

Chapter 2:

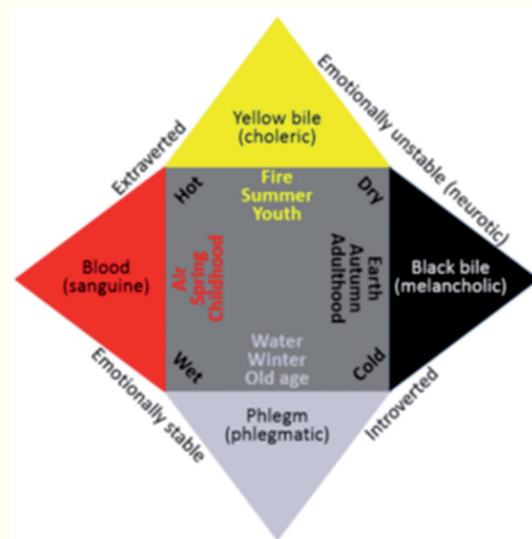
Persian Medicine





A. History

The first evidences of civilization in Iran (Persia) date back to 10,000 years ago. Later on, local civilizations and cities were developed in the Iranian plateau. In the next step, great empires started to be formed by Iranians from 7th century BC. The greatest was the Achaemenid Empire that ruled Persia and most civilized parts of the earth (550-330 BC) (Fig. 1).



During this long time, medical sciences (Persian medicine) were highly developed, in particular in the Sassanid Kingdom (224-637 AD) (Fig. 2).

Medical sciences were specialized in ancient Persia, and many physicians with specific specialties like surgeons, psychologists, pharmacists, ophthalmologists, forensic physicians, etc. had permissions to work. Many medical advancement and findings, e.g. finding pulmonary circulation and uterus contractions during natural vaginal delivery, were reported for the first time in that period. There was an organized medical council in the Sassanid Empire to regulate medical services and issue work permissions for physicians. Medical ethics, in particular for women's rights, was highly developed and regulated. Jondishapour University and Hospital, as the first teaching hospital in the world, was built and organized by the Sassanids in south west Persia. It was a huge university, attracting many scientists from all around the world to integrate their knowledge. There were many professors and students with various nationalities and religions working and studying safely and freely.

The time of great empires was ended by the elimination of the Sassanid Empire (224-637 AD) by



Figure 1. Achaemenid Empire (c. 500 BC)



Figure 2. The Sassanid Empire (224-627 AD)

the Arab Muslims' attack to Persia in 7th century AD. After this event, the religion of the Persian people started to change to Islam, and the Islamic era of the history of Iran started.

In the Islamic era, this Persian tradition was transferred by Jondishapour physicians to Baghdad, the capital of the Abbasid Caliphate, and was developed in the Islamic world. Physicians of Islamic world (mostly Persians) continued collecting medical knowledge from other civilizations (like Greece and India) and translated their medical texts to Arabic (as the official language of the Abbasid Caliphate), and they then flourished medical sciences during later centuries. It was a revolution in developing medical sciences during 9th to 13th centuries, called the Islamic Golden Age. Many Persian physicians like Akhawayni, Rhazes, Avicenna, Haly Abbas, Jorjani, etc. advanced all aspects of medical sciences.

Persian medicine is based on a holistic paradigm and based on four elements: Fire, water, earth, and air. Its principles are discussed briefly in this chapter.

The books of Persian medicine, like the *Canon of Medicine* by Avicenna, were translated to many languages, and this paradigm of medical sciences became the main medical system in the west of Asia and Europe until the 17th century. After the Mongolian attacks to Persia in 13th century, this golden age of Islamic era was ended, and, after that, there was a period of turmoil for Persian medicine. Sometimes, during powerful dynasties like the Safavid era (Fig. 3), a good foundation existed to advance of medical sciences, and scientists created valuable medical works. During wars and unstable and weak governments, there was not any chance to direct attention to this knowledge.



Figure 3. Safavid Empire (1501-1736)

After the 18th century, by developing western medicine and due to the weakness of Persian governments during the Qajar Dynasty (1794-1925) to provide medical services and public health, Persian medicine began to be replaced by western medicine until contemporary era. However, it was preserved within the culture of the people and also by more than 17,000 individual surviving titles of Persian medical texts. After the Islamic revolution in Iran in 1979, attention to Persian medicine began, and, finally, the first schools and departments for traditional medicine (Persian medicine) were established, and PhD courses were founded in 2006. Nowadays, there are three related academic fields in Iran:

PhD course of Persian Medicine, only for MD applicants

PhD course of Traditional Pharmacy, only for PharmD (pharmacist) applicants

Msc and PhD courses of History of Medicine





A.Persian Medicine Great Scientists

There were hundreds of Persian scientists who had great contribution to develop Persian medicine during history. Ten of most well knowns and influential ones are briefly introduced in this section as below:



Threata (The symbol of medicine in Persian mythology)

Trearta is a mythical figure in Persian history who is believed that was the first physician in Iranian mythology. According to Zoroasterian beliefs, Ahura Mazda (God) dedicated a jewelry golden knife to him for surgery. Also, it is mentioned that he was familiar with medicinal effects of plants. In the history books he was introduced as a scientist who was expert in medicine, astronomy and philosophy. Mythically, he is known as inventor of medicine in Persian literature.



