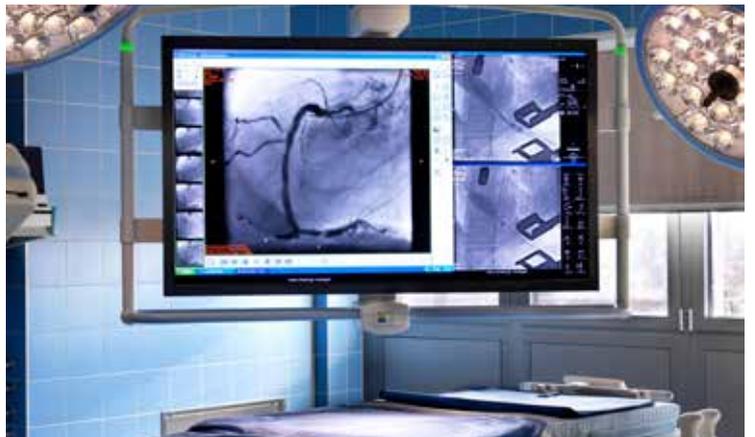


Innovative Medical Solutions from Mecklenburg-Vorpommern, Germany



BioCon Valley®

**Mecklenburg
Vorpommern** 

Ministry of Economics,
Construction and Tourism

Life Sciences and Healthcare in Mecklenburg-Vorpommern





The importance of the healthcare industry in Germany continues to increase. With an economic output that accounts for roughly ten per cent of the country's GDP and a total of 5.4 million jobs, this industry has long held a leading position among Germany's economic sectors. The "health land" of Mecklenburg-Vorpommern, a state in north-eastern Germany, also views the healthcare industry as one of the most outstanding and promising fields for innovative products and services.

Here and throughout the world, we are seeing an increasing interest in health, as well as a steadily rising demand for products, methods and services that maintain and restore health. With its exceptional healthcare system and expertise in the field of medicine, Germany plays a leading role in the international healthcare arena and enjoys an excellent reputation in many countries. This situation offers outstanding opportunities for products and services from companies in the healthcare sector in Mecklenburg-Vorpommern.

Innovations from the healthcare industry play an especially important role. The branches of medical and biotechnology have been undertaking pioneering work in association with research institutes in Mecklenburg-Vorpommern, especially university-based institutes. Their achievements include implants and biomaterials, as well as findings from

plasma research and research on x-rays.

Our state offers special expertise in the area of diabetes treatment. The incidence of this "disease of affluence" is soaring worldwide. Diabetes and its complications impose an immense economic burden on individuals and healthcare systems. Innovations such as telemedicine solutions from Mecklenburg-Vorpommern can offer effective means for addressing such challenges.

On the following pages, we will be presenting examples of innovative and scientific excellence in Mecklenburg-Vorpommern. I hope to spark your interest in the many outstanding products and services from our state.

There is much to be discovered in the exciting state of Mecklenburg-Vorpommern. We hope you will take the time to learn more about us and even pay us a visit!

Harry Glawe

A handwritten signature in black ink, appearing to read 'H. Glawe'. The signature is written in a cursive style with a long vertical stroke extending downwards from the end.

Minister of Economics, Construction and Tourism
Mecklenburg-Vorpommern

Health is the decisive factor for an individual's quality of life. Over the past several years, the healthcare industry here has developed into a crisis-proof economic sector with high growth potential. Demographic change, above all in the industrialised nations that are seeing great increases in life expectancy, has played a substantial role in this development. Our state, Mecklenburg-Vorpommern, has been particularly affected by these demographic trends and was early to recognise the associated challenges as an opportunity, adjusting its strategies and structures accordingly with the founding of the network BioCon Valley and the government approval of the state's master plan "Gesundheitswirtschaft 2020" ("Healthcare Industry 2020").

These steps have led to the establishment of an objective shared by business, science and politics: to develop Mecklenburg-Vorpommern as a "health land". Currently the healthcare industry in our state employs more than 15% of the working population and accounts for almost 14% of our gross domestic product – twice the national average. It is our stated aim to exploit these opportunities to develop not only products but also exemplary solutions that have pioneering character both internationally and nationally for the future development of the healthcare industry.

This applies not only to new diagnostic and therapeutic methods and epidemiological studies but also to system solutions and the transfer of knowledge.



In these areas our state has many assets to draw on, such as one of the world's longest traditions in diabetes care and dialysis therapy, state-of-the-art radiotherapy in the field of oncology, an internationally leading role in implantology and biomaterial development and the new potentials of plasma medicine. Our state's extensive expertise is reflected in its approx. 60 modern facilities for rehabilitation medicine with a total of 12,000 beds, its establishment and operation of hospitals and clinics of advanced medicine and its construction of the new clinic for University Medicine Greifswald, one of the most modern clinic buildings in Germany. All of this, together with the government-approved master plan Gesundheitswirtschaft 2020, guarantees both us and our partners in Germany and abroad reliability and continuity for future projects. BioCon Valley, as a central network, has helped support and shape this development from the very beginning and is an important member of the ScanBalt Organisation, Europe's largest network in the field of biotechnology and life sciences.

All of our resources are at your disposal.

Prof Dr. Dr. h.c. (mult.) Horst Klinkmann,

Fellow Royal Collage of Physicians, President of BioCon Valley,
President of the Mecklenburg-Vorpommern
Board of Trustees for Health Economy

Table of Contents

Greetings

Greetings from Minister Harry Glawe 2

Greetings from Prof. Dr. Dr. h.c. (mult.) Horst Klinkmann 3

Context

Hospital 2020 – Strategic Hospital Planning 5

E-Health and Telemedicine 6

Healthcare Services and Rehabilitation 8

Population Based Approaches towards Modern Healthcare 12

Innovation and Health Care Related Industries 13

Specialist Providers in Mecklenburg-Vorpommern

Ambulantes Zentrum für Prävention und Rehabilitation GmbH 18

Apheresis Center Rostock ACR 20

BioArtProducts GmbH B.A.P. 22

BIOMEDRO 24

CyberKnife Centre Güstrow 26

DST GmbH 28

HOFFRICHTER GmbH 30

IMAGE Information Systems Europe GmbH 32

Institute of Diabetes “Gerhardt Katsch”, Karlsburg 34

Infokom GmbH 36

INP Leibniz-Institut für Plasmaforschung und Technologie e.V. 38

INROS LACKNER AG 40

Heart and Diabetes Center - Klinikum Karlsburg 42

Medical Biomaterial Products GmbH 44

neoplas GmbH 46

Oehm und Rehbein GmbH 48

University of Rostock University Eye Hospital 50

University Medicine Greifswald Department of Obstetrics and Gynecology 52

University Medicine Greifswald Pediatric Surgery 54

University Medicine Greifswald Community Medicine 56

PKMV e.V. – State Association of Private Hospitals in Mecklenburg-Vorpommern) 58

BioCon Valley® GmbH 60

Credits/Legal Information 62

Hospital 2020 – Strategic Hospital Planning

The economic and social importance of the healthcare market, both in Mecklenburg-Vorpommern and internationally, continues to increase.

There is a high demand for the design and construction of hospitals and treatment centres. Increasing costs for innovative treatments, high-end medical equipment and energy efficiency have significant effects on the economic viability and attractiveness of a medical building.

Hospital modernisation also involves new approaches for tackling financial challenges. We see a medical centre as a very human location, and even as a highly effective business unit. Various factors are becoming more important and can contribute to the optimisation of the



financial situation and the treatment flow for the creation of a service-oriented and multimodal healthcare centre. Interdisciplinary co-operation with specialised medical practices, hotels and external service providers can have a positive effect on operating costs and ease the burden on the hospital's budget.

Nevertheless, a main task is to optimise internal work and patient flows. There is great potential for cost reduction through intelligent hospital management: central operat-

ing theatres, interdisciplinary treatment units, flexible-use wards and short distances for patients and supplies.

The impending changes in therapeutic and treatment approaches will also bring about changes in the hospital workflow. Treatment and care times will be reduced. A faster recovery has positive effects on both patient and hospital. The consideration of demographic changes has an influence on medical disciplines. Age-related polymorbidity requires interdisciplinary treatment in a hospital.

In a region like Mecklenburg-Vorpommern, the field of healthcare is not limited to hospitals and medical prac-

tices. The healthcare market, which has long recognised the potential for combining health and recovery, offers holistic healthcare services. Architects must work together with hospital operators and external specialists to find optimised solutions for hospital modernisation.

Torsten Ruwoldt
André Hundt
Inros Lackner AG
Rostock, Germany

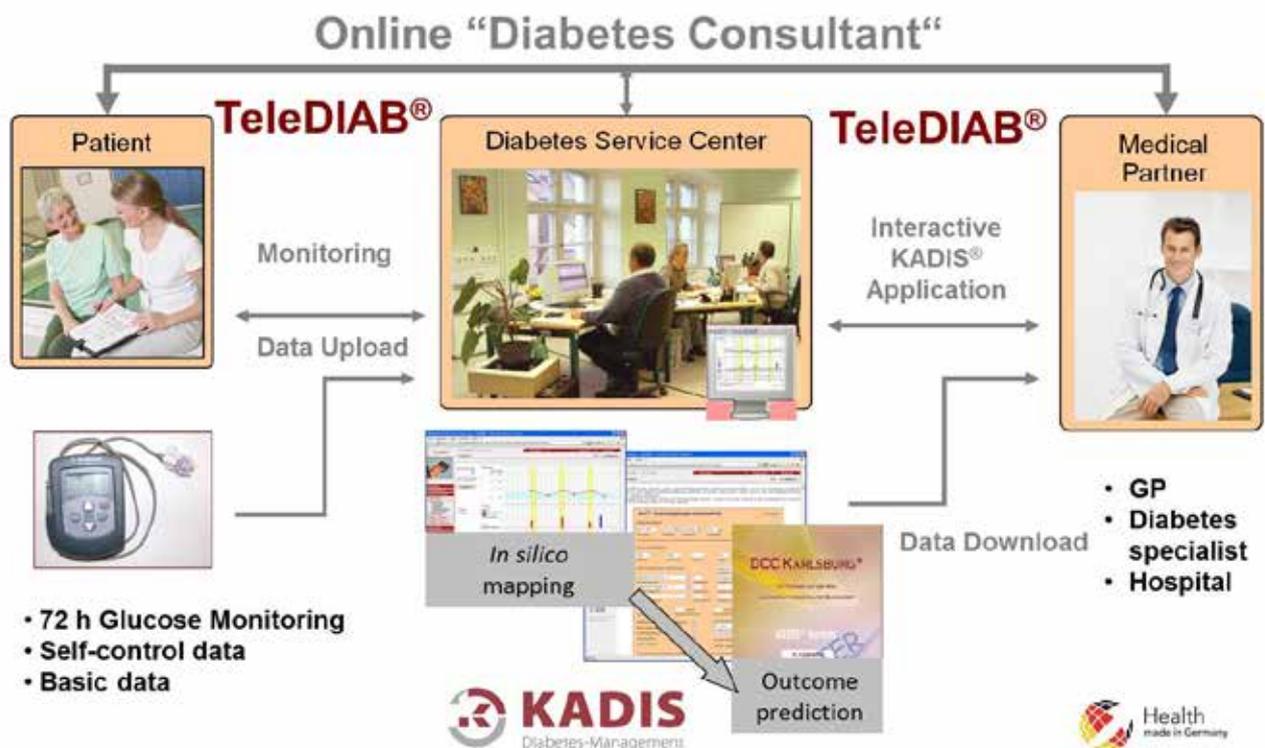
Randomized controlled trials have convincingly shown that appropriate diabetes care that maintains HbA1c levels within the target range decreases the development and progression of micro- and macrovascular complications such as blindness, kidney failure, and coronary heart disease.

