1 lunch	Day 1 dinner	Day 2 lunch	Day 2 dinner	Day 3 lunch Day 3 dinner
moderate	Day 1 lunch Day 1 dinner	Day 2 lunch Day 2 dinner	Day 3 lunch Day 3 dinner	Day 4 lunch Day 4 dinner	Day 5 lunch Day 5 dinner
strong	Day 1 lunch Day 1 dinner Day 2 lunch	Day 2 dinner Day 3 lunch Day 3 dinner	Day 4 lunch Day 4 dinner Day 5 lunch	Day 5 dinner Day 6 lunch Day 6 dinner	Day 7 lunch Day 7 dinner

One general formula for lack of appetite used in Ayurveda that is useful for all three *doshas* is Dhanyapanchakam churna, comprised of equal parts dhaniya (*Coriandrum sativum* seed), hriverum *(Pavonia odorata* herb), musta rhizome *(Cyperus rotundus* rhizome/tuber), bilwa *(Aegle marmelos* unripe fruit), and shunthi (*Zingiber officinalis* rhizome), along with smaller amounts of saindhava (pink salt). The standard dose for Dhanyapanchakam churna is 2-3 grams given with warm water, twice daily.

For aruchi caused by emotional factors *(aghantuja aruchi)* it is important to resolve these feelings by creating a pleasant and comforting environment for the patient.

Indigestion

If the causes for poor appetite are not addressed and food continues to be consumed without consideration, the result in Ayurveda is *ajirnam*, or indigestion. There are three basic causes of indigestion in Ayurveda, each of which relates to one of the three *doshas,* called *amaja ajirnam (kapha), vidagdha ajirnma (pitta),* and *vistamba ajirnam (vata).*

Amaja ajirnam

The most common form of indigestion is *amaja ajirnam*, caused by the production of *ama* from a weakness of the digestive fire *(mandagni)*, caused by *kapha dosha*. Signs and symptoms of *ama* include a lack of appetite, nausea/vomiting, abdominal heaviness, mucus congestion, lethargy, puffiness under the eyes, and frequent burping with the taste of the previous meal. One useful formula in *amaja ajirnam* is Pippalyadi churna, given in doses of 1-2 grams, with warm water, twice daily. Pippalyadi churna is comprised of equal parts:

- pippali *(Piper longum* fruit)
- haritaki *(Terminalia chebula* fruit)
- musta *(Cyperus rotundus* rhizome)
- dhaniya *(Coriandrum sativum* seed)
- shunthi (*Zingiber officinalis* rhizome)
- vidam lavana (salt made from the fruit of *Phyllanthus emblica)*

In Chinese medicine, *amaja ajirnam* relates to a deficiency of Stomach and Spleen *yang* that allows for the accumulation of dampness causing Food Stagnation. Remedies to warm the middle and dispel dampness are thus called for, such as Li Zhong Wan (Regulate Middle Pill), Ping Wei San (Calm Stomach Powder), and Fu Zi Li Zhong Pian (Aconite Regulate Middle Pills).

In the Western herbal tradition, one classic formula mentioned in Benjamin Colby's *Guide To Health* (1846) for dispelling canker is Samuel Thomson's original Composition Powder, given in doses of 5 mL mixed with 150 mL warm water, 2-3 times daily before meals. The Composition Powder is comprised of equal parts:

- bayberry *(Myrica cerifera* bark)
- ginger (*Zingiber officinalis* rhizome)
- cayenne *(Capsicum annuum* fruit)
- cinnamon *(Cinnamomum cassia* bark)
- prickly ash *(Zanthoxylum americanum* bark)

Vistambha ajirnam

A lack of appetite may also occur if the liver is blocked or stagnant in its function. In Ayurveda this relates to an increase *pitta*, calling for the use of *pitta*-reducing formulas such as Avipattikara churna. In Chinese medicine this blockage of liver function relates to Liver *qi* stagnation, manifesting as a lack of appetite, a bitter taste, belching, acid reflux, borborygmi,

and loose motions. Among the more important formulas to resolve this issue is Xiao Yao San (Rambling Powder), taken in doses of 6-9 g, traditionally taken along with 6 g wei jiang *(Zingiber officinalis*, baked rhizome) and 3 g of bo he *(Mentha haplocalyx* herb). Xiao Yao San (Rambling Powder) is comprised of:

