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RESEARCH ARTICLE

Contemporary Chinese Pulse Diagnosis: A Modern Interpretation of an Ancient and Traditional Method

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Abstract
Contemporary Chinese Pulse Diagnosis (CCPD) is the system of pulse diagnosis utilized by Dr John He Feng Shen, OMD, and documented by Dr Leon Hammer, MD, in the book *Chinese Pulse Diagnosis, A Contemporary Approach*. It is the traditional method of the Ding family medical lineage from the Shanghai region and dated to the 15th century in Chinese language texts. The fundamentals of this system are, however, much older and can be directly traced to one of the earliest classic texts of Chinese medicine, the Neijing Suwen.

Being passed from the last direct inheritor of Ding knowledge (Dr Shen) to modern practitioners of Chinese medicine by way of Dr Hammer and his students, it represents an important system of advanced diagnosis. Although modern diagnostic technology provides very sophisticated diagnoses, for these instruments to be effective, the disease process must already have a physical manifestation. CCPD on the other hand provides the earliest warnings of physiological processes, which if left unchecked, may result in the subsequent appearance of a disease.

This article describes the derivation and principles of this system of pulse diagnosis, and explores its successful integration into the modern practice of Chinese medicine.

1. Introduction

Patient evaluation within Oriental medicine incorporates four traditional methods of inquiry - questioning, auscultation, observation and palpation. Assessment of the pulse (most commonly at the radial artery) is thought historically and in modern practice to contribute important diagnostic information to 'palpation', and thus play a significant role guiding the clinical decisions that establish diagnoses. As such different methods of pulse diagnosis developed throughout history across the various traditions of Oriental medicine. Although each gathered slightly different information, the purpose of all was to alert the physician to changes in normal physiological functioning that had the

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potential to result in illness and disease. Originating from the Chinese medical tradition, Contemporary Chinese Pulse Diagnosis (CCPD) is one such method.

CCPD otherwise known as Shen-Hammer pulse diagnosis is the system of pulse diagnosis utilized by Dr John He Feng Shen, OMD [1] and documented by Dr Leon Hammer, MD, in the book *Chinese Pulse Diagnosis, A Contemporary Approach* [2]. This pulse system is founded in a long history of Chinese medical knowledge that existed in China prior to the Communist Revolution [2,3]. For reasons of success and survival, the secrets prized by the historic family lineages were closely guarded. Those without direct inheritance of the oral tradition had little or no access to the information. In the case of CCPD however, remarkable circumstances occurring in recent history have allowed people outside the lineage access to this knowledge.

This article aims to outline the origins and history of CCPD and describes the fundamental principles of this comprehensive system of pulse diagnosis.

2. Recent history

2.1. Dr John HF Shen, OMD

Dr Shen began his studies of Chinese medicine in the early 1930s, graduating from Shanghai College of Chinese Medicine in 1935. Formerly the Shanghai Technical College, it was an official school operated by the Ding family physicians, one of four influential lineages in Menghe medicine [4]. On completion of the program, he apprenticed with Ding Ji Wan, the last inheritor of the Ding-Fei pulse system, a method of pulse diagnosis dated to the 15th century and by custom accessible only to those with birthright entitlements [3].

Several years after his graduation, the outbreak of the Chinese War of Resistance against Japan (1937) saw thousands of refugees settle the foreign concessions of inner Shanghai. Seeing an opportunity, Dr Shen together with 10 other doctors set up a hospital to provide low-cost medical care for the people who lived in these crowded inner city areas. At its busiest times, Dr Shen alone would reportedly treat more than 200 people per day [5], providing him with an enormous amount of clinical experience and empirical knowledge from the very outset of his career.

In 1949, Dr Shen settled in Taiwan, having fled the political conditions that swept China as a result of the Communist Revolution. He practiced Chinese medicine there for at least 12 years, endeavoring to improve the diagnostic methods, particularly honing his skills in radial artery pulse diagnosis. By 1964, his reputation was growing, and the Malaysian Chinese Medical Trade Union invited Dr Shen to travel Southeast Asia as a visiting medical consultant [5].

