



## Wenlin Wang: a “weird doctor” in defiance of the Matthew effect

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### Preface

There is a concept in economics called “the Matthew effect”, which describes a phenomenon in which a person with more resources is more likely to be more successful. This opinion has led to familiar assertions like “poor families make poor children”, and “your platform is more important than your personal ability”. However, is it possible that every life is planned according to economic principles?

Prof. Wenlin Wang, who grew up living in a poor family, claims that he was just trying to open a well, but he eventually opened a new subdiscipline of medical science.

### Profile

Prof. Wenlin Wang (*Figure 1*) obtained his medical doctor degree from the First Military Medical University (now Southern Medical University) and then received postdoctoral training at Sun Yat-sen University. Currently, he is the director of the Department of Cardiothoracic Surgery of the Second People’s Hospital of Guangdong Province and the director of the Institute of Chest Wall Surgery under the Guangdong Second People’s Hospital. He also serves as the chair of the Professional Committee on Chest Wall Surgery at the Guangdong Association of Thoracic Diseases, and is a member of the International Society for Minimally Invasive Cardiothoracic Surgery, and of the Standing Committee of the Guangdong Society of Cardiothoracic Surgery.

As a pioneer of chest wall surgery in China, Prof. Wang invented the revolutionary “Wang procedure” for funnel chest in young children and the “Wenlin procedure” for a variety of complex thoracic deformities. Every year, his team completes more than 500 surgeries for thoracic deformities. These include difficult complex surgeries for thoracic deformities like the world’s first “double lung transplantation plus surgery for severe thoracic deformity”, the world’s largest series of patients receiving surgery for pectus excavatum, the oldest (59-year-old) Chinese patient receiving a surgery for pectus excavatum, and the oldest (56-year-old)

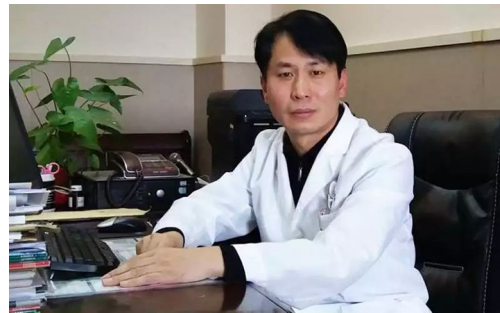


Figure 1 Prof. Wenlin Wang.

Chinese patient receiving a surgery for pigeon chest.

### A weird doctor

In the community of thoracic surgeons, Wenlin Wang is best known for a type of surgery named after him: the Wang procedure. The surgery is designed for young children with funnel chest (or pectus excavatum), and overturns the conventional wisdom that children under five cannot undergo corrective surgery for funnel chest.

However, few relevant articles about this procedure have been published in scientific journals. When we searched the term “Wang Procedure” on [www.cnki.net](http://www.cnki.net), only two results were available: one is “Experience with Wang procedure for treatment of pectus excavatum in young children”, published in the *Journal of Southern Medical University* and authored by Prof. Wang himself and his colleagues; the other was a summary of the clinical experience in 21 cases of the Wang procedure, published in the *Journal of Clinical Surgery*, but Prof. Wang was not listed as an author.

In stark contrast, when we searched for “Wang Procedure” on the search engine Baidu, we found a staggering 4.91 million results, with information from local traditional media, public social network platforms, and popular health consultation websites. Apart from some news reports from conventional media, a large majority of the stories were reprinted from a WeChat public account “Expert in surgery for thoracic deformity”, which is solely



**Figure 2** Chinese first department of chest wall surgery was inaugurated at the Second People's Hospital of Guangdong on May 9<sup>th</sup>, 2018.

managed by the 52-year-old Prof. Wang, who writes articles, edits video clips, and releases these to the public.

At the bottom of the search page in Baidu, there are two searches related to the Wang procedure. One is about the patent right of the Wang procedure, and the other is a question about whether there is a registered doctor in China whose name is Wenlin Wang.

You likely cannot find a surgeon at any public hospital in China who is as passionate as Prof. Wang in promoting himself through the Internet and traditional media. He even named a new type of surgery after himself. Most doctors, however, are overwhelmed by challenging research tasks, but this is not such a big problem for him. Perhaps his high-profile personality and his lack of “scientific evidence” have led to growing skepticism among patients about his identity as a doctor. In fact, he is indeed a registered doctor, and his patent for the Wang procedure does exist.