Borzouyeh (6th century)

Borzouyeh (Borzūya) who is called Perzoos in Latin was a famous physician who was coeval with Khosrow I, the Sassanid king of ancient Persia who ruled from 531 to 579 CE. Borzouyeh was encouraged to learn medicine when he was 7 years old, and he became a great scientist who

was deeply involved with medical ethics. He worked at Jondishapour University as head of the royally sanctioned professional association for physicians for the entire Persian Empire (*Irān dorostpād*). Borzouyeh travelled to India for research, and brought back with him many Sanskrit books which he translated into Pahlavic. One of these books was the Panchatantra. This book was later translated from Pahlavic to Arabic by Ibn al-Muqaffa (724 – 760 CE) under the title Kalila and Dimna in Islamic era. Regarding, it escaped the destruction and accessible nowadays. The description of uterus contractions during Natural vaginal delivery by Borzouyeh in the preface of this book is the earliest remained report of this medical fact in the history.



Rhazes (865-925 AD)

Abu Bakr Muhammad ibn Zakariya Razi (865–925 AD), who is known as Rhazes in the west, was born and died in Rey (near Tehran, the capital of current Iran). He was one of the outstanding Persian physicians, pharmacists, chemists and philosophers in the medieval era. There are many discoveries in pharmacy and chemistry, such as ethanol and sulfuric acid, attributed to Rhazes. Furthermore, he had many clinical achievements in medicine, such as ophthalmology, neurosurgery, pediatrics, as well as the treatment of kidney diseases, infectious diseases, hydrocephalus, facial palsy, measles and smallpox, etc. Rhazes also contributed to the surgical procedures performed in the airway including tracheostomy. Rhazes is acknowledged as a prominent scientific writer on various subjects of medicine and philosophy. He wrote over 200 books and

treatises. His most well-known manuscripts were *Al-Hawi fi al-Tibb (Liber Continens)*, as a comprehensive medical encyclopedia, and *Al-Mansuri fi al-Tibb (Liber Al Mansoori)*, as a medical teaching text for medical students. Overall, he was known as an empiricist and emphasized clinical observations more than philosophical views. It appears that Rhazes was the pioneer of the experimental views in clinical practice. He had an interesting critical view on science and believed in animal and human studies to evaluate medicines and medical methods. Therefore, he accessed many new findings with the help of his unique scientific view. He broke Galenic taboos, challenged ancient beliefs and presented new advancements in medical sciences and practice. It was a great critical point in the medicine development in history. Also, the history of medical evaluations including preclinical evaluations, animal researches and clinical studies should be reconsidered, and Rhazes can be credited as the first person who included such views into medical practice.



Akhawayni (d. 983)

Akhawayni (who was called as Joveini in Latin) was born in Bokhara, a city in the north east of Old Persia, in early 10th century AD and thus became known as Al-Bokhari. Bokhara was a great and important city, located on the Silk Road. Persia at that time was ruled by the Samanid dynasty, the first Persian kingdom that rose after the Muslims defeated, in 637 AD, the Sassanid Empire, the last ancient Persian dynasty. Akhawayni lived and worked in Bokhara and also in Tus (a city in eastern Iran). He studied medicine under Abu al-Qasem Maqane'i Razi who was the student of Rhazes, the renowned Persian physician and chemist. He documented his 20 years' experiments of medicine in four manuscripts, *Kitab al-Nabz* (the book on the pulse), *Kitab al-Tashrih* (the book on anatomy), *Qarabadin* (pharmacopeia) and *Hidāyat al-Muta'allimin fi al-Tibb* (The

Students' Handbook of Medicine, the only book surviving today). *Hidāyat* is the first medical textbook written in Persian in the Islamic era. In the Islamic Golden Age most of the scientific writings were in Arabic, the *Franca Lingua* of that period. But Akhawayni broke this tradition and wrote in his native Persian (Farsi). The book includes 184 chapters (*Bāb*) covering wide aspects of medicine. It seems his main interest in medicine was psychiatry and especially melancholy, thus becoming known as *Pezeshk-e-Divanegan* (Physician to the Insane). He died around 983 AD and was buried in his hometown.

He has many innovations and findings in medical issues like early differentiation between seizure and hysteria, early differentiation between nerves and tendons, early descriptions of meningitis and first report of fever curve.





Haly Abbas (949-982)

Ali ibn Abbas Majusi Ahvazi, also known as Haly Abbas in the west, was a renowned Persian physician of his era. He is regarded as the first scientist who rejected ancient Galenic principles of medicine and who tried to present a new kind of medicine, based on observational data. Haly Abbas was born in Arejan, a city near Ahvaz, southwest of Persia (presently Iran), in 949 AD. Although he was a Muslim, his father (Abbas) and ancestors belonged to a famous family practicing Zoroastrianism (a Persian religion predating the Islam). Therefore, he was known as 'Majusi', a name referring to Zoroastrian followers. After primary schooling in his native town, he moved to Shiraz and was educated in medicine by the prominent Persian physician Abu Maher Shirazi. Later, he set off for Baghdad and became the court physician to Azod od-Dowleh Panah (Fana) Khusraw (936–983), an emir (King) of the Buyid dynasty in Persia. Haly Abbas was also one of the prominent physicians attending the Azodi Hospital in Baghdad. During his time in Baghdad, Haly Abbas wrote a large medical encyclopedia entitled *Kāmil al-Sināa al Tibbiya* (The Perfect Book of the Art of Medicine) or *al-Maliki* (The Royal Book), dedicated to the king. The main part of this book was translated into Latin by Constantinus Africanus (1015–1087), under the title of Pantegni, without any reference to Haly Abbas; apparently, this is one of the

oldest documented cases of plagiarism in the history of medicine. Around 1127, Stephen of Pisa translated the entire book in Antioch (under the name of *Liber Regius* or *Liber Regalis Dispositionis*). This book was frequently reprinted in the west. The Royal Book became one of the main reference books for medical practice and teaching during that period. Although, some historians believe that the Royal Book is more comprehensive and also better classified than *The Canon of Medicine* by Avicenna (1025 AD), it has for some reason always been eclipsed by Avicenna's work. On his death, in 982, Haly Abbas was likely buried in Baghdad or else in Shiraz (the exact site is unknown). He lived during the period of great Islamic and Persian scholars. He was aware of many sources of ancient medical knowledge, including Persian, Indian and Graeco-Roman. He added his own observations and treatments to this previous knowledge and integrated all this in the comprehensive account of medicine he left to later generations, especially in his *Liber Regius*. This book had a marked influence on Avicenna (980–1037). Haly Abbas is therefore regarded as the bridge connecting ancient and medieval times, and also between western and eastern worlds.



