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Brief biographical sketch

My career at UCSF has encompassed clinical work, teaching, research and serving as division chief and director of cardiac anesthesia. Our patients include the full spectrum of heart disease, from neonates undergoing complex congenital repairs to adults requiring coronary artery bypass surgery, valve repair, and transplantation. I was one of the first to publish the utility of transesophageal echocardiography (TEE) in infants and children. In 1990, I helped to establish an intraoperative transesophageal service for infants and children undergoing surgical which has become an integral part of the perioperative care. Since then, we have been one of the leading centers in this area both in the United States and internationally. I have mentored numerous residents and fellows in anesthesia and pediatric cardiology, as well as faculty in adult and pediatric cardiology. I have served on several task forces establishing guidelines for transesophageal echocardiography for cardiac surgery of children and adults.
Besides the extensive work I did in congenital heart disease, I made significant contributions in TEE in adult cardiology and was awarded the role of Fellow in American College of Cardiology, which is highly unusual for an anesthesiologist.
I also made direct contributions to science in anesthesia, studying the role of intraoperative nitric oxide and establishing the utility of the anesthetic sevoflurane in infants and children. The contributions of this work has led to routine use of nitric oxide and exclusivity of sevoflurane in pediatric anesthesia. I have also been involved in establishing guidelines for the use of coagulations factors in pediatric cardiac surgery.

My research interests have focused on the anatomy, physiology and pharmacology of patients with cardiac disease. I was fortunate during my fellowship in cardiac anesthesia to be at the forefront of the development of transesophageal (TEE) echocardiographic probes with capabilities for Doppler imaging and for infants and children. Since retiring from UCSF, I have remained clinically active in anesthesia, working and teaching at various locations, including at the SFVAHCS. Last fall, when working with the orthopedic surgeons there, I

observed the use of 3D printing (3DP) models in their surgeries. It was very clear to me that the augmented reality (AR) and 3DP enhanced the learning, not only for the patients and surgeons, but everyone on the health care team. AR is seeing the model on a viewing goggles, and 3D prints can be held in the palm of one's hand. Patient care has been directly impacted, by improving procedural planning, case efficiency and outcomes, so much so, that I observed that in the operating room at SFVAHCS, when 3D prints were used, team dynamics and morale improved quickly with everyone understanding the anatomy and what was trying to be achieved for the patient.

I also work at UCSF Benioff Children's Hospital at Mission Bay as a recall anesthesiologist in the Pediatric Heart Center. Realizing the great potential of AR and 3DP for congenital heart disease, I brought together the orthopedic surgeons taking care of our veterans at SFVAHCS with the pediatric cardiologists and congenital cardiac surgeons taking care of our most frail neonates and infants with congenital heart disease (CHD). Together, we were provided strategic support for a multi-disciplinary center for applied 3D technologies. This will advance precision surgery throughout UCSF Health, by synergizing the expertise of multiple medical specialists resourced with innovative hardware and software, developing campus wide connectivity and technical expertise in AR and 3DP. With the Dickson award, I plan to develop a library of congenital heart disease that will be used for teaching the complicated anatomy.