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The German Heart Centre Munich (Deutsches Herzzentrum München, DHM) has made history as a role model for first-class, patient-oriented medicine. This high-capacity hospital in the Lazarettsstrasse in Munich has provided cutting-edge care for patients in the entire field of cardiovascular disease for 40 years. The concept of treating people of all ages with all forms of cardiological disease under a single roof has become well established, having since been applied to numerous other areas of medical specialisation over the decades.

Cardiovascular disease concerns us all. It is still the most frequent cause of death in industrialised nations. The number of people suffering from heart disease has been on the increase for years, creating a growing need for care provision. The German Heart Centre has performed an excellent service in this area ever since it was founded. Patients receive optimum care with state-of-the-art diagnostics and therapy, as well as benefiting from close interdisciplinary cooperation between the departments. In the field of cardiological imaging, for example, the DHM uses the world’s fastest and lowest radiation CT scanner. Study results for the treatment of coronary artery disease and myocardial infarction have influenced national and international guidelines. The DHM is also one of Germany’s leading specialist hospitals in the deployment of transcatheter heart valves. Clinics all over Germany now take part in the induction courses offered by the DHM in the use of these new techniques. The DHM has set standards in the area of electrophysiology, too, improving the mapping of cardiac arrhythmia using magnetic navigation systems. A GPS-guided mapping system has been deployed with great success since 2013 as part of a research project.

Research into cardiovascular disease is a key focus of the activities at the DHM, which collaborates with Technische Universität München (TUM) as well as Klinikum rechts der Isar der TUM. The DHM takes on key research assignments as an integral member of the Munich Heart Alliance in the German Centre for Cardiovascular Research (DZHK) and as partner for integrated research projects of the European Union. Thus medical progress and innovative treatment methods are inseparably combined at this institution.

On this note, I wish the highly qualified and dedicated staff of the German Heart Centre Munich continued success, and I wish all patients a swift, successful treatment.

Munich, April 2014

Dr. Ludwig Spaenle  
Bavarian Minister of Education, Science and the Arts
Since its foundation in 1974 as the first heart centre in Europe, the German Heart Centre has served as a model for other institutions numerous times. The new medical concept of treating patients of all ages with all types of cardiovascular disease at one facility has proved to be highly effective and has become accepted in other areas of medicine. The guiding principle of the hospital is to consolidate at one location the various medical branches required for the diagnosis and treatment of cardiovascular disorders, thus providing optimal patient care through close interdisciplinary cooperation. The institution consists of the Department of Cardiovascular Surgery; the Department of Cardiac and Circulatory Diseases; the Department of Paediatric Cardiology and Congenital Heart Disease as well as the Institute for Laboratory Medicine; the Institute for Anaesthesiology and the Institute for Radiology and Nuclear Medicine.

Welcome to the German Heart Centre Munich

The German Heart Centre Munich has gone down in history as a paragon for the consolidation of state of the art medical treatment of cardiovascular diseases at one centralised location.
The name German Heart Centre Munich stands for world class medical excellence. The Centre has given many impulses to medical development. Since its establishment, more than 400,000 patients have been treated on an outpatient basis and almost 200,000 were treated inpatient. 42,000 operations with heart-lung machine have been performed. The first successful heart transplantation in Germany was done at the German Heart Centre Munich in 1981.

The clinic offers all types of heart surgery and surgery on the large blood vessels, including catheter-based procedures. 96% of the patients receiving coronary artery bypass surgery are treated with arterial grafts which have a significantly better long-term patency than venous grafts. The grafts for bypass surgery are usually removed endoscopically at the German Heart Center Munich. Concerning surgical therapy of heart valve disease, special consideration is given to the preservation of the heart valves. If valve repair is not possible, there is a wide range of options to select the suitable implant regarding the age and lifestyle of the patient. The German Heart Center Munich also runs a homograft bank. There is broad experience particularly with regard to the treatment of extremely difficult cases. The cardiac surgery department is equipped with the latest technology such as intraoperative blood flow measurement, angiography, or 3D echocardiography. New minimally invasive techniques are used whenever suitable.

Since June 2007, the German Heart Centre offers catheter-based valve implantations that are via the femoral artery in the groin or the apex of the heart. Today, it is one of the world’s largest “TAVI” centers offering less invasive treatment of aquired valve disease. All procedures are performed on the beating heart without heart-lung-machine and are optimal for elderly patients at increased risk for conventional surgery. Furthermore, the clinic of cardiac and vascular surgery specializes in all minimally invasive surgical techniques and operations with small incisions. The advantage is not only seen in the improved cosmetics for the patient, but also in a positive effect on the healing process. Avoiding a 20-30cm long incision in the mid-sternum line, video-assisted mitral valve repair is performed through a 5 to 6 cm incision on the right side of the chest. Aortic valve replacement can also be performed minimally invasive through a partial sternotomy with a 6-7cm incision. Another main focus is surgery of congenital heart defects in children, adolescents and adults. The German Heart Center Munich is one of the world-wide leading centers for pediatric surgery. All types of surgical correction of congenital heart defects are offered. Complex congenital heart defects are operated even in infants weighing less than 2,000 grams. In cardiology, highly specialized doctors
perform diagnostics and treatment of a wide range of diseases, such as narrowed coronary artery vessels, calcified heart valves, and heart rhythm disturbances. The heart centre is considered as one of the leading centers in the world in the field of interventional cardiology, the centre used all kinds of modern stents and offered the most advanced diagnosis and therapy in treating cardiac arrhythmias. The clinic is specially good for the emergency cases of acute myocardial infarction, supplied with modern Chest Pain Units. With its seven cardiac catheterization laboratories, the German Heart Center Munich is one of the largest and most experienced centers in Germany. Catheter-based therapies play also a growing role in the pediatric interventional cardiac catheterization. The range of treatment includes the opening of closed heart valves, dilatation of narrowed heart valves and the implantation of new heart valve, all done catheter-interventional through the groin. The dilation of constricted blood vessels, the closure of connections between the major arteries or between the two atria or the two chambers are now routine. The spectrum concerning electrophysiology and intravascular ultrasound has been extended through the opening of the second heart catheter measuring rooms in the new building. The department of paediatric cardiology and Munich fire department sharing a civic neonatal emergency service. DHM own research department accompanied with the cooperation of the Technical University Munich ensure the continuous development of the medical methods and an innovative science-based medicine. Additional to the experimental animal facilities, the DHM has its own research laboratory for molecular biology and molecular genetics. The valuable new building from October 1996 based on five operating rooms with complete cardiac surgical facilities, a hybrid operating room and a total of eight cardiac catheterization rooms. The five intensive care units are on the latest level of technology. DHM is considered as a pilot project in the Free State of Bavaria through its full digital X-ray technology as well as the installation of screen network (PACS), digital X-archive and radiology information system. This applies to the laboratory institution also, all results values are done digitally and transmitted through the internal network to the stations. The clinic has also its special facilities, for example a pharmacy, helicopter landing place, social service, blood supply depot and physiotherapy. DHM took also into consideration the care of the patient’s relatives, Ronald McDonald House is on the ground of the clinic, taking into consideration the care of the patient’s relatives, Ronald McDonald House is a home for the parents of young patients, a possibility to stay close to their children during their inpatient treatment.
Vision

Humanity approach

The German Heart Centre combines state of art medical treatment with humanity. It is the flexible, highly motivated involvement and cooperation of various professional groups working as a team that enhances the recuperation and recovery of the patients. The physical, emotional, social and cultural needs of the patients as well as their right to self-determination are fundamental to our work. Our goal is to provide diagnostic, therapeutic and other services tailored to the needs of each patient.

Responsibility

Above and beyond the specialisation of the various professional groups and departments, each member of the team is devoted to combining highly technological medicine with humane care. Because of the substantial responsibility assumed by the staff members, their needs are important as well. They must be involved in the decision-making process in their own and/or related fields. Communication transcends professional hierarchies. To maintain the high standard of medicine at the Heart Centre, all staff members regularly take part in professional development programmes.
Loyalty

The professional and personal integrity of each staff member provides the basis for responsible interaction with patients, their relatives and colleagues as well as the cooperation with practitioners and other health care professionals and institutions. All staff members loyally support „enterprise“ German Heart Centre Munich. We are aiming at optimal efficiency and a conscientious environmental context.