However, the recommendations of the general clinical practice guidelines have not been widely adopted, especially in regions and countries without adequate access to state-of-the-art methods in diabetes care and management and where traditional practices may prevail. Consequently, the growing number of people affected with overt

diabetes and late diabetic complications has driven up the cost of diabetes care and imposed heavy financial burdens on national health care systems. Appropriate and cost-effective diabetes care can be achieved, however, by application of new technologies, such as telemedicine-supported personalized diabetes management systems (PDM).

In many regions worldwide significant barriers and practice site customs impede the delivery of optimal diabetes care. Physician barriers include time constraints that limit the ability to maintain knowledge of current evidence-based research results. Given the importance of improved glycaemic control, the growing need to enhance telemed-

Diabetes mellitus – Global Challenge and Innovative Solutions



icine-supported access to state-of-the-art and cost-effective methods for improving diabetes management is a major health care challenge today. Effective and cost-saving management of diabetes has been facilitated in Germany by implementation of PDM and telemedicine-based communication into routine diabetes care.

PDM is generated by using the interactive diabetes management program KADIS® (Karlsburg Diabetes Management System) in combination with the diabetes related communication platform TeleDIAB®, which have been developed during the past thirty years in the Institute of Diabetes "Gerhardt Katsch" Karlsburg, Germany.

The patented KADIS® program supports primary care providers in their outpatient settings by patient-focused visualization and evaluation of the current metabolic situation and by providing online access to the KADIS® program to predict the outcome of metabolic control in reaction to different therapeutic interventions in a given individual patient by world-wide unique KADIS®-based simulation procedure.

Assessment of each patients' individual metabolic situation requires only an input of baseline characteristics, such as insulin dosage, caloric intake, and physical activity and a patient-related, individually characteristic daily glucose profile. As a therapy simulator, the KADIS®-based PDM program assists physicians in choosing individual dia-

betes management regimes that are most appropriate for achieving patient-focused glycaemic targets.

Several national and international pilot studies, including in the United Arab Emirates, have convincingly demonstrated, that in patients with insufficient glycaemic control, HbA1c can be significantly reduced by up to 1.5% if telemedicine-supported, KADIS®-based PDM is implemented in diabetes management. In addition, the first results from running the PDM program in Germany revealed an annual cost reduction of up to 900 USD per patient per year.

Dr. Eckhard Salzsieder
Institute of Diabetes "Gerhardt Katsch"
Karlsburg e.V., Germany

Health Care Services and Rehabilitation

High Quality Medicine at the German Baltic Sea Coast

Welcome to Mecklenburg-Vorpommern, the federal health state No. 1 in Germany. The aim of our two medical schools, located in Rostock and Greifswald, is to serve our population and promote and restore its well-being. Both university medical centres and our strong medical faculties are home to high-quality medicine, innovation and progress in patient treatment, research and teaching. We provide our patient with individual and empathetic care.

Our two medical schools belong to the oldest in the country and are renowned for their cutting-edge research and development in biomedical engineering.



More than 7.000 highly qualified and motivated staff in different medical professions take care of your needs. Over 40 medical departments and institutes from all disciplines of medicine offer a wide spectrum of treatment in our both universities. Recognized international and national research groups are established.

REMDIS (The implant technology of the future), DZNE (German Center for Neurodegenerative Diseases), DZHK (German Centre for Cardiovascular Research), or GANI_MED (Greifswald Approach to Individualized Medicine) as well as epidemiological studies like SHIP (Study of Health in Pomerania), and SNIIP (Survey of Neonates in Pomerania) - just to name few-are here at home.

Interdisciplinary treatment of breast cancer patients take place in two internationally approved and certified centres. Also our cardiology, ophthalmology and orthopaedic surgery enjoy highest reputation. More than 3.000 children are born each year in our university hospitals in Rostock and Greifswald. Pregnancy associated diseases are treated by recognized experts. Regenerative medicine is an important focus in Rostock too. Our novel and highly effective teaching methods are ranked very high by students and build up a basis for the high quality medicine in our federal state and elsewhere.

Prof. Dr. med. Marek Zygmunt
University Medicine Greifswald, Germany

Private Sector of Medical Service

Mecklenburg-Vorpommern boasts two university clinics and a wide range of high-calibre general and specialised hospitals. In the past 20 years, the state government has fully renovated all hospitals, equipping them with the most modern medical technologies available. The state's clinics offer patients high-comfort, hotel-quality accommodation. Rooms with 1-2 beds and integrated bathrooms are standard in all clinics.

In the state's healthcare facilities, great importance is attached to hygiene management in order to prevent the spread of resistant pathogens. In the pilot project Health, Innovative Care and Regional Economy (HICARE) – an action alliance against multi-resistant bacteria – a concerted regional approach is taken for the development and testing of effective, standardised and transferrable intervention measures to efficiently battle the spread of multi-resistant bacteria (MRB).

Almost all clinics, including the university clinics, are tele-medically linked by a data network, meaning that x-ray and biopsy findings can be shared between healthcare facilities in a fast and uncomplicated manner.

In addition to the large healthcare facilities in Neubrandenburg, Stralsund, Schwerin and Güstrow, which offer

top-quality medical care on a par with that of the university clinics, there are highly specialised outpatient treatment centres whose services include highly specialised dialysis systems and non-invasive methods for the treatment of tumours. The treatment of diabetes mellitus has a long tradition in Mecklenburg-Vorpommern as an important area of focus, and since the reunification of Germany, this focus has expanded to include the field of surgical and interventional cardiology.

Many innovative companies in the healthcare industry are supplying new and interesting products for the diagnosis and early detection of diseases. Other key areas include telematics for the optimisation of metabolic control in diabetes and new methods for wound management using plasma medicine.

We hope to earn your trust and confidence. Come visit us in Mecklenburg-Vorpommern!

Prof. Dr. med. Wolfgang Motz
Heart and Diabetes Center – Klinikum Karlsburg

Rehabilitation in Mecklenburg-Vorpommern

Medical rehabilitation is a component of the healthcare system aimed at supporting the chronically ill by sustainably promoting their self-determination and participation in social life. This is accomplished by striving to prevent, cure or improve the incapacitating conditions and social impairments that can result from illness, or to prevent a significant worsening of these conditions.

In Mecklenburg-Vorpommern an extensive range of rehabilitation services are available. A total of 62 modern rehabilitation clinics with more than 5,400 employees offer the best possible medical and therapeutic treatment.

Rehabilitation has a long tradition in Mecklenburg-Vorpommern. For more than 200 years, the resort towns along Mecklenburg-Vorpommern's Baltic coast have been popular sites for health treatments.

In 1793 a tradition of resort therapy, therapeutic bathing and rehabilitation began in Heiligendamm involving in particular the targeted use of the maritime climate, seawater, chalk, brine and peat pulp as natural therapies for disease prevention and rehabilitation. Mecklenburg-Vorpommern is a land of health and holidaymaking. Here, medical services are perfectly linked with tourist destinations.



More than ever before, social and demographic changes are necessitating an effective medical rehabilitation system. This includes the consideration of the somatic, psychological and social dimension of the illness, as well as its sequelae and interactions.

Medical rehabilitation takes a holistic approach. It is based on a bio-psycho-social treatment chain. This treatment approach is the cornerstone for successful rehabilitation. Health is one of the most important keys to a happy life. Living healthier, longer and more actively are the main objectives and aspirations. And prevention is playing an increasingly important role. Preventive measures can attenuate or delay the onset of illnesses. practice. The rehabilitation clinics in Mecklenburg-Vorpommern are ideally suited for offering such therapies. Internal and external quality management systems monitor the treatment processes, guaranteeing continual improvement and a high level of expertise. The rehabilitation clinics in Mecklenburg-Vorpommern treat all major medical conditions, such as orthopaedic, cardiovascular, psychosomatic, oncological, internal and neurological diseases.

The treatment period is generally 3 weeks. Patients who are looking for treatments focused more on the use of natural remedies can find them in clinics specially designated for naturopathic treatments. The chair of naturopathic medicine of the University of Rostock Medical Faculty pro-

vides advice and support for these procedures, acting as a link between research, education and We look forward to meeting you and wish you a successful recovery process in Mecklenburg-Vorpommern.

Rainer Grimm
PKMV e.V. – State Association of Private
Hospitals in Mecklenburg-Vorpommern

Population Based Approaches towards Modern Healthcare

Populations Do Differ

Following World War II, the partition into East and West Germany had yielded two subnations with each having its own course of life expectancy. While mortality in West Germany decreased similarly to the decrease observed in other Western nations, these changes were less pronounced in East Germany.

In particular during the 1980ies, mortality of adults living in East Germany worsened relative to their West German counterparts. One year after the reunification of Germany in 1991, female and male babies born in the East expected an average lifespan that was three to four years shorter than in the West. At the time of reunification of Germany in 1990, there was a considerable lack of scientifically valid data from East Germany to explain the regional differences in life expectancy. Mecklenburg-Vorpommern is the least densely populated Federal State in Germany, and over the past 20 years, the age structure of the society has dramatically changed. Due to migration and decrease in birth rates, the population of Mecklenburg-Vorpommern has changed from the youngest to the oldest one in Germany.

There are no simple solutions for these regional challenges, but population representative data should always form the basis. In the Vorpommern part of the state, SHIP provides valuable information on the prevalence of risk factors and diseases in the Northeast German population. Indeed, the

strong cardiometabolic risk factor burden at least partly explains the low life expectancy in Northeast Germany and points towards directed actions of health policy makers. Beyond explaining regional disparities in life expectancy, population-based data may promote further activities. Long-term follow-ups of the SHIP cohorts are the basis for risk prediction, planning of health care allocation and discussion on alternative health care concepts like telemedicine approaches or individualized medicine in this rural area. The population-based design of SHIP attracts companies to establish reference values for laboratory methods and imaging modalities. Finally the high-tech orientation of the examination program offers opportunities for vendors of innovative medical devices and laboratory kids to validate their products and a population-based setting. Yes, populations do differ. But the combination of demographic changes and cardiometabolic risk profile is not unique for Northeast Germany, and examples for preventive and health care programs established here may serve as template for other rural areas elsewhere in the world. In this sense, welcome to Mecklenburg-Vorpommern and its population!

Prof. Dr. med. Henry Völzke
Institute for Community Medicine
University Medicine Greifswald, Germany

Innovation and Healthcare

Related Industries

From Challenges to Opportunities

Already now EU health care sector spending ranges from 5-11% of regional GDP facing further increase due to demographic development and the fast development of new technologies revolutionizing prediction, prevention and treatment of illness. These trends will not only pose serious threats to the social systems but also to the economic development, especially on a regional level. The aging population together with negative trends in demographic development will not only lead to higher social costs but also to the increasing shortage of qualified workforce and brain drainage due to emigration as motivated and talented individuals will move for the best opportunities.

