

Shaping the future together

Annual Report 2022

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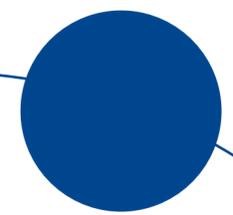
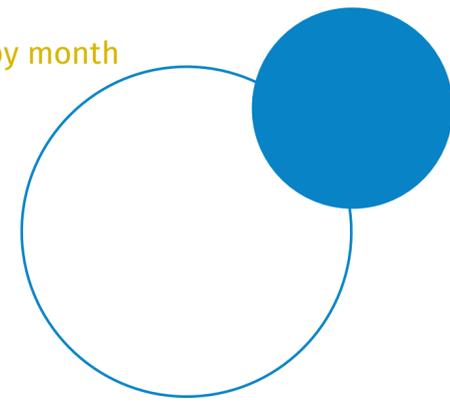
Excellent

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Dear Reader,

For many of us, 2022 was once again a special year – though not, unfortunately, always in a positive sense. The war in Ukraine is a development that we, living in the middle of Europe, long thought could never happen again, and it has presented enormous challenges not only to the people living there, but also to their neighbours and everyone who is providing support and assistance. At the same time, the Covid-19 pandemic continued to hold everyone in its grip, and any respite was a long way away.

It is not only in times of crisis that networks are especially important; after all, together we can be strong and can master even exceptional challenges. Such long lasting crisis situations can, in particular, be highly stressful for cancer patients, who depend on excellent care and an efficient health system while they are undergoing what is often protracted and complex treatment. And it is often the smallest, the youngest, who are particularly affected. A cry for help reached us here in March 2022 from our colleagues in Poland who were in urgent need of support in caring for children with cancer who had fled from Ukraine. Within a very short space of time, and working together, we were able to take the young patients with their families and provide care for them – most of them in North Rhine-Westphalia, and many of them at the West German Cancer Center (WTZ). Working together, we succeeded in finding accommodation, organising social and psychological care, providing assistance in working with the authorities and helping to find places for the children in day care, in kindergartens and in schools. And, of course, it goes without saying that, as an Oncology Center of Excellence, our “core business” is to provide the best possible medical care.

Excellent research as a basis for providing state-of-the-art medical care is the result of the path jointly taken at WTZ, in which we pool our strengths and continue to develop our Network. All this is only possible with an outstanding team – consisting not only of nursing staff, physicians and scientists – which combines dedication and the highest level of competence. And this is not something to be taken for granted. We, too, compete for the most talented staff – with the aim of providing our patients with the best possible care and offering our staff the best possible conditions.

In the WTZ Consortium’s joint Annual Report you will learn why working with artificial intelligence is part of WTZ doctors’ everyday work, how we support physicians focusing on research from their undergraduate studies up to professorships, and why WTZ is especially concerned that patients should be involved in research, in care and in processes.

We do hope you enjoy reading the report.



Dr Stefan Palm
General Manager
WTZ Essen



Prof. Philipp Lenz
General Manager
WTZ Consortium Partner Münster



Dr Stefan Palm
General Manager
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Prof. Philipp Lenz
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Milestones

What happened in 2022, and which topics will be important in 2023? Prof. Annalen Bleckmann, Director of WTZ Münster, and Prof. Dirk Schadendorf, Director of WTZ Essen, consider last year's milestones and the highlights of the coming year.



Prof. Annalen Bleckmann

Since 2021 the WTZ Consortium has been a member of a network of 21 oncology clinics which have joined forces as the 'German Network for Personalized Medicine'. The project is receiving funding of 21 million euros and is set to run for 48 months. In 2022 it certainly picked up speed: together, we are developing joint standards and establishing molecular tumour boards in order to enable patients to have the best possible individual treatment."



People who survive cancer have to cope with a variety of consequences about which, however, they are often insufficiently informed. The 'Optilater' Consortium, headed by WTZ Essen, aims to change that with the support of WTZ Münster and thereby improves long-term care for cancer survivors nationwide. For this purpose, we are receiving around 2.3 million euros in funding over three years from the German Ministry of Health."

Prof. Dirk Schadendorf



In 2022, the Multiscale Imaging Center started its work at WTZ Münster. The Center brings together in one building all the research and technology relating to biomedical imaging. Soon, the Body and Brain Institute will follow, in which specialists from a variety of disciplines will be carrying out research into diseases and their origins from the viewpoint of the interaction between the brain and the body. In Essen, an Institute of Sport and Exercise Therapy is being set up for the treatment and aftercare of cancer patients.”

Prof. Annalen Bleckmann



Two major topics will be a part of WTZ’s activities through 2023: firstly, the German Cancer Aid organisation will again be carrying out an assessment of us and reviewing our funding as an Oncology Center of Excellence. The renewed application will as much be part of our agenda as the new Hospital Structure Plan, which we expect to lead to great changes in collaboration with other hospitals and doctors’ surgeries.”

Prof. Dirk Schadendorf



In Katharina Kaminski and Julia Beusing-Markmann we have, for the first time, two permanent members of staff in the WTZ locations who are responsible exclusively for patient involvement and self help. Providing a link between patients and medical staff, they make an important contribution to strengthening patients’ autonomy.”

Prof. Dirk Schadendorf



With the Ruhr and Westphalian Cancer Days and the Rowing to Fight Cancer initiative, we made decisive contributions in 2022 to providing information to cancer patients, their families and the general public. In 2023 we will continue to take our lead from the oncological focuses of WTZ, but will place additional emphasis on the patients’ perspective.”

Prof. Annalen Bleckmann



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Artificial intelligence in oncology

Whether in early detection, diagnostics or therapy – using the support provided by artificial intelligence (AI) is part of WTZ doctors' everyday work.

Processing even huge quantities of data rapidly, accurately and without any signs of fatigue: AI can really ease the strain where people often reach their limits. In the WTZ Consortium there is hardly any department in which this support is not used.

Anyone thinking of AI immediately has scenarios from science fiction films in their mind. However, “the use of artificial intelligence in medicine has long since become routine,” as Prof. Jens Kleesiek points out. Kleesiek heads the Medical Machine Learning research group at the Institute of AI in Medicine (IKIM) at University Hospital Essen (UME). “For a long time now, for example, computer algorithms have been evaluating long-term ECGs. But ultimately, AI is only one piece of the puzzle in a doctor’s decision-making process. It can provide rapid, reliable, fatigue-free support for individual steps in diagnostics or therapy – but it cannot

replace the entire process. It means, though, that the specialists have more time for the essential part of their work: interaction with patients. Prof. Walter Heindel, Director of the Radiology Clinic at WTZ Münster, sums up the advantages of using AI: “AI guarantees quality-assured documentation and is able to process and analyse even large quantities of data – for example, image and laboratory data – within a very short space of time. This saves time and personnel – which is an important point in times when specialists are in short supply.” All areas of oncology can benefit from new AI algorithms: from the early detection of cancer to diagnostics and choosing the right therapy.



AI in early detection

Walter Heindel's special field is the early detection of cancer. He has succeeded in training an algorithm to the extent that it not only recognises tiny calcium deposits in mammography images but can also assess whether they are benign or malignant. "On the basis of images from over 600 women on whom invasive assessment diagnostics were completed, it was clear that in these cases the performance shown by AI was equal to that of any radiologist."

Similar conclusions have been reached by Prof. Lale Umutlu, Deputy Director of the Institute of Diagnostic and Interventional Radiology and Neuroradiology at WTZ Essen: "Working together with a start-up company, we tested an algorithm on the images from

over 450,000 screening mammographies. Initially, it evaluated the images entirely on its own; then it carried out a pre-screening, taking a decision-referral approach, and it presented to a radiologist only those cases in which there was some doubt." What became apparent in the process was that the algorithm cannot by itself replace the work of two radiologists. However, the combination of AI and radiologist delivers significantly better results than a screening carried out by two radiologists does. "The product which resulted from this published study is already available on the market and is being used in practice in radiology."



Artificial intelligence makes it possible to take a new approach in medicine which was not previously available. However, huge quantities of data are needed for this – and this is a resource which WTZ has to a high degree."

Prof. Walter Heindel
Director of the Clinic of Radiology at UKM

No one should have to lose their job as a result of AI – but AI does give us the opportunity to spend more time on those cases in which it cannot help."



Prof. Lale Umutlu
Deputy Director of the Institute of Diagnostic and Interventional Radiology and Neuroradiology at UME

AI in other diagnostics

Most cases of cancer are discovered by being felt, or through imaging, with invasive examination methods being used in the further diagnostic process. Here, too, artificial intelligence can reduce stress markedly – both for medical staff and for patients. For example, Prof. Felix Nensa, a consultant for thoracic imaging and digitalisation at the Institute of Diagnostic and Interventional Radiology and Neuroradiology at WTZ Essen, has developed an AI-assisted method which makes it possible to replace traditional invasive biopsies for brain tumours. "As a result, the genetic profile and the classification of tumours can be read off from MRI images."

This not only provides relief for the patient but also delivers better results, as the findings from an invasive biopsy depend on the place where, and the time when, the specimen was taken, whereas an MRI always captures the entire cranium. Artificial intelligence is also used for analysing images at WTZ Münster. For example, Prof. Michael Schäfers, Director of the Clinic of Nuclear Medicine, has developed an algorithm which not only detects lesions on the basis of PET/CT images, but also classifies them by type and stage. Together with Dr Robert Seifert, Clinician Scientist and junior doctor at the Clinics of Nuclear Medicine in Münster and Essen



Prof. Felix Nensa
Consultant for thoracic imaging and digitalisation at the Institute of Diagnostic and Interventional Radiology and Neuroradiology at UME

(see News on page 19), he is now taking a step further: “We are taking a molecular approach in which AI builds a bridge between image and therapy.” For this purpose, the radioactively labelled substances employed in the PET scan are used. “We exchange the diagnostic beam source for a therapeutic one and use the radioactive tracers in order to guide the therapy beam directly to the relevant spot.” AI takes on the job of comparing the diagnostic datasets with the therapeutic datasets – “As a result, and thanks to machine learning, it is possible to undertake individual, and therefore very gentle, therapies.”



