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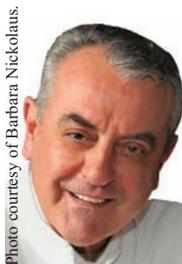
Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

European Perspectives in Cardiology



Pioneer in Cardiac Surgery: Roland Hetzer, MD, PhD



Responsible for Setting Up Germany's Third Heart Transplant Programme in 1983, Planning and Running the German Heart Centre, and Pioneering Work on Heart Pumps and Triple Immunosuppression

Roland Hetzer, chair and head of surgery at the German Heart Centre, Berlin, Germany, professor of surgery, Free University of Berlin, and professor of surgery, Humboldt University, Berlin, talks to Jennifer Taylor, BSc, MSc, MPhil.

The first-ever implantation of a rotational heart pump into a patient was carried out in 1998 by Professor Roland Hetzer, MD, PhD, chair and head of surgery at the German Heart Centre in Berlin, Germany, professor of surgery, Free University of Berlin, and professor of surgery, Humboldt University, Berlin, and after the experience, his respect for the human body grew enormously.

Until that moment, all pumps had operated on a pulsatile basis like the natural heart, but this new pump, which was created by Professor Michael DeBakey, MD, from the Baylor College of Medicine in Houston, Tex, had a turbine motor, which produced a nonpulsatile continuous flow. Professor DeBakey knew from animal experimentation that organ function could tolerate nonpulsatile blood flow, but it was not clear how the body would react and whether specific qualities such as memory would tolerate it. They found that the human body compensated completely.¹ Professor Hetzer explains, "Before that time we thought it was not possible because there is no pulse anymore, and we had learned in physiology that pulsatility is an important factor for tissue perfusion. This obviously is not so."

The pumps are now routinely implanted at the German Heart Centre and patients have lived >6 years without any adverse events. The success of the procedure opened up a whole series of questions, such as how the receptors work under these different conditions and how blood pressure is

regulated. Professor Hetzer comments, "I am constantly wandering in the desert trying to find people who will dedicate their time and their work to such interesting and exciting questions."

"Professor Gerbode Had Established a Well-Known Foreign Fellowship Programme, and I Was Foreign Fellow Number 99"

Born in 1944 in Neuhammer, Sudetenland, now Czech Republic, Hetzer was deported with his family to West Germany in 1947. From 1950 to 1963, he attended primary and secondary school at Aystetten and Augsburg (close to Munich) in Bavaria, Germany. He had a good memory and easily became enthusiastic about things. The idea of becoming a doctor came from a school friend. Although he was mainly interested in physics and chemistry, at the age of 17, he decided medicine would allow him to combine natural sciences and interaction with people. He studied medicine first at the University of Mainz, Mainz, Germany, and then at the University of Munich, Munich, Germany. Outstanding teachers proved inspirational at both universities, but it was the mid-1960s, and he also met some peculiar people. "In Munich, the professor of anatomy would teach in a black coat with a velvet collar," Professor Hetzer recalls.

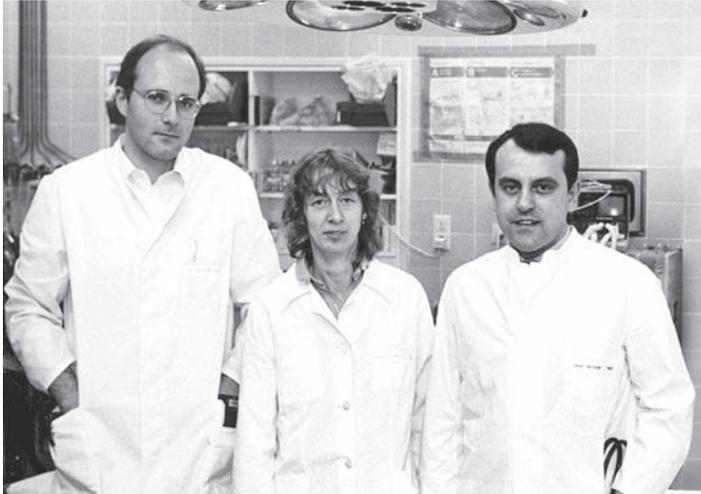
As a student Hetzer needed to make a living and was lucky enough to meet some doctors in Augsburg early on who employed him in their practice and the hospital during vacations. By the time he had finished medical school, he had so much experience in surgery and urology that he could have been mistaken for a resident. A love for surgery developed early on in his studies. He explains, "I like anatomy, I like to do things manually, and I like to see my results."

