

Acupuncture Treating Dystrophy Based on pH —Mathematical Reasoning of Treatment Principle Based on Yin Yang Wu Xing Theory in Traditional Chinese Medicine (III)

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Abstract

Theory of both Zangxiang (藏象) and Jingluo (经络) is useful in understanding disease. By using mathematical reasoning based on Yin Yang Wu Xing Theory in Traditional Chinese Medicine (TCM), this paper demonstrates the treatment principle: “Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time” (治病求本, 标本兼治). It means that for a human body, there is the mathematical structure of both Zangxiang and Jingluo as her/his second physiological system. It can be used to determine both the root-cause and symptoms of the sick organ by using both Zangxiang and Jingluo. In general, for the human blood pH value, the normal range of theory is [7.34539, 7.45461] nearly to [7.35, 7.45], and the center is 7.4. The first or second transfer law of a human body’s energies changes according to the different blood pH values whether in the normal range or not. Human disease treatment should protect and maintain the balance of two incompatibility relations: the loving relationship and the killing relationship. As an application, acupuncture is used to treat limb-girdle muscular dystrophy.

Keywords

Traditional Chinese Medicine (TCM), Yin Yang Wu Xing Theory, Steady Multilateral Systems, Incompatibility Relations, Side Effects, Medical and Drug Resistance Problem

1. Introduction

Theory of both Zangxiang (藏象) and Jingluo (经络) is useful in understanding disease. Zangxiang and Jingluo are two general mathematical structures. Human body blood pH value of both Zangxiang and Jingluo is a general parameter link-

ing together the complexity of relations between organ pairs, the organ itself, the capabilities for intervention reaction and self-protection of the body and mind as a whole, related to the environment, food, health and personal history, air, water, earth, climate, season, etc. Human body blood pH value is as useful in understanding disease as the average is in statistics, or as the expected value is in probability calculation.

The studies of Prof. Macro Pianesi, President of the International Association UN PUNTO MACROBIOTICO, began as a pioneer work continuing the work of Japanese Nyoiti Sakurazawa, known in the West as Georges Ohsawa, the founding father of Macrobiotics. For example, thanks to these studies and macrobiotic cooking, over 25,000 disease patients have been cured in the last 8 years in the state of Africa alone, even with understandable and interesting economic implications.

Macrobiotic diet therapy trials have started in other parts of the world as well, including China: Prof. Wang Bin (Director of the Department of Medical Matters, Tibetan and Ethnic Medicine Hospital, University of Traditional Chinese Medicine, Beijing), Dr. Weiguo Ma and Dr. Bing Xu (also from the University of Traditional Chinese Medicine, Beijing), and Dr. Yujing Quian (Doctor in Traditional Chinese Medicine at Capital Normal University), who reported their experiences in a conference held in Italy on October 18, 2010.

Mario Pianesi never ceases to thank the Ancient Chinese for the depth of their thinking, and for the value they give to food in their reflections and observations. Among others, Prof. Mario Pianesi identifies an important indicator for human health: the value of blood pH, which, under normal conditions, ranges from 7.35 to 7.45, and the center is 7.4. Outside this range (acid: Yin condition; alkaline: Yang condition), disease appears. Almost always, when there is a disease, the condition of blood is a Yin condition, little is a Yang condition.

There are a lot of evidences (e.g., experimental identification for probability and real applications) to support this viewpoint, such as, Shirakabe *et al.* [1], Kaur *et al.* [2], Aly *et al.* [3], Intven *et al.* [4], Patel *et al.* [5], Handman *et al.* [6], Natalia *et al.* [7], Barfod *et al.* [8], Zhu *et al.* [9], Zhu *et al.* [10], Robert *et al.* [11], Mona *et al.* [12], Saritas *et al.* [13], Stevens *et al.* [14], and so on.

The body begins to activate the necessary mechanisms to restore this parameter to its appropriate range. If the body is unable to restore optimal pH levels, the disease may become chronic and lead to dire consequences.

Zhang *et al.* [15]-[23] have started a great interest and admired works for Traditional Chinese Medicine (TCM), where, through mathematical reasoning, they demonstrate the presence of incompatibility relations, which are predominant in daily life, yet absent in traditional Aristotelian Western logic.

Many people as Western person are beyond all doubt, the Yin Yang Wu Xing theory is superior to the traditional true-false logic, which does not contemplate incompatibility relations, which Zhang [19] has expertly explained from a mathematical standpoint.

The work Zhang [15] [16] has started, allows many people like Western person to think of a true re-foundation of mathematical language, to make it a better suited tool for the needs of mankind and the environment. Although so doing, Zhang [19] also brings to light the difficulty of establishing the values of both the intervention reaction coefficients ρ_1, ρ_2 and the self-protection coefficient ρ_3 as parameters with due accuracy.

In this paper, the introduction of a parameter such as a blood pH value will be suggested, in order to facilitate the understanding and the calculation of these values. This paper ventures to suggest this with all due to respect, because it be believed that the path Zhang [15] [16] has started, in such an understandable way from the mathematical point of view, will be very useful for all mankind searching for tools to understand the mechanisms of life.

The article proceeds as follows. Section 2 contains a parameter model and basic theorems, in order to explain the intervention reaction coefficients ρ_1, ρ_2 and the self-protection coefficient ρ_3 through the introduction of a parameter model to study the normal range of a human blood pH value, while the first or second transfer law of a human body's energies is demonstrated in Section 3, proved through the concept of both relation costs and the relationship analysis of steady multilateral systems. Furthermore, if the range of a human blood pH value is divided into four parts from small to large, for the body in every part, the prevention or treatment method of a human body's diseases as the treatment principle of TCM is given respectively in Section 4. As an application, acupuncture is used to treat limb-girdle muscular dystrophy in Section 5 and conclusions are drawn in Section 6.

2. Parameter Model and Basic Theorems

The concepts and notations in Zhang [18] are start and still used.

Let $\varphi = (\sqrt{5} - 1)/2 = 0.61803399$ be the gold number. Denoted $\rho_0 = 0.5897545123$, namely healthy number. It is because the healthy number ρ_0 can make the healthy balance conditions $\rho_1 = \rho_3, \rho_2 = \rho_1\rho_3$ and $1 - \rho_2\rho_3 = \rho_1 + \rho_2\rho_3$ hold if $\rho_1 = \rho_0, \rho_2 = \rho_0^2$ and $\rho_3 = \rho_0$. Assuming $\rho'_0 = 0.68232780$, namely unhealthy number. It is because under a poor self-protection ability, the unhealthy number ρ'_0 can make the following unhealthy balance conditions hold:

$$\begin{aligned}\rho_1 - \rho_3 &= \rho_3 = \rho'_0/2 = 0.34116390, \\ \rho_2 - \rho_1\rho_3 &= \rho_1\rho_3 = (\rho'_0)^2/2 = 0.23278561 \\ 1 - \rho_2\rho_3 &= \rho_1 + \rho_2\rho_3\end{aligned}$$

if $\rho_1 = \rho'_0, \rho_2 = (\rho'_0)^2 = 0.46557123$ and $\rho_3 = \rho'_0/2$. Thus $\rho_0 < \varphi < \rho'_0$.

A parameter model of a human blood pH value in a mathematical sense based on Yin Yang Wu Xing Theory of TCM is reintroduced by using the functions $\lambda(x)$ and $\rho(x)$ of the human blood pH value x described as follows.

Let $x \in (7, 7.8)$ be a human blood pH value, where the values 7 and 7.8 are

the minimum and maximum acceptable the blood pH value. Denoted the center value 7.4 is the target as the expectation of the human blood pH value. Define a function $\lambda(x)$ of the blood pH value x in below:

$$\lambda(x) = \frac{|x-7.4|}{(7.8-x)(x-7)}, \forall x \in (7, 7.8)$$

$$= \begin{cases} \frac{x-7.4}{(7.8-x)(x-7)}, & 7.8 > x \geq 7.4; \\ \frac{7.4-x}{(7.8-x)(x-7)}, & 7 < x < 7.4. \end{cases} \quad (1)$$

A parameter model is considered as

$$\rho(x) = \frac{1/2}{\lambda(x)+1/2}, \forall x \in (7, 7.8). \quad (2)$$

Theorem 2.1 Under model (2), the following statements hold.

1) The one that $0 < \rho(x) = \frac{1/2}{\lambda(x)+1/2} \leq 1$ is equivalent to the other that

$$0 \leq \lambda(x) = \frac{1-\rho(x)}{2\rho(x)} < +\infty, \text{ where } \lambda(x) \text{ is a monotone decreasing function of } x$$

if $x \in (7, 7.4]$ or a monotone increasing function of x if $x \in [7.4, 7.8)$; and $\rho(x)$ is a monotone decreasing function of $\lambda(x)$ if $\lambda(x) \in [0, +\infty)$; and $\lambda(x)$ is a monotone decreasing function of $\rho(x)$ if $\rho(x) \in (0, 1]$.

(2) If $1 \geq \rho(x) \geq \rho_0$, then

$$\lambda(x) = \frac{1-\rho(x)}{2\rho(x)} \leq \frac{1-\rho_0}{2\rho_0} = \rho_0^2 \leq \rho(x)^2 \leq 1;$$

$$\frac{\lambda(x)}{\rho(x)} = \frac{1-\rho(x)}{2\rho(x)^2} \leq \frac{1-\rho_0}{2\rho_0^2} = \rho_0 \leq \rho(x) \leq 1; \text{ and } \frac{\lambda(x)}{\rho(x)^2} = \frac{1-\rho(x)}{2\rho(x)^3} \leq \frac{1-\rho_0}{2\rho_0^3} = 1.$$

3) If $0 < \rho(x) < \rho_0$, then

$$\lambda(x) = \frac{1-\rho(x)}{2\rho(x)} > \frac{1-\rho_0}{2\rho_0} = \rho_0^2 > \rho(x)^2 > 0;$$

$$\frac{\lambda(x)}{\rho(x)} = \frac{1-\rho(x)}{2\rho(x)^2} > \frac{1-\rho_0}{2\rho_0^2} = \rho_0 > \rho(x) > 0; \text{ and } \frac{\lambda(x)}{\rho(x)^2} = \frac{1-\rho(x)}{2\rho(x)^3} > \frac{1-\rho_0}{2\rho_0^3} = 1.$$

4) Taking $0 < \rho_1 = \rho(x) < \rho_0, \rho_2 = \rho(x)^2$ and $\rho_3 = c\rho(x)$ where $0 \leq c \leq 1$, there are

$$\rho_1 - \rho_3 = \rho(x)(1-c) \geq 0, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c) \geq 0,$$

$$\text{and } (\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3,$$

where

$$|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| > 2(1-c)\rho_0^3 = (1-c)0.41024.$$

5) Taking $1 \geq \rho_1 = \rho(x) \geq \rho_0, \rho_2 = \rho(x)^2$ and $\rho_3 = c\rho(x)$ where $0 \leq c \leq 1$, there are

firstly, $\rho_1 - \rho_3 = \rho(x)(1-c) \geq 0, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c) \geq 0$ and
 $(\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 \geq 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$ if
 $1 \geq c \geq \frac{1-\rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \geq 0;$

secondly, $\rho_1 - \rho_3 = \rho(x)(1-c) > \rho(x)/2, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c) > \rho(x)^2/2$
and $(\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$ where
 $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| \leq (\rho'_0)^3 = 0.31767$ if $0 \leq c < \frac{1-\rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq \frac{1}{2}$ in
which $1 > \rho(x) \geq \rho'_0;$

thirdly, $\rho_1 - \rho_3 = \rho(x)(1-c) \geq \rho(x)/2,$ and
 $\rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c) \geq \rho(x)^2/2$
 $(\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$ where
 $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| \leq 2\rho_0^3 = 0.41024$ if $0 \leq c \leq \frac{1}{2} < \frac{1-\rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1$
in which $\rho_0 \leq \rho(x) < \rho'_0;$

finally, $\rho_1 - \rho_3 = \rho(x)(1-c) < \rho(x)/2, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c) < \rho(x)^2/2$
and $(\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$ where
 $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| < (\rho'_0)^3 = 0.31767$
if $\frac{1}{2} < c < \frac{1-\rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1$ in which $\rho_0 \leq \rho(x) < \rho'_0.$

In particular, when c is nearly to $1/2$, there are

$$\rho_1 - \rho_3 = \rho(x)(1-c) \rightarrow \rho(x)/2, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c) \rightarrow \rho(x)^2/2$$

and the following statements hold.

a) The absolute value $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)|$ is nearly to 0 if
 $0 < c < \frac{1-\rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq \frac{1}{2}$ in which $1 > \rho(x) \geq \rho'_0.$

b) The value $[(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)]$ is included in the interval
 $[-\rho_0^3 = -0.20512, 0)$ respectively if $0 < c \leq \frac{1}{2} < \frac{1-\rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1$ in which
 $\rho_0 \leq \rho(x) < \rho'_0.$

c) The value $[(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)]$ is included in the interval
 $[-\rho_0^3 = -0.20512, 0)$ respectively if $\frac{1}{2} < c < \frac{1-\rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1$ in which
 $\rho_0 \leq \rho(x) < \rho'_0. \#$

Corollary 2.1 Under model (2), the following statements hold.

1) For any $0 < d < 1$, there is a unique solution $u \in (7, 7.4)$ and there is also a unique solution $v \in (7.4, 7.8)$, such that

$$\lambda(7.4) = 0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \lambda(u) = \lambda(v) = (1 - d)/(2d),$$

$$\rho(u) = \rho(v) = d \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(7.4).$$

2) The condition $x \in [7.35, 7.45]$ is equivalent to each of the following conditions:

$$\lambda(7.4) = 0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \lambda(7.35) = \lambda(7.45) = 0.31743,$$

$$\rho(7.35) = \rho(7.45) = 0.61167 \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(7.4).$$

3) The condition $x \in [7.35129, 7.44871]$ is equivalent to each of the following conditions:

$$\lambda(7.4) = 0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \lambda(7.35129) = \lambda(7.44871) = 0.30902,$$

$$\rho(7.35129) = \rho(7.44871) = \varphi \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(7.4).$$

4) The condition $x \in [7.34539, 7.45461]$ is equivalent to each of the following conditions:

$$\lambda(7.4) = 0 \leq \lambda(x) \leq \lambda(7.34539) = \lambda(7.45461) = \rho_0^2 = 0.34781,$$

$$\rho(7.34539) = \rho(7.45461) = \rho_0 \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(7.4).$$

5) The condition $x \in [7.36307, 7.43693]$ is equivalent to each of the following conditions:

$$\lambda(7.4) = 0 \leq \lambda(x) \leq \lambda(7.36307) = \lambda(7.43693) = (\rho_0')^2 / 2 = 0.23279,$$

$$\rho(7.36307) = \rho(7.43693) = \rho_0' \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(7.4). \#$$

Theorem 2.1 and Corollary 2.1 can be found in Zhang [23].

Remark 1. In west, through experiment or through practice observation, many researchers [1]-[14] have obtained the normal range of human blood pH value as $x \in [7.35, 7.45]$. But in TCM, from Yin Yang Wu Xing Theory, Zhang [17] has already determined: $\rho_0 \leq \rho_1 \leq 1$ for the normal range of a healthy body. Taking $\rho_1 = \rho(x)$, $\rho_2 = \rho(x)^2$ and $\rho_3 = c\rho(x)$ where $0 \leq c \leq 1$ for a human body which has the capabilities of both intervention reaction and self-protection. From Corollary 2.1, the condition $\rho_0 \leq \rho_1 = \rho(x) \leq 1$ is equivalent to $x \in [7.34539, 7.45461]$. In other words, in Theory of TCM, the normal range of human blood pH value is considered as $x \in [7.34539, 7.45461]$, nearly to $x \in [7.35, 7.45]$. Of course, little difference of the two intervals which makes the diagnosis of disease as a result, there may be no much difference as a suspect. In fact, TCM uses the rule $\rho_0 \leq \rho_1 \leq 1$ from the Yin Yang Wu Xing Theory in-

stead of the normal range of human blood pH value. The equivalence of Corollary 2.1 shows that TCM is The scientific.

Zhang [17] has already determined: a body is said healthy when the intervention reaction coefficient ρ_1 satisfies $1 \geq \rho_1 \geq \rho_0$. In logic and practice, it's reasonable that $\rho_1 + \rho_2$ is near to 1 if the input and output in a human body are balanced, since an output organ is absolutely necessary other organs of all consumption. In case: $\rho_1 + \rho_2 = 1$, all the energy for intervening organ can transmit to other organs which have neighboring relations or alternate relations with the intervening organ. The condition $1 \geq \rho_1 \geq \rho_0$ can be satisfied when $\rho_2 = \rho_1 \rho_3$ and $\rho_3 = \rho_1$ for an organ since $\rho_1 + \rho_2 = 1$ implies $\rho_1 = \varphi \approx 0.61803 \geq \rho_0$. In this case, $\rho_2 = \varphi^2 \approx 0.38197$. If this assumption is set up, then the intervening principle: "Real disease with a healthy body is to rush down its son and virtual disease with a healthy body is to fill its mother" based on the Yin Yang Wu Xing theory in image mathematics by Zhang *et al.* [20], is quite reasonable. But, in general, the ability of self-protection is often insufficient for a usual human body, *i.e.*, ρ_3 is small. A common standard is $\rho_3 = (1 - \rho_1) / (2\rho_2) \approx 1/2$ which comes from the balance condition $(1 - \rho_2\rho_3) = (\rho_1 + \rho_2\rho_3)$ of the loving relationship if $\rho_1 + \rho_2 \approx 1$. In other words, there is a principle which all losses are bear in a human body. Thus the general condition is often $\rho_1 \approx 0.61803 \geq \rho_3 \approx 0.5 \geq \rho_2 \approx 0.38197$. Interestingly, they are all near to the golden numbers. It is the idea to consider the unhealthy number $\rho'_0 = 0.68232780$ since the poor condition of self-protection ability $\rho_3 = \rho'_0 / 2 = 0.34116390$ can make the unhealthy balance conditions hold

$$\begin{aligned}\rho_1 - \rho_3 &= \rho_3 = \rho'_0 / 2 = 0.34116390, \\ \rho_2 - \rho_1\rho_3 &= \rho_1\rho_3 = (\rho'_0)^2 / 2 = 0.23278561 \\ 1 - \rho_2\rho_3 &= \rho_1 + \rho_2\rho_3\end{aligned}$$

if $\rho_1 = \rho'_0$ and $\rho_2 = (\rho'_0)^2 = 0.46557123$.

By Theorem 2.1 and Corollary 2.1, $x \in [7.35, 7.45]$ implies $1 \geq \rho_1 = \rho(x) \geq 0.61167 = \rho(7.35) = \rho(7.45)$.

And $x \in [7.35129, 7.44871]$ implies

$$1 \geq \rho_1 = \rho(x) \geq \varphi = \rho(7.35129) = \rho(7.44871)$$

And $x \in [7.34539, 7.45461]$ implies

$$1 \geq \rho_1 = \rho(x) \geq \rho_0 = \rho(7.34539) = \rho(7.45461),$$

where $\lambda(7.34539) = \lambda(7.45461) = \frac{1 - \rho_0}{2\rho_0} = \rho_0^2$

since $(1 - \rho_0^3) = (\rho_0 + \rho_0^3)$.

And $x \in [7.36307, 7.43693]$ implies

$$1 \geq \rho_1 = \rho(x) \geq \rho'_0 = \rho(7.36307) = \rho(7.43693),$$

where $\lambda(7.36307) = \lambda(7.43693) = \frac{1 - \rho'_0}{2\rho'_0} = \frac{(\rho'_0)^2}{2}$

since $(1 - \rho'_0) = (\rho'_0)^3$.

The last one is the healthy interval in a person's self-protection ability poor conditions. The interval range than the normal human body's health requirements too strict, only the first three interval ranges are considered as a normal human body's health. If keep two decimal places, then the first three intervals are the same as $x \in [7.35, 7.45]$. This shows that range $x \in [7.35, 7.45]$ is stable. The interval as the normal range of human blood pH value may be also appropriate. To conservative estimates, the interval of the largest length of the first three range intervals is used, *i.e.*, $x \in [7.34539, 7.45461]$, as the theoretical analysis of the normal range. In fact, the range $x \in [7.34539, 7.45461]$ is better than the range $x \in [7.35, 7.45]$. It is because the range $x \in [7.34539, 7.45461]$ satisfies the healthy balance conditions $\rho_1 = \rho_3, \rho_2 = \rho_1 \rho_3$ and $(1 - \rho_2 \rho_3) \leq (\rho_1 + \rho_2 \rho_3)$ if $\rho_1 = \rho(x), \rho_2 = \rho(x)^2$ and $\rho_3 = c\rho(x) \rightarrow \rho_1$. In other words, the parameter $\rho_1 = \rho(x) \geq \rho_0$ or the range $x \in [7.34539, 7.45461]$ is the healthy running condition of both the killing relationship and the loving relation at the same time. But neither are the others. The human blood pH value must be precise calculation to keep at least 5 decimal places can ensure correct because of its sensitivity to the diagnosis of disease.#

Remark 2. Western Medicine is different from TCM because the TCM has a concept of *Chi or Qi* (气) as a form of energy. From the energy concept, that one organ or subsystem of the human body is not running properly (or disease, abnormal), is that the energy deviation from the average of the organ is too large, the high (real disease) or the low (virtual disease). But there do not exist these concepts of both real diseases and virtual diseases in Western medicine. For the normal range of blood pH value of some human body as $x \in [7.34539, 7.45461]$, in TCM, if $x > 7.45461$, the body is considered as a real disease since the human blood pH value is too high; if $x < 7.34539$, the body is considered as a virtual disease since the human blood pH value is too low. Thus TCM identifies an important indicator for a human body's health: the human blood pH value, which, under normal conditions, ranges from 7.34539 to 7.45461. Outside this range (acid: Yin condition; alkaline: Yang condition), disease appears. Almost always absolutely, when there is virtual disease, the condition of human blood pH value is a Yin condition; when there is real disease, the condition of human blood pH value is a Yang condition.#

Remark 3. Obviously, when applying the hypothesis of Theorem 2.1 and Corollary 2.1 to other fields than a human body's health, it is necessary to identify a global parameter in each field that is able to yield a general Yin or Yang condition in relation to the average behavior of the studied phenomenon, and that maintains the equations at a sufficiently simple level of writing and application. In fact, let $x \in (\min, \max)$ where the values min and max are the minimum and maximum acceptable the index x . Denoted the value t_0 is the target as the expectation of the index x such that $\rho(t_0) = 1$. In Equations (1) and (2), replace 7, 7.8, 7.4 by \min, \max, t_0 , respectively. The equivalent condition of a healthy

body $\rho_0 \leq \rho_1 = \rho(x) \leq 1$ is considered as $x \in [u, v], \min < u < t_0 < v < \max$, where

$$\begin{aligned} \rho(u) = \rho(v) = \rho_0 \leq \rho_1 = \rho(x) &= (1/2) / [\lambda(x) + (1/2)] \leq 1 = \rho(t_0), \\ \lambda(t_0) = 0 \leq \lambda(x) &= (1 - \rho(x)) / (2\rho(x)) \leq \rho_0^2 = \lambda(u) = \lambda(v) \\ &= \rho(u)^2 = \rho(v)^2 \leq \rho_2 = \rho(x)^2 \leq \rho_1 = \rho(x) \leq 1. \# \end{aligned}$$

3. Relationship of the Steady Multilateral Systems

3.1. Energy Changes of a Steady Multilateral System

In order to apply the reasoning to other fields rather than a human body's health, Zhang [17] has started a steady multilateral system imitating a human body. A most basic steady multilateral system is as follows.

Theorem 3.1 [20] *For each element x in a steady multilateral system V with two incompatibility relations, there exist five equivalence classes below:*

$$\begin{aligned} X &= \{y \in V \mid y \sim x\}, X_S = \{y \in V \mid x \rightarrow y\}, X_K = \{y \in V \mid x \Rightarrow y\}, \\ K_X &= \{y \in V \mid y \Rightarrow x\}, S_X = \{y \in V \mid y \rightarrow x\}, \end{aligned}$$

which the five equivalence classes have relations in **Figure 1**.#

The Yin Yang Wu Xing model can be written as follows. Define

$$V_0^5 = X, V_1^5 = X_S, V_2^5 = X_K, V_3^5 = K_X, V_4^5 = S_X$$

corresponding to wood, fire, earth, metal, water, respectively, and assume $V^5 = V_0^5 + V_1^5 + V_2^5 + V_3^5 + V_4^5$ where $V_i^5 \cap V_j^5 = \emptyset, \forall i \neq j$ (hereinafter the same).

