In 1956, the young Ernst Wolner was in his penultimate year of secondary school and planning to study law. Then in October that year, the Hungarian Revolution against the communist government displaced refugees into neighbouring Austria. A chance visit to the city hospital to visit a family member opened Dr Wolner’s eyes to the plight of the refugees and led him to change his mind. He decided to pin his career hopes on medicine.

“It was a Sunday afternoon, and my mother asked me to visit a female relative,” Dr Wolner recalled. “It was in the days before easy access to telephones, and when I got to the hospital, my relative had been discharged on the Friday before. So I had some time on my hands and realised from the refugees I saw that if I became a lawyer and I ever had to move to another country, I wouldn’t be able to practice. But with medicine, I could practice anywhere — in every country, on every continent.”

As it turned out, this foresight was not required, as Dr Wolner, who was born just after the start of World War II, obtained his degree from medical school he carried out research on coronary flow and heart function in the university’s departments of anatomy and pharmacology.

Dr Navratil, who encouraged his career in artificial cardiac devices, was a “real mentor,” but Dr Wolner says he has been motivated by all those who work with him in the Department of Cardiothoracic Surgery. “By the age of 41, I was the head of the department, and my coworkers inspired me. What I can really say is that the department has a really broad spectrum — 50% of what we do has always been innovation, implementing new technologies, and we have done thousands of heart transplants over the years.”

IABP transplants were just the beginning of the Vienna programme on assisted circulation. In the 1970s, the team was testing left ventricular assist devices in calves, and in 1986 they carried out an artificial heart bridge to transplant operation in a human.

“I wrote a lot of papers speculating how it would be in the early 1990s,” Dr Wolner said. “With the exception of energy transfer, it has all been realised. At the beginning of the programme, nuclear energy was a real high point, and we were thinking that all the problems of the power source with mechanical devices would be solved by a nuclear-powered battery in the body, which would provide power for the whole life of the device.” He believes that developing an energy source that can power cardiac assist devices from within the body is one of the biggest challenges in the field.

In the 1980s, Dr Wolner and his colleagues developed the Vienna Artificial Heart, a pulsatile artificial ventricle, Cardiac assist devices, such as the new, miniaturised HeartWare centrifugal pump, have been the focus of Dr Wolner’s career.
Chair of Hope

Some of Europe’s leading cardiac surgeons give up their time to offer hope to young heart patients across the globe through the medium of the Chair of Hope charity, founded by Sir Magdi Yacoub (right). Mark Nicholls explains how the project functions.

There are many children with serious heart conditions in countries such as Egypt, Kenya, Mozambique, Mauritius, and Jamaica, where cardiology services are limited. A decade ago, the prospect of effective treatment for them was virtually nonexistent.

But now a growing number of children from some of the poorest parts of the world are receiving lifesaving cardiac surgery from a group of Europe’s leading surgeons, who give up their own time to treat young patients without payment.

Working under the banner of the Chair of Hope, a charity based in London, United Kingdom, the surgeons operate on children in underdeveloped countries. Importantly, equipment and training is offered to enable the establishment of cardiac teams in those countries to continue the work.

The most serious cases are brought to the United Kingdom to receive treatment in hospitals such as Great Ormond Street, the Royal Brompton, Harefield, and Guys and St Thomas’ Hospitals, all in London, United Kingdom. Surgeons taking part include Victor Tsang, MS, FRCS, MSc, consultant cardiac surgeon at Great Ormond Street Hospital, who, as well as volunteering his services in England to treat children, travels regularly to assist treating the backlog of paediatric cardiac cases in Jamaica. Sir Magdi Yacoub, FRS, FRCS — who founded the charity in 1995 — and Dr Tsang have been helping local surgeon Roger Irvine, DM, MB, DS, (who trained with Sir Magdi in the United Kingdom) to establish an autonomous paediatric cardiac service in Kingston, the capital city of Jamaica, by developing education materials, holding teaching seminars for nurses, donating equipment, and training key clinical personnel.

Dr Tsang said, “With the support of the local cardiologists, cardiac surgeons, nurses, and perfusionists, we undertake a wide range of open heart surgery for congenital and
rheumatic heart disease in Jamaica. We see the children we operated on a year later, and it is most satisfying to see them running around full of energy and joy.”

Consultant cardiac surgeon at the Royal Brompton and Harefield Hospitals, Babulal Sethia, FRCS, has contributed to surgical programmes for Chain of Hope in Egypt, Mauritius and, most recently, Brazil, as well as operating on patients in London. He explained that the surgical operations cover the full range of neonatal, infant, paediatric, and adult congenital cardiac surgery.

“We are currently focussing on the development of educational initiatives wherever we work, and thereby trying to ensure that the overseas units become self-sufficient within an agreed, defined time frame,” said Dr Sethia.