- 9 g – chai hu *(Bupleurum falcatum* root)
- 9 g – chao dang gui *(Angelica sinensis* root, dry fried)
- 9 g – bai shao *(Paeonia alba* root)
- 9 g – bai zhu *(Atractylodes macrocephala* root)
- 9 g – fu ling *(Poroa cocos* fruiting body)
- 4.5 g – zhi gan cao *(Glycyrrhiza uralensis* root, stir-fried in honey)

In the Western Herbal tradition, the Thomsonian Spiced Bitters formula has application when the liver is blocked in its function, prepared as fine powder. The Spiced Bitters formulas can also be used in jaundice, and is suggested in loss of appetite with debility and fatigue *(vidagdha ajirnam).* The dose is 5 mL of the powder given with 125 mL hot water, three times a day, before eating:

- 16 parts – poplar bark *(Populus alba* bark)
- 4 parts – goldenseal *(Hydrastis canadensis* root/rhizome)
- 6 parts – prickly ash bark *(Zanthoxylum americanum* bark)
- 4 parts – ginger *(Zingiber officinalis* rhizome)
- 4 parts – clove *(Syzygium aromaticum* flower bud)
- 2 parts – cinnamon *(Cinnamomum cassia* bark)
- 4 parts – balmony *(Chelone glabra* root)
- 3 parts– cayenne *(Capsicum frutescens* fruit)
- 40 parts – white sugar

Vidagdha ajirnam

If the digestive fire is irregular in its function due to an increase in *vata*, one useful formula is Hingwastak churna, given in doses of 2-3 g bid-tid. Another important formula for *vidagha ajirnam* is Trikatu rasayana vati, given in doses of 2 pills twice daily. In Chinese medicine, the character of *vidagdha ajirnam* relates to a deficiency of Stomach and Spleen *qi*, calling for formulas such as Bao He Wan (Preserve Harmony Pill), Liu Jun Zi Tang (Six Gentlemen Decoction), and Bu Zhong Yi Qi Wan (Tonify Middle Augment Essence Decoction).

In the Western herbal tradition the concept of deficiency isn't as fully developed as it is Ayurveda or Chinese medicine, at least as it relates to the concept of restoring vitality to digestive function. Stimulants, carminatives, and cholagogues make up the primary approach to stimulating weak digestion.

Nausea and vomiting

Nausea relates to a feeling of discomfort in the stomach that sometimes precedes the urge to vomit. It is a non-specific symptom that has a variety of possible causes including emotional distress, motion sickness, dizziness, migraine, fainting, hypoglycemia, pregnancy, infection, or

poisoning. It is a common side effect of many drugs including antacids (e.g. metoclopramide), anti-inflammatories (e.g. acetaminophen), antibiotics, and chemotherapeutic drugs. Vomiting refers to the involuntary, forceful expulsion of the stomach contents, and in most cases promotes the resolution of nausea, and only needs be treated with supportive means. Like diarrhea or excessive sweating, however, vomiting can result in the loss of electrolytes and lead to a life-threatening dehydration (see Gastroenteritis and diarrhea, page 201).

Apart from supportive measures to restore digestion and prevent dehydration, if nausea and/or vomiting persist beyond a couple days specific treatments can be given to resolve the condition. According to each tradition, this includes:

Ayurveda

- pippali *(Piper longum* fruit) churna
  - Rx: 1-2 g taken with honey, twice daily
- amla *(Phyllanthus emblica* fruit) fresh juice
  - Rx: 10-15 mL taken with honey and pink salt
- equal parts katuka *(Picrorhiza kurroa* rhizome) and chitraka *(Plumbago zeylanica* root) decoction
  - Rx: 30-60 mL twice daily
- equal parts nagara *(Cyperus pertenuis* tuber/rhizome) and dhaniya *(Coriandrum sativum* seed) decoction
  - Rx: 60-90 mL bid
- Dashamula kashaya (Ten Roots Decoction)
  - one part – shalaparni *(Desmodium gangeticum* root)
  - one part – prishnaparni *(Uraria picta* root)
  - one part – brihati *(Solanum indicum* root)
  - one part – kantakari *(Solanum xanthocarpum* root)
  - one part – gokshura *(Tribulus terrestris* root)
  - one part – bilwa *(Aegle marmelos* unripe fruit)
  - one part – agnimantha *(Premna integrifolia* root)
  - one part – shyonaka *(Oroxylum indicum* root)
  - one part – kashmari *(Gmelia arborea* root)
  - one part – patala *(Stereospermum suaveolens* root)
    - Rx: 60-90 mL bid