Avicenna (980-1032)

Ibn Sina, called Avicenna in West, was born in Afshaneh, a city in northeast of old Persia in 980 A.D. His father, Abdollah, was a local governor and Setareh was the name of his mother. Avicenna showed his intelligence when he was only a child. He finished learning Persian literatures as well as Quran when he was 10 years old. Then, he started learning philosophy and medicine and became a famous physician at 18 years old. In that age, he gained a special opportunity to use and

access unique books in royal library as a gift when he could treat Nuh, the prince of the Samanid dynasty. Later, he went to Jorjan when Samanid dynasty was defeated by Mahmood Ghaznavi, the king of Ghaznavi dynasty. During next years, he traveled around Persia and stayed in Ray (near Tehran), Hamadan (west of Persia) and Isfahan (center of Persia). He had political positions and also related challenges. He became prime minister as well as political prisoner when he stayed in Hamadan when Shams al-Douleh was the king of that era. He wrote some of his books in prison. He stayed in Isfahan in the last years of his life and finally died because of a chronic disease during his travel to Hamadan, where he was buried. Avicenna was one of the most influential scholars in the progress of medical sciences throughout the history. His great medical encyclopedia, *the Canon of Medicine* was known as a medical textbook in western and eastern universities until 17th century AD. Due to his crucial findings and great influence on science, he was famed and called as “*Sheikh-alRa’eis*” in Persia and “Prince of Physicians” in the West. Nowadays, his birthday (23 August) is celebrated as “the day of physicians” in Iran.



Jorjani (1042-1137)

Jorjani (Hussain ibn Muhammad ibn Mahmoud ibn Ahmad Hussaini Jorjani) was born in Jorjan, a city in the northeast of Iran, on April 19, 1024 AD. He completed his

medical education under Abd al-Rahman ibn Ali ibn Abi Sadegh (995–1077 AD), who is often regarded as the second Hippocrates, together with Ahmad ibn Farrukh, author of the medical encyclopedia *The Essentials*. In addition to medicine, Jorjani was also interested in Islamic jurisprudence and Sufism. In 1110 AD, he moved to Khwarazm, the capital of the Kharazmshahi dynasty to become court physician of Qutb al Din Mohammad. There, he was later nominated director of the large municipal hospital and pharmacy. Finally, Jorjani settled in Merv, the capital city of the Seljuk dynasty, where he died in 1137 AD. Although, the lingua franca of the Islamic territories during the medieval time was Arabic, Jorjani changed this tradition and used Persian texts and terminology to describe medical subjects. Therefore, he is documented as the author of the first large medical encyclopedia in the Persian language during the Islamic era. He completed this comprehensive work at the age of 70, using his vast experience in medicine. This work, *Zakhireye Kharazmshahi* (Treasure of the Khwarazm Shah) is now regarded as the largest Persian medical encyclopedia, comprising more than 750,000 words and ten volumes; it can be compared with *the Canon of Avicenna* and the *Continens* of Rhazes. In addition to his own experience, Jorjani expanded on the experimental findings of Rhazes and rational descriptions of Avicenna, while he referred to various Persian, Greek, and Islamic scholars before him, with the intention to create standard medical terms in *Zakhireye Kharazmshahi*. His book covers nearly all aspects of medicine, including principles of medicine, human anatomy and physiology, etiology of diseases, health and hygiene, and nutrition; it also contains descriptions of medical procedures such as blood sampling, cupping and venesection, disease symptoms and their management, surgical approaches and pharmacology. He made numerous discoveries and innovations in medical issues; for example, he accurately described two types of facial palsy; spastic and paralytic. While the paralytic type would originate in the facial nerve, the spastic variety was muscular and secondary to spasm or inflammation of the facial or cervical muscles. Also the description by Jorjani of the association between trigeminal neuralgia and arterial movements close to the nerve is a novel theory for his time. He was also the first to describe the relationship between



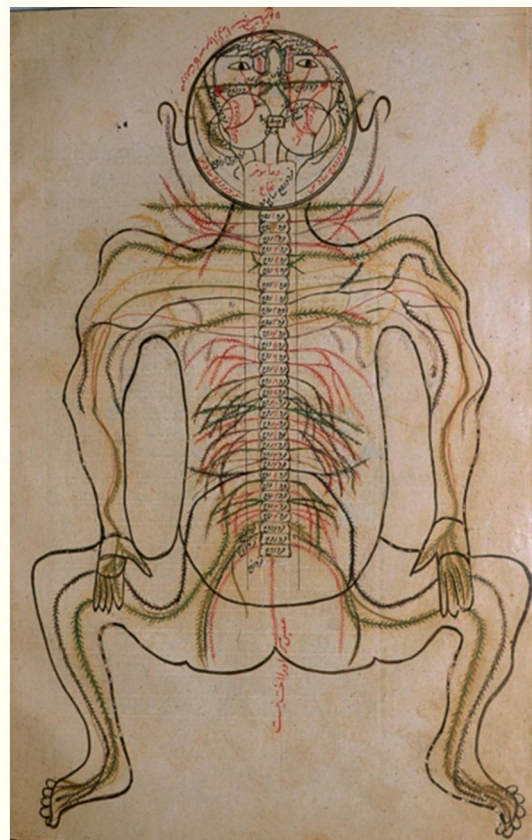


exophthalmia and goiter. In his description of the optic nerve, Jorjani believed that light reached the brain through this nerve and he comprehensively described the optic chiasm.