And take $\mathfrak{R}^5 = \{R_0^5, R_1^5, R_2^5, R_3^5, R_4^5\}$ satisfying

$$R_r^5 = \sum_{i=0}^4 V_i^5 \times V_{\text{mod}(i+r,5)}^5, \forall r \in \{0, 1, 2, 3, 4\}, R_i^5 * R_j^5 = R_{\text{mod}(i+r,5)}^5,$$

where $V_i^5 \times V_j^5 = \{(x, y) : x \in V_i^5, y \in V_j^5\}$ is the Descartes product in set theory and

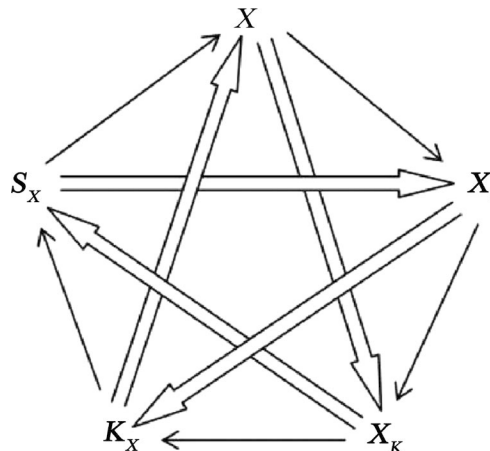


Figure 1. Finding Yin Yang Wu Xing Model.

$R_i^5 * R_j^5 = \{(x, y) : \exists u \in V \text{ such that } (x, u) \in R_i^5, (u, y) \in R_j^5\}$ is the multiplication relation operation. The relation multiplication of $*$ is isomorphic to the addition of module 5. Then (V^5, \mathfrak{R}^5) is a steady multilateral system with one equivalent relation R_0^5 and two incompatibility relations $R_1^5 = (R_4^5)^{-1}$ and $R_2^5 = (R_3^5)^{-1}$ where $(R_i^5)^{-1} = \{(x, y) : (y, x) \in R_i^5\}$ is the inverse relation operation. The Yin and Yang mean the two incompatibility relations and the Wu Xing means the collection of five disjoint classifications of $V^5 = V_0^5 + V_1^5 + V_2^5 + V_3^5 + V_4^5$. The model is called Yin Yang Wu Xing model, denoted simply by $V^5 = \{0, 1, 2, 3, 4\}$.

It can be proved by Theorem 3.2 in Zhang [23] that the steady multilateral system in Theorem 3.1 is the reasoning model of Yin Yang Wu Xing in TCM if there is an energy function $\varphi(*)$ satisfying

$$\begin{aligned} \frac{\Delta\varphi(X)}{\Delta} &\rightarrow \frac{d\varphi(X)}{dX} = (1 - \rho_2\rho_3) = (1 - c\rho(x)^2) > 0; \\ \frac{\Delta\varphi(X_s)}{\Delta} &\rightarrow \frac{d\varphi(X_s)}{dX} = (\rho_1 + \rho_2\rho_3) = \rho(x)(1 + c\rho(x)^2) > 0; \\ \frac{\Delta\varphi(X_k)}{\Delta} &\rightarrow \frac{d\varphi(X_k)}{dX} = -(\rho_1 - \rho_3) = -\rho(x)(1 - c) < 0; \\ \frac{\Delta\varphi(K_x)}{\Delta} &\rightarrow \frac{d\varphi(K_x)}{dX} = -(\rho_2 - \rho_1\rho_3) = -\rho(x)^2(1 - c) < 0; \\ \frac{\Delta\varphi(S_x)}{\Delta} &\rightarrow \frac{d\varphi(S_x)}{dX} = (\rho_2 - \rho_1\rho_3) = \rho(x)^2(1 - c) > 0, \end{aligned}$$

if increase the energy of X ($\forall \Delta\varphi(X) = \Delta > 0$).

The parameter $\rho_v = \rho_1 + \rho_2\rho_3$ is called the coefficient of the vital or righteousness energy. The parameter $\rho_e = 1 - \rho_2\rho_3$ is called the coefficient of the evil energy. A human body is called healthy if the vital or righteousness coefficient $\rho_v = \rho_1 + \rho_2\rho_3$ is greater than or equal to the evil coefficient $\rho_e = 1 - \rho_2\rho_3$. Otherwise, the human body is called unhealthy. For a healthy human body, the transfer law of the Yang vital or righteousness energy in the Yin Yang Wu Xing Model is

$$\begin{aligned} \text{Wood}(X) &\rightarrow \text{Fire}(X_s) \rightarrow \text{Earth}(X_k) \rightarrow \text{Metal}(K_x) \\ &\rightarrow \text{Water}(S_x) \rightarrow \text{Wood}(X). \end{aligned}$$

Figure 1 in Theorem 3.1 is the figure of Yin Yang Wu Xing theory in Ancient China. The steady multilateral system V with two incompatibility relations is equivalent to the logic architecture of reasoning model of Yin Yang Wu Xing theory in Ancient China. What describes the general method of human bodies can be used in the human body.

By non-authigenic logic of TCM, *i.e.*, a logic which is similar to a group has nothing to do with the research object [20], in order to ensure the reproducibility such that the analysis conclusion can be applicable to any a human body, a logical analysis model can be chosen which has nothing to do with the object of study. The *Tao* model of Yin and Yang is a generalized one which means that two is basic. But the *Tao* model of Yin Yang is simple in which there is not in-

compatibility relation. The analysis conclusion of *Tao* model of Yin Yang cannot be applied to an incompatibility relation model. Thus the Yin Yang Wu Xing model with two incompatibility relations of Theorem 3.1 will be selected as the logic analysis model in this paper.

On the other hand, the steady multilateral system $(V^2, \mathfrak{R}^2) = (V_0^2 + V_1^2, \{R_0^2, R_1^2\})$ is called the *Tao* model, denoted simply by $V^2 = \{0, 1\}$, if it satisfies the following conditions:

$$R_r^2 = \sum_{i=0}^1 V_i^2 \times V_{\text{mod}(i+r,5)}^2, r \in \{0, 1\}, R_i^2 * R_j^2 = R_{\text{mod}(i+r,2)}^2,$$

$$R_0^2 = \{(0, 0), (1, 1)\}, R_1^2 = \{(0, 1), (1, 0)\}.$$

The relation multiplication of $*$ is isomorphic to the addition of module 2. The element 1, or 0 is called a Yang force or a Yin force respectively. For a healthy human body, the transfer law of the *Tao* force in the *Tao* model is from Yang to Yin.

In TCM, any material can be found, not Yang is Yin. No matter of Yin and Yang are unable to see, known as dark matter, or nonphysical. Therefore, the *Tao* force often exists in the physical world. Any steady multilateral system only force under the action of the *Tao*, may be to perceive.

Furthermore, the steady multilateral system

$$(V^6, \mathfrak{R}^6) = (V_1^6 + \dots + V_6^6, \{R_1^6, \dots, R_6^6\})$$

is called the *Telluric effluvium* model, denoted simply by

$V^6 = \{e, (12), (13), (23), (123), (132)\}$, if it satisfies the following conditions:

$$R_r^6 = \sum_{i=1}^6 V_i^6 \times V_{i*r}^6, \forall r \in \{1, 2, \dots, 6\},$$

$$R_i^2 * R_j^2 = R_{i*r}^2,$$

$i * r$	$1 = e$	$2 = (12)$	$3 = (13)$	$4 = (23)$	$5 = (123)$	$6 = (132)$
$1 = e$	$1 = e$	$2 = (12)$	$3 = (13)$	$4 = (23)$	$5 = (123)$	$6 = (132)$
$2 = (12)$	$2 = (12)$	$1 = e$	$5 = (123)$	$6 = (132)$	$3 = (13)$	$4 = (23)$
$3 = (13)$	$3 = (13)$	$6 = (132)$	$1 = e$	$5 = (123)$	$4 = (23)$	$2 = (12)$
$4 = (23)$	$4 = (23)$	$5 = (123)$	$6 = (132)$	$1 = e$	$2 = (12)$	$3 = (13)$
$5 = (123)$	$5 = (123)$	$4 = (23)$	$2 = (12)$	$3 = (13)$	$6 = (132)$	$1 = e$
$6 = (132)$	$6 = (132)$	$3 = (13)$	$4 = (23)$	$2 = (12)$	$1 = e$	$5 = (123)$

The number 1, or 2, or 3 is called the *tengen* (天元), the earth material (地元), the people ability (人元), respectively. The set of $\{1, 2, 3\}$ is called three types of talent or material. It is with elements, $e, (12), (13), (23), (123), (132)$. The each of elements, $e, (12), (13), (23), (123), (132)$, is called the primordial energy (元气), essence derived from food (谷气), defensive energy (卫气), essential substance circulating in the channels and blood vessels (营气), genuine energy (真气), pectoral energy (宗气), respectively. Another name is respectively

shaoyang (e) (少阳), yangming ((12)) (阳明), taiyang ((13)) (太阳),
jueyin ((23)) (厥阴), shaoyin ((123)) (少阴), taiyin ((132)) (太阴).

Generally positive or Yang material, they are able to be perceived, but few can see the material itself, can only use signs. Therefore, the Yang energy symptoms of the set $M_1 = \{e, (12), (13)\}$ calls the marrow energy (髓); The Yin energy of the set $M_2 = \{(123)\}$ calls the blood energy (血); The Yin energy of the set $M_3 = \{(132)\}$ calls the saliva energy (津); The Yin energy of the set $M_4 = \{(23)\}$ calls the essence of water and grain (水谷精微).

Growth and conveyance in the six energies $e, (12), (13), (23), (123), (132)$ known as the six roots (根); As the fruit of these six energies $e, (12), (13), (23), (123), (132)$ known as the six fruits (结); Storage of these four energies M_1, M_2, M_3, M_4 known as the four seas (四海); Energy exchange of the four kinds of M_1, M_2, M_3, M_4 known as the four streets (四街). Of course, for a healthy human body, the transfer law of each of the six energies $e, (12), (13), (23), (123), (132)$ is from its root (root-causes) (根) to its fruit (symptoms) (结).

Western Medicine is different from TCM because the TCM has a concept of *Chi or Qi* (气) as a form of energy of steady multilateral systems. It is believed that this energy exists in all things of steady multilateral systems (living and non-living) including air, water, food and sunlight. *Chi* is said to be the unseen vital force that nourishes the human body and sustains the human body's life. It is also believed that an individual is born with an original amount of *Chi* at the beginning of human body's life and as a human body grows and lives, the human body acquires or attains *Chi* or energy from "eating" and "drinking", from "breathing" the surrounding "air" and also from living in its environment. The steady multilateral system having an energy is called the anatomy system or the first physiological system. And the first physiological system also affords *Chi* or energy for the steady multilateral system's meridian system (*Zang Xiang* (藏象) and *Jing-Luo* (经络)) which forms a parasitic system of the steady multilateral system, called the second physiological system of the steady multilateral system. The second physiological system of the steady multilateral system controls the first physiological system of the steady multilateral system. A steady multilateral system would become ill or dies if the *Chi* or energy in the steady multilateral system is imbalanced or exhausted, which means that $\rho_1 = \rho(x) \rightarrow 0, \rho_2 = \rho(x)^2 \rightarrow 0$ and $\rho_3 = c\rho(x) \rightarrow 0$.

For example, in TCM, a human body as the first physiological system following the Yin Yang Wu Xing theory was classified into five equivalence classes as follows:

wood (X) = {liver, bravery, soul, ribs, sour, east, spring, birth};

xiang-fire (X_S^x) = {pericardium, the triple energizer, nerve, the blood, bitter taste, the south, summer, growth};

earth (X_K) = {spleen, stomach, willing, meat, sweetness, center, long summer, combined};

metal (K_X) = {lung, large intestine, boldness, fur, spicy, west, autumn, accept};
 water (S_X) = {kidney, bladder, ambition, bone, salty, the north, winter, hiding};
 jun-fire (X_S^j) = {heart, small intestine, nerve, the blood, bitter taste, whole
 body, whole direction, throughout the year, overall growth}.

Fire (X_S) = xiang-fire (X_S^x) \cup jun-fire (X_S^j).

There is only one of both loving and killing relations between every two classes. General close is loving, alternate is killing.

In every category of internal, think that they are with an equivalent relationship, between each two of their elements there is a force of similar material accumulation of each other. It is because their pursuit of the goal is the same, *i.e.*, follows the same “Axiom system”. It can increase the energy of the class at low cost near to zero if they accumulate together. Any nature material activity follows the principle of maximizing so energy or minimizing so cost. In general, the size of the force of similar material accumulation of each other is smaller than the size of the loving force or the killing force in a stable human body. The stability of any human body first needs to maintain the equilibrium of the killing force and the loving force. The key is the killing force. For a stable human body, if the killing force is large, *i.e.*, $\rho_3 = c\rho(x)$ becomes larger by Theorems 3.4 and 3.5 below, which needs positive exercise, then the loving force is also large such that the force of similar material accumulation of each other is also large. They can make the human body more stable. If the killing force is small, *i.e.*, $\rho_3 = c\rho(x)$ becomes smaller by Theorems 3.4 and 3.5 below, which means little exercise, then the loving force is also small such that the force of similar material accumulation of each other is also small. They can make the human body becoming unstable. The *Chi* or energy is also called the food hereafter for simply. In order to get the food, by Attaining Rule in Zhang [23], the second physiological system must make the first physiological system intervened, namely exercise. It is because only by intervention on the first physiological system, the second physiological system can be to get food.

The second physiological system of the steady multilateral system controls the first physiological system of the steady multilateral system, abiding by the following rules.

Definition 3.1 (Zangxiang (藏象)) *Assume the Yin Yang Wu Xing model V^5 is implemented by the Tao force of the Tao model V^2 . Then the steady multilateral system $V^2 \times V^5 = \{(i, j) | i \in V^2, j \in V^5\}$ is called the Zangxiang or the Five Zang-organs model of the steady multilateral system.*

The Zangxiang model satisfies as follows:

$$R_{(r,r')}^{(2,5)} = \sum_{(i,i')=(0,0)}^{(1,4)} V_{(i,i')}^{(2,5)} \times V_{(\text{mod}(i+r,2), \text{mod}(i'+r',5))}^{(2,5)}, \forall (r, r') \in V^2 \times V^5,$$

$$R_{(i,i')}^{(2,5)} * R_{(j,j')}^{(2,5)} = R_{(\text{mod}(i+j,2), \text{mod}(i'+j',5))}^{(2,5)}.$$

Each of the elements,

$$(1, 0), (0, 0), (1, 1), (0, 1), (1, 2),$$

$$(0, 2), (1, 3), (0, 3), (1, 4), (0, 4),$$

is called respectively

Jia(1,0), Yi(0,0), Bing(1,1), Ding(0,1), Wu(1,2),
 Ji(0,2), Geng(1,3), Xin(0,3), Ren(1,4), Gui(0,4),

corresponding to the Chinese words respectively:

甲(1,0), 乙(0,0), 丙(1,1), 丁(0,1), 戊(1,2),
 己(0,2), 庚(1,3), 辛(0,3), 壬(1,4), 癸(0,4),

also corresponding to the notations in Theorem 3.1 respectively:

$X^+(1,0)$, $X^-(0,0)$, $X_S^+(1,1)$, $X_S^-(0,1)$, $X_K^+(1,2)$,
 $X_K^-(0,2)$, $K_X^+(1,3)$, $K_X^-(0,3)$, $S_X^+(1,4)$, $S_X^-(0,4)$.

Here, each of the elements: X, X_S, X_K, K_X, S_X is called wood, fire, earth, metal, water, respectively, and this is $*$ Yang, $*$ Yin.

In TCM, another name of the Zangxiang system is the ten Heavenly Stems (天干). It means in the changes of energy transmission, plays a major role, is under the power of positive (Yang), although it is invisible, the reason of behind the sign.

In the ten heavenly stems, Yang is respectively:

Jia $X^+(1,0)$ liking Yang wood, Bing $X_S^+(1,1)$ liking Yang fire,
 Wu $X_K^+(1,2)$ liking Yang earth, Geng $K_X^+(1,3)$ liking Yang metal,
 Ren $S_X^+(1,4)$ liking Yang water;

Yin is respectively:

Yi $X^-(0,0)$ liking Yin wood, Ding $X_S^-(0,1)$ liking Yin fire,
 Ji $X_K^-(0,2)$ liking Yin earth, Xin $K_X^-(0,3)$ liking Yin metal,
 Gui $S_X^-(0,4)$ liking Yin water.

Yin is in the inside (里), Yang is in the outside (表). The relationship between the inside and the outside is the liking relationship.

The laws of the Zangxiang system or the ten Heavenly Stems model are summarized in Figure 2.#

Definition 3.2 (Jingluo) Assume the Telluric effluvium model V^6 is implemented by the Tao force of the Tao model V^2 . Then the steady multilateral system $V^2 \times V^6 = \{(i, j) | i \in V^2, j \in V^6\}$ is called the Jingluo or the Six Fu-organs model of the steady multilateral system.

The Jingluo model satisfies as follows:

$$R_{(r,r')}^{(2,6)} = \sum_{(i,i')=(0,1)}^{(1,6)} V_{(i,i')}^{(2,6)} \times V_{(\text{mod}(i+r,2),i'*r')}^{(2,6)}, \forall (r, r') \in V^2 \times V^6,$$

$$R_{(i,i')}^{(2,6)} * R_{(j,j')}^{(2,6)} = R_{(\text{mod}(i+j,2),i'*j')}^{(2,6)}$$

Each of the elements,

(0, e) (1, e) (0, (12)) (1, (12)) (0, (13)) (1, (13))
 (0, (23)) (1, (23)) (0, (132)) (1, (132)) (0, (123)) (1, (123))

is called respectively

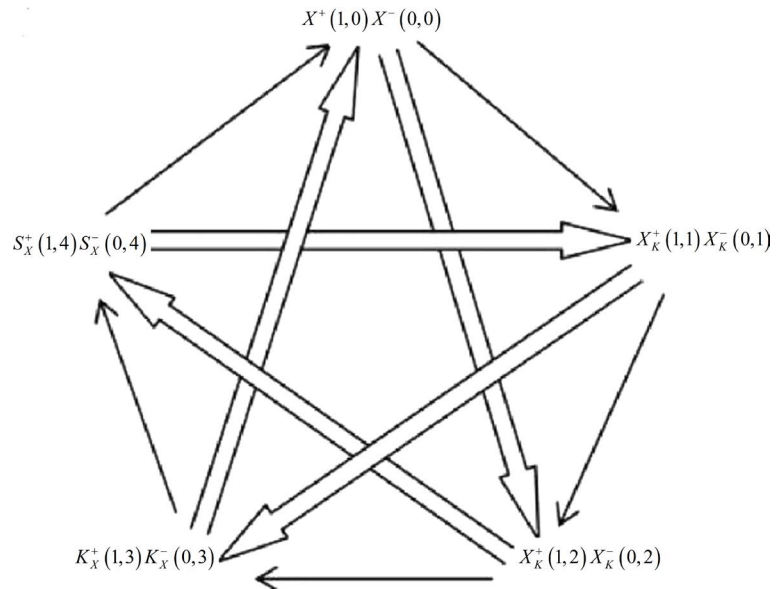


Figure 2. Relations of ten Heavenly Stems.

Zi(0,e) Hai(1,e) Chen(0,(12)) Mao(1,(12)) Shen(0,(13)) Wei(1,(13))
 Chou(0,(23)) Xu(1,(23)) Si(0,(132)) Yin(1,(132)) You(0,(123)) Wu(1,(123));

Corresponding to the Chinese words respectively:

子(0,e) 亥(1,e) 辰(0,(12)) 卯(1,(12)) 申(0,(13)) 未(1,(13))
 丑(0,(23)) 戌(1,(23)) 巳(0,(132)) 寅(1,(132)) 酉(0,(123)) 午(1,(123));

Also corresponding to the notations in Theorem 3.1 as the five viscera and six entrails respectively:

$X^+(0,e)$ $X_S^{x+}(1,e)$ $X_K^+(0,(12))$ $K_X^+(1,(12))$ $S_X^+(0,(13))$ $X_S^{j+}(1,(13))$
 $X^-(0,(23))$ $X_S^{x-}(1,(23))$ $X_K^-(0,(132))$ $K_X^-(1,(132))$ $S_X^-(0,(123))$ $X_S^{j-}(1,(123))$.

Here, each of the elements: $X, X_S^x, X_K^x, K_X^x, S_X^x, X_S^j$ is called wood, xiang-fire (相火), earth, metal, water, jun-fire (君火) respectively, and this is $^+$ Yang, $*^-$ is Yin.*

In TCM, another name of the Jingluo system is the twelve Earthly Branches (地支). It means in the changes of energy transmission, plays a second role, is under the power of negative (Yin), although it is tangible, a sign of strength can be observed directly.

In the twelve earthly branches, Yang is respectively

Zi $X^+(0,e)$ liking Yang water, Hai $X_S^{x+}(1,e)$ liking Yin water,
 Chen $X_K^+(0,(12))$ liking Yang earth, Mao $K_X^+(1,(12))$ liking Yin wood,
 Shen $S_X^+(0,(13))$ liking Yang metal, Wei $X_S^{j+}(1,(13))$ liking Yin earth;

Yin is respectively

Chou $X^-(0,(23))$ liking Yin earth, Xu $X_S^{x-}(1,(23))$ liking Yang earth,
 Si $X_K^-(0,(132))$ liking Yin fire, Yin $K_X^-(1,(132))$ liking Yang wood,
 You $S_X^-(0,(123))$ liking Yin metal, Wu $X_S^{j-}(1,(123))$ liking Yang fire.

Yin is in the inside (里), Yang is in the outside (表). The relationship between the inside and the outside is the liking relationship.

In the twelve earthly branches, other names of them are corresponding to the human body's organs respectively.

- Foot jueyin liver meridian (0,(23)),
- Foot shaoyang gallbladder meridian (0,e),
- Hand jueyin pericardium meridian (1,(23)),
- Hand shaoyang triple energizer meridian (1,e),
- Foot taiyin spleen meridian (0,(132)),
- Foot yangming stomach meridian (0,(12)),
- Hand taiyin lung meridian (1,(132)),
- Hand yangming large intestine meridian (1,(12)),
- Foot shaoyin kidney meridian (0,(123)),
- Foot taiyang bladder meridian (0,(13)),
- Hand shaoyin heart meridian (1,(123)),
- Hand taiyang small intestine meridian (1,(13)).

Or, respectively,

- 足厥阴肝经(0,(23)), 足少阳胆经(0,e),
- 手厥阴心包经(1,(23)), 手少阳三焦经(1,e),
- 足太阴脾经(0,(132)), 足阳明胃经(0,(12)),
- 手太阴肺经(1,(132)), 手阳明大肠经(1,(12)),
- 足少阴肾经(0,(123)), 足太阳膀胱经(0,(13)),
- 手少阴心经(1,(123)), 手太阳小肠经(1,(13)).

*The laws of the Jingluo system or the twelve Earthly Branches model are summarized in **Figure 3**.#*

In TCM, the Zangxiang and Jingluo models are not the anatomy systems as

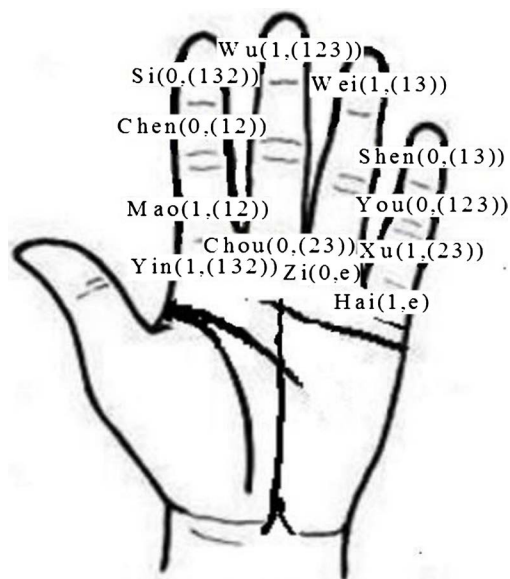


Figure 3. Relations of twelve Earthly Branches.

the first physiological system corresponding to their steady multilateral systems, are only them the mathematical logic models. If there are the Yin Yang Wu Xing model V^5 , the Telluric effluvium model V^6 and the Tao model V^2 , then the Zangxiang model $V^2 \times V^5$ and the Jingluo model $V^2 \times V^6$ must be existed in logic. So they form a parasitic system of the Yin Yang Wu Xing system V^5 , namely the second physiological system of the steady multilateral systems $V^2 \times V^5$ and $V^2 \times V^6$.