Chinese medicine

- Xiao Ban Xia Tang (Minor Pinellia Decoction)
  - harmonizes Stomach, descends Rebellious *qi*, stops vomiting
  - Rx: 200 mL bid
- Xiang Sha Liu Jun Zi Tang (Six Gentleman Decoction with Saussurea and Amomum)
  - restores/regulates *qi*, strengthens Spleen, harmonizes Stomach
  - decoction, Rx: 200 mL bid
  - granules, Rx: 3-4 g bid-tid
- Ding Xiang Shi Di Tang (Clove and Persimmon Calyx Decoction)
  - augments *qi,* warms middle, descends Rebellious *qi*, relieves hiccup
  - decoction, Rx: 200 mL bid

  - granules, Rx: 3-4 g bid-tid
- Wu Zhu Yu Tang (Evodia Decoction)
  - warms/restores Spleen and Stomach, descends Rebellious *qi*, relieves vomiting
  - decoction, Rx: 200 mL bid
  - granules, Rx: 3-4 g bid-tid

Western herbal

- herbs: chamomile flower, black horehound, peppermint leaf, ginger rhizome, cayenne fruit, prickly ash bark, cinnamon bark, clove flower bud, fennel seed
- Antiemetic Drops
  - 15 g – powdered cayenne (*Capsicum annuum* fruit)
  - 2 g – salt
  - 250 mL – apple cider vinegar
  - 250 mL – water
    - 5 mL ad lib

Unani

- Jawarish Pudina Wilayti
  - 22 g – barg-e-sudab (*Ruta graveolens* leaf)
  - 56 g – boora armani (*Bole armeniac* powder)
  - 230 g – zanjabeel (*Zingiber officinale* rhizome)
  - 185 g – zeera safaid (*Cuminum cyminum* seed)
  - 375 g – zeera siyah (*Carum carvi* seed)
  - 175 g – filfil siyah (*Piper nigrum* fruit)
  - 7 g – agar hindi (*Aquilaria agallocha* heartwood)
  - 7 g – ilaichi khurd (*Elettaria cardamomum* fruit)
  - 7 g – ilaichi kalan (*Amomum subulatum* fruit)
  - 7 g – pudina khushk (*Mentha arvensis* herb)
  - 7 g – taj qalmi (*Cinnamomum cassia* bark)
  - 7 g – jaiphal (*Myristica fragrans* seed)
  - 7 g – qaranfal (*Syzygium aromaticum* flower bud)
  - 300 g – anardana (*Punica granatum* seed)
  - 300 g – tamar hindi (*Tamarindus indicus* fruit pulp)
  - 300 g – maweez munaqqa (*Vitis vinifera* fruit)
  - 7.3 kg – qand safaid (sugar)
  - 450 mL – sirka desi (vinegar)
  - 10 g – sat pudina (menthol)
  - 1100 mL – sharbat zanjabeel (syrup)
  - 500 mL – aab-e-leemun (lemon juice)
    - confection, Rx: 5 g ad lib
    - used for zof-e-hazm (indigestion), qai (vomiting), imtela (nausea)

