

Computer in medicine therapy

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THE computer is the best and most loyal disciple I have had in my lifetime. With it, I shall die without regret."

So said 80-year-old Li Jingzi, a senior doctor of the Beijing Huguosi Chinese Medicine Hospital, who is noted for treating coronary heart disease. Li has cured many patients over the years, but as he got older he found he had to reduce his case load because of his failing health. In 1983, however, Li's hospital cooperated with a Beijing research institute to programme his experiences and methods into computer software. In the following five years, the programme was spread throughout the country, leading to the diagnosis and treatment of more than 37,000 patients. This greatly surpassed the figure Li treated in five years and the effectiveness rate reached 97.78 percent.

The idea of marrying the computer to traditional Chinese medicine appeared in the 1970s. Before that, the preservation and carrying forward of traditional Chinese medical techniques were very difficult tasks for China's public health departments.

Chinese medicine differs from Western medicine in its

highly personal approach to individual patients. After an examination that may include feeling the pulse, watching the coating on the tongue or reading the patient's complexion, the doctor makes a diagnosis. He then prepares a prescription of medicinal herbs, taking the patient's constitution, mental condition and the influence of the local environment into consideration. Because the treatment varies from patient to patient, the substance of traditional Chinese medicine depends, to a high degree, on a doctor's clinical experiences. In recent years, the deaths of many old doctors, who left behind no written works, caused incalculable losses. This is one of the reasons why researchers turned to the computer.

In 1979, the first Chinese medicine software was used successfully in diagnosing and treating liver trouble. This came as a result of four years of work by one of its designers, Guo Rongjiang, now a senior engineer at the China Computer Technology Service Corp.

Like many Chinese, Guo believes in traditional Chinese medicine. When he read reports about the computer systems used by some Western doctors, he was inspired to provide the same powerful tool to Chinese

practitioners. Guo believed that if the experiences of old Chinese practitioners were available in computers, the problem of passing on their techniques would be solved. Moreover, those experiences would be more widely available.

Guo and his colleagues visited Guan Youbo, a well-known Chinese doctor specializing in the treatment of liver disease. The old doctor gladly accepted Guo's proposal and provided him with the details of many cases, prescriptions and clinical experiences. Using these, Guo worked out a programme.

Guo's achievement immediately stirred wide interest and response and work in this field mushroomed over the following ten years. So far, more than 200 computer systems for Chinese medicine have been established, among which 60 have received state approval. In 1984, the Ministry of Public Health formally listed specialist computer systems for traditional Chinese medicine as one of its key research projects.

In 1986, a hospital of Chinese medicine in Zuzhou, Anhui Province, was the first to establish a computerized diagnosis system. Other institutions began to develop similar programmes based on the experiences of Guan Youbo and other noted Chinese doctors.

Clinical experience has proven the advantages of using computers. For instance, it has made Chinese medicine more standardized, systematic and precise. Through computerization, all the theories and experiences accumulated over a lifetime by a noted Chinese doctor can be screened, generalized and programmed. Preserved in the computer, these techniques can be tested and perfected in clinical practice.

What is more, the computer system has made experts' skills accessible to far more patients. The Guan Youbo system for liver trouble has been used in at least 40 hospitals throughout the country.

"That means we have 40 Guan Youbos," its maker Guo Rongjiang said.

Because the Chinese medicine programmes are usually put in micro-computers, they have gone into hospitals on the prefecture and county levels. This means doctors have been able to use computers to make a diagnosis and give treatment long before they would normally have the opportunity to study a certain expert's thinking. Undoubtedly, this is good news for patients in China's broad rural areas who want access to the methods of noted doctors.

More importantly, there is now a group of Chinese medicine doctors who are familiar with computers. This opens up a broad and hopeful future for traditional Chinese medicine.

Zhao Shuyi, a senior doctor of Xiyuan Hospital of the Academy of Traditional Chinese Medicine in Beijing, is one of this group. After she graduated from college in the 1940s, Zhao became a gynaecologist using the clinical practices of Western medicine. At the end of the 1950s,

however, Zhao became a student of Qian Boxuan, a well-known expert in gynaecology of Chinese medicine, and devoted to the practice of Chinese medicine.

In 1980, Zhao co-operated with a software research institute of the Chinese Academy of Sciences to develop a computer programme based on Qian's experiences in diagnosing and treating dysmenorrhoea (painful menstruation). After reading all of Qian's recorded dysmenorrhoea cases, she enumerated more than 120 symptoms, 300 prescriptions and 200 forms of the illness. Then she drew out 40 symptoms from the 120 and matched them with corresponding descriptions and treatments which were put into the computer. Thus the first Qian Boxuan Expert System was born.

Using the programme in 1983, Zhao found that the system could not precisely express the thinking of the expert in the face of complicated clinical requirements. So Zhao re-pro-

grammed it into two categories of primary and secondary symptoms. With the two categories complementing each other, any specific illness can be given a proper clinical description by the computer. The new system has been applied in clinical practice and its effectiveness has markedly increased. A survey of 1,769 patients, who received treatment by this programme three times or more, showed a 100 percent effectiveness rate.

Now Qian is dead but his rich experiences over 70 years have been stored in 15 computer programmes that have been spread to more than 40 hospitals in China. Zhao herself is still shuttling between traditional Chinese medicine and the computer, ready to programme more software on the basis of new clinical experiences.

Traditional Chinese medicine programmes have even entered the software market and some have been exported. At the Sixth World Medical Science Information Symposium held in October 1989 in Beijing, Chinese experts read more than 30 academic theses most of which were about Chinese medicine software. They were received with interest by the participants, including those from developed countries.