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As a physician-scientist, Jian'an Wang developed several innovative devices for valvular interventions. His research on improving the efficacy of stem cell implantation in infarcted myocardium through hypoxemic preconditioning was validated on animal models and phase 1 clinical trials. He led several of the major national research programs, making him one of the top investigators in China. He co-authored over 200 publications and was co-inventor of 25 patents.

Q: Among clinical practice, scientific research, teaching, and hospital management, which one do you prefer?

I prefer to be a good cardiologist, but I'm also a fine hospital administrator with a strong sense of responsibility. To be a qualified physician, first, you should have a detailed understanding of the disease. Second, you should give an accurate diagnosis of the disease. Third, you should be decisive enough to act in difficult cases, even if with limited information. But the most important thing is that you must be kind to your patients. Besides these goals, as an interventional cardiologist, I hope to treat very difficult and challenging cases and continuously improve my clinical skills.

Q: Could you describe some of your exciting clinical research projects?

My team and I strive to be one of the best teams on interventional treatment of heart diseases in China and well-respected worldwide. Partly, this goal must be achieved through innovation. To this end, I am leading several large-scale clinical studies to address critical questions to advance cardiovascular treatment.

One of the studies, FLAVOUR, an international, multicenter, randomized clinical trial, compares the safety and efficacy of intravascular ultrasound (IVUS) or fractional flow reserve (FFR) guided percutaneous coronary intervention (PCI) in patients with

borderline coronary stenosis. Through this study, I hope to gain some insights on the optimal evaluation and treatment strategy for the above-mentioned patients. The trial has finished enrollment of almost 2000 patients, and by November, all patients will have completed the two-year follow-up visit. Encouraged by its progress, we have initiated a follow-up study, FLAVOUR 2, to compare clinical outcomes of IVUS- and QFR-guided PCI in patients with coronary artery disease. We have enrolled more than 600 patients out of the ~2000 target number, and we hope to complete the trial by 2023.

We are also working with engineers to test VenusA Plus II, a new type of transcatheter aortic valve, in treatment of valvular heart disease. And based on preliminary results, our heart center is leading an expanded clinical study across China to investigate the efficacy and safety of a device related to mitral valve wall.

Transcatheter aortic valve replacement (TAVR) is increasingly applied for stenotic bicuspid aortic valves. However, the risk of brain injury, especially silent cerebral ischemic lesions that may potentially deteriorate neurological or cognitive functions, was not clear. To address this knowledge gap, my heart center compared new cerebral ischemic lesions after TAVR, measured by diffusion-weighted MRI (DW-MRI), between bicuspid aortic valves patients and tricuspid aortic valves patients. We

found that bicuspid aortic valves are associated with larger and more lesions, compared with tricuspid aortic valves, suggesting embolic protection should be provided for bicuspid aortic valve patients. This is the first such study in the world, and its results were published in the *Journal of the American College of Cardiology* last year.

Q: How can we speed up the innovation in interventional treatment of heart diseases?

We need to learn and innovate. It is very important to create and promote synergy between medicine and technology. In my opinion, physicians should be capable of identifying and summarizing clinical problems. We should also be good communicators and advisors, so that the R&D engineers and other technicians can fully understand what kind of medical device that the patients need. When the engineers receive clear and timely feedback from us, the potential design problems of the medical device are resolved quickly, and the innovation can move forward faster.

Take the VenusA Plus as an example. First, I drafted the primary idea of the second-generation valve, then a clinician in my team explained it to the engineers, and finally we worked together to design the new device. During the early phase of development, the engineers observed every TAVR procedure and received real-

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SAHZU was founded in 1869 by the British Church Missionary Society and was considered the best hospital in the Far East. The hospital has two campuses with 3,200 beds and over 6,000 employees, including 1,951 physicians and 2,728 nurses in 57 clinical departments, many of which are national clinical departments or disciplines approved by the National Health Commission. SAHZU has become the role model for Chinese hospitals in transcatheter valve intervention, the micro-incision cataract surgery, colorectal cancer, and severe burns. With nearly 6 million outpatients, 193,000 inpatients, and 153,000 surgeries every year, SAHZU is one of the most efficient public hospitals in China.



time feedback on the valve. At our bi-weekly meetings, we reviewed the cases in-depth and discussed them with the engineers, who then adjusted the design accordingly.

The essence of "synergy between medicine and technology" is to combine the wisdom of those two quite different fields, shortening the time from idea to market approval for a medical device, and meeting the growing demand from patients.

Q: How does your heart center train young cardiologists?

Young physicians undergo training in several aspects in our center. Foremost, they are constantly enriched by new knowledge through clinical practice, and discussing complex cases — even the rare but inevitable lethal ones. To be a

highly successful physician, you should also have broad interests and solid grasp of modern methodology and technology. We therefore require graduate students to take engineering and technology courses, to participate in lab meetings and journal clubs every week, and to practice advanced interventional and imaging technology.

We encourage our young cardiologists to interact with their peers and top cardiologists in China and around the world. We host two international conferences in Hangzhou every year — Qianjiang International Cardiovascular Conference and China Valve Hangzhou, and every physician of our team play some role in the conferences, such as inviting speakers, giving oral or poster presentations, and moderating sessions. Some serendipitous encounters during

the conferences have turned into long-lasting collaborations. In addition, we have case discussion seminars with the UCLA Medical Center every quarter, where young physicians on both sides of the Pacific Ocean share clinical knowledge and forge professional relationships. International trainees from Europe and Asia in our center bring their unique training and cultural backgrounds that are invaluable to our young physicians.

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