    - 9-12 g – chao bai zhu *(Atractylodes macrocephala*, dry-fried root)
    - 3-4.5 g – rou gui *(Cinnamomum cassia* twig)
    - 9-15 g – wei rou dou kou *(Myristica fragrans*, roasted seed)
    - 6-15 g – he zi *(Terminalia chebula* fruit)
    - 6-20 g – mi zhi *ying* su ke *(Papaver somniferum* pericarp)
    - 9-15 g – bai shao *(Paeonia lactiflora* root)
    - 6-12 g – dang gui (*Angelica sinensis* root, stir-fried in wine)
    - 6-9 g – mu xiang *(Saussurea lappa* root)
    - 6-9 g – zhi gan gao *(Glycyrrhiza uralensis* root, stir-fried in honey)
        - warms Spleen, restores deficiency, stops diarrhea
        - Rx: 200 mL bid-tid
- Si Shen Wan (Four Miracle Pill)
    - 4 parts – bu gu zhi *(Psoralea corylifolia* seed)
    - 1 part – chao wu zhu yu *(Evodia rutaecarpa* dry-fried seed)
    - 2 parts – rou dou kou *(Myristica fragrans* seed)
    - 2 parts – wu wei zi *(Schisandra chinensis* fruit)
        - warms Spleen, binds up intestines, stops diarrhea
        - Rx: 200 mL bid-tid

Formulations – Western herbal

- Dr. Christopher's Diarrhea Formula
    - 6 parts – bistort *(polygonum bistorta* root)
    - 6 parts – raspberry (*Rubus idaeus* leaf)
    - 1 part – Composition Powder
        - decoction, 30-90 mL very few hours

Formulations – Unani

- Habb-E-Raal
    - pill (500 mg), Rx: 1-2 pills bid, after meals

Small intestine bacterial overgrowth (SIBO)

Small intestine bacterial overgrowth (SIBO) is a digestive disorder caused by the infiltration and accumulation of colonic bacteria within the small intestine. Normally the small intestine is relatively sterile, as the digestive secretions of the stomach and small intestine exert a powerful antimicrobial effect to limit bacterial growth. As the chyme passes from the small intestine to the colon through the ileocecal sphincter it is inoculated by bacteria within the cecum, after which colonic bacteria ferment the chyme to form the feces. In SIBO, however, there is a retrograde flow of bacteria into the small intestine through the ileocecal sphincter, where they take up residence and interfere with the process of digestion and absorption. Excessive bacterial concentrations in the small intestine cause direct inflammation to the epithelial cells leading to diarrhea, whereas improperly digested nutrients such lipids, proteins, and carbohydrates that pass into the colon induce diarrhea by osmosis.

Patients with SIBO typically develop signs and symptoms associated with **irritable bowel syndrome (IBS),** including nausea, bloating, vomiting, diarrhea and/or constipation, malnutrition, weight loss, and malabsorption. Considered to some extent a "waste-basket" diagnosis, recent research has demonstrated that up to 78% of IBS patients likely suffer from SIBO.[42] Some patients may lose weight and children with SIBO may fail to thrive. Impaired fat digestion evidenced by steatorrhea may also occur, leading to deficiencies of fat-soluble nutrients and vitamins. Likewise, SIBO may impair the absorption of iron and vitamin B12, and lead to chronic anemia.

There are a number of factors that cause or promote SIBO, including immunosuppression from the use of immunosuppressant medications, as well as both acquired and inherited immunodeficiency conditions. Patients with chronic pancreatitis are also at risk due to an impairment in the secretion of digestive enzymes (Trespi and Ferrieri 1999). Patients that have undergone surgery for Crohn's disease in which the ileum is damaged or removed are at increased risk of SIBO (Kholoussy al 1986). Medications that impair gastric acid secretion including PPIs are associated with an increased risk of developing SIBO (Lo and Chan 2013). More broadly, SIBO appears to be related the development of intestinal permeability, and is linked to autoimmune conditions such as fibromyalgia and roseacea (Lykova et al 2005, Goebel et al 2008, Parodi et al 2008).

The gold standard for the diagnosis of SIBO relies upon an aspirate obtained from the jejunum by endoscopy that is cultured for bacteria. The most common bacteria isolated from the small intestine of patients with SIBO are *Escherichia coli, Streptococcus, Lactobacillus, Bacteroides*, and *Enterococcus* species. A positive diagnosis of SIBO is obtained if the bacterial load is greater than 105 bacteria per millilitre, but a count as low as 103 may still suggest SIBO if the flora is predominately colonic type bacteria. The results of culturing, however, are not always representative, and false positives may occur due to contamination from the oral flora. As such, with reproducibility rates as low as 38% the reliability of this diagnostic technique has been questioned (Quigley and Quera 2006).