Hetzer then worked as a medical assistant at Haunstetten City Hospital in Bavaria, and in 1971 he went to the newly established Hannover Medical School, Hannover, Germany,

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The core team at the first heart transplantation in Hannover, 1983: Professor Hetzer (right) with fellow surgeon H. Warnecke (left) and nurse, U. Suethof (centre). Photograph courtesy of Professor Hetzer.

for 5 years of surgical training in abdominal surgery, trauma surgery, and thoracic and cardiovascular surgery. For its time, it was a modern science-oriented department that bucked the trend of the monolithic surgical departments in Germany due to the leadership of the chief, Professor Hans Borst, MD, who was trained in the United States and was 1 of the pioneers of cardiac surgery in Germany. He attracted Hetzer to the new, rapidly exploding field, which at that stage was largely experimental.

After passing the American exam, Hetzer took up a clinical fellowship in cardiovascular surgery at the Pacific Medical Center, San Francisco, Calif, home to one of the pioneers of cardiac surgery, Professor Frank Gerbode, MD, from 1976 to 1977. Professor Hetzer recalls laughing, "He [Professor Gerbode] had established a very well-known foreign fellowship programme, and I was foreign fellow number 99." The longstanding, high-quality programme has hosted a number of fellows who have since become well known. Professor Gerbode was 70 years old then, "a real old-fashioned gentleman" and "always very elegant," says Hetzer. "He drove a Rolls Royce and had the largest sailing yacht in the Bay of San Francisco. On some weekends, I had to work on his yacht as a sailing mate."

"Maybe 90% of the Achievements in Heart Transplantation Came Out of That Institution [Stanford University Medical Center], and It Was a Unique Place to Learn"

It was an excellent period and one of the best times in Professor Hetzer's life. Because the programme in San Francisco was not too onerous, he had time to make several visits to Stanford University Medical Center, Palo Alto, Calif, which was not far away. There he made contact with Professor Norman Shumway, MD, who was directing a famous heart transplantation programme. The centre also had good programmes in paediatric surgery and aortic surgery. Professor Hetzer says, "This was the one institution in the whole world where heart transplantations were performed on a regular basis in the mid-1970s."

Hetzer learned everything about running a heart transplantation programme: how to select and prepare patients, transplantation, treatment afterwards, immunosuppression, biopsies, and the histology of the biopsies. "All this is the original work of the Stanford group," he says. "You can say that maybe 90% of the achievements in heart transplantation came out of that institution and it was a unique place to learn."

Of all the cardiac surgeons with whom Professor Hetzer has worked, Professor Shumway has had the biggest influence on his thinking. When working in a scientific institution, there was a delicate balance between scientific interests and the interests of the patient, which were not always the same. Professor Shumway was peculiar in that he always put the patients' interests first. Compared with others working in heart transplantation at that time, he was a very modest man who shied away from media attention.

Establishing Germany's Third Heart Transplantation Programme and Introducing Triple Immunosuppression

On his return to Hannover in 1978, Hetzer became a staff surgeon, followed by promotions to assistant in 1979 and then associate professor of surgery in 1983. From 1983 to 1986, he established and directed the third heart transplantation programme in Germany at Hannover Medical School.

Initiating the programme was a tough job. There was a lack of capacity for conventional cardiac surgery, in particular coronary bypass surgery. Departments were small, and there were obstacles to overcome, especially from cardiologists who thought transplantation would consume too much of this capacity.

Once the programme was set up, however, it grew rapidly. During the first 2 years, they performed 72 heart transplantations, which was a large number then. The success brought funding from the university and the state in Hannover. It was a fruitful time for Professor Hetzer, who was engrossed in this exciting new field, which was still open to new developments. He was therefore able to develop a spectrum of interests, which included valve surgery and endocarditis.

