

# BIAN QUE'S PULSE WAVE DIAGNOSTIC

## DIAGNOSTIC BACKGROUND

The Bian Que's Pulse Wave Diagnostic feature is based on a unique diagnostic approach of Traditional Chinese Medicine, the examination of twelve meridians: a method to choose an emerging or relatively emerging pulsating vessel that is exemplifying or easy to inspect, among the twelve meridians and the Bian Que's exclusive pulse examination of the inch opening (wrist pulse).



Read more about this approach at:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3942893/>

## VYVO PULSE WAVE ANALYSIS

**Check the continuous status of some of your organs and assists you in understanding how to improve your daily lifestyle and live a healthier life.**

Pulse Wave Diagnostic allows any person without expensive medical equipment, but with their VYVO devices, to independently control for their functional health state.

**The analysis is conducted on the basis of Atrial Fibrillation measurements. A new Pulse Wave report is calculated every 3 hours, only if Atrial Fibrillation detection is active.**

**The failure to process the report, is caused by an absence of measurements or incomplete or partial detections by the device.**

**To ensure the correct analysis processing and the report production, the device must be worn correctly, continuously, and the detection of Atrial Fibrillation must be active.**

Through this analysis, the users can learn their level of health assessment, adaptability of organism, level of stress, balance expenditure/energy recovery, as well as find areas to focus to improve their quality of life and reduce the risk of unexpected health problems.

The Algorithms in the app and the interpretation of the obtained results are based on numerous scientific studies and recommendations European Society of Cardiology and the North American Society of Pacing and Electrophysiology.

Electrical and mechanical phenomena occurring in the heart, simulate the external signs of a pulse wave. With the aid of mathematical methods, the function analyzes the language of the rhythm of the heart. This allows us to evaluate the functioning performance of both individual organs, systems of the body, and the state of a person as a whole.

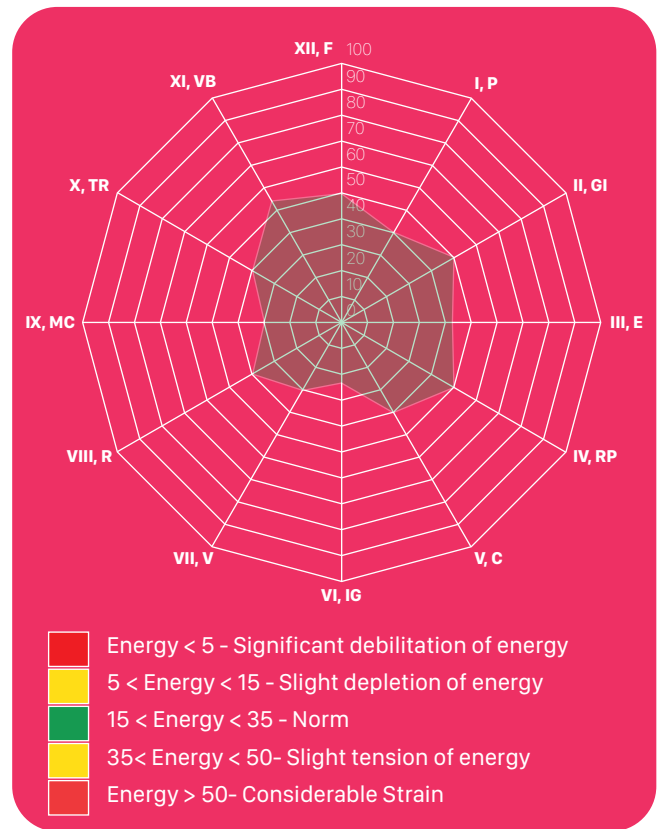
# 1. MERIDIANS ANALYSIS

The meridian system, also called channel network, is a concept in traditional Chinese medicine about a path through which the life-energy is referred to and known as "Qi" flows.

The term 'meridian' describes the overall energy distribution system of Chinese Medicine and helps to explain how essential substances of the body (Qi, blood, and body fluids) permeate the whole body.

The twelve standard meridians, also called Principal Meridians, are divided into Yin and Yang groups.

The energy of each meridian shows the status of related organ system activity and can help to identify and treat diseases.