Following 7 years in this influential position, his sister sponsored his immigration to the USA [3] where in 1974, he first encountered Dr Hammer in a medical office in East Hampton, NY. For the next 25 years, Dr Shen operated clinics in the Chinatowns of both Manhattan, and Boston, and continued to develop his methods of diagnosis and treatment. By the 1980s, his skill as a practitioner was world-renowned, and he lectured extensively in Australia, the USA, and Europe between 1978 and 1995 [1,3]. Dr Shen continued his practice of Chinese medicine in the USA until 2000, when he returned to his native city of Shanghai shortly before his death [3].

2.2. Dr Leon Hammer, MD

Dr Hammer began his study of medicine at Cornell University Medical College, NY in 1948. On completion of his residency, he commenced his medical career as a psychiatrist and having an interest in psychoanalysis, he spent a further 7 years at the William A. White Institute of Psychoanalysis and Psychiatry in New York. He specialized in child psychiatry and directed a child guidance clinic and the Drug Abuse Councils on the Southeast Shore of Long Island. He also lectured at Adelphi University, and was a Psychiatric Consultant and associate professor at Southampton College in Southampton, NY [Hammer L, Oral communication, 2007].

In 1971, following an 8-year period working with Alexander Lowen (Bioenergetics), and 3 years with Fritz Perls (Gestalt therapy), he began his study of Oriental medicine. For 4 years, he was educated under the guidance of Dr Jon D van Buren in England, alongside Giovanni Maciocia [Hammer L, Oral communication, 2007]. On his return to New York, Dr Hammer experienced Dr Shen's extraordinary diagnostic ability in a colleague's medical office [1,3]. Committed to learning these skills, he subsequently completed 8 years of apprenticeship under Dr Shen's direct tutelage, attending his Manhattan Chinatown clinic 3 days a week. The mentorship concluded with Dr Hammer's relocation from the New York City area; however, he maintained a close association with Dr Shen that lasted until his death [3].

Throughout his career, Dr Shen "had a strong desire to improve the Chinese diagnostic techniques" [1]. This was equally matched by Dr Hammer's determination to document a diagnostic system that from his medical perspective showed exceptional empirical integrity [3] [Hammer L, Oral communication, 2007]. During their close to 30-year alliance they evolved concepts based on the combined experience of their medicine, and Dr Hammer worked closely with Dr Shen to document the pulse system he used, standardizing the theoretical framework of the method and terminology used within the system [2] [Hammer L, Oral communication, 2005].

3. Influence of the Chinese medical classics on CCPD

Oriental medicine is not composed of a single theoretical system, nor is it a single system of practice [6]. Many practices and theories exist within the medicine, of which many can be directly traced to the medical classics. As such there are numerous models of pulse diagnosis that exist, each employing different terminology and operating systems in terms of pulse depths, pulse positions, and pulse qualities. Each method yields a somewhat different set of information; however, the common outcome of all is to provide the practitioner with diagnostic clues that are relevant to the particular paradigm of practice.

Amongst the more well-known methods of pulse diagnosis are those that use two depths to assess the radial artery and have their origins in the Nan Jing [7], such as the

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method documented by Wang Shu-He [8]. There are also methods that incorporate three depths and have their origins in the Neijing Suwen [9]. CCPD exemplifies the latter and also exhibits evidence of later concepts from interpretations of the work of Li Shi Zhen (1564) and Zhang Jie-Bing (1624) [2].

3.1. CCPD - A three-depth system

CCPD is an example of a three-depth system of radial artery pulse diagnosis. Although the model formally describes eight depths, in practice three main depths are palpated. These are termed the qi, blood, and organ depths [2]. CCPD gives preference for the six principal or major pulse positions to the zang or yin organs owing to their primary role in physiological function. The fu or yang organs are found in the secondary or complementary positions that are mostly located in relation to a principal position on the radial artery [2].