In 1985, Professor Hetzer performed the first heart transplantation in a child in Germany. He recalls, "It was a natural thing to accept the challenge of a paediatric transplantation," adding that the real challenge was transplanting infants, something he began later in Berlin. The 8-year-old boy lived for 16 additional years with the transplanted heart (the mean survival time after heart transplantation was 10 to 12 years). Unfortunately, like many others who had been transplanted, the patient developed renal failure due to the toxic effect of immunosuppression. He therefore received a kidney transplant from his mother, but died suddenly after the transplantation.

At Hannover, Professor Hetzer introduced triple immunosuppression, which later became standard practice for heart transplantation. In the early 1980s, cyclosporine A had been introduced, but at high doses it was toxic to the kidneys and liver. Professor Hetzer lowered the dose of cyclosporine A

and added 2 more immunosuppressive agents with a different mechanism, azathioprine and corticosteroids, plus antithymocyte globulin, which had been developed at Stanford University. The continuous long-term triple immunosuppression proved beneficial for patients, and although different drugs are available today, the technique is still used. This work produced Professor Hetzer's most important article from his time in Hannover.²

Setting up the German Heart Centre, Which Has Performed 65 000 Open Heart Operations and Provides Every Treatment Modality for Every Age Group

By the mid-1980s, Professor Hetzer became involved in planning the German Heart Centre in Berlin. It was an ambitious venture

because Berlin at that time was a political island. West Berlin was surrounded by East Germany but was completely dependent on financial support from West Germany. Professor Hetzer recalls, "The government in West Berlin in the mid-1980s, under Richard von Weizsäcker, who later became federal president, wanted to establish some extraordinary things in West Berlin to support the self-confidence of the poor West Berliners. One of them was to set up a large cardiac surgery centre." The centre would be too large for the population of West Berlin, and no patients could come from East Germany because of the political borders, which meant that it would rely on the transfer of large numbers of patients from West Germany by plane.

"I was a young man, and when you are young you are courageous, you don't think twice," says Professor Hetzer. "I knew the situation in West Germany, which still had long waiting lists for conventional cardiac surgery. So I happily took over this post in West Berlin and at the same time became full professor of the Free University of Berlin."

That was 1985, and since then Professor Hetzer has been chair of the centre, which in just 2 years fulfilled its target of performing 2500 open heart operations per year. It was the only large centre in Germany at the time.

After the unification of Germany at the end of 1989, suddenly thousands of patients who had not been treated could come to West Germany from East Germany. The German Heart Centre was the only institution large enough to cope with the numbers, and in the early 1990s, it was asked by the government to increase its capacity to 3500 open heart operations a year, a level it has maintained until now. The team at the German Heart Centre has now performed 65 000 open heart operations. A large transplantation programme was also set up, which is still the largest in Germany, and the team has carried out 1800 heart transplantations. In addition, >1500 artificial heart pumps have been implanted, the largest number in the world in one institution.

The German Heart Centre's main feature is that it offers the full spectrum of all treatment modalities. There



Professor Hetzer (right) and colleagues showing Richard von Weizsäcker (left), president of the Federal Republic of Germany from 1984 to 1994, around the German Heart Centre in 1986. Photograph courtesy of Udo Lauer.

are programmes for children, infants, and newborns, coronary and valve surgery, a large aortic programme that performs 500 cases per year, and transplantations for the heart, lungs, heart and lungs, and artificial pumps. "It means that there is no treatment modality that is not available here," says Professor Hetzer. "This was the main goal of the institution." Today the spectrum of patients is also completely covered. Operations can be performed on patients over age 90 and on premature babies. Professor Hetzer's smallest open heart surgery patient weighed just 900 g.

Demonstrating Recovery of Dilated Cardiomyopathy After Treatment With an Artificial Pump

Aside from patient care, a number of innovations have been introduced, such as the artificial heart.