## 1.1. MERIDIANS ANALYSIS NOTE



### Meridian of Lungs (I, P)

It includes lungs, skin surfaces, central and peripheral nervous systems. So, the system which manages gas and water exchange of the body with the external environment is meant under the word "Lungs." The physical organ lungs carry out the consumption of oxygen and the emission of carbon dioxide and also moisture from the body. An essential part of regulation in water-salt metabolism takes part through sweating on the skin surface. Skin surfaces also determine protection from the external impact of the environment. To manage this complicated and extensive system that provides a connection with the external environment and filtration of different metabolism's processes, the conception "Lungs" involves here central and peripheral nervous systems. Just certain functions of the nervous system are included here: control of interrelation of the body and external environment. *(It is needed to remember that here it is spoken about classification on the basis of functional features but not morphological ones. Correspondingly, the nervous system is included in the all "12 organs," but different functional tasks of the nervous system are meant in each separate case.)*



### Meridian of the large intestine (II, GI)

It is responsible for the transportation of wastes, and it also plays an essential role in the absorption of water. "Large intestine" is a paired organ of "Lungs." When normal circulation of vital energy takes place in "Lungs," large intestine also functions normally, and its good emptying is provided. Disorders in the circulation of vital energy in the "Lungs" cause difficulties during exhaling. When the state of the large intestine's overfilling and heat accompanied by constipation appears, the following statement may be caused: the energy of "Lungs" stops going down: it causes dyspnea.



### Meridian of the stomach (III, E)

It manages consumption and digestion of food. This is a paired organ of "Spleen." To understand the difference between the role of "Spleen" as a manager of digestion and "Stomach," it is needed to consider that "Spleen" is the "Yin" organ, while "Stomach" is the "Yang" organ. The process of digestion is divided into two parts on the basis of the dialectic principle: "yang" processes of crushing and digestion of food are functions of "Stomach," while "yin" processes of nutrients' absorption are a function of "Spleen." Support for balance between these two processes provides quality digestion.



### Meridian of spleen and pancreas (IV, RP)

The function of the spleen (as a functional system) involves control of all processes of absorption of food and moisture, and their transportation around the body, and also control of blood and muscles. Of course, such extensive functions go beyond the spleen, as a physiological organ. The function of stemming blood flow is mainly meant under the control of blood. When this function is disordered, different bleedings take place. As for the connection between muscles and functioning of limbs, it appears from the function of the transportation of nutrients to them. If nutrients are delivered to muscles, they keep their elasticity and strength; when transportation of nutrients is disordered, muscles become weaker.



### Meridian of heart (V, C)

It is responsible for blood transportation. But the function of "Heart" is not limited by this item. According to conceptions of traditional Chinese medicine, "Heart" has the leading role in the management of numerous mental and psychic functions, which are included in the activity of the central nervous system under the conception of modern western medicine. Another function of "Heart" is sweating. There is the following rule in Chinese medicine: "Blood and sweat have the same origin." "Lack of sweat means the absence of blood, and lack of blood means the absence of sweat. Spending of blood takes place during excessive sweating". Particularly, in the case of diseases, symptoms of deviated heart rate are noted, if a person has sweated too much, and as a result, too much blood has been spent.



### Meridian of the small intestine (VI, IG)

According to conceptions of Chinese medicine, "Small intestine" is responsible for getting and transformation of substances." It gets nutrients from the stomach, processes them, carrying out the dividing of transparent and muddy substances at the same time. The transparent part (nutritional substances) is absorbed, and it passes through the spleen, spreading throughout the body nourishing it. The muddy part passes to the large intestine. Aqueous digestive juices remained from metabolism passes below to urinary bladder. "Heart" and "Small intestine" are paired organs. Meridian of heart exits the heart and passes to the small intestine. Meridian of small intestine exits it, and it is connected with the heart. This internal connection carries out the motion of heat. Deviation in this function leads to pathologic states. For example, in the case of heat's motion downs to the small intestine, it evaporates the body's fluid. It leads to rare urination, and rosy color of urination which gives hot evaporations. The motion of the large intestine's heat to the heart may "sing" it. In this case, the patient has a state of excitation, rushing, and bubbles in the mouth and on the tongue.