However, at the same time a paradigm shift has occurred: Health care is not only a cost for society but also a driver of a competitive and knowledge based health economy. Health is also an important factor of employment. Health contributes to wealth and investments in health foster long-term growth and sustainability of economies. A healthy population is necessary for the economic productivity and prosperity and wealth on the other hands supports better health. Health care strongly and directly benefits from research and technological development in life sciences and - at the same time it also triggers such a development, an example of a "business driven technology".

According to Leo A. Nefiodow the whole market economy will be triggered by landmark inventions in health and life sciences. The health sector will be the bearer of the next 6th "Kondratieff cycle" of global economic development.

Mecklenburg-Vorpommern has recognized this opportunity. In the surrounding of a strong research and clinical environment more than 100 small and medium sized enterprises focusing on innovative products, technologies or services for health and life sciences have developed since the fall of the Iron curtain. One special focus is the field of e-health and telemedicine which span all forms of innovation from product innovation over process innovation to organizational innovation. Thus being a complex system that requires change management and adaptation at all levels for a successful and sustainable implementation. If this is not addressed by involving all stakeholders in this complex supply chain, chances of success will be very low. E-health and telemedicine could take advantage of mechanisms and policies being implemented for innovation and macro-regional development and thus support the implementation of telemedicine on a broader scope.

Although the implementation of e-health and telemedicine into practice is still a challenge in overall Europe first success stories can be described. OR Technology has been

operating in the area of digital image processing since 1991, targeting the national and international market. The company, located in Rostock, Germany, provides system solutions for conventional and digital X-ray technology in human and veterinary medicine. With several thousand installed X-ray and image processing systems, the company is represented in over 50 countries worldwide. Large hospitals and universities as well as smaller surgeries are using ORTechnology's solutions with great success.

Other success stories of telemedicine solutions from Mecklenburg-Vorpommern comprise the Telemedicine Network and the "AGnES" telemedicine project. The Telemedicine network was implemented in the Vorpommern region since 2002, focusing on information exchange and knowledge sharing by telepathology, teleradiology and teleconferencing in the scarcely populated Polish German Baltic Sea border region. Since 2006, the infrastructure has also been used for digital mammography. In parallel a network of hard-ware and software-based solutions was implemented to replace the transport of patients and/or histological material samples and thus to accelerate and promote tumor diagnostics in the mostly rural area. Cost savings are moreover possible due to the fact that not every hospital needs its own pathologist but that histological data can be transmitted pseudonymised electronically to a

pathologist in a specialist centre.

"AGnES" stands for "local medical doctor support via e-health systemic intervention by nurses". Special trained nurses monitor therapy and raise patient data during their home visits to immobilized patients, equipped with a telemedicine device including laptop and videophone. The AGnES e-health solution contributes to reduce the number of cost-intensive doctor's home visits in territorial states and allow patients to remain longer in their home environment.

Bernd Oehm
Oehm und Rehbein GmbH
Rostock, Germany

Dr. Wolfgang Blank
BioCon Valley GmbH
Greifswald, Germany



Specialist Providers in Mecklenburg-Vorpommern

Best of
Northern Germany

**Mecklenburg
Vorpommern** 



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Please feel free to contact us at any time. We would be pleased to answer any additional questions concerning medical services in Germany.

Our specially trained and certified professionals prepare individual plans for a healthy diet (including training sessions on food-shopping and cooking), as well as suitable physiotherapeutic programmes, such as aqua aerobics, medical training therapy, group courses and relaxation techniques.

Diabetes mellitus – prevention, treatment – active lifestyle

The ever-increasing incidence of diabetes mellitus worldwide owing to modern lifestyles does not mean that diabetes cannot be prevented or effectively treated.

On the contrary: both scientific research and clinical practice in this area around the globe demonstrate the importance of early diagnosis as the main goal in diabetes management. Regular check-ups for individuals in high-risk groups are considered to be of utmost importance. These high-risk groups include patients suffering from arteriosclerosis, hypertension and/or obesity, as well as the elderly.

The permanent increase in blood glucose levels is regarded as a major factor in the development of this illness. The normalisation of glucose levels constitutes a key requirement for minimising the development of diabetes-related complications. An appropriate diet, an optimal exercise programme, glucose-lowering medication and insulin contribute to the achievement of this aim.

If a patient develops type 2 diabetes mellitus, an appropriate diet is recommended as an integral part of the therapy. If a treatment of exercise and dietary modification proves insufficient to control the disease, oral medication can be prescribed. Adhering to these guidelines makes it possible to control the diabetes and enjoy an active lifestyle for many years to come. Following this approach we offer a broad range of modern services directed at prevention, diagnosis and therapy, both at our medical outpatient centre and in co-operation with other medical institutions in Northern Germany.

Our specially trained and certified professionals prepare individual plans for a healthy diet (including training sessions on food-shopping and cooking), as well as suitable physiotherapeutic programmes, such as aqua aerobics, medical training therapy, group courses and relaxation techniques.

Our services for non-German-speaking patients can be compiled from a selection of modules:

- All services offered on a native-speaker level, thus ensuring a comfortable stay and effective treatment
- Individual selection of the best medical institution for the patient's needs

- Selection of the medical institution, medical personnel and conditions of stay in consultation with the patient
- Preparation of the necessary documents in the German language for the specific treatment, including video conferences with the medical personnel involved
- Communication, special rates for international calls
- Written quote, payment transactions, final invoice
- Travel to and from Germany (special fares from Scandinavian and Lufthansa)
- Transfer, accommodation
- Translation of medical reports (e.g. into Russian)
- Recommendations for further treatment, e.g. aftercare



Apheresis Center Rostock (ACR)

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The ACR is equipped with most advanced apheresis techniques. Currently more than 2,000 apheresis treatments are performed annually with severe lipid disorders linked to premature atherosclerosis and cardiovascular events as well as steroid-resistant ulcerative colitis being the major indications. The ACR is internationally respected and very well connected to other apheresis groups. It supports educational and scientific activities and personnel exchange programs.

When medication fails – apheresis might help

What does “apheresis” stand for? In the medical sense the term “apheresis” is used to describe a technology of separating cells or soluble factors from body fluids by means of an extracorporeal system.

Since the first clinical application of traditional plasma exchange about 50 years ago selective apheresis technologies have been developed and continuously improved to allow an effective elimination of pathogenic target constituents from circulating peripheral blood. Today apheresis technologies are very safe and can be used to treat a wide spectrum of metabolic, immunologic and rheologic disturbances.



ACR experiences and particular features:

- Independently run apheresis clinic
- Member of a regional interdisciplinary outpatient clinic network
- Medical Director is Dr. Wolfgang Ramlow, a nephrologist with more than 25 years of practical experience with apheresis therapy. He is a member of several national and international expert committees. From 2009-11 he served as President of the International Society for Apheresis (ISFA)
- The ACR core staff consists of 3 nephrologists and 7 specially trained and educated apheresis operators
- QM system according to German standards
- Worldwide unique selection of apheresis technologies
- Long-standing experience in pre-clinical and clinical evaluation of apheresis techniques
- Development of clinical trial protocols
- Major indications: severe lipid disorders (hypercholesterolemia, extreme high lipoprotein(a) levels), ulcerative colitis, sudden hearing loss



ACR services:

Together with its partners ACR can provide support in ...

- Initiating apheresis therapy in other institutions
- Performing apheresis treatments in other institutions
- Setting up an apheresis unit / clinic
- Discussing clinical questions concerning apheresis therapy
- Teaching medical staff how to organize and perform apheresis treatments
- Establishing continuous education programs for medical staff and physicians
- Organizing scientific workshops, symposia, congresses

A typical apheresis candidate:

- Myocardial infarction / ischemic stroke before the age of 40
- Family history of premature cardiovascular disease
- Not on target levels of LDL-cholesterol and / or lipoprotein (a) despite maximal lipid-lowering medication



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BioArtProducts GmbH (B.A.P.) is a medical research and service company that is an integrative part of a regional interdisciplinary outpatient clinic network. B.A.P. develops and helps to implement screening programs, treatment algorithms and quality management systems with the main emphasis on cardiometabolic and renal risk assessment. Early identification of high-risk patients is extremely important in order to prevent accelerated progression to cardiovascular events or dialysis dependency. Moreover, B.A.P. develops proprietary software for medical studies and registers and supports health facilities to implement cross-sectoral cooperation structures.

Cardiometabolic and renal risk assessment in early stage ...a benefit of patients and health insurance

Business segments:

Development of software with medical background

- Development and implementation of screening software for the early identification of patients with diabetes, hypercholesterolemia and premature cardiovascular and/ or kidney diseases
- Development of a web-based infrastructure for prospective data collection multicenter studies or in national medical registers
- "Medi Apps" programming – innovative IT-solutions to increase the patients' compliance

Quality management according to German standards

- Development, implementation and evaluation of quality management systems for dialysis and apheresis
- Special modules for hygiene management
- Joint projects with health authorities and insurance companies

Pre-clinical and clinical research

- Pre-clinical and clinical evaluation of devices and disposables for blood purification products (dialysis and apheresis)

Educational activities

- Special teaching and training programs for dialysis and apheresis staff
- Organization of scientific and educational meetings

Our major fields of interest:

- Early identification of symptom free patients with extreme cardiometabolic and renal risk
- Development of individualized treatment strategies for patients with extreme cardiometabolic risk
- Initiation of FH screening programs in close cooperation with partners from science and industry

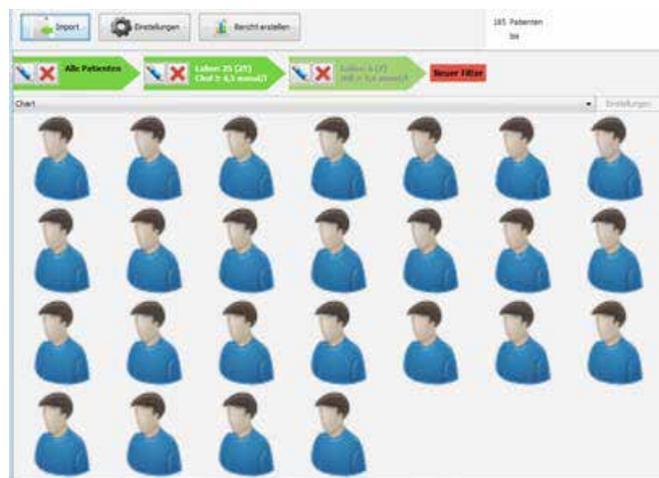
Atherosclerotic cardiovascular diseases are the leading course of mortality in industrialized countries, but only a few people know their individual cardiovascular risk factors and the consequences thereof.

B.A.P. has a special focus on screening for diabetes, nephropathy, hypercholesterolemia, and cardiovascular comorbidities. We bring together laboratory data, diagnoses and drug prescriptions to identify high-risk patients in early disease stage.