As far as processing large quantities of data is concerned, artificial intelligence is somewhat ahead of humans. But working with patients and their medical history individually will always need human interaction.”

Prof. Jens Kleesiek
Head of the Medical Machine Learning research group at the Institute of AI in Medicine (IKIM) and Vice-Director of WTZ Essen

The use of AI in making prognoses

Artificial intelligence is also used before a therapy begins. At both WTZ locations, for example, algorithms are currently used before starting selective internal radio therapy (SIRT) to check whether the patient in question can handle the therapy. “SIRT is a method for treating liver tumours locally, with radioactively labelled glass microspheres being injected directly into the liver, where they destroy the adjacent tumour tissue,” Nensa explains. AI helps in the process of deciding for or against this therapy, which is mostly only used after all other methods have been exhausted. “The algorithm evaluates the image data we have and assesses whether the second liver lobe can compensate the loss of tissue and whether, as a result, the treatment can reasonably be applied at all.”

Prognoses regarding the success of any cancer treatment are also made by means of AI. One example of this is the so-called Body Composition Analysis (BCA). At WTZ Essen, it was demonstrated that the individual constitution of a patient can be gauged from image data, enabling a prognosis to be made regarding the success of the treatment. “The relevant algorithm thus makes it possible to give even better advice as regards deciding on a form of treatment, and it is already being used in all university clinics all over Germany,” as Kleesiek explains.

The use of AI in treatment

The Ethos system is also already being used in the WTZ Consortium. It consists of radiotherapy equipment which includes not only state-of-the-art imaging units but also an AI unit. “This means that the radiotherapy plan can be adapted on a daily basis to a patient’s particular situation,” as Prof. Hans Eich, Director of the Radiation Therapy Clinic at WTZ Münster explains. “Any changes in tumour extension or weight loss in a patient are taken into account immediately, making it possible to achieve optimum protection of the surrounding tissue.” In Münster, EU funding of 1.3 million euros was acquired **(see News on page 18)** for upgrading the radiological equipment. Beforehand, the doctors and physicists informed themselves at WTZ Essen, where the Ethos system, costing 3.8 million euros, has already been in operation in the Radiation Therapy Clinic since December 2021, and where the first adaptive radiotherapy applications using this technology were carried out in Germany. “Currently, we are using Ethos mainly for pelvic tumours and lung tumours,” says Prof. Martin Stuschke, Director of the Radiation Therapy Clinic at WTZ Essen. In the

case of pelvic tumours, the therapy system recognises the current form of the bladder and the bowel and adapts the target volume to the current form of the surrounding organs, which leads to greater protection of the organs. The speed of the entire process – which can only be achieved by using AI – is a basic requirement for adapting the dosage on the treatment table because otherwise the forms and positions of organs can undergo significant changes. “Before this radiation treatment is approved, the results provided by the AI-assisted algorithms are examined by medical specialists and medical

physicists and, if necessary, optimised,” says Stuschke. In this process, the collaboration between humans and machines is becoming ever faster and ever more precise.



Prof. Hans Eich
Director of the Radiation Therapy Clinic at UKM, and Vice-Director of WTZ Münster



Artificial intelligence has already found its way into operating theatres, too – not replacing surgeons, though, but complementing their work by means of artificial intelligence built into a robot. A team led by Dr Maximilian Kückelhaus at WTZ Münster, for example, has developed an innovative method for carrying out operations (see article “Fighting

breast cancer”), in which a surgical robot designed especially for microsurgery is linked to a robotic microscope. “This enables us to work in a much more precise and tissue-conserving manner than is possible with conventional operation techniques.” During the operation the surgeon’s movements are transmitted via a joystick to tiny instruments, with

any trembling of the human hand being removed. At the same time, a 3D augmented reality headset is used which is connected to a camera on a robot arm and which follows the surgeon’s head movements. As a result, complicated angles are also possible on the operating table – even when the surgeon is not standing at the operating table at all. The method is used for example on patients with breast cancer who need a complex breast reconstruction.

Something which is equally complex is replacing bones which have been destroyed by cancer or by opening the cranium. Here, too, artificial intelligence makes a valuable contribution. At WTZ Essen, an algorithm is used which produces a template from CT images showing the defect; this template can then be printed out, using a 3D printer, and inserted into the cranium. “Prof. Jan Egger’s team organised an international competition on this question and

also successfully developed an algorithm of their own,” says Kleesiek. 3D printers have also been in use for years now in Münster, too: in orthopaedics, dentistry, heart surgery and in teaching. The reason is that the implants, with their precise fit, not only help in actual operations but are also used in preparatory work. Despite all these successes, one thing is clear for Michael Schäfers: “We are still only right at the beginning. AI has enormous potential. In five years’ time, the majority of the AI applications currently being used will not exist anymore – simply because they will have been replaced by new, improved methods.”



In tumour orthopaedics, for example, AI opens up new possibilities for making implants which fit precisely

Any AI application is only as smart as the data which are fed into it. So who is responsible if something goes wrong? The increasing use of AI is throwing up some intriguing ethical questions.”



Prof. Michael Schäfers
Director of the Clinic for Nuclear Medicine at UKM and Vice-Director of WTZ Münster

Haemato-oncology and stem-cell transplantation

WTZ is among the leading centers in Germany in the fight against cancers of the haematopoietic system

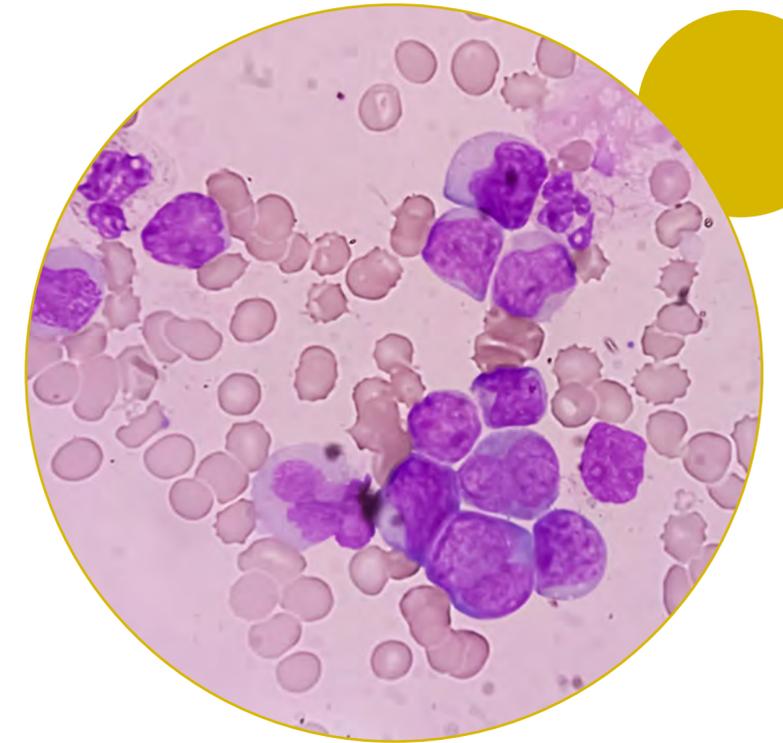
The most up-to-date diagnostic methods, interdisciplinary concepts for treatment, and numerous clinical studies: collaboration between locations in the WTZ Consortium makes it possible to take a coordinated approach, at the highest university level, to treating patients with malignant diseases of the haematopoietic system. The focus here is on acute forms of leukaemia, aggressive lymphomas and stem-cell transplantation.

Haemato-oncology and stem-cell transplantation are often mentioned together in one breath. This is related to the fact that haemato-oncology deals with malignant diseases of the haematopoietic system which can often only be cured by a stem-cell transplantation. As one of the leading care centers in Germany, WTZ with its experienced, interdisciplinary team treats all diseases of the haematopoietic system – from leukaemia to multiple myeloma and lymphoma, in both adults and children. Performing 280 stem-cell transplantations every year, WTZ is

one of the largest certified transplantation centers in Europe. And in research, too, WTZ is one of the leaders. In a large number of studies, patients have access to innovative therapy concepts which raise hopes of further improvements to the results of treatments applied. As a member of the Leukaemia Study Alliance Steering Group, for example, WTZ is pursuing the vision of making acute myeloid leukaemia (AML) a curable disease for all those affected by it.

Leukaemia and stem-cell transplantations

AML is the most frequent form of acute leukaemia in adults and, if not treated, leads to death within just a few weeks. An allogenic stem-cell transplantation, i.e. a transfer of another person's haematopoietic stem cells, represents the only chance of a cure. "So far, this therapy option was only available to patients who were in complete remission," explains Prof. Matthias Stelljes, department head at the UKM Bone Marrow Transplantation Center. To achieve this, chemotherapy in high doses is applied until no more leukaemia cells can be detected. "However, even with intensive chemotherapy this can only be achieved in about half of the patients affected." In a study, though, the Stelljes team was now able to demonstrate that a preparatory therapy



lasting just 11 to 12 days, and with a stem-cell transplantation being carried out immediately afterwards, was able to achieve comparable success even without previous complete remission – and with fewer side-effects and a shorter stay in hospital. "The results of our study are questioning what was previously an international standard in the treatment of leukaemia. They suggest that if a compatible stem-cell donation is available, the transplantation should be carried out as soon as possible – even if there are still leukaemia cells in the patient's body."



Prof. Georg Lenz
 Director of Medical Clinic A at UKM,
 President-Elect of the German Lymphoma Alliance,
 and Scientific Director of WTZ Münster

Bone marrow transplants (BMT) themselves are carried out both in Münster and in Essen in highly specialised hospital wards equipped with isolation rooms, their own internal intensive-care ward, BMT coordination, BMT outpatients care and their own area for the production of stem-cell preparations. The team consisting of doctors, nurses and medical assistants, as well as staff working in physiotherapy, social services and psycho-oncology, have many years of experience in the field of stem-cell transplantation, guaranteeing optimum care whenever an allogenic stem-cell transplantation is prepared and performed and follow-up care is carried out.