Competence

Cardiovascular disease is the most common cause of death in western industrialized nations. In Germany about 6,500 children are born annually with congenital heart defects. The German Heart Centre was one of the first „one-organ“ institutions to successfully provide interdisciplinary treatment of cardiovascular diseases. It was our objective to lower the number of deaths caused by cardiovascular disorders through preventive and highly specialised medicine. Clinical research at the Heart Centre as well as research in collaboration with the Technical University of Munich solidify the centre’s leading position in the development of diagnostic and therapeutic concepts on a national and international level.

Quality assurance

Our treatment depends on the highest quality standards, the main target of the treatment is the quality improvement of our patient’s lives. We lead interdisciplinary conferences and participate in national and international quality comparisons, and give further our knowledge and skill to the doctors from home and abroad in form of training courses. Training and conferences help us to keep our skills at the highest level, the mild therapy methods have been researched and used here early. We are interested in the therapeutic success of our patients, even after their discharge.
How the heart works

No mechanical device, no water faucet, hose or pump is a true match for the human heart; it is the most efficient pump ever created.

The size of a clenched fist, the adult heart pumps up to 8,000 litres of blood daily at a rate of 5 litres per minute. It can theoretically fill three bathtubs within an hour and fifty-five Olympic-sized swimming pools within the lifespan of a seventy-year-old. The heart and blood are essentially interconnected, they form a symbiotic relationship, a perpetual cycle working day and night shifts that they can be called, in modern business terms, a joint venture which the heart regulates and orchestrates. Thirty billion red blood cells race through the body over 96,000 kilometres of arteries, veins and capillaries, the body’s expressways, streets and alleys. The capillaries are so narrow that the blood cells can only pass through in single file. As the heart itself needs to be supplied with blood, coronary arteries encircle it like a wreath. Every second the bone marrow produces two million new red blood cells. Each contains hemoglobin which chemically binds with oxygen. At a rate of seventy times a minute, the heart pumps the blood with its cargo of red blood cells into the lungs. There the red blood cells are loaded with oxygen and embark on a journey longer than twice around the world.

The heart is the first stop. The oxygen enriched red blood cells are pumped from the left atrium to the left ventricle. Pacemaker cells activate the contraction
of the muscular walls of the heart. The heart valves then open and red blood cells are pumped into the blood vessels. Initially, they race through the body; near the heart the vessels are like expressways. The ultimate goal of the red blood cells, however, is the each individual cell. Every single one must be supplied with oxygen and other nutrients that can be converted into energy. So their speed is reduced gradually and they are finally dispersed into even the narrowest of alleyways. After unloading their oxygen cargo, the red blood cells flow back to the heart through the veins. They are sucked into the right atrium of the heart. The right ventricle pumps the into the lungs and, once again, the red blood cells are refuelled with oxygen before they flow to the left side of the heart. Their speed depends on the heartbeat. An athlete’s heart can beat about two hundred times a minute, almost three times more quickly than the heart of an untrained person. An untrained heart pumps a good five litres per minute; the heart of an athlete pumps twenty-five litres. The athlete’s heart also weighs more; the heart of a non-athlete weighs about three hundred grams while that of an athlete can weigh almost twice as much.

In ancient Egypt being athletic could have led to eternal hell and damnation. The ancient Egyptians believed that in course of a lifetime sins accumulated in the heart. The heart was weighed on the final judgement day – the heavier the heart, the more sinful it had be.

However, it was not until the English anatomist William Harvey announced his discovery of the true nature of the circulation of the blood in his „De Motu Cordis et Sanguinis“ (On the Movement of the Heart and Blood) published in 1628 that the background for more understanding was established. He calculated that the heart pumped more than twice the entire blood volume of an adult in a half hour. As this volume could never be exhausted and then newly produced by the body, he concluded that there must be a finite amount of blood in a closed system of tubes within the body. This was a purely scientific observation; there was not even a hint of the heart as the chamber of sins or the seat of the soul.

Harvey broke with tradition. 2,100 years before his time, the poets of the Sumerian Gilgamesh epic viewed the heart as the symbol for emotions. The Chinese attributed to the heart an additional centre of the intellect. Greek philosophers separated formal and logical cognitive ability from the heart.
and relegated it to the brain. Aristotel-les proclaimed it the seat of the everlast- ing soul. In the Middle Ages the heart appeared as a symbol of Christian mysticism. Christian regarded the heart of Jesus as a symbol for God’s love for mankind.

“I think, therefore I am.” contradicted the philosopher and scientist René Descartes in the seventeenth century. Doubtful of the faculties with which parts of the body were then thought to be endowed, he considered feelings in the heart region deceptive. These conclusions coupled with those of William Harvey changed the reflective concept of the heart in the Age of Enlightenment. The heart was no longer the seat of emotions, the soul or of conscience, but rather a perfect hydrau- lic pump.

The emphasis on feelings and imagina- tion in arbitrary opposition to logic and reason during the Romantic period led to a rejection of image of the heart as a pump. The heart now stood for all things intangible, incomprehensible and otherworldly. Language itself balked at the idea of the heart as an organic pump; after all the heart can be broken, one can cry one’s heart out, lose one’s heart, or wear one’s heart on one’s sleeve. Even today these idioms are common usage. Scientists have stopped trying to fight psychological explanations since they too are at a loss to explain precisely what induces this muscular pump to do what it does. How does a pacemaker cell know it should contract seventy
times a minute? What is the essence of this mysterious force that only a few cells possess? In strictly biological terms, the sinus node in the right atrium generates electric impulses and conducts them throughout the muscle of the heart, stimulating the heart to contract and pump blood. Although this happens independently of the brain and the spinal cord, it is influenced by the nervous system. The sympathetic nervous system accelerates the heart rate while the parasympathetic nervous system, particularly the vagus nerve, decreases it. Many people have felt their heart beating in both pleasant and unpleasant situations. The parasympathetic nervous system, together with the sympathetic nervous system, constitutes the autonomic nervous system, the branch of the nervous system that performs involuntary functions. The sympathetic nervous system causes sudden heart palpitations by quickly releasing nonadrenalin at the nerve endings of the heart muscle, on the other hand, the vagus nerve ensures rest and relaxation. The function of the heart, therefore, is also influenced by emotions, fears, joy and mental health.

Theoretically at least, each red blood cell can sense if a person is in an extraordinary psychological situation. The red blood cell has three months to recognise this situation and then it dies. However, the bone marrow ceaselessly produces new blood cells and the heart continues beating. Incidentally, almost always on the left.
The department of cardiovascular surgery at the German Heart Center Munich is known internationally as pioneer in treating both acquired heart disease (bypass surgery, heart valve surgery, etc.) and congenital heart disease being the largest center in Germany for pediatric surgery.

The entire spectrum of interventions on both the heart and the large blood vessels are performed (from complex pediatric surgery to valve-sparing procedures, coronary artery revascularization, catheter-based aortic valve implantation, surgical repair or interventional treatment of the intra-thoracic aorta with stents and artificial heart implantation).

In the field of acquired heart diseases, there is a trend towards minimally invasive methods. The department of cardiovascular surgery has specialized in minimally invasive heart valve surgery. In particular, mitral valve repair is regularly performed through a minimal incision between 5 to 6 cm under the right breast, which leads to a very good cosmetic result. Aortic valve replacement can also be performed in a minimally invasive way. The sternum is cut partially on the upper half of the chest and not completely (partial sternotomy). The incision is only 6 to 7 cm instead of 20 to 30 cm for full sternotomy. In addition, new surgical methods allow repair instead of replacement of heart valves. All available repair techniques to preserve the mitral and aortic valve are offered at the German Heart Center Munich.

Catheter-based aortic valve implantation was introduced at the department of cardiovascular surgery at the German Heart Center Munich in June 2007. This new treatment option has been performed successfully on more than 600 cardiac patients in the first four years. Patients who were formerly refused for cardiac surgery because of severe aortic calcifications or severe co-morbidities can be offered the new catheter-based treatment. Catheter-based aortic valve implantation is performed on the beating heart, thus avoiding the heart-lung machine. As a truly minimally invasive procedure, no sternotomy is neces-
sary. The catheter valve prosthesis is advanced via catheter through a vessel (femoral artery, subclavian artery, or aorta) or through the apex of the heart with minimal incisions or percutaneous puncture. Procedure time is considerably shorter as compared to conventional surgery. All catheter-based procedures are performed in a so-called hybrid operating room which fulfills all requirements of a conventional operating theater and is additionally equipped with a modern cardiac catheterization angiography unit.