German Lipidapheresis-Registry



Screening Software



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 Biomedizinische Forschung und
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 Germany

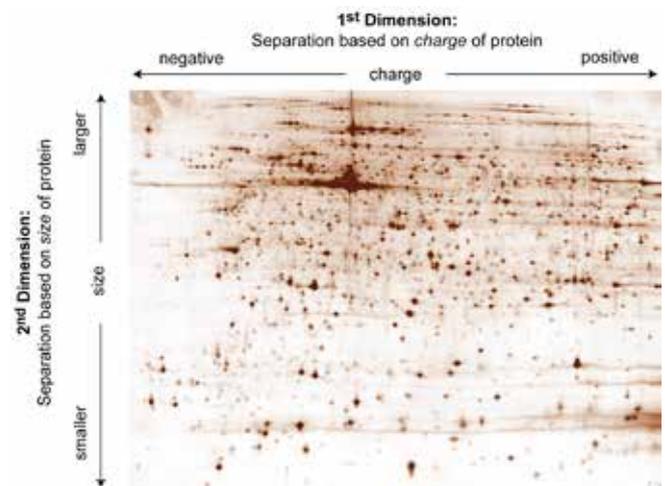
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BIOMEDRO Biomedizinische Forschung und Entwicklung GmbH is committed to basic medical research, the development of diagnostic test systems, and the carrying out of clinical studies investigating innovative treatment and diagnostic strategies in rheumatic autoimmune diseases.

BIOMEDRO BIOTECH

performs basic medical research, with a predominant focus on biomarker discovery using sophisticated proteomics approaches such as two-dimensional gel electrophoresis. Methodologies such as recombinant DNA technology are employed in order to translate screening results into building blocks that can be used in the development of diagnostic test systems.

BIOMEDRO DIAGNOSTICS develops ELISA tests using individual, highly purified recombinant antigens – resulting in hits that are very specific. Novel technologies are implemented in many of our test systems. For example, in our anti-dsDNA ELISA, the DNA antigen is anchored to the matrix through a unique “bridging molecule”, that allows for the optimal presentation of highly purified, protein-free double-stranded DNA. These test systems offer a state-of-the-art, no-nonsense solution for the diagnosis of rheumatic autoimmune diseases.



Products in development:

- Anti-dsDNA ELISA
- Anti-SS-A ELISA
- Anti-SS-B ELISA
- Anti-RNP ELISA
- Anti-Sm ELISA
- Anti-Jo-1 ELISA
- Anti-Scl-70 ELISA
- Anti-PmScl ELISA
- Anti-MPO ELISA
- Anti-PR3 ELISA
- Rheumatoid Factor ELISA

BIOMEDRO CLINICAL RESEARCH carries out clinical trials under contract to the pharmaceutical industry, and has reached the status of a national clinical testing center through the carrying out of Phase II, III and IV Clinical Studies. A vital partner in this area is the largest rheumatology clinic in Mecklenburg-Vorpommern, the Rheumazentrum Prof. Dr. med. Gunther Neeck.



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CyberKnife™ Radiosurgery is now available in Güstrow for highest precision cancer treatment throughout the body. The CyberKnife offers the most advanced tumor treatment with highest comfort and minimal side effects through robotic and image guidance and motion compensation.

Oncology Network Northern Germany: CyberKnife Robotic Radiosurgery

The CyberKnife™ Radiosurgery System in Güstrow is the latest technology of the Oncology Network Northern Germany which consists of the four Baltic University Clinics in Kiel, Luebeck, Rostock and Greifswald and the hospitals in Stralsund and Neubrandenburg and many more. The CyberKnife was originally developed in Stanford, USA, but many of its hard- and software packages were developed in Germany, especially at the University of Luebeck. So the Oncology Network is proud that the latest version of the CyberKnife is available for cancer treatment in the heart of Mecklenburg-Vorpommern.

The sub-millimeter accurate treatment of the CyberKnife allows the utmost patient comfort and the most advanced cancer therapy for many tumor types. By sophisticated digital image management and his robot-controlled precision linear accelerator the CyberKnife is capable of targeting the tumor with high dose while at the same time sparing the healthy surrounding organs. As the only system worldwide, the CyberKnife is even capable of motion compensation i.e. when the tumor moves due to the patients breathing. Through special computer control systems the tumors are always precisely targeted. This further maximizes the sparing of healthy organs and therefore allows for maximum efficiency in the irradiation of tumors with minimal side effects especially in moving organs.

For a treatment in the Oncology Network Northern Germany each patient will be reviewed by our multidisciplinary medical expert committee consisting of the

universities and big hospitals in Northern Germany. For each patient an individual treatment opinion will be given by a group of experts in radiation and internal oncology, radiology, surgery, and many more depending on the location and kind of cancer. With that the best possible treatment can be offered and CyberKnife Radiosurgery in one out of many options of the Oncology Network Northern Germany. With the CyberKnife alone tumors throughout the body can be treated, but they have to be clearly localized and not too big in size. Otherwise a combined therapy

may be possible in our Network. In example malignant and benign tumors in the head and spine, such as brain and spine Metastases, Meningioma, Acoustic Neuroma and Uveal Melanoma are typical indications for CyberKnife. Functional diseases such as Trigeminal Neuralgia or Atrial Venous Malformations are also commonly treated if they are inoperable. In the body primary and secondary lung and liver tumors and in some cases and often in combination with other therapies kidney, pancreas, lymph-nodes and prostate tumors can be treated.



Contact:

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www.dst-diagnostic.com

DST Diagnostische Systeme & Technologien GmbH is a company that develops, manufactures and markets in vitro tests for point of care diagnostics.

DST has committed itself to high user friendliness and excellent reliability and patient compliance.



DST

Diagnostische Systeme & Technologien GmbH – Diagnostics made in Germany –

The number of allergic patients in industrialized countries has increased over the past 30 years. Presently approximately 30% of the European population is affected. 70% of the allergic people are being or have been treated by health care professionals. For several reasons only 5% of allergic people have received laboratory diagnostics to determine the origin of their suffer.

The meaning of diagnostics and the treatment of allergies vary significantly within Europe and all over the world. It is a fact that in most countries only too little specialists focus on adequate prevention strategies as treating the symptoms is often easier and faster, less difficult and less cost intensive.

DST has identified the chances in developing, manufacturing and marketing in vitro tests for point of care diagnostics. Major products of the company are tests based on the FastCheckPOC® platform that require only little amounts of capillary or heparin blood. These tests come as complete kits and do not require any further equipment or readers. The test result becomes visible as an unambiguous patented display after max. 30 minutes. DST's FastCheckPOC® allergy tests screen specific IgE against multiple airborne or food allergens, respectively and covers 90% of the relevant European allergies.

Furthermore, DST also offers sIgE and sIgG4 based liquid allergen diagnostic systems for manual or automated laboratory testing. DST is ISO-certified and works under GMP-conditions, the tests are CE-marked.

The advertisement features a red background with a white curved area on the left. At the top left, a row of six icons represents various allergens: a cat, nuts, a strawberry, an egg, pollen, and carrots. Below these icons is a red banner with the website www.dst-diagnostic.com. To the left of the banner is a certification logo for DST, listing 'Certified Management System', 'ISO 9001', and 'EN ISO 13485'. Below the banner are four vials labeled 'Allergen extracts'. To the right is a white 'FastCheckPOC' device and a multi-well plate with a pipette, labeled 'Liquid Allergen System'. The DST logo and tagline 'DIAGNOSTICS AT A DROP' are in the top right. The CE mark is in the bottom right. The company name and address are at the bottom.

DST
DIAGNOSTICS AT A DROP®

www.dst-diagnostic.com

FastCheckPOC®

Liquid Allergen System

Allergen extracts

GMP
GOOD MANUFACTURING PRACTICE

CE

Diagnostische Systeme & Technologien GmbH · Güstrower Strasse 16 · 19059 Schwerin · Germany

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HOFFRICHTER GmbH was founded in 1992 by Helmut Hoffrichter. The first products were high precision ceramiccapacitive pressure sensors and rhinomanometers for physical and medical applications.

As a new branch, the sleep medicin started to develop. Today the range of devices reaches from respiration therapy devices to high quality ventilators. Also a lot of different accesories can be found in the portfolio of the company.



“Quality makes the difference“

is the philosophy of the company. This means highest demands on technology, materials and design of the devices.

The variety of products is a quality sign as well. The product line currently consists of three series with a total of 12 different respiratory therapy devices and 3 different ventilators, of which one has won the Red Dot Design Award 2012.

HOFFRICHTER not only aims for high quality products, but also for the idea that medical devices for home care adapt well to the ambiance of the patients.

Meanwhile, the devices from HOFFRICHTER are known worldwide and are sold successfully in more than 50 countries through local distributors.



Headquarter in Schwerin

Respiratory therapy devices

Respiratory therapy devices are designed for the treatment of sleep-related breathing disorders in patients weighing 30 kg or more.

The device generates a positive airway pressure, which keeps open the airways of the patient during sleep. The therapy pressure is administered via a breathing mask (nose mask, nasal pillow or full face mask), which must be equipped with an exhalation valve to ensure the derivation of the exhaled air. Various therapy modes can be set in the therapy devices. Basis is the monolevel therapy (CPAP) and selfregulatory modes (Auto CPAP), in which the pressure varies, depending on events, within predetermined pressure limits. Furthermore, Flexline modes are available, to increase the therapeutic comfort for patients.



point 2 - the latest respiration therapy device.

Ventilators

Home ventilation is a field of intensive care. Patients who are ventilated mechanically because of temporary or permanent disorders of nervous system or respiratory muscles can find help in HOFFRICHTER ventilators. A distinction is made between invasive and non-invasive ventilation. Here, patients primarily are treated pressure / volume- controlled or only assisted. Again, the field of further special modes is nearly endless.

For all types of ventilation, one of the three different ventilators from HOFFRICHTER will give patients a new, better and autonomous life.



TRENDvent – Winner of the Red Dot Design Award 2012

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IMAGE Information Systems Europe GmbH provides complete, easy-to-use and innovative medical imaging solutions to radiology professionals worldwide.

IMAGE Information Systems –

For a better view in diagnostics

IMAGE Information Systems (IMAGE) is a worldwide operating manufacturer of innovative medical imaging solutions. We develop and provide easy-to-use Picture Archiving and Communication Systems (PACS), integrated nuclear medicine solutions, economic radiology information systems as well as high-quality medical display solutions. IMAGE has a special know-how in the field of teleradiology, medical interfaces and optimal integration of digital solutions into medical processes.

With our iQ product range, customers can be sure to work with the most recent technology available in the market. These products can easily be integrated with products from other vendors, for example with any HIS, RIS and EMR. All applications have intuitive user interfaces in local languages and their solutions are easy and fast to install and maintain.

iQ-VIEW is a multimodality radiology workstation that has been developed by radiologists for radiologists. It is the first DICOM viewer worldwide that has received the DICOM-CD certificate of the German Radiological Society. This guarantees that portable media created with iQ-VIEW fulfill the requirements for DICOM media and can be used properly on any PC.