3.2. Influence of the Neijing Suwen

The arrangement on the radial artery of the major pulse positions in CCPD are very similar to that described by the Neijing Suwen [9], one of the earliest canons of Chinese medical literature compiled during the late Warring States and early Han periods(c. 400 BCE—260 CE) [10]. This classic emphasizes the importance of the storing function of the zang or yin organs compared to the transporting function of the fu or yang organs. Exception is given to the Stomach or "the sea of nutrients" as it is the origin of the "pure essence" of the Spleen that circulates to nourish the five zang organs. Therefore, the yin organs, the Heart, Liver, Lung, Kidney Yin, and Kidney Yang, as well as the Stomach (the only yang organ included) are perceived as the significant energetic factors and are assigned the six main pulse positions [9].

The Neijing Suwen also describes the pulse positions on the radial artery as being an anatomically correct representation of the body. The distal positions are described as reflecting the chest, the middle positions the epigastrium to abdomen, and the proximal positions the abdomen to feet [9]. In doing so, the pulse positions are organized according to the Triple Burner. Likewise, the CCPD model retains the anatomical integrity of the homunculus at the wrists with both the principal and complementary positions each placed within the appropriate area of the Three Burning Spaces.

3.3. Influence of Li Shi Zhen

Li Shi Zhen (1564) further developed the Triple Burner model that was first described by the Neijing Suwen [9]. He elaborated this by identifying an association of the Gall Bladder with the Liver, or the left middle position; the Spleen with the Stomach, or the right middle position; and the Intestines and Bladder with the Kidney pulses, or the proximal positions [11]. Similarly CCPD associates these organs via the relationship between the principal and complementary positions. Li Shi Zhen also describes palpation of the superficial, middle, and deep aspects of the pulse [11], which is a foundation of the CCPD method.

3.4. Influence of Zhang Jie-Bing

Zhang Jie-Bing (1624) expounded Wang Shu-He's two-depth model [8] and described the placement of additional pulse positions that show similarity to those used in CCPD. He listed the Sternum as the superficial pulse in the right distal location, which has a correlation to, and suggests a prelude to what Dr Shen later referred to as the Diaphragm position. Further, Zhang Jie-Bing's arrangement places the Large Intestine in relation to the left proximal position and the Small Intestine to the right proximal position. Although these are placed at a more superficial depth, the same organs are related in CCPD by the association of the proximal and complementary positions. Another similarity suggesting the influence of Zhang Jie-Bing is Dr Shen's positioning of the Pericardium within the left distal position, which bears some correlation with that of Zhang Jie-Bing [2].

3.5. The Model of Wang Shu-He - A two-depth system

By comparison, the most commonly encountered pulse model described by Wang Shu-He in the Mai Jing (c. 280 CE) [8] incorporates two depths [12, 13]. It is one of many pulse systems first mentioned in the Nan Jing classic (c. 200 CE) [7], including Wang Shu-He's lesser known elaboration of Chapter 5 that describes palpation of various depths measured by "beans of pressure" [14]. Undoubtedly, the most important concept transmitted by this manuscript that affected many subsequent pulse systems is its identification of the radial artery as the predominant site for assessing a patient's pulse. The two depth method of Wang Shu-He is what predominates in teaching institutions in Australia, Europe, and the USA and is most commonly used today by practitioners of these counties [2].

When comparing this model with a three-depth system such as CCPD, several major organizational differences become apparent. Obviously within the Wang Shu-He method two main depths of the pulse are palpated, but more significantly, it exhibits a deviation from the system first mentioned in the Neijing Suwen, where organs were placed at the wrist according to their location within the Triple Burner. Instead, this model assigns pulse positions according to zang fu elemental partners with the zang or solid organs accessed deep and the fu or hollow organs more superficially.

With this arrangement, there is no anatomical correlation of the organization of organs on the radial pulse with that of the body. The Heart and Small Intestine, and the Lung and Large Intestine constitute the distal or cun positions, while the Kidney and Bladder, and Pericardium and Triple Heater form the chi or proximal positions. In both situations, there are organs from the lower burner placed within the distal pulse positions and organs from the upper burner placed with the proximal positions. This, therefore, eliminates the ability to assess the function of the Triple Burner via bilateral palpation of the principal positions.