Myelomas and malignant lymphomas

When lymph nodes swell up, independently of any defence activity, the cause may be a malignant new growth. There will be a genetic defect in certain immune cells which can lead to such cells proliferating uncontrollably without any infection being present. Experts distinguish between so-called Hodgkin's lymphoma – in which the diseased cells merge with one another – and all other malignant lymphomas: the so-called non-Hodgkin's lymphoma. This latter group comprises more than 40 diseases, which all have their own stages and sub-types.



Prof. Bastian von Tresckow
 Deputy Director of the Clinic for Haematology
 and Stem-Cell Transplantations at UME

Specialists from the fields of haematology, radiation therapy, nuclear medicine and transfusion medicine work hand-in-hand at WTZ, pushing forward research and therapy relating to lymphomas. In addition to the three conventional forms of therapy – radiation, chemotherapy and surgery – WTZ focuses on an innovative treatment which combines the characteristics of immunotherapy, cell therapy and gene therapy: so-called chimeric antigen receptor T-cells (CAR-T-cells). In this therapy, the body's own T-cells – which serve to make it immune to diseases – are modified in such a way that they can accurately bind and destroy cancer cells. This therapy is approved for B-cell lymphomas, acute lymphatic leukaemia, mantle cell lymphomas and multiple myelomas.



*Whether in our joint research,
 or in organising events for
 community-based doctors, or if
 there is a lack of beds: the col-
 laboration across WTZ locations
 benefits everyone involved."*

Prof. Christoph Schliemann
 Head of the Haemato-Oncological Center and
 Head of the Leukaemia Department at Medical
 Clinic A at UKM



One focus in further developing the work we are jointly carrying out in our field is on the introduction of innovative cell therapies – with the aim of curing even more children and adolescents who have cancer and of increasing their quality of life both during and after the therapy.”

Prof. Claudia Rössig
 Director of the Clinic for Paediatric Haematology and Oncology at UKM and member of the Board of UKM

“Numerous studies and publications attest to the success of the collaboration existing between WTZ locations,” says Prof. Georg Lenz, Director of the Medical Clinic A at UKM, President-Elect of the German Lymphoma Alliance, and Scientific Director of WTZ Münster. “In 2022, for example, WTZ took a leading role in drawing up the Oncology and S3 Guideline on Diagnostics, Therapy and Aftercare for adult patients with a diffuse large B-cell lymphoma and related entities.” The study published in late 2022 on the application of a nivolumab-based therapy in the case of Hodgkin’s lymphoma at an early stage, and with an unfavourable prognosis, attracted a great deal of attention. Nivolumab had only been approved for the treatment of recurring lymphomas and after a stem-cell transplantation,” explains Prof. Bastian von Tresckow, Deputy Director of the Clinic for Haematology and Stem-Cell Transplantation at UME. “In a study involving 109 patients, we were able to demonstrate that treatment with nivolumab in combination with chemotherapy and radiotherapy leads directly to excellent results in the first line and with a minimum of side-effects.”

The basis of the lymphoma programme at WTZ is a wide range of clinical activities and a systematic collection of tumour tissue, as well as a thriving programme of basic research which is extremely active at both locations in the teams headed by Prof. Georg Lenz and Prof. Christian Reinhardt. The latter team plays an active role, for example, in a range of Collaborative Research Centers and in EU research alliances working on lymphomas.



Prof. Matthias Stelljes
 Head of Department at the UKM Bone Marrow Transplantation Center



Collaboration between Münster and Essen is marked by a high degree of collegiality and excellence, and our declared aim is to continue developing WTZ together in order to consolidate its leading position.”

Prof. Christian Reinhardt
 Director of the Clinic for Haematology and Stem-Cell Transplantations at UME and Vice-Director of WTZ Essen



The integration and translation of innovative options for treatment from research into clinical applications is one of the main aims of the successful collaboration at WTZ. Unique forms of treatment can be offered to children and adolescents with leukaemia, lymphomas and solid tumours.”

Prof. Dirk Reinhardt
Director of Paediatric Clinic III at UME

Paediatric haematology

Children are not small adults. This is why, at WTZ, patients in childhood and adolescence are treated by paediatric specialists. “Because, fortunately, we only have a small number of cases in the paediatric oncology department, we are not specialised in individual types of cancer but deal with 35 different tumour entities – from solid tumours and brain tumours to forms of leukaemia,” explains Prof. Dirk Reinhardt, Director of Paediatric Clinic III at UME. For certain entities, however, there is always a cross-clinic study group responsible. Dirk Reinhardt heads the national AML study group. “We keep the national and European registries, which makes it possible to trace back individual cases – some of them as far

See article “Myeloid leukaemia in children with trisomy 21”

back as 40 years ago.” In addition, the national and European reference laboratory is located at WTZ Essen: every sample from every child in Germany ends up here. “A standardisation of therapy concepts and decades of intensive national and international exchanges of experience have made a significant improvement to the survival of children and adolescents with AML.”

Long years of experience in treating children with cancer have made the WTZ Consortium a destination for children and adolescents from all over the world: every year, almost 300 young patients from other countries come to WTZ for radiotherapy. On average, they spend eight to ten weeks in the clinic – which is why a whole house was built here for families.

WTZ is also one of the major centers in Germany and Europe as regards stem-cell transplantation for children and adolescents. Prof. Birgit Burkhardt is a senior physician at the Clinic for Paediatric Haematology and Oncology at UKM and Head of the paediatric BMT programme there, and a research study she headed attracted much attention: on the basis of data from 639 underage patients with non-Hodgkin’s lymphoma, she was able to demonstrate that, even

in the case of recurring lymphomas, a stem-cell transplantation has a markedly positive influence on patients’ survival rates. “There is no comparable study which can present such a large number of cases,” says Burkhardt. “Many national groups contributed their data – and the study shows how important national and international cooperation is in cancer research.”



Prof. Birgit Burkhardt
Senior physician at the Clinic for Paediatric Haematology and Oncology at UKM and Head of the paediatric BMT programme there

News from the Consortium

UKM is a training center for robotic surgery

Interactive training sessions, videos and simulation operations are all part of the standard repertoire of basic and further training in robot-assisted surgery – but they are no substitute for an operation performed live in the operating theatre. This is especially true of very complex operations such as an oesophagectomy, for which UKM is now officially a **Center of Excellence and Training**, offering colleagues from other hospitals and centers an opportunity to take part in such an operation, which lasts for some hours. The aim is to spread expertise, so that patients in many different places have access to this enhanced surgical technology. With more than 200 robot-assisted oesophagectomies performed, as well as the experience accumulated in over 600 complex robot-assisted visceral operations, UKM is one of the leaders in Germany in surgery employing this technology – and, as a result, a special role has been bestowed on surgery here: since 2022, the Clinic for General, Visceral and Transplantation Surgery is a training center for colleagues from German-speaking countries.

“Even though the use of robotics is very widespread nowadays, what marks out our location is the fact that we began to successfully perform highly complex operations with the daVinci system at an early stage, establishing the approach here, and I am delighted that our robotics expert Dr Jens Peter Hölzen is now one of just two proctors in Germany who are allowed to teach robot-assisted oesophagectomies,” says Clinic Director Prof. Andreas Pascher.

Aiming to improve care: alliance project examines long-term survival after cancer

Prof. Uta Dirksen, Deputy Director of Paediatric Clinic III and Prof. Viktor Grünwald, who holds a Carolus Endowed Professorship for Interdisciplinary Uro-Oncology at WTZ Essen, initiated the **“Optilater” Consortium**, which aims to provide enhanced support for cancer survivors. The German Ministry of Health is funding “Optilater” to the tune of around 2.3 million euros for three years. Those involved are the leading oncology centers in North Rhine-Westphalia, the German Children’s Cancer Registry and numerous patients’ organisations. The Consortium, which is under the leadership of WTZ Essen, aims to find out how things currently stand as regards care for cancer survivors and what patients would like to have additionally – in particular, the extent to which support is needed and made use of in the fields of nutrition, exercise, psycho-oncology, social medicine and specialised care; whether the care provided for all sections of the population is carried out in accordance

with the relevant guidelines; and whether there are any gaps in the current guidelines for care. WTZ Münster, one of the partners in the “Optilater” Consortium, is involved in Work Package 1 through the Institute of Epidemiology and Social Medicine at the University of Münster. “Our role is to provide an overall picture of the actual care situation for cancer sufferers in Germany today. This is done above all by means of anonymised data from medical insurance funds,” says Dr André Karch, clinical epidemiologist and Deputy Institute Director. The second step, says Karch, will involve an evaluation which will aim to compare the status quo with the optimum care proposed in guidelines.

Thoracic Surgery Clinic certified as Center of Excellence

The WTZ Lung Cancer Center at UME was already certified by the German Cancer Society (OnkoZert) back in 2009. In April 2022, the Thoracic Surgery Clinic at UME's Ruhrlandklinik (RLK) received its **first certification as a Center of Excellence** by the German Thoracic Surgery Society (DGT). The DGT highlighted in particular the Clinic's active work in producing studies resulting from its own basic research and its clinical studies on thoracic surgery, as well as its active participation in several clinical registries. In addition to the high quality of the Clinic's processes, with numerous defined treatment procedures, and the high quality of results with a low quota of complications and lethality, what was also assessed positively was the high degree of quality in the Clinic's structures. What stood out in particular were the short, rapid decision-making paths, the tumour conferences taking place several times a week, the intensive interdisciplinary work and the high level of expertise in endoscopy.

"Having the Thoracic Surgery Clinic certified as a Center of Excellence is an outstanding distinction, as well as a very important decision-making aid for patients who need thoracic surgery," says Prof. Servet Bölükbas, Director of the Thoracic Surgery Clinic at RLK.