Professor Hetzer's predecessor at the Free University in Berlin, Professor Emil Sebastian Bücherl, MD, had worked experimentally on developing a total artificial heart for the previous 15 years. As a result, Professor Hetzer inherited a programme that included specialists in the mechanical support programme. When Professor Bücherl retired, Professor Hetzer encouraged an entrepreneur to buy the rights for the pumps from the university. In 1988, Berlin Heart became the first company in Europe to produce ventricular assist devices. Professor Hetzer has since helped develop the systems. In the early 1990s, for example, they developed a paediatric assist programme with miniaturised ventricular assist devices which today are still the only ones in the world for long-term application in small children, infants and newborns.³

The artificial pumps were first used as a bridge to transplantation, with the intention of keeping these young patients alive until a heart was available for transplantation. They performed the first bridge to transplantation on a child in 1990. Professor Hetzer says, "I think it's very important to recognise that with this bridge to transplantation concept, those pumps reached their first acceptable application. If we had started at that time with the intention of permanent



Professor Hetzer with a child in whom he implanted a paediatric ventricular assist device. Photograph courtesy of Barbara Nickolaus.

implants of those pumps, I think we probably would have met a lot of opposition because of ethical reasons.”

Later on it became apparent that there were not enough hearts to perform transplantation on everyone, and patients had to stay on the pumps for a long time. This provided the opportunity to develop pumps for permanent use.

In 1995 Professor Hetzer and his colleagues discovered that some chronically sick hearts could completely recover after being unloaded with an artificial heart pump, and the pump could then be explanted.⁴ They were the first in the world to demonstrate this recovery, although it had been suspected for some time. Of the 6 patients whose pumps were explanted in 1995, 3 are still alive with their own recovered hearts.

The exciting concept was met with scepticism at first, but researchers in London and the United States have since observed the same recovery. Professor Hetzer’s group has now demonstrated that the heart can recover when unloaded with an artificial pump in 40 patients with dilated cardiomyopathy, which is the most frequent indication for heart transplantation in patients of all ages. This is, however, a small fraction of patients among the hundreds with dilated cardiomyopathy in whom no recovery was seen.

It is still not known why recovery occurs, in which patients it will occur, and when it happens whether it will be long lasting. Because there are no reliable predictive data, identifying patients in whom recovery will take place involves performing pump stop trials to observe how the heart functions without the artificial pump. Given that explantation is the best solution for some patients, it’s an area that deserves further research.

In September 2009, Professor Hetzer’s group was the first to implant 2 pumps, 1 for the right ventricle and 1 for

the left ventricle.⁵ Modern implantable pumps are primarily made for the left side of the heart because it is the left ventricle that fails in most instances in dilated cardiomyopathy or coronary artery disease. In more severe heart failure, the right side of the heart may also need treatment. For these patients, the team modified a small rotational pump. The original version is used for the left ventricle and the modified version for the right ventricle. Today 15 patients have the combination, which acts as an artificial heart because the patient’s natural heart has no function and the 2 pumps take over. Professor Hetzer says, “I think this will open up the door for many, many patients who until recently could not be treated with implantable long-lasting pump systems.”

Now Professor Hetzer and his team are working with a few companies to develop a total artificial heart, which will be an implantable substitute for the natural heart using rotational pumps as the drive systems. He believes this will be a good solution for patients with huge infarcts, rupture of the septum between the ventricles, or cardiac tumours.

“I Gave the Robot Away to the Abdominal Surgeons. They Were Happy”

As a broad-range cardiac surgeon working in the large Berlin unit with its full spectrum of all treatment modalities, Professor Hetzer has worked on many different types of problems and introduced a number of technical modifications. He has modified valve repair techniques so they did not require the use of foreign materials,⁶ and he introduced a new procedure for Ebstein anomaly.⁷ But unlike the early days in Hannover, when it was quite easy to make new developments, today cardiac surgery and cardiology are both so far advanced that modifications have to be made against a background of existing good results with established methods.

Modifying or introducing new techniques into a field where there are already good results with other techniques creates a difficult ethical situation. One example is the period when it was fashionable to use robots for cardiac surgery. It soon became apparent that the robot was not advantageous because it was less accurate than human hands and eyes, therefore more dangerous, and it was more time consuming and costly. He recalls, “I gave the robot away to the abdominal surgeons. They were happy.”