Born in the 1960s, he has an excellent education and training background. He graduated from the Army Medical University (formerly the Third Military Medical University), received a doctoral degree from Southern Medical University, and completed his postdoctoral studies at Sun Yat-sen University. Following this, he came to work at the Department of Cardiac Surgery, at the General Hospital of PLA Southern Theater Command (formerly the General Hospital of Guangzhou Military Region).

In 2009, a 42-year-old Prof. Wang was appointed to head the Department of Cardiothoracic Surgery at the Second People's Hospital (SPH) of Guangdong. He recalled that the department had only 40 beds at that time, and the number of inpatients was often below 20. Chinese medical resources had already been falling short of demand at the beginning of the 21st century, and it was uncommon for a department in a tertiary hospital to have a hospitalization

rate of less than 50%. In fact, the department was not capable of performing ordinary thoracotomies, let alone cardiac surgeries. To maintain normal operations, surgeons in the Department of Cardiothoracic Surgery had to perform general surgeries. Apparently, this was not an optimal option for Wang, who had completed post-doctoral training at Sun Yat-sen University. Even from these humble beginnings, however, Prof. Wang managed to set up China's first department of chest wall surgery in less than ten years (*Figure 2*).

Prof. Wang has taken a path few people have taken and done things even fewer people have done, and as a result, he has gained a great deal. He is indeed a “weird doctor”.

### Is Wenlin Wang a “weird” doctor?

During this time, Prof. Wang found that departments of thoracic surgeries in large hospitals were rushing to develop therapies for intrathoracic diseases. Guangzhou is home to the top two medical centers in this field, including the Guangzhou Institute of Respiratory Diseases (the First Affiliated Hospital of Guangzhou Medical University) and Guangdong Cardiovascular Institute (Guangdong People's Hospital).

As patients with heart disease or those seeking general heart surgeries tended to visit these two hospitals, there was only one path for SPH: become the No. 1 hospital at treating chest wall diseases.

Due to their limited medical resources, departments of thoracic surgery in many tertiary hospitals had not paid much attention to chest wall diseases. Many surveys have shown that the incidence of chest deformity is above 1%, and many patients have nowhere to get treated. In addition, the chest wall is very close to the heart and inexperienced thoracic surgeons dare not perform this risky surgery. Prof. Wang had been trained in cardiac surgery and was very familiar with the anatomical structure of the heart. “*Even if the heart is affected, I'm confident (in completing the surgery successfully),*” says Wang.

After coming to work at the SPH, Wang began to treat funnel chest patients while performing heart surgeries. In 2013, he made a firm decision to shift the department's priority to chest wall surgeries.

In order to attract more patients to get treated at SPH, Prof. Wang has stepped up online marketing. His Douyin account was even blocked because a picture of a seriously deformed chest was deemed pornographic. “*My Douyin account had as many as 650,000 visitors, but I was later forced*

to open a new account and can only release X-ray pictures.” It seems like a funny story now, but you can still feel the bitterness in Prof. Wang from what happened. “*When I used to work in a large hospital, I didn't need any special promotion. But I changed after I came to work here.*” Mistrust of patients and the bumpy road ahead for this subdiscipline have made a lot of trouble for him—“*because I take a road in the opposite direction to many others.*”

Now his department represents the last glimpse of hope for patients with complicated chest wall illness in Guangdong and even other provinces. However, the medical talent for these procedures remains in dire shortage. The department now has 60 ordinary beds and 10 intensive care beds, but patients are taken care of by only five doctors and 20 nurses. Apparently, it is severely understaffed for meeting with the growing demands and dealing with day-to-day clinical activities.

In addition to maintaining and updating new media accounts, Prof. Wang also has to write SCI articles. “*We have no people to do this job. I have written five SCI articles this year, and, fortunately, all of them have been accepted.*” Though, there has been a shortcut made available to him: many foreign researchers have contacted him and asked him to share clinical data in exchange for a co-author title in their SCI articles, in order to lessen the burden of his research work. He ultimately declined their offers, however.