4. The CCPD system

CCPD incorporates eight depths and 28 pulse positions that are palpated with a particular technique and sequence to

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determine the presence/absence of approximately 80 pulse qualities. CCPD exhibits some significant differences to other pulse systems that specifically relate to location of positions and ways of palpation.

4.1. The depths

During a typical pulse examination, the majority of palpation occurs at three main depths (qi, blood, and organ); however, in theory, eight depths exist, each of which is briefly explored. Moving from the most superficial towards the deepest, these are as follows. See Fig. 1 for pulse depths.

1. Above the qi depth, [floating]
2. Qi depth, and
3. Blood depth,

The organ depth, which consists of three depths,

4. Qi of the organ depth,
5. Blood of the organ depth,
6. Substance of the organ depth, and

7. Firm depth (below the organ depths) and
8. Hidden depth (just above the bone)

When felt bilaterally with all the six fingers, the three main depths represent the systemic state of qi/metabolic activity, blood/pure fluids, and yin organs respectively. In the principal positions, the qi and blood depths represent that organ's contribution to these substances within the whole organism, while the organ depth relates information regarding the organ parenchyma. Although the three main depths provide the majority of information, all the depths are examined briefly for relevant diagnostic indications [2].

4.2. Pulse positions

4.2.1. Principal positions

Located on the radial artery, the six principal positions correspond to the major yin organs, arranged according to the Triple Burner.

Left	Position	Right
Heart	Distal (cun)	Lung
Liver	Middle (guan)	Stomach or Spleen
Kidney Yin (and Yang)	Proximal (chi)	Kidney Yang (and Yin)

Subtle development of the Neijing Suwen model is however evident. In the case of the right middle position, Spleen pathology is considered in the presence of soft or pliable qualities that indicate qi/yang deficiency, and Stomach pathology with robust and hard qualities that indicate heat and yin deficiency. Similarly, in the proximal positions, when the usually reduced pulse qualities associated with Kidney deficiency are dominated by the robust qualities associated with infection (e.g., Flooding Excess), bladder pathology may be considered on the right side and intestinal excess heat pathology such as colitis may be considered on the left [2]. See Fig. 2 for the pulse positions.

The middle and proximal positions are felt, as with most pulse systems, longitudinal to the course of the artery with the flat pad of the middle and ring fingers, respectively. The distal positions, however, are felt transverse to the vessel at the site on the wrist where the radial artery terminates and divides into three smaller vessels. They are palpated by rolling the index finger distally so the radial edge of the finger lies adjacent to the proximal border of the scaphoid bone. Thus, the lateral side of the index finger monitors the sensation that occurs as the pulse wave disperses at this vessel partition [2].

4.2.2. Complementary positions

Distinguishing it from other pulse systems, CCPD exhibits 22 complementary positions that represent yang organs, areas of the body or specific structures (e.g., the diaphragm) [2]. Most have a close relationship to a principal position and are accessed by rolling the relevant finger from the main position. Some are located along the course of the radial artery—distal or proximal to the main position, while others are found just off the artery, medial or lateral to the main position [2].