In the past 30 years, heart valve surgery has always been one main focus at the German Heart Center Munich. Based on this long-term experience, the center for minimally invasive, reconstructive and interventional treatment of heart valve disease was founded („European Heart Valve Center“). Its own working group performs research on valve specific topics. Its medical care services cover patients with all kinds of heart valve disease who are facing an operation at the German Heart Center Munich or return for follow-up. Furthermore, the center is also a competent partner to answer all queries in this regard for colleagues from other medical fields.

Coronary artery bypass surgery is performed using the most modern surgical techniques. Leading in this field, graft harvesting is performed endoscopically. To avoid a long scar on the forearm or leg. An incision of only 2-3cm results in rather no wound healing problems and a perfect cosmetic result.

Aortic disease is treated by several methods at the department of cardiovascular surgery. In addition to conventional surgery, interventional placement of stent grafts has been performed for several years. The new interventional procedures avoid a thoracotomy and the need of the heart-lung machine.

Another focus at the German Heart Center Munich is the treatment of congenital heart disease at any age from newborn to adult patients. The clinic is one of the leading institutions in this field. The correction of complex congenital heart defects is performed even in newborns weighing less than 2,000 grams. Some patients are treated under deep hypothermia of the organism using the heart-lung machine. The use of minimally invasive techniques has also been increased in surgery of congenital heart disease during the past decade. For the replacement of the pulmonary valve, a common procedure in pediatric cardiac surgery, the German Heart Center has a human heart valve bank (homograft bank), where human heart valves are processed for use in the OR.

Beyond that the department of cardiovascular surgery owns a large experimental laboratory. Research projects such as the development of an automatic heart-lung machine, tissue engineering, clinical and experimental study of heart valves, the development of new technologies for surgical tele-manipulators („robots“), the development of an artificial heart device, projects on modern imaging techniques, biosignal processing and theoretical cardiovascular physics are conducted there. Engineers and scientists from other fields are working

Contributions to cardiac surgery:
- Introduction of the mammary artery anastomosis in Germany on 3 December 1976
- The first successful heart transplantation in Germany on 7 May 1981
- Setting up its own homograft bank for processing human heart valves
- Further development of extracorporeal circulation and heart-lung machine towards automation and miniaturization
- Development of a new centrifugal pump for the heart-lung machine
- Development of minimally invasive surgical procedures
- Surgery with telescopic manipulators (robotic surgery)
- The first world’s total endoscopic mitral valve repair with telemanipulator „Da Vinci“ in 2000
- Further development of the early correction of congenital heart defects in infants
- Pilot clinic in developing quality assurance of cardiac surgery
- Leading role in transcatheter procedures: The world’s first implantation of a transapical CoreValve on 26 June 2007

International leading position in complicated congenital heart defects correction:
- Anatomical correction of TGA
- Fontan operation
- Ross operation
- Operation of BWG syndrome
- Valvuoplasty in Ebstein’s disease

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Interview

Even as a student you were determined to be a heart surgeon. Why? Surgery on the heart is more complex than on motionless organs. But as a student I did not know that a heart surgeon is exposed to much more stress than any other surgeon.

Stress leads to heart attacks, at least some doctors say... Yes, OK. But I think that stress at work or stress induced by problems is not a cause of heart disease. What is more important is how the individual deals with stress. My work is very rewarding, especially the gratitude of the patients after the operation. This is a chance to transform stress into energy.

Are there times when you regret having chosen this profession? No. Naturally, sometimes I would like to go out to eat or for a walk in the park. Just like that. There are too many days on which I get up in the morning and go to the clinic when it is dark outside and when I come home, it is dark again. But then there are the moments of thankfulness that I can help so many people.

Those who want to help must suffer? The little free time I do have, actually has to be coordinated with my work. I perform about 450 operations each year, about two per day. On the day before an operation, I cannot do strenuous sports because I need 100% of my energy for the operation the next day. I cannot eat too much either because then I sleep restlessly.

How long does a heart operation take? For open-heart operations the heart has to be stopped. This must not take longer than three hours.

Can you interrupt such an operation? No.

With the need for such high concentration, do you sometimes have doubts about yourself? No, if a race driver thinks he should...
drive more slowly, he is not very well suited for his job.

**Dr. Brinkman from the Black Forest Clinic (a long-running German television series) constantly had self doubts.** Heart surgeons are subjected to much more pressure than the doctors on television. In the programme, the doctors are mainly concerned with the personal problems and the everyday life of their patients. If I were to do that, I would be in need of a psychiatrist in a few months. I get a stomach-ache when I watch those programmes. But I know some colleagues who enjoy them.

**Do you and your colleagues at least have enough time to deal with the psychological state of the patients?** Of course. Patients with a heart problem are above all afraid when they come to such a highly specialised clinic. The first thing we do is try to alleviate their fear and create an atmosphere of trust. Not only a relationship of trust with the nursing staff and the physicians, but also trust in the healing power of modern medicine, which is our most effective tool.

**Will genetic engineering and biotechnology change heart surgery?** Both fields will certainly cause major changes in surgery. In the years to come there will be fewer operations because we will learn how to prevent diseases.

**For many people the heart is not a normal organ but the site of the soul, emotions and feelings. What is the heart for you?** The emotional component is based on human imagination, not reality. Still, as a physician I feel respect for the heart. It has a central position in the body. People feel that it is an organ that has a life of its own. But of course that is nonsense. We only live because the heart supports the circulation.
In the developed world, disease of the heart and blood vessels is currently the leading cause of death. In fact it outnumbers deaths from cancers and accidents combined. Diseases of the heart and circulation may be classified into 3 main areas: heart disease including heart attack and serious rhythm disturbances, stroke and disease of the arteries to the brain, and disease of the arteries supplying the arms and legs. The German Heart Centre is at the forefront in fighting disease in all 3 of these areas.

From diagnosis of disease in high-tech cardiac computed tomography and state-of-the art magnetic resonance scanners to immediate specialist treatment, the German Heart Centre offers patients the full spectrum of cardiovascular care. Procedures to re-open blocked arteries are performed by dedicated teams working full-time in the centres cardiac catheterization laboratories. Coronary events are frequently caused by occlusions of epicardial artery vessels. Dilatation with a small balloon enables to re-establish blood flow, which is mostly supported by the implantation of a stent. The German Heart Centre has been a world leader in stent development and testing over the last 15-20 years. Patients who are having a heart attack need prompt care. All patients with chest pain or complaints are initially assessed for signs of heart attack in our certified chest pain unit. We know that the blocked arteries that cause heart attacks must be opened as soon as possible. It is well-recognized that more “time saved” means more “heart muscle saved”. Furthermore it is now clear that opening the clotted-off artery that is causing the heart attack saves more lives than using “clot-busting” drugs. For this reason every minute counts and the German Heart Centre offers patients around the clock emergency heart catheter service 365 days a year. In addition, the research work of our specialists has helped guide the treatment of countless heart attack patients world-wide. The DHM offers also treatment for occlusion or severe narrowing of the arteries of the neck or the legs.
valves can be safely treated in a specific operation room. With these possibilities a complex valve repair can successfully be performed without open heart surgery.

Serious rhythm disturbances lead to sudden heart failure and death in over 100,000 Germans every year. One of the key responsibilities of our centre is to detect and diagnose these problems. Electro-physiological examinations using controllable catheters allow for precise insight into the electrical circuitry that controls heart function with every heartbeat. Life-threatening rhythm problems can be overcome through the implantation of pacemakers and defibrillators as well as through the ablation of abnormal heart conduction pathways. Patients with life-threatening disease are monitored continuously in our intensive care units using the newest technology and highly trained staff offer mechanical support of failing cardiac and respiratory function and dialysis replacement of kidney function. On the other hand stable patients can recover on our modern cardiac wards and in our VIP patient suites.

Disease of the arteries to the brain is the leading cause of stroke. Our team of specialist angiologists diagnoses and treats this problem on a daily basis. Where previously open surgery was necessary to relieve blockages, the procedure is now performed under local anaesthesia using balloons and stents. Similarly obstructions to blood flow in peripheral blood vessels, which can lead to gangrene and amputation, are relieved with modern drug-coated balloons and stents. An area of particularly active development is the treatment of high blood pressure with a catheter ablation of the nerves to the kidneys. This offers the chance to relieve the burden of multiple medications that is otherwise required by patients to keep their condition in check.