In TCM, the Zangxiang model cannot be observed directly, so it is hidden behind the Jingluo system, namely the Zangxiang (藏象) model. Chinese word “藏” is the meaning of the hidden behind. Therefore, only the twelve meridians can be observed. Began to grow the 12 kinds of energies of each place, referred to as the basic root-causes (本). To generate the results of the 12 kinds of energies, referred to as the symptoms (标). Management of the 12 kinds of energies of each system, known as meridians or the Jingluo systems. Of course, for a healthy human body, the transfer law of each of the 12 kinds of energies is from its basic root-causes (本) to its symptoms (标).

In spite of the ten heavenly systems cannot be observed, but it can be observed according to the reasoning of the twelve earthly branches system. So the logic relation of both the ten heavenly stems system and the twelve earthly branches system must be known.

Definition 3.3 (Logic Relation of Ten Heavenly Stems Hidden behind Twelve Earthly Branches) *Logic Relation of Ten Heavenly Stems Hidden behind Twelve Earthly Branches must follow the relationship between the growth of the ten heavenly elements.*

For the ten heavenly stems, although they are hidden in the 12 earthly branches, the existing way is not completely the same. They each have 12 kinds of growth status.

rowing (长生), bathing (沐浴), crowned (冠带), officer (临官), emperor (帝旺), decay (衰退), disease (得病), death (死亡), tomb (墓), extinction (绝), child (胎), raise (养).

According to the names of Yin and Yang attribute is different, their growth way also each are not identical. Yang heavenly stems energy transmission is energy transmitted along the twelve earthly branches, and Yin heavenly stems energy transfer is against the twelve earthly branches transmission of energy transmitted sequence.

The following ten heavenly stems are hidden behind the twelve earthly branches as follows:

Zi(0, e) = {Gui(0,4)}, liking Yang water;
 Chou(0, (23)) = {Ji(0, 2), Gui(0,4), Xin(0,3)}, liking Yin earth;
 Yin(1, (132)) = {Jia(1,0), Bing(1,1), Wu(1,2)}, liking Yang wood;
 Mao(1, (12)) = {Yi(0,0)}, liking Yin wood;
 Chen(0, (12)) = {Yi(0,0), Wu(1,2), Gui(0,4)}, liking Yang earth;
 Si(0, (132)) = {Bing(1,1), Geng(1,3), Wu(1,2)}, liking Yin fire;

- Wu(1, (123)) = {Ding(0,1), Ji(0,2)}, liking Yang fire;
- Wei(1, (13)) = {Ding(0,1), Ji(0,2), Yi(0,0)}, liking Yin earth;
- Shen(0, (13)) = {Geng(1,3), Ren(1,4), Wu(1,2)}, liking Yang metal;
- You(0, (123)) = {Xin(0,3)}, liking Yin metal;
- Xu(1, (23)) = {Xin(0,3), Wu(1,2), Ding(0,1)}, liking Yang earth;
- Hai(1, e) = {Ren(1,4), Jia(1,0)}, liking Yin water.

All Logic Relations of Ten Heavenly Stems Hidden behind Twelve Earthly Branches are summarized in **Figure 4**.

See **Figure 4**, and **Table 1** and **Table 2**, all pure Yang: Jia, Bing, Geng, Ren of Ten Heavenly Stems are hidden behind Palms corners, clockwise for growth and officer. Only Yang earth: Wu of Ten Heavenly Stems is hidden behind Palms on both sides, clockwise for the growth, crowned, officer, disease and cemeteries.

All pure Yin: Yi, Ding, Xin, Gui of Ten Heavenly Stems are hidden behind the sides of the palms, counterclockwise to raise, crowned and officer. Only Yin

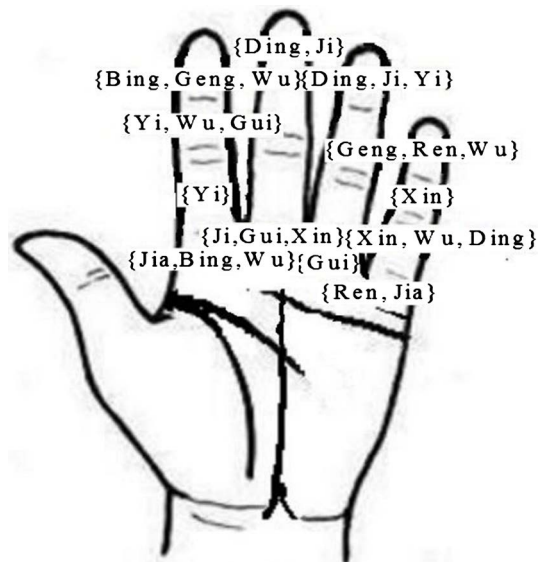


Figure 4. Ten Heavenly Stems Hidden behind Twelve Earthly Branches.

Table 1. Ten Heavenly stems grow-strong-die-extinction (I).

	grow	bath	crown	officer	emperor	decay
Jia	Hai	Zi	Chou	Yin	Mao	Chen
Bing	Yin	Mao	Chen	Si	Wu	Wei
Wu	Yin	Mao	Chen	Si	Wu	Wei
Geng	Si	Wu	Wei	Shen	You	Xu
Ren	Shen	You	Xu	Hai	Zi	Chou
Yi	Wu	Si	Chen	Mao	Yin	Chou
Ding	You	Shen	Wei	Wu	Si	Chen
Ji	You	Shen	Wei	Wu	Si	Chen
Xin	Zi	Hai	Xu	You	Shen	Wei
Gui	Mao	Yin	You	Zi	Hai	Xu

Table 2. Ten Heavenly stems grow-strong-die-extinction (II).

	disease	death	tomb	extinction	child	raise
Jia	Si	Wu	Wei	Shen	You	Xu
Bing	Shen	You	Xu	Hai	Zi	Chou
Wu	Shen	You	Xu	Hai	Zi	Chou
Geng	Hai	Zi	Chou	Yin	Mao	Chen
Ren	Yin	Mao	Chen	Si	Wu	Wei
Yi	Zi	Hai	Xu	You	Shen	Wei
Ding	Mao	Yin	You	Zi	Hai	Xu
Ji	Mao	Yin	You	Zi	Hai	Xu
Xin	Wu	Si	Chen	Mao	Yin	Chou
Gui	You	Zi	Hai	Xu	You	Shen

earth: Ji of Ten Heavenly Stems is hidden behind Palms up and down, counterclockwise for the tomb, crowned and officer. #

Property 3.1 (Ten Heavenly Stems Grow-Strong -Die -Extinction Hidden behind Twelve Earthly Branches) Ten heavenly stems under a number of laws, the ten heavenly stems inside the twelve earthly branches transmission rule can be gotten as follows. The five Yang heavenly stems: Jia, Bing, Wu, Geng, Ren was born by Hai, Yin, Yin, Si, Shen clockwise respectively; The five Yin heavenly stems: Yi, Ding, Ji, Xin, Gui was born by Wu, You, You, Zi, Mao counterclockwise respectively. Using mathematical language, all of these laws are summarized in **Table 1** and **Table 2**.#

Property 3.2 (The rationality of the name of Twelve Earthly Branches)

The following notations in **Definition 3.2** is reasonable.

$$\begin{array}{cccccc} X^+(0,e) & X_S^{x+}(1,e) & X_K^+(0,(12)) & K_X^+(1,(12)) & S_X^+(0,(13)) & X_S^{j+}(1,(13)) \\ X^-(0,(23)) & X_S^{x-}(1,(23)) & X_K^-(0,(132)) & K_X^-(1,(132)) & S_X^-(0,(123)) & X_S^{j-}(1,(123)). \end{array}$$

It is with the correct meaning of the Yin Yang Wu Xing Model in **Theorem 3.1**.#

Energy concept is an important concept in Physics. Zhang etc [21] introduce this concept to the steady multilateral systems or image mathematics [20] and uses these concepts to deal with the steady multilateral system diseases (mathematical index too high or too low). In mathematics, a steady multilateral system is said to have Energy (or Dynamic) if there is a non-negative function φ^* which makes every subsystem meaningful of the steady multilateral system. Similarly to Zhang etc [21], unless stated otherwise, any equivalence relation is the liking relation, any neighboring death relation is the loving relation, and any alternate relation is the killing relationship.

Suppose that V is a steady multilateral system having an energy, then V in the steady multilateral system during a normal operation, its energy function for any subsystem of the steady multilateral system has an average (or expected value in Statistics), this state is called as normal when the energy function is nearly to the average. Normal state is the better state.

That a subsystem of the steady multilateral system is not running properly (or disease, abnormal) is that the energy deviation from the average of the subsystems is too large, the high (real disease) or the low (virtual disease).

In addition to study these real or virtual diseases, TCM is often not only considered the energy change (Attaining or Affording) of each element in the corresponding group, but also studied a kind of relation costs. There are three kinds of relationship between each two elements of the Zangxiang system or the Jingluo system, namely the merged, synthesized and combined.

The merged relationship between two the same elements x and y is the joining operation in a set, *i.e.*, $\{x\} \cup \{y\} = \{z\}$. The element z is the result of two the same elements x and y merging. The purpose of merging is in order to get the large result energy of element z through inputting two the same elements x and y .

The synthesized relationship between two elements x and y is the multiply operation in the corresponding group system with a multiplication $*$, *i.e.*, $x * y = z$. The element z is the result of two elements x and y synthesized. The purpose of synthesized is in order to get the result energy of element z through inputting two elements x and y .

The combined relationship between two elements x and y is the division operation in the corresponding group system with a multiplication $*$, *i.e.*, $x^{-1} * y = z$. The element z is the cost of two elements x and y combined. The purpose of combined is in order to maintain or strengthen the relation between x and y through inputting the cost element z .

In general, a relationship cost is low if the cost element in the corresponding group is easy to get. A relationship cost is high, on the other hand, if the cost element in the corresponding is hard to come by.

In this case, in general, the human body pH value $x \in [7.34539, 7.45461]$ or $\rho_0 \leq \rho_1 = \rho(x) \leq 1$. This relation cost is low because this relation cost element is easy to get. The low relation cost can make the intervention increasing the sizes of both the intervention reaction coefficients ρ_1, ρ_2 and the self-protection coefficient ρ_3 .

But in general, the human body blood pH value $x \notin [7.34539, 7.45461]$ or $0 < \rho_1 = \rho(x) < \rho_0$. This relation cost is high because the relation cost element is hard to come by. The high relation cost can make the sizes of both the intervention reaction coefficients ρ_1, ρ_2 and the self-protection coefficient ρ_3 decreasing response to intervention.

The purpose of intervention is to make a human body return to normal state. The method of intervention is to increase or decrease the energy of an organ.

What kind of intervening should follow the principle to treat it? Western medicine emphasizes directly treatments on the sick organ after the sick of organ has occurred, but the indirect intervening of oriental medicine is required before the sick of organ will occur. Which is more reasonable?

Based on this idea, many issues are worth further discussion. For example, if an intervening has been implemented to a sick organ before the sick of organ

will occur, what relation disease will be low cost which does not need to be intervened? what relation disease will be high cost which needs to be intervened?

3.2. Kinds of Relationship Costs of Steady Multilateral Systems

For a steady multilateral system V with two incompatibility relations, suppose that the subsystems X, X_S, X_K, K_X, S_X are the same as those defined in Theorem 3.1. Then the relation diseases can be decomposed into the following classes:

Definition 3.4 (merged(合并), synthesized(合成) and combined (化合))
Suppose that both x and y are two elements of system of Zangxiang or Jingluo.

The merged relationship between two the same elements x and y is the joining operation in a set, i.e., $\{x\} \cup \{y\} = \{z\}$. The element z is the result of two the same elements x and y merging. The purpose of merging is in order to get the large result energy of element z through inputting two the same elements x and y .

The synthesized relationship between two elements x and y is the multiply operation in the corresponding group system with a multiplication $*$, i.e., $x * y = z$. The element z is the result of two elements x and y synthesized. The purpose of synthesized is in order to get the result energy of element z through inputting two elements x and y .

The combined relationship between two elements x and y is the division operation in the corresponding group system with a multiplication $*$, i.e., $x^{-1} * y = z$. The element z is the cost of two elements x and y combined. The purpose of combined is in order to maintain or strengthen the relation between x and y through inputting the cost element z .

The synthesized and combined operations in system of Zangxiang or Jingluo are the same since $x^{-1} = x \cdot \#$

Property 3.3 Suppose that both x and y are two elements of the Zangxiang system. Then the following statements are true.

1) The lowest cost element is

$$Yi(0,0) = Zl(0,0) = X^-(0,0).$$

The second low cost is

$$Jia(1,0) = Jia(1,0) = X^+(1,0).$$

The third low cost is

$$Ding(0,1) = Ding(0,1) = X_S^-(0,1) = [S_X^-(0,4)]^{-1} = [Gui(0,4)]^{-1} = [Gui(0,4)]^{-1}.$$

The fourth low cost is

$$Bing(1,1) = Bing(1,1) = X_S^+(1,1) = [S_X^+(1,4)]^{-1} = [Ren(1,4)]^{-1} = [Ren(1,4)]^{-1}.$$

2) The highest cost element

$$Wu(1,2) = Wu(1,2) = X_K^+(1,2) = [K_X^+(1,3)]^{-1} = [Geng(1,3)]^{-1} = [Geng(1,3)]^{-1}.$$

The second high cost is

$$Ji(0,2) = Ji(0,2) = X_K^-(0,2) = [K_X^-(0,3)]^{-1} = [Xin(0,3)]^{-1} = [Xin(0,3)]^{-1}.$$

3) *The synthesized relationships of the ten Heavenly Stems at zero costs are as follows:*

The ten heavenly stems synthesized

(十天干合化)

$$\text{Jia}(1,0) * \text{Ji}(0,2) = \text{Wu}(1,2)$$

→ Yang earth (甲己合化土),

$$\text{Yi}(0,0) * \text{Geng}(1,3) = \text{Geng}(1,3)$$

→ Yang metal (乙庚合化金),

$$\text{Bing}(1,1) * \text{Geng}(0,3) = \text{Ren}(1,4)$$

→ Yang water (丙辛合化水),

$$\text{Ding}(0,1) * \text{Ren}(1,4) = \text{Jia}(1,0)$$

→ Yang wood (丁壬合化木),

$$\text{Wu}(1,2) * \text{Gui}(0,4) = \text{Bing}(1,1)$$

→ Yang fire (戊癸合化火).

4) *The combined relationships of the ten Heavenly Stems at low costs are as follows:*

Jia(1,0) and Yi(0,0) like Jia(1,0) and Yi(0,0)

(甲乙同类甲乙)

$$(\text{Jia}(1,0))^{-1} * \text{Jia}(1,0) = \text{Yi}(0,0)$$

→ Yin wood (甲甲比肩),

$$(\text{Jia}(1,0))^{-1} * \text{Yi}(0,0) = \text{Jia}(1,0)$$

→ Yang wood (甲乙劫财),

$$(\text{Yi}(0,0))^{-1} * \text{Jia}(1,0) = \text{Jia}(1,0)$$

→ Yang wood (乙甲劫财),

$$(\text{Yi}(0,0))^{-1} * \text{Yi}(0,0) = \text{Yi}(0,0)$$

→ Yin wood (乙乙比肩).

Bing(1,1) and Ding(0,1) like Bing(1,1)

and Ding(0,1) (丙丁同类丙丁)

$$(\text{Bing}(1,1))^{-1} * \text{Bing}(1,1) = \text{Yi}(0,0)$$

→ Yin wood (丙丙比肩),

$$(\text{Bing}(1,1))^{-1} * \text{Ding}(0,1) = \text{Jia}(1,0)$$

→ Yang wood (丙丁劫财),

$$(\text{Ding}(0,1))^{-1} * \text{Bing}(1,1) = \text{Jia}(1,0)$$

→ Yang wood (丁丙劫财),

$$(\text{Ding}(0,1))^{-1} * \text{Ding}(0,1) = \text{Yi}(0,0)$$

→ Yin wood (丁丁比肩).

Wu(1,2) and Ji(0,2) like Wu(1,2)

and Ji(0,2) (戊己同类戊己)

$$(\text{Wu}(1,2))^{-1} * \text{Wu}(1,2) = \text{Yi}(0,0)$$

→ Yin wood (戊戊比肩),

$$(\text{Wu}(1,2))^{-1} * \text{Ji}(0,2) = \text{Jia}(1,0)$$

→ Yang wood (戊己劫财),

$$(\text{Ji}(0,2))^{-1} * \text{Wu}(1,2) = \text{Jia}(1,0)$$

→ Yang wood (己戊劫财),

$$(\text{Ji}(0,2))^{-1} * \text{Ji}(0,2) = \text{Yi}(0,0)$$

→ Yin wood (己己比肩).

Geng(1,3) and Xin(0,3) kill Geng(1,3)
and Xin(0,3) (庚辛同类庚辛)

$$(\text{Geng}(1,3))^{-1} * \text{Geng}(1,3) = \text{Yi}(0,0)$$

→ Yin wood (庚庚比肩),

$$(\text{Geng}(1,3))^{-1} * \text{Xin}(0,3) = \text{Jia}(1,0)$$

→ Yang wood (庚辛劫财),

$$(\text{Xin}(0,3))^{-1} * \text{Geng}(1,3) = \text{Jia}(1,0)$$

→ Yang wood (辛庚劫财),

$$(\text{Xin}(0,3))^{-1} * \text{Xin}(0,3) = \text{Yi}(0,0)$$

→ Yin wood (辛辛比肩).

Ren(1,4) and Gui(0,4) like Ren(1,4)
and Gui(0,4) (壬癸同类壬癸)

$$(\text{Ren}(1,4))^{-1} * \text{Ren}(1,4) = \text{Yi}(0,0)$$

→ Yin wood (壬壬比肩),

$$(\text{Ren}(1,4))^{-1} * \text{Gui}(0,4) = \text{Jia}(1,0)$$

→ Yang wood (壬癸劫财),

$$(\text{Gui}(0,4))^{-1} * \text{Ren}(1,4) = \text{Jia}(1,0)$$

→ Yang wood (癸壬劫财),

$$(\text{Gui}(0,4))^{-1} * \text{Gui}(0,4) = \text{Yi}(0,0)$$

→ Yin wood (癸癸比肩).

Jia(1,0) and Yi(0,0) love Bing(1,1)
and Ding(0,1) (甲乙生丙丁)

$$(\text{Jia}(1,0))^{-1} * \text{Bing}(1,1) = \text{Ding}(0,1)$$

→ Yin fire (甲偏印丙),

$$(\text{Jia}(1,0))^{-1} * \text{Ding}(0,1) = \text{Bing}(1,1)$$

→ Yang fire (甲正印丁),

$$(\text{Yi}(0,0))^{-1} * \text{Bing}(1,1) = \text{Bing}(1,1)$$

→ Yang fire (乙正印丙),

$$(\text{Yi}(0,0))^{-1} * \text{Ding}(0,1) = \text{Ding}(0,1)$$

→ Yin fire (乙偏印丁).

Bing(1,1) and Ding(0,1) love Wu(1,2)
and Ji(0,2) (丙丁生戊己)

$$(\text{Bing}(1,1))^{-1} * \text{Wu}(1,2) = \text{Ding}(0,1)$$

→ Yin fire (丙偏印戊),

$$(\text{Bing}(1,1))^{-1} * \text{Ji}(0,2) = \text{Bing}(1,1)$$

→ Yang fire (丙正印己),

$$(\text{Ding}(0,1))^{-1} * \text{Wu}(1,2) = \text{Bing}(1,1)$$

→ Yang fire (丁正印戊),

$$(\text{Ding}(0,1))^{-1} * \text{Ji}(0,2) = \text{Ding}(0,1)$$

→ Yin fire (丁偏印己).

Wu(1,2) and Ji(0,2) love Geng(1,3)
and Xin(0,3) (戊己生庚辛)

$$(\text{Wu}(1,2))^{-1} * \text{Geng}(1,3) = \text{Ding}(0,1)$$

→ Yin fire (戊偏印庚),

$$(\text{Wu}(1,2))^{-1} * \text{Xin}(0,3) = \text{Bing}(1,1)$$

→ Yang fire (戊正印辛),

$$(\text{Ji}(0,2))^{-1} * \text{Geng}(1,3) = \text{Bing}(1,1)$$

→ Yang fire (己正印庚),

$$(\text{Ji}(0,2))^{-1} * \text{Xin}(0,3) = \text{Ding}(0,1)$$

→ Yin fire (己偏印辛).

Geng(1,3) and Xin(0,3) love Ren(1,4)
and Gui(0,4) (庚辛生壬癸)

$$(\text{Geng}(1,3))^{-1} * \text{Ren}(1,4) = \text{Ding}(0,1)$$

→ Yin fire (庚偏印壬),

$$(\text{Geng}(1,3))^{-1} * \text{Gui}(0,4) = \text{Bing}(1,1)$$

→ Yang fire (庚正印癸),

$$(\text{Xin}(0,3))^{-1} * \text{Ren}(1,4) = \text{Bing}(1,1)$$

→ Yang fire (辛正印壬),

$$(\text{Xin}(0,3))^{-1} * \text{Gui}(0,4) = \text{Ding}(0,1)$$

→ Yin fire (辛正印癸).

Ren(1,4) and Gui(0,4) love Jia(1,0)
and Yi(0,0) (壬癸生甲乙)

$$(\text{Ren}(1,4))^{-1} * \text{Jia}(1,0) = \text{Ding}(0,1)$$

→ Yin fire (壬偏印甲),

$$(\text{Ren}(1,4))^{-1} * \text{Yi}(0,0) = \text{Bing}(1,1)$$

→ Yang fire (壬正印乙),

$$(\text{Gui}(0,4))^{-1} * \text{Jia}(1,0) = \text{Bing}(1,1)$$

→ Yang fire (癸正印甲),

$$(\text{Gui}(0,4))^{-1} * \text{Yi}(0,0) = \text{Ding}(0,1)$$

→ Yin fire (癸偏印乙).

5) *The combined relationships of the ten Heavenly Stems are at highest costs as follows.*

Jia(1,0) and Yi(0,0) kill Wu(1,2)

and Ji(0,2) (甲乙克戊己)

$$(\text{Jia}(1,0))^{-1} * \text{Wu}(1,2) = \text{Ji}(0,2)$$

→ Yin earth (甲戊偏相克),

$$(\text{Jia}(1,0))^{-1} * \text{Ji}(0,2) = \text{Wu}(1,2)$$

→ Yang earth (甲己正相克),

$$(\text{Yi}(0,0))^{-1} * \text{Wu}(1,2) = \text{Wu}(1,2)$$

→ Yang earth (乙戊正相克),

$$(\text{Yi}(0,0))^{-1} * \text{Ji}(0,2) = \text{Ji}(0,2)$$

→ Yin earth (乙己偏相克).

Wu(1,2) and Ji(0,2) kill Ren(1,4)

and Gui(0,4) (戊己克壬癸)

$$(\text{Wu}(1,2))^{-1} * \text{Ren}(1,4) = \text{Xin}(0,3)$$

→ Yin metal (戊壬偏相克),

$$(\text{Wu}(1,2))^{-1} * \text{Gui}(0,4) = \text{Geng}(1,3)$$

→ Yin metal (戊癸正相克),

$$(\text{Ji}(0,2))^{-1} * \text{Ren}(1,4) = \text{Geng}(1,3)$$

→ Yin metal (己壬正相克),

$$(\text{Ji}(0,2))^{-1} * \text{Gui}(0,4) = \text{Xin}(0,3)$$

→ Yin metal (己癸偏相克).

Ren(1,4) and Gui(0,4) kill Bing(1,1)

and Ding(0,1) (壬癸克丙丁)

$$(\text{Ren}(1,4))^{-1} * \text{Bing}(1,1) = \text{Ji}(0,2)$$

→ Yin earth (壬丙偏相克),

$$(\text{Ren}(1,4))^{-1} * \text{Ding}(0,1) = \text{Wu}(1,2)$$

→ Yin earth (壬丁正相克),

$$(\text{Gui}(0,4))^{-1} * \text{Bing}(1,1) = \text{Wu}(1,2)$$

→ Yin earth (癸丙正相克),

$$(\text{Gui}(0,4))^{-1} * \text{Ding}(0,1) = \text{Ji}(0,2)$$

→ Yin earth (癸丁偏相克).

