

Knowledge exchange—Working together across the globe



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With the second highest population, India holds the honor as the largest democracy in the world. Recognized for her potential opportunities and widely spoken English language, many companies saw the value to outsource service functions to this country in the later part of the 20th century. Armed with the perseverance of her citizens, high educational standards, and rich natural resources, India has overcome her religious/caste divides and emerged as a significant force in the global economy.

Unfortunately, the Western lifestyle has also brought a rising incidence of noncommunicable diseases including diabetes, hypertension, and cardiovascular disease, the latter constituting a major cause of mortality in Indians.¹ However, because of its focus on defense and infrastructure development, the government spends only 3.7% of gross domestic product on health care.² The budget for health care is considerably lower than that of Western European countries or the United States, where health care expenditure may reach 19% of the gross domestic product. While third party payers are becoming popular among the private or public sector workforce, the majority of the citizens still pay out of pocket for their medical care. Cultural norms dictate that given a choice between food on the table, a roof over their head, education for their children or financing a daughter's marriage, health care assumes a lower priority. Life-expectancy increase is largely attributed to an emphasis on preventive medicine; however, there remains a sizable gap in health care access, especially for advanced care such as arrhythmia management, oncology treatment, or organ transplantation. In this

article, we outline our shared experience through partnership in clinical care and education.

Sri Sathya Sai Institute of Higher Medical Sciences, India, was established with the aim to provide free medical care to the sick and ailing with the dedication, commitment, love and the best of skills, so that they will be cured in body, mind and spirit, consistent with the mission statement by Sri Sathya Sai Central Trust. This trust, founded by Sri Sathya Sai Baba in 1972 at Puttaparthi, Andhra Pradesh, India, has and continues to undertake numerous service activities in the field of education, health care, and rural development since inception, providing inspiration to many. The trust has built 2 tertiary care hospitals, one in Prasanthigram, Andhra Pradesh, inaugurated in 1991, and one in Whitefield, Bengaluru, established in 2001 (Figures 1 and 2). The trust is funded by charitable donations from all over the world, and funds are allocated every year according to the needs reported by the hospital leadership. The cost of all medical care at Whitefield campus in a fiscal year is approximately US\$19 million. When one enters the hospital, the welcoming dome provides the feeling of an *ashram*, a place of peaceful retreat. It is noteworthy that there is no billing department in these hospitals because medical care is provided completely free of charge. Patients come in by "word of mouth," as there are no advertisements for care provided by the medical personnel. Besides employees, some volunteers spend time, regularly contributing service to the society. When interviewed, one volunteer said, "I am retired; I don't want to sit and watch TV. What better way to spend a retired life than to help people?"

A few of the authors of this article have been familiar with this establishment for many decades and have had the opportunity to make frequent trips to provide arrhythmia care at the institution. Visiting health care physicians spend a week at a time and perform, train, and guide arrhythmia ablation procedures and device implantations. As the program evolved,

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Figure 1 Sri Sathya Sai Institute of Higher Medical Sciences (SSSIHMS), Whitefield, Bengaluru, India. Photo courtesy of the SSSIHMS.



Figure 2 Sri Sathya Sai Institute of Higher Medical Sciences (SSSIHMS), Prasanthigram, Andhra Pradesh, India. Photo courtesy of the SSSIHMS.

one of the authors was able to spend a sabbatical year and worked with the hospital leadership to upgrade the cardiac catheterization laboratory with advanced integrated electrophysiology (EP) workstation to function as a hybrid EP laboratory as well. EnSite NavX (Abbott Inc., India) mapping was chosen because of the versatility of application to patients of different ages and sizes as well as ease of multiple uses of patches externally. During this sabbatical year, the cardiology team initiated 3-dimensional (3D) mapping cases, with industry providing logistical support. The NavX patches were noted to be effective for 18 hours, and they were used for the entire period of 18 hours on multiple patients safely to maximize cost-effectiveness. It was an emotionally moving experience when our first patient, a young girl with cardiomyopathy induced by atrial tachycardia located in the right atrial appendage, came to the hospital. While the parents had given up hope after she was resuscitated from pulseless electrical activity arrest, they were ecstatic when her heart function normalized after ablation with 3D mapping assistance. This sentinel patient set the stage for building a program that would, over the next decade, treat many more unique and complex cases. Of note, 3D mapping and ablation procedures are quite expensive and offered free of cost at this institution to these underserved patients. The diagnostic and ablation catheters are also used multiple times after appropriate reprocessing, sterilization, and validation metrics. Reuse of catheters is a common standard of practice in other hospitals in the geographic region. Device implantation,