World's first in surgery: entirely robot-assisted microsurgery performed for the first time

A great success for robotic microsurgery in Münster – and worldwide – both for medicine and for science: a team led by Dr Maximilian Kückelhaus and Prof. Tobias Hirsch from the Center for Musculoskeletal Medicine at the University of Münster performed the **first-ever entirely robot-assisted microsurgery** on humans. The pair developed an innovative surgical method in which a new type of surgical robot, designed especially for microsurgery, was linked up to a robotic microscope. This method enables the surgeon to be separated entirely from the operating area. The deployment of robots for clinical research takes place in cooperation with UKM and the specialist clinic in Hornheide. The project is receiving over 1.1 million euros in funding from the European Union. "This new surgical method enables us to work with a far greater degree of accuracy and precision than is possible using conventional techniques," says Kückelhaus. "It means that less tissue is destroyed, and the recovery process is faster." The specialists use the method for breast cancer patients who need complex breast reconstructions, for example.

Funding period extended for Clinician Scientist Programme at University of Duisburg-Essen

Since 2019, doctors at the Medical Faculty at the University of Duisburg-Essen (UDE) have been entitled to funding from UME's Clinician Scientist Academy (UMEA). The funding covers release periods for research work, 50 per cent on average, as well as a mentoring and qualification programme running in parallel. As a result of the successes already achieved, the German Research Foundation has now approved **further funding of around 1.35 million euros** for the next two years. The Clinician Scientist Programme, which lasts three years, is aimed at doctors working towards their habilitation and an academic career at University Medicine Essen. In its assessment, the DFG praised the outstanding commitment shown by the university, as well as the tailor-made translational orientation of the programme – from which, so far, over 40 UMEA clinician scientists have benefited.

"Funding programmes such as UMEA are indispensable for modern university medicine. The clinician scientists who have undergone training through it make a major contribution to the knowledge we gain and to medicine tomorrow," says Prof. Dagmar Führer, the Head of the programme and Director of the Clinic for Endocrinology, Diabetology and Metabolism at UME. "Our Medical Faculty showed its commitment to junior researchers at a very early stage, and we are delighted that the DFG has enabled us, with its funding, to continue our work," adds Prof. Anke Hinney, Vice-Dean and Deputy Head of the UMEA programme.

See article "Clinician Scientist Programme"

Visceral medicine: interdisciplinary collaboration for improved patient care

The **Clinic for General, Visceral and Transplantation Surgery** (Director: Prof. Andreas Pascher) and **Medical Clinic B** (Director: Prof. Jonel Trebicka) at UKM are working intensively on the continued development of interdisciplinary visceral medicine. In 2022, for example, the **North-West German Abdominal Center** was set up under the aegis of WTZ Münster, to which the **Visceral Oncology Center** also belongs. Here, tumour diseases of the gastrointestinal tract, the liver, the bile ducts and gall bladder, the pancreas and the peritoneum are treated by interdisciplinary teams of specialists using the most up-to-date technologies and methods. The Center not only represents a platform for collaboration at UKM in the field of visceral medicine, it also promotes exchanges with external partners such as the Clinics of Visceral Medicine at Josephs-Hospital in Warendorf and Marienhospital in Steinfurt. In addition, both

clinics together have set up interdisciplinary endoscopy and a variety of new methods – for example, the Apollo Overstitch method and the link-up between endo-hepatology and robotic surgery. “Under the motto ‘Listen to your gut feeling’ we are treading new paths in collaboration in the field of visceral medicine in order to further improve diagnoses and treatments of diseases of the abdominal organs,” says Andreas Pascher. “These new paths include interdisciplinary wards, the establishment of state-of-the-art methods of treatment, new surgical procedures and the continued development of our Magnet clinic with the aim of bringing together the best medical and care teams under our roof.”

Artificial intelligence in radio-oncology – the Ethos system

In radiation treatment for cancer, accuracy plays an important role – the malignant tumour has to be treated precisely and the surrounding healthy tissue treated as gently as possible. A key factor in this respect is imaging before and during the radiotherapy. Specially constructed computer tomographies with a low radiation dosage on the radiation device (cone beam CT) enables radio-oncologists to survey the tumour region and ensure that the radiotherapy field is correctly captured. All radiotherapy devices at UKM are fitted with modern imaging units which enable such checks to be made quickly. As a result, precision in the therapy can be increased, with higher – and, therefore, more effective – doses aimed at the target area, and side-effects can be avoided. One innovative development in this connection is the arrival of artificial intelligence (AI) which makes it possible for the radiotherapy to be personalised to an even greater degree: on the radiation device, an individual day-by-day adaptation is made of the radiotherapy plan to the patient’s anatomy (“plan of the day”). This means that changes in the extent of the tumour – such as a reduction in size as a positive reaction to radiotherapy, or

an increase if the tumour grows – or changes in a patient’s weight can all be taken into account immediately. This modern, computer-intensive form of planning can be put into practice with the aid of the new Ethos system, which includes an AI unit. This upgrading of a modern radiotherapy device was made possible by 1.3 million euros of financial assistance from the European Fund for Regional Development (REACT-EU). The introduction of AI-assisted radiotherapy is to be accompanied by a variety of radio-physical clinical studies. This provides WTZ Münster and WTZ Essen with ideal opportunities for collaboration as there is a device of the same design at the Radiotherapy Clinic at UME which has been working successfully since December 2021.

[See article “AI in oncology”](#)

Cancer research: Robert Seifert receives Memorial Grant

Digitalisation does not stop at the doors of the world of medicine. One person who puts it to intensive use is Dr Robert Seifert, a junior doctor and researcher at the University of Münster, who received the prestigious Else Kröner Memorial Grant for his innovative research project. The award, worth 230,000 euros, enables up to six young doctors every year to take a 24-month break from their clinical work in order to devote themselves entirely to research in this time. For Seifert, who works at the University Clinics for Nuclear Medicine in Münster and Essen, this is the starting signal for his project to optimise therapeutic studies through molecular imaging and artificial intelligence. Specifically, his research focuses on the evaluation of so-called PSMA therapies in patients with prostate cancer. PSMA is the prostate-specific membrane antigen, a possible target structure in advanced prostate cancer.

Currently there is a lack of important findings as regards which patients do actually benefit from this therapy. “Using AI and modern imaging techniques, we want to learn more about who is a candidate for PSMA therapy. After evaluating all metastases and other characteristics, a more strongly individualised therapy will be possible,” says the 30-year-old Seifert. Prostate cancer is the most frequent form of cancer in men – so an improved understanding of the disease would benefit many patients. But women, too, can benefit because the new methods can also be transferred to other forms of cancer.

[See article “AI in oncology”](#)

Early detection of breast cancer

Breast cancer is the most frequent form of cancer in women. The Robert Koch Institute reports that doctors currently diagnose a mammary carcinoma 70,000 times every year, with more than 18,000 patients dying every year as a result of the disease. Beginning in 2005, the quality-assured Mammography Screening Programme (MSP) for the early detection of breast cancer was implemented on a nationwide scale for the general population in Germany. The aim of the MSP is to reduce the number of women dying from breast cancer while at the same time minimising the potential stress for eligible women, for example from radiation exposure, overdiagnoses and overtreatment. As there were no national data available for a benefit/risk assessment when the German MSP was approved, and the evaluation was only based on the results of international studies from previous decades, the research team headed by Dr Heike Minnerup and Prof. André Karch from the Institute of Epidemiology and Social Medicine at the University of Münster is evaluating the impact of this early detection study on deaths from breast cancer in Germany. **Funding of around 5.5 million euros is being provided for three years for the research project** by two German Ministries – the Ministry of the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), and the Ministry of Health (BMG) – as well as by the Mammography Screening Office.

New Emmy Noether group researching into the metabolism of tumours

The German Research Foundation (DFG) enabled a **new Emmy Noether group** to be set up at the Faculty of Medicine at the University of Duisburg-Essen (UDE), providing 1.9 million euros in funding for the next six years for an innovative cancer research project headed by Prof. Alpaslan Tasdogan at WTZ Essen. Tasdogan – an oncologist, immunologist and dermatologist – came to UME in 2021 through North Rhine-Westphalia’s Return Programme. “With his translational competence, Prof. Tasdogan is a real gain for Essen,” says WTZ Director Prof. Dirk Schadendorf. Tasdogan and his team are focusing on the metabolism of tumours. The question they are most interested in is how normal cells can become malignant, and where a metabolome may be vulnerable. In explaining the award, the DFG emphasised not only Tasdogan’s specialist expertise but also the qualities of Essen as a research center. There was praise, too, for the way many institutes and clinics work hand-in-hand and for the thorough training and support for clinician scientists across all career stages.

How do tumours manage to remain immune to radiotherapy?

In the joint research alliance involving the Faculties of Medicine and Biology at UDE, **which is receiving 8.5 million euros in funding from the German Research Foundation (DFG)**, the researchers from Research Training Group GRK 2762 are studying how aggressive cancer cells in the lung or the pancreas of some patients manage to remain immune to radiotherapy; the researchers are using this for joint training natural scientists and physicians. They are also looking at why the risk of metastases forming is higher in some patients than in others, or why unwanted side effects can occur. To find answers to these questions, the researchers are looking for biological features (biomarkers). “If we can learn to understand the biological principles impacting on the way the therapy progresses, this therapy can be better adapted to the patient’s individual risk profile, and radiation resistance mechanisms in a tumour can be systematically influenced by means of medication,” says Prof. Martin Stuschke, deputy GRK spokesman and Director of the Clinic and Polyclinic for Radiotherapy (UME). He coordinates the research work together with Prof. Verena Jendrossek, Vice-Director of WTZ Essen, GRK spokeswoman and Executive Director of the Institute of Cell Biology (tumour research) at UME, and bioinformatics specialist Prof. Daniel Hoffmann from the Center for Medical Biotechnology (ZMB) at UDE.