Bing(1,1) and Ding(0,1) kill Geng(1,3)

and Xin(0,3) (丙丁克庚辛)

$$(\text{Bing}(1,1))^{-1} * \text{Geng}(1,3) = \text{Ji}(0,2)$$

→ Yin earth (丙庚偏相克),

$$(\text{Bing}(1,1))^{-1} * \text{Xin}(0,3) = \text{Wu}(1,2)$$

→ Yang earth (丙辛正相克),

$$(\text{Ding}(0,1))^{-1} * \text{Geng}(1,3) = \text{Wu}(1,2)$$

→ Yang earth (丁庚正相克),

$$(\text{Ding}(0,1))^{-1} * \text{Xin}(0,3) = \text{Ji}(0,2)$$

→ Yin earth (丁辛偏相克).

Geng(1,3) and Xin(0,3) kill Jia(1,0)

and Yi(0,0) (庚辛克甲乙)

$$(\text{Geng}(1,3))^{-1} * \text{Jia}(1,0) = \text{Ji}(0,2)$$

→ Yin earth (庚甲偏相克),

$$(\text{Geng}(1,3))^{-1} * \text{Yi}(0,0) = \text{Wu}(1,2)$$

→ Yang earth (庚乙正相克),

$$(\text{Xin}(0,3))^{-1} * \text{Jia}(1,0) = \text{Wu}(1,2)$$

→ Yang earth (辛甲正相克),

$$(\text{Xin}(0,3))^{-1} * \text{Yi}(0,0) = \text{Ji}(0,2)$$

→ Yin earth (辛乙偏相克).

The ten heavenly stems rushing

(十天干相冲)

$$(\text{Jia}(1,0))^{-1} * \text{Geng}(1,3) = \text{Xin}(0,3)$$

→ Yin metal (甲庚相冲),

$$(\text{Yi}(0,0))^{-1} * \text{Xin}(0,3) = \text{Xin}(0,3)$$

→ Yin metal (乙辛相冲),

$$(\text{Ren}(1,4))^{-1} * \text{Bing}(1,1) = \text{Ji}(0,2)$$

→ Yin earth (壬丙相冲),

$$(\text{Gui}(0,4))^{-1} * \text{Ding}(0,1) = \text{Ji}(0,2)$$

→ Yin earth (癸丁相冲),

$$(\text{Wu}(1,2))^{-1} * \text{Ji}(0,2) = \text{Jia}(1,0)$$

→ Yang wood (戊己无冲).

*All relation laws of the Zangxiang system or the ten Heavenly Stems model are summarized in **Figure 2**. It means that both the liking relation and the loving relation have the low cost, but the killing relation has high cost.#*

Property 3.4 *Suppose that both x and y are two elements of the Jingluo system. Then the following statements are true.*

1) *The lowest cost elements are as follows:*

$$\text{Chou}(0,(23)) = \text{丑}(0,(23)) = X(0,(23))$$

= 阴营气 → liver (肝),

$$\text{You}(0,(132)) = \text{巳}(0,(132)) = K_x(0,(132))$$

= 阴宗气 → spleen (脾),

$$\text{Wu}(0,(123)) = \text{酉}(0,(123)) = X_s^x(0,(123))$$

= 阴真气 → kidney (肾).

The second low cost elements are as follows:

$$\text{Zi}(0,e) = \text{子}(0,e) = X(0,e)$$

= 阴元气 → gallbladder (胆),

$$\text{Chen}(0,(12)) = \text{辰}(0,(12)) = X_k(0,(12))$$

= 阴谷气 → stomach (胃),

$$\text{Shen}(0,(13)) = \text{申}(0,(13)) = S_x(0,(13))$$

= 阴卫气 → bladder (膀胱).

2) *The highest relation cost elements are as follows*

$\text{Hai}(1, e) = \text{亥}(1, e) = X_S^j(1, e)$
 = 阳元气 → triple energizer (三焦),
 $\text{Mao}(1, (12)) = \text{卯}(1, (12)) = K_X(1, (12))$
 = 阳谷气 → large intestine (大肠),
 $\text{Wei}(1, (13)) = \text{未}(1, (13)) = S_X(1, (13))$
 = 阳卫气 → small intestine (小肠).

The second high cost elements are as follows

$\text{Xu}(1, (23)) = \text{戌}(1, (23)) = X_S^-(1, (23))$
 = 阳营气 → pericardium (心包),
 $\text{Yin}(1, (132)) = \text{寅}(1, (132)) = K_X(1, (132))$
 = 阳宗气 → lung (肺),
 $\text{Wu}(1, (123)) = \text{午}(1, (123)) = X_S^+(1, (123))$
 = 阳真气 → heart (心).

3) The merged relationships of the twelve Earthly Branches at zero costs are as follows:

Number three rendezvous (地支三会局)
 $\{\text{Yin}(1, (132)), \text{Mao}(1, (12)), \text{Chen}(0, (12))\}$
 → {Yin wood, Yang wood, Yang earth }
 → (寅卯辰三会东方木),
 $\{\text{Si}(0, (132)), \text{Wu}(1, (123)), \text{Wei}(1, (13))\}$
 → {Yin fire, Yang fire, Yin earth }
 → (寅卯辰三会南方火),
 $\{\text{Shen}(0, (13)), \text{You}(0, (123)), \text{Xu}(1, (23))\}$
 → {Yang metal, Yin metal, Yang earth }
 → (寅卯辰三会西方金),
 $\{\text{Hai}(1, e), \text{Zi}(0, e), \text{Chou}(0, (23))\}$
 → {Yin water, Yang water, Yin earth }
 → (亥子丑三会北方水).

4) The synthesized relationships of the twelve Earthly Branches at zero costs are as follows:

Number six synthesized (地支六合化)
 $\text{Zi}(0, e) * \text{Chou}(0, (23)) = \text{Chou}(0, (23))$
 → Yin earth (子丑合化土),
 $\text{Yin}(1, (132)) * \text{Hai}(1, e) = \text{Si}(0, (132))$
 $\text{Si}(0, (132)) * \text{Hai}(1, e) = \text{Yin}(1, (132))$
 → Yang wood (寅亥合化木),
 $\text{Mao}(1, (12)) * \text{Xu}(1, (23)) = \text{Si}(0, (132))$
 → Yin fire (卯戌合化火),

$$\text{Chen}(0, (12)) * \text{You}(0, (123)) = \text{Shen}(0, (13))$$

→ Yang metal (辰酉合金),

$$\text{Si}(0, (132)) * \text{Shen}(0, (13)) = \text{Chou}(0, (23))$$

$$\text{Chou}(0, (23)) * \text{Chou}(0, (23)) = \text{Zi}(0, e)$$

→ Yang water (巳申化水),

$$\text{Wu}(1, (123)) * \text{Wei}(1, (13)) = \text{Chen}(0, (12))$$

→ Yang earth (未午化土).

5) *The combined relationships of the twelve Earthly Branches at low costs are as follows:*

Number six combined (地支三合局)

$$(\text{Shen}(0, (13)))^{-1} * \text{Zi}(0, e) = \text{Shen}(0, (13)),$$

$$(\text{Zi}(0, e))^{-1} * \text{Chen}(0, (12)) = \text{Chen}(0, (12)),$$

$$(\text{Chen}(0, (12)))^{-1} * \text{Shen}(0, (13)) = \text{You}(0, (123)),$$

$$\text{Chen}(0, (12)) * \text{You}(0, (123)) * \text{Shen}(0, (13)) = \text{Zi}(0, e)$$

→ Yang water (申子辰化合水局).

$$(\text{Wei}(1, (13)))^{-1} * \text{Mao}(1, (12)) = \text{Yin}(1, (132)),$$

$$(\text{Wei}(1, (13)))^{-1} * \text{Hai}(1, e) = \text{Shen}(0, (13)),$$

$$(\text{Hai}(1, e))^{-1} * \text{Mao}(1, (12)) = \text{Chen}(0, (12)),$$

$$\text{Shen}(0, (13)) * \text{Chen}(0, (12)) * \text{Hai}(1, e) = \text{Yin}(1, (132))$$

→ Yang wood (亥卯未化合木局).

$$(\text{Yin}(1, (132)))^{-1} = \text{Wu}(1, (123)),$$

$$(\text{Wu}(1, (123)))^{-1} * \text{Xu}(1, (23)) = \text{Chen}(0, (12)),$$

$$(\text{Xu}(1, (23)))^{-1} * \text{Yin}(1, (132)) = \text{Shen}(0, (13)),$$

$$\text{Chen}(0, (12)) * \text{Shen}(0, (13)) = \text{Wu}(1, (123))$$

→ Yang fire (寅午戌化合火局).

$$(\text{Chou}(0, (23)))^{-1} * \text{Si}(0, (132)) = \text{Shen}(0, (13)),$$

$$(\text{Si}(0, (132)))^{-1} * \text{You}(0, (123)) = \text{Si}(0, (132)),$$

$$(\text{You}(0, (123)))^{-1} * \text{Chou}(0, (23)) = \text{Chen}(0, (12)),$$

$$\text{Mao}(0, (12)) * \text{You}(0, (123)) = \text{Shen}(0, (13))$$

→ Yang metal (巳酉丑合金局).

Number six combined (地支六化合)

$$[\text{Zi}(0, e)]^{-1} * \text{Chou}(0, (23)) = \text{Chou}(0, (23))$$

→ Yin earth (子丑化合土),

$$[\text{Yin}(1, (132))]^{-1} * \text{Hai}(1, e) = \text{You}(0, (123)),$$

$$[\text{You}(0, (123))]^{-1} * \text{Hai}(1, e) = \text{Yin}(1, (132))$$

→ Yang wood (寅亥化合木),

$$[\text{Mao}(1, (12))]^{-1} * \text{Xu}(1, (23)) = \text{Si}(0, (132))$$

→ Yin fire (卯戌化合火),

$[\text{Chen}(0, (12))]^{-1} * \text{You}(0, (123)) = \text{Shen}(0, (13))$
 → Yang metal (辰酉化合金),
 $[\text{Si}(0, (132))]^{-1} * \text{Shen}(0, (13)) = \text{Chen}(0, (12)),$
 $[\text{Chen}(0, (12))]^{-1} * \text{Chen}(0, (12)) = \text{Zi}(0, e)$
 → Yang water (巳申化合水),
 $[\text{Wu}(1, (123))]^{-1} * \text{Wei}(1, (13)) = \text{Chou}(0, (23))$
 → Yin earth (午未化合土).

(6) *The combined relationships of the twelve Earthly Branches at high costs are as follows.*

Number six evils (地支六害)

$(\text{Zi}(0, e))^{-1} * \text{Wei}(1, (13)) = \text{Wei}(1, (13))$
 → Yin earth (子未相害),
 $(\text{Chou}(0, (23)))^{-1} * \text{Wu}(1, (123)) = \text{Mao}(1, (12))$
 → Yin wood (丑午相害),
 $(\text{Yin}(1, (132)))^{-1} * \text{Si}(0, (132)) = \text{Hai}(1, e)$
 → Yin water (寅巳相害),
 $(\text{Mao}(1, (12)))^{-1} * \text{Chen}(0, (12)) = \text{Hai}(1, e)$
 → Yin water (卯辰相害),
 $(\text{Shen}(0, (13)))^{-1} * \text{Hai}(1, e) = \text{Wei}(1, (13))$
 → Yin earth (申亥相害),
 $(\text{You}(0, (123)))^{-1} * \text{Xu}(1, (23)) = \text{Mao}(1, (12))$
 → Yin wood (酉戌相害).

Number six rushed (地支六冲)

$(\text{Zi}(0, e))^{-1} * \text{Wu}(1, (123)) = \text{Wu}(1, (123))$
 → Yang fire (子午相冲),
 $(\text{Chou}(0, (23)))^{-1} * \text{Wei}(1, (13)) = \text{Yin}(1, (132))$
 → Yang wood (丑未相冲),
 $(\text{Yin}(1, (132)))^{-1} * \text{Shen}(0, (13)) = \text{Mao}(1, (12))$
 → Yin wood (寅申相冲),
 $(\text{Mao}(1, (12)))^{-1} * \text{You}(0, (123)) = \text{Wei}(1, (13))$
 → Yin earth (卯酉相冲),
 $(\text{Shen}(0, (13)))^{-1} * \text{Xu}(1, (23)) = \text{Wu}(1, (123))$
 → Yang fire (申戌相冲),
 $(\text{Si}(0, (132)))^{-1} * \text{Hai}(1, e) = \text{Wu}(1, (123))$
 → Yang fire (巳亥相冲).

Number three punished (地支三刑)

(a). Three - elements punishment (三元刑, 环刑)
 (No punishment of kindness (无恩之刑))
 $(\text{Yin}(1, (132)))^{-1} * \text{Si}(0, (132)) = \text{Hai}(1, e)$
 → Yin water (寅刑巳),
 $(\text{Si}(0, (132)))^{-1} * \text{Shen}(0, (13)) = \text{Chen}(0, (12))$
 → Yang earth (巳刑申),
 $(\text{Shen}(0, (13)))^{-1} * \text{Yin}(1, (132)) = \text{Mao}(1, (12))$
 → Yin wood (申刑寅).

(b). Three - elements punishment (三元刑, 环刑)

(The power of punishment (持势之刑))

$$(\text{Chou}(0, (23)))^{-1} * \text{Xu}(1, (23)) = \text{Hai}(1, e)$$

→ Yin water (丑刑戌),

$$(\text{Xu}(1, (23)))^{-1} * \text{Wei}(1, (13)) = \text{You}(0, (132))$$

→ Yin metal (戌刑未),

$$(\text{Wei}(1, (13)))^{-1} * \text{Chou}(0, (23)) = \text{Wu}(1, (123))$$

→ Yang fire (未刑丑).

(c). Two - elements punishment (二元刑, 对刑)

(A punishment of rude (无礼之刑))

$$(\text{Zi}(0, e))^{-1} \text{Mao}(1, (12)) = \text{Mao}(1, (12))$$

→ Yin wood (子刑卯),

$$(\text{Mao}(1, (12)))^{-1} \text{Zi}(0, e) = \text{Mao}(1, (12))$$

→ Yin wood (卯刑子).

(d). One - element punishment (一元刑, 自刑)

(A punishment of things very (物极之刑))

$$(\text{Chen}(0, (12)))^{-1} \text{Chen}(0, (12)) = \text{Zi}(0, e)$$

→ Yang water (辰刑辰),

$$(\text{Wu}(1, (123)))^{-1} \text{Wu}(1, (123)) = \text{Zi}(0, e)$$

→ Yang water (午刑午),

$$(\text{You}(0, (123)))^{-1} \text{You}(0, (123)) = \text{Zi}(0, e)$$

→ Yang water (酉刑酉),

$$(\text{Hai}(1, e))^{-1} \text{Hai}(1, e) = \text{Zi}(0, e)$$

→ Yang water (亥刑亥).

All relation laws of the Jingluo system or the twelve Earthly Branches model are summarized in Figure 3. It means that the hand phase in Figure 3, all transverse relationship with low cost, but all vertical relationship with high cost. On the other hand, in the three types {Yin, Mao}, {Wu, Wei}, {Xu, Hai} or the three types {Chen, Si}, {Shen, You}, {Zi, Shou} for the vertices of the triangle respectively, the relationship between the cost is low. Otherwise, the relationship between the cost is high.#

3.3. First Transfer Laws of a Human Body's Energies of Steady Multilateral Systems with a Healthy Body

Suppose that a steady multilateral system V having energy function φ^* is normal or healthy. Let x be the human blood pH value of V . Taking $\rho_1 = \rho(x)$, $\rho_2 = \rho(x)^2$, and $\rho_3 = c\rho(x)$ where $0 \leq c \leq 1$ and $\rho(x)$ is defined in Equations (1) and (2). The healthy body means that the conditions $\rho_0 \leq \rho(x) \leq 1$ and $0 < c \leq 1$ hold. By Corollary 2.1, it is equivalent to the normal range $x \in [7.34539, 7.45461]$ or the healthy condition $\rho_1 + \rho_2\rho_3 \geq 1 - \rho_2\rho_3$. That $c \rightarrow 0$ implies that the body is without the ability of self-protection, i.e., $\rho_3 = c\rho(x) \rightarrow 0$. Of course, the body cannot be healthy. It is because for any $x \neq 7.4$, when $c \rightarrow 0$, there are

$$\begin{aligned}\rho_1 + \rho_2\rho_3 &= \rho(x) + c\rho(x)^3 \rightarrow \rho(x) < 1 \\ \leftarrow 1 - c\rho(x)^3 &= 1 - \rho_2\rho_3,\end{aligned}$$

such that the healthy condition $\rho_1 + \rho_2\rho_3 \geq 1 - \rho_2\rho_3$ cannot hold.

By using Corollary 2.1 and Theorems 2.1 and 3.1, the following Theorems 3.2 and 3.3 can be obtained as the transfer law of occurrence and change of a human body's energies with a healthy body.

Theorem 3.2 (The first transfer law of the ten Heavenly Stems with a healthy body) *Let the human blood pH value $x \in [7.34539, 7.45461]$ which is equivalent to the conditions $\rho_0 \leq \rho_1 = \rho(x) \leq 1$ and $0 < c \leq 1$.*

The transfer law of each of the 10 kinds of energy in the the Zangxiang system or the ten Heavenly Stems model is from its root-causes to its symptoms. Furthermore, for the healthy body, the transfer law of the Yang vital or righteousness energies of the ten heavenly stems is transferring along the loving or liking order of the ten heavenly stems as follows:

$$\begin{aligned}\overset{\text{less}}{\rightarrow} \text{real Jia}(1,0)X^+ &\leftrightarrow \overset{\text{less}}{\text{real Yi}}(0,0)X^- \\ \overset{\text{less}}{\rightarrow} \text{real Bing}(1,1)X_S^+ &\leftrightarrow \overset{\text{less}}{\text{real Ding}}(0,1)X_S^- \\ \overset{\text{rare}}{\rightarrow} \text{virtual Wu}(1,2)X_K^+ &\leftrightarrow \overset{\text{less}}{\text{virtual Ji}}(0,2)X_K^- \\ \overset{\text{more}}{\rightarrow} \text{virtual Geng}(1,3)K_X^+ &\leftrightarrow \overset{\text{less}}{\text{virtual Xin}}(0,3)K_X^- \\ \overset{\text{rare}}{\rightarrow} \text{real Ren}(1,4)S_X^+ &\leftrightarrow \overset{\text{less}}{\text{real Gui}}(0,4)S_X^- \\ \overset{\text{less}}{\rightarrow} \text{real Jia}(1,0)X^+ &\leftrightarrow \overset{\text{less}}{\text{real Yi}}(0,0)X^- \rightarrow \dots\end{aligned}$$

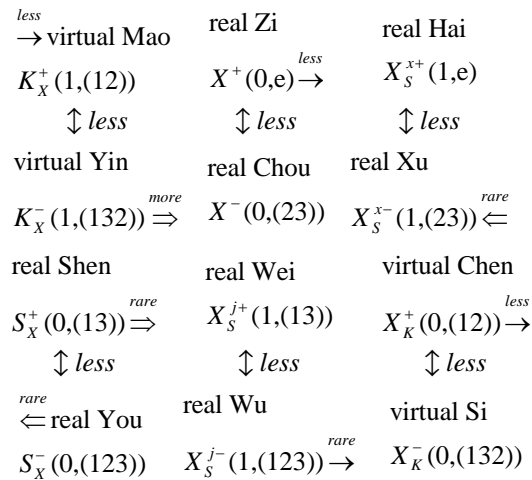
And the transfer law of the Yin vital or righteousness energies of the ten heavenly stems is transferring against the loving or liking order of the ten heavenly stems as follows:

$$\begin{aligned}\dots &\overset{\text{less}}{\leftarrow} \text{virtual Yi}(0,0)X^- \leftrightarrow \overset{\text{less}}{\text{virtual Jia}}(1,0)X^+ \\ \overset{\text{less}}{\leftarrow} \text{virtual Gui}(0,4)S_X^- &\leftrightarrow \overset{\text{less}}{\text{virtual Ren}}(1,4)S_X^+ \\ \overset{\text{rare}}{\leftarrow} \text{real Xin}(0,3)K_X^- &\leftrightarrow \overset{\text{less}}{\text{real Geng}}(1,3)K_X^+ \\ \overset{\text{more}}{\leftarrow} \text{real Ji}(0,2)X_K^- &\leftrightarrow \overset{\text{less}}{\text{real Wu}}(1,2)X_K^+ \\ \overset{\text{rare}}{\leftarrow} \text{virtual Ding}(0,1)X_S^- &\leftrightarrow \overset{\text{less}}{\text{virtual Bing}}(1,1)X_S^+ \\ \overset{\text{less}}{\leftarrow} \text{virtual Yi}(0,0)X^- &\leftrightarrow \overset{\text{less}}{\text{virtual Jia}}(1,0)X^+ \leftarrow \dots\end{aligned}$$

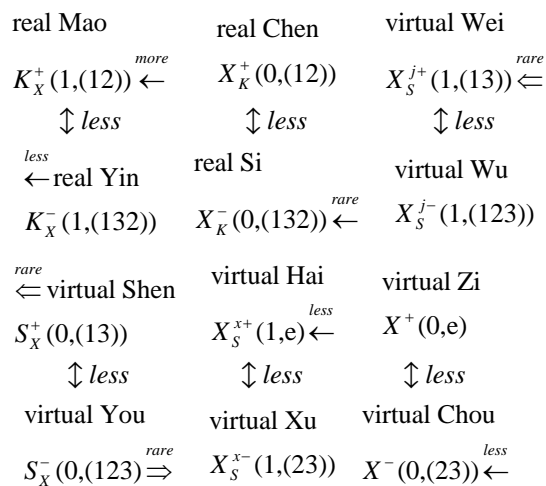
*All transfer laws of the Zangxiang system or the ten Heavenly Stems model for a healthy body are summarized in **Figure 2**. It means that only both the liking relation and the loving relation have the transfer law of the Yang or Yin vital or righteousness energies of the ten heavenly stems. Yang is transferring along the loving or liking order of the ten heavenly stems. Yin is transferring against the loving or liking order of the ten heavenly stems.#*

Theorem 3.3 (The first transfer law of the twelve Earthly Branches with a healthy body) *Let the human blood pH value $x \in [7.34539, 7.45461]$ which is equivalent to the conditions $\rho_0 \leq \rho_1 = \rho(x) \leq 1$ and $0 < c \leq 1$.*

The transfer law of each of the 12 kinds of energy in the Jingluo system or the twelve Earthly Branches model is from its root-causes to its symptoms. Furthermore, for the healthy body, the transfer law of the Yang vital energies of the twelve earthly branches is transferring along the loving or liking order of the twelve earthly branches as follows.



The transfer law of the Yin vital energies of the twelve earthly branches is transferring against the loving or liking order of the ten heavenly stems as follows.



*All transfer laws of the Jingluo system or the twelve Earthly Branches model for a healthy body are summarized in **Figure 3**. It means that only both the liking relation and the adjacent relation have the transfer law of the Yang or Yin vital or righteousness energies of the twelve earthly branches. Yang is transferring along the loving or liking order of the twelve earthly branches. Yin is transferring against the loving or liking order of the twelve earthly branches.#*

Remark 4. Theorems 3.2 and 3.3 are called the transfer law of occurrence and

change of a human body's energies with a healthy body, simply, the first transfer law.

