

Xin Zhou: patients come ahead of fame

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Prof. Xin Zhou does not talk too much about himself. As a famous expert in respiratory medicine and the chief of the Department for Respiratory and Critical Care Medicine at the Shanghai Jiao Tong University Affiliated First People's Hospital, he has obtained numerous achievements during his 42-year career. However, he always downplayed his significant accomplishments.

To the contrary, he prefers talking about his patients: *“Being a doctor is to relieve patients from disease and pain. What I am hoping for is not to leave behind a good name but solve problems for patients.”*

How can I step back when patients need me?

Due to the nationwide outbreak of SARS, 2003 is an unforgettable year for many Chinese people. During this emergency, hundreds of people a day were diagnosed with this deadly contagious disease, which frightened people into taking every possible step to avoid contracting the virus, including wearing masks, keeping rooms well-ventilated, drinking Isatis root tea, and spraying disinfectant solutions. Despite all these measures, the virus remained an invisible threat.

At that time, Zhou was in the frontline of combat against the epidemic disease as a member of the Shanghai Expert Team for SARS Prevention and Control. The photo below shows him performing closed-chest drainage for spontaneous pneumothorax in a critically ill patient with SARS (Figure 1). While closed-chest drainage was the most effective treatment for pneumothorax, it requires close contact between the doctor and patient, which increased the risk of being infected by the SARS virus. According to statistics, many SARS patients in 2003 were medical staff, and some of them died from the disease.

Looking at the photo, Zhou recalled, *“Medical staff's dedication to saving patients received heavy media coverage, but I had no time to think about anything other than performing surgeries to save patients in critical conditions. How could I flinch as a chest physician? The top priority was to relieve patients from pain”*.



Figure 1 Photo of Prof. Xin Zhou published in *Jiefang Daily* on May 1st, 2003.

Zhou's family members knew nothing about this dangerous experience. *“My family was only told that I went to treat SARS patients, but I have never told them that I wore a mask to conduct closed-chest drainage.”* He explained, *“Telling them the truth would only make them worry.”*

Six years later, Zhou joined the battle against the influenza A pandemic (H1N1). He participated in the treatment of Shanghai's first H1N1 patient. Due to the patient's critical condition, which included multiple organ failure, Zhou kept a close eye on the patient to enable immediate adjustment to treatment protocols when needed. He spent 3 hours a day traveling on the way to and from the southern branch of the First People's Hospital where the patient was hospitalized. Thanks to these and other efforts, the patient became China's first cured case of H1N1 virus (Figure 2).

As a member of the National Health Commission and Shanghai influenza A expert teams, Zhou participated in the formulation of influenza A treatment protocols and helped more than ten hospitals in Shanghai and many hospitals in Fujian and Gansu provinces to save patients in critical condition. He was thus honored as a “Shanghai

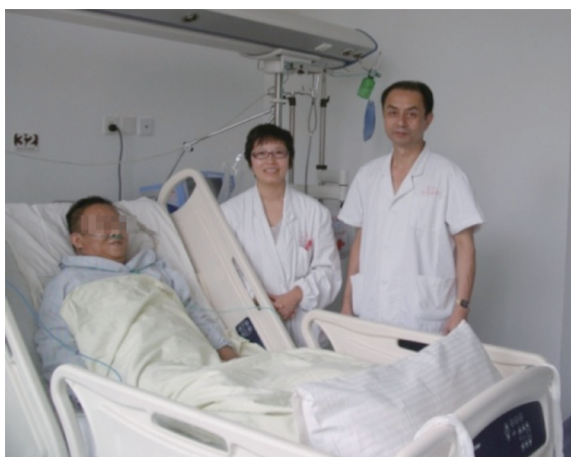


Figure 2 Prof. Zhou (first from the right) and the first Chinese patient cured of the H1N1 virus in Shanghai in 2009.



Figure 3 Zhou was commended as a "Shanghai Outstanding Worker" in 2010.

Model Worker", "Outstanding Individual of the National Health System", and a "National Model of Medical Ethics" (Figure 3).