A non-invasive alternative to culturing jejunal aspirations are breath tests that detect the bacterial metabolism of carbohydrates to hydrogen and/or methane. This test requires that the patient fasts for a minimum of 12 hours before drinking a solution containing glucose or lactulose, and then measuring expired hydrogen and methane concentrations over a 2–3 hour period. The hydrogen breath test has been criticized, however, as it depends on the presence of hydrogen producing bacteria, and does not measure the proportion of non-hydrogen producing bacteria (Simrén M, Stotzer PO. 2006). Other similar breath tests measure the bacterial metabolism of D-xylose and glycocholic acid.

Medical treatment

SIBO is usually treated with a rotating course of antibiotics including tetracycline, amoxicillin, fluoroquinolones, metronidazole, neomycin, and rifaximin. More recently, some medical practitioners have recommended probiotics as a first line of therapy, including

[42] Ghoshal UC, Shukla S, Ghoshal U. 2017. Small Intestinal Bacterial Overgrowth and Irritable Bowel Syndrome: A Bridge between Functional Organic Dichotomy. *Gut Liver.* 11(2): 196–208.

supplementation with *Lactobacillus casei*, *L. plantarum, L. plantarum*, *L. rhamnosus*, and *L. acidophilus*, although some probiotic species such as *L. fermentum* and *Saccharomyces boulardii* have been found to be ineffective (Quigley and Quera 2006). Another alternative to antibiotic therapy is a restricted diet low in fiber to limit the fuel for bacterial fermentation, called the FODMAP diet.

Holistic treatment

SIBO relates to a fundamental weakness of digestion, typically caused by dietary and lifestyle factors such as improper food combinations, eating raw or improperly prepared food, eating too much food, eating at irregular times, and chronic mental/emotional stress. To resolve SIBO dietary modification is often suggested, and while this can be helpful, without proper treatment the diet may become limited as the patient becomes increasingly intolerant to a wide variety of foods, risking not just convenience but also nutrition and health. A good example of this is the supposed connection between SIBO and "histamine intolerance," the latter of which has long and diverse list of histamine-containing foods that must be avoided. Another frequent recommendation are probiotics and lacto-fermented foods to restore the gut microbiome, but such interventions should not be given before digestion has begun to improve, introduced to the diet in only small amounts. While dietary factors and probiotics are obviously important to restore gut health, applying just these factors alone will typically fail to resolve the condition.

A key feature of SIBO is a failure of the ileocecal sphincter to properly close and prevent the retrograde flow of bacteria into the ileum from the cecum. The ileocecal sphincter can be compromised by a number of factors, including low-grade to moderate inflammation of the cecum and appendix caused by an impairment of the colonic microbiome. A diet too low in fiber increases the risk of diverticular disease, such as cecal diverticulitis that can impair the function of the ileocecal sphincter. Likewise, a diet too high in fiber – usually commensurate with poor digestion – causes the ileocecal sphincter to remain open too often, facilitating the retrograde flow of bacteria. Apart from stretch receptors in the ileum that stimulate its opening, the tonicity of the ileocecal sphincter is regulated by the secretion of digestive hormones including gastrin (secreted in the stomach) and CCK (secreted in the duodenum). Thus, an impairment of the stomach and duodenum, as well as the biliary system that plays a role in the feedback regulation of CCK, all serve to promote a dysegulation of the ileocecal sphincter.

In Ayurveda SIBO is related to the same factors as indigestion *(ajirna)* and the accumulation of *ama*, but specifically resembles a disorder called *grahani*, a condition that often arises due to the improper treatment of gastroenteritis. The disorder relates to a relative increase in stomach function, often causing an increase in appetite, but typically a feeling of discomfort a few hours after eating due to an impairment in the alkaline secretions of the duodenum *(grahani)*. There are four basic causes of *grahani:* three related to a vitiation of each one of *doshas*, and a fourth relating to all three *doshas* in combination *(sannipata)*. Mental and emotional factors such as *chinta* (worry), *bhaya* (fear), and *krodha* (anger) also play an important role in *grahani*, each of which relates to a pariclar *dosha,* i.e. worry *(kapha),* fear *(vata),* and anger *(pitta).*