especially cardiac resynchronization therapy, and interrogation training were also provided. Thereafter, groups of physicians and EP technologists visited regularly until the recent coronavirus disease 2019 pandemic lockdown. Some of these trips were funded by a charitable foundation initiated by Sala Hasanein, but most team visits were self-funded and voluntary.

The workflow of record maintenance and update of the waiting list of patients at this institution is remarkable. Many of these patients live in remote villages without proper street addresses; the only accessibility is a P.O. box number. Typically plans are initiated in advance of our visits, including credentialing of visiting physicians, visa applications, and compilation of the patient list. The hospital provides the team lead with a patient list and brief medical history to prepare ahead of the visit. The patients identified have complex arrhythmias requiring ablation or device implantation. Many of them had failed previous ablation procedures. The visiting team applies for grants from the industry for device donations. Industry partners supported and supplied bradycardia and tachycardia therapy devices. Donated devices must be cleared by the Indian government as noncommercial imports for the patient care in advance of the visiting health care team. The hospital scheduling service used to send a letter to the potential patients by postal mail. With the wide use of cell phone technology, phone calls and instant messaging are currently used for communications. Patients arrive at the security check with their appointment numbers on the day they are expected after traveling

long distances. The families are accommodated in a facility close to the hospital.

Once our team visits the hospital, we show respect by following the cultural norms of the hospital. We start the day with didactics for the trainees. The hospital has cardiology residents and interventional cardiology fellows as well as a nursing and a cardiac care technology training program. Medical charts are evaluated in the morning and chosen in the order of age group, giving priority to the pediatric patients. Anesthesiology support is readily available. The nurses and cardiac technologists are cross-trained for interventional catheterization and EP procedures. The turnaround time in the laboratory is impressive. Once the patient leaves the room, the housekeeper who is in the immediate vicinity walks in to clean the room. The next patient is ready to be moved in to begin the procedure. As the table is being set up, the patient gets prepared to begin the procedure, with approximately 10–15 minutes transpiring from the previous case end to the next case start. Finally, the hospital staff commits fully to supporting the team, willingly working late into the night so as to allow full usage of the 18-hour time limit of the NavX patches.

Another striking aspect is the cleanliness in the hospital. The floors and the walls are free of dirt and are extremely clean, thanks to a hyperalert cleaning crew. It should be noted that the infection rate for device implants is low. This construct of this program maximizes a knowledge exchange between the local and the visiting health care providers. The unique patient population representing a wide variety of disease conditions is a mutual learning opportunity. We admire the commitment of the local team and the humility of physicians/staff at the institution. We are always welcomed with smiles and gifts of delicious food.

When we see a mother's folded hands in appreciation or the joy in a father's eye asking for a selfie on the cell phone

or when a patient prostrates himself at your feet in gratitude, the only emotion that surfaces is humility. We appreciate how wealthy our health care system is compared with those we have just partnered with and leave with a heavy heart that we could not do more in the time we were there.

We want to share this experience with our readers to provide an example of partnering with local institutions as one mechanism to bridge the gaps in access for those living in health care resource-constrained areas. A willingness to share knowledge and time goes a long way to help patients. Education, training, and partnership with local physicians may be an example to keep the sustainability of the advanced medical care in the geographic location where supportive environment is created for the services and ideas exchange to occur. As a result of our partnership, we have invited physicians at the institution to visit us for knowledge sharing. Mutual education is an enriching experience that triggers a constant urge to return the following year.

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