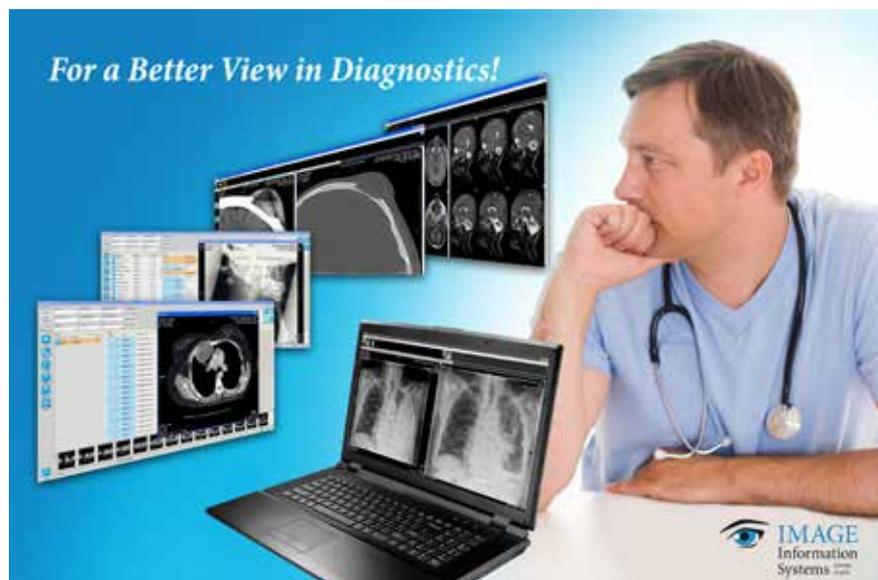
iQ-WEBX is a complete online solution for storing, viewing and distributing medical imaging studies and reports. Its web-based DICOM viewer and DICOM structured report module make it ideal for teleradiology purposes.

iQ-RIS is the soul of the radiology department, accompanying the PACS for maximal efficiency. It is a flexible radiology information system, which can easily be customized to meet the requirements of any hospital or imaging center. Representing the next generation of radiology information systems, iQ-RIS offers superb tools for the optimization of the radiological workflow and allows integration with almost any PACS.

Teleradiology

By implementing teleradiology systems, hospitals and imaging centers increase their independence, flexibility as well as savings in time and resources. Additionally, they can outsource possibilities for sub-specializations while keeping high standards and eliminating bottle-necks. Radiologists do not have to be present at the same location as the patients and even the largest images can be transferred in a matter of minutes.

iQ-MOBILITY is the perfect mobile teleradiology solution for quickly receiving and sending big amounts of medical imaging data and having available virtually all professional tools required for medical imaging diagnostics and post-processing anywhere, anytime, even when using regular internet connections.



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The internationally renowned Karlsburg Institute of Diabetes "Gerhardt Katsch" in Karlsburg, a former WHO reference center for diabetes, has many years of experience in providing personalized support for doctors and patients, in experimental and clinical research in type II diabetes research, in training doctors in diabetology, as well as in the general organization and coordination of outpatient and clinical support for diabetics.

KADIS® - Personalized diabetes management

Measure your own blood glucose level over the course of the day and identify individual patterns

- Optimized therapy management with evidence-based decision support for the treating physician
- Avoid hospital visits
- No revolving door effect
- Optimize your everyday metabolism
- Improved medical expertise
- Save on costs

The TeleDIAB® project team at the Institute of Diabetes "Gerhardt Katsch" in Karlsburg has developed the unique KADIS® interactive support program, which is based on many years of research and will soon become available online as well. Since 2006, KADIS® has been used for inte-

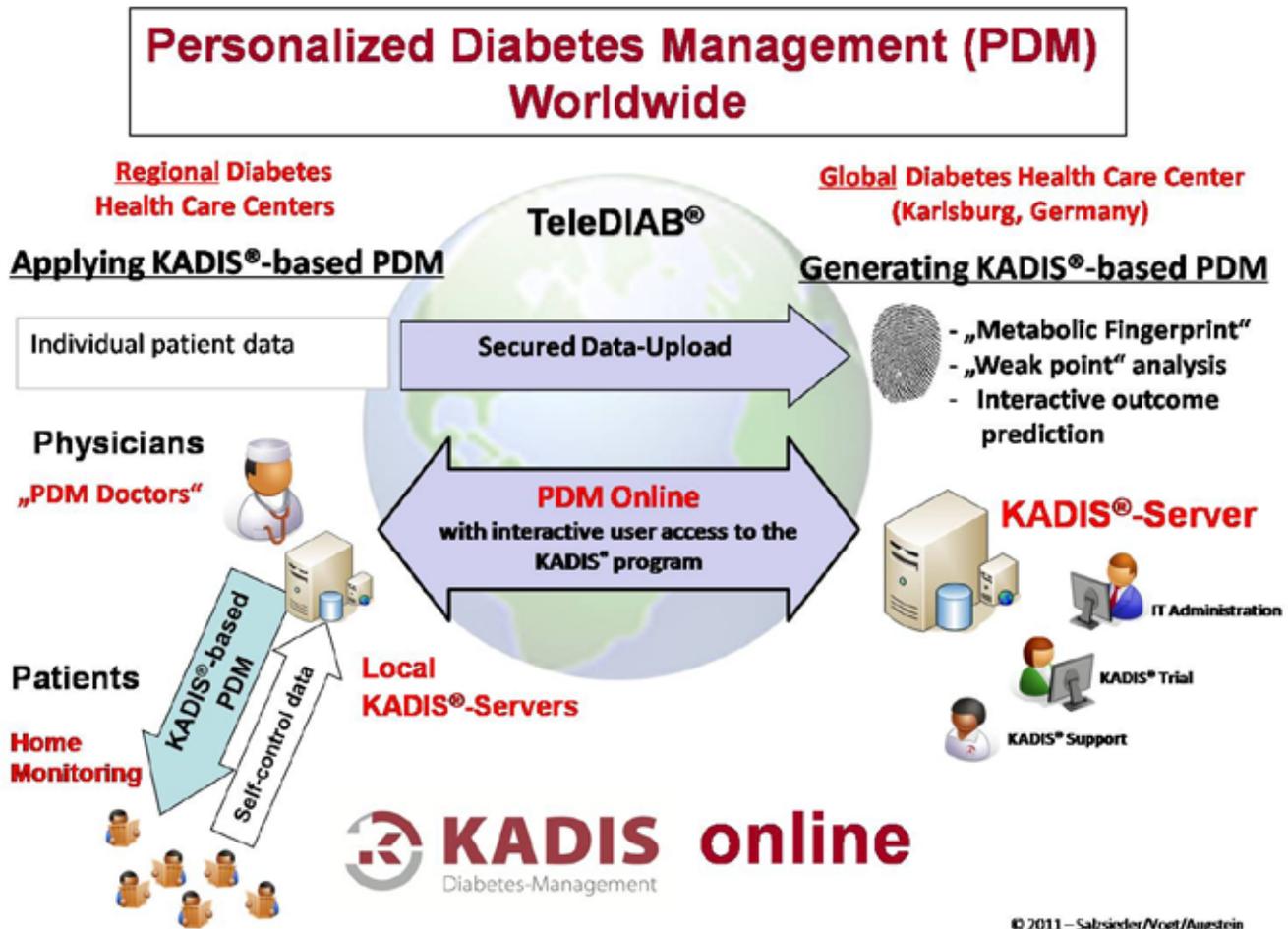


grated diabetic support activities in Germany with great success. With continuously measured blood glucose readings and self-checking data, the program makes it possible to develop customized recommendations for optimizing the patient's metabolic management under everyday conditions and to provide personalized decision-making support for the treating physician.

The Karlsburg Diabetes Management System KADIS® is a computer-supported, evidence-based program which enables diabetes specialists to quickly and reliably analyze individual therapy options. The goal is to overcome identi-

fied weaknesses in the patient's personal metabolism management by predicting his or her expected blood glucose curve. Based on the treatment guidelines developed by the German Diabetes Society, various therapeutic options can be identified by varying the following:

- Insulin therapy (dosage, timing, type)
- Oral diabetes medication (dosage, timing, type)
- Exercise (intensity, timing, duration)
- Food (number of bread units, timing, type)



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Infokom (founded in 1991) offers customer-oriented full-range IT solutions. Our range of services includes consulting, software development and IT training, as well as the distribution, installation and management of hardware, software and networks. We are proud of our international cooperative ventures and relationships, especially in the Middle East, the USA and China, as well as of our experience in sourcing, planning and running international pilot projects in the health sector.

Mobil Diab®: Modern, innovative solutions for assisting in the monitoring and treatment of diabetes patients.

The idea behind Mobil Diab® is to involve the patient in the therapy process and to motivate him to actively participate in the treatment process.

Infokom is a partner in the European FEARLESS project of the Ambient Assisted Living Initiative with partners in Austria, Spain, Italy and Germany. The goal of this project is to improve the quality of life for people in all stages of life by combining new technologies with their social environment. The basic idea involves recognizing events and threats such as falls (diabetics have a higher risk of falling than non-diabetics) early and to trigger an automatic alarm that summons help. Infokom is developing the integrated data system and innovative marketing strategies for this project. This empowers the patient to take responsibility for his treatment in partnership with the physician.

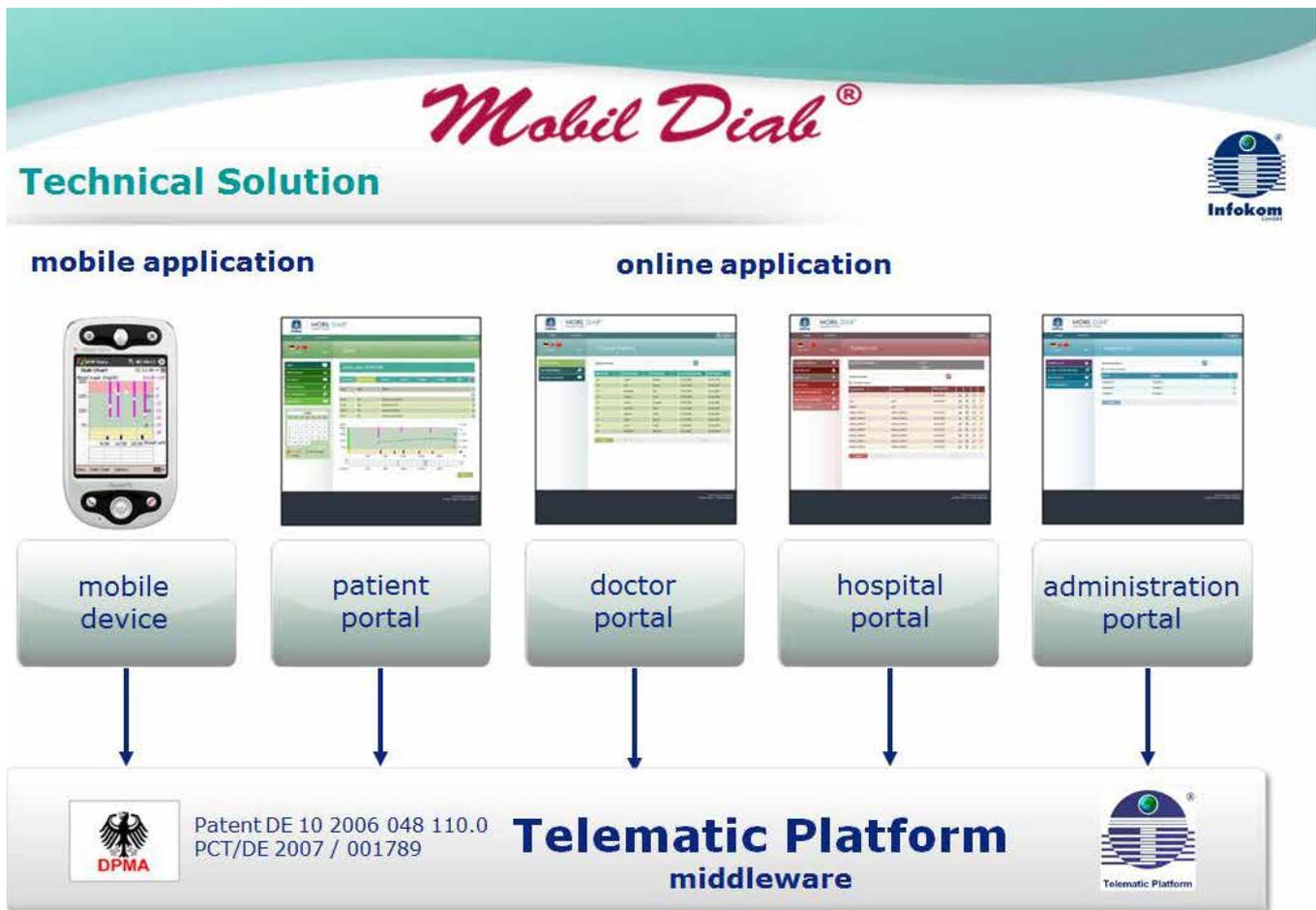
The system offers the opportunity for interactive communication between the doctor and the patient. The patient keeps an electronic diary, in which he continuously records his personal health data (blood glucose levels, medication, food, exercise, etc.), and makes this information available to the doctor. This way, the doctor can monitor the patient's data remotely.