For a Yang energy of X and the Zangxiang system or the ten Heavenly Stems model for a healthy body, the first transfer law is transferring along the loving or liking order of the ten heavenly stems as follows:

$$\begin{aligned}
 & \xrightarrow{\text{less}} \text{real } X^+ \leftrightarrow \text{real } X^- \\
 & \xrightarrow{\text{less}} \text{real } X_S^+ \leftrightarrow \text{real } X_S^- \\
 & \xrightarrow{\text{rare}} \text{virtual } X_K^+ \leftrightarrow \text{virtual } X_K^- \\
 & \xrightarrow{\text{more}} \text{virtual } K_X^+ \leftrightarrow \text{virtual } K_X^- \\
 & \xrightarrow{\text{rare}} \text{real } S_X^+ \leftrightarrow \text{real } S_X^- \\
 & \xrightarrow{\text{less}} \text{real } X^+ \leftrightarrow \text{real } X^-
 \end{aligned}$$

For a Yin energy of X and the Zangxiang system or the ten Heavenly Stems model for a healthy body, the first transfer law is transferring against the loving or liking order of the ten heavenly stems as follows:

$$\begin{aligned}
 & \text{virtual } X^- \xrightarrow{\text{less}} \text{virtual } X^+ \\
 & \xleftarrow{\text{less}} \text{virtual } S_X^- \leftrightarrow \text{virtual } S_X^+ \\
 & \xleftarrow{\text{rare}} \text{real } K_X^- \leftrightarrow \text{real } K_X^+ \\
 & \xleftarrow{\text{more}} \text{real } X_K^- \leftrightarrow \text{real } X_K^+ \\
 & \xleftarrow{\text{rare}} \text{virtual } X_S^- \leftrightarrow \text{virtual } X_S^+ \\
 & \xleftarrow{\text{less}} \text{virtual } X^- \leftrightarrow \text{virtual } X^+
 \end{aligned}$$

For a Yang energy of X and the Jingluo system or the twelve Earthly Branches model for a healthy body, the first transfer law is transferring along the loving or liking order of the twelve earthly branches as follows:

$$\begin{aligned}
 & \text{real Chou } X^- \xrightarrow{\text{less}} \text{real Zi } X^+ \\
 & \xrightarrow{\text{less}} \text{real Hai } X_S^{x+} \leftrightarrow \text{real Xu } X_S^{x-} \\
 & \xrightarrow{\text{rare}} \text{real You } S_X^- \leftrightarrow \text{real Shen } S_X^+ \\
 & \xrightarrow{\text{rare}} \text{real Wei } X_S^{j+} \leftrightarrow \text{real Wu } X_S^{j-} \\
 & \xrightarrow{\text{less}} \text{virtual Si } X_K^- \leftrightarrow \text{virtual Chen } X_K^+ \\
 & \xrightarrow{\text{less}} \text{virtual Mao } K_X^+ \leftrightarrow \text{virtual Yin } K_X^- \\
 & \xrightarrow{\text{rare}} (\text{real You } S_X^- \leftrightarrow \text{real Shen } S_X^+) \\
 & \xrightarrow{\text{less}} \text{real Chou } X^- \leftrightarrow \text{real Zi } X^+
 \end{aligned}$$

For a Yin energy of X and the Jingluo system or the twelve Earthly Branches model for a healthy body, the first transfer law is transferring against the loving

or liking order of the twelve earthly branches as follows

$$\begin{aligned}
 & \overset{\text{less}}{\leftarrow} \text{virtual Zi } X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual Chou } X^- \\
 & (\overset{\text{less}}{\leftarrow} \text{virtual Shen } S_X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual You } S_X^-) \\
 & \overset{\text{rare}}{\leftarrow} \text{real Yin } K_X^- \overset{\text{less}}{\leftrightarrow} \text{real Mao } K_X^+ \\
 & \overset{\text{more}}{\leftarrow} \text{real Chen } X_K^+ \overset{\text{less}}{\leftrightarrow} \text{real Si } X_K^- \\
 & \overset{\text{rare}}{\leftarrow} \text{virtual Wu } X_S^{j-} \overset{\text{less}}{\leftrightarrow} \text{virtual Wei } X_S^{j+} \\
 & \overset{\text{rare}}{\leftarrow} \text{virtual Shen } S_X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual You } S_X^- \\
 & \overset{\text{rare}}{\Rightarrow} \text{virtual Xu } X_S^{x-} \overset{\text{less}}{\leftrightarrow} \text{virtual Hai } X_S^{x+} \\
 & \overset{\text{less}}{\leftarrow} \text{virtual Zi } X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual Chou } X^-
 \end{aligned}$$

Because the energy change between $\overset{\text{less}}{\leftarrow} \text{virtual Zi } X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual Chou } X^-$ and $\overset{\text{less}}{\leftarrow} \text{real Yin } K_X^- \overset{\text{less}}{\leftrightarrow} \text{real Mao } K_X^+$ needs to be adjusted by the energy of $\overset{\text{less}}{\leftarrow} \text{virtual Shen } S_X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual You } S_X^-$, so generally believe that the Yin energy of X begins with the Yang energy of $\text{real Yin } K_X^- \overset{\text{less}}{\leftrightarrow} \text{real Mao } K_X^+$. This is in Zi to Yin (11 PM at night to the next day at half past five) need to have a rest.

The transfer relation of the first transfer law running is the loving or liking relationship, denoted by \rightarrow or \leftrightarrow . The running condition of the first transfer law is both $(\rho_1 + \rho_2\rho_3) \geq (1 - \rho_2\rho_3)$ and $\rho_3 = c\rho(x) > 0$.

By Theorem 2.1 and Corollary 2.1, the running condition is nearly equivalent to both $\rho_0 \leq \rho_1 = \rho(x) \leq 1$ and $0 < c \leq 1$. The best-state condition of the first transfer law is $\rho_3 = c\rho(x)$ where $c \rightarrow 1$ which is the best state of ρ_3 for a healthy body. To follow or utilize the running of the first transfer law is equivalent to the following method. For doing so, it is in order to protect or maintain the loving relationship. The method can strengthen both the value $(\rho_1 + \rho_2\rho_3) = (\rho(x) + c\rho(x)^3)$ tending to be large and the value $(1 - \rho_2\rho_3) = (1 - c\rho(x)^3)$ tending to be small at the same time. In other words, the way can make all of both $\rho(x)$ and c tending to be large. It is because the running condition of the loving or liking relationship $(\rho_1 + \rho_2\rho_3) \geq (1 - \rho_2\rho_3)$ is the stronger the use, which dues to $\rho_1 = \rho(x)$ the greater the use. In other words again, if the treatment principle of the loving relationship disease is to use continuously abiding by the first transfer law, then all of both the intervention reaction coefficients $\rho_1 = \rho(x), \rho_2 = \rho(x)^2$ and the coefficient of self-protection $\rho_3 = c\rho(x) > 0$ where $0 < c \leq 1$ will tend to be the best state, *i.e.*, $\rho(x) \rightarrow 1$ and $0 < c \rightarrow 1$.

Side effects of medical problems were the question: in the medical process, destroyed the balance of the normal systems which are not sick or intervened subsystems. The energy change of the intervened system is not the true side effects issue. The energy change is called the pseudo or non-true side effects issue

since it is just the food of the second physiological system of the steady multilateral system for a healthy body by Attaining Rule. The best state of the self-protection coefficient, *i.e.*, $\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1$, where $c \rightarrow 1$, implies the non-existence of any side effects issue if the treatment principle of TCM is used. Therefore any disease that causes side effects issue occurrence in the first place dues to the non-best state of self-protection ability, *i.e.*, $\rho_3 = c\rho(x) < \rho(x) = \rho_1$. To follow or utilize the running of the first transfer law can make both $\rho(x) \rightarrow 1$ and $0 < c \rightarrow 1$. At this point, the paper advocates to follow or utilize the first transfer law. It is in order to avoid the side effects issue occurrence for a healthy body.#

3.4. Second Transfer Laws of a Human Body's Energies of Steady Multilateral Systems with an unhealthy Body

Suppose that a steady multilateral system V having energy function $\varphi^{(*)}$ is abnormal or unhealthy. Let x be the human blood pH value of V . Taking $\rho_1 = \rho(x)$, $\rho_2 = \rho(x)^2$ and $\rho_3 = c\rho(x)$ where $0 \leq c \leq 1$, and $\rho(x)$ is defined in Equations (1) and (2). The unhealthy body means that the conditions $\rho_0 > \rho(x) > 0$ and $0 \leq c \leq 1$ hold, which is equivalent to the abnormal range $x \in [7.34539, 7.45461]$.

From [20] and by using Corollary 2.1 and Theorems 2.1 and 3.1, the following Theorems 3.4 and 3.5 can be obtained as the transfer law of occurrence and change of a human body's energies with an unhealthy body.

Theorem 3.4 (The transfer law of the ten Heavenly Stems with an unhealthy body) *Let the human blood pH value $x \notin [7.34539, 7.45461]$ which is equivalent to the conditions $\rho_0 > \rho_1 = \rho(x) > 0$ and $0 \leq c \leq 1$.*

The transfer law of each of the 10 kinds of energy in the Zangxiang system or the ten Heavenly Stems model for an unhealthy body is from its root-causes to its symptoms.

Furthermore, for the unhealthy body, if a subsystem X of a steady multilateral system V falls a real disease, then the disease comes from the mother S_X of X . The transfer law of the Yang vital or righteousness energies of the ten heavenly stems is transferring against the killing or liking order of the ten heavenly stems as follows:

$$\begin{aligned}
 & \text{real Jia } (1,0) X^+ \overset{\text{less}}{\Leftrightarrow} \text{real Yi } (0,0) X^- \\
 & \overset{\text{rare}}{\Leftarrow} \text{real Geng } (1,3) K_X^+ \overset{\text{less}}{\Leftrightarrow} \text{real Xin } (0,3) K_X^- \\
 & \overset{\text{rare}}{\Leftarrow} \text{real Bing } (1,1) X_S^+ \overset{\text{less}}{\Leftrightarrow} \text{real Ding } (0,1) X_S^- \\
 & \overset{\text{rare}}{\Leftarrow} \text{real Ren } (1,4) S_X^+ \overset{\text{less}}{\Leftrightarrow} \text{real Gui } (0,4) S_X^- \\
 & \overset{\text{more}}{\Leftarrow} \text{virtual Wu } (1,2) X_K^+ \overset{\text{less}}{\Leftrightarrow} \text{virtual Ji } (0,2) X_K^- \\
 & \overset{\text{less}}{\Leftarrow} \text{real Jia } (1,0) X^+ \overset{\text{less}}{\Leftrightarrow} \text{real Yi } (0,0) X^-
 \end{aligned}$$

And if a subsystem X of a steady multilateral system V falls a virtual disease,

then the disease comes from the son X_S of X . The transfer law of the Yin vital or righteousness energies of the ten heavenly stems is transferring along the killing or liking order of the ten heavenly stems as follows:

$$\begin{aligned}
 & \text{virtual Yi } (0,0) X^- \overset{\text{less}}{\leftrightarrow} \text{virtual Jia } (1,0) X^+ \\
 & \overset{\text{rare}}{\Rightarrow} \text{virtual Ji } (0,2) X_K^- \overset{\text{less}}{\leftrightarrow} \text{virtual Wu } (1,2) X_K^+ \\
 & \overset{\text{rare}}{\Rightarrow} \text{virtual Gui } (0,4) S_X^- \overset{\text{less}}{\leftrightarrow} \text{virtual Ren } (1,4) S_X^+ \\
 & \overset{\text{rare}}{\Rightarrow} \text{virtual Ding } (0,1) X_S^- \overset{\text{less}}{\leftrightarrow} \text{virtual Bing } (1,1) X_S^+ \\
 & \overset{\text{more}}{\Rightarrow} \text{real Xin } (0,3) K_X^- \overset{\text{less}}{\leftrightarrow} \text{real Geng } (1,3) K_X^+ \\
 & \overset{\text{less}}{\Rightarrow} \text{virtual Yi } (0,0) X^- \overset{\text{less}}{\leftrightarrow} \text{virtual Jia } (1,0) X^+
 \end{aligned}$$

All transfer laws of the Zangxiang system or the ten Heavenly Stems model for an unhealthy body are summarized in **Figure 2**. It means that only both the liking relation and the killing relation have the transfer law of the Yang or Yin vital or righteousness energies of the ten heavenly stems. Yang is transferring against the killing or liking order of the ten heavenly stems. Yin is transferring along the killing or liking order of the ten heavenly stems.#

Theorem 3.5 (The transfer law of the twelve Earthly Branches with an unhealthy) *Let the human blood pH value $x \notin [7.34539, 7.45461]$ which is equivalent to the conditions $\rho_0 > \rho_1 = \rho(x) > 0$ and $0 \leq c \leq 1$.*

The transfer law of each of the 12 kinds of energy in the Jingluo system or the twelve Earthly Branches model for an unhealthy body is from its root-causes to its symptoms.

Furthermore, for the unhealthy body, if a subsystem X of a steady multilateral system V falls a real disease, then the disease comes from the mother S_X of X . The transfer law of the Yang vital energies of the twelve earthly branches is transferring against the killing or liking order of the twelve earthly branches as follows:

real Mao	real Hai	real Wei
$K_X^+(1,(12)) \overset{\text{rare}}{\leftarrow}$	$X_S^{x+}(1,e)$	$X_S^{j+}(1,(13)) \overset{\text{rare}}{\leftarrow}$
\Downarrow less	\Downarrow less	\Downarrow less
$\overset{\text{rare}}{\leftarrow}$ real Yin	real Xu	real Wu
$K_X^-(1,(132))$	$X_S^{x-}(1,(23)) \overset{\text{less}}{\leftrightarrow}$	$X_S^{j-}(1,(123))$
$\overset{\text{rare}}{\leftarrow}$ real Shen	virtual Chen	real Zi
$S_X^+(0,(13))$	$X_K^+(0,(12)) \overset{\text{less}}{\leftarrow}$	$X^+(0,e)$
\Downarrow less	\Downarrow less	\Downarrow less
real You	virtual Si	real Chou
$S_X^-(0,(123)) \overset{\text{more}}{\leftarrow}$	$X_K^-(0,(132))$	$X^-(0,(23)) \overset{\text{rare}}{\leftarrow}$

For the unhealthy body, if a subsystem X of a steady multilateral system V falls a virtual disease, then the disease comes from the son X_S of X . The transfer

law of the Yin vital energies of the twelve earthly branches is transferring along the killing or liking order of the twelve earthly branches as follows:

$$\begin{array}{ccc}
 \text{real Mao} & \text{virtual Zi} & \text{virtual Chen} \\
 K_X^+(1,(12)) \xRightarrow{\text{less}} & X^+(0,e) & X_K^+(0,(12)) \xRightarrow{\text{rare}} \\
 \Downarrow \text{less} & \Downarrow \text{less} & \Downarrow \text{less} \\
 \xRightarrow{\text{more}} \text{real Yin} & \text{virtual Chou} & \text{virtual Si} \\
 K_X^-(1,(132)) & X^-(0,(23)) \xRightarrow{\text{rare}} & X_K^-(0,(132)) \\
 \xRightarrow{\text{rare}} \text{virtual Shen} & \text{virtual Wei} & \text{virtual Hai} \\
 S_X^+(0,(13)) & X_S^{+j}(1,(13)) \Leftrightarrow^{\text{less}} & X_S^{-x}(1,e) \\
 \Downarrow \text{less} & \Downarrow \text{less} & \Downarrow \text{less} \\
 \text{virtual You} & \text{virtual Wu} & \text{virtual Xu} \\
 S_X^-(0,(123)) \xRightarrow{\text{less}} & X_S^{-j}(1,(123)) & X_S^{-x}(1,(23)) \xRightarrow{\text{more}}
 \end{array}$$

All transfer laws of the Jingluo system or the twelve Earthly Branches model for an unhealthy body are summarized in **Figure 3**. It means that only both the liking relation and the alternate relation have the transfer law of the Yang or Yin vital or righteousness energies of the twelve earthly branches. Yang is transferring against the killing or liking order of the twelve earthly branches. Yin is transferring along the killing or liking order of the twelve earthly branches.#

Remark 5. Theorems 3.4 and 4.5 are called the transfer law of occurrence and change of energies with an unhealthy body, simply, the second transfer law.

For a Yin energy of X and the Zangxiang system or the ten Heavenly Stems model for an unhealthy body, the second transfer law is transferring along the killing or liking order of the ten heavenly stems as follows:

$$\begin{array}{l}
 \xRightarrow{\text{less}} \text{virtual } X^- \Leftrightarrow^{\text{less}} \text{virtual } X^+ \\
 \xRightarrow{\text{rare}} \text{virtual } X_K^- \Leftrightarrow^{\text{less}} \text{virtual } X_K^+ \\
 \xRightarrow{\text{rare}} \text{virtual } S_X^- \Leftrightarrow^{\text{less}} \text{virtual } S_X^+ \\
 \xRightarrow{\text{rare}} \text{virtual } X_S^- \Leftrightarrow^{\text{less}} \text{virtual } X_S^+ \\
 \xRightarrow{\text{more}} \text{real } K_X^- \Leftrightarrow^{\text{less}} \text{real } K_X^+ \\
 \xRightarrow{\text{less}} \text{virtual } X^- \Leftrightarrow^{\text{less}} \text{virtual } X^+
 \end{array}$$

For a Yang energy of X and the Zangxiang system or the ten Heavenly Stems model for an unhealthy body, the second transfer law is transferring against the killing or liking order of the ten heavenly stems as follows:

$$\begin{array}{l}
 \xleftarrow{\text{less}} \text{real } X^+ \Leftrightarrow^{\text{less}} \text{real } X^- \\
 \xleftarrow{\text{rare}} \text{real } K_X^+ \Leftrightarrow^{\text{less}} \text{real } K_X^- \\
 \xleftarrow{\text{rare}} \text{real } X_S^+ \Leftrightarrow^{\text{less}} \text{real } X_S^-
 \end{array}$$

$$\begin{aligned}
 & \overset{\text{rare}}{\leftarrow} \text{real } S_X^+ \overset{\text{less}}{\leftrightarrow} \text{real } S_X^- \\
 & \overset{\text{more}}{\leftarrow} \text{virtual } X_K^+ \overset{\text{less}}{\leftrightarrow} \text{virtual } X_K^- \\
 & \overset{\text{less}}{\leftarrow} \text{real } X^+ \overset{\text{less}}{\leftrightarrow} \text{real } X^-
 \end{aligned}$$

For a Yin energy of X and the Jingluo system or the twelve Earthly Branches model for an unhealthy body, the second transfer law is transferring along the killing or liking order of the twelve earthly branches as follows:

$$\begin{aligned}
 & \overset{\text{less}}{\Rightarrow} \text{virtual } Zi \ X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual } Chou \ X^- \\
 & \overset{\text{rare}}{\Rightarrow} \text{virtual } Si \ X_K^- \overset{\text{less}}{\leftrightarrow} \text{virtual } Chen \ X_K^+ \\
 & \overset{\text{rare}}{\Rightarrow} \text{virtual } Shen \ S_X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual } You \ S_X^- \\
 & \overset{\text{rare}}{\Rightarrow} \text{virtual } Wu \ X_S^{j-} \overset{\text{less}}{\leftrightarrow} \text{virtual } Wei \ X_S^{j+} \\
 & \overset{\text{less}}{\leftrightarrow} \text{virtual } Hai \ X_S^{x+} \overset{\text{less}}{\leftrightarrow} \text{virtual } Xu \ X_S^{x-} \\
 & \overset{\text{more}}{\Rightarrow} \text{real } Yin \ K_X^- \overset{\text{less}}{\leftrightarrow} \text{real } Mao \ K_X^+ \\
 & \overset{\text{less}}{\Rightarrow} \text{virtual } Zi \ X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual } Chou \ X^-
 \end{aligned}$$

For a Yang energy of X and the Jingluo system or the twelve Earthly Branches model for an unhealthy body, the second transfer law is transferring against the killing or liking order of the twelve earthly branches as follows:

$$\begin{aligned}
 & \overset{\text{less}}{\leftarrow} \text{real } Zi \ X^+ \overset{\text{less}}{\leftrightarrow} \text{real } Chou \ X^- \\
 & \overset{\text{less}}{\leftarrow} \text{real } Yin \ K_X^- \overset{\text{less}}{\leftrightarrow} \text{real } Mao \ K_X^+ \\
 & \overset{\text{rare}}{\leftarrow} \text{real } Hai \ X_S^{x+} \overset{\text{less}}{\leftrightarrow} \text{real } Xu \ X_S^{x-} \\
 & \overset{\text{less}}{\leftarrow} \text{real } Wu \ X_S^{j-} \overset{\text{less}}{\leftrightarrow} \text{real } Wei \ X_S^{j+} \\
 & \overset{\text{rare}}{\leftarrow} \text{real } Shen \ S_X^+ \overset{\text{less}}{\leftrightarrow} \text{real } You \ S_X^- \\
 & \overset{\text{more}}{\leftarrow} \text{virtual } Si \ X_K^- \overset{\text{less}}{\leftrightarrow} \text{virtual } Shen \ X_K^+ \\
 & \overset{\text{less}}{\leftarrow} \text{real } Zi \ X^+ \overset{\text{less}}{\leftrightarrow} \text{real } Chou \ X^-
 \end{aligned}$$

The transfer relationship of the second transfer law running is the killing or liking relationship, denoted by \Rightarrow or \leftrightarrow . The running condition of the second transfer law is both $(\rho_1 + \rho_2\rho_3) < (1 - \rho_2\rho_3)$ and $\rho_3 = c\rho(x) \geq 0$.

By Theorem 2.1 and Corollary 2.1, the running condition is equivalent to both $\rho_0 > \rho_1 = \rho(x) > 0$ and $1 \geq c \geq 0$. That $\rho_3 = c\rho(x) \rightarrow 0$ means the lack of capability of self-protection. Of course, it is the basis condition of running the second transfer law.

The stopping condition of the second transfer law is both $(\rho_1 + \rho_2\rho_3) \geq (1 - \rho_2\rho_3)$ and $\rho_3 = c\rho(x) > 0$, which is the running condition of the first transfer law, or, the existence condition of capabilities of both intervention reaction and self-protection. To follow or utilize the running of the second transfer law is equivalent to the following method. For doing so, it is to

protect and maintain the killing or liking relationship of the steady multilateral system. The method can strengthen all of both $\rho_1 - \rho_3 = \rho(x)(1-c)$ and $\rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c)$ tending to be small at the same time. In other words, using the method can make c tends to be large for a fixed $\rho(x) > 0$. It is because the transferring condition of the killing or liking relation disease $(\rho_1 + \rho_2\rho_3) < (1 - \rho_2\rho_3)$ is the weaker the use, which dues to $\rho_3 = c\rho(x)$ is the greater the use. The transferring way can make both $\rho_1 - \rho_3 \rightarrow 0$ and $\rho_2 - \rho_1\rho_3 \rightarrow 0$ at the same time such that the killing or liking relation disease cannot be transferred. In other words again, if the treatment principle of the killing relationship diseases is to use continuously abiding by the second transfer law, then the coefficient of self-protection will tend to be the occurrence state, *i.e.*, $\rho_3 = c\rho(x) > 0$ where $1 \geq c \geq \frac{1-\rho(x)}{2\rho(x)^3} \geq 0$, and the coefficients of intervention reaction also will tend to the healthy state, *i.e.*, $\rho_0 \leq \rho_1 = \rho(x) \leq 1$, such that $(\rho_1 + \rho_2\rho_3) \geq (1 - \rho_2\rho_3)$.#

Medical and drug resistance problem is that such a question, beginning more appropriate medical treatment, but is no longer valid after a period. In the state

$$\begin{aligned}\rho_1 - \rho_3 &= \rho(x)(1-c) \rightarrow 0, \\ \rho_2 - \rho_1\rho_3 &= \rho(x)^2(1-c) \rightarrow 0,\end{aligned}$$

by Theorem 3.4 and 3.5, any medical and drug resistance problem is non-existence if the treatment principle of TCM is used. But in the state

$$\begin{aligned}\rho_1 - \rho_3 &= \rho(x)(1-c) \rightarrow \rho(x), \\ \rho_2 - \rho_1\rho_3 &= \rho(x)^2(1-c) \rightarrow \rho(x)^2,\end{aligned}$$

by Theorems 3.4 and 3.5, the medical and drug resistance problem is always existence, even if the treatment principle of TCM has been used. It is because virtual X_K cannot kill real S_X if X is intervened by increasing its energy. In other words, the lack of capability of self-protection, *i.e.*, $\rho_3 = c\rho(x) \rightarrow 0$, implies the possible existence of a medical and drug resistance problem, although the treatment principle of TCM has been used. At this point, the paper advocates to follow or utilize the second transfer law in order to prevent and avoid the medical and drug resistance issue occurrence for the unhealthy body.#

4. Treatment Principle of TCM

In order to explain treatment principle of TCM, the changes in the blood pH value range is divided into four parts. From [20], Theorems 2.1 and 3.1-3.5, Properties 3.1-3.4 and Corollary 2.1, it can be easily proved that the following theorem is true.