In the field of scientific research the German Heart Centre is a pioneer and the work of its investigators has helped to shape the treatment of patients around the globe. Local investigators and scientists from many countries work together on projects from basic experimental bench work to translational medicine and trials of new medicines and technologies.
Interview

Prof. Schunkert, you are the new director of the Cardiology Department. Where will you place the focus of your future work?

The heart is a wonderful organ. However, it may cause difficulties in one or the other way. The most frequent cardiac problem results from poor blood supply to the heart. Moreover, heart failure, heart rhythm disorders, heart valve disorders or diseases of the large vessels may occur.

Our team at the German Heart Center Munich offers care for all these cardiac conditions.

What is your approach?

Importantly, one senior physician has to overlook all information available for a patient. In fact, often it is not only the heart but its interaction with other tissues, for example the kidney, which causes a given health condition. Our team at the German Heart Center Munich aims to understand the overall situation of the patient in order to provide optimal treatment.

How do you qualify the physicians of the German Heart Center Munich?

Modern cardiology developed highly sophisticated instruments for the treatment of various cardiac conditions. In this respect, we practice a large number of minimal invasive procedures in order to reopen occluded coronary vessels, to treat heart rhythm disorders and heart failure, or to replace cardiac valves. In fact, most cardiac disorders can be treated nowadays with various catheter-based interventions.

All these procedures require longtime experience and can be realized only by a highly specialized team.

We at the German Heart Center are fortunate to conduct a large number of procedures (more than 8000 per year), such that we have highly trained and experienced investigators for each of these conditions.
What is the personal focus of your work?
Together with the patient I wish to develop a treatment strategy that serves the needs in the individual situation. Both patient preferences as well as the needs of the respective cardiac condition and the subsequent treatment options need to find consideration. Many hours a day I spend in the catheterization laboratory to take care of my patients.

What are the challenges of the future?
A major challenge is to treat patients less invasively. Such sophisticated treatment requires an optimally structured team of physicians, nurses and physical therapists. To guide this team towards ever increasing challenges is certainly a highly demanding task.

Fortunately, in our Heart Center we live a special team spirit in working together with cardiac surgeons, pediatric cardiologists and specialists in cardiac anesthesiology and cardiac imaging. I am very thankful to find all these disciplines in our house such that we can offer the full treatment spectrum to each and every patient with cardiac conditions.

You mentioned before that your discipline, cardiology, underwent enormous progress. What are the greatest achievements?
Treatment of elderly patients with severe calcification of the aortic valve or leaky mitral valves has been very difficult. Nowadays, we can take care of these patients with minimal invasive procedures in order to replace or fix a broken valve.

Likewise there has been enormous progress in the treatment of atrial fibrillation or ventricular tachycardia by catheter ablation, which became routine in our hospital. Thereby, many patients can avoid long-term medical treatment. The earlier ablation therapy is conducted the better is the outlook.
Heart failure is nowadays treated by complex but highly effective medical treatment. In patients with more severe heart failure, we offer novel treatment modalities including defibrillators, resynchronization therapy and cardiac assist devices. Finally, well-balanced physical exercise in patients with heart failure becomes a strong focus of our work.
Catheter based treatment of coronary and peripheral arteries became better and better. Coronary stents of the second and third generation are well tolerated and cause only rarely re-occlusions or thrombus formation, which markedly improved long-term success.

What is the reputation of the German Heart Center Munich in the academic world?
A number of cardiac societies from all over the world send their most talented physicians to train at the German Heart Center, which we consider as a great honor. Indeed, many of our staff physicians are professors for young colleagues coming from all over the world.

Of course, we are very glad to see that Focus, a leading journal of the lay press, elected the German Heart Center Munich and its cardiologists and hypertension specialists into the top ranks of respective fields in Germany.
When the German Heart Centre Munich was founded in 1974, the idea of diagnosing and treating any illness of the heart at any age was unique in the world and was copied by many hospitals in several countries afterwards.

The Department of Paediatric Cardiology and Congenital Heart Disease cares for patients with congenital heart defects from fetus to the adult and is one of the most active centres in Europe. Head of the Department is Prof. Dr. Peter Ewert.

State of the art diagnosis and treatment are offered to 9,000 patients (7,000 outpatients and 2,000 inpatients) every year. More than 600 cardiac catheterizations in two digital biplane catheterization laboratories are done every year, the vast majority of which are therapeutic interventions like balloon dilatation in case of stenotic valves (aortic valve, pulmonary valve), interventional pulmonary valve implantation, balloon dilatation and/or stent implantation in vascular stenosis (pulmonary arteries, coartation of the aorta), closure of atrium- and ventricular septal defects as well as closure of open ductus arteriosus.

The closure of atrial septal defects are performed under echocardiographic guidance without any X-ray exposure. Transesophageal echocardiography in complex lesions pre- and intraoperatively is one of the topics in the echo lab. Over 10,000 transthoracic and 800 transesophageal examinations were done in 2013.

550 patients - more than 200 younger than one year - undergo surgery every year. All preoperative diagnostic measures are available in the Department of Paediatric cardiology and Congenital Heart disease including ultra fast computer tomography and magnetic resonance imaging.

After surgery the patients will be transferred directly to the intensive care unit 3.3 of the clinic. With its fully equipped 16 beds, this ward is unique in Germany.
Specific achievements of the department

- **Interventional cardiac catheterization (repair)**
  All interventional cardiac catheterization treatments are available. Interventional pulmonary valve implantation, opening closed pulmonary valves (Radio frequency perforation), Balloon dilation of aorta and pulmonary valves, angioplasty and "stenling" of pulmonary artery stenosis and descending aorta, catheter device closure of the atrial septal (ASD) and ventricular septal defects (VSD), closure of aortopulmonary collateral vessels, coronary artery fistula and patent ductus arteriosus (PDA), ductus stenting.

- **Echocardiography**
  Fetal echocardiography (with 3-D reconstruction), transthoracic and transoesophageal echocardiography (TTE)

- **Electrophysiology**
  Mapping of all primary and secondary atrial arrhythmia with the CARTO system, ablation of atrial and ventricular tachycardia in hearts with complex cardiac defects, for instance after Fontan operations or after transposition of the great arteries (TGA)

- **Paediatric Cardiac Surgery**
  Every type of reconstructive and palliative cardiac surgery, including the Norwood palliation, staged univentricular heart palliation, correction of anomalous left coronary artery from the pulmonary artery (ALCPA), Fallot' tetralogy in neonates or infants less than one year of age, AV septal defects, reconstructive surgery of Ebstein's abnormality as well as the Ross operation (also neonatal).

Specific tasks of the German Heart Centre as a university clinic:

- educational courses for medical students
- basic research in the molecular biological laboratory
- clinical long term follow up studies after specific treatment of congenital heart disease, studies on myocardial performance and myocardial perfusion

As children are not just little adults and adults with congenital heart diseases are not children, a warm and familiar nursing atmosphere is provided on the two standard wards. 23 beds are reserved for neonates, infants and school children (ward 3.1) - 6 rooms are specially equipped for mother and baby nursing.

On ward 3.2 (for adolescents and adults), there are 15 beds divided in five single rooms (hotel standard), two double rooms and two triple rooms. Central monitoring (ECG, oxygen saturation, blood pressure, respiration) is possible at every spot.

Psychosocial support during the everyday business at the clinic is provided by two specialised nurses, one psychologist and an occupational therapist who care not only for the patients but also for the parents in their difficult situation before or after the operation. In case of a longer hospital stay, school children are supported by an in-house school. In the hospital area there is an apartment house with 27 apartments for parents and other family members available.

The Department of Paediatric Cardiology and Congenital Heart Disease is located on the third floor with all three wards (54 beds in total), two cath labs and two echolabs. The outpatient department, the executive secretariat, spiroergometry and the magnetic resonance imaging (MRT) are situated on the ground floor.

Admission for diagnostics or therapy (cardiac catheterisation or surgery) is possible at any time, at night and at day, on seven days a week. The medical team consists of 39 physicians (25 specialists and 14 doctors in training).

As part of the Technical University of Munich there are widespread research activities: basic research in the field of pulmonary hypertension and its molecular regulation, acute inflammatory disease in children after bypass operation, departmental research with special interest in myocardial perfusion and cellular metabolism in congenital heart disease, haemodynamic and morphologic correlation in univentricular hearts, and specific cardiovascular monitoring on the ICU.
Interview

Is it different to treat children?
Oh, yes. To treat children is a special challenge, but at the same time an extraordinary luck, because today we are able to help most of our little patients in a way that gives them the possibility to lead a relatively unburdened life. But we are no longer purely a pediatric clinic. Half of our patients are adults with congenital heart diseases. They are special as well, since many of them are well known to us since their birth.