“Training other colleagues in the care of children born with congenital heart disease facilitates the care of so many more children than would be possible simply by treating patients in our own centres in England,” he added. But he said there is also the opportunity to learn from the experiences of other countries and “potentially bring benefit to patients in our own centre when we return to the UK.”

Without surgical intervention, the children would have little hope. “In many instances, the alternative is prolonged incapacity, extra suffering, and premature death. The fact that so many children can return to a normal quality of life brings much joy to their families and those who care for them,” said Dr Sethia.

Paediatric cardiologist Philipp Bonhoeffer, MD, from Great Ormond Street Hospital, said that in poor countries neonates with cardiac disease often never get to a hospital, and die at home. However, many of the children who do survive the neonatal period often have relatively simple cardiac lesions. “It is difficult and wrong to deny children their right to life when a relatively simple procedure can save them,” he said.

He added that cardiac interventional work lends itself very well to the environment they find themselves working in, with basic x-ray equipment and monitors available in even the poorest countries.

“Furthermore, cardiac catheterisation does not have the same requirements as surgery in terms of staffing and intensive care facilities,” he said. “Balloon dilatation of stenotic valves can therefore easily be carried out in congenital and acquired heart disease. Mitral stenosis in the context of rheumatic heart disease is common even in children and is easily treated,” he explained. “Pulmonary stenosis can be dilated in the classic indication, but can also be carried out as a palliative measure in children with cyanotic congenital heart disease.”

Basically every intervention can be performed in a very simple setting, he said. “The environment of a catheter laboratory also allows for excellent cardiological education in countries where no cardiological services are available. Therefore it can be used as a first step into cardiac treatment. Cardiac surgery can then be developed at a later stage along with the intensive care requirements. This is
how we initially developed services in Kenya and Mozambique, where interventional catheterisation and cardiac surgery are now regularly performed.” He added that the more important impact is the provision of local training for health professionals.

Dr Bonhoeffer continued, “For example, I developed a technique of mitral dilatation more than 10 years ago. Then I taught my Kenyan colleagues to carry out mitral dilatations without my help. They have now saved the lives of hundreds of children with severe mitral stenosis in my absence.”

Chain of Hope Executive Director Emma Scanlan explained that some children are still brought to the United Kingdom for treatment and are looked after by host families, but a growing number of missions are undertaken to third world countries to treat children closer to where they live, and to help establish cardiac services in those countries.

Ms Scanlan said, “We send doctors, volunteer surgeons, and nurses overseas to operate on children, and also to offer training to exchange knowledge and transfer skills, whether technical or clinical. Advice on the management of cardiac disease in those countries is also given.” Mozambique, for example, had no cardiac services prior to the charity’s involvement.

The charity began by focussing on congenital heart disease, but is becoming more experienced in dealing with rheumatic heart disease and more complex cases. Ms Scanlan explained that diseased and malfunctioning valves are being replaced with human tissue valves, and in the case of mitral valves, these are repaired where possible. The reason behind these strategies is to avoid reliance on anticoagulants, because these drugs are not always readily available in these countries, and they require intensive and accurate management. Chain of Hope surgeons are now looking at ways of tackling endomyocardial fibrosis, which is a growing problem in some parts of the world.

So what motivates surgeons and other medical staff to take part? Ms Scanlan said, “I believe they feel it is a sense that medicine, science, and technology do not belong to a certain part of the world, they belong to humankind. It’s not just about providing services now, but about providing services for the future.”

A recent mission saw Sir Magdi Yacoub take a team to Egypt. Working with an Italian charity, they were able to equip a children’s hospital in Cairo with an operating theatre for cardiac surgery and an intensive care unit, and also helped to provide further training and experience to local staff. Ms Scanlan explained the need for such facilities, as Egypt has a huge backlog of patients with rheumatic heart disease and a high incidence of congenital heart disease.

A mission, typically costing £40 000, normally lasts around 2 weeks, the first week being for surgical work with 15 to 20 operations conducted in that time. The second week is for postoperative work, during which the team sees the children safely through intensive care and can offer support and training to the local team.

Founder patron Sir Magdi said that in the last 10 years Chain of Hope has grown significantly in the type of work it does and is making a significant difference to the lives of children who may not otherwise get treatment. Around 1 child in every 100 in the countries affected are born with a heart defect. Sir Magdi said, “Most of these problems can be corrected by operations that are performed as a matter of routine in the developed countries. In contrast, if uncorrected, these defects can cause considerable suffering and premature death.”

Chain of Hope relies on donations in order to provide the £600 000 it needs each year to remain operational. If any readers would like to know more, they can contact Emma Scanlan on 0207 351 1978 or visit the Chain of Hope website at www.chainofhope.org.

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