Clinician scientist as a career: University of Münster receives funding for doctors engaged in research

For physicians who are actively involved not only in patient care but also in research, there are many scientific questions and issues relating to clinical applications which present themselves directly from everyday work in hospitals. Looking at things from this patient-oriented point of view can make a decisive contribution to research leading to concrete improvements in medical care – but the dual career path of so-called clinician scientists is challenging in many respects and therefore needs specific new structures to support it. The Medical Faculty at the University of Münster is receiving from the German Research Foundation financial support amounting to more than two million euros for, initially, three years; with this funding, the Faculty aims to expand its **career programme for doctors engaged in research**: clinician scientists.

Most of the funding will be channelled into building up a new programme module enabling physicians to gain qualifications in the scientific field in addition to their specialist training. “For this demanding phase in their careers, we want to offer participants as much individual planning freedom as possible, as well as a mindful use of ‘time’ as a resource and a network providing support at every level,” explains nuclear medicine specialist Prof. Michael Schäfers, spokesman for the new Clinician Scientist Programme entitled “Careers”.

[See article “Clinician Scientist Programme”](#)

Endowed professorship in melanoma research

Prof. Florian Rambow holds the new endowed Chair (Wolfgang and Gertrud Böttcher Foundation) of Applied Tumour Bioinformatics with a focus on melanoma research at the Faculty of Medicine at UDE and is the Head of the corresponding department at WTZ Essen. He examines and systematises the black skin cancer on tumour maps – because one melanoma can differ from another. For this reason he is creating high-resolution tumour maps for skin cancer patients. These maps provide information on the interior of the tumour, down to the single-cell level. This has become possible as a result of progress made in molecular biology and nanotechnology. Cancer cells can now be examined individually, and changes documented. “The project will provide researchers with functional maps of a developing tumour ecosystem,” says Rambow; cancer cells and tissue changes signalling degeneration will be recorded.

First certification of the Westphalian Lung Cancer Center UKM – SFH

At the **Westphalian Lung Cancer Center UKM – SFH**, a variety of specialists from University Hospital Münster (UKM) and St. Franziskus-Hospital (SFH) work together to care for patients with malignant diseases of the lung. In December 2022 the Center was successfully certified by OnkoZert on behalf of the German Cancer Society (DKG). Prior to this, external auditors from OnkoZert, an independent certification institute at DKG, took a very detailed look at the care structures within the cross-location Lung Cancer Center. “The aim of these assessments carried out by DKG – which are done in many different areas of cancer medicine – is to improve the care of cancer patients and enable them to have the best possible treatment in every phase of their illness in line with the current state of medicine and research,” says Prof. Annalen Beckmann, Director of WTZ Münster and Head of Thoracic Oncology at UKM. “We are delighted that together, as a team, we were able to meet the high standards required by OnkoZert and convince the assessors of the quality

of our work,” adds Prof. Georg Lenz, Director of Medical Clinic A at UKM. It means that the Westphalian Lung Cancer Center UKM – SFH is the only certified university lung cancer center in the Westphalia-Lippe region. Dr Anne Bremer, a senior physician in the Department of Haematology and Oncology at SFH, and her colleague Dr Arne Wichmann, a pneumologist at SFH, stress the benefits of the collaboration. “The treatment of lung cancer is a team effort. We pool the skills of both partners, and patients have direct access to what each location has to offer.”

First certification of the Kidney Cancer Center (UME)

The **Kidney Cancer Center at WTZ Essen received its first certification in 2022** from the German Cancer Society (DKG). This means that the Uro-Oncology Center now covers a third tumour entity after prostate cancer and bladder cancer. The Kidney Cancer Center is represented by the Head of the Uro-Oncology Center, Prof. Boris Hadaschik (Director of the Urology Clinic at UME and Vice-Director of WTZ Essen), by Prof. Viktor Grünwald (Carolus Endowed Professorship for Interdisciplinary Uro-Oncology), and by Dr Claudia Kesch (Coordinator at the Kidney Cancer Center). “The basis for the certification is the yearly verification that we enable our patients to receive the best possible treatment in every phase of their illness and that this treatment is subject to the highest quality standards. It means that patients can rely on us to provide them with excellent medical and nursing care, as well as taking psychosocial aspects into account. For us, this certification is a very gratifying form of recognition for the high-quality work we do, and an important advertisement for our clinic,” say the delighted team members at the Kidney Cancer Center.

New cancer drugs beyond chemotherapy

The state government of North Rhine-Westphalia (NRW) is providing 19.4 million euros of funding for the **CANcer TARgeting (CANTAR) Research Network**. CANTAR pools highly complementary knowledge from all over NRW, building on cooperations already established. Research at WTZ Essen is headed by Prof. Christian Reinhardt, Director of the Clinic for Haematology and Stem-Cell Transplantation at UME. “We want to identify specific drivers of cancer diseases and systematically block them off. We also want to understand how cancer cells can evade an attack by the body’s own immune system,” says the Vice-Director of WTZ Essen. To this end, substances are to be developed which impact specifically on tumours or intervene in metabolic processes while leaving normal tissue unharmed. CANTAR closes the gap between basic research and translational clinical cancer research.

Well positioned

Some new appointments in the WTZ Consortium



Prof. Alex W. Friedrich has been the new Chief Executive and Medical Director of UKM since January 2022. Friedrich was born in Nuremberg and was previously Professor of Medical Microbiology at the University of Groningen and Director of the Department of Medical Microbiology, Virology and Hospital Hygiene at University Hospital Groningen. Münster is not new to him: up to 2010 he worked as a senior physician at the Institute of Hygiene within the Medical Faculty of the University of Münster. In the past, he received several accolades for his work in support of public health – including the Johann-Peter Frank Medal in 2014, the Robert Koch Prize in 2019, the German Order of Merit in October 2021,

and, for his work during the Covid-19 pandemic, the Order of the Netherlands Lion – the highest civilian order of merit in the Netherlands. At UKM, Friedrich aims to continue to expand and optimise the networks already in existence, against the background of the new Hospitals Plan for North Rhine-Westphalia published by the NRW state government. “We are a university hospital which offers a range of care which no other hospital in north-western Germany can offer. For this, we need partners. This means that regional and supraregional collaborations, for example within WTZ, are important in order to be able to offer the best possible therapies to patients, regardless of where they live.”



Prof. Eva-Maria Skoda has been Professor of Psycho-Oncology and Somatic Psychology at the Medical Faculty of UDE since July 2022. Since the beginning of 2022 she has been Head of the Psycho-Oncology Department at WTZ Essen. The focus of her research is on how great the emotional stress is on patients who have been diagnosed with cancer, and which innovative digital psychosomatic measures are necessary.



Prof. Barbara M. Grüner has been the new Professor of Cell Plasticity and Metastasis Formation at the Medical Faculty of UDE since October 2022. In her research at University Hospital Essen she is looking into which mechanisms enable cancer cells to leave their original tumour and spread in the body. Besides genetic factors, she focuses on acquired properties and the metabolism of cells.



Prof. Rupert Conrad has been the new Director of the Clinic of Psychosomatic Medicine and Psychotherapy at UKM since July 2022, taking over from Prof. Gereon Heuft, who held the position for 23 years. Conrad took his Abitur at the Gymnasium Paulinum in Münster, so moving from University Hospital Bonn (UKB) to Münster means a move back home. At UKM he aims to expand digital psychosomatics: “New technologies such as virtual reality headsets make it possible to experience a variety of environments and everyday situations in therapy in a very realistic way. This has enormous potential for treating patients in psychosomatic medicine and will revolutionise our work in future.”



Prof. Servet Bölükbas has been the new Director of the Clinic for Thoracic Surgery and Thoracic Endoscopy at the Ruhrlandklinik (UME) since July 2022. He is an expert on lung cancer and his research focuses include multimodal therapy contexts with lung-conserving resections in cancer of the thorax.



Dr Philipp Papavassilis was appointed as the new head of the Prostate Center at UKM by Prof. Jan Andres Schrader, the director of the Clinic for Urology and Pediatric Urology, on 1 July 2022. Papavassilis took over from Prof. Axel Semjonow after serving as his deputy from 2018 to 2022. “I am looking forward to working together with a well-functioning team, and the first aim I have is to reduce still further the time between suspecting an illness and actually diagnosing it, which is so stressful for our patients,” says Papavassilis, whose field of expertise is the diagnosis of prostate cancer by means of MRI fusion biopsies. In this, live ultrasound images of the prostate are combined with MRI images already previously produced.



Prof. Felix Nensa has been the new Professor of Radiology with a focus on artificial intelligence at the Medical Faculty at UDE since March 2022. An experienced radiologist, Nensa wants to forge closer links between the Chair of Radiology and both the Institute of Artificial Intelligence in Medicine (IKIM) and the Institute of Diagnostic and Interventional Radiology and Neuroradiology at UKM, so that results can be immediately introduced into clinical care.



Prof. Jonel Trebicka took over as Head of the Clinic of Internal Medicine B (Gastroenterology, Hepatology, Endocrinology and Clinical Infectiology) at UKM on 1 May 2022. A liver specialist and an expert on portal hypertension, Trebicka previously worked at University Clinic Frankfurt, where he headed the Translational Hepatology Department. In Münster, the Clinic's new Director wants to continue optimising patient care in a variety of areas. "My clear objective is for us to become a reference center by means of innovative diagnostics and treatment methods – not only for patients with liver cirrhosis, acute chronic liver failure and transplantation, but also in the field of hepatobiliary endoscopy and oncology."



Dr Mitra Tewes has been the new Medical Director in the Department of Palliative Medicine at UME since July 2022. This department includes the palliative medical services at UME, outpatient counselling and the establishment of a Specialised Outpatients Palliative Care unit (SAPV). As an expert on palliative care for many years now, something close to Tewes' heart is the timely, needs-based integration of palliative medicine in treatment processes for both inpatients and outpatients.