How do you win the trust of children?
At first the parents have to be convinced of what we are doing and to trust us. And then it is most important to be open and sincere with the children. A needle hurts, surely nothing to argue about, but when you are able to encourage a child that they can bear it – it may even have the chance to grow.

May there be psychological damage if a child spends a long time in hospital?
It may happen but it is not inevitable. We need more psychologists and specialised teachers to care for these children. But, even though it seems not to “pay off” in relation to economical benchmarks, and I take pride that our hospital employs a psychiatrist, a children’s play therapist and two specially trained paediatric nurses for the support of our team for psychosocial care.

Sometimes clowns hop around the wards...
Yes, those are our hospital clowns, real clowns, that come once a week to cheer up the children. A wonderful thing! But the clowns visit the ward for adults with congenital heart diseases, too. One can never be too old for clowns in a hospital.

Do parents also provide support for their children?
Of course! They are the most important backup for their children – especially at the hospital. During a heart catheter examination for example, I offer the relatives if they want to, to stay in the catheter laboratory. Whatever we are doing is not witch craft and the relative’s presence enhances better understanding and confidence. We might not forget, however, that a clinical stay can push the parents to their limits, too. Therefore it is important...
You have three children yourself. What goes through the mind of parents on learning that their child has a heart defect?

They experience a shock. Always. You have to give them time to realize. But there are also soon-to-be parents who already know, based on the prenatal ultrasound, that their child has a heart disease. Thus, we offer a prenatal outpatient consultation for them. Fortunately, we can offer treatment for nearly all congenital heart defects and the children not only survive, but have a high quality of life.

Are there young adults who were operated at your clinic and now want to have children of their own?

Of course! This is not that rare. There was a lot of reluctance in the past, but nowadays we know that in most cases this is not a big problem. We know our female heart patients very well and are able to advice and comfort them during their pregnancy. The connection to a center with adequate experience is most important.

What goes through your mind when you cannot help a child?

If a patient is passing away in my clinic it is very, very tragic, no matter if it is a child or an adult, because they are young patients! The whole team tries to comfort the relatives during this situation. In the aftermath we come together as a team. We discuss whether we can learn something of the incident, to do something different next time or probably find a complete new approach. This is an important part of the progress in the treatment of the young patients with congenital heart diseases.

The death rate in the Department for Paediatric Cardiology is less than three percent...

...this is unique in Germany. There are very, very rare departments in the world with such a low rate. Of course this is wonderful, but for us it is now important that the children and the young adults, who are leaving our clinic, feel as healthy as possible. Most of them are having a high life span and- at least just as important, they have a high quality of life, in spite of the congenital heart disease.
Highly specialized cardio-anesthetists render the whole spectrum of cardiac surgery as it is routinely practiced at the German Heart Centre Munich.

The physicians of the Institute for Anaesthesiology treat and monitor all patients who underwent heart operations in the operating room and in the intensive-care unit. Our anaesthesiological team manage increasingly in applying the anaesthesia process on elderly patients with a long process of illness or in a strongly impaired general departmental condition through the preoperative phase. Since 30 years, staffs of the department have been meeting the complex standards in cooperation with the affiliated blood-group-serological laboratory and blood bank, its unit for pre-surgical autologous blood donation as well as physiotherapists belonging to the institute.

Given the system of autologous blood donation which was introduced in 1989, the probability of using blood transfusion stemming from third parties in operations could be drastically reduced.

The donated blood components before the operation, are often separately preserved and made ready for the operation.

After a detailed preliminary discussion with the patient in the ward, one day before the operation, all patients are given a tranquilizer for the night and a strong “pre-anaesthetic medication” on the day of surgery ahead of removal to the operation room as prescribed by the anaesthetist so that they are already very sleepy when the actual anaesthesia is introduced in the vestibule of the operation room.

During surgery, the patients are surveyed at the highest safety level with the most modern hemodynamic interlinked monitoring system, and computer-controlled data management.
The latest equipment in form of modified EEGs are available for each operation to measure the anaesthesia and adjust the optimal dose for each patient.

The maintenance of sufficient circulatory conditions during cardiac surgery particularly after the deactivation of the heart-lung-machine, is mostly possible only by the use of sophisticated medication to increase the contraction force of the heart, or to regulate the diameter of the blood vessels.

The transesophageal echocardiography is used in all cardiac operations, especially for valve surgery and congenital heart defects, this means controlling the result directly at the end of the operation.

One focal point of the department lies in the pre-surgical care and medical supply for children and babies. Far more than 13,000 children and new-born babies have been treated from 1974 to 2010.

Our common goal is the primary surgical correction of complex congenital heart disease in infancy. The decisive progress in the field of heart surgery together with the extracorporeal circulation and the anesthetic management enabled DHM nowadays to carry out almost all kinds of heart operations even in newborn and premature babies with body weight less than 2,000 grams, through the use of the heart-lung machine.

Milestone contributions to anaesthesia

- Introduction and further development of intravenous anaesthesia methods with ultra short acting anaesthesia and analgesic agents in the sense of a total intravenous anaesthesia.
- Application of electro-acupuncture as a supplement to the general anaesthesia in more than 1,000 operations.
- Directive departmental examinations for recording the impacts of extracorporeal circulation on the clotting system
- Examinations for the pharmacological treatment of the malfunction of blood clotting during and after extracorporeal circulation to avoid homologous blood products
- Introduction of mechanical blood-saving measures after heart operations
- Build-up of autologous blood donation system
- Working out the theoretical and technical prerequisites for the performance of hypothermal circulatory arrest for the correction of cardiac diseases
- Introduction of new techniques for the pharmacological and mechanical impacting of systemic inflammatory response during and after extracorporeal circulation
- Introduction of the pre-operative, continuous computer-backed recording of the vital parameters of patients for documentation and quality assurance

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The transesophageal echocardiography is used in all cardiac operations, especially for valve surgery and congenital heart defects, this means controlling the result directly at the end of the operation.
The laboratory medicine is essential in the process of diagnosis, disease prognostic assessment, therapy control as well as the detection of cardiovascular risk factors.

The Institute generally works behind the scenes and is often not apparent to the patient. Laboratory physicians advise doctors, nursing staff and patients in all matters of this rapidly advancing interdisciplinary field.

Several hundred analytical procedures for characterising naturally occurring substances, cells as well as drugs are constantly being updated and maintained at the state-of-the-art. Presently about one million individual assays in the area of hematology, hemostasis, general clinical chemistry, immunology and protein chemistry, serology, endocrinology, metabolism, gene testing and drug monitoring are carried out each year exclusively by specialists. All laboratory results pass through a multi-step technical and medical review process before the findings are made available to the physicians at the ward. The measurements obtained are put through rigorous verification and continuous internal and external quality control measures to ensure their accuracy. The findings are then validated through a patient-oriented medical assessment carried out by the doctors at the Institute.

„Good is not fast enough“ is the motto of the Institute for Laboratory Medicine. With 40 percent intensive care beds, the laboratory must offer high-quality analytical diagnosis in minimum processing times.

Dr. Siegmund Braun
Director of the Institute

Institute for Laboratory Medicine
The modern facilities are supported by an efficient laboratory IT system that is fully integrated throughout the entire hospital information system.

The Institute follows since more than 15 years the fundamentals of business excellence, it was considered in 1999 through an external assessment as the first in its art according to the model of the European Foundation for Quality Management (EFQM). The Institute received in 2006 as the first in Europe the recognition „Recognized for Excellence“ EFQM.

Pathobiochemistry and the improvement of diagnostic techniques for heart disease remain at the forefront of research at the Institute. However, it also fosters the research of all other departments of the hospital as well as external partners of the Technical University Munich with its analytical skills.

The Institute is a leading centre for educating patients on self-management of oral anticoagulants. (Contact person: Dr. S. L. Braun)

**Contributions to Laboratory Medicine**

- Development of laboratory techniques and methods for the prophylaxis, diagnosis, therapeutic monitoring and monitoring of the course of heart diseases.
- Competence centre for laboratory medicine
- High-efficiency analysis
- Frequent and detailed advisory service
- Patient training
- Optimisation of economic efficiency by means of business administrative methods and of application of Total Quality Management (TQM)

**Scientific contributions**

- Evaluation of new biochemical markers for diagnosis, therapeutic methods and prognosis of cardiac diseases.
- Studies conducted to investigate the changes in blood coagulation and inflammation reaction during and after heart surgery
- Introduction of platelet function testing in the routine diagnostics.
- Study on the value of cardiac and inflammatory markers in the field of sports medicine.
Institute for Radiology und Nuclear Medicine

DHM diagnostic radiology offers all the necessary techniques for different examinations, covering digital pulmonary function test and all types of vessel imaging in non-invasive technique. Children are examined with the lowest doses (e.g. pulsed screening, digital X-ray technology and MRT).