Zhou said he was only able to earn these accolades because he was fortunate enough to join the fight against these serious public health events. After receiving these honors, Zhou continued to dedicate himself to day-to-day clinical services and donated all the award money he won to the dozens of nurses at his hospital who were suffering from tumors.

Zhou said, "A doctor has to treat patients during his whole career. I will still stay at the frontline in similar situations in the future."

It is my unequivocal duty to solve complicated problems

Many unknown areas in medical science are ripe for further exploration. With the development of medical technology, there will inevitably be more innovations and breakthroughs. As Zhou stated, "As doctors at a tertiary hospital, we should try to be pioneers."

Emergency tracheal intubation is a common way to save patients with respiratory failure. For patients with burns or tachypnea, it is challenging to conduct intubation, and it takes more time for anesthetists to complete the procedure. For critically ill patients, time is life.

Zhou noticed the problem and tried to find a solution.

Bronchofiberscopy was introduced into China in the early 1980s. As a diagnostic tool, the flexible bronchofiberscope allows doctors to get a clear picture of patients' laryngeal condition. Zhou wondered whether it could be used to facilitate tracheal intubation. After a feasibility assessment, Zhou and his colleagues performed tracheal intubation on a patient with the help of a bronchofiberscope. "It was very successful, and the process only took one minute", Zhou recalled.

Now, the "bronchofiberscope-assisted emergency nasotracheal intubation" has been widely applied in treating patients with severe respiratory failure, which dramatically increases the success rate of intubation, saves time, and lowers the incidence of complications.

Later, Zhou achieved a successful application of the bronchoscope in the treatment of severe respiratory diseases. He also explored new therapies for adult respiratory distress syndrome; for instance, he used glucocorticoids and low positive end-expiratory pressure (PEEP) for treating acute respiratory distress syndrome. In China, he took the lead in using *Aspergillus* antigen detection technology in the early diagnosis of invasive aspergillosis, promoting the early diagnosis of aspergillosis in immunocompromised individuals. As one of the corresponding authors, he was the first in China to publish an expert consensus on the diagnosis and treatment of invasive fungal infection in 2006.

For Zhou, it is a doctor's responsibility to solve patients' problems. "Some patients would visit me with their family members many years after they were discharged from the hospital. I am pleased to learn that they later got married and had kids!"

At the beginning of the new millennium, Zhou developed a novel non-invasive ventilation mask.

For most of their time in use, non-invasive ventilation masks have been widely applied in clinical services, but



Figure 4 Scholar Nanshan Zhong (right) confers the Certificate of Expert Membership of the Chinese Thoracic Society to Xin Zhou (left).

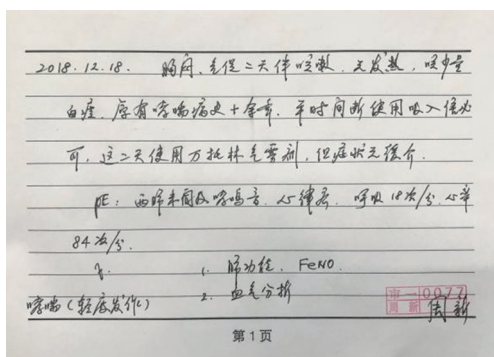


Figure 5 A medical record that was written by Zhou.

one imported mask costs about RMB 1,000. Also, these imported masks do not allow gastric intubation, which is hugely inconvenient for critical patients who were incapable of independent feeding.

To address the problem, Zhou asked university researchers to improve the imported masks. “We added a hole on the mask to allow gastric intubation. Meanwhile, we adjusted the size and material of the imported masks based on the facial features of Chinese people.” Compared with the imported masks, the home-made non-invasive ventilation masks were comfortable and more affordable. These advantages won the product two national patents and the third prize of the Shanghai Outstanding Invention Award in 2007.

Zhou compared innovation to road building: “I take the lead to build a small road, and other followers will broaden it. If everyone can build a small road, the development of medical

science will become smoother (Figure 4).”

No rules, no compass

Every week, Zhou receives numerous patients from across the country. Despite busy outpatient work, he carefully writes their medical records (Figure 5). “Each medical record is important to future diagnosis, a responsibility for patients. Meanwhile, a medical record can be seen as a label of mine.”