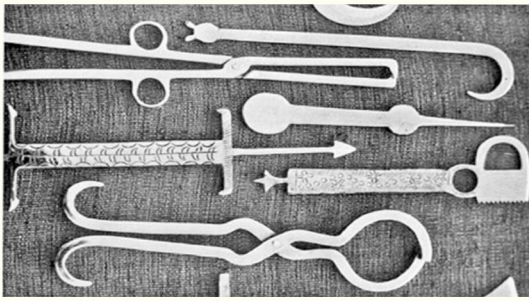
Qutb al-Din Shirazi (1236-1311)

Qutb al-Din was born in Shiraz, south of Persia in 1236AD, and died and was buried in Tabriz in 1311. He was a polymath and had many manuscripts in the fields of philosophy, mathematics, medicine, astronomy, music, literature, and Islamic studies. He was mainly famous for his contributions to astronomy and philosophy. He also had important works in the field of medical sciences like *Resaleh fi Bayan al-Haja ela al-Teb va Adab al-Atebba va Vasayehom* [a manuscript on medical ethics], and *Resala fi al-Baras* [treaties on Vitiligo]. His great medical text is *al -Tuhfa al-Sa'diyya*, a commentary on the first volume of *the Canon of Medicine* (written by Avicenna in 1025AD). He is called *Allama* (polymath) for his extraordinary expertise in almost all fields of contemporary sciences. The peaceful and cultural environment of his hometown and family contributed to his development despite a time of horror from Mongolian repeated invasions of the Islamic countries. Qutb al-Din never ceased learning and researching and migrated widely in order to find scientists to learn from them. He worked in many centers as a teacher and researcher. He practiced medicine and educated students, and his books on other fields of science reflect his comprehensive mastery of most of the basic sciences and the humanities. Qutb al-Din's social and political roles make him one of the paramount of Iranian elites who contributed to the re-establishment of the Persian-Islamic civilization after its destruction by the Mongolians in the thirteenth century.



Mansur (14th century)

Mansur ibn Mohammad ibn Ahmad ibn Yousef ibn Ilyas, Mansur, was an anatomist and physician in Shiraz in the middle of the 14th century AD. He was a descendent of a scholar and of a knowledgeable family. He, a late 14th century anatomist and physician from Shiraz, published his illustrated book on anatomy. Mansur's anatomy (*Tashrih-i Badan-i Insan*) was written following the Mansur's medical synopsis, *Kefaye Mojahedieh*. The book is dedicated to Prince Pir Mohammad Bahador who most likely was the grandson of Timur (Tamerlane) and the Ruler of the Fars Province from 1394 to 1409. The book of Mansur is believed to be the first comprehensive anatomical illustrated manuscript containing two-dimensional pictures of the human body. This 14th-century treatise is composed in Persian and is organized into five articles on the skeleton, nerves, muscles, veins and arteries, each illustrated with a full-page diagram and with a final chapter including an image of a pregnant woman delivering a breech baby. These chapters have description part and related figure involving brief explanation. Mansur's illustrations were often used in other Persian or Arabic medical manuscripts for at least two centuries in Persia.



Hakim Mohammad (17th century)

Hakim Mohammad was a surgeon contemporary with Shah Abbas the Great (1571–1629 CE) and Shah Safi I (1611–1642 CE), the fifth and sixth kings of the Safavid dynasty. He is the author of the book of *Dhakhira-yi-Kamilah* (The Perfect Treasury or the Treasury of perfection). *Dhakhira-yi-Jarrahi* (the Treasury of surgery) is another name of his book according to the manuscript of the book in the library Paris. There is insufficient information about this great surgeon, but he introduced himself in the preface of his book. It is only clear that he was born in Persia. Then, according to the contents of his book, it seemed he migrated to the Ottoman Empire in youth and had served as a

medical officer in the Ottoman army. He accompanied the Ottoman army at least in one of the failed battles for the capture of Baghdad. In one case, he wrote that at least 20,000 soldiers had been wounded in his army during 3 days of war. In another case, he reported that despite the efforts of 19 surgeons in the Hafiz Ahmad Pasha camp, 4000 people died from 18,000 injuries. Later, he came back to his homeland and dedicated his book to the king of Persia. *Dhakhira-yi-Kamilah* is a unique clinical book which was totally written about the surgery in the Safavid period. The language of the book is Persian and was dedicated to Shah Safi I, the Persian king. It is one of the earliest written independent books on surgery in the history.

C. Persian Medicine Theory

Persian Medicine (PM) is a school that views the world as a suitable context created by the wise and omniscient Almighty Lord. PM consists of the sum total of all the knowledge and practices used in diagnosis, prevention and elimination in Persia from ancient times to the present. It is based entirely on practical experience and observations passed down from one generation to another. The structure of PM has two main branches, namely a theoretical branch and a practical branch, each of which also branches into subcategories as follows: 1. The theoretical branch: This branch is a science that discusses the status and changes of the human body as well as the causes and signs of health and disease. 2. The practical branch: This branch is also a science, and although it may remind us of practical procedures, it is really the science of how to maintain health and how to regain it after the occurrence of diseases. Physiological functions of the human body are considered to be based on seven factors in the PM, known as “*Umoor-e-Tabee-e-yeh*”. These are as follows I. Four elements (*Arkan*), II. Temperament (*Mizaj*), III. Humors (*Akhlat*), IV. Organs (*A'za*), V. Spirits (*Arwah*), VI. Faculties and Forces (*Qova*), and VII. Functions (*Af'al*).