Theorem 4.1 *Suppose that the subsystem X of a steady multilateral system falls ill. Let x be the human body blood pH value of the steady multilateral system. Denoted the parameters of the normal range as follows*

$$a = 7.34539, b = 7.45461, t_0 = 7.4.$$

Then the following statements are true.

1) Suppose that $x < a$ as virtual, in which X or X_K falls a virtual disease with an unhealthy body. The subsystem X or X_K itself is the root-cause of a happened virtual disease. And the son X_S of X is the symptoms of an expected or a happened virtual disease. The primary treatment is to increase the energy of the subsystem X or X_K directly. And the secondary treatment is to increase the energy of the son X_S of X , and at the same time, to decrease the energy of the prisoner K_X of X_S .

2) Suppose that $x \in [a, t_0)$ as virtual-normal, in which X or S_X will fall a virtual disease with a healthy body. The mother S_X of X is the root-cause of an expected virtual disease. And the subsystem X or S_X is the symptoms of an expected virtual disease. The primary treatment is to increase the energy of the mother subsystem S_X of X which is an indirect treating for X . And the secondary treatment is to increase the energy of X itself, and at the same time, to decrease the energy of the prisoner X_K of X .

3) Suppose that $x \in [t_0, b]$ as real-normal, in which X or X_S will encounter a real disease with a healthy body. The son X_S of X is the root-cause of an expected real disease. And the subsystem X itself is the symptoms of an expected real disease. The primary treatment is to decrease the energy of the son subsystem X_S of X which is an indirect treating for X . And the secondary treatment is to decrease the energy of X itself, and at the same time, to increase the energy of the bane K_X of X .

(4) Suppose that $x > b$ as real, in which X or K_X encounters a real disease with an unhealthy body. The subsystem X or K_X itself is the root-cause of an expected or a happened real disease. And the mother S_X of X is the symptoms of an expected real disease. The primary treatment is to decrease the energy of the subsystem X or K_X directly. And the secondary treatment is to decrease the energy of the mother S_X of X , and at the same time, to increase the energy of the bane X_K of S_X .#

Remark 6. Treatment principle of Theorem 4.1 based on ranges of the human body blood pH value is called the treatment principle of TCM, since it is in order to protect and maintain the balance of two incompatibility relations: the loving or liking relationship and the killing or liking relationship.

For the unhealthy body where $x < a$ or $x > b$, the treatment principle is the method for doing so in the following:

The primary treatment is to increase or decrease the energy of X directly corresponding to $x < a$ or $x > b$ respectively, and the secondary treatment is to increase the energy of X_S or X_K while to decrease the energy of K_X or S_X , respectively.

The primary treatment is in order to protect and maintain the loving or liking relationship, abiding by TCM's ideas "Virtual disease with an unhealthy body is to fill itself" and "Real disease with an unhealthy body is to rush down itself". It

is because the method for doing so is not only greatly medical diseases of their own, but also provides the pseudo side effects as the food for the second physiological system. The method is to promote the first physiological system running since the second physiological system controls the first physiological system. And it is also to improve the loving or liking relationship to develop since the loving or liking relationship mainly comes from the first physiological system. The loving or liking relationship to develop can strengthen both that $\rho_1 + \rho_2\rho_3 = \rho(x) + c\rho(x)^2$ tends to be large and that $1 - \rho_2\rho_3 = 1 - c\rho(x)^3$ tends to be small at the same time. In other words, the way can make all of both $\rho(x)$ and c tend to be large, at least, c greater than zero for an unhealthy body and $\rho_0 \leq \rho(x) \leq 1$, such that the body from unhealthy to healthy, or the first physiological system works, or, the occurrence of capability of self-protection, or, the running of the first transfer law, or, the stopping of the second transfer law.

The secondary treatment is in order to protect or maintain the killing or liking relationship, abiding by TCM's ideas "Don't have disease cure cure non-ill" and "Strong inhibition of the same time, support the weak". By the second transfer law in Theorems 3.4 and 3.5, the more serious relation disease is the relation disease between virtual X_S and real K_X , or between real S_X and virtual X_K respectively.

Abiding by TCM's idea "Don't have disease cure cure non-ill", it must be done to prevent or avoid the more serious relation disease between virtual X_S and real K_X , or between real S_X and virtual X_K occurrence respectively.

Abiding by TCM's idea "Strong inhibition of the same time, support the weak", it must be done to increase the energy of X_S or X_K while decrease the energy of K_X or S_X respectively.

The method for doing so can improve the killing or liking relationship to develop since real X_S or X_K can kill virtual K_X or S_X respectively. The killing or liking relationship to develop means that both $\rho_1 - \rho_3 = \rho(x)(1-c)$ and $\rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c)$ tend to be small at the same time. In other words, the way can make, for fixed $\rho(x)$, c tending to be large, at least, greater than zero for an unhealthy body, such that the body from unhealthy to healthy, or the first physiological system works, or, the occurrence of capability of self-protection, or, the running of the first transfer law, or, the stopping of the second transfer law.

For the healthy body where $x \in [a, t_0]$ or $x \in (t_0, b]$, the treatment principle is the method for doing so in the following:

The primary treatment is to increase or decrease the energy of S_X or X_S corresponding to $x \in [a, t_0]$ or $x \in (t_0, b]$ respectively, and the secondary treatment to increase the energy of K_X or X while to decrease the energy of X or X_K , respectively.

The primary treatment is in order to protect and maintain the loving or liking relationship, abiding by TCM's ideas "Virtual disease with a healthy body is to

fill mother” and “Real disease with a healthy body is to rush down its son”. It is because the method for dong so is not only greatly medical diseases of their own, but also provides the pseudo side effects as the food for the second physiological system. The method is to promote the first physiological system running since the second physiological system controls the first physiological system. And it is also to improve the loving or liking relationship developing since the loving or liking relationship mainly comes from the first physiological system. The loving or liking relationship developing can strengthen both that $\rho_1 + \rho_2\rho_3 = \rho(x) + c\rho(x)^2$ tends to be large and that $1 - \rho_2\rho_3 = 1 - c\rho(x)$ tends to be small at the same time. In other words, using the way can make all of both $\rho(x)$ and $0 < c$ tending to be large, the best, all equal to 1 for a healthy body, such that the capability of self-protection is in the best state, or, the non-existence of side effects issue, or, the non-existence of medical and drug resistance problem.

The secondary treatment is in order to protect or maintain the killing or liking relationship, abiding by TCM’s ideas “Don’t have disease cure cure non-ill” and “Strong inhibition of the same time, support the weak”. By the first transfer law, the more serious relation disease is the relation disease between real X and virtual K_X or between virtual X and real X_K corresponding to real X or virtual X , respectively.

Abiding by TCM’s idea “Don’t have disease cure cure non-ill”, it must be done to prevent and avoid the more serious relation disease between real X and virtual K_X or between virtual X and real X_K occurrence corresponding to real X or virtual X respectively.

Abiding by TCM’s idea “Strong inhibition of the same time, support the weak”, it must be done to increase the energy of K_X or X while decrease the energy of X or X_K respectively.

The method for doing so can improve the killing or liking relationship developing since real K_X or real X can kill virtual X or virtual X_K respectively. The killing or liking relationship developing also means that both $\rho_1 - \rho_3 = \rho(x)(1-c)$ and $\rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c)$ tend to be small at the same time. In other words, using the way can make, for fixed $\rho(x)$, $0 < c$ tending to be large, the best, equal to 1 for a healthy body, such that the capability of self-protection is in the best state, or, the non-existence of side effects, or, the non-existence of medical and drug resistance issue.#

5. Acupuncture Is Used to Treat Limb-Girdle Muscular Dystrophy

The patient, female, 3 years old. Four months ago complained of fatigue, abdominal pain. She is more likely to be tired and restless than her peers, and cry after waking up at night. To Zhengzhou city a hospital check ecg showed: extended PR value. By checking the myocardial enzyme: the index of creatine kinase was high (500.5 U/L, normal range (26, 200)), the body’s blood pH value was low (7.24409, virtual, normal range [7.34539, 7.45461] and the center 7.4), preliminary determination of myocarditis. By myocarditis was discharged on

hospital treatment after 9 days, 20 days after the review of myocardial enzyme: the index of creatine kinase higher, (1573 U/L, normal range (26, 200)), the body's blood pH value lower (7.23682, virtual, normal range [7.34539, 7.45461] and the center 7.4). Hence to a Beijing hospital for emg and its genetic testing. Genetic testing results show that a clear diagnosis of limb girdle muscular dystrophy. This disease in western medicine, there is no treatment and effective drugs. On July 3, 2017 children to Henan province Zhang Bibo institute of TCM acupuncture treatment.

Children are suffering from the disease is a genetic disease, is relatively rare. Should adhere to the TCM thinking. According to the clinical symptoms, muscular dystrophy in TCM "expression paralysis syndrome" category. Need to regulate spleen and stomach, benefit *Chi* and blood. The age of children is small, her capability of self-protection is poor. Her pathogenesis is lack of innate endowment, acquired taste disorder, need to regulate spleen and stomach, tonic is deficient.

Because the body pH blood value is $x = 7.23682 < a = 7.34539$ or $\rho < \rho_0$, by (1) of Theorem 4.1, the subsystem earth(X_K) (the spleen and stomach) falls a virtual disease with an unhealthy body. The subsystem earth(X_K) (the spleen and stomach) itself is the root-cause of a happened virtual disease. And the son xiang-fire (X_S^x) (the pericardium and the triple energizer) of wood(X) (the liver and gallbladder) is the symptoms of an expected virtual disease. The primary treatment is to increase the energy of the subsystem earth(X_K) (the spleen and stomach) directly. And the secondary treatment is to increase the energy of the son xiang-fire (X_S^x) (the pericardium and the triple energizer) of wood(X) (the liver and gallbladder), and at the same time, to decrease the energy of the prisoner metal (K_X) (the lung and large intestine) of xiang-fire (X_S^x) (the pericardium and the triple energizer).

Therefore, the primary treatment in to find out holes: SanYinJiao (三阴交, to increase the energy of the subsystem earth (X_K^-) (the spleen) directly), ZuSanLi (足三里, to increase the energy of the subsystem earth (X_K^+) (the stomach) directly), the TianShu (天枢, to increase the energy of the subsystem earth (X_K^+) (the stomach) directly), ZhongWan (中脘, to increase the energy of the subsystem earth (X_K^+) (the stomach) directly).

Secondary treatment is to find out holes: NeiGuan (内关, to increase the energy of the son xiang-fire (X_S^{x-}) (the pericardium) of wood(X) (the liver and gallbladder)), HeGu (合谷, to decrease the energy of the prisoner metal (K_X^+) (the large intestine) of xiang-fire (X_S^x) (the pericardium and the triple energizer)).

Methods: mild reinforcing and attenuating, prick .Once a day.

After 40 days of acupuncture therapy, the children lack of power and fatigue symptoms improved significantly, not to cause abdominal pain, sleep smoothly at night. Review of myocardial enzymes: the index of creatine kinase is lower, (192 U/L, normal range (26, 200)), the body's blood pH value is virtual-normal (7.34929, normal range [7.34539, 7.45461] and the center 7.4). Children with

symptoms improved obviously, and myocardial enzyme decline in more than half. Return no recurrence.

Muscular dystrophy in TCM belongs to “expression paralysis syndrome” category. The paper of the emperor neijing (“皇帝内经”) discusses the pathogenesis “limbs are adhered to in the stomach ..., spleen disease cannot make the stomach fluid, limb may not be the great water spirit, bones and muscles are not born to chi, reason need not how”, “the energy (Chi) of the foot TaiYin spleen meridian is off, pulse will not honor muscle”, “so the lung hot leaf scorch, fur muscles weak thin, the born is an expression paralysis syndrome”. Think its pathogenesis is: the spleen and stomach are deficient, *Chi* and blood not free.

The paper of the emperor neijing (“皇帝内经”) treatment method is put forward as follows: “treating expression paralysis syndrome alone takes the YangMing meridian”, “fill their honor (荣穴) and smooth their shu (俞穴), adjust its virtual and real condition, harmony with its inverse and smooth. Channels of the same flesh and blood, with its time by month”. Points out that the treatment should take its YangMing meridian, fill their honor (荣穴) and smooth their shu (俞穴).

SanYinJiao hole (三阴交穴, three vaginal intercourse hole) belongs to the foot TaiYin spleen meridian or the subsystem earth (X_K^-). It is one of the famous Yang back nine needle holes (回阳九针穴, clinical first aid commonly used nine effective acupuncture point, for the treatment of syncope, cold limbs vein lies, Yang would like to take off, the operation can be back to Yang to save lives. Due to the “acupuncture poly examples”(“针灸聚英”), that is, YaMen (哑门), LaoGong (劳宫), SanYinJiao (三阴交), YongQuan (涌泉), DaXi (大溪), ChungWan (中腕), HuanTiao (环跳), ZuSanLi (足三里), HeGu (合谷)). Acupuncture three vaginal intercourse hole advocates the and blood of the whole body, fills the energies of spleen and stomach, helps the transport of the energies, clears and activates the channels and collaterals, and harmonies with the effect of *Chi* and blood.

ZuSanLi hole (足三里穴, foot three mile hole) belongs to the foot YangMing stomach meridian or the subsystem earth (X_K^+). It is one of the famous four total holes (四总穴, Ancient acupuncture doctor summed up four holes commonly used in clinical practice effect. The holes are ZuSanLi (足三里), WeiZhong (委中), LieQue (列缺), or HeGu (合谷). “Acupuncture dacheng” (“针灸大成”) carrying “four total hole song”: “both belly and abdominal stay at ZuSanLi, both waist and back find in Weizhong, the head looks for LieQue, both surface and mouth are closed by HeGu.” Briefly summarizes the way the attending of the four points. Future generations on this basis, and gain “both chest and threats response in NeiGuan (内关), first aid looking for ShuiGou (水沟)” two words, said six total holes). It is also one of the famous twelve sky-star holes (天星十二穴, one of the most important and commonly used acupuncture points in a human body’s twelve meridians, the treatment of diseases is widespread, curative effect is obvious. The holes are ZuSanLi (足三里), NeiTing (内庭), QvChi (曲

池), HeGu (合谷), WeiZhong (委中), ChengShan (承山), TaiChong (太冲), KunLun (昆仑), HuanTiao (环跳), YangLing (阳陵), TongLi (通里), LieQue (列缺)). Of course, it is also one of the famous Yang back nine needle holes (回阳九针穴). “The peaceful holy benevolence formulae” (“太平圣惠方”) said “the five labors won over and thin, seven injured empty spent, all adjustments by the foot three mile”. Needle foot three mile, make up and down with blood *Chi* lines, YangMing meridian *Chi* can be better run in channels and collaterals, to charge the insides or five-zang and six-fu organs.

Acupuncture SanYinJiao and ZuSanLi, a spleen and a stomach, a surface and an inside, health the spleen and harmony the stomach, is good for *Chi* and produces blood, and finally increases the energy of earth (X_K).

TianShu hole (天枢穴, pivot hole) also belongs to the foot YangMing stomach meridian (足阳明胃经) or the subsystem earth (X_K^+). It is also the tomb of hand YangMing large intestine meridian (手阳明大肠经). It is the hub of the stomach. Acupuncture TianShu hole can dredge relieving *Chi*, regulate the hardness of middle and lower energizers. Has the energy function of two-way regulate spleen and stomach, can increase the energy of the subsystem earth (X_K^+).

ZhongWan hole (中脘穴, ChungWan hole) belongs to the Ren vein (任脉) or the foot YangMing stomach meridian (足阳明胃经) or the subsystem earth (X_K^+). It is one of the famous Yang back nine needle holes (回阳九针穴). It is also the tomb of foot YangMing stomach meridian (足阳明胃经). It is also the gather hole of fu-organs of eight gather holes. It is also the gather hole of the hand TaiYang bladder meridian (手太阳膀胱经), the hand ShaoYang triple energizer meridian (手少阳三焦经) and Ren vein (任脉). Acupuncture ZhongWan can regulate spleen and stomach, regulate *Chi* activity of six-fu-organs, can increase the energy of the subsystem earth (X_K^+).

NeiGuan hole (内关穴, Shut hole) belongs to the hand JueYin pericardium meridian (手厥阴心包经) or the subsystem xiang-fire (X_S^{x-}). It is one of the famous six total holes (六总穴). This hole for collaterals acupuncture point, secondly, one of the gather holes of eight veins. The hand JueYin pericardium meridian presided over the network to its heart. Acupuncture NeiGuan can promote the heart Yang, leader of the sanjiao (triple energizer), and finally can increase the energy of xiang-fire (X_S^{x-}).

HeGu hole (合谷穴, valley hole) belongs to the hand YangMing large intestine meridian (手阳明大肠经) or the subsystem metal (K_X^+). It is one of the famous Yang back nine needle holes (回阳九针穴). It is one of the famous four total holes (四总穴) or six total holes (六总穴). It is also one of the famous twelve sky-star holes (天星十二穴). It is the original point of the hand YangMing large intestine meridian. The original holes flow in the SanJiao (triple energizer), originated from the kidney under the navel of motion energy (*Chi*). Acupuncture HeGu can stimulate the function of movement of the whole body energy (*Chi*), to decrease the energy of the subsystem metal (K_X^+).

The above points are suitable, can adjust the energy function of spleen and

stomach, tonic dredge *Chi* and blood, promote the viscera energy function recovery.

This example with the type of limb with muscular dystrophy, at present, in the world is a medical problem, no effective drugs and methods of treatment. The author USES “regulate spleen and stomach, *Chi* and blood tonic” thinking of traditional Chinese medicine treatment of 40 days, does have effect and obvious effect. Consulting relevant literature, the writer has not been found by acupuncture treatment of this kind of disease related information, so the topic.

The analysis of this paper focus on the mathematical structure of both Zangxiang and Jingluo. How about the real cases? In the real cases, there are a lot of kinds of diseases. In mathematics, first, you must determine the scope of the illness. That is to say: must determine which Zangxiang and meridian disease belongs to. For example, for the purpose of this case, must first determine the disease belongs to the spleen Zang and the foot YangMing stomach meridian.

How to fit the Zangxiang (藏象) and Jingluo (经络) into a mathematical model. Regards the Zangxiang and Jingluo as a mathematical model, which can be mathematically proved that deal with the method of the disease. For example, for the purpose of this case, dealing with the first method is to deal directly with the spleen Zang of the disease as the root-cause, *i.e.*, to increase the energy of the spleen Zang. Auxiliary treatment method is to increase the energy of the pericardium meridian as symptoms, at the same time, reduce the energy of the lung meridian as symptoms. This method of healing must pass the mathematics to prove.

The effect of Zangxiang and Jingluo on the blood pH value should be evaluated. Measurement of the blood pH value objective is to determine whether the body health, disease of real or virtual illness, and mathematically sure cure method. For example, for the purpose of this case, the blood pH range, is the situation of the (1) of Theorem 4.1 as virtual, natural the cure method is determined. So, measuring the blood pH value in the range is a very important work. Because for different people in different time, the treatment methods are not the same. Must by measuring the blood pH value in the range at any time, to determine the cure method should be used at any time.

For the purpose of this case, it may be not necessary to show the hand ShaoYin heart meridian (手少阴心经). But from the perspective of mathematical analysis, the hand ShaoYin heart meridian is must considered. Because the hand ShaoYin heart meridian and the hand JueYin pericardium meridian although belong to the heart Zang, but the hand JueYin pericardium meridian can substitute for the hand ShaoYin heart meridian under fault. So to increase the energy of the heart Zang must be the hand JueYin pericardium meridian, can't be the hand ShaoYin heart meridian.#

6. Conclusions

This work shows how to treat the diseases of a human body by using the human

blood pH value x . For the human blood pH value, the range of theory is $[7.34539, 7.45461]$ nearly to $[7.35, 7.45]$. By both the Zangxiang system or the ten Heavenly Stems model and the Jingluo system or the twelve Earthly Branches model, there is the first or second transfer law of human energies corresponding to a healthy body or an unhealthy body respectively. The first or second transfer law of human energies changes according to the different human body's blood pH values whether in the normal range or not. For the normal range, the first transfer law of human energies in Theorems 3.2 and 3.3 runs; for the abnormal range, the second transfer law of human energies in Theorems 3.4 and 3.5 runs.

We assume that the range of a human body's blood pH value x is divided into four parts from small to large. Both second and third are for a healthy body with a virtual or real disease respectively. In this case, the root-cause of a virtual or real disease is the mother or son of the falling-ill subsystem X respectively, and the symptoms are the subsystem X itself. Abiding by TCM's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), the works are first the prevention or the treatment for the mother or son of a virtual or real disease respectively, the second the prevention or the treatment for a more serious relation disease between virtual X and real X_K or between real X and virtual K_X , respectively. Both the root-cause and the symptoms come from the first transfer law of human energies in Theorems 3.2 and 3.3.

And both first and fourth are for an unhealthy body with a virtual or real disease respectively. In this case, the root-cause of a virtual or real disease is the subsystem X itself and the symptoms of the son or mother of the falling-ill subsystem X respectively. Abiding by TCM's idea: "Searching for the primary cause of disease in treatment, treat both symptoms and root-cause" (治病求本, 标本兼治), the works are first the prevention or the treatment for itself of a virtual or real disease respectively, the second is the prevention or the treatment for a more serious relation disease between virtual X_S and real K_X or between real S_X and virtual X_K , respectively. Both the root-cause and the symptoms come from the second transfer law in Theorems 3.4 and 3.5.

Human disease treatment should protect and maintain the balance or order of two incompatibility relations: the loving or liking relationship and the killing or liking relationship. The method for doing so can make the $\rho_3 = c\rho(x)$ tend to be large, *i.e.*, all of both $\rho(x)$ and c tend to be large, at least, greater than zero for an unhealthy body; or, the best, equal to 1 for a healthy body.

The following way can make the capabilities of both intervention reaction and self-protection become in the best state, the non-existence of side effects issue, the non-existence of medical and drug resistance problem, and so on.

1) Suppose that $x < a = 7.34539$, as virtual, in which X or X_K falls a virtual disease with an unhealthy body. The subsystem X or X_K itself is the root-cause of a happened virtual disease. And the son X_S of X is the symptoms of an expected

or a happened virtual disease. Abiding by TCM's idea: "Searching for the primary cause of disease in treatment, treat both symptoms and root-cause" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCM's idea "Virtual disease with an unhealthy body is to fill itself" (虚则补之), increase the energy of X or X_K directly.

In order to protect or maintain the killing relationship, abiding by TCM's idea "Don't have disease cured, cure non-ill" (不治己病治未病), do a preventive treatment for the more serious relation disease between virtual X_S and real K_X .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), increase the energy of the son X_S of X while decrease the energy of the prisoner K_X of X_S .

2) Suppose that $a = 7.34539 \leq x \leq t_0 = 7.4$, as virtual-normal, in which X or S_X falls a virtual disease with a healthy body. The mother S_X of the subsystem X is the root-cause of an expected virtual disease. And the subsystem X itself is the symptoms of an expected virtual disease. Abiding by TCM's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCM's idea "Virtual disease with a healthy body is to fill its mother" (虚则补其母), increase the energy of the mother S_X of X . The treating way is an indirect treating for X .

In order to protect or maintain the killing relationship, abiding by TCM's idea "Don't have disease cured, cure non-ill" (不治己病治未病), do a preventive treatment for the more serious relation disease between virtual X and real X_K .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), increase the energy of X itself while decreasing the energy of the prisoner X_K of X .

3) Suppose that $t_0 = 7.4 < x \leq b = 7.45461$, as real-normal, in which X or S_X falls a real disease with a healthy body. The son S_X of the subsystem X is the root-cause of an expected real disease. And the subsystem X itself is the symptoms of an expected real disease. Abiding by TCM's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCM's idea "Real disease with a healthy body is to rush down its son" (实则泄其子), decrease the energy of the son S_X of X . The treating way is an indirect treating for X .

In order to protect or maintain the killing relationship, abiding by TCM's idea "Don't have disease cured, cure non-ill" (不治己病治未病), do a preventive treatment for the more serious relation is ease between real X and virtual K_X .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), decrease the energy of X itself while increasing

the energy of the bane K_X of X .

4) Suppose that $x > b = 7.45461$, as real, in which X or K_X falls a real disease with an unhealthy body. The subsystem X or K_X itself is the root-cause of a happened real disease. And the mother S_X of X is the symptoms of an expected or a happened real disease. Abiding by TCM's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCM's idea "Real disease with an unhealthy body is to rush down itself" (实则泄之), decrease the energy of X or K_X directly.