Complying with standards has become a habit of Zhou’s: “The more experienced an internist is, the more compliant he is with the rules. Just like driving, all people should stick to traffic rules”. But what is the standard? Zhou has an answer “Doctors should follow the steps of the guidelines on disease diagnosis and treatment.”

Take a cold as an example: “It is not a standard procedure for doctors to use antibiotics and intravenous fluids for treating a cold!”

He further explained, “Cold medications are enough for the common cold without bacterial infection or complications; if the patient coughs with yellow sputum, antibiotics are needed; if the patient is considered likely to catch influenza with fever and muscle soreness, then anti-influenza drugs can be used.”

“The principle is to follow the procedures and standards! We aim to spend the least time and money to solve problems.”

Preventing asthma-caused death

China has roughly 30 million asthma patients, but only 28.5% have their conditions kept under full control. Every year, many people have to be hospitalized due to asthma attacks.

“Famous singer Teresa Teng died from an acute asthma attack at the age of 48.” In his early years as a doctor, Zhou encountered many patients who died due to the same reason. “As chest physicians, we should not let patients die from asthma attacks.”

Zhou emphasized that the biggest problem for asthma patients is their low compliance. “Hypertensive patients remember to take medicines every day even without symptoms. Why? They are fully aware of the possible hazards, such as stroke and myocardial infarction. However, asthma patients usually stop taking medicines by themselves when there is no attack. Asthma is a chronic disease that cannot be cured, and severe attacks may be fatal.”

The poor self-management of asthma patients has long worried Zhou. “It is highly related to our inadequate education of the public about the disease.” In 2016, Zhou was appointed to lead the asthmology team of the Chinese Thoracic



Figure 6 Photo of Prof. Kaisheng Yin, Prof. Jiangtao Lin, scholar Nanshan Zhong, and Xin Zhou (from left to right) at the inaugural ceremony of the China Asthma Alliance in 2005.

Society. *“Now that I’m holding the post, I have to do something together with doctors specializing in asthmology.”*

To better guide asthma patients to conduct self-management better, he organized the development of the *Chinese Expert Consensus on the Self-management of Bronchial Asthma Patients* (2018). The book included health education related to the self-management of asthma for patients, self-management instruments, and identification and handling of signs pointing to acute asthma attacks. In October, he initiated the formulation of the Chinese guidelines on diagnosis and treatment of bronchial asthma. In December 2018, the *Handbook of Asthma Patient Self-management* compiled by Zhou was published for distribution to asthma patients.

As one of the chief superintendents of the China Asthma Alliance (CAA) (Figure 6), Zhou has made extensive efforts in formulating a guide for asthma prevention and control and promoting official diagnosis and treatment of the disease. Compared with those in first- and second-tier cities, the standard diagnosis and treatment of asthma at grass-root hospitals still lags far behind. In recent years, Zhou has organized experts of the asthmology team to give more than 100 lectures on official diagnosis and treatment methods for asthma in small and underdeveloped cities including Baise, Zunyi, and Yan’an. *“China is a vast country. It is our priority to improve the ability of grass-roots medical institutions to prevent and treat respiratory diseases. We are unable to know the actual conditions unless we visit those small cities.”*

Zhou stressed that the two goals of chronic disease treatment include resolving the existing symptoms and preventing the risk of future attacks. *“Asthma patients can*

work and live like healthy people if they take medications and examine lung functions regularly.”

A 40-year habit, a 20-year manuscript

One morning in the early 1980s, Zhou planned to have breakfast after an emergency night shift and unexpectedly met Prof. Tong Xie, who was coming to work by bike, at the door. Prof. Xie was then director of the urinary surgery department at the hospital and one of the founders of China’s dialysis and renal transplant.