There is also a terminology called *Tabiat* (Nature) in the Persian medicine, which plays a key role in the paradigm as a wisdom force in the body to keep it healthy and usher the body back to health after a disease. “*Umoor-e-Tabee-e-yeh*” means the affairs assigned to *Tabiat*.

The meaning of *Tabiat* (Nature) in medicine:

Tabiat is a deep philosophical terminology in Persian and Greek philosophies. In medicine, however, it indicates an innate power in the body with tact that controls all aspects of the body. It is not under the control of the person. It was believed that its acts in the best interest of the body. In sudden events that may befall the body, reflexes are under the control of nature. In Persian medicine, it is called “*Qovaie Modabereh Badan* (The body's tactful power)”.





Some Principles of *Tabiat* (Nature):

- Wisdom (*Hikmat*): It means that nature does not work in vain.
- Cosmos: It was a theory originated by the Persians in ancient eras. In this theory, each part of the body is homologous with a part in the universe. According to this theory, some events in the body (as the small world) like death, follow the universe (as the great world), considered as a good matter in terms of evolution.
- Attorney: It means that *Tabiat* (Nature) is the deputy of the soul in maintaining body interests and managing body issues.
- Treatment: This principle is the result of the three past principles. *Tabiat* had to keep the body healthy; and in disorders, it tries to restore health. Rhazes (865–925 AD) claimed that “*Tabiat* is the supreme physician”.

Physician and *Tabiat* (Nature):

Based on Persian medicine principles, the physician is the servant of *Tabiat* (Nature). He/she should try to help the nature of the patient to restore health. It is mentioned by Persian physicians that a physician can help the nature via the following:

- 1. Reinforce body powers in two ways:

By life style modifications: There were six principles for health in Persian medicine called “*Sette Zaroorieh*” (Figure 4) including air (cleanness, temperature, and geographical situation), nutrition (food and drinks), exercise, sleeping and waking, excretion of unnecessary

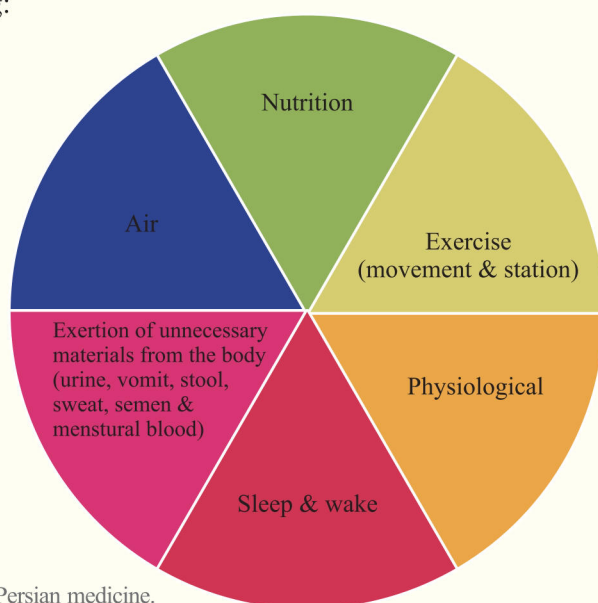


Figure 4. *Sette Zaroorieh* (6 principles to keep health) in Persian medicine.

a. Using spices and medicines

- 2. Helping nature to help the body avoid harmful agents on the inside or outside. Therefore, in PM, it is believed that *Tabiat* (Nature) is the main controller of body health; and physicians should help it to keep the body healthy and also to restore health in case of diseases. There are too many books on Persian medicine and drugs, both simple drugs (herbs, minerals and animals) and formulations (compound drugs). They can be categorized as below:

- Books on simple drugs: They mostly present simple drugs (herbs, minerals and animals) as monographs. They are categorized as the ones that only describe simple drugs to identify and also the ones that describe their pharmacology and therapeutic issues.
- Books on formulations: These books are Persian pharmacopeias, called *Qarabadins*. In these books, all aspects related to formulations and dosage forms are described.
- Special pharmaceutical books: They are mostly treaties and books on a special subject in pharmacy, for example a book on opium or a book on cardiologic drugs.
- Chapters in comprehensive medical books: In the main Persian medicine reference books like the *Canon of Medicine (al-Qanun fi al-Teb)* or *Liber Continent (al Havi)*, there are some chapters or parts on simple and compound medicines. Also, in most medical texts, drugs for the treatment of diseases are mentioned.

Affairs related to the nature “*Umoor-e-Tabee-e-yeh*”

As mentioned before, normal functioning and balance of the human body is based on the 7 factors of “*Umoor-e-Tabee-e-yeh*”.

1. Arkan

In Persian medicine, it is believed that all creatures consist of four main substances, called the four elements. They include fire, air, water and earth. Of course, the basis of these elements is based on philosophy and they are different from the actual fire, air, water, and earth available to us, but since the characteristics of each of them are similar to the actual one, they are named in this way. Our body consists of all these elements, but the amount of each is not equal to the other. For example, there may be more fire in your body than water, earth and air, and, in your friend's body, there may be more water than fire, earth and air. This point causes individual differences in people (personalized medicine). For example, some people are brave and some are cowards; some have a strong memory and some are forgetful; some people get skin rash by eating a small amount of dates and others easily eat plenty of dates and have no problems. In Persian medicine, the causes of such individual differences are clearly explained based on “*Arkan*” and “*Mizaj*”. Each of the *Arkan* (four elements) has certain functions and characteristics on which the “*Mizaj*” (temperament) is based.

● Fire: The nature of the fire is hot and dry. Fire generates agility, rapid penetration, and lightness, and it lowers the coldness. Objects with more fire element in their structure are more agile, faster and more intrusive than others. Having more of the fire element, the person also acts faster and more agile than others.