In Chinese medicine, SIBO typically relates to an underlying impairment of the Spleen *qi* that is typically commensurate with Liver *qi* stagnation. In a state of health, the Liver regulates the function of the Spleen, but if the Liver *qi* stagnates and the Spleen *qi* is weak, the Liver overwhelms the Spleen. This pattern of "Liver attacking Spleen" typically results in an alternating pattern of Liver *qi* stagnation (e.g. constipation, abdominal distention, borborygmi, and colic), with a pattern of Spleen *qi* deficiency (e.g. weak digestion, fatigue, loose motions). Stomach function may also be impaired, including Stomach *yang* deficiency and Stomach *qi* deficiency (Food Stagnation). Liver *qi* stagnation can also cause Stomach Fire and promote symptoms such as epigastric discomfort and gastric reflux. A key formula used to harmonize the function of the Liver and Spleen, indicated in a diarrhea-dominant pattern, is Tong Xie Yao Fang (Formula for Painful Diarrhea):

- 9-12 g – chao bai zhu *(Atractylodes macrocephala* dry-fried root)
- 6-24 g – chao bai shao *(Paeonia alba* dry-fried root)
- 4.5-9 g – chao chen pi *(Citrus reticulata* pericarp)
- 3-6 g – fang feng *(Ledebouriella divaricata* root)

This formula is based on an older version called Si Ni San (Frigid Extremities Powder), which is better indicated in a constipation-dominant pattern:

- 9-12 g – chai hu *(Bupleurum falcatum* root)
- 6-24 g – chao zhi shi *(Citrus aurantium* dry-fried immature fruit)
- 4.5-9 g – bai shao *(Paeonia alba* root)
- 3-6 g – gan cao *(Glycyrrhiza uralensis* root)

Both formulas contain bai shao *(Paeonia alba* root), a key herb to harmonize the Liver and Spleen, but contain different herbs with similar and opposing functions. Tong Xie Yao Fang contains fang feng instead of chai hu to spread the Liver *qi,* but compared to the latter has more of a warming, upward-moving activity to oppose diarrhea. Likewise, both formulas contain bai zhu and gan cao to nourish the Spleen *qi*, but again bai zhu has more of an upward-moving quality. The primary difference between these formulas comes from the action of chao zhi shi in Si Ni San, the roasted immature fruit of the bitter orange. Chao zhi shi directs the *qi* downwards and unblocks the bowels, whereas chen pi is more directed to the underlying issue of Food Stagnation.

Both Tong Xie Yao Fang and Si Ni San can be modified based on additional patterns. For Damp-Heat symptoms, herbs such as huang lian *(Coptis chinensis* root/rhizome), huang qin (*Scutellaria baicalensis* root), and huang bai (*Phellodendron amurense* bark) can be added, whereas for Cold patterns warming herbs are indicated, such as including rou gui *(Cinnamomum cassia* bark), gan jiang (*Zingiber officinalis* rhizome), and zhi fu zi (*Aconitum carmichaeli*, processed lateral roots). To help resolve the diarrhea specifically, astringing herbs that enhance digestion are used, such as fu ling *(Poria cocos* fruiting body), he zi (*Terminalia chebula* fruit), and shi liu pi *(Punica granatum* pericarp).

The following is a review of the basic elements required in holistic medicine to resolve SIBO:

Enkindle the digestive fire

- ensure regular meal times; do not eat if not hungry; avoid over-eating
- periodic fasting on warm water, or eating simple foods
    - e.g. kitchari, soup, stew (see graduated diet, p. 182)
- temporarily limit/avoid high fiber (FODMAP) foods
- avoid raw, cold, dry, or excessively greasy or sweet foods
- digestive stimulants, e.g. shunthi *(Zingiber officinalis* rhizome), pippali *(Piper longum* fruit), maricha *(Piper nigrum* fruit), ela *(Elettaria cardamomum* fruit), hingu *(Ferula narthex* gum), tumburu *(Zanthoxylum alatum* pericarp/bark), cayenne *(Capsicum annuum* pod)
- carminatives, e.g. yavani *(Trachyspermum ammi* fruit), ajwain *(Trachyspermum ammi* seed), aniseed *(Pimpinella anisum* seed), fennel *(Foeniculum vulgare* seed), caraway *(Carum carvi* seed), chamomile *(Matricaria chamomilla* flower), calamus *(Acorus calamus* rhizome)
- trophorestoratives, e.g. Ashwagandha *(Withania somnifera* root), ren shen *(Panax ginseng* root), dang shen *(Codonopsis pilosula* root), huang qi *(Astragalus membranaceus* root), bone broth (fat free), vegetable peel/seaweed soup