In order to protect or maintain the killing relationship, abiding by TCM's idea "Don't have disease cured, cure non-ill" (不治己病治未病), do a preventive treatment for the more serious relation disease between real S_X and virtual X_K .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), decrease the energy of the mother S_X of X while increase the energy of the bane X_K of S_X .

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

Proof of Property 3.1. See **Figure 3.**, since the emperor prosperous place of Jia Yang wood of the ten heavenly stems is in Mao of the twelve earthly branches, so the rowing place is in Hai. It is because by Definition 3.3, counterclockwise to arrange, emperor as Mao, officer as Yin, crowned as Chou, bathing as Zi, rowing as Hai.

Similarly, the emperor prosperous place of Bing, Wu, Geng, Ren Yang fire, earth, metal, water of the ten heavenly stems is in Wu, Wu, You, Zi of the twelve earthly branches, so the rowing place is in Yin, Yin, Si Shen of the twelve earthly branches respectively.

See **Figure 3.** Again, since the emperor prosperous place of Yi Yin wood of the ten heavenly stems is in Yin of the twelve earthly branches, so the rowing place is in Wu. It is because by Definition 3.3, clockwise to arrange, emperor as Yin, officer as Mao, crowned as Chen, bathing as Si, rowing as Wu.

Similarly, the emperor prosperous place of Ding, Ji, Xin, Gui Yin fire, earth, metal, water of the ten heavenly stems is in Si, Si, Chen, Hai of the twelve earthly branches, so the rowing place is in You, You, Zi, Mao of the twelve earthly branches respectively.

Therefore, the five Yang heavenly stems: Jia, Bing, Wu, Geng, Ren was born Hai, Yin, Yin, Si, Shen respectively; The five Yin heavenly stems: Yi, Ding, Ji, Xin, Gui was born Wu, You, You, Zi, Mao respectively. It completes the proof.#

Proof of Property 3.2. By Definition 3.3 and Properties 3.3 and 3.4, there are

$$\begin{aligned} Zi(0, e) &= \{Gui(0,4)\}, \\ Chou(0, (23)) &= \{Ji(0,2), Gui(0,4), Xin(0,3)\}, \\ \Rightarrow Ji(0,2) * Gui(0,4) * Xin(0,3) &= Gui(0,4), \\ Gui(0,4)^{-1} * Gui(0,4) &= Yi(0,0). \end{aligned}$$

Therefore, the synthesized and synthesized or combined relationship between two elements

$$Zi(0, e) = \{Gui(0,4)\} \quad \text{and} \quad Chou(0, (23)) = \{Ji(0,0), Gui(0,4), Xin(0,3)\}$$

is Yi(0,0) as wood (X) in Theorem 3.1.

Similarly, the synthesized and combined relationship between two elements

$$Yin(1, (132)) = \{Jia(1,0), Bing(1,1), Wu(1,2)\} \quad \text{and} \quad Mao(1, (12)) = \{Yi(0,0)\}$$

is Geng(1,3) as metal (K_X) in Theorem 3.1 since

$$\begin{aligned} Yin(1, (132)) &= \{Jia(1,0), Bing(1,1), Wu(1,2)\}, \\ Mao(1, (12)) &= \{Yi(0,0)\}, \\ \Rightarrow Jia(1,0) * Bing(1,1) * Wu(1,2) &= Geng(1,3), \\ Yi(0,0)^{\pm 1} * Geng(1,3) &= Geng(1,3). \end{aligned}$$

The synthesized and synthesized relationship between two elements

$$Chen(0, (12)) = \{Yi(0,0), Wu(1,2), Gui(0,4)\} \quad \text{and}$$

$$Si(0, (132)) = \{Bing(1,1), Geng(1,3), Wu(1,2)\}$$

is Ji(0,2) as earth (X_K) in Theorem 3.1 since

$$\begin{aligned}
\text{Chen}(0, (12)) &= \{\text{Yi}(0, 0), \text{Wu}(1, 2), \\
\text{Gui}(0, 4), \text{Si}(0, (132)) &= \{\text{Bing}(1, 1), \text{Geng}(1, 3), \text{Wu}(1, 2)\} \\
\Rightarrow \text{Yi}(0, 0) * \text{Wu}(1, 2) * \text{Gui}(0, 4) &= \text{Bing}(1, 1), \\
\text{Bing}(1, 1) * \text{Geng}(1, 3) * \text{Wu}(1, 2) &= \text{Bing}(1, 1), \\
\text{Bing}(1, 1) * \text{Bing}(1, 1) &= \text{Ji}(0, 2).
\end{aligned}$$

The synthesized and synthesized relationship between two elements

$$\begin{aligned}
\text{Wu}(1, (123)) &= \{\text{Ding}(0, 1), \text{Ji}(0, 2)\} \quad \text{and} \\
\text{Wei}(1, (13)) &= \{\text{Ding}(0, 1), \text{Ji}(0, 2), \text{Yi}(0, 0)\}
\end{aligned}$$

is $\text{Ding}(0, 1)$ as xiang-fire (X_s^x) (相火) in Theorem 3.1 since

$$\begin{aligned}
\text{Wu}(1, (123)) &= \{\text{Ding}(0, 1), \text{Ji}(0, 2)\}, \\
\text{Wei}(1, (13)) &= \{\text{Ding}(0, 1), \text{Ji}(0, 2), \text{Yi}(0, 0)\}, \\
\Rightarrow \text{Ding}(0, 1) * \text{Ji}(0, 2) &= \text{Xin}(0, 3), \\
\text{Ding}(0, 1) * \text{Ji}(0, 2) * \text{Yi}(0, 0) &= \text{Xin}(0, 3), \\
\text{Xin}(0, 3) * \text{Xin}(0, 3) &= \text{Ding}(0, 1).
\end{aligned}$$

The synthesized relationship between between the comprehensive energy of two elements

$$\text{Shen}(0, (13)) = \{\text{Geng}(1, 3), \text{Ren}(1, 4), \text{Wu}(1, 2)\} \quad \text{and} \quad \text{You}(0, (123)) = \{\text{Xin}(0, 3)\}$$

is $\text{Ren}(1, 4)$ as water (S_x) in Theorem 3.1 since

$$\begin{aligned}
\text{Shen}(0, (13)) &= \{\text{Geng}(1, 3), \text{Ren}(1, 4), \text{Wu}(1, 2)\}, \\
\text{You}(0, (123)) &= \{\text{Xin}(0, 3)\}, \\
\Rightarrow \text{Geng}(1, 3) * \text{Ren}(1, 4) * \text{Wu}(1, 2) &= \text{Ren}(1, 4), \\
\text{Xin}(0, 3)^{-1} * \text{Wu}(1, 2) &= \text{Ren}(1, 4).
\end{aligned}$$

The synthesized relationship between two elements

$$\text{Xu}(1, (23)) = \{\text{Xin}(0, 3), \text{Wu}(1, 2), \text{Ding}(0, 1)\} \quad \text{and} \quad \text{Hai}(1, e) = \{\text{Ren}(1, 4), \text{Jia}(1, 0)\}$$

is $\text{Bing}(1, 1)$ as jun-fire (X_s^j) (君火) in Theorem 3.1 since

$$\begin{aligned}
\text{Xu}(1, (23)) &= \{\text{Xin}(0, 3), \text{Wu}(1, 2), \text{Ding}(0, 1)\}, \\
\text{Hai}(1, e) &= \{\text{Ren}(1, 4), \text{Jia}(1, 0)\}, \\
\Rightarrow \text{Xin}(0, 3) * \text{Wu}(1, 2) * \text{Ding}(0, 1) &= \text{Bing}(1, 1), \\
\text{Ren}(1, 4)^{-1} * \text{Jia}(1, 0) * \text{Xin}(0, 3) * \text{Wu}(1, 2) &= \text{Bing}(1, 1).
\end{aligned}$$

Therefore, the following notations in Definition 3.2 is reasonable.

$$\begin{array}{cccccc}
X^+(0, e) & X_s^{x+}(1, e) & X_K^+(0, (12)) & K_X^+(1, (12)) & S_X^+(0, (13)) & X_s^{j+}(1, (13)) \\
X^-(0, (23)) & X_s^{x-}(1, (23)) & X_K^-(0, (132)) & K_X^-(1, (132)) & S_X^-(0, (123)) & X_s^{j-}(1, (123))
\end{array}$$

It is with the correct meaning of the Yin Yang Wu Xing Model in Theorem 3.1.#

Proof of Property 3.3. Consider the Zangxiang system or the ten Heavenly Stems model $V^2 \times V^5 = \{(i, j) \mid i \in V^2, j \in V^5\}$. Its all relations are as follows:

$$\begin{aligned}
R_{(0,0)}^{(2,5)} &= \{((0,0), (0,0)), ((1,0), (1,0)), \\
&((0,1), (0,1)), ((1,1), (1,1)), ((0,2), (0,2)), \\
&((1,2), (1,2)), ((0,3), (0,3)), ((1,3), (1,3)), \\
&((0,4), (0,4)), ((1,4), (1,4))\},
\end{aligned}$$

$$R_{(1,0)}^{(2,5)} = \{((0,0),(1,0)),((1,0),(0,0)),$$

$$((0,1),(1,1)),((1,1),(0,1)),((0,2),(1,2)),$$

$$((1,2),(0,2)),((0,3),(1,3)),((1,3),(0,3)),$$

$$((0,4),(1,4)),((1,4),(0,4))\},$$

$$R_{(0,1)}^{(2,5)} = \{((0,0),(0,1)),((1,0),(1,1)),$$

$$((0,1),(0,0)),((1,1),(1,0)),((0,2),(0,3)),$$

$$((1,2),(1,3)),((0,3),(0,4)),((1,3),(1,4)),$$

$$((0,4),(0,0)),((1,4),(1,0))\},$$

$$R_{(1,1)}^{(2,5)} = \{((0,0),(1,1)),((1,0),(0,1)),$$

$$((0,1),(1,2)),((1,1),(1,2)),((0,2),(1,3)),$$

$$((1,2),(0,3)),((0,3),(1,4)),((1,3),(0,4)),$$

$$((0,4),(1,0)),((1,4),(0,0))\},$$

$$R_{(0,2)}^{(2,5)} = \{((0,0),(0,2)),((1,0),(1,2)),$$

$$((0,1),(0,3)),((1,1),(1,3)),((0,2),(0,4)),$$

$$((1,2),(1,4)),((0,3),(0,0)),((1,3),(1,0)),$$

$$((0,1),(0,1)),((1,1),(1,1))\},$$

$$R_{(1,2)}^{(2,5)} = \{((0,0),(1,2)),((1,0),(0,2)),$$

$$((0,1),(1,3)),((1,1),(0,3)),((0,2),(1,4)),$$

$$((1,2),(0,4)),((0,3),(1,0)),((1,3),(0,0)),$$

$$((0,4),(1,1)),((1,4),(0,1))\},$$

$$R_{(0,3)}^{(2,5)} = \{((0,0),(0,3)),((1,0),(1,3)),$$

$$((0,1),(0,3)),((1,1),(1,3)),((0,2),(0,0)),$$

$$((1,2),(1,0)),((0,3),(0,1)),((1,3),(1,1)),$$

$$((0,4),(0,2)),((1,4),(1,2))\},$$

$$R_{(1,3)}^{(2,5)} = \{((0,0),(1,3)),((1,0),(0,3)),$$

$$((0,1),(1,4)),((1,1),(0,3)),((0,2),(1,0)),$$

$$((1,2),(0,0)),((0,3),(1,1)),((1,3),(0,1)),$$

$$((0,4),(1,2)),((1,4),(0,2))\},$$

$$R_{(0,4)}^{(2,5)} = \{((0,0),(0,4)),((1,0),(1,4)),$$

$$((0,1),(0,0)),((1,1),(1,0)),((0,2),(0,1)),$$

$$((1,2),(1,1)),((0,3),(0,2)),((1,3),(1,2)),$$

$$((0,4),(0,3)),((1,4),(1,3))\},$$

$$\begin{aligned}
R_{(1,4)}^{(2,5)} = & \{((0,0),(1,4)),((1,0),(0,4)), \\
& ((0,1),(1,0)),((1,1),(0,0)),((0,2),(1,1)), \\
& ((1,2),(0,1)),((0,3),(1,2)),((1,3),(0,2)), \\
& ((0,4),(1,3)),((1,4),(0,3))\},
\end{aligned}$$

Use of these relations, to calculate the cost of all the specified relationship, can be found: the loving or liking relationship with low cost, and the killing relationship with the high cost. It completes the proof.#

Proof of Property 3.4. Consider the Jingluo system or the twelve Earthly Branches model $V^2 \times V^6 = \{(i, j) | i \in V^2, j \in V^6\}$. Its all relations are as follows:

$$\begin{aligned}
R_{(0,e)}^{(2,6)} = & \{((0,e),(0,e)),((1,e),(1,e)), \\
& ((0,(12)),(0,(12))),((1,(12)),(1,(12))), \\
& ((0,(13)),(0,(13))),((1,(13)),(1,(13))), \\
& ((0,(23)),(0,(23))),((1,(23)),(1,(23))), \\
& ((0,(123)),(0,(123))),((1,(123)),(1,(123))), \\
& ((0,(132)),(0,(132))),((1,(132)),(1,(132)))\},
\end{aligned}$$

$$\begin{aligned}
R_{(1,e)}^{(2,6)} = & \{((0,e),(1,e)),((1,e),(0,e)), \\
& ((0,(12)),(1,(12))),((1,(12)),(0,(12))), \\
& ((0,(13)),(1,(13))),((1,(13)),(0,(13))), \\
& ((0,(23)),(1,(23))),((1,(23)),(0,(23))), \\
& ((0,(123)),(1,(123))),((1,(123)),(0,(123))), \\
& ((0,(132)),(1,(132))),((1,(132)),(0,(132)))\},
\end{aligned}$$

$$\begin{aligned}
R_{(0,(12))}^{(2,6)} = & \{((0,e),(0,(12))),((1,e),(1,(12))), \\
& ((0,(12)),(0,e)),((1,(12)),(1,e)), \\
& ((0,(13)),(0,(132))),((1,(132)),(1,(132))), \\
& ((0,(123)),(0,(123))),((1,(123)),(1,(123))), \\
& ((0,(23)),(0,(23))),((1,(23)),(1,(23))), \\
& ((0,(13)),(0,(13))),((1,(13)),(1,(13)))\},
\end{aligned}$$

$$\begin{aligned}
R_{(1,(12))}^{(2,6)} = & \{((0,e),(1,(12))),((1,e),(0,(12))), \\
& ((0,(12)),(1,e)),((1,(12)),(0,e)), \\
& ((0,(13)),(1,(132))),((1,(132)),(0,(132))), \\
& ((0,(123)),(1,(123))),((1,(123)),(0,(123))), \\
& ((0,(23)),(1,(23))),((1,(23)),(0,(23))), \\
& ((0,(13)),(1,(13))),((1,(13)),(0,(13)))\},
\end{aligned}$$

$$R_{(0,(13))}^{(2,6)} = \{((0, e), (0, (13))), ((1, e), (1, (13))), ((0, (12)), (0, (123))), ((1, (12)), (1, (123))), ((0, (13)), (0, e)), ((1, (13)), (1, e)), ((0, (23)), (0, (123))), ((1, (23)), (1, (123))), ((0, (123)), (0, (12))), ((1, (123)), (1, (12))), ((0, (132)), (0, (23))), ((1, (132)), (1, (23)))\},$$

$$R_{(1,(13))}^{(2,6)} = \{((0, e), (1, (13))), ((1, e), (0, (13))), ((0, (12)), (1, (123))), ((1, (12)), (0, (123))), ((0, (13)), (1, e)), ((1, (13)), (0, e)), ((0, (23)), (1, (123))), ((1, (23)), (0, (123))), ((0, (123)), (1, (12))), ((1, (123)), (0, (12))), ((0, (132)), (1, (23))), ((1, (132)), (0, (23)))\},$$

$$R_{(0,(23))}^{(2,6)} = \{((0, e), (0, (23))), ((1, e), (1, (23))), ((0, (12)), (0, (132))), ((1, (12)), (1, (132))), ((0, (13)), (0, (123))), ((1, (13)), (1, (123))), ((0, (23)), (0, e)), ((1, (23)), (1, e)), ((0, (123)), (0, (13))), ((1, (123)), (1, (13))), ((0, (132)), (0, (12))), ((1, (132)), (1, (12)))\},$$

$$R_{(1,(23))}^{(2,6)} = \{((0, e), (1, (23))), ((1, e), (0, (23))), ((0, (12)), (1, (132))), ((1, (12)), (0, (132))), ((0, (13)), (1, (123))), ((1, (13)), (0, (123))), ((0, (23)), (1, e)), ((1, (23)), (0, e)), ((0, (123)), (1, (13))), ((1, (123)), (0, (13))), ((0, (132)), (1, (12))), ((1, (132)), (0, (12)))\},$$

$$R_{(0,(123))}^{(2,6)} = \{((0, e), (0, (123))), ((1, e), (1, (123))), ((0, (12)), (0, (13))), ((1, (12)), (1, (13))), ((0, (13)), (0, (23))), ((1, (13)), (1, (23))), ((0, (23)), (0, (12))), ((1, (23)), (1, (12))), ((0, (123)), (0, (132))), ((1, (123)), (1, (132))), ((0, (132)), (0, e)), ((1, (132)), (1, e))\},$$

$$\begin{aligned}
R_{(1,(123))}^{(2,6)} &= \{((0, e), (1, (123))), ((1, e), (0, (123))), \\
&((0, (12)), (1, (13))), ((1, (12)), (0, (13))), \\
&((0, (13)), (1, (23))), ((1, (13)), (0, (23))), \\
&((0, (23)), (1, (12))), ((1, (23)), (0, (12))), \\
&((0, (123)), (1, (132))), ((1, (123)), (0, (132))), \\
&((0, (132)), (1, e)), ((1, (132)), (0, e))\}, \\
R_{(0,(132))}^{(2,6)} &= \{((0, e), (0, (132))), ((1, e), (1, (132))), \\
&((0, (12)), (0, (23))), ((1, (12)), (1, (23))), \\
&((0, (13)), (0, (12))), ((1, (13)), (1, (12))), \\
&((0, (23)), (0, (13))), ((1, (23)), (1, (13))), \\
&((0, (123)), (0, e)), ((1, (123)), (1, e)), \\
&((0, (132)), (0, (123))), ((1, (132)), (1, (123)))\}, \\
R_{(1,(132))}^{(2,6)} &= \{((0, e), (1, (132))), ((1, e), (0, (132))), \\
&((0, (12)), (1, (23))), ((1, (12)), (0, (23))), \\
&((0, (13)), (1, (12))), ((1, (13)), (0, (12))), \\
&((0, (23)), (1, (13))), ((1, (23)), (0, (13))), \\
&((0, (123)), (1, e)), ((1, (123)), (0, e)), \\
&((0, (132)), (1, (123))), ((1, (132)), (0, (123)))\},
\end{aligned}$$

Use of these relations, to calculate the cost of all the specified relationship, can be found: the hand phase in **Figure 3**, all transverse relationship with low cost, but all vertical relationship with high cost.

On the other hand, in {Yin, Mao}, {Wu, Wei}, {Xu, Hai} type or {Chen, Si}, {Shen, You}, {Zi, Shou} type for the vertices of the triangle respectively, the relationship between the cost is low. Otherwise, the relationship between the cost is high. It completes the proof.#

Proof of Theorem 3.2. See **Figure 2.**, in the Zangxiang system or the ten Heavenly Stems model for a healthy human body, only both the liking relation and the loving relation have the transfer law of the Yang or Yin vital or righteousness energies. By Theorem 3.2 of Zhang [23], Yang is transferring along the order of the loving relationship. Yin is transferring against the order of the loving relationship.

By Property 3.3, the following relation cost (0, (23)) is low.

$$\begin{aligned}
&(X^+(1,0), X^-(0,0)), (X_S^+(1,1), X_S^-(0,1)), \\
&(X_K^+(1,2), X_K^-(0,2)), (K_X^+(1,3), K_X^-(0,3)), \\
&(S_X^+(1,4), S_X^-(0,4)) \in
\end{aligned}$$

$$R_{(1,0)}^{(2,5)} = \{((0,0),(1,0)),((1,0),(0,0)), ((0,1),(1,1)),((1,1),(0,1)),((0,2),(1,2)), ((1,2),(0,2)),((0,3),(1,3)),((1,3),(0,3)), ((0,4),(1,4)),((1,4),(0,4))\}.$$

It is because the element (1, 0) of the ten Heavenly Stems is a Tao force, which is a low cost if the Yin Yang Wu Xing model V^5 is implemented by the Tao force of the Tao model V^2 . Their relations are called the liking relation.

Because the liking relationship cannot change the transfer law of the order of the loving relation, so, by Theorem 3.2 in Zhang [23], Yang is transferring along the order of the ten heavenly stems. Yin is transferring against the order of the ten heavenly stems. It completes the proof.#

Proof of Theorem 3.3. See Figure 3., in the Jingluo system or the twelve Earthly Branches model for a healthy human body, only both the liking relation and the adjacent relation have the transfer law of the Yang or Yin vital or righteousness energies.

By Definition 3.3, the elements of the twelve earthly branches have properties: Zi as the Yang water, Chou as the Yin earth, Yin as the Yang wood, Mao as the Yin wood, Chen as the Yang earth, Si as the Yin fire, Wu as the Yang fire, Wei as the Yin earth, Shen as the Yang metal; You as the Yin metal, Xu as the Yang earth, Hai as the Yang water. Here, earth element exists everywhere, so the energy transport order is mainly composed of wood, fire, metal and water elements.

About wood, fire, metal and water element to determine a natural transmission law of wood to fire, to metal by soil, then reach the water. That is to say: a natural Yin energy transmission rule is as follows:

- ← Yang wood Yin ↔ Yin wood Mao
- ← Yang earth Chen ↔ Yin fire Si
- ← Yang fire Wu ↔ Yin earth Wei
- ← Yang metal Shen ↔ Yin metal You
- ← Yang earth Xu ↔ Yin water Hai
- ← Yang water Zi ↔ Yin earth Chou ←

Its main content is still follow the intergeneration transmission sequence of Yin Yang Wu Xing.

By Property 3.4, the following relation cost (0, (23))

$$(X^+(0,e), X^-(0,(23))), (X_s^{+x}(1,e), X_s^{-x}(1,(23))), (X_K^+(0,(12)), X_K^-(0,(132))), (K_X^+(1,(12)), K_X^-(1,(132))), (S_X^+(0,(13)), S_X^-(0,(123))), (X_s^{+j}(1,(123)), X_s^{-j}(1,(123))) \in$$

$$R_{(0,(23))}^{(2,6)} = \{((0,e),(0,(23))),((1,e),(1,(23))), ((0,(12)),(0,(132))),((1,(12)),(1,(132))), ((0,(13)),(0,(123))),((1,(13)),(1,(123))), ((0,(23)),(0,e)),((1,(23)),(1,e)), ((0,(123)),(0,(13))),((1,(123)),(1,(13))), ((0,(132)),(0,(12))),((1,(132)),(1,(12)))\}.$$

It is because the element (0, (23)) of the twelve Earthly Branches is an essential substance circulating in the channels and blood vessels (营气). It is a low cost element if a human body “eats”. Their relations are called the liking relation for a healthy human body, denoted by $\overset{less}{\leftrightarrow}$.