As German Heart Centre Munich early 2002 was the first worldwide in using the 16 lines Multislice CT, managed an innovations contract that allows regular upgrades to this fastest and most advanced CT system (currently dual-source CT Flash). The most outstanding investigation here is the non-invasive coronary angiography, therefore it is known for the manufacturer and for dose-saving heart examinations as international reference address.

A 1.5 Tesla magnetic resonance imaging is also available since 2006, which is mainly used for the detection of heart disease in childhood and adulthood.

The Institute has a radiological information system (RIS) and a so-called PACS (Picture Archiving and Communication System) for patients images and medical results archiving, and works 24 hours a day similar to the radiological diagnosis department.

In addition to specific nuclear cardiology techniques, the department offers also a complete spectrum institute of nuclear medicine, the examinations are carried out with a modern digital dual-head camera, the diagnostic main points are the scintigraphic diagnosis of acute myocardial infarction and the congenital heart defects examinations.

Regarding the research sector, the institute works together since May 1998 with the director of the nuclear medicine hospital of the Technical University Munich (Prof. Dr. M. Schwaiger).
Contributions to Radiological and Nuclear-Medical Diagnostics

- Co-introduction of the digital subtraction angiography in venous and arterial vascular diagnostics
- Introduction and optimization of myocardial scintigraphy in planar – as well as in SPECT-technology
- Optimization of non-invasive nuclear-medical diagnostics of complex paediatric cardiac dysfunctions
- Co-introduction and optimization of the digital x-ray technique as well as introduction of picture archiving and distribution techniques
- Introduction of non-invasive coronary angiography by means of the 16-line multi-slice CT into the diagnostic routine
- Introduction of sub-mSv coronary CT using Flash-Scan

Scientific contributions

- Participation in the scientific evaluation of interventional and operative therapy concepts in myocardial revascularization particularly with nuclear-medical methods.
- Participation in the scientific evaluation and further development of the interventional treatment of carotid stenoses by means of stent implantation in cooperation with the departments of angiology and neurology of the Technical University of Munich.
- Carrying out studies in the field of cardiac imaging (in close cooperation with the adult cardiology department)
- Pioneering in publications and management of multi-center studies on radiation dose in cardiac CT
Patient Care

A qualified and motivated nursing staff is necessary for the successful treatment and care of patients. These professionals are primarily motivated by a deep Christian need to care and look after patients.

At German Heart Center Munich there are 400 health and nursing personnel as well as employees from the voluntary social year (FSJ), trainees from Munich vocational nursing schools BRK and „Maria Regina“ plus the technical surgical assistants-school (OTA) of Rosenheim hospital. All doing their best for the physical and psychological well-being of the patients.

The adults and children professional nurses who represent the largest occupational group at German Heart Center Munich, are in constant communication with the doctors and the other responsible staff, the medical care is based on a possible partnership between the carer and the patients.

The high quality of patient care at the German Heart Centre can also be attributed to the excellent working conditions offered by this modern and state-of-the-art clinic. Tasks not within the sphere of patient care such as providing the Heart Centre with drugs and medical supplies or waste dis-
Proposal are relegated to ancillary personnel. Consequently, the 400 members of the nursing staff can attend exclusively to their specific duties. Patient care at the Heart Centre is marked by individual planning according to standard guidelines. Qualified and experienced professionals are on duty around the clock in three shifts. Each ward has a head nurse whom the patients can contact if they have special requests and questions. Continuity between the shifts is assured by direct interaction and a briefing on the particular care of each individual patient.

The goal of the nursing staff is to provide committed and medically supported patient care for the wellbeing of each individual.

The members of the nursing staff of the German Heart Centre are responsible for:

- Three cardiac medical and surgical adult wards
- Two intermediate care wards for adults
- Three intensive care units for adults
- Emergency admission unit for adults - Chest Pain Unit (CPU)
- Two cardiac wards for children
- Intensive care unit for children (divided by age)
- Central operating rooms with central sterilisation facilities
- Anaesthesiology department
- Eight cardiac catheter units for intervention therapy for adults and children
Cardiac surgeons, cardiologists and anaesthesiologists work closely together. In addition to all facilities of a cardiac operation theater, a hybrid operation room offers additionally X-ray possibilities and hemodynamic measurements, as known from a cardiac catheter laboratory. Through rotation of the X-ray arm, a CT-like and three-dimensional imaging is made possible. Cardiological and cardiac surgical emergencies can be diagnosed and treated in the new hybrid operation room simultaneously without any delay or additional transport risk, exemplary are the acute aortic diseases, such as aortic aneurysm or aortic dissection, these can now be treated through an open surgery or endovascular - a catheter through a vessel - or a combination of both processes. The Hybrid allows also an immediate surgical result monitoring by ultrasound, much better as the traditional monitoring, a significant gain for the patient concerning treatment safety and quality. The possibility of endovascular process has gained also a great importance for the bypass surgery and heart valve replacement, severe peripheral vessels narrowing can be treated at the same time during the main surgery, this reduced the risk of serious blood circulation disorder. New therapeutic options methods in the cardiology and heart valve surgery, such as catheter-based aortic valve replacement, can only safely done in a Hybrid operating room, avoiding both, a major operation with sternum severance or the use of the heart-lung machine. The procedure is performed on the beating heart with minimal incision or interventional (inserting a catheter through a vessel). In case of a sudden need for an open heart surgery instead of a planned interventional procedure, the Hybrid operation theater provides the highest level of safety by doing the operation directly, saving both time and risk caused by transporting the patient in a serious situation. The cooperation of experts from different fields in the Hybrid operation room will overcome not only the limits in the treatment methods but also the historical limitation of the different medical fields. The modern technology of a Hybrid operating room provides new therapeutic options for the patients who were previously not operable and facilitate the high risky operations.

German Heart Center Munich has a Hybrid operating theater since early 2007. This new room which represents a combination of a fully equipped cardiac surgical operating room and a fully satisfying cardiac catheterization lab led to completely new therapeutic options in the heart surgery.
Somatom Definition Flash (Dual-Source Heart - CT)

As German Heart Centre Munich early 2002 the first worldwide who used the 16 lines Multislice CT, managed an innovations contract that allows regular upgrades to the most efficient multi-slice CT system (Somatom Definition Flash since April 2009).

In addition to its complete high-resolution computed tomography - non invasive vascular imaging of the whole body - manage also a sharp and clear representation imaging of the non-invasive coronary arteries with a dose of less than 1 mSv.

The diagnosis requires relatively a short time (for the thorax less than 1 second) and is very comfortable for the patient, provides fantastic three-dimensional images of the heart and its coronary anatomy.

German Heart Center Munich is one of the the few global reference addresses for the cardiovascular dual-source manufacturer and known as location for the DSCT, therefore, the exclusive heart CT for the Federal German Air Force is in this clinic.

This devise is operated in a close cooperation between the department of adult cardiology (Prof. Dr. Schunkert) and the institute for radiology and nuclear medicine (Dr. Martinoff).

MAGNETOM Avanto

The new 1.5 Tesla Magnetic Resonance imaging (MRT) type Avanto with its whole-body technology is available in German Heart Center Munich since early 2006, all standard MRT scans, including all cardiac imaging in children and adults are carried out here without radiation exposure, in this aspect there is a close cooperation between the department of congenital heart defects and the department of adult cardiology.
The management works according to the public regulations determined by the state budget and the Bavarian financial regulation. This combination of commercial business and modern management methods, within the above mentioned framework, in addition to its own independency and together with the excellent medical services, contributes significantly to the success of the clinic.

Nowadays, the use of modern management methods has been increased due to the competition growth among the hospitals.

The essential adjustment of the framework scope takes the first place in this development process, which insured continuously the economic security of German Heart Center Munich.

Robert Siegert
Commercial Director

Public corporation with modern management

German Heart Centre is a public corporation in a framework of a non eligible institution under public law.
At the time of its founding in 1974, the German Heart Centre Munich was the first heart centre in Germany; since then many more heart centres have followed its benchmark example.