Highlights month by month



14.1.
Ruhr Cancer Day:
 Patient's Day for the WTZ Consortium in Essen



1.2.
 UKM "surgery" on World Cancer Day, online talk:
Immuno-oncology – new, innovative forms of treatment



1.3.
 NRW Economics Minister Isabel Pfeiffer-Poensgen **visits the "Cancer Research Center Cologne Essen – CCCE"** at WTZ at University Hospital Essen and the Center for Integrated Oncology (CIO) at University Hospital Cologne

January

February

March

April



14.2.
17th Sarcoma Tour of WTZ Essen with 121,800 euros in donations for research into sarcomas

16.2.
6th Essen Translational Oncology Symposium ETOS at WTZ Essen (German Cancer Research Center, DTK, partner location Essen/Düsseldorf)

26.4.
Certification of Thoracic Surgery Clinic at UME's Ruhrländlinik by the German Thoracic Surgery Association (DGT), making it a Center of Excellence.

See News on page 17



9.–11.6.
105th Annual Conference of the DGP
 (German Pathology Association)
 at Halle Münsterland

14.6.
First certification of Kidney Cancer Center at WTZ Essen by the German Cancer Society (DKG)
See News on page 21



13.8.
 Information event **“Living with Fatigue”** – kick-off event at WTZ Essen for the WTZ day-of-action series

May

June

July

August

11.5.
 2nd Münster Spring Symposium of the Visceral Oncology Center at UKM



10.6.
Patho-Run:
 Charity run for Münster Cancer Aid for Children



22.6.
 “Learning about the prostate”: information evening for patients at the Schloss in Münster, organised by the UKM Prostate Center



18.8.
 Prof. Klaus-Michael Debatin (University Hospital Ulm), Chair of the WTZ Scientific Advisory Council, receives an **honorary doctorate** from the Medical Faculty of UDE



27.8.
Westphalian Cancer Day:
 Patients’ Day for the WTZ Consortium in Münster



18.9.
1st benefit regatta “Rowing to fight cancer”
 on Lake Baldeney in Essen
 raises 15,000 euros in donations
 for sport and exercise therapies
 at WTZ Essen



See article “Rowing to fight cancer”



6.12.
**Audit for first certification
 of Westphalian Lung Cancer
 Center at UKM – SFH** carried out by
 the German Cancer Society (DKG)

September

October

November

December

19.10.
 4th Münster Autumn Symposium





Personal

- 29** Advanced nursing practice
- 33** The WTZ Patients Advisory Committee
- 35** Rowing to fight cancer



Advanced nursing practice

The complexity and dynamics of direct patient care are constantly increasing – and the WTZ Consortium reacts by establishing extended care

Demographic change, new methods of diagnosis and treatment, and the increasing digitalisation of the health sector have led to new care requirements and new areas of activity which need professional solutions. In this context, the concept of advanced nursing practice has proved its worth on the international stage, and it is now being established in the WTZ Consortium. In these interviews, the people responsible for this explain what is behind the concept and describe the benefits of this approach.

What is behind the concept of advanced nursing practice?

Andrea Schmidt-Rumposch, Director of Nursing and member of the UME Board: Advanced nursing practice means nursing care for highly complex patients, for example in oncology. This care places enormous demands on nursing staff. Internationally, the nursing specialists working in this field have a lot of experience and have also gained an academic degree. These so-called advanced practice nurses (APNs) are deployed for extended activities in direct patient care.



Thomas van den Hooven, Director of Nursing and member of the UKM Board: Experiences in other countries have shown that introducing these new interprofessional roles means that the number of gaps in the care system can be decreased and complications in treatment can be reduced. This is why we in the WTZ Consortium set about establishing the role of the advanced practice nurse in Essen and Münster at an early stage.



Rigo Fangemann
Advanced practice nurse at UKM

What provided the impetus to go down this path?

Bernadette Hosters, Head of the Care Development and Research Department at UME: On the one hand, patient care was becoming ever more complex and, as a result of new methods of treatment and new findings in nursing science, demands in the field of nursing were undergoing a marked change – so competences needed to be increased. At the same time, there were hardly any opportunities at that time for nursing specialists working in direct patient care to have further training and development. Most people embarking on a degree course then went into care management or into nursing education.

Nina Kolbe, healthcare scientist at UKM: Our experience has been similar. In Rigo Fragemann we had someone here at UKM who fancied taking up the challenge and developing the role of the advanced practice nurse with us here. We actually received funding for it, too. Today, there are three APNs working in Essen, four in Münster, and more positions are being advertised.

In establishing APNs in the field of oncology, the WTZ Consortium is a pioneer in Germany. How are you developing the role?

Nina Kolbe: It is always the patients who define the starting point for any activity. We come together in interprofessional teams and look out for any gaps in the care system. Our aim is always to improve the quality of the care provided.

Bernadette Hosters: Specific fields of activity are defined in discussions with the interprofessional team – for example with nursing staff, with the medical services, with other health professionals and, naturally, with the APNs. With their combination of nursing experience and academic education, the APNs contribute evidence-based expertise to nursing practice, and this supports the team’s professional development.



Sarah Kühnel
Advanced practice nurse in the Haematology/Stem-Cell Translation Clinic at UME

Did the doctors or the nursing staff express any concerns or resistance?

Andrea Schmidt-Rumposch: The biggest concern which the medical service had was that the APNs would not be working directly with patients. However, everyday experience in practice has dispelled such concerns.

Thomas van den Hooven: From nursing staff we repeatedly heard that experience was everything and that it couldn’t be replaced by any amount of theory. We were able to counter that by involving nursing staff in the workshops organised for developing the role.



Thomas van den Hooven
Director of Nursing and member of the UKM Board



Andrea Schmidt-Rumposch
Director of Nursing and member of the UME Board

What tasks do the APNs in Essen and Münster currently have?

Bernadette Hosters: In addition to clinical care, our APNs drive the professional development of the team, are involved in research, attend congresses and publicise the role of the advanced practice nurse at universities and symposia.

Nina Kolbe: Establishing one APN takes between two and five years. At the beginning, there is always work in a clinic, then other tasks follow one after the other such as training as regards patients and family members, organising consultations with specialists or doing ward rounds, advising colleagues and training staff members.



What is a typical day in the working life of an advanced practice nurse?

Rigo Fangemann: I work in caring for patients with bone-related tumours. My day normally begins on the ward, asking which patients have the greatest need of care. Specific tasks are then dictated by individual situations: this might be a consultation, for example, or calling in the social services. I'm a designated contact for patients – not only in the hospital, but also by phone when the patient is back home. Another of my tasks is to supervise colleagues doing a bachelor course.

Sarah Kühnel: I work in the field of haematology and stem-cell transplantation. Nursing work here often has to do with the prevention of infections and with side effects relating to chemotherapy. After doing the general round of the ward, there are often further rounds to see certain patients with colleagues who have greater specialisation, or there are discussions with doctors. In the afternoon I often do research and read specialist literature so as to keep up to date in my work.

Why did you want to become an advanced practice nurse?

Sarah Kühnel: In 2016 I completed my training as a nurse and started working straight away in the field of stem-cell transplantation. I wanted to continue my training, so I then took a degree course in nursing science. Currently I'm working on my master's degree. What I find so fascinating about the role of an APN is that I can put into practise everything that I work on in my studies, and therefore improve nursing care.

Rigo Fangemann: After my training I first worked at the LWL Clinic, then spent five years in the Haemato-Oncology Department at UKM – where I felt the ever-stronger desire to expand my knowledge and continue training. So, alongside my work, I did a bachelor's and a master's course in nursing science. I never wanted to work in management or teaching, though – I wanted to continue having direct contact with patients. For me, the opportunity to work as an APN combines the best of both worlds.



Nina Kolbe
Nursing scientist in the Nursing Science Department at UKM

What do you wish for the future of APNs in the WTZ Consortium?

Rigo Fangemann: It would be great to see the profession publicised more during initial training, so that we would then get more colleagues with whom we could discuss things.

Bernadette Hosters: Internationally, APNs are already well established. It would be great if the WTZ Consortium could help to consolidate them in Germany.

Nina Kolbe: And, naturally, we would be delighted to show people how effective APNs are for nursing care.

Is there cross-location cooperation between UKM and UME?

Nina Kolbe: We discuss things regularly, with the aim of leveraging synergies and, for example, developing not only joint documents but also an overarching knowledge and further training platform for nurses.

Bernadette Hosters: We also deputise for one another at nursing symposia.



Bernadette Hosters
Head of the Care Development and Research Department at UME

The WTZ Patients Advisory Committee

Since April 2020, the Patients Advisory Committee in the WTZ Consortium has been advocating a stronger orientation towards patients in both research and care

The challenges facing the health service are becoming more diverse and more complex – which makes it even more important, in this period of change, to listen to what patients have to say. It is for this reason that in April 2020 the WTZ Consortium set up a Patients Advisory Committee, whose aim is to improve structural patient involvement in all areas.

The Committee is always appointed for three years and consists of experienced patients and family members. “Those involved have experienced for themselves that things don’t always run as well as they could, and now they want to work towards making improvements,” explains Karin Kastrati. A kidney cancer patient is a member of her family, and she is actively involved in the non-profit organisation “Das Lebenshaus”, as well as being chair of the Patients Advisory Committee. “Specifically, it’s not about providing advice for individual patients but about improving the situation for all patients.”



Active support on Westphalian Cancer Day: Annette Hünefeld, Bruno Köhler, Karin Kastrati and Katharina Kaminski (from left)

In regular meetings, fields of activity are first defined. “In our work, we want to make a contribution to extending cancer research to include patients’ views, as well as to improving oncological care and thus patients’ well-being,” is how committee member Annette Hünefeld summarises the committee’s key aims. An important issue for her, for example, is that patients’ views should be included right from the beginning in projects relating to clinical research, asking the question: “Is this feasible, and does it make sense, from the point of view of patients and their families?”

