

施設紹介

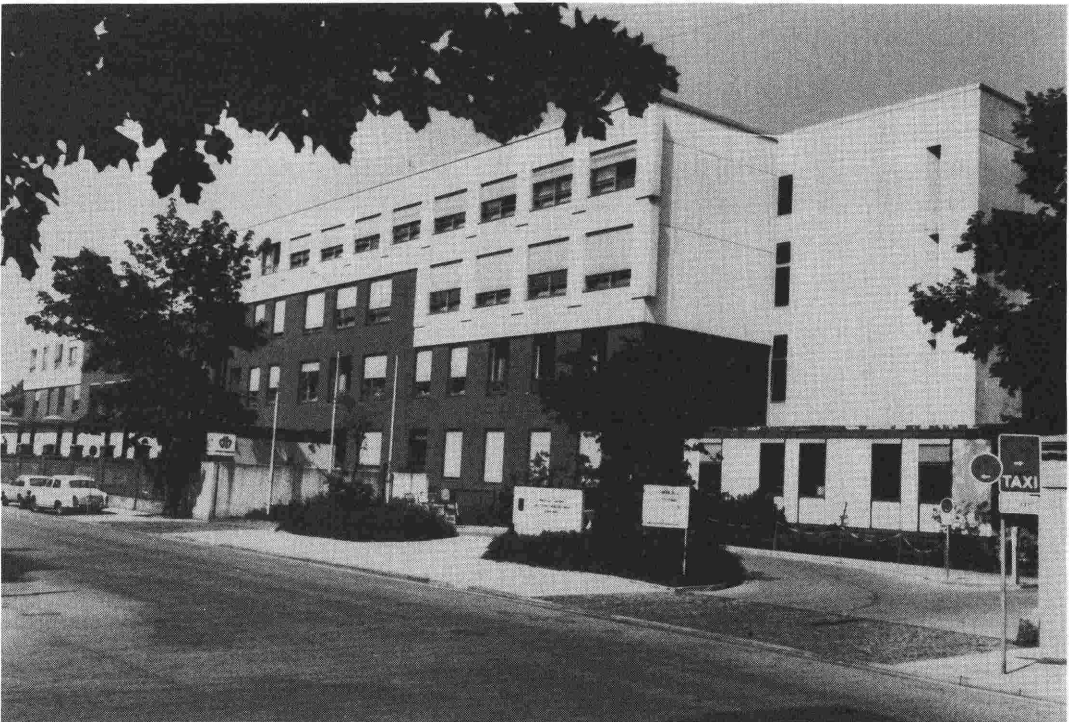
Report on Department of Anesthesiology German Heart Center Munich

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The idea to create a special clinic for cardiac patients was born in the heads of experienced clinicians of the Ludwig-Maximilian University of Munich, where the first open-heart operation in Germany was performed by Prof. R. Zenker in 1958. This idea came true after a hospital with old tradition (Red Cross Hospital, built in

1870) had been rebuilt and supplied with modern medical equipment of highest standards.

The work begun in 1973 in 7 departments (anesthesiology, adult and pediatric cardiology, laboratory medicine, cardiac surgery, experimental department for basic research and



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radiology), the first cardiac operation was performed April, 1974.

The years that followed have witnessed many seasons of growth. The hospital employs now 88 physicians and scientists, 150 nurses and 257

technical and supportive personnel.

In 1988 14,300 individuals were cared for in outpatient departments and 4,460 patients were treated in one of the departments.

The hospital has 140 beds: 92 adult and 48 pediatric ones, including 37 intensive care beds. Six intensive beds are reserved for patients following PTCA. In 1988 541 cases were treated with this method.

The hospital is also dedicated to study diseases of the heart circulatory system. Also the renowned journal the "Herz" (heart) was founded in 1975 and since then is edited by the leading physicians of the hospital. An important event was the signing of a contract in 1985 which coordinates scientific research programs with the Faculty of Medicine of the Munich University (Klinikum rechts der Isar).

The Department of Anesthesiology was founded by J. A. Richter, M. D., Chef of the department. The main tasks for the 10 staff anesthesiologists are: medical treatment, research and education.

The activities of this unit include physical and respiratory therapy, transfusion medicine, anesthesia and intensive care.

The 8 physical therapy nurses take care of pa-

tients before and after surgery.

The subdepartment transfusion medicine (7 technicians) supplies all departments of the hospital with blood products. The technique of preoperative autologous blood donation and conservation with deep-freezing technique was introduced in 1987. Using this technique 91% of patients could have been operated without homologous blood transfusion. An important task of this subdepartment is to perform emergency and routine laboratory analysis (blood gases: 23,774 measurements; electrolytes: 12,011 measurements in 1988) needed in ORs and in surgical ICUs.

The work of 11 anesthesiologists in 3 ORs is supported by 11 nurse anesthetists.

Anesthesiologists' work load and results of cardiac operations in 1988 are given in Table 1. For the early correction of congenital heart diseases the technique of deep hypothermic circulatory arrest (DHCA) was introduced in 1973. After gaining experience, this technique is routinely used now for infants and children less than 10 kg body weight. Table 2 summarizes the results of correction and partial correction of congenital heart defects with DHCA between 1975 and 1988. The decreasing mor-

Table 1 Anesthesiologists' work load and results of cardiac operation in 1988 at German Heart Center Munich

	No. of cases	No. of death
Anesthesia for cardiac operations		
— valve procedures (single or multiple)	206	7
— coronary bypass	487	3
— congenital lesions	445	14
— miscellaneous (thoracic aortic aneurysm, WPW-syndrome, heart tumor etc.)	27	4
— cardiac transplantation	6	1
Subtotal:	1, 171	29 (2.48%)
Anesthesia for diagnostic and therapeutic procedures (cardiac catheter laboratory or ICU)	192	
Anesthesiologists stand-by (pacemaker implantations etc.)	185	
Total:	1, 648	