Each and every one is committed to the reduction of the death rate of cardiovascular disorders. Quality control has been an integral part of the medical and nursing profession for the last forty years.

Nevertheless, medical and technological advances, the complex organisation of a hospital at which a successful medical outcome is the result of many interconnected steps, and increasing economic pressure in the field of health care call for even more effort: the key concept is quality management.

As opposed to many other countries, quality control and certified medical quality were not required by law in Germany for a long time. Often taking the initiative, the German Heart Centre’s proactive introduction of systematic quality control and extensive quality management was pioneering.

The German Heart Centre and four other clinics were at the forefront in the development of quality management for cardiovascular surgery. In 1986 the German Society of Cardiovascular Surgery set up a commission to develop quality control; the German Heart Centre was a member from the very beginning. The pilot study QUADRA was sponsored by the German Ministry for Research and Technology as well as the Federal Ministry of Health and Social Security. Today all clinics for cardiovascular surgery in Germany participate. In the nineties, the German Heart Centre was among the first to take part in the project for quality control in paediatric cardiology.

The German Heart Centre has operated
Quality management, Total Quality Management (TQM) and the European Foundation for Quality Management Excellence Model (EFQM-Model) are concrete tools that continually challenge us to excellence. It is a puzzle with nine pieces.

1. Leadership. We self critically assess our management style. A patriarchal system no longer meet the requirements of a modern heart centre.

2. Policy and strategy. We realize that there are heart centres other than ours. We do not fear transparency or competition and are at all times willing to have the quality of our work independently assessed.

3. People. Keeping abreast with state-of-the-art developments and advancements is imperative at a high-tech medical institution. Professional development and close collaboration with other departments is therefore crucial.

4. Partnerships and resources. National and international cooperation in research, health care as well as management is maintained and encouraged. We share information and learn from others.

5. Processes. Diagnosis and treatment is more than the sum of its individual steps. The improvement of this process is a constant obligation.

6. Customer results. Over and beyond successful medical results, we take into account the personal opinion of our patients and the referring physicians as well as self help groups and organisations.

7. People results. The satisfaction of our patients is dependent on the satisfaction of our employees. Although not only because of this, we try to provide optimal working conditions.

8. Society results. Our mission, the state-of-the-art medical treatment and care of patients with cardiovascular disorders, is one we always have accomplished successfully. We are interested that the general public also be made aware of this.

9. Key performance results. For more than 40 years excellent medical and scientific results are a matter of course for us. We will and must continue to provide such results in accordance to our guidelines for thrift and economising requirements.

According to the Total Quality Management (TQM) guidelines since 1997 and was the first hospital of its type to be internally assessed according to the model of the European Foundation for Quality Management (EFQM). This model, originally used in the industrial sector, has become widely accepted in the field of health care.

In 1999 the German Heart Centre competed for the Ludwig-Erhard Prize, the German award for outstanding quality, which requires extensive involvement with the principles of quality management. The German Heart Centre was honoured as an exemplary organisation and paragon for all health care facilities.
Ronald McDonald House Munich at the German Heart Centre

McDonald’s Kinderhilfe Stiftung is the provider of Ronald McDonald House at German Heart Center Munich. It has the aim helping seriously ill children and their families.

The main point in this project is to offer Ronald McDonald Houses in the neighborhood of special clinics. They offer the parents and siblings of seriously ill children during their hospital stay a temporary home to remain close to their young fosterlings.

In this parents’ house, find the family a retreat possibility from the exhausting clinic everyday life but also a quick return to their child to give him what the medicine cannot give: love, strength and confidence.

Ronald McDonald House is at German Heart Center Munich since 1995, it was completely remodeled in 2012 and provides now 24 comfortable apartments and shared rooms like kitchen, three living rooms, one playing room for younger children and laundry facilities. The main and volunteer staff help and advice the families; therefore there is a weekly gourmet breakfast and family dinner in a pleasant atmosphere. The costs for this families apartment is 20 Euros per night, usually paid back from the insurance companies. Each year, obtain around 600 families this kind of help and support.

McDonald’s Kinderhilfe Stiftung has been engaged since 1987 for the health and welfare of the children in Germany. The foundation runs nationwide 19 Ronald McDonald Houses, close to children’s hospitals as a temporary home for the families of seriously ill children and be able through 3 Ronald McDonald Family Rooms to return back directly and safely to their child at any time. The foundation supports also projects which devote themselves to the children wellbeing, and it is also a part of an international organization working according to the same principles. McDonald’s Germany Inc. covers, as the largest donor, the annual administrative costs of McDonald’s Kinderhilfe Stiftung, there are also friends and donors from the industry and trade fields, besides individuals who support Ronald McDonald Houses. All these sponsors help many children in getting healthy quickly through the love and support of the nearby parents: Closeness helps recovery.

Ronald McDonald House Munich at the German Heart Centre

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Further information can be found on:
www.mcdonalds-kinderhilfe.org
The Friends of the German Heart Centre Foundation was founded in 1986 to aid the Heart Centre in achieving its goals by providing financial support from donations and membership fees.

In the prevailing times of limited financial resources and in spite of fees for services as well as state and federal assistance, the Heart Centre is dependent on this financial support.

Since its establishment, the Foundation has provided over 4.2 million Euro for the acquisition of new equipment, organisation of medical congresses, distribution of scientific publications, surgery at no cost for those unable to afford it, and accommodations for family members of hospitalised patients.

In collaboration with the departmental directors and management, the Board of Directors decide on the most meaningful and cost-effective use of the funds adhering to strict scientific and ecological considerations. The main body of the Foundation consists of a seven member executive board, who are responsible for the annual budget, the annual report and the recruitment of new members. Along with the committee they also promote the goals of the Foundation.

Why should I become a member of the Friends of the German Heart Centre Foundation?

Cardiovascular disease in the industrialized nations is still the number one cause of illness and death. One of every two individuals in Germany will at one time or another develop some type of cardiovascular disorder.

This means that you, a member of your family or a friend or acquaintance could become afflicted. In Germany alone, cardiovascular illnesses are responsible for about 400,000 deaths each year. It is only through intensive research, educational advertising, development of new medication and treatment, that the mortality rate has been lowered.

If you would like to support our cause with the enrolment as a member or with a donation, you will not only be making a contribution for the advancement of medicine but you will also help us in an endeavour which - as everyone knows - may be of benefit to you at one point or another.
From A-Z

Dear patient,

This alphabetical index is to provide you with a helpful guide and information source during your stay at the Heart Centre.

Do not hesitate to ask questions, express your wishes or make suggestions.

We wish you all the best and above all, a rapid recovery and good health during your stay in our hospital.

Yours, Commercial Directorate

Accompanying family:
The Ronald McDonald House is available for the accommodation of parents or relations, accompanying paediatric patients. Information on other means of accommodation can be obtained in the wards or at the office of the Head Consultant of the respective department. The social workers are also available with plenty of advice and information.

Admission:
The admission of patients is done on the ground floor opposite the main entrance.

It is open from Monday to Thursday from 07:00 - 15:45 hrs and on Fridays until 13:30 hrs.
Outside these opening hours, admission is done directly on the wards.

Bank machine:
A bank machine is in the entrance next to the cafeteria.
Coffeeshop:
Drinks, snacks, magazines and routinely needed articles may be purchased here. The coffee shop is located in the vicinity of the main entrance.

The opening hours are:
- from Monday to Friday: 06.30 – 17.00 hrs
- Saturday: 09.00 – 10.00 hrs, 13.00 – 17.00 hrs
- Sunday: 13.00 – 17.00 hrs

Room service possible:
Phone: +49 (0) 89 1218-1035

Counseling and training:
The following counselling services are available:
- Dietary advice for patients by dieticians can be obtained through the heads of the individual wards.
- AG Self-control of anticoagulation (ASA) Appointments can be obtained through:
  Telephone: +49 (0) 89 1218-1012
- Genetic counseling. Information on this subject can be obtained from the heads of the individual wards.

Drinks:
The supply of drinks is an integral part of our service in our hospital. You will be supplied with the type and amount of drinks appropriate to your health. In case you wish and are allowed to drink something else, you may purchase this at the coffee shop on the ground floor or from the beverages machine (in basement), after paying the desired drinks.

Fellow patients:
We endeavour to place „suitable“ patients together in the same room. Naturally, that does not always work out, so we ask for mutual respect, consideration and understanding during your stay in hospital.