Understanding and optimising the “patient journey”

In actual care, the committee’s primary concern is that the journey undertaken by patients through all the phases of their illness should be understood and optimised. “This so-called ‘patient journey’ stretches from hospital admission to aftercare,” Karin Kastrati explains, “and it should ideally take place as quickly as possible, and in as patient-friendly a way as possible.” It is here that the opportunities offered by digitalisation play a key role – whether in the changeover to paperless working or in relieving nursing staff from routine work so that there is more time for care for, and attention to, patients. “We are working to get patients involved in such digitalisation processes right from the beginning.”

And word seems to have gradually got around that not only patients but also physicians and the administration benefit from this approach. “For example, the Center for Familial Breast and Ovarian Cancer at University Hospital Münster consulted us on a patient-friendly design for their internal forms,” says Annette Hünefeld.

Internal and external lobbying

In order for more and more departments to involve the Patients Advisory Committee in their work, what is needed above all is patience and perseverance. “It certainly needs a bit of time for our concept to spread through two university hospitals,” comments Karin Kastrati. This is why the Committee undertakes a lot of internal communication. “We get involved in the Directorate and in steering committees and are included in strategy meetings and working groups.”

The Committee also shows its face outside the hospitals, though, spreading information about the work it does, for example during the **Rowing to fight cancer event (see page 35)** or at specific cancer-related events. “We are particularly proud that we are not just an item on the programme at the Ruhr Cancer Day in Essen and the Westphalian Cancer Day in Münster, but are actively involved in designing these events,” says Annette Hünefeld. What was earlier just a talk given as part of the programme has now become an interactive day with workshops and panel discussions, and the Committee is involved all day, providing input and acting as moderators.” In this way, the Committee not only attracts attention internally and externally for the work it does, but also uses specific examples to show what patient orientation can be like.

“Integrating patients in research, care and process optimisation is a real gain for everyone involved.”

Karin Kastrati
Chair of the WTZ Patients Advisory Committee



Public Facebook group “NETWORKING together – the WTZ Patients Advisory Committee”



Rowing to fight cancer

In caring for cancer patients, the WTZ Consortium is counting more and more on the beneficial effect of sports therapy and exercising

Since 2005, the “Leben mit Krebs” (“Living with Cancer”) Foundation has been organising regattas all over Germany in collaboration with local rowing clubs and cancer treatment centers. In September 2022 such a regatta was held for the first time on Lake Baldeney, with WTZ Essen acting as the cooperation partner in this case. In spite of constant rain, the event was extremely successful – but it is only one element in the wide range of exercise and sport on offer in the WTZ Consortium.

“For anyone who has had a heart attack or a stroke, sport and exercise are nowadays a perfectly natural part of their programme of regular care, and our aim in the WTZ Consortium is to build up similar structures here,” explains Prof. Dirk Schadendorf, Director of WTZ Essen and of the Dermatological Clinic at UME. For this purpose, not only are offers for inpatients and outpatients designed and implemented – many studies are also carried out in order to demonstrate, also to the health insurance funds, the effectiveness of exercise therapy in care for cancer patients.

“Our work shows that regular physical activity has a measurable influence on health and well-being in the case of people with cancer,” says Dr Miriam Götte, sports scientist at WTZ Essen. “People who regularly exercise are measurably fitter, can cope better with operations, chemotherapy and radiotherapy, and have less trouble with fatigue, anxieties and depression.” And this applies during the entire course of the illness, from diagnosis to aftercare. “In the past, exercise therapy was started only after treatment, as part of a rehabilitation programme. Today, it always begins at an earlier stage.” The challenges are adapted to individual conditions: “There is always something that we can do,” explains Prof. Philipp Lenz, General Manager of WTZ Münster and Head of Palliative Medicine. “It’s not always a detailed sports programme which is necessary – for many patients, what can be helpful is just progressive muscle relaxation or relearning everyday skills such as sitting upright or going to the lavatory alone.”



The exercises on offer in the WTZ Consortium

Therefore, besides the use of traditional physiotherapy and ergotherapy for patient care, there is a wide range of sport and exercise on offer at both WTZ locations. For many years now, for example, WTZ Münster has been offering yoga courses for people with or after cancer; dancing courses have also been enthusiastically received. At the UKM Brain Tumour Center there is a regular offer of courses with a personal trainer, and hiking days and skiing trips are also organised. The Paediatric Oncology Clinic also offers such skiing trips, as well as stand-up paddling and similar activities; and there is also a dedicated sports therapist here. At the Paediatric Oncology Clinic and for patients on the “Blue Ward” at WTZ Essen, individualised sports therapy is part of the regular care provided, parallel to treatment; there are also aftercare offers such as climbing, water sports and sports camps. The headquarters of the nationwide **“ActiveOncoKids” Network** is also here. Exercise therapy in the field of palliative medicine and a rehab sports group in the Gynaecology Clinic are firmly established.



Winning everyone’s hearts: the children in the “ActiveOncoKids” Network

Regatta on Lake Baldeney

A special highlight in September 2022 was the regatta which was held on Lake Baldeney in Essen under the motto “Rowing to fight cancer”. “The WTZ Consortium took part in such a regatta organised by the “Leben mit Krebs” Foundation in Lingen two years ago, and we decided straight away to bring the event to Essen,” says Dirk Schadendorf. Despite continuous rainfall, 60 highly motivated teams took part, each with four rowers – including patients, medical staff, former patients, members of self-help groups and staff from local companies and organisations. Some of them even learnt how to row especially for the

event. “This dedication shows us how great the need is for offers relating to exercise,” says a delighted Miriam Götte. All the more gratifying, too, that not only were 15,000 euros raised in the event to help finance the sports and exercise activities on offer at WTZ Essen, but public attention was also drawn to this important topic. “This was definitely not the last regatta organised by the WTZ Consortium,” adds Philipp Lenz. “If everything runs according to plan, there will be a “Rowing to fight cancer” event held in Münster soon, too.”



Building systematic care structures and demonstrating the effect of exercise therapy on the well-being of cancer patients – that is what we are aiming for in the WTZ Consortium.”

Prof. Dr Philipp Lenz
General Manager of WTZ Münster and
Head of Palliative Medicine at UKM

Innovative



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Planning a family despite cancer

Cancer is an enemy that attacks at many levels and which can also threaten plans to have a family. The WTZ Consortium provides support in couples' desire to have children after treatment for cancer

Cancer often requires aggressive treatment, which can lead to a loss of fertility. It is therefore important to inform patients – before their treatment begins – of the range of possibilities available to preserve fertility. The WTZ Consortium offers men and women several options for family planning after they have survived their cancer.

How bad is it? When will the chemotherapy begin? Will radiotherapy be necessary? Anyone who is diagnosed with cancer is suddenly faced with existential questions which, in the case of an aggressive tumour, often need answers within a very short space of time. “During the traditional sequence of radiotherapy, chemotherapy and surgery, any thoughts of possibly wanting to have children later are pushed to one side,” says Prof. Sabine Kliesch, a senior consultant at the Department of Clinical and Surgical Andrology at UKM. “However, each of these steps in itself contains a high degree of risk for a patient’s fertility.” This is why the question of having children – either now or later – is discus-



Dr Nicola von Ostau
Senior physician and
Head of the Urology Polyclinic
at UME



Prof. Dr Sabine Kliesch
Senior consultant at the Department of
Clinical and Surgical Andrology at UKM



sed with patients as early as possible in the WTZ Consortium, so that relevant measures can be taken. “Something that far too many people still don’t know,” says Dr Nicola von Ostau, a senior physician and Head of the Urology Clinic at UME, “is that since 2021 the health insurance funds bear most of the costs of these cryopreservation measures for all women under 40, and all men under 50, for whom we prescribe treatment which is potentially mutagenic or teratogenic.”



Our work is relevant not only for cancer patients, but for all people who need to have treatment which is potentially mutagenic or teratogenic.”

Dr Verena Nordhoff
Head of the Reproductive Medicine Laboratory at UKM

Cryopreservation of egg cells or ovarian tissue

“One in four patients with breast cancer at WTZ Essen is under 40 years of age, and women are having children at an ever later age – so the question of having children despite cancer is becoming increasingly important,” says Dr Ann-Kathrin Bittner, a senior physician at the Clinic for Gynaecology and Obstetrics at UME. “There are currently two options available to women to preserve their fertility before any treatment which might harm the ovaries.” The first corresponds to the procedure in the case of artificial insemination: the ovaries are stimulated in such a way that a large number of mature egg cells can be obtained and frozen. In any later desire to have children, these egg cells can then be fertilised and inserted into the womb – even if there is no longer any activity on the part of the ovaries.

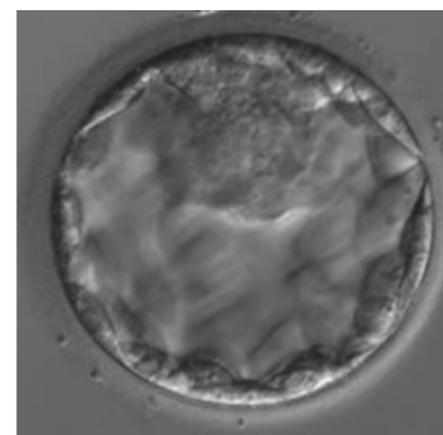
“The drawback in this method is that a time slot of at least 14 days is needed, and that it can only be applied in the case of women who are out of puberty,” says Tanja Sperlbaum, a senior physician at the UKM Fertility Clinic. The second option – which is very short-term and also possible for children and adolescents – is to remove and freeze ovarian tissue. “There is about a 30 per cent chance of becoming pregnant later and having a child after transplanting the ovarian tissue back into the womb by means of laparoscopy.”



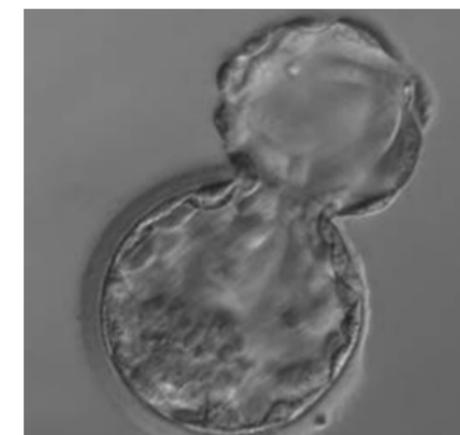
Egg cell before cryopreservation



ICSI



Blastocyst on Day 5



Hatching blastocyst on Day 5



For many patients, being diagnosed with cancer, and the effects of cancer on their own fertility, is too much to handle at first. At WTZ, we always ask about plans to have children, and we then provide appropriate advice.”

