



## The Academic Inheritance and Innovation of Chinese Anesthesiology

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China is one of the top five countries worldwide with the largest improvement of health-care access and quality of medical services in recent years. The rapid development of anesthesiology has played an indispensable role. Improvements of anesthesiology practice in China include the development of novel technologies and ideas to refine patient care and outcome, especially in pain-control and overall patient perioperative well-being. However, the lack of anesthesiologists and the imbalance of development in different areas are tough situations facing anesthesiology in China. In the future, we intend to make due efforts to achieve perioperative safety while providing adequate pain management for all patients in China.

On March 30, 1842, Crawford Williamson Long in the United States successfully administered ether to remove a tumor from the neck of a patient for the first time. This year is considered the beginning of the modern anesthesiology. Since then, anesthesiology has undergone 176 years of development. The drugs, technologies, and concepts created by numerous excellent anesthesiologists, academic institutions, conference organizations, journals, and magazines have promoted anesthesiology's rapid progress.

In China, there is an old saying that goes, "Shen Nong tasted all kinds of plants, but nearly 70 kinds of poison were encountered in a day". This saying reflects that the ancient Chinese people made strong efforts to find some medicine for curing pain. More than 1700 years ago, in the 2nd century AD, the great Chinese physician Tuo Hua invented "azeotrope" and administered general anesthesia during abdominal surgery. Since the founding of new China in 1949, anesthesiology has continued to develop for 70 extraordinary years. Moreover, standardized training for residents and anesthetists, the research and application of new anesthetic techniques, using short duration drugs, the popularization of new equipment, and the spreading of multi-center clinical research achievements are leading the anesthesiology in China to a brilliant future.

In a successful transition from anesthesiology to perioperative medicine, we made significant achievements in contributing to science and clinical research with a strong focus in translational medicine, perioperative pain management, blood conservation, and quality improvement through big data research and clinical trials with a record number of publications in prestigious journals. Professor Chung-yuan Lin from The University of Chicago Medical Center is dedicated to the theory, practice, and research of low flow closed circulation anesthesia, which has been widely accepted by anaesthesiologists. Professor Li-Ze Xiong, the president of Chinese Society of Anesthesiology (CSA), has a good academic background in the research field of perioperative Brain protection where he has achieved good academic results. Professor Jin Liu, the ex-president of Chinese Society of Anesthesiology (CSA), focuses on the research field of translational medicine and has achieved outstanding accomplishments. However, there is still a gap between China and many developed countries. In the future, we will continue to work hard, keep innovating and exploring.

We have nearly 80,000 anesthesiologists perform more than 43 million surgeries per year. This number keeps increasing at an annual rate of 13%. In 2015, the Anesthesiology Branch of Chinese Medical Association (CMA) conducted a survey covering 16,275 medical institutions in mainland China. 86.5% (14,071) conducted clinical anesthesia. In 2014, a total of 50,080 surgical beds were opened, with 244,463 surgeons and 75,233 anesthesiologists. The average annual number of operations per surgical bed in China is 544, and the ratio of surgeons to anesthesiologists is 6.7:1. The total number of anesthesiologists per surgical bed is 1.5, while each anesthesiologist was responsible for an annual total of 919 cases of anesthesia, including indoors and outdoors. These data indicate that there is 6-fold more anesthesia work for anesthesiologists in China as compared to anesthesiologists in Europe and the United States. China's large population is seriously out of proportion to its tens

of thousands of anesthesiologists, which puts forward a severe mission for Chinese anesthesiologists. There is still a long way to go to an ideal future, but it can be reached by our efforts.

In 2017, a new concept in perioperative analgesia was proposed in China: Perioperative analgesic NSAIDs and regional technical analgesia. The theory indicates that the purpose of perioperative analgesia is to relieve surgical pain and decrease adverse reactions, while the essence is to prevent the occurrence of peripheral and central sensitization. Multimodal analgesia weakens the central nervous system's pain signals through opioid medications and other analgesic modalities including regional block analgesia. Such a combination of analgesic drugs with different pathways, or different measures, through a variety of mechanisms to produce analgesic effect, can obtain a better analgesic effects and reduce drug side effects to a minimum.

In 2018, we share the same glory of our specialty and similar problems and pain with you. We need "a collaborative effort in perioperative and pain medicine" as proposed in the first ICAA-CSA joint symposium at University of California, San Francisco on October 12<sup>th</sup>, 2018. We will achieve our goal providing an outstanding care to our patients through hard work, innovation, and collaboration.

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