It means that any advances will be smaller or in different directions, such as the new field of hybrid surgery, which combines surgical techniques with catheter techniques in the same session by a team of surgeons and cardiologists. It is being used for valve implantations via catheter in very old, very sick people, with good results and a short hospital stay.

Professor Hetzer sees the use of hybrid surgery expanding, with surgeons and cardiologists working together and eventually the new profession of “heart doctor” being developed for people who can do both surgical and catheter techniques. He already has a team of 7 or 8 “heart doctors.”

“We Always Had a Large Number and Large Spectrum of Coworkers From Other Countries”

In 1987, Professor Hetzer was awarded the Order of Merit of Berlin, the first year of the honour, and in 1995, he was awarded the Order of Merit of the Federal Republic of Germany for inventing the profession of perfusionist. When he arrived in Berlin he needed people to run the heart–lung machine during open heart operations, a demanding job for which there was no established training in Europe, only in the United States. In 1987, he established an Academy for Perfusionists, which became the first such school for perfusionists on the continent. After this, the profession of perfusionist was entered into the law texts and became an official role. At the same time, a school was established in London, England.

Professor Hetzer has also been awarded honorary professorships from the Shanghai Second Medical University, Shanghai, China (1999) and the Medical Center Nikiforov, St. Petersburg, Russian Federation (2008), and honorary doctorates from the University in Fujian, Fujian, China (2001), the Kardinal-Stefan-Wyszynski University, Warsaw, Poland (2002), the University in Sarajevo, Bosnia and Herzegovina (2002), the Burdenko Academy, Voronezh, Russian Federation (2006), the Pirogov Center, Moscow, Russian Federation (2007), and the State University Moscow Lomonosov, Russian Federation (2009).

He attributes these honours to the fact that he needed a large staff at the German Heart Centre and could not do it without people from abroad. He says, “From the first day, I kept the door open for foreign coworkers. For a surgeon it’s not so important that he understands the language so perfectly, he must primarily be able to do excellent operations. So we always had a large number and large spectrum of coworkers from other countries.” One of Professor Hetzer’s principle coworkers was a Chinese surgeon, who, when China opened up in the early 1990s, helped forge connections with institutions in China, Japan, Korea, and Vietnam.

A Career in Cardiac Surgery “Will Occupy Your Whole Life. You Will Not Be Able to Lead the Life of a Normal Citizen With Free Time and Holidays”

At 66 years of age, under German law, Professor Hetzer will step down in the next 2 to 3 years, but he says: “There are so many things I haven’t done, like writing books or travelling to places where I haven’t been, so I guess if my health permits I think I will have a full day in the future also.” Meanwhile, 2 of his 4 children are pursuing medicine—a son is just starting medical school, and a daughter is nearly finished and is interested in neurology. “I think she wants to discover the secrets of the human brain, thinking, and personality,” he says.

As for those who wish to delve into a career in surgery, he warns that the field “will occupy your whole life.” He says, “You will not be able to lead the life of a normal citizen with free time, holidays, and things like this.” It’s also important to keep a balance between patient benefits and the pursuit of studies on novel therapies. Finally, he advocates following



Professor Hetzer (left) and M. Loebe (right) implanting the first rotational blood pump in a human in 1998, watched by Professor DeBakey (centre). Photograph courtesy of Barbara Nickolaus.

the advice of one of the first doctors who taught him as a student, who said, “Never look at making money. In medicine when you concentrate solely on your work, money will come by itself.” “It’s true,” says Professor Hetzer. “If you are working in clinical medicine, I think you should never think about money because first, the patients feel it, and second, it will influence your activities.”