As a result, the doctor can adapt the therapy at any time, intervene if necessary and make relevant information available to the patient.

Mobil Diab® offers diabetics the opportunity to monitor their medical data 24 hours a day. The data can be matched with the telematics platform (TMP) at any time. In the case of emergencies, the system will notify the doctor in charge and provide him with the relevant data.

The main features are:

- Easy-to-handle and transportable device with integrated mobile phone
- Diary for continuous recording of the medical data
- Integrated measuring devices and camera
- Matching of data independently of time and location with the TMP
- Reminder features
- Receiving messages from the physician
- Multilingual
- Simple Windows-based user interface



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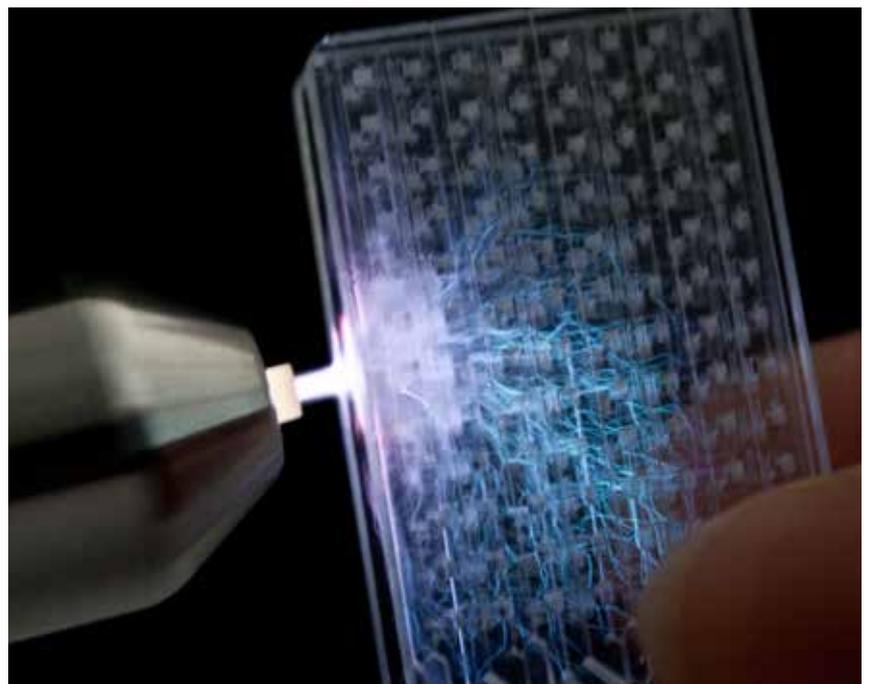
www.inp-greifswald.de

The Leibniz Institute for Plasma Science and Technology (INP Greifswald) is the largest non-university-affiliated institute in the field of low-temperature plasmas, their basic principles and technical application in Europe.

Plasma medicine for diabetes wound management: from science to prototype

Greifswald has become a leading international center for plasma medicine in recent years. One of the major reasons for this development is the safety and tolerability of plasma applications. The establishment of the first professorship in the field is another indicator of plasma medicine's potential for the future.

The Leibniz Institute for Plasma Science and Technology (INP Greifswald) is the largest non-university-affiliated institute in the field of low-temperature plasmas, their basic principles and their technical application in Europe. INP conducts application-oriented basic research and aims to improve established plasma-assisted procedures and products.



INP also adapts plasmas to customer-specific needs and offers feasibility studies, consulting and other services.

The therapeutic use of cold plasma sources is developing into a separate international medical field. The use of physical plasmas may become established in only a few years as a tool for fighting dangerous hospital-based infection sources as well as for introducing patient-friendly treatment methods.

The therapeutic use of plasmas directly on or in the human body is a totally new field that is rapidly raising interest all over the world under the name plasma medicine. A major potential application area for plasma medicine involves the healing of wounds such as foot wounds, which are common in diabetics, because badly healing chronic wounds can make the affected patients' lives miserable.



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The optimal combination of aesthetics, functionality and economic aspects is particularly important for our planners.

Bringing space to life

Our architects and planning specialists conceive all-embracing concepts with high standards of architectural design and the development of sophisticated supporting structures. We promote the energetic optimization of buildings and decisively contribute to the technical and economic success of the construction projects.

Whether it is for new construction or renovation, our goal is to develop sustainable and cost-effective energy concepts to further reduce energy consumption. Our focal points are not only on the use of regenerative energies such as solar radiation and near-surface geothermal energy, but also on intelligent control systems.

We are planning for:

- Property developments
- Hospitals and medical facilities
- Laboratories and educational institutions
- Residential buildings and hotels
- Sports facilities
- Convention and exhibition centres
- Industrial and commercial building
- Car parks / Underground parkings



Heart and Diabetes Center - Klinikum Karlsburg

Contact:

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The KLINIKUM KARLSBURG hospital is a renowned facility for cardiovascular disorders and diabetes, as well as an important specialty hospital for diabetes patients with cardiovascular disorders and children and adolescents with diabetes.

Ever since July 2010, the KLINIKUM KARLSBURG hospital owns the most modern heart surgery theatre of Northern Germany.

Each year, roughly 2,500 cardiac and vascular surgeries and over 5,000 cardiological procedures are performed at the center. The diabetes clinic treats over 2,000 patients of all ages annually. The broad experience of our physicians and employees gives the patients peace of mind and ensures that their treatment will be successful.

Simply cordially: High tech medicine at the Klinikum Karlsburg

Innovation

On the fields of cardiovascular medicine and cardiology, scientific progress is impressive. In these disciplines, the KLINIKUM KARLSBURG hospital is among the leading institutions of Northern Germany. Within the field of heart surgery, the most modern surgical methods including minimally invasive procedures are employed.

Thus, for example, drug coated stents (implants) of the most recent generation are used, patients with severe congestive heart failure after myocardial infarction are treated with stem cells and patients affected by cardiac arrhythmias are treated with electrotherapeutics and implantable defibrillators. Even with the implantation of aortic valve stents in patients at risk of advanced age, the physicians at the KLINIKUM KARLSBURG hospital achieve great successes.

Safety

Surgical interventions at the heart are a medical challenge. Owing to a comprehensive risk management, the specialised team of the KLINIKUM KARLSBURG hospital succeeds in reducing potential risks to a minimum. Thus, for example, patients receive small bracelets before surgeries, on which the most important personal data are recorded. Particularly impressive is the progress in telemedicine.

The monitoring centres allow for - if necessary - recording and analysing the heart rhythms of all 100 heart patients

around the clock. During the day, the electronically monitored patient can leave his room nevertheless. A small portable device delivers all the important information to the team of physicians. This way, it is possible to address potential cardiac arrhythmias immediately.

No patient weakened by illness or surgery is exposed to additional risks. For example, the hygiene management of the hospital, which is developed well above average, ensures that the risk of hospital infections is minimal.



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The MBP GmbH offers effective solutions for tissue regeneration and advanced wound care with emphasis on supporting the body's own healing capabilities. Safety and effectiveness of our products are the results of our expertise on collagen and innovative alignment of the company.

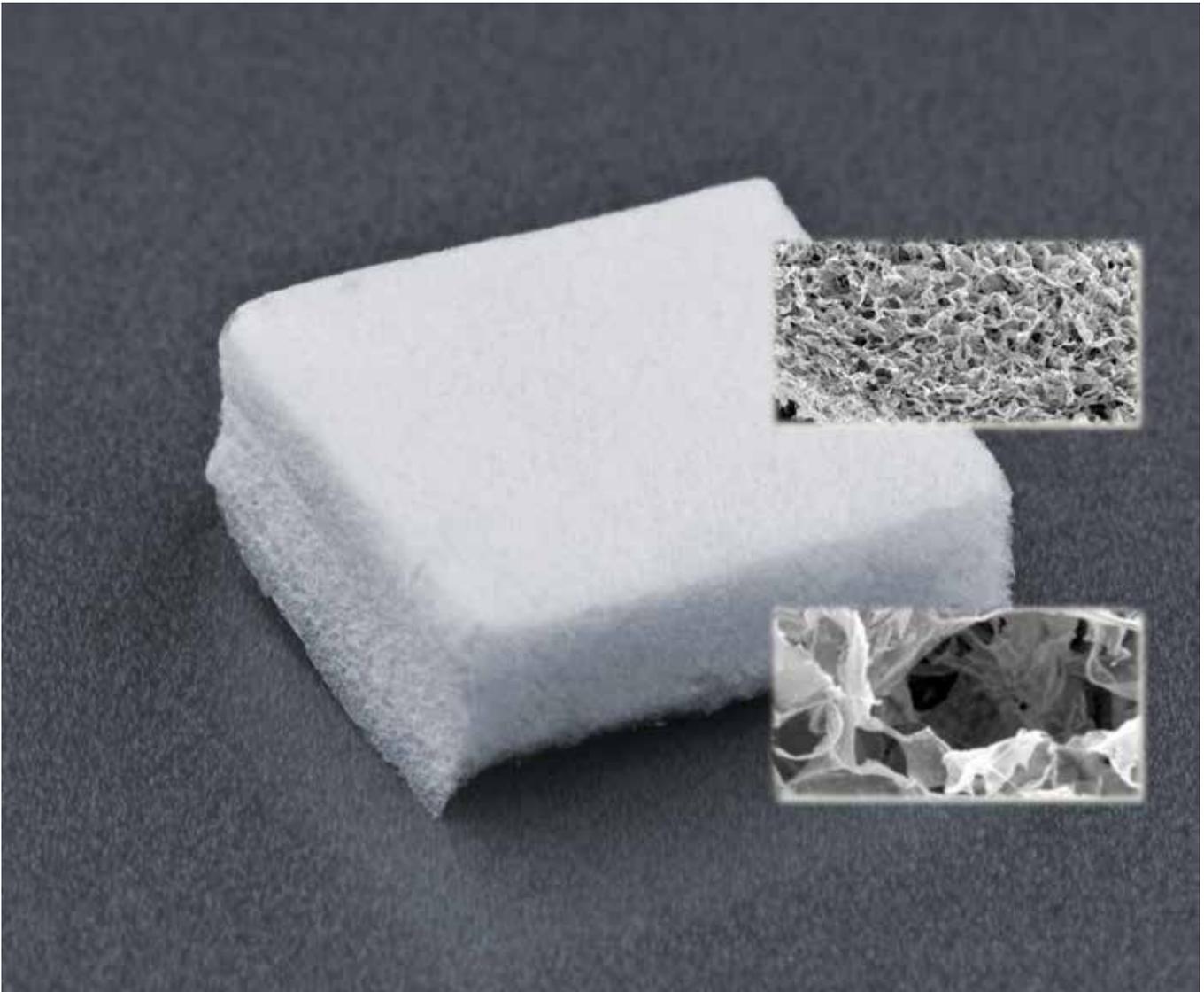
Collagen is known to have positive influence on wound healing by binding proteases on the one hand and on the other hand attracting and hosting body's own fibroblasts. In consequence the proliferation of fibroblasts is supported and the body's own collagen production is enhanced leading to fast wound healing. This makes our MB-Collagen a perfect device for the treatment of trauma wounds, Ulcus decubitus or chronic wounds.