“*I have served at several hospitals, and I hope to find a way to success with my experience as a surgeon. Fundamentally, I think a surgeon should first practice his skills, and then summarize these experiences so as to produce valuable articles.*”

There is a proverb in Guangdong, “*What you do should match with what you have.*”

Do you still think him a “weird” doctor?

### The surgery named after Wenlin Wang

On April 7<sup>th</sup>, 2019, Prof. Wang published an article online, saying he set a record for performing a funnel chest surgery in seven minutes and 13 seconds. Four days later, he announced that the record was broken again with a time of six minutes and 27 seconds. Such complicated surgeries took several hours in the past, and now Prof. Wang has figured out a new method to complete the surgery in an average time of 10 minutes.

According to traditional guidelines, funnel chest repair is performed only in patients older than five years; however, “*the surgery can be more effective in younger children with stable*

*conditions,*” asserts Prof. Wang. As of now, the youngest child operated by Wang's team was only 11 months old.

During the interview, Prof. Wang laughs a lot and uses a lot of body language to explain the delicate nature of the Wang procedure. Meanwhile his passion for developing advanced technologies reveals the tech geek inside him. His obsession has turned funnel chest repair from a high-risk operation into a shorter operation with a lower age range and higher replicability. In less than a year, he has offered technical assistance to more than 50 hospitals in China and has helped many hospitals to establish departments of chest wall surgery.

Due to the high replicability of the surgery, he was unable to get early patent protection for it. “*A doctor had just changed the name of the surgery and published an article to introduce my surgical techniques. I had to use my name for the new surgery as a result.*”

“*It's over now and it doesn't matter. The most important thing is to hone your skills.*”

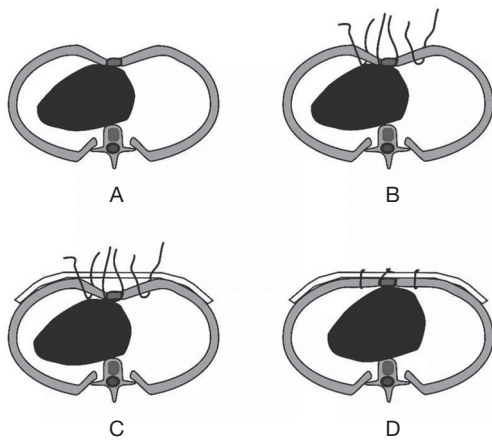
According to a colleague who has been working with Prof. Wang for many years, he did not discuss the technical aspects of the Wang procedure in the past as much as he did during this interview.

Perhaps in the past, Wenlin Wang was not a person with a sense of security. Now, he has self-confidence and is grateful to the people around him, such as his considerate wife. Also, he deeply appreciates Prof. Kaican Cai of the Thoracic Surgery Department at Southern Hospital of Southern Medical University, and Prof. Jianxing He at the First Affiliated Hospital of Guangzhou Medical University. “Both of them have offered direct help for the inauguration of the first department of chest wall surgery in China and the establishment of a professional committee on chest wall surgery,” says Prof. Wang.

These two mentors offered strong support to Prof. Wang at a time when he was in desperate need of help. Details of the first case of the Wang procedure are also revealed for the first time during this interview.

### The first case of the Wang procedure: past experience

Funnel chest is repaired by the conventional Ravitch procedure and the thoracoscope-assisted minimally invasive Nuss procedure. Although Prof. Wang had less experience in these two procedures, his solid surgical skills encouraged him to try it.



**Figure 3** The basic principle of the Wang procedure (with the generous permission of Prof. Wenlin Wang).

His first Ravitch procedure was performed together with Prof. Peiwu Sun during his post-doctoral training at Sun Yat-sen University. *“During the Ravitch procedure, the chest needs to be opened for detaching all the deformed ribs before the sternum from the ribs are flipped over for reconstruction. It was very bloody.”*

After he mastered the Nuss procedure to repair funnel chest, Prof. Wang was constantly sought after by parents of pediatric patients younger than three years old. *“I was very helpless at that time, because the Nuss procedure is only indicated for patients older than five years. Some bold doctors were willing to take the risk for kids at three or four, but they were bound to draw criticism if they performed the surgery on kids less than three years old.”*

In a Nuss procedure, the surgeon places an arc-shaped steel plate inside the patient’s chest, which also harbors the heart—an obviously critical organ. In order to make sure the plate does not injure the heart, the surgeon must put the plate at an appropriate position with the help of a thoracoscope, so as to lift the sunken ribs. The Nuss procedure has been in existence for about 20 years but is still limited by its high failure rate and poor prognosis. Although many improved procedures had been developed, it was still believed children below the age of five do not have a well-developed chest wall to bear the risk.