Zhou looked at his watch, and it was just past 6:30 a.m. He then asked, *“Prof. Xie, why do you come to work so early?”* Prof. Xie answered with a smile, *“I come early every day to see patients ahead of their surgery.”* Prof. Xie’s home was about a 40-minute ride away from the hospital, which meant that he had to set off before 6:00 a.m. *“As a famous expert, Prof. Xie comes to see patients early. Why can’t I? Since then, I also arrive at the hospital by 6:30 a.m. every morning. It has now become a habit.”*

Zhou has stuck to the habit for four decades, which is even known to new doctors at his department. He routinely goes to the respiratory intensive care unit (RICU) to see patients and talk with nurses to learn about the patients’ conditions in the previous night. *“For me, I can learn about patients’ conditions promptly; for patients, the visit by a doctor is a comfort.”*

Zhou kept a manuscript written by Prof. Weiwu Deng, renowned chest physician and then director of the Respirology Department at Shanghai Ruijin Hospital, in 1976.

In 1976, Zhou was still an intern at the Respirology Department of Ruijin Hospital. He asked Prof. Deng to proofread a medical translation. To his surprise, Prof. Deng revised the translation sentence by sentence and transcribed it since the original text was full of notes.

“I kept the manuscript for more than 20 years, but unfortunately lost it later. The manuscript reminds me to be as careful as Prof. Deng!”

As of this year, at the age of 65, Zhou has been a doctor for 42 years. *“The hospital is like my home. I am glad that my students have taken over and the number of young people has multiplied. Respiratory medicine will surely see further development.”*

Video link: <https://v.qq.com/x/page/k0818ejkl3j.html>

Profile

Prof. Xin Zhou was born in 1953. He graduated from the Department of Medicine at the Shanghai Second Medical

University in 1976. After graduation, he began working in the Department of Respiratory Medicine of the Shanghai First People's Hospital. In 1991, he was promoted to deputy chief physician. In 1998, he won the professional title of Chief Physician. In 2002, he became a doctor's tutor and second-degree professor. He has been a visiting doctor in the University Hospital Heidelberg, Germany and a member of the board of directors of the Chinese Medical Association. Currently he also serves as the vice-chairman of the Chinese Thoracic Society, a member of the standing committee of the Chinese Association of Chest Physicians (CACP), the vice-chairman of the CACP Asthma and Allergy Working Committee, the chief of the Asthma Group of the Chinese Thoracic Society, and the chairman of the Shanghai Association of Chest Physicians. He is the core expert of the National Popularization Program for Clinical Rational Use of Antibiotics of the National Health Commission, the former chairman of the Shanghai Thoracic Society, the vice-chairman of the Shanghai Society of Internal Medicine, and the chief of the Expert Group on Standardized Training and Assessment of Respiratory Medicine Doctors in Shanghai.

He is a winner of special allowances granted by the State Council. He has been awarded the honorable titles including Shanghai Anti-SARS Model Worker, Shanghai Excellent Communist Party Member, Outstanding Individual of the National Health System, National Model of Medical Ethics, and Shanghai Labor Model. He also won the Chinese Respiratory Doctor Award awarded by the Chinese Medical Doctor Association.

Prof. Zhou edited or contributed to the development of *Chinese Guidelines on Asthma Diagnosis and Treatment* and

Chinese Guidelines on the Diagnosis and Treatment of a Cough. His study on the diagnosis and treatment of bronchial asthma has won the National Science and Technology Progress Award (second class) (in cooperation with professor Shi Huanzhong) and the Shanghai Science and Technology Progress Award (third class). He is also the winner of the Shanghai Excellent Invention Award (third class; twice) and the holder of two national patents. As editor-in-chief or deputy editor-in-chief, he has compiled seven monographs including *Waveform Analysis and Clinical Application in Mechanical Ventilation* and *Respiratory and Critical Care Medicine*. As the first author or correspondent author, he has published over 200 articles in peer-reviewed journals, including 40 articles in SCI-indexed journals. He has trained about 20 doctoral candidates. He is a fellow of the American College of Chest Physicians (FCCP). Also, he serves as the deputy editor-in-chief of *Chest (Chinese Edition)*, *Chinese Journal of Respiratory and Critical Care Medicine*, *Chinese Journal of Asthma (Electronic Edition)*, and *Shanghai Medical Journal*.

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Footnote

Conflicts of Interest: The author has no conflicts of interest to declare.

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