Food/ Menu:
Our aim is to offer you a high-grade and above all, variable range of delicious food. Please do not forget that the diet eventually prescribed for you during your stay may differ from your usual eating habits. The menu is valid for one week and is released on Sundays. It can be found either in the rooms or on the information board of the wards.

Hairdresser:
An appointment can be made, through the nursing staff, with a hairdresser who comes to the hospital.

Hospital volunteer service:
A volunteer service, called „Green Ladies“, will be at your service to assist in minor errands or whenever you need someone to talk to. Inform the nursing staffs on your ward or leave a message at the information desk on the ground floor, whenever you wish to use the services of these volunteers.
Information:
The Information desk can be found in the vicinity of the main hall and is at your disposal with all necessary information.

Internet:
As a special service, the DHM [German Heart Centre Munich] offers you, as our guest, free Internet access for use with your own private terminal device, provided such use is compatible with your medical treatment.

Mails/ Letters:
There is unfortunately, no letterbox in the hospital. You may handover franked mail to the nursing staffs or at the information desk on the ground floor.

Parking spaces:
Unfortunately, there are only a limited number of parking spaces in our short-term parking space which is not free-of-charge.

Patient rooms:
The patient rooms are modern double-bed rooms. Every room has a combined shower and water closet. A cupboard and a safe is also available for your personal effects. Space is limited, kindly bring only your most necessary belongings to the hospital. The German Heart Centre cannot be liable for your valuables or cash. We offer however the option of depositing valuables in the hospital safe. The nursing staffs will gladly inform you with the necessary details.

Physiotherapy:
The department of physical therapy provides invaluable care especially in providing excellent post-operative therapy and treatment. A highly motivated team of physiotherapists works at the German Heart Centre.

Radio:
The transmission facility installed in the hospital is made to serve as a source of information and entertainment. The nursing staff will explain how to use the radio to you. Kindly ensure that no one is disturbed.

Road description:
See graphical road map page 48/ 49
Self-help groups:
Self-help groups have emerged for different groups. Information on the range of offers or assistance can be obtained from the relevant department. Information materials on the self-help groups can be found on the wards.

Smoking:
The German Heart Centre is a „non-smoking“ hospital. Smoking is not permitted in the entire building.

Social services:
Social services can be found on the ground floor, room 0-116 beside the Coffeeshop. It can be reached under:
Telephone: +49 (0) 89 1218-1037 and +49 (0) 89 1218-1040.
In co-operation with the public social welfare department, the social services department provides help and advice on:
- Arranging follow up treatment
- Rightful entitlements
- Handicap registration

Spiritual welfare and Church service:
- A catholic hospital minister works in our establishment and visits the patients regularly. His office is located on the ground floor in the atrium and can be reached under:
  Telephone: +49 (0) 89/1218-1036 or email: dillitzer@dhm.mhn.de.
- The protestant hospital minister can be requested to visit the house on demand, through the information.
- You may also leave a message for the minister at the information.
- Church services are held every Monday at 14:30 hrs in the worship room in the atrium on the ground floor.

Taxi:
The cost of using taxis for trips to and from the hospital is assumed by the patients. Your health insurance will inform you about reimbursement options. Taxis may be ordered through the information.
Telephone:
If you have no telephone at your bedside, there are two public telephones (coin telephone, card telephone) in the atrium on the ground floor at your disposal. You may of course be given a bedside telephone for a daily charge of € 2.30. For this purpose, you will be given a card which you may load for making calls, on the charging device on the ground floor beside the paediatric outpatient department or on the 2nd Floor opposite to the elevator. Kindly observe the „Information on the usage of patient telephone“, which you receive on admission.

Television:
Patient rooms are fitted out with televisions sets which can be used free-of-charge. Kindly ensure that your fellow patients agree with your usage of the television at all times, and that no one is disturbed. Do not forget the rest periods and use a headphone if necessary to avoid disturbing others.

Valuable personal effects:
Valuable personal effects may be deposited if necessary, at the cashier’s office. It is located at the entry lobby (also see „Hospital rooms“).

Visiting hours:
Visiting hours vary from ward to ward. Nursing staffs will provide precise information on visiting hours. In exceptional cases, visiting hours may be restricted by the physician or when a medical or nursing procedure may require visitors to leave the room. We ask for your co-operation. Children under the age of 14 are not allowed to visit the children’s ward. Children are permitted in the general wards and the intensive-care units only after consultation with the physician treating the patient concerned.
Numbers of patients and procedures

- Number of inpatient patients
- Number of cardiovascular operations
- Number of open-heart procedures
- Number of open-heart procedures in children
- Cardiac catheterisation in adults
- Cardiac catheterisation in children
- Electrophysiological procedures
How to reach us

The German Heart Centre Munich is situated in Lazarettstraße 36 in 80636 München, i.e. in the heart of Munich.

You can reach us quite easily by car, rail, air or public transport:

**By rail**

Take the underground train Line U1 from the train station, to the train stop Maillingerstraße or take the Tram number 20 or 21 to Hochschule Lothstraße. From here, the remaining distance is only a few minutes on foot.

**By air**

There is an S-train from the Franz-Josef-Strauss airport to the main railroad station. From there, take the underground train line U1 to the train stop of Maillingerstraße or take the Tram number 20 or 21 to Hochschule Lothstraße. From here, the remaining distance is only a few minutes on foot.

**By public transport**

Take the underground train line U1 to the train stop of Maillingerstraße

Tram number 20 or 21 to Hochschule Lothstraße

**By car**

Lazarettstraße can be accessed directly from Nymphenburger Straße or Dachauer Straße. There are a limited number of parking spaces in front of the house.
A 95 from the direction of Garmisch
Take the Garmisch highway A95 heading for Munich till the end of the highway. Take a left at the Central Ring West. Follow the central ring till the bridge of Donnersberg is left behind. Exit the ring shortly before entering the tunnel and take a right into Nymphenburger Strasse in the direction of the city centre. In Nymphenburger Strasse, take a left into Lazarettstrasse (4th street).

A 96 from the direction of Lindau
Take highway A96 to the direction of Munich until the end of the highway, this leads automatically to the central ring West. Follow the central ring until the bridge of Donnersberg is left behind. Exit the ring shortly before entering the tunnel and take a right into Nymphenburger Strasse in the direction of the city centre. In Nymphenburger Strasse, take a left into Lazarettstrasse (4th street).

A 8 from the direction of Stuttgart
Take the highway A8 in the direction of Munich till the end of the highway. Enter the traffic circle and take the 3rd exit. Continue to follow Verdistraße. Along the line, Verdistraße becomes Amalienburgstrasse which in turn also becomes Menzinger Strasse and finally ends up as Notburgastrasse. Take a left at the Roman square. Follow the street until it ends up automatically, in Nymphenburger Strasse. Take a left in Nymphenburger Strasse into Lazarettstrasse (4th street).

A 9 from the direction of Nuremberg
Take the highway A9 in the direction of Munich until the end of the highway and follow the central ring West in the direction of Lindau or Garmisch-Patenkirchen. From the central ring, take a left into Nymphenburger Strasse, take a left again into Lazarettstrasse.

A 92 from the direction of Deggendorf
At the highway junction AK Neufahrn/68/Eching-Ost change over from A92 to A9 in the direction of Munich. Proceed to the end of the highway and follow the central ring West in the direction of Lindau or Garmisch-Patenkirchen. At the central ring, take a left into Nymphenburger Strasse in the direction of the city centre, take a left again into Lazarettstrasse (4th street).

A 94 from the direction of Passau
Take the A94 until the end of the highway, this leads automatically to the central ring West. Follow the central ring until the bridge of Donnersberg is left behind. Exit the ring shortly before entering the tunnel and take a right into Nymphenburger Strasse in the direction of the city centre. In Nymphenburger Strasse, take a left into Lazarettstrasse (4th street).

A 8 from the direction of Salzburg
Take the A8 in the direction of Munich-Giesing until the end of the highway, this leads automatically, to the central ring West. Follow the central ring until the bridge of Donnersberg is left behind. Exit the ring shortly before entering the tunnel and take a right into Nymphenburger Strasse in the direction of the city centre. In Nymphenburger Strasse, take a left into Lazarettstrasse (4th street).
Information on the Internet

You will find more information about the German Heart Centre Munich, the departments and institutes, your hospital stay and much more.

Visit our internet site at:

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Commercial Directorate

Commercial Director:
Robert Siegert

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Director of the Department:
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