If large areas of the body are affected by loss of skin eg. due to burns or traumatic injuries then the organism faces a dangerous situation. The patient lost his natural protection against microorganisms and suffers from caloric loss. Xenoderm is a split-skin graft to cover these areas leading to pain relief and restoring the wound micro-environment. Wound healing is enhanced under improved cosmetic results.

Besides the wound healing enhancement collagen has an additional hemostatic effect. By two complementary working pathways collagen effectively stops the bleeding. The first path works via the concentration of erythrocytes throughout the swelling effect of collagen. The second pathway aggregates the erythrocytes on the collagen fibers leading to the release of coagulation factors and thus initiating the coagulation cascade. The described properties, traceless resorbability and outstanding biocompatibility make the Surgicoll® product family to effective and reliable hemostats of choice.

MBP stands for:

- 32 years in collagen experience
- "Hand in hand" development of new products with their customers
- Certified according DIN EN ISO 13485:2008
- Adhering to GMP standards since 1994



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neoplas puts its emphasis on the support of academic and industrial R&D. Our clients are public research institutions and high technology companies:

- Expedient technology development
- Efficient technology management
- Effective technology marketing

neoplas closes the gap between the initial idea in the lab and the successful product launch on the market. Our experience enables us to overcome the numerous barriers of the highly complex technology transfer landscape and therefore achieves measurable results more quickly.

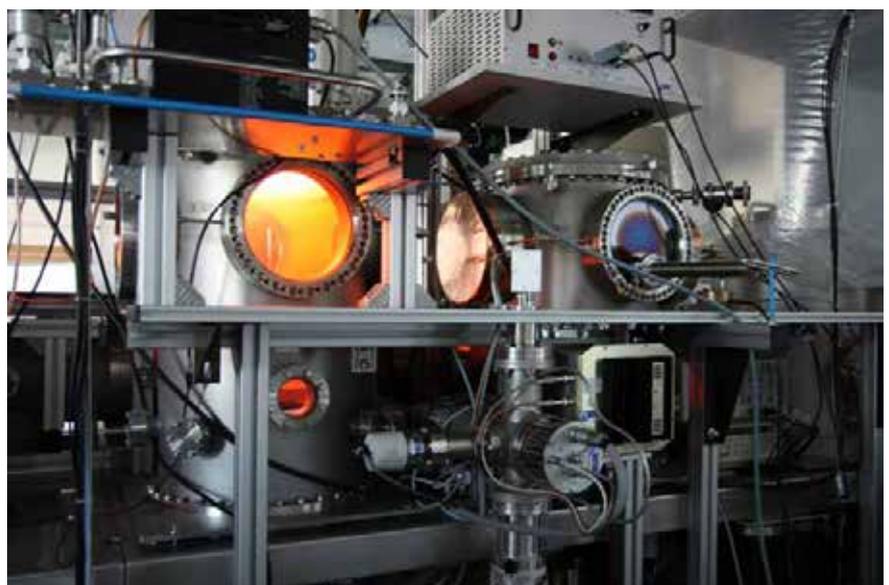
Typical research fields are plasma medicine, enzyme immobilization and biodecontamination.

From science – for science – into the market

Plasma devices for research and development

Plasma medicine is a rapidly developing field – like laser medicine was 20 years ago. Every day new research groups around the world are getting active in this promising field for the treatment of wounds and skin diseases. Essential tools for this research are comprehensively characterized and well described plasma systems (plasma sources).

The device is CE-certified for industrial applications such as surface hydrophilization. The plasma source is reproducibly characterized and well documented in peer-reviewed journals and its therapeutic potential was demonstrated on many occasions. The device is intended exclusively for research purposes (no medical device).



Gold standard in plasma medicine

The “kinpen” plasma jet was developed in cooperation with medical scientists, physicists and engineers. Due to its very well documented characteristics, it is set to become the gold standard in R&D in plasma medicine such as the treatment of biological surfaces and structures. With this tool, practitioners are able to move to the forefront of modern international treatment standards. Experiences from numerous disciplines were combined during product development.



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OR Technology (Oehm und Rehbein GmbH) has produced digital X-ray technology and developed image management systems for over 20 years. Our in-house solutions are used in private practices, hospitals and radiology. The successful track record includes more than 2000 installed image processing systems in over 50 countries.

OR Technology – A competent partner for digital X-ray imaging

The story of OR Technology is closely connected with the developments in medical technology over the past two decades. A visionary strategy, innovative ideas, consistent quality policies, investments in development and service, as well as the strategic set-up of an international network of distributors enabled our company to grow from a supplier of medical practice administration systems within Germany to a software system provider operating around the world.

Headquarters Rostock, Germany



Tailor-made innovation

Close consultation with doctors and universities is an integral part of our company's approach. As a result, we are in a position to offer technically mature and individually adjusted system solutions to our partners in human and veterinary medicine, as well as in industry. All product development takes place within our company.

The portfolio ranges from DR retrofits for existing X-ray systems, CR systems and complete X-ray systems to the mobile

detector suitcase solution for outdoor use (e.g. on ships and oil rigs, in remote locations or disaster management). Innovative research and the further development of our dicomPACS® digital image processing software have led to the highly professional dicomPACS®DX-R acquisition software which is an integral part of all our digital X-ray solutions. Renowned system integrators (OEMs) are also using individualized versions of this dicomPACS®DX-R acquisition software as a component within their systems with great success.

Areas of activity



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As part of the University of Rostock's Medical Center, the University Eye Clinic is also active in scientific research. In recent years it has been particularly successful in the use of lasers for ophthalmological applications, especially in the treatment of malicious diseases of the eye, eye socket and eyelids.

Rostock Cornea Modul:

Three-dimensional laser diagnostics for patients with diabetic retinopathy University of Rostock

The experimental developments of a research group led by Prof. Rudolf Guthoff at the University of Rostock Eye Clinic now allow three-dimensional imaging of the cornea – something that was previously scarcely considered possible – and could, among other things, be used for improved diagnosis of nerve damage among diabetic patients (diabetic retinopathy).

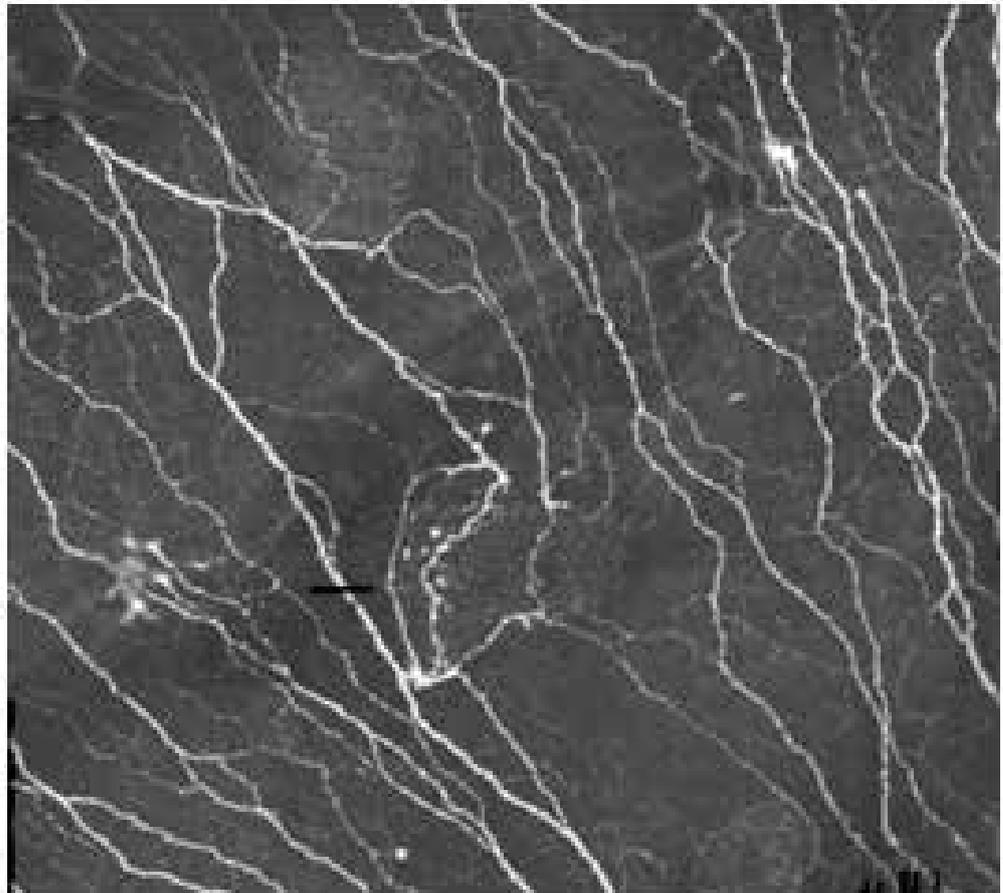
New diagnostics for nerve damage caused by diabetes

For some years now, the University of Rostock Eye Clinic has been working on the development of imaging techniques that provide microscopic views of a patient's cornea. In cooperation with Heidelberg Engineering GmbH (Dossenheim), we developed a marketable device that is based on laser scanning technology. In the meantime, further advances permit us to produce three-dimensional images of the human cornea in a way that used to be considered virtually impossible.

In recent months it became apparent that the nerves running through the cornea may be used as an indicator of damage in the peripheral nerve system in diabetics. In cooperation with the Karlsruhe-based Institute for Technology and the University of Leipzig we were also able to develop software modules for quantifying the level of nerve damage.

Today, this method is already being used in the United States, Australia and Manchester, England, where the positive results of the scientists in Rostock could be confirmed.

We expect this technology to replace the previous need for collecting biopsies from the skin of diabetics and provide a non-invasive way to monitor nerve changes caused by degenerative diseases, especially diabetes. We are currently conducting clinical studies in cooperation with the Süd-stadt Rostock Medical Center and the Institute for Clinical Diabetology at the German Diabetes Center of Heinrich Heine University in Duesseldorf.



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The history of the University Medicine Greifswald began on October 17, 1456 with the founding of the University of Greifswald and its medical faculty. Today the University Medicine Greifswald encompasses a wide range of services offered by multiple facilities working in co-operation, including 21 clinics/policlinics, 19 institutes and other important facilities.

By 2014 the various facilities, which are currently distributed throughout the city, will be consolidated in a single location. Once this restructuring is complete, the University Medicine Greifswald will be able to work even more effectively and innovatively, as the most modern medical facility in Germany.