*“At that time, I told these parents that their kids could receive the surgery only when they were older. But I was asking myself why they have to wait. In fact, heart surgeries were already being performed in kids aged one or two.”*

After reviewing the literature, Prof. Wang found that

almost all studies were focused on optimizing the Nuss procedure rather than changing the surgical principle. *“I resorted to critical thinking and finally concluded that the fundamental principle of the operation was incorrect.”*

From 2014 to 2015, Prof. Wang abandoned the mechanical principle of lifting the depressed sternum outwards. Instead, he chose to place the arc-shaped steel plate on the surface of the bone structure of the chest wall and gave the depressed sternum a pull-out force before it was fixed. This design completely eliminates all operational steps inside the thoracic cavity, and therefore the risks associated with the intrathoracic steps are subsequently removed (Figure 3).

After the basic principle was established, Prof. Wang began to think about the related incision and surgical techniques. *“Only a few small incisions are needed in the Nuss procedure. You can’t make such a big cut in your operation.”* One day, Prof. Wang tactfully made a small median incision through which the arc-shaped steel plate was placed into one side of the chest wall tunnel and then slowly moved to the contralateral tunnel. Thus, the incision problem was satisfactorily solved. The new procedure was theoretically feasible but was essentially a subversive approach. A proper patient was still needed.

### The first case of the Wang procedure: a first attempt

*“I was still waiting for an opportunity when a two-year-old baby was brought to our hospital.”* The baby had a funnel chest, which severely affected his respiratory and circulation systems. A corrective surgery had to be performed immediately to save his life. However, he had already received a heart surgery and could not bear a Nuss procedure due to severe adhesions inside his thoracic cavity. The Ravitch procedure became the only option for him. *“Why not have a try and make a small incision to see if the Wang procedure works? If it is successful, the trauma will be smaller and the recovery will be faster; if it’s not, there is still a chance for the Ravitch procedure.”*

This is how he describes the first case of the Wang procedure:

*“OK, cut it, separate it, create a tunnel, put the steel plate inside. Oh my god, I was so excited that tears were falling down, and that’s it. I told my team that the Nuss procedure would not be performed in our center. This was the surgery we needed. It’s so simple.”*

However, Prof. Wang was not content with what they

had done. He designed a special steel plate for the Wang procedure. The steel plate was divided into two sections, and a button was fastened in the middle, so as to reduce the surgical trauma and facilitate the operation. Since then, Prof. Wang and his team have never stopped trying to improve the Wang procedure.

### A son of a poor family in defiance of the Matthew effect

*"I grew up in the countryside, so I can endure more hardship."*

Wenlin Wang was born in Jiaozuo City, Henan Province. He has six siblings and he is the second oldest. His father was a high school graduate but was unable to receive higher education due to unfavorable policy reasons; he therefore wanted his children to fulfill his dream. His brother dropped out of school to work so that he could make money to support his younger brothers and sisters. Wenlin Wang lived up to the expectations of his father and brother. At the national college entrance examination, he received the province's highest score in chemistry and became the village's first university student.

Besides his excellent performance in the chemistry test, he was also outstanding in other subjects of science. His enthusiasm for learning new things and the ability to endure hardship dates back to his childhood. When he was a child, Wenlin Wang was curious about everything. He disassembled a radio, television, clock, and even an electricity meter. He had once been determined to become a radio repairer. In middle school, Wenlin Wang was taught by a physics teacher who could assemble a radio. The teacher told a story about Nikola Tesla, the inventor of alternating current, and Prof. Wang had one more figure to worship.

*"A few years ago, when I figured out a procedure that could fix funnel chest without surgical operation, I decided to name it after Tesla. In my mind, only this great name could match the procedure."* Even today, Prof. Wang is still a fan of Nikola Tesla.