Decrease intestinal irritation, inflammation, and spasm

- alkaline remedies, to be used with carminatives and digestive stimulants
    - e.g. shankha bhasma (calcinated *Turbinella pyrum* shell), shukti bhasma (calcinated *Ostrea gigas* shell), pravala bhasma (calcinated coral)
- antispasmodics, e.g. bilva *(Aegle marmelos* unripe fruit), hingu *(Ferula narthex* gum), musta *(Cyperus rotundus* rhizome/tuber), bai shao *(Paeonia lactiflora* root), chen pi *(Citrus reticulata* pericarp), shan za *(Crataegus pinnatifida* fruit), wild yam *(Dioscorea villosa* root), crampbark *(Viburnum opulus* bark), hops *(Humulus lupus* strobiles), cannabis *(Cannabis indica* flower), belladonna *(Atropa belladonna* root)
- vulneraries, e.g. calendula *(Calendula officinalis* flower), plantain *(Plantago spp.* leaf), selfheal *(Prunella vulgaris* leaf), St. John's wort *(Hypericum perforatum* flower), licorice *(Glycyrhiza glabra* root), chickweed *(Stelaria media* herb)
- demulcents, use judiciously as mucopolysaccharides may be too high in fiber, e.g. shatavari *(Asparagus racemosa* root), mai men dong *(Ophiopogon japonicus* root), tian men dong *(Asparagus cochinchinensis* root), slippery elm *(Ulmus fulva* inner bark), marshmallow *(Althaea officinalis* root)
- avoid Factors that promote intestinal permeability, p. 166

Inhibit diarrhea and prevent dehydration

- astringents, e.g. bilva *(Aegle marmelos* unripe fruit), dadima *(Punica granatum* rind), raspberry/blackberry *(Rubus spp.* root), cinnamon *(Cinnamomum cassia* bark), goldenseal *(Hydrastis canadensis* root/rhizome), haritaki *(Terminalia chebula* fruit decoction), bayberry *(Myrica cerifera* bark), agrimony *(Agrimonia eupatoria* herb), cranesbill geranium *(Geranium maculatum* root), oak *(Quercus alba* bark)
- lightly salted rice soup (i.e. kanjika or congee, see p. 182) prepared at a 1:8 ratio
- WHO ORT

Support bile synthesis and excretion

- cholagogues, e.g. chai hu *(Bupleurum falcatum)*, dandelion *(Taraxacum officinalis* root*)*, turmeric *(Curcuma longa* rhizome), gentian *(Gentiana lutea* root), yellowdock *(Rumex crispus* root), barberry *(Berberis/Mahonia spp.* root), chiretta *(Swertia chiretta* herb), fringetree *(Chionanthus virginica* root bark*)*

Restore balance to the gut microbiome

- antimicrobials, e.g. barberry *(Mahoia/Berberis spp.* root*)*, goldenseal *(Hydrastis canadensis* root/rhizome*)*, coptis *(Coptis spp.* rhizome/root*)*, kutaja *(Holarrhena antidysenterica* bark), haritaki *(Terminalia chebula* fruit decoction*)*, garlic *(Allium sativum* bulb), hing *(Ferula narthex* gum), guggul *(Commiphora wightii* resin, myrrh *(C. myrrha* resin), sweet annie *(Artemisia annua* herb), black walnut *(Juglans nigra* green hull), nimba *(Azadirachta indica* leaf/bark), quassia *(Quassia amara* wood), pau d'arco *(Tabebuia spp.* bark)
- probiotics, introduced after appetite has improved and symptoms diminished
  - live culture foods, e.g. yogurt, buttermilk *(takra)*, lacto-fermented pickle brine
- supplements: *Lactobacillus, Bifidobacterium, Saccharomyces boulardii*
- avoid yeasted foods, e.g. fruit, bread, wine, beer, kombucha/tibicos, etc.
- avoid all refined sweeteners and sweet/dried fruit