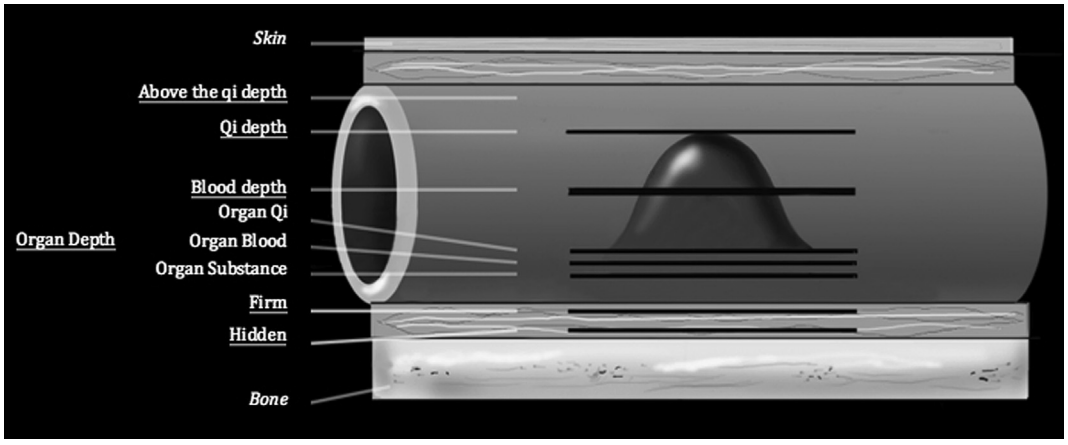

Figure 1 From 'Chinese Pulse Diagnosis, A Contemporary Approach' (2).

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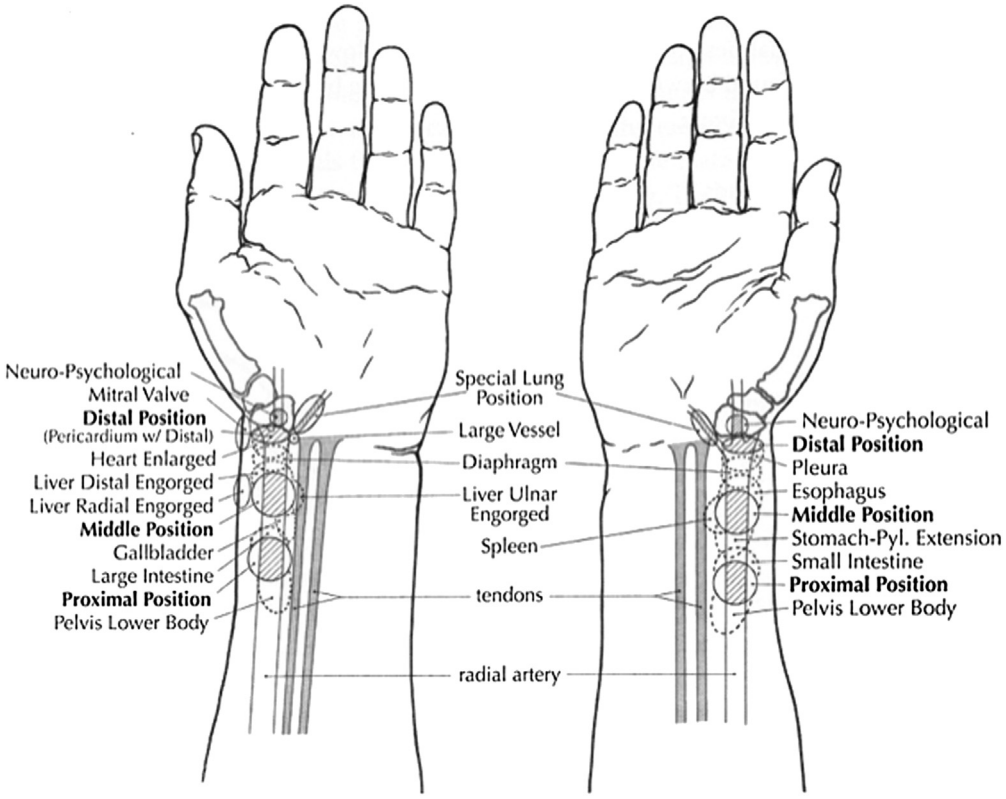

Figure 2 From 'Handbook of Contemporary Chinese Pulse Diagnosis' (21).

The complementary positions are as follows: (L) and (R) Neuropsychological; (L) and (R) Special Lung; Mitral Valve; Large Vessel; Pericardium; Heart Enlarged; Distal, Radial and Ulnar Liver Engorged; (L) and (R) Diaphragm; Gall Bladder; Large and Small Intestine; (L) and (R) Pelvic Lower Body; Pleura; Esophagus; Special Spleen; and Stomach Pylorus Extension positions.