Table 2
Age (months)

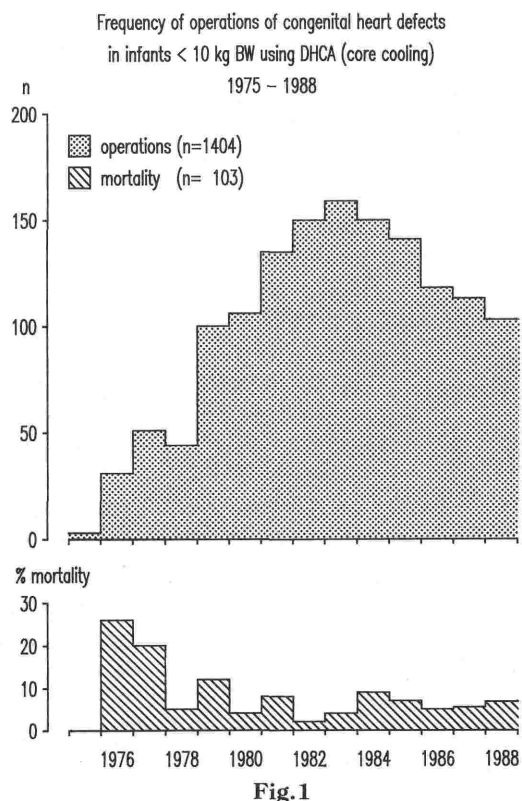
Defects	< 1	1 - 3	4 - 6	7 - 12	> 12	total		
	n ±	n ±	n ±	n ±	n ±	n	±	±%
TGA	28 2	66 1	37 0	54 0	50 0	235	3	1.2
TGA + VSD	8 1	7 1	9 0	13 0	26 1	60	3	5.0
VSD	1 0	31 2	84 2	109 1	72 0	297	5	1.7
TOF	7 1	11 0	25 1	40 0	68 3	152	5	3.3
trunc. art. comm.	3 0	14 3	7 1	5 1	5 1	34	6	17.6
tot. A-V canal		12 2	23 2	40 2	26 1	101	7	7.0
TAPVC	35 4	25 1	11 0	7 0	2 0	80	5	6.2
valv. AS	35 7	20 0	6 0	4 0	2 0	67	7	10.4
complex defects	66 25	31 5	19 4	19 6	18 6	153	46	30.0
other	24 0	28 1	41 2	33 2	30 0	156	5	3.2
re-operation	4 2	14 3	14 3	19 1	18 2	69	11	16.0
total	208 42	259 19	276 15	343 13	317 14	1404	103	7.3
mortality (%)	20	7.3	5.4	3.7	4.4			

tality, as a result of improved surgical and anesthesiological management is illustrated in Figure 1. The proportion of operations in infants and children is fairly high—about 40 per cent of all operations—because the catchment area for this patient group involves not only Munich (1.3 million inhabitants) and Bavaria (10 million inhabitants) but also other parts of Germany and its neighbor countries like Austria and Italy, as well as from Arabic States (United Arab Emirates etc.)

The anesthesiological technique underwent a continuous development due to introduction of new drugs, methods and monitoring and other devices. The mile-stones of this development, given in Table 2, indicate also an improvement of patient management at the same time.

The research program deals with numerous theoretical and practical problems of cardiac anesthesia and related subjects, such as:

- anesthetic methods benzodiazepine-opioid combinations for total intravenous



anesthesia (TIVA)

- pathophysiology of deep hypothermic circulatory arrest (DHCA)
- cerebral function monitoring using EEG spectral analysis
- perioperative vasodilator, and calcium channel blocker therapy
- treatment of hypertension with serotonin antagonist
- perioperative blood saving methods (autotransfusion, hemoseparation, intra and postoperative retransfusion, pharmaceutical methods)
- intraoperative hemocoagulation (heparin-protamin requirement, desmopressin acetate therapy, antithrombin III substitution, aprotinin therapy)

The results of these studies were presented at national and international meetings and published in renowned periodicals like *Anaesthesist*, *Herz*, *Journal of Thoracic and Cardiovascular Surgery*, *Thoracic and Cardiovascular Surgeon*, *Journal of Cardiovascular Pharmacology*, *Journal of Carodithoracic Anesthesia*, *Arzneimittelforschung/Drug Research*, etc..

Between 1974 and 1989 156 articles and book chapters, written by the anesthesiologists, appeared.

Scientific organizations

Anesthesiologists are taking part in the activities of the SCA, EACTA and The Working

Group of German Heart Anesthesiologists, organizing meetings(2nd and 3rd International Symposium on Anaesthesia for Cardiac Patients) and elaborating quality control of cardiovascular anesthesia in Germany.

Postgraduate training

The department provides opportunity for postgraduate training in cardiovascular anesthesia. 30 anesthesiologists, mainly from Europe (Western and Eastern), Austria, Hungary, Sweden, Switzerland, UdSSR, The Netherlands, but also from USA, Canada and Asia made use of this possibility in the last years.

Future perspectives

The capacity of the hospital (3 ORs) is completely utilized with 1,459 operations per year. Also other departments of the hospital cannot cope with the increasing number of patients. Therefore a new building is being planned with 5 ORs and 48 ICU beds beside the hospital with a total cost of about 200 million German Marks, allowing about 2000 open-heart operations per year. The increasing number of patients' care for tomorrow is a major responsibility of the department today. Therefore, until the work may start in the new building, tremendous work should be done, doctors, nurses and technical personal should be trained, the newest equipment should be installed.