In high school, his physics teacher told them that they should read thick books in the first and second years of high school, and then read thin books in the third year. Ever since, these words have influenced how Wenlin Wang has learned and worked. *"Now, my greatest understanding is that no doctor can be a master of everything. Any doctor who has made a mark in the history of medicine concentrates on one aspect of medical science and explores it in-depth."* Prof. Wang has condensed his book of surgery and focused on the

subdiscipline of chest wall surgery.

These days, Wenlin Wang gets up at 5:00 a.m. every day and comes to the office at about 6:30 a.m. He first examines patients' medical records and thinks about if any patient requires special management. Then, he begins to update WeChat and Weibo accounts and answers patients' questions on online platforms. After that, he begins to make the rounds of the wards and goes to the operating room. After supper, he takes a 30-minute walk with his wife to a nearby park, which is the most relaxing moment in the day for him. He then returns home, reads academic literature, and deals with paperwork until midnight. He has been repeating this schedule day after day. When asked how he can sustain success under unfavorable conditions, Prof. Wang replies in an emotional tone: *"I grew up in a poor family and I can stand up to hardship. I'm 52 now, but I'm still not afraid of hardship."*

*"Stay patient in the operating room. Dig a well in ten years."*

When asked to give some advice to young surgeons, he offers two similar answers. In a prepared reply to our interview questions, he urged young surgeons to stay patient in the operating room; during the face-to-face interview, he pauses and says, *"you have to keep digging when making a well"*.

In an elaboration of his first piece of advice *"stay patient in the operating room"*, he explains that he did everything by himself, that many young people are complaining that they do not have a good boss or are that they are in a bad situation. Continuing, he states there is nothing stopping someone from opening a public WeChat account or reading a lot of academic articles to polish one's technical skills. In thoracic surgery, there is much to do and much to learn.

*"Dig a well in ten years"* is a reference to a report about his ten-year commitment to chest wall surgeries in SPH.

*"Stick to one thing, and you will definitely do a good job,"* he adds.

As he becomes more and more experienced in thoracic wall surgeries, Prof. Wang has found that patients with Jeune syndrome, a rare disease, will suffer from restricted heart and lung functions when they become older because their ribs and costal cartilages will grow into the thoracic cavity. The traditional surgical procedures, which are based on the assumption that ribs stop growing at a certain age, can only be used as crude measures for emergent cases and cannot cure the disease. Since 2018, the introduction of Wenlin's procedure has saved the lives of many children with Jeune syndrome; the procedure placed fourth out of ten for the top clinical technologies in the third quarter of

2018.

The year of 2019 marks the 11th year since Prof. Wang came to work at SPH. He has performed chest wall surgeries in about 3,000 patients, including complicated and risky surgeries for thoracic deformity. No one expected that these remarkable achievements would be made after the hospital split the Department of Cardiothoracic Surgery into two separate departments in 2013. The team, under the leadership of Prof. Wenlin Wang, has so far obtained 53 national patents. These accolades were all achieved after the first case of the Wang procedure was performed.

### Afterword

Even during the preparatory stage of this interview, I was deeply impressed by Prof. Wang's high efficiency and his own values about the world and life. One week before the interview was scheduled to take place, he asked if he needed to prepare anything. Within 24 hours, he wrote an 8,000-character paper and answered questions we planned to ask during the face-to-face interview.

I visited his office during the interview, and everything in the room was placed in good order. His colleague told me that he never put off anything that was supposed to be done. But I was still unaware of the gentleness and softness behind this firm strength.

He believed the interview would go more smoothly if he could write something and answer the questions in advance. When I asked to visit the inpatient wards, he took a white uniform hung on the door and put it back in a moment,

and then asked a nurse to get a more suitable nurse uniform for me. *"The last thing I want to do is to be harsh with my team members. We are all very busy, and harsh words won't fix anything."*

During the interview, I did not hear well-prepared answers about his career plan. The environment is changing, and he is changing as well. He has his own ideas, but he has never been radical. This is why he made preparations for two years before performing the first Wang Procedure. He repeats phrases like "I did not intend to hit the target", "I have to do this because no one else is willing to", and "I can do anything if necessary". He is demonstrating the spirit of workmanship, because he takes everything as it is.

A person like him seems to be "weird" but is definitely invaluable to our society.

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### Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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