As the complementary positions are not part of the yin organ system, the three depths do not apply. Although various qualities may be present at different depths, each of which bears diagnostic significance, they are not specifically aligned with the qi, blood, or organ depths [2]. In addition, pulse qualities found in those positions off the main artery (e.g., Neuropsychological, Mitral Valve) are often transient; therefore, palpation should not be rushed and wait for all sensations to become apparent [2]. See Fig. 2 for pulse positions.

4.3. Pulse qualities

CCPD incorporates approximately 80 pulse qualities [2]. In an attempt to eliminate the metaphoric ambiguity of the classical literature [15—19], each quality was described according to sensation, using modern language. All terms defined within the system are fixed, and each quality is given a specific diagnostic interpretation that takes into consideration its specific location.

The pulse qualities can be categorized according to either pulse dimensions or grouped by the condition that is represented by the quality. All pulse qualities and interpretations are explained in full in Chinese Pulse Diagnosis, A Contemporary Approach [2] and Handbook of Contemporary Chinese Pulse Diagnosis [21].

4.3.1. Volume

Volume is a reflection of metabolic activity or the strength of qi or yang heat within the body. Pulses can exhibit characteristics of either robust volume (conditions of excess, heat and stagnation) or reduced volume (conditions of qi [blood] and yang deficient cold).

4.3.2. Depth

Depth provides information regarding the location and stage of the disease. Generally, more superficial pulses are associated with acute diseases involving the wei qi, while the deeper pulses are a sign of more profound chronic illness.

4.3.3. Width

Width primarily reflects the condition of the blood. Thin pulses are associated with blood deficiency and more chronic conditions, while wide pulses are associated with conditions of excess (heat, toxicity, increased viscosity) and more acute patterns.

4.3.4. Length

Length refers to the how far the impulse extends under or beyond the index, middle, and ring fingers when palpating both wrists with all six fingers. In the absence of qualities that indicate excess heat, long pulses tend to indicate plentiful or abundant qi, and pulses that are short indicate deficient and/or stagnant qi.

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4.3.5. Shape

These pulse qualities are recognized by shape and reflect excesses or deficiencies of certain substances. Shape is further divided into pulse qualities that are:

- *Fluid* (feel pliable and as though they move under the fingers) and represent turbulent blood flow within the vessel resulting from sources such decreased fluid metabolism or pathogenic heat.
- *Nonfluid* (feel either hard and smooth, or hard and coarse)
  - *Nonfluid, hard, smooth* represent the process of qi stagnation causing pathogenic heat, ultimately damaging the yin.
  - *Nonfluid, hard, coarse* indicate disruption to the smooth flow of qi and blood and represent situations such as blood stagnation.
- *Miscellaneous* (recognized by their shape but not related by any defining characteristic) represent various conditions in the position in which these qualities are found.

4.3.6. Modifiers

These qualities are used to clarify or better define the primary pulse qualities.

4.3.7. Anomalous

The anomalous qualities are those that under normal anatomical circumstances are not present on the radial pulse and include anomalous vessels and anatomical structures.

4.4. Methods of palpation

During a CCPD evaluation, the radial arteries are palpated with differing amounts of pressure to assess the presence of qualities at the three main depths, on the entire pulse, and in each of the principal positions. Both unilateral and bilateral methods are incorporated, each yielding separate and distinct information with differing diagnostic significance. All information obtained from the examination is recorded on the standard CCPD pulse form [2,21].

4.4.1. Pulse large segment

Concurrent palpation with both hands using the index, middle, and ring fingers provides the broad focus of the pulse exam, or the all-encompassing, universal energetic patterns and state of substances of the organism. It is termed the pulse large segment and assesses the uniform qualities on the entire pulse, as well as the qi, blood, and organ depths; Rate, Rhythm, Waveform and comparison of the left and right sides. Large segment findings often take diagnostic priority, especially in the case of Rate and Rhythm irregularities as they provide crucial information regarding the heart or cardiovascular function.

4.4.2. Small segment

Single finger palpation of the individual positions, or the pulse small segment, provides the close focus of the exam. Starting on the left followed by right wrist, the principal and complementary positions are palpated or assessed in a distal to proximal direction. The principal positions convey information regarding the dominant factors affecting the yin organs and their interrelationship. The complementary positions indicate the functioning of the yang organs and/or the associated areas of the body. While still important, small segment findings are often addressed in treatment once large segment problems have been addressed.