● Air: The nature of air is hot and moist. When water is heated, it turns into steam. The steamed water has a higher energy level than water itself, because we need to consume energy to convert water to steam, so the air is warmer than water. The air is plastic and flexible, and its role is to create lightness and softness. It also makes porosity and distance between the components of substances. Those who have more air element in their body, also have larger bones than others, because the air has created distance between their bone particles.

Note that in Persian medicine, moisture does not mean immersion in water, but it means flexibility and plasticity.

● Water: The nature of water is cold and moist. It creates plasticity and flexibility in objects. Objects with more water element are more fluid and flexible than others. Having more water, the person is more flexible in dealing with issues.

● Earth: The nature of earth is cold and dry. Earth creates stability in objects. Having more earth element in the body, the person forgets memories later than others.

In general, if any of these elements exists appropriately in the body composition, the organs will be able to perform their proper function.

2. Mizaj

“*Mizaj*” (temperament) is a quality which is a consequence of mutual interactions of the four contradictory primary qualities (hotness, coldness, moisture, dryness) residing within the elements. These elements are so meticulously intermixed with each other that they lie in a very intimate relationship to one another. Their opposite powers intermittently conquer and are conquered until a state of balance is reached that is uniform throughout the whole. This result is called the temperament “*Mizaj*”. In other words, *Mizaj* means the dominant quality of the compound object.

Mizaj is one of the most important canons of the Persian medicine system. It has an important function in maintaining the ideal healthy state of an individual.

3. Akhlat

“*Akhlat*” is the plural of “*Khelt*” (humor). In the PM viewpoint, the food we eat after digestion in the stomach and liver is divided into four major groups of fluids: Yellow bile, blood, phlegm and black bile. Each of these is called humor. Humors also have their own temperament. Blood is hot and moist, phlegm is cold and moist, yellow bile is hot and dry, and black bile is cold and dry. The relationship between *Arkan*, *Mizaj* and *Akhlat* is shown in Table 1.

Table 1: The relationship between Arkan, Mizaj and Akhlat

Arkan (The Four Elements)	Fire	Air	Water	Earth
Mizaj (Temperament)	Hot and dry	Hot and moist	Cold and moist	Cold and dry
Akhlat (Humors)	Yellow bile	Blood	Phlegm	Black bile





The tissues and organs of the body are formed from humors. In PM, it is believed that digestion of food and its transformation into body tissues occurs during the four digestive stages: The first digestion is in the stomach; the second is in the liver, the third digestion is in the vessels, and the fourth digestion happens in the tissue. The waste material from each of these four stages, in some way, is excreted from the body. The waste materials derived from the first digestion is excreted through the stool, those of the second digestion exit the body through urine, and the third and fourth digestion waste material are excreted through sweat, pus, hair, nails, discharge of the ears, nose, etc. The effects and functions of humors are

controlled by *Tabiat* (Nature). *Tabiat* perfectly knows that at a certain time, which of the humors and how much of that humor should exist in a certain part of the body, and how it should work. Thus, in each individual, every part of the body has a unique natural combination of these humors, and, when they are in balance, the body is healthy. If they became imbalanced or unhealthy, illness is resulted. Because this balance is different for every person, it is necessary for the physician to determine the patient's normal humoral condition before he/she could assess the changes that caused the illness. The characteristics and functions of natural humors of the body are shown in Table 2.

Table 2: The characteristics and functions of natural humors of the body

Humors	Temperament	Characteristics	Functions
Yellow bile	Hot and dry	Yellow color, light, ardent, bitter, thin	Diluting the blood, stimulating bowel movements
Blood	Hot and moist	Red color, moderate consistency, sweet, no bad smell	Body development, warming, moistening and freshening the body
Phlegm	Cold and moist	Sweetish, moderate consistency, white color, odorless	Feeding some organs like the brain, ready to become blood, moistening the body and joint
Black bile	Cold and dry	Black color, blood deposition, astringent	Feeding some organs like the bones and joints Stimulating appetite creating stability in the body

4.A'za

"A'za" is the plural of "Ozv" which means organ. Organs are composed of humors. They are divided into two groups of simple and compound organs.

Simple organ: The organ whose components are the same. These organs include bone, cartilage, chord, ligament, nerve, artery, vein, membrane, skin, fat, muscle, hair and nails.

Compound organ: The organs of the body which are composed of simple organs, such as eye, ear, hand, etc.

In terms of application, the organs are categorized as follows:

- Chief organs (*Raieseh*): Damage to them is harmful for human survival or reproduction, thus they are very important and vital.

Chief organs are divided into two groups:

- Important for survival: Heart, brain and liver
- Important for reproduction: Testis and ovary
- Non-chief organs (*Gheire-Raieseh*): These organs are divided into two groups:
 - Servant of chief organs (*khadem-al-Raieseh*): Each of the chief organs has a servant that delivers its power to the rest of the organs. These servant organs are:
 - Arteries: Servant of the heart
 - Veins: Servant of the liver
 - Nerves: Servant of the brain
 - Seminiferous tubules: Servant of the testis
 - Fallopian tube: Servant of the ovaries
 - Non-servant of chief organs (*Gheire-khadem-al- Raieseh*):

- Subordinate organs (*Maruoseh*): Kidney, stomach, spleen, lung
- Non-Subordinate organs (*Gheire- Marouseh*): Bones and cartilages

Temperament of the organs:

Each organ of the body has its own temperament, which is appropriate to its function.

- Hot tempered organs (respectively from the warmest to the most temperate): Heart, liver, lung, muscle, spleen, kidney, arteries, veins, skin of the hand palm.
- Cold tempered organs (respectively from the coldest to the most temperate): Fat, hair, bone, cartilage, chord, ligament, membrane, nerve, spinal cord, brain, skin.
- Moist tempered organs (respectively from the wettest to the most temperate): Fat, brain, spinal cord, breast tissue, testis tissue, lung, liver, spleen, kidney, muscle, skin.
- Dry tempered organs (respectively from the driest to the most temperate): Hair and nail, bone, cartilage, ligament, chord, membrane, arteries, veins, motor nerve, heart, sensory nerve, skin.