References

- Potapov EV, Loebe M, Nasser BA, Siniawski H, Koster A, Kuppe H, Noon GP, DeBakey ME, Hetzer R. Pulsatile flow in patients with a novel non-pulsatile implantable ventricular assist device. *Circulation*. 2000;102:III1183–III1187.
- Hetzer R, Warnecke H, Schüler S, Süthoff U, Borst HG. Heart transplantation: a two-year experience. *Z Kardiol*. 1985;74(Suppl 6):51–58.
- Hetzer R, Loebe M, Potapov EV, Weng Y, Stiller B, Hennig E, Alexi-Meskishvili V, Lange PE. Circulatory support with pneumatic paracorporeal ventricular assist device in infants and children. *Ann Thorac Surg*. 1998;66:1498–1506.
- Müller J, Wallukat G, Weng YG, Dandel M, Spiegelsberger S, Semrau S, Brandes K, Theodoridis V, Loebe M, Meyer R, Hetzer R. Weaning from mechanical cardiac support in patients with idiopathic dilated cardiomyopathy. *Circulation*. 1997;96:542–549.
- Hetzer R, Krabatsch T, Stepanenko A, Hennig E, Potapov EV. Long-term biventricular support with the heartware implantable continuous flow pump. *J Heart Lung Transplant*. 2010;29:822–824.
- Hetzer R, Delmo-Walter E, Hübler M, Alexi-Meskishvili V, Weng Y, Nagdyman N, Berger F. Modified surgical techniques and long-term outcome of mitral valve reconstruction in 111 children. *Ann Thorac Surg*. 2008;86:604–613.
- Hetzer R, Nagdyman N, Ewert P, Weng YG, Alexi-Meskishvili V, Berger F, Pasic M, Lange PE. A modified repair technique for tricuspid incompetence in Ebstein’s anomaly. *J Thorac Cardiovasc Surg*. 1998;115:857–868.

Contact details for Professor Hetzer: German Heart Centre Berlin, Augustenburger Platz 1, 13353 Berlin. Tel: +49-30-4593-2000; fax: +49-30-4593-2100. E-mail: hetzer@dhzb.de

Jennifer Taylor is a freelance medical journalist.

European Meetings Update

20 October–30 November 2010

19–22 October

31st National Congress of the Italian Society of Invasive Cardiology (GISE)

Genova, Italy

For further details, contact:

t.langella@oic.it

21–23 October

Annual Meeting of the Spanish Society of Cardiology

Valencia, Spain

For further details, contact:

slegendre@secardiologia.es

21–23 October

31st Panhellenic Cardiological Congress of the Hellenic Cardiological Society

Athens, Greece

For further details, contact:

info@hcs.gr

21–24 October

26th Congress of the Turkish Society of Cardiology

Istanbul, Turkey

For further details, contact:

tkd@tkd.org.tr

21–24 October

2nd Congress of the Croatian Association of Cardiology Nurses

Opatija, Croatia

For further details, contact:

edvard.ziher@spektar-holidays.hr

22–23 October

9th Symposium on Advances in Cardiac Diseases (From Caliper to Catheters)

Turin, Italy

For further details, contact:

acd2010@aristea.com

22–23 October

3rd European Teaching Course in Adult Congenital Heart Disease

Lund, Sweden

For further details, contact:

info@malmokongressbyra.se

28–30 October

Delivering Patient Care in Heart Failure

Sophia Antipolis, France

For further details, contact:

seminars@ecardio.org

30–31 October

The Experts “Live” Workshop 2010

Taormina, Italy

For further details, contact:

segreteria@alpha.sm

3–5 November

Cardio Lipid 10

Ain Sokhna, Egypt

For further details, see:

<http://www.cardiolipid.com/>

4–6 November

Autumn Meeting of the Netherlands Society of Cardiology

Egmond aan Zee, Netherlands

For further details, contact:

bureau@nvvc.nl

13–17 November

American Heart Association

Scientific Sessions 2010

Chicago, IL

For further details, see:

<http://scientificsessions.americanheart.org/portal/scientificsessions/ss/>

25–26 November

13th British Society for Heart Failure

Autumn Meeting

London, United Kingdom

For further details, contact:

info@bsh.org.uk

25–26 November

XV Annual Meeting of the San Marino Society of Cardiology, XI Sudden Death

San Marino, San Marino

For further details, contact:

info@progettocuore.sm

30 November–3 December

XIV International Symposium on Progress in Clinical Pacing

Rome, Italy

For further details, contact:

pacing2010@aimgroup.eu

Editor: Christoph Bode, MD, FESC, FACC, FAHA
 Managing Editor: Lindy van den Berghe, BMedSci, BM, BS
 We welcome comments. E-mail lindy@circulationjournal.org

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