4.5. CCPD and diagnostic considerations

CCPD, like pulse diagnosis systems from many traditions, is predicated on the belief that the radial artery represents the health of the person. Further to this, in the presence of disease or dysfunction, specific predictable variations manifest on the pulse that indicate analogous changes in the state of the organs, substances, and metabolic activity. During a CCPD exam, the practitioner detects and records any deviations from the normal pulse.

The findings of the pulse examination are then analyzed within the theoretical framework of CCPD and integrated with information gained from other methods of investigation such as questioning, observation, and auscultation. For diagnostic interpretation, all data are then referenced to the broader structure of Oriental medicine. Finally the concluding diagnoses are prioritized, and treatment or management is then planned according to immediate, medium-term (or root), and long-term (or secondary) interventions.

5. CCPD and modern Chinese medicine

CCPD represents knowledge that has been developed and used by Chinese medicine physicians for centuries to maintain the health of their patients. Methods of early diagnosis were developed based on meticulous clinical observations accumulated by numerous generations of medical experts. Pulse evaluation was and continues to be very important to advanced diagnosis, and the assessment of the patient's "terrain" [3]. In Dr Hammer's experience it accesses the earliest stages of the disease process long before blood chemistries reveal these signs [Hammer L, Email communication, 2012]. It provides the doctor with an in-depth cross section of that person somewhere between birth and death and exposes their potential vulnerabilities. Early intervention with the implementation of appropriate life-long management strategies means the patient was and is less likely to fall ill.

Despite CCPD being an ancient skill, it has translated well to modern clinical practice. Acutely aware of the difficulties in learning a subjective technique, complicated by the misperceptions created by the complexities of pulse descriptions in the classic literature, Dr Hammer strove to operationally define CCPD prior to current studies establishing the importance of doing so [20]. By revising the traditional pulse explanations he carefully documented the method employed by Dr Shen using clear definitive terminology [2]with the intention that all who learn the system interpret the definitions and implement the procedure in the same way every time.

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Following Dr Shen and Hammers' prior collaborative efforts with documentation, the past 20 years have seen Dr Hammer and his longstanding students work to improve the methods of teaching CCPD. A concise clinical handbook was published in 2012 [21] to support practical application as well as transmission of the skill to small groups rather than just one apprentice, as was the way of tradition. Current research has substantiated that practitioners (trained in this way) who are skilled and experienced with using CCPD can complete reliable pulse assessments on their patients [22]. This and recent recognition has also seen CCPD workshops extend beyond the USA to Australia, Europe, Canada, and Taiwan, confirming the assimilation of this ancient skill.

Another important aspect relevant to its modern integration is the dynamic nature of CCPD, which reflects and adapts to the evolving health issues that face our present-day population. The system is continually revised by practitioners' feedback and modified on the basis of new pulse findings with regard to modern problems. Dr Hammer and certified teachers of the system (listed at www.dragonrises.org) are actively conferring, updating, and correlating the interpretations of qualities to pertinent clinical findings. As such, accumulated clinical experience, supported by pulse descriptions of the "split vessel" and its possible relationship to cancer by Efrem Korngold, coauthor of *Between Heaven and Earth* [23], have lead to the incorporation of this quality into CCPD [13]. Also, new areas for investigation have been established, where once rare pulse qualities are appearing with more frequency in relation to chronic disease [24,25]; and the over exposure of human ecology to electromagnetic radiation [26], and environmental toxicity [27].

CCPD is a comprehensive pulse system based on organ diagnosis that is applicable to both acupuncture and Chinese herbal medicine. Strongly rooted in the classic literature, the model is dynamic and continues to evolve with our ever-changing environment and patterns of health. Its clinical application enables the practitioner to diagnose the earliest stages of disease and assess the ecology in which the pathogen has the potential to flourish. Identifying these vulnerabilities, CCPD when considered with all other diagnostic information leads to effective management solutions for maintaining health in an often-compromised modern world.

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