### Meridian of the bladder (VII, V)

It is responsible for storing and excreting the urinary waste fluids passed down from the kidneys. As an organ, the bladder has only this function, but as an energy system, the bladder is intimately related to

the functions and balance of the autonomous nervous system. That's because of the bladder energy meridian runs along the back of the body from head to heel, with two parallel branches flowing along each side of the spinal column. These four branches of the bladder meridian exert a direct influence on the sympathetic and parasympathetic trunks of the autonomous nervous system, whose condition of modern life, over activates the sympathetic system, causing tension and pain along the spine and its periphery.



### Meridian of kidneys (VIII, R)

According to conceptions of Chinese medicine, the function of Kidneys" is, first of all, production of marrow, spinal cord, and brain. "Kidneys" manage bones, and they are a source of reproduction at the same time. They manage reproductive functions, and they are responsible for the exchange of fluids. According to Chinese medicine, retention and excretion of urine depend not only on urinary bladder but also on kidneys. When "Kidneys" have a sufficient amount of energy, "Urinary bladder" can retain urine completely, and be opened and closed normally. This is a condition of the normal exchange of fluids in the body. When "Kidneys" don't have a sufficient amount of energy, "Urinary bladder" loses its ability to retain urine. Functioning of the opening and closing of the urinary bladder becomes disordered; urination can't be controlled, excessive urination or unintentional urination takes place.



### Meridian of the pericardium (IX, MC)

It is actually an external sac of the heart. "Pericardium" separates the heart from other organs of the chest. According to conceptions of Chinese medicine, in addition to the protective function for the heart, it manages blood circulation through blood vessels. Together with "Heart," "Pericardium" influences on the central nervous system, the activity of the mind and psychic state.



### Meridian of three heaters (X, TR)

Upper, lower, and middle heaters are meant under the conception "Three heaters." "Upper heater" is located over the esophagus, and contains such organs, as "Heart" and "Lungs." "Middle heater" is in the upper abdominal part, approximately at the level with the stomach, and it contains "Spleen" and "Stomach." "Lower heater" is located below the navel in the lower abdominal part, and it includes kidneys and liver, "Small intestine," "Large intestine" and "Urinary bladder." "Three heaters" manage the work of all internal organs; from the position of modern medicine, "Three heaters" are like the endocrine system. But this is just physiological matching, which doesn't include the whole conception about the circulation of energy, existing in Chinese medicine.



### Meridian of the gallbladder (XI, VB)

According to conceptions of Chinese medicine, it has doubled function: storage of bile and it's releasing to the digestive duct. The energy of "Gallbladder" is connected with the psychic state of a person. Psychic diseases and psychosomatic disorders, such as insomnia, the excessive intensity in dreams, heartbeats, etc., are often treated with consideration of gallbladder in Chinese medicine. "Gallbladder" has a close relation to "Stomach" and "Spleen," supporting them during carrying out of digestive functions by them.

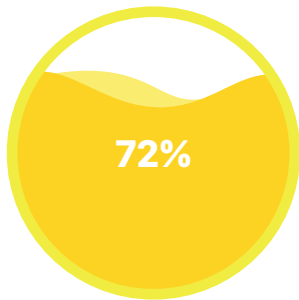


### Meridian of the liver (XII, F)

According to conceptions in Chinese medicine, it carries out the following functions: 1. Accumulation and regulation of blood. 2. Transportation and excretion of different substances from the body. 3.

Control of tendons. According to Chinese traditional medicine, "Liver accumulates blood, while heart transports it. When a person has movements, blood passes to vessels. If the person rests, blood flows to the liver back". According to Chinese conceptions, such important function of blood as filtration is explained as the love of the liver for order. Above all, dysfunctions in the liver are manifested in psychics and digestion. The following rule is valid in Chinese medicine: the psychic state of a person is managed not only by heart, but it also has a close connection with "Liver." Dysfunctions of "Liver" lead to depressions. Chinese people believe that "liver loves order, and it doesn't love sorrows and sadness"; "intense stress is harmful to the liver." Another function of "Liver" is the management of tendons. It is explained in the following way: tendons are nourished with blood, which is accumulated in the liver. When there is no sufficient amount of blood in the liver, the nutrition of tendons is not provided.