Because the liking relationship cannot change the transfer law of the order of the loving relation, so, the above elements replacing transmission rule of the twelve earthly branches element, get the transmission law of the twelve earthly branches:

$$\begin{aligned}
 &\overset{less}{\leftarrow} \text{virtual Zi } X^+ \overset{less}{\leftrightarrow} \text{virtual Chou } X^- \\
 &(\overset{less}{\leftarrow} \text{virtual Shen } S_X^+ \overset{less}{\leftrightarrow} \text{virtual You } S_X^-) \\
 &\overset{rare}{\leftarrow} \text{real Yin } K_X^- \overset{less}{\leftrightarrow} \text{real Mao } K_X^+ \\
 &\overset{more}{\leftarrow} \text{real Chen } X_K^+ \overset{less}{\leftrightarrow} \text{real Si } X_K^- \\
 &\overset{rare}{\leftarrow} \text{virtual Wu } X_S^{j-} \overset{less}{\leftrightarrow} \text{virtual Wei } X_S^{j+} \\
 &\overset{rare}{\leftarrow} \text{virtual Shen } S_X^+ \overset{less}{\leftrightarrow} \text{virtual You } S_X^- \\
 &\overset{rare}{\Rightarrow} \text{virtual Xu } X_S^{x-} \overset{less}{\leftrightarrow} \text{virtual Hai } X_S^{x+} \\
 &\overset{less}{\leftarrow} \text{virtual Zi } X^+ \overset{less}{\leftrightarrow} \text{virtual Chou } X^-
 \end{aligned}$$

The relationship

$$\begin{aligned}
 &\text{virtual Wu } X_S^{j-} \overset{less}{\leftrightarrow} \text{virtual Wei } X_S^{j+} \\
 &\overset{rare}{\leftarrow} \text{virtual Shen } S_X^+ \overset{less}{\leftrightarrow} \text{virtual You } S_X^- \\
 &\overset{rare}{\Rightarrow} \text{virtual Xu } X_S^{x-} \overset{less}{\leftrightarrow} \text{virtual Hai } X_S^{x+}
 \end{aligned}$$

can be abbreviated as

$$\begin{aligned}
 &\text{virtual Wu } X_S^{j-} \overset{less}{\leftrightarrow} \text{virtual Wei } X_S^{j+} \\
 &\overset{less}{\leftrightarrow} \text{virtual Xu } X_S^{x-} \overset{less}{\leftrightarrow} \text{virtual Hai } X_S^{x+}
 \end{aligned}$$

Thus

$$\begin{aligned}
 &\overset{less}{\leftarrow} \text{virtual Zi } X^+ \overset{less}{\leftrightarrow} \text{virtual Chou } X^- \\
 &(\overset{less}{\leftarrow} \text{virtual Shen } S_X^+ \overset{less}{\leftrightarrow} \text{virtual You } S_X^-) \\
 &\overset{rare}{\leftarrow} \text{real Yin } K_X^- \overset{less}{\leftrightarrow} \text{real Mao } K_X^+ \\
 &\overset{more}{\leftarrow} \text{real Chen } X_K^+ \overset{less}{\leftrightarrow} \text{real Si } X_K^- \\
 &\overset{rare}{\leftarrow} \text{virtual Wu } X_S^{j-} \overset{less}{\leftrightarrow} \text{virtual Wei } X_S^{j+} \\
 &\overset{less}{\leftrightarrow} \text{virtual Xu } X_S^{x-} \overset{less}{\leftrightarrow} \text{virtual Hai } X_S^{x+} \\
 &\overset{less}{\leftarrow} \text{virtual Zi } X^+ \overset{less}{\leftrightarrow} \text{virtual Chou } X^-
 \end{aligned}$$

Because the order

$$X(\leftarrow S_X) \leftarrow K_X \leftarrow X_K \leftarrow X_S \leftarrow X(\leftarrow S_X) \leftarrow$$

is transferring against the loving order of the twelve earthly branches, of course, by Theorem 3.2 in Zhang [23], it is the transfer law of the Yin vital or righteousness energies of the twelve earthly branches.

By Theorem 3.2 in Zhang [23], Yang is transferring along the order of the loving relationship. Yin is transferring against the order of the loving relationship. So, the transfer law of the Yin vital or righteousness energies of the twelve earthly branches is transferring against the order of the loving or liking relationship. It is because the liking relationship cannot change the transfer law of the order of the loving relation.

Thus, the transfer law of the Yang vital or righteousness energies of the twelve earthly branches is as follows:

$$\begin{aligned}
 & \text{real Chou } X^- \overset{\text{less}}{\leftrightarrow} \text{real Zi } X^+ \\
 & \overset{\text{less}}{\rightarrow} \text{real Hai } X_S^{x+} \overset{\text{less}}{\leftrightarrow} \text{real Xu } X_S^{x-} \\
 & \overset{\text{rare}}{\leftarrow} \text{real You } S_X^- \overset{\text{less}}{\leftrightarrow} \text{real Shen } S_X^+ \\
 & \overset{\text{rare}}{\Rightarrow} \text{real Wei } X_S^{j+} \overset{\text{less}}{\leftrightarrow} \text{real Wu } X_S^{j-} \\
 & \overset{\text{rare}}{\rightarrow} \text{virtual Si } X_K^- \overset{\text{less}}{\leftrightarrow} \text{virtual Chen } X_K^+ \\
 & \overset{\text{less}}{\rightarrow} \text{virtual Mao } K_X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual Yin } K_X^- \\
 & (\overset{\text{rare}}{\rightarrow} \text{real You } S_X^- \overset{\text{less}}{\leftrightarrow} \text{real Shen } S_X^+) \\
 & \overset{\text{less}}{\rightarrow} \text{real Chou } X^- \overset{\text{less}}{\leftrightarrow} \text{real Zi } X^+
 \end{aligned}$$

The relationship

$$\begin{aligned}
 & \text{real Hai } X_S^{x+} \overset{\text{less}}{\leftrightarrow} \text{real Xu } X_S^{x-} \\
 & \overset{\text{rare}}{\leftarrow} \text{real You } S_X^- \overset{\text{less}}{\leftrightarrow} \text{real Shen } S_X^+ \\
 & \overset{\text{rare}}{\Rightarrow} \text{real Wei } X_S^{j+} \overset{\text{less}}{\leftrightarrow} \text{real Wu } X_S^{j-}
 \end{aligned}$$

can be abbreviated as

$$\begin{aligned}
 & \text{real Hai } X_S^{x+} \overset{\text{less}}{\leftrightarrow} \text{real Xu } X_S^{x-} \\
 & \overset{\text{less}}{\leftrightarrow} \text{real Wei } X_S^{j+} \overset{\text{less}}{\leftrightarrow} \text{real Wu } X_S^{j-}
 \end{aligned}$$

Thus

$$\begin{aligned}
 & \text{real Chou } X^- \overset{\text{less}}{\leftrightarrow} \text{real Zi } X^+ \\
 & \overset{\text{less}}{\rightarrow} \text{real Hai } X_S^{x+} \overset{\text{less}}{\leftrightarrow} \text{real Xu } X_S^{x-} \\
 & \overset{\text{less}}{\leftrightarrow} \text{real Wei } X_S^{j+} \overset{\text{less}}{\leftrightarrow} \text{real Wu } X_S^{j-} \\
 & \overset{\text{rare}}{\rightarrow} \text{virtual Si } X_K^- \overset{\text{less}}{\leftrightarrow} \text{virtual Chen } X_K^+ \\
 & \overset{\text{less}}{\rightarrow} \text{virtual Mao } K_X^+ \overset{\text{less}}{\leftrightarrow} \text{virtual Yin } K_X^- \\
 & (\overset{\text{rare}}{\rightarrow} \text{real You } S_X^- \overset{\text{less}}{\leftrightarrow} \text{real Shen } S_X^+) \\
 & \overset{\text{less}}{\rightarrow} \text{real Chou } X^- \overset{\text{less}}{\leftrightarrow} \text{real Zi } X^+
 \end{aligned}$$

Because the order

$$X \rightarrow X_S \rightarrow X_K \rightarrow K_X (\rightarrow S_X) \rightarrow X \rightarrow$$

is transferring along the loving order of the twelve earthly branches, of course, by Theorem 3.2 in Zhang [23], it is the transfer law of the Yang vital or righteousness energies of the twelve earthly branches.

Therefore, the transfer law of the Yang or Yin vital or righteousness energies of the twelve earthly branches is obtained as follows: Yang is transferring along the liking or loving order of the twelve earthly branches. And Yin is transferring against the liking or loving order of the twelve earthly branches. It completes the proof.#

Proof of Theorem 3.4. See Figure 2., in the Zangxiang system or the ten Heavenly Stems model for an unhealthy human body, only both the liking relation and the killing relation have the transfer law of the Yang or Yin vital or righteousness energies. By Theorem 3.3 of Zhang [23], Yang is transferring against the order of the killing relationship. Yin is transferring along the order of the killing relationship.

By Property 3.3, the following relation cost (1, 0) is low.

$$\begin{aligned} & (X^+(1,0), X^-(0,0)), (X_S^+(1,1), X_S^-(0,1)), \\ & (X_K^+(1,2), X_K^-(0,2)), (K_X^+(1,3), K_X^-(0,3)), \\ & (S_X^+(1,4), S_X^-(0,4)) \in \\ & R_{(1,0)}^{(2,5)} = \{((0,0), (1,0)), ((1,0), (0,0)), \\ & ((0,1), (1,1)), ((1,1), (0,1)), ((0,2), (1,2)), \\ & ((1,2), (0,2)), ((0,3), (1,3)), ((1,3), (0,3)), \\ & ((0,4), (1,4)), ((1,4), (0,4))\}. \end{aligned}$$

It is because the element (1, 0) of the ten Heavenly Stems is a Tao force, which is a low cost if the Yin Yang Wu Xing model V^5 is implemented by the Tao force of the Tao model V^2 . Their relations are called the liking relation.

Because the liking relationship cannot change the transfer law of the order of the killing relation, so, by Theorem 3.3 in Zhang [23], Yang is transferring along the order of the killing or liking relation of the ten heavenly stems. Yin is transferring along the order of the killing or liking relation of the ten heavenly stems. It completes the proof.#

Proof of Theorem 3.5. See Figure 3., in the Jingluo system or the twelve Earthly Branches model for an unhealthy human body, only both the liking relation and the alternate relation have the transfer law of the Yang or Yin vital or righteousness energies.

By Property 3.4, the following relation cost (0, (23)) is low.

$$\begin{aligned} & (X^+(0,e), X^-(0,(23))), (X_S^{+x}(1,e), X_S^{-x}(1,(23))), \\ & (X_K^+(0,(12)), X_K^-(0,(132))), (K_X^+(1,(12)), K_X^-(1,(132))), \\ & (S_X^+(0,(13)), S_X^-(0,(123))), (X_S^{+j}(1,(123)), X_S^{-j}(1,(123))) \in \end{aligned}$$

$$R_{(0,(23))}^{(2,6)} = \{((0,e),(0,(23))),((1,e),(1,(23))), ((0,(12)),(0,(132))),((1,(12)),(1,(132))), ((0,(13)),(0,(123))),((1,(13)),(1,(123))), ((0,(23)),(0,e)),((1,(23)),(1,e)), ((0,(123)),(0,(13))),((1,(123)),(1,(13))), ((0,(132)),(0,(12))),((1,(132)),(1,(12)))\}.$$

It is because the element (0, (23)) of the twelve Earthly Branches is an essential substance circulating in the channels and blood vessels (营气). It is a low cost element if the economic society “eats”. Their relations are called the liking relation for a healthy human body, denoted by \Leftrightarrow .

By Theorem 3.3 in Zhang [23], Yang is transferring against the order of the killing relationship. Yin is transferring along the order of the killing relationship. So, the transfer law of the Yin vital or righteousness energies of the twelve earthly branches is transferring along the order of the killing or liking relationship. It is because the liking relationship cannot change the transfer law of the order of the killing or liking relation.

In mathematics, by Theorem 3.3 in Zhang [23], for the unhealthy human body, the transfer law of the Yin vital energies of the twelve earthly branches is as follows:

Mao	Zi	Chen
$K_X^+(1,(12)) \Rightarrow$	$X^+(0,e)$	$X_K^+(0,(12)) \Rightarrow$
\Downarrow	\Downarrow	\Downarrow
\Rightarrow Yin	Chou	Si
$K_X^-(1,(132))$	$X^-(0,(23)) \Rightarrow$	$X_K^-(0,(132))$
\Rightarrow Shen	Wei	Hai
$S_X^+(0,(13))$	$X_S^{+j}(1,(13)) \Leftrightarrow$	$X_S^{+x}(1,e)$
\Downarrow	\Downarrow	\Downarrow
You	Wu	Xu
$S_X^+(0,(123)) \Rightarrow$	$X_S^{-j}(1,(123))$	$X_S^{-x}(1,(23)) \Rightarrow$

It is because the order

$$K_X \Rightarrow X \Rightarrow X_K \Rightarrow S_X \Rightarrow X_S \Rightarrow$$

is transferring along the killing order of the twelve earthly branches.

Similarly, Yang is transferring against the order of the killing or liking relationship. So, the transfer law of the Yang vital or righteousness energies of the twelve earthly branches is transferring against the order of the killing or liking relationship. It is because the liking relationship cannot change the transfer law of the order of the killing or liking relation.

In mathematics, by Theorem 3.3 in Zhang [23], for the unhealthy human body, the transfer law of the Yang vital energies of the twelve earthly branches is

as follows:

$$\begin{array}{ccccc}
 \text{Mao} & & \text{Hai} & & \text{Wei} \\
 K_X^+(1,(12)) \Leftarrow & & X_S^{+x}(1,e) & & X_S^{+j}(1,(13)) \Leftarrow \\
 \Downarrow & & \Downarrow & & \Downarrow \\
 \Leftarrow \text{Yin} & & \text{Xu} & & \text{Wu} \\
 K_X^-(1,(132)) & & X_S^{-x}(1,(23)) \Leftrightarrow & & X_S^{-j}(1,(123)) \\
 \Leftarrow \text{Shen} & & \text{Chen} & & \text{Zi} \\
 S_X^+(0,(13)) & & X_K^+(0,(12)) \Leftarrow & & X^+(0,e) \\
 \Downarrow & & \Downarrow & & \Downarrow \\
 \text{You} & & \text{Si} & & \text{Chou} \\
 S_X^-(0,(123)) \Leftarrow & & X_K^-(0,(132)) & & X^-(0,(23)) \Leftarrow
 \end{array}$$

It is because the order

$$K_X \Leftarrow X_S \Leftarrow S_X \Leftarrow X_K \Leftarrow X \Leftarrow$$

is transferring against the killing order of the twelve earthly branches. It completes the proof.#

Proof of Theorem 4.1. Let

$$a = 7.34539, b = 7.45461, t_0 = 7.4.$$

1) By the (1) of Theorem 4.1 in Zhang [23], X and X_K as continuous subsystems of occurring disease, it only need to be proved that the subsystem X itself is the root-cause of a virtual disease and that the son subsystem X_S of X is the symptoms of disease at this time.

In this case, the human body is unhealthy. The first physiological system is running hardly. The loving relationship is running hardly. Only the killing relationship run normally.

By Theorems 3.2 and 3.3, the first transfer law of a human body's energies is not to work. By Theorems 3.4 and 3.5, the second transfer law of a human body's energies is beginning to work.

By the theory of Zangxiang and Jingluo in Definition 3.1 and 3.2, the virtual disease of the subsystem X is transferring from the virtual disease of its son X_S for a good self-protection ability. Consider whether the subsystem X virtual disease, the cause of its root-cause will be able to direct the subsystem X treatment. In the following, consider the result of the subsystem X direct intervention.

From Theorem 3.2 and Corollary 3.2 in [20], the subsystem X was considered as virtual. When the capability of self-protection is nearly to the best state, *i.e.*, $\rho_3 = c\rho(x)$ where $c \rightarrow 1$, if you increase the energy of the subsystem X directly, then its capabilities of both intervention reaction and self-protection can make the subsystems S_X , K_X and X_K restored at the same time, but the subsystems X and X_S will increase their energies, *i.e.*, changed by the increments

$$\begin{aligned}
 \Delta\varphi(X)_2 &\rightarrow (1 - \rho(x)^3)\Delta > 0, \\
 \Delta\varphi(X_S)_2 &\rightarrow (\rho(x) + \rho(x)^3)\Delta > 0,
 \end{aligned}$$

respectively.

Since the human body blood pH value $x < a$ makes $0 \leq \rho_1 = \rho(x) < \rho_0$ such that $(\rho(x) + \rho(x)^3) < (1 - \rho(x)^3)$, therefore the subsystem X can obtain the large increment $\Delta\varphi(X)_2 = (1 - \rho(x)^3)\Delta > 0$ and the subsystem X_S will get the small increment $\Delta\varphi(X_S)_2 \rightarrow (\rho(x) + \rho(x)^3)\Delta > 0$. The later is the pseudo side effects issue, by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the human body is unhealthy, virtual and X intervened makes that the second physiological system will attain the *Chi* or energy (Yang energy) from the son X_S of the intervened subsystem X . The attaining way is an indirect treating for X as an unhealthy human body with a virtual disease. That means for the intervened subsystem X direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem X deficiency disease is why disease at this time. Thus, the subsystem X itself is the root-cause of a virtual disease. Of course, the son subsystem X_S of X is the symptoms of disease at this time. Need to use the method of the intervening principle of “Strong inhibition of the same time, support the weak” (抑强扶弱) action to treat.

2) By the (2) of Theorem 4.1 in Zhang [23], X and S_X as continuous subsystems of occurring disease, it only need to be proved that the mother S_X of subsystem X is the root-cause of a virtual disease and the subsystem X itself is the symptoms of a virtual disease at this time.

In this case, the human body is healthy. The first physiological system is running normally. The loving relationship is running normally. The liking relationship is also running normally. By Theorems 3.2 and 3.3, the first transfer law of a human body’s energies is doing to work. By Theorems 3.4 and 3.5, the second transfer law of a human body’s energies is not to work.

By the theory of Zangxiang and Jingluo in Definition 3.1 and 3.2, the virtual disease of the subsystem X is transferring from the virtual disease of its mother S_X for a good self-protection ability. Consider whether the mother S_X of the subsystem X virtual disease, the cause of its root-cause will be able to direct the mother S_X of the subsystem X treatment. In the following, consider the result of the mother S_X of the subsystem X treatment direct intervention.

From Theorem 3.2 and Corollary 3.2 in [20], the subsystem X will be considered as virtual. First the case is studied that the capability of self-protection is in the best state, *i.e.*, $\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1 > 0$ where $c \rightarrow 1$. If the energy of the subsystem S_X is intervened to increase its energy, then its capabilities of intervention reaction and self-protection can make the subsystems K_X , X_K and X_S restored at the same time, but the subsystems S_X and X will increase their energies, *i.e.*, changed by the increments

$$\begin{aligned}\Delta\varphi(S_X)_2 &\rightarrow (1 - \rho(x)^3)\Delta > 0, \\ \Delta\varphi(X)_2 &\rightarrow (\rho(x) + \rho(x)^3)\Delta > 0,\end{aligned}$$

respectively.

Since the human body blood pH value $a \leq x \leq t_0$ makes $1 \geq \rho_1 = \rho(x) \geq \rho_0$ such that mainly $(\rho(x) + \rho(x)^3) \geq (1 - \rho(x)^3)$, therefore the subsystem X can obtain the large increment $\Delta\varphi(X)_2 = (\rho(x) + \rho(x)^3)\Delta > 0$ and the subsystem S_X will get the small increment $\Delta\varphi(S_X)_2 = (1 - \rho(x)^3)\Delta$. The later is the pseudo side effects issue, by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the human body is healthy, virtual and S_X intervened makes that the second physiological system will attain the *Chi* or energy from the intervened subsystem S_X directly for a healthy with a virtual disease. That means for the intervened subsystem S_X direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem S_X deficiency disease is why disease at this time. Thus, the mother subsystem S_X of X is the root-cause of a virtual disease. Of course, the subsystem X itself is the symptoms of a virtual disease at this time. Need to use the method of the intervening principle of “Strong inhibition of the same time, support the weak” (抑强扶弱) action to treat.

3) By the (3) of Theorem 4.1 in Zhang [23], X and X_S as continuous subsystems of occurring disease, it only need to be proved that the son X_S of X the root-cause of a real disease and the subsystem X itself is the symptoms of a real disease at this time.

In this case, the human body is healthy. The first physiological system is running normally. The loving relationship is running normally. The liking relationship is also running normally. By Theorems 3.2 and 3.3, the first transfer law of a human body’s energies is doing to work. By Theorems 3.4 and 3.5, the second transfer law of a human body’s energies is not to work.

By the theory of Zangxiang and Jingluo in Definitions 3.1 and 3.2, the virtual disease of the subsystem X is transferring from the virtual disease of its son X_S for a good self-protection ability. Consider whether the son X_S of the subsystem X virtual disease, the cause of its root-cause will be able to direct the son X_S of the subsystem X treatment. In the following, consider the result of the son X_S of the subsystem X treatment direct intervention.

From Theorem 3.2 and Corollary 3.2 in [20], the subsystem X will be considered as real. First the case is studied that the capability of self-protection is in the best state, *i.e.*, $\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1$ where $c \rightarrow 1$. If the energy of the subsystem X_S is intervened to decrease its energy, then its capabilities of intervention reaction and self-protection can make the subsystems X_K , K_X and S_X restored at the same time, but the subsystems X and X_S will decrease their energies, *i.e.*, changed by the increment

$$\begin{aligned}\Delta\varphi(X)_2 &\rightarrow -(\rho(x) + \rho(x)^3)\Delta > 0, \\ \Delta\varphi(X_S)_2 &\rightarrow -(1 - \rho(x)^3)\Delta > 0,\end{aligned}$$

respectively. Since the human body blood pH value $t_0 < x \leq b$ makes $1 > \rho_1 = \rho(x) \geq \rho_0$ such that mainly $(\rho(x) + \rho(x)^3) \geq (1 - \rho(x)^3)$, therefore the subsystem X can obtain the substantial reduction

$\Delta\varphi(X)_2 = -(\rho(x) + \rho(x)^3)\Delta < 0$ and the subsystem X_S will get a modest reduction $\Delta\varphi(X_S)_2 = -(1 - \rho(x)^3)\Delta < 0$. The later is the pseudo side effects issue,

by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the human body is healthy, real and X_S intervened makes that the second physiological system will attain the *Chi* or energy from the intervened subsystem X_S directly for a healthy with a real disease. That means for the intervened subsystem X_S direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem X_S real disease is why disease at this time. Thus, the son subsystem X_S of X is the root-cause of a real disease. Of course, the subsystem X itself is the symptoms of a real disease at this time. Need to use the method of the intervening principle of “Strong inhibition of the same time, support the weak” (抑强扶弱) action to treat.

4) By the (4) of Theorem 4.1 in Zhang [23], X and K_X as continuous subsystems of occurring disease, it only need to be proved that the subsystem X itself is the root-cause of a real disease and that the mother S_X of X is the symptoms of a real disease at this time.

In this case, the human body is unhealthy. The first physiological system is running hardly. The loving relationship is running hardly. Only the killing relationship is running normally. By Theorems 3.2 and 3.3, the first transfer law of a human body's energies is not to work. By Theorems 3.4 and 3.5, the second transfer law of a human body's energies is beginning to work.

By the theory of Zangxiang and Jingluo in Definitions 3.1 and 3.2, the virtual disease of the subsystem X is transferring from the real disease of its mother S_X for a good self-protection ability. Consider whether the subsystem X virtual disease, the cause of its root-cause will be able to direct the subsystem X treatment. In the following, consider the result of the subsystem X treatment direct intervention.

From Theorems 3.2 and Corollary 3.2 in [20], the subsystem X was considered as real. When the capability of self-protection is in the best state, *i.e.*, $\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1$ where $c \rightarrow 1$, if the energy of the subsystem X is intervened to decrease its energy directly, then its capabilities of intervention reaction and self-protection can make the subsystems X_{K_S} , K_X and X_S restored at the same time, but the subsystems X and S_X will decrease their energies, *i.e.*, changed by the increments

$$\Delta\varphi(X)_2 \rightarrow -(1 - \rho(x)^3)\Delta < 0,$$

$$\Delta\varphi(S_X)_2 \rightarrow -(\rho(x) + \rho(x)^3)\Delta < 0,$$

respectively.

Since the human body blood pH value $x > b$ makes $0 \leq \rho_1 = \rho(x) < \rho_0$ such that $(\rho(x) + \rho(x)^3) < (1 - \rho(x)^3)$, therefore the subsystem X can obtain the substantial reduction $\Delta\varphi(X)_2 = -(1 - \rho(x)^3)\Delta < 0$ and the subsystem S_X will get a modest reduction $\Delta\varphi(S_X) = -(\rho(x) + \rho(x)^3)\Delta < 0$. The later is the pseudo side effects, by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the human body is unhealthy, real and X intervened makes that the second physiological system will attain the *Chi* or energy from the mother S_X of the intervened subsystem X . The attaining way is an indirect treating for X as an unhealthy human body with a real disease. That means for the intervened subsystem X direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem X real disease is why disease at this time. Thus the subsystem X is the root-cause of a real disease. Of course, the mother S_X of X is the symptoms of a real disease at this time. Need to use the method of the intervening principle of “Strong inhibition of the same time, support the weak” (抑强扶弱) action to treat. It completes the proof.#