5. *Arwah*

“*Arwah*” is the plural of “*Rooh*” (spirit) which is a very soft and ethereal physical body composed of steam aroused from the good and fine part of normal humors. The spirit is gentle, smooth, and moving. It is worth noting that “*Rooh*” in Persian medicine is the medical spirit that is in the body and discussed in the natural sciences and differs from the immaterial soul that is discussed in theology.

There are three types of medical spirit:

- 1) Vital spirit (*Rooh-e- Hayvani*) that is in the heart and spreads by the blood in the arteries throughout the body.
- 2) Natural spirit (*Rooh-e-Tabiee*) that is in the liver and promotes the growth and development of the body.
- 3) Sensual spirit (*Rooh-e-Nafsani*) that is in the brain and involved in nervous system functions and mental-psychological phenomenon.

In a healthy person, *Arwah* are under the strict control of *Tabiat*. In the other words, *Tabiat* manages *Arwah* in such a way that everything goes well for the health of the body.

6. *Qova*

“*Qova*” is the plural of “*Qoveh*” and means the forces and faculties that cause interactions in the body. There are three types of forces in the body:

- 1) Vital forces (*Qovaye- Hayvani*) that create movement, energy and vital functions of the body. They are also the source of feeling scared or angry. In other words, the vital force freshens the body to receive the natural and sensual spirits.
- 2) Natural forces (*Qovaye-Tabiee*) that perform the nourishment of the tissues and organs.
- 3) Sensual forces (*Qovaye-Nafsani*) that make sense, movement, and the ability to judge and decide.

Natural and sensual forces are subdivided into specific categories as follows:

Natural forces (*Qovaye-Tabiee*):

- The forces that are served (*Qova-ye- Makhdoomeh*):

- The forces that are necessary for human survival: These forces make food changes to replace the body's depletion and develop the body at an early age. If the food does not reach the organs by such forces, the organs will be depleted and the person becomes ill. These forces are:

- Feeder force (*Qove-ye-Ghazieh*): It nourishes the body.
- Developer force (*Qove-ye-Namieh*): It develops the body.

- The forces that are necessary for human reproduction:

- Generator force (*Qove-ye-Movalledeh*): It produces the fertility factor in males and females, and separates and creates special faculties of each organ.

- Configurator force (*Qove-ye-Mosaverah*): It is responsible for configuration and formation of the organs.

- The servant forces (*Qova-ye-Khademeh*):

- Absorptive force (*Qove-ye-Jazabeh*): It is responsible for absorbing useful edibles for the organ.
- Retentive force (*Qove-ye-Masekeh*): It holds the absorbed substances for a certain time.
- Digestive force (*Qove-ye-Hazemeh*): It digests the absorbed food to make it usable for the organ.
- Propulsive force (*Qove-ye-Daf'eh*): It disposes the digestive wastes.

Sensual forces (*Qovaye-Nafsani*):





- Perceptive forces (*Qova-ye-Modrekeh*): They create perception and conception. These forces include:
 - Exterior perceptive forces:
 - The five senses (vision, audition, olfaction, gustation and sematosensation)
 - Interior perceptive forces:
 - Common sense (*Hes-e-Moshtarak*): It understands the messages sent by each of the five senses.
 - Thought (*Khiyal*): It saves and stores the subjects perceived by the common sense.
 - Realization (*Vahm*): It understands the details of the subjects perceived by the common sense.
 - Memory (*Hafezeh*): It stores the details of the subjects understood by realization.
 - Imagination (*Motasarrefeh*): It modifies the subjects saved in the thought and the ones understood by the realization.
- Provocative forces (*Qova-ye-Moharrekeh*):
 - Motive force (*Qove-ye-Baeseh*): It stimulates useful action and prevents harmful action.
 - Active force (*Qove-ye-Faeleh*): It uses the muscles to execute the commands of the motive force.
- Moderator force (*Qove-ye-Modabbereh*): It analyzes, processes, and manages livelihood affairs. The nature (*Tabiat*) is responsible for managing these forces.

Table 3 summarizes the division of forces from the perspective of Persian medicine.

Table 3. The division of forces in Pm

Forces	Natural forces	The forces that are served	The forces that are necessary for human survival	Feeder force	
				Developer force	
		Servant forces	The forces that are necessary for human reproduction	Generator force	
				Configurator force	
	Absorptive force				
	Retentive force				
	Sensual forces	Perceptive forces	Exterior perceptive forces	The five senses (vision,audition, olfaction, gustation and sematosensation)	
				Interior perceptive forces	Common sense
		Thought			
		Realization			
Memory					
Imagination					
Provocative forces		Motive force			
	Active force				
Moderator force					
Vital force					

7. Af'al

“Af'al” means body functions as a result of the interaction of forces. Af'al are divided into two parts:

- Single functions (*Af'al-e-Mofrad*): Functions that are performed with one force, such as absorption or repulsion.
- Compound functions (*Af'al-e-Morakkab*): Functions that are performed with two or more forces, such as appetite, which comes from absorptive force and perceptive force.

The purpose of all natural affairs (*Umoor-e-Tabee-e-yeh*) is to perform body functions completely and correctly. In other words, natural affairs are like an interconnected chain in which the integrity and balance of all its parts are necessary to achieve a proper function. The cause of an impairment of function or the occurrence of any disorder in human health can be explained by a review of this chain.