Formulations – Ayurveda

- Musta-bilwadi yoga
  - 4 parts – musta *(Cyperus rotundus* rhizome/tuber)
  - 4 parts – bilwa *(Aegle marmelos* unripe fruit)
  - 4 parts – dhaniya *(Coriandrum sativum* seed)
  - 4 parts – hriverum *(Pavonia odorata* herb)
  - 4 parts – shunthi *(Zingiber officinalis* rhizome)
  - 4 parts – twak *(Cinnamomum verum* bark)
  - 4 parts – shatapushpa *(Pimpinella anisum* seed)
  - 2 parts – saindhava (pink salt)
  - 1 part – shankha bhasma (calcinated *Turbinella pyrum* shell)
    - a *grahi* remedy for diarrhea
    - 3-5 g bid-tid
- Chandraprabha vati
  - 2 pills bid-tid
- Shambhukadi vati
  - 2 pills bid-tid

Formulations – Chinese medicine

- Bu Zhong Yi Qi Wan (Tonify Middle Augment Essence Decoction)
  - for Spleen *qi* deficiency
  - decoction, Rx: 200 mL bid-tid
  - tea pills, Rx: 8 pills bid-tid
  - granules, Rx: 2-4 g bid-tid
- Xiao Yao San (Rambling Powder)
  - spreads Liver *qi,* strengthens Spleen

  - powder, Rx: 6-9 g bid-tid
  - granules, Rx: 2-4 g bid-tid
- Ban Xia Xie Xin Tang (Pinellia Decoction to Drain the Epigastrum)
  - harmonizes Stomach, directs Rebellious *qi* downwards, disperses distension
  - decoction, Rx: 200 mL bid-tid
  - granules, Rx: 3-4 g bid-tid
- Tong Xie Yao Fang (Formula for Painful Diarrhea)
  - for diarrhea-dominant conditions
  - decoction, Rx: 200 mL bid-tid
  - restores Spleen, harmonizes Spleen and Liver, expels dampness
  - granules, Rx: 3-5 g bid-tid
- Si Ni San (Frigid Extremities Powder)
  - for constipation-dominant conditions
  - restores Spleen, harmonizes Spleen and Liver, expels dampness
  - decoction, Rx: 200 mL bid-tid
  - powder, Rx: 6-9 g bid-tid
  - granules, Rx: 2-4 g bid-tid

Formulations – Unani

- Habb-E-Raal
  - pill (500 mg), Rx: 1-2 pills bid, after meals
- Jawarish-E-Jalinoos
  - 25 g – mastagi *(Pistacia lentiscus* resin)
  - 10 g – sumbul-ut-teeb *(Nardostachys jatamansi* resin)
  - 10 g – heel khurd *(Elettaria cardamomum* resin)
  - 10 g – saleekha *(Cinnamomum cassia* resin)
  - 10 g – darchini *(Cinnamomum zeylanicum* resin)
  - 10 g – khulanjan *(Alpinia galanga* resin)
  - 10 g – qaranfal *(Syzygium aromaticum* resin)
  - 10 g – sad kufi *(Cyperus rotundus* resin)
  - 10 g – zanjabeel *(Zingiber officinale* resin)
  - 10 g – filfil daraz *(Piper longum* resin)
  - 10 g – filfil siyah *(Piper nigrum* resin)
  - 10 g – qust shireen *(Saussurea lappa* resin)
  - 10 g – ood-e-balsan *(Commiphora gileadensis* resin)
  - 10 g – asaroon *(Asarum europaeum* resin)
  - 10 g – habb-ul-aa *(Myrtus communis* resin)
  - 10 g – chiraita shireen *(Swertia chirata* resin)
  - 10 g – zafran *(Crocus sativus* resin)
  - 600 g – qand safaid (sugar)
    - used in zof-e-meda (weakness of the stomach) and nafkh-e-shikam (flatulence in the stomach)
    - confection, Rx: 5-15 g