## 2. BIOLOGICAL ENERGY



Values of Biological energy can help to understand the status:

- Energy < 300 ms<sup>2</sup> - Reserves of energy are exhausted (Restoration of "vital powers," choice of the optimal regime in work and rest, and compensation of main disease's development are required).
- 300 ms<sup>2</sup> < Energy < 700 ms<sup>2</sup> - Reserves of energy are reduced essentially (Reduction of creative potential and ability to work; time and resources needed for restoration in case of diseases increase significantly).
- 700 ms<sup>2</sup> < Energy < 1,500 ms<sup>2</sup> - Reserves of energy are reduced (Reduction in performance to work).
- 1,500 ms<sup>2</sup> < Energy < 6,000 ms<sup>2</sup> - Reserves of energy are within norm (Optimal regime of functioning).
- Energy > 6,000 ms<sup>2</sup> - Reserves of energy are excessive (essential imbalance in consumption of vital powers, state of vegetative dysfunction).

The analysis is a characterization on the basis of the absolute value of the Total Power on the spectrum (TP). Total Power of the whole spectrum (TP) reflects general adaptive capacities of the body, reserves of vital powers.

A person with a high value of the total power of spectrum is not always more resilient (tougher) than a person with a lower value of TP.

But values of the same person should be compared: if their value of TP is higher today than yesterday, it means that they have rested well and gained power.

But if their TP value has become lower, it means, in term of valuation as that day not being a good day.

## 3. BALANCE OF ANABOLIC AND CATABOLIC PROCESSES

Anabolic processes (anabolism) represent the formation of new structures and substances in the body, renewal, and growth of tissues, including muscle one.

Catabolic processes (catabolism) represent processes which are opposite to anabolic one: the destruction of substances and structures, including muscle one.

Both metabolic states serve different purposes and are necessary for life, but it seems are too often that many of us experience a state of catabolism more than we need to.

The balance between these 2 processes (BAC) can help to understand the status of the body.



- **BAC < 33%** - the process of catabolism predominates in the body.
- **33% < BAC < 66%** - there is an equilibrium of catabolic and anabolic processes in the body.
- **BAC > 66%** - the process of anabolism predominates in the body.

## 4. STRESS INDEX

The analysis can define an Index of regulatory systems tension. The stress could be assessed from the photoplethysmogram (PPG), a non-invasive signal which captures changes in blood volume over time in a bed of tissue. The PPG signal contains information about heart muscle function, the circulatory system, blood flow, and its constituents, blood perfusion (which is linked to body temperature), BP and its variability, the autonomic nervous system (ANS, both central and local, through the variability of its amplitude and the inter-beat intervals), and respiratory function.



- If  $SI < 30$** , there is a state of expressed distress with a predominance of stress-limiting systems' activity.
- If  $30 < SI < 60$** , there is a state of compensated distress with a tendency to the predominance of stress-limiting systems' activity.
- If  $60 < SI < 120$** , there is a state of eustress (optimum of adaptation from a position of physiological regulation).
- If  $120 < SI < 200$** , there is a state of tension in adaptation mechanisms with a tendency to the enhancement of stress-realizing systems' activity.
- If  $SI > 200$** , there is a state of expressed stress with the possibility of damaging influence on systems and organs by excessive activity of stress-realizing systems.

**\*The Pulse Wave Analysis function is only available by using an Android OS device.**

## LEGAL DISCLAIMER

**THE RESULT OF THE DIAGNOSTIC IS FOR PERSONAL EVALUATION ONLY, AND IT CANNOT BE USED AS CLINICAL DIAGNOSTICS. DIAGNOSIS CAN ONLY BE CONDUCTED BY MEDICAL PERSONNEL OR PHYSICIANS.**

Some measurements require the installation of the VYVO Smart App available for Android OS 4.3 or later and for Apple OS ver. 10.0 or later.

Unless otherwise specified, VYVO devices and related services are not medical devices and are not intended to diagnose, treat, cure, or prevent any disease. With regard to accuracy, VYVO has developed products and services to track certain wellness information as accurately as reasonably possible. The accuracy of VYVO's products and services is not intended to be equivalent to medical devices or scientific measurement devices.

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