D.Principles of Treatment in Persian Medicine

Treatment in Persian medicine is based on three parts:

I.Essential recommendations (*Tadabir setteye zaroorieh*)

They include: 1) Healthy air, 2) nutrition,3) physical activity and repose, 4) control of stress, 5) control of retention and repose, and 6) managing awakening and sleep). Among these recommendations, nutrition plays a more important role in treatment, and, in this chapter, nutrition will be discussed more completely.

II. Medicinal plants

III. Manual intervention

-Nutrition

It was believed in Persian Medicine that nutritional recommendations are the first step of treatment and, they begin with nutritional recommendations on foods and drinks. The second step is medicinal plants, and the third is manual intervention like massage, cupping, phlebotomy, etc. According to the “Theory of Humors” in Persian medicine, each kind of food or drink is composed of specific temperament. For example, beef has hot and dry temperament and lettuce has cold and moist temperament. Therefore, the quantity and quality of food and drink intake should be observed clearly in disease treatments.

Diseases are divided into 2 types, namely “acute” and “chronic” according to their duration. “Acute” diseases refer to extreme and severe problems, which last for a short time. “Chronic” diseases refer to long-lasting and conditional situations. According to Persian medicine treatment rules, in acute diseases, physical strength (patient's energy) is quite enough for the patient, and the physician is allowed to reduce the quantity and quality of food intake in order to help the natural power combat directly against the disease. However, in chronic diseases, physical strength is lacking because of the long duration of the disease. Hence, the physician is not allowed to reduce food quality and quantity same as in acute conditions. In chronic situations, the physician should observe both the patient's physical strength and the disease's severity. For example, in acute diseases like common cold or acute asthma, the quantity and quality of food is reduced, and the patient is prescribed to consume a small volume of light

meals in the acute phase in order to let the natural power focus on combating against the disease and remove waste materials and pathogenic agents from the body. These light meals, such as soup or pottages, consist of vegetables, beans, legumes, without animal protein. But in chronic diseases such as osteoporosis or chronic asthma, which may last for decades and there is damage to the internal function, physical strength reduces considerably, and the natural power is not strong enough to focus on combating the disease. In this condition, the physician should prescribe food with high quality and low quantity such as egg yolk, baked lamb and well-cooked bread. According to Persian medicine treatment rules, when the human body is full of waste materials and undigested substances, food intake should be reduced completely in order to provide the natural power enough time to focus on the process of *Nozj* in body. *Nozj* is a rheological change in matter for better consumption or excretion. In disease condition, the natural power causes the waste materials to be excreted and removed from body through the phenomenon of *Nozj*.

The other important fact in chronic diseases is appetite and the digestion process. It means that in chronic situation, appetite and the digestion process are weakening considerably, and patients cannot tolerate high amounts of food. Therefore, recommended diets should consist of food with low quantity and high quality features.

-Medicinal plants

There are 3 rules for medicinal plants prescription (Quality, Quantity and Timing)

Quality:

According to the “Theory of Humors” in Persian medicine, any kind of medicinal plant is composed of temperaments. For example, *Piper nigrum* has hot and dry temperament, *Solanum nigrum* has cold and dry temperament, etc. Diseases are divided to 3 groups, and dystemperament is one of them.

The basic rule of dystemperament treatment is based on “Treatment against” or “*alaj be zed*” that means in cold temperaments, physicians should prescribe medicinal plants with hot temperaments, and vice versa.

Quantity (Dosage)

Organ and disease severity are 2 factors that





determine the dose of medicine. (Importance of an organ and disease severity)

Importance of an organ: There are 4 factors that determine the importance of an organ:

- 1.Temperament
- 2.Nature (histology)
- 3.Location (anatomical situation)
- 4.Strength

Timing:

The time to take medications is the last rule for medicinal plants prescription. Many people, who are taking tablets or other medicines, are not sure about the best time to use them. According to Persian medicine treatment rules, the best times for prescribed medications of liver disorders are in the morning before breakfast, and, for brain disorders, at night before sleep. Also, at the beginning of an abscess formation, topical medications like balms that inhibit inflammation, are recommended in order to avoid abscess formation.

Common recommendations in all disease treatments

Reinforcing the moral courage and heart function is essential to improve disease condition. Traveling, changing living environment and climate, and participating in parties that make the patient happy are very useful in the patient's recovery.

Dystemperament treatment

According to the viewpoint of Persian medicine, there are two types of dystemperament:

- a.Single dystemperament
- b.Compound dystemperament

In single dystemperament, treatment is based on changing the quality of humors. In compound dystemperament, removing waste substances (evacuation or *Tangheeyeh*) from body is the first step of treatment, and, afterward, changing the quality of humors should be considered as the second step.

There are ten rules that should be considered by physicians before evacuation in patients:

1.When the body is full of waste product such as undigested material, evacuation should be done very slowly in order to avoid harmful complications.

- 2.Physical strength
- 3.Extreme warm or cold or anemia
- 4.Extreme obesity or thinness
- 5.Susceptibility to diarrhea or intestinal

ulcers

- 6.Senility or childhood
- 7.Extremely cold climate (purgation is forbidden)
- 8.Geographical location (cities with very hot or cold weather) (evacuation is forbidden)
- 9.Occupation
- 10.Person who is not used to evacuation habitually

According to Persian medicine treatment rules, five rules are necessary for evacuation:

1)The aim of evacuation is reducing the quantity or quality of substances

2)The level of evacuation should match the patient's physical strength.

3)Evacuation should be in line with the natural route of waste material excretion. For example, the physician should help a patient to vomit when he has nausea, and, when a patient feels bloated, the physician should prescribe laxative in order to remove waste products via defecation.

4)Waste products should be removed from the body through its natural route. For example, in treatment of liver disease, phlebotomy of the basilic vein is recommended.

5)In acute diseases, there is no need for the process of *Nozj*. However, in chronic diseases, the process of *Nozj* is necessary.