The highest quality for the benefit of our patients.

Gestational diabetes

University Medical centre Greifswald offers today a top level medical care and a wide range of services in 21 departments and 19 institutes. Greifswald is home to one of the oldest obstetrical and gynaecological departments in Germany.

Our obstetricians and gynaecologists provides comprehensive personalized healthcare at the highest medical and scientific level designed to meet women's needs from childhood and adolescence through the reproductive years into menopause and beyond. Our teams of specialists offers preventive gynaecologic care, reproductive endocrinology and infertility treatment and complete pregnancy care from preconception through delivery, with specific diagnosis and management for virtually any complications during pregnancy.

There is a range of intensive medical care facilities available to deal with problematic births. Modern treatment methods and equipment comply with the latest standards. Our clinical expertise of the physicians is continually improved by several scientific projects in our research laboratories and through participation in national and international studies. Additionally, we have physicians who specialize in complex gynaecologic surgical conditions and malignancies.

Top-quality medical care

The University Medicine Greifswald has 926 beds, including 23 day-unit beds for mental health services and 10 day-unit places for palliative care services. In 2011 a total of 150,000 patients were treated, of which 37,806 received either in-patient or day-care treatment.

Training and research

- 1,714 matriculated students in the medical faculty
- 560 students at the University Medicine Greifswald vocational school
- Information system for research
- Programmes: Community Medicine (CM) and Study of Health in Pomerania (SHIP)
- Project: Individualized Medicine in Greifswald
- Research training group "Host-pathogen interactions in generalized bacterial infections"
- Gerhard Domagk scholarship programme for young research scientists



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Greifswald pediatric surgery is the surgical partner for COACH (Collaborative Alliance on Congenital Hyperinsulinism). This is a Germany-wide network of specialists dedicated to hyperinsulinism

Congenital hyperinsulinism (CHI)

is a rare inborn error of glucose metabolism. In contrast to diabetes mellitus there is an excessive secretion of insulin from pancreatic islet cells resulting in life-threatening hypoglycemia. Symptomatology often arises already in the newborn period: apathia, loss of consciousness, fits. Without proper treatment severe neurological deficits ensue.

Diagnosis

is made by persistent hypoglycemia ($< 50\text{mg/dL}$ or $< 3\text{mmol/L}$) together with inadequate insulin levels

Genetic investigation

of patient and the parents reveals a mutation in about 50% of cases

¹⁸F-L-DOPA-PET/CT

distinguishes between non-focal and focal forms of congenital hyperinsulinism and localizes the focal lesion with a precision of 1 mm

Therapy

depends on the form of congenital hyperinsulinism

Focal CHI

only a small area of the pancreas (5-13mm) is affected. Only the focal lesion is removed by highly selective surgery, if possible by laparoscopy

Atypical segmental mosaic CHI

normal and pathological islet cells coexist side by side.

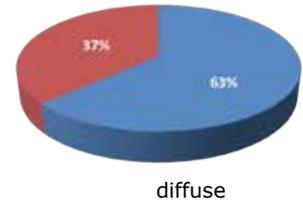
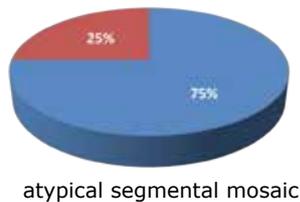
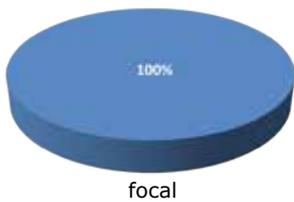
Often there is an accumulation of pathological islet cells in certain areas of the pancreas ("segmental mosaic")

Diffuse CHI

all islet cells of the pancreas are affected homogenously. Medical therapy is indicated with diazoxide, octreotide or glucagon, in most cases for years. If unresponsive many children benefit from a reduction of the islet cell mass by a laparoscopic pancreatic tail resection.

Results

of surgical therapy in CHI (Hyperinsulinism Germany International)



Diabetes

Our diabetes rate is 0%. We do not perform the sub/near-total pancreatic resections any more because of the unacceptably high rate of diabetes (> 90%) later in puberty.

Hyperinsulinism Germany International

is an interdisciplinary consortium of experienced specialists dedicated especially to congenital hyperinsulinism. It is based in Germany in the cities of Greifswald, Magdeburg and in Berlin. Today it has the broadest experience with surgical therapy of CHI in Europe and excellent results in patients coming from all over Germany and all parts of the world.



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Aims of CM at the University are to improve the quality of life of the regional population and to secure high-standard health care in the region in the long run.

SHIP International

Data comparability among population studies is of increasing importance. On the one hand the prevalence of health-related risk factors and diseases have to be compared to identify health burdens, which are specific for regional populations or nations. The results of studies comparing the absolute prevalence of risk factors and diseases are a major precondition to efficiently design preventive programmes and to allocate health care resources.

On the other hand data from population studies are used scientifically to explore associations between risk factors and diseases. Particularly the advent of genome-wide association studies strengthened the need to replicate weak genetic associations and fostered international collaborations among epidemiological studies.

Studies of Health in Populations (SHIP International) is aimed to build up an international consortium of population-based studies with well harmonized data. In sharp contrast to many other consortia, which pool existing data from different studies after data have been collected, SHIP International offers a platform for international collaborators to standardize examinations from the design of their studies and during data collection.

SHIP International started with SHIP West Pomerania. This study includes 8700 adult participants recruited from populations registries in Northeast Germany. SHIP West Pomerania has one of the most comprehensive examination programmes ever been applied in a population-based setting

including even sleep monitoring and whole-body magnetic resonance imaging.

The Brazilian SHIP Santa Catarina will be the second study of SHIP International. Between 2013 and 2015, a population of 3000 adults will be recruited from the cities of Blumenau and Pomerode. The examination programme will take at least four hours and will comprise interview, blood pressure measurements, biomaterial sampling, OGTT, anthropometric measurements, ultrasound and dental examinations. Further researchers from America, Europe and Africa have expressed their interest to become a part of SHIP International.



International

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The PKMV (State Association of Private Hospitals in Mecklenburg-Vorpommern), together with the BDPK (Federal Association of Private Hospitals in Germany, Berlin) and 11 other state associations, represents the legal and political interests of member clinics on the state and federal level.

The PKMV: Philosophy and functions

The member clinics of the PKMV know that human health is a fundamental condition for a healthy society. The German healthcare system – and its clinics – is tasked with fulfilling this fundamental condition to the greatest possible extent. This mission is currently being achieved thanks to Germany's high-quality system of medical care, which is not only one of the best in the world but is also available to everyone regardless of financial means. Hospitals and rehabilitation clinics are the service-providers in this system.

According to the convictions of all those responsible, the system must be further developed in order to ensure that optimal and affordable healthcare services will also be available for future generations. The conditions for this are created by a framework that sets incentives for the pursuit of top quality and efficiency for all parties concerned. For private clinics in the PKMV, this commitment towards a market-oriented principle of efficiency and performance is associated with the following concepts:

- Patient orientation: a good knowledge of patients' needs is key in determining the range of medical services with which clinics earn and justify the confidence of their patients.
- Success as a basis for existence: clinics must have the freedom to be financially successful, because stable and positive earnings are essential for quality and for a high level of healthcare. Financial success allows for the development of new services that meet the needs of patients.

- Innovations make advanced medicine affordable: investments help make innovations and scientific advances possible and increase the attractiveness of medical services. In clinical practice, the effects of such investment can be seen in various ways: in the form of motivated and qualified employees, as effective technologies and through rational core processes in the clinic.
- The employee as a partner: employees are the heart and soul of every clinic. Everything a clinic does is connected with the personal and professional qualifications of its employees.
- Need-based structures: meeting the needs of patients requires a comprehensive range of medical services that transcend individual healthcare sectors.

Quality management institute for rehabilitation

The PKMV is affiliated with the Institute for Quality Management in the Healthcare System (IQMG), which supports member clinics in the implementation of quality management systems in in-patient medical rehabilitation.

The Institute for Quality Management in the Healthcare System (IQMG) has taken on the task of developing quality-management tools for the healthcare sector. The first such tool was the integrated quality-management programme for rehabilitation (IQMP-Reha).



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BioCon Valley[®] GmbH has locations in Greifswald and Rostock to network companies, research facilities and clinics in the state. It serves as a central information hub and provides support for projects aiming to commercialize the latest research results in the region.



Becoming Germany's leading state for healthcare and wellness

As the central point of contact and service provider for the life sciences and healthcare industries in northeastern Germany, BioCon Valley[®] guides the development of Mecklenburg-Vorpommern into the leader among German states in the field. It also supports the healthcare and wellness sector as well as technology-oriented businesses and research facilities with projects in health tourism, medical wellness, prevention, rehabilitation and technological development. As one of Germany's "bio regions", BioCon Valley[®] is part of a German network of providers and offers services for international cooperation, particularly in Northern Europe, as a co-founder of the international "ScanBalt" network of biotechnology initiatives around the Baltic Sea.

Main areas of activity

Modern life sciences are the source of innovative products and services for medicine, agriculture, nutrition and the environment. Core competencies in Mecklenburg-Vorpommern are in the areas of diabetes, individualized and regenerative medicine, medical technologies and diagnosis, modern plant and animal breeding, animal health, industrial or white biotechnology. The health and wellness sector is based on natural competitive advantages like a healthy climate and intact landscapes. Together with the traditional strengths of the region such as tourism, a maritime economy, agriculture, and medical competence, a wide range of services are available.

Strong partners

With two university medical centers, 39 hospitals, over 60 preventive care and physical therapy facilities and 59 officially recognized health resorts and recovery facilities, Mecklenburg-Vorpommern offers a superb healthcare and wellness infrastructure. The subject of diabetes plays a central role in this endeavor.



*BioCon Valley® headquarters
at BioTechnikum Greifswald*

Credits

Images

Landesmarketing Mecklenburg-Vorpommern	Cover, p. 1
State Ministry of Economics, Construction and Tourism	p. 2
Ambulantes Zentrum für Prävention und Rehabilitation GmbH	p. 19
Apheresis Center Rostock (ACR)	p. 20, 21
BioArtProducts GmbH (B.A.P.)	p. 22, 23
BioCon Valley GmbH	p. 3
BIOMEDRO	p. 24, 25
BioTechnikum GmbH	p. 61
CyberKnife Centre Güstrow	p. 27
DST GmbH	p. 29
Fotostudio Wasmund Wolgast & Greifswald	p. 8, 53
HOFFRICHTER GmbH	p. 30, 31
IMAGE Information Systems GmbH	p. 32, 33
Institute of Diabetes "Gerhardt Katsch", Karlsburg, Germany	p. 6, 34, 35
Infokom GmbH	p. 37
INP Leibniz-Institut für Plasmaforschung und Technologie e.V.	p. 38, 39
INROS LACKNER AG	p. 5, 41
Heart and Diabetes Center - Klinikum Karlsburg	p. 43
Moorbad" Bad Doberan, Dr. Ebel Fachklinik	p. 10, 59
Medical Biomaterial Products GmbH	p. 45
neoplas GmbH	p. 46, 47
Oehm und Rehbein GmbH	p. 48, 49
University of Rostock University Eye Hospital	p. 51
University Medicine Greifswald	p. 55, 57

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