Dr Ann-Kathrin Bittner
Senior physician at the Clinic for Gynaecology and Obstetrics at UME

Cryopreservation of sperm or testicular tissue

“For boys and men, there are three methods for being able to have children after mutagenic or teratogenic treatment,” says Sabine Klietsch. As soon as a patient is able to ejaculate, there is the possibility of freezing his sperm – “and sperm can be stored for 30 years or more without any impairment to its quality.” If no sperm can be detected, mature testicular tissue can also be removed to obtain sperm.



Prof. Stefan Schlatt
Director of CeRA at UKM

“This option is not available to boys before they reach puberty,” adds Prof. Stefan Schlatt from the Center for Reproductive Medicine and Andrology (CeRA) at UKM. “They do not yet have any seminal discharge, and the testicles do not produce any sperm.” It is here that WTZ offers an experimental approach (“Androprotect”), which Schlatt explains as follows: “We take immature testicular tissue from the boy in question and freeze it. Later, we then try to develop sperm from the stem cells of the testicle to enable the patient to have children.” Although the maturing of sperm from stem cells in the lab, or through tissue or cell transplantation, has not yet been successful in humans, research is in full swing, and the results are promising. “So far, and with the approval of the Ethics Commission, immature testicular tissue with stem cells from over 160 boys – aged between just a few months and puberty – has already been stored.” Along with other possibilities for preserving fertility, this opens up a variety of options for men to have children of their own even after aggressive cancer treatment.



Tanja Sperlbaum
Senior physician at the UKM Fertility Clinic

Fighting breast cancer

At the UKM Breast Center, oncologists and plastic surgeons collaborate on breast reconstruction using patients' own tissue

If a breast has to be removed, entirely or to a large extent, the prospect of a reconstruction is a great relief for most of the women affected. At the Breast Center at WTZ Münster, not only silicone implants are used: the reconstruction of the breast using the body's own tissue is also possible. In the following interview, the Center's director Dr Joke Tio and Prof. Tobias Hirsch, Head of Plastic Surgery at UKM and senior consultant in the Department of Plastic, Reconstructive and Aesthetic Surgery at the Specialist Clinic in Hornheide, describe this innovative surgical method and explain why it is so important to speak about all available options before any tumour is removed.

You offer an interdisciplinary consultation session at the UKM Breast Center. What benefits does this joint approach to consultation have?

Dr Joke Tio: The consultation session is aimed at patients for whom we are not able to preserve the breast, but where we have to remove it entirely or to a large extent. In most cases, this is already clear right at the beginning of the therapy, and in the

consultation session we provide advice on the various options for reconstruction. For the patient, it is a great relief to have enough time to come to a decision and to know that at the end of all the treatment she undergoes she will have a reconstructed breast. We decide together with the patient whether this reconstruction should be achieved by means of implants or the body's own tissue. In coming to a decision, we take account not only of medical aspects but also of the patient's individual wishes and particular situation in life.

Prof. Tobias Hirsch: The tactical procedure can be better agreed if the planning for the reconstruction by plastic surgery is already done before the breast cancer operation – for example, which operation takes place when and, if necessary, what the best time is for any additional radiation. In particular, the line of incision and the approach paths can be agreed upon – which ensures a much better final result as regards scars and the shape of the breast.



Dr Joke Tio
Head of the
UKM Breast Center

Close and timely coordination between the Oncology and Plastic Surgery departments is a precondition for the best possible reconstruction of a breast. Innovative methods here ensure that the surgery is gentler and the recovery rapid.



Prof. Tobias Hirsch
Head of Plastic Surgery
at UKM

Only specialist clinics and centers offer reconstruction of the breast with the body's own tissue. How does this surgical method work?

Prof. Tobias Hirsch: In this surgical method, fatty tissue and, if necessary, skin is taken from the abdomen or behind the thigh. Tiny blood vessels are prepared under a magnifying glass and then grafted directly with the tissue transplant. After that, we close the abdominal wall – as we do in the case of an abdominoplasty. A new breast is formed with the transplant and is connected up again to the blood supply via the blood vessels.

Dr Joke Tio: The new breast consists of tissue from the body which feels like breast tissue: it has the same body temperature and gains or loses weight for example in line with the body's weight. The patient has no feeling of having any foreign body inside her, and the new breast is part of her body. "It's part of me!" is something that we often hear during after-care. Nevertheless, there are some women who opt for a silicone implant – because they want to avoid any further operation, for example, or because they smoke or have diabetes and don't want to take any risks. Ultimately, what's always important for us in the consultations is to present all possible options and, together with the patient, find the best possible solution for her.

Prof. Hirsch, your team performs more than 100 breast reconstructions per year using the body's own tissue, you carry out scientific evaluations of each operation and continue developing the technique. What are you working on right now?

Prof. Tobias Hirsch: The digitalisation of robotic microsurgery is playing an increasingly important role in our role. Since last year, and with funding from the European Union, we have been working on a combination of surgical robot and robotic microscope which is unique worldwide ([see article "AI in oncology"](#)). In this process, the surgical robot is controlled via a kind of joystick which transfers the surgeon's movements to tiny instruments, without any trembling at all of the human hand. Moreover, this surgical robot is connected to a robotic microscope which displays the operating area via a 3D headset and is controlled by the surgeon's head movements. This not only enables views to be taken of the operating area at complicated angles, but also permits a more relaxed posture for the surgeon. It means that anatomical structures with a diameter often of only 0.3 millimetres can be connected safely with one another over a period of hours, at maximum concentration, and conserving the tissue. And because the surgeon is completely separated from the operation area, experts may in future be able to perform specialised operations from anywhere in the world without needing to travel.



Dr Maximilian Kückelhaus with the surgical robot (left), which is linked up to a robotic microscope (right)

Proton therapy for eye tumours

WTZ at University Hospital Essen (UME) is the world's only cancer center for eye tumours, and its Ophthalmology Clinic and Particle Therapy Clinic offer all available forms of treatment for eye tumours – including, since November 2021, proton therapy

Eye tumours are relatively rare, occurring between 500 and 600 people in Germany each year. Around 400 of these are treated in the UME's Eye Clinic, where – under the aegis of WTZ Essen – the complete range of ophthalmological cancer treatment has been provided for decades now; only in the case of proton treatment was it necessary to work together with centers in France and Switzerland. In the West German Proton Therapy Center Essen (WPE), the Particle Therapy Clinic has started using a therapy unit specialising in proton treatment. In the following interview, Prof. Beate Timmermann, Director of the Particle Therapy Clinic and Medical Director of WPE, and Prof. Nikolaos E. Bechrakis, Director of the Ophthalmology Clinic, explain the background.

What are uveal melanomas, and who as a rule is affected by them?

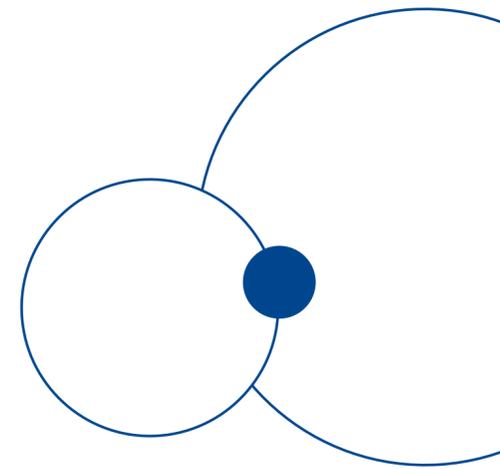
Prof. Nikolaos Bechrakis: Uveal melanomas develop from pigmented cells in the choroid which proliferate in an uncontrolled way. They belong to a small group of tumours which actually occur directly in the eye. This means they differ from metastases in the eye, which have their origin at other places in the body. The people affected are mostly patients aged between 50 and 60, but we also treat around 50 children per year.

What options are available for treating eye tumours?

Prof. Nikolaos Bechrakis: The worst case is when we have to remove the eye affected – but that is a step that we seek to avoid as a rule. The alternative is radiation treatment on the tumour, and in such cases we use either brachytherapy or proton therapy. The latter has the advantage that it can be applied in very small spaces and with an extremely high degree of precision, with the result that, even in the case of larger tumours, the optic nerve and the macula – the point at which vision is sharpest – mostly remain undamaged. In using this form of treatment,

we succeed in preserving more than 80 per cent of the affected eyes and, in 50 per cent of cases, avoiding blindness.

Prof. Beate Timmermann: In fact, proton therapy has been used very successfully for over 40 years now in treating eye tumours. However, specialist knowledge, a great deal of experience and the utmost care are all necessary in order both to monitor the tumour and to preserve the eye and eyesight. In Germany, such expertise was only present in Berlin – but thanks to the collaboration with the Ophthalmology Clinic and the Particle Therapy Clinic/WPE, WTZ Essen can be added to the list.



The introduction of proton therapy in treating malignant eye tumours is an important milestone for WPE and the Eye Clinic. It significantly extends the range of treatments at UME, and thereby also at WTZ Essen, and gives new hope to many patients."

Prof. Beate Timmermann
Medical Director of the West German Proton Therapy Center Essen (WPE) and Director of the Particle Therapy Clinic at UME

Designing and constructing the therapy unit for eye tumours lasted several years. What was so complicated about it?

Prof. Beate Timmermann: Proton therapy for the eye makes special demands regarding precision and safety, and we spent a long time working with the manufacturer on the technical details. In contrast to our other four treatment units, in the case of eye tumours we don't move the radiation device – we move the patient and the eyes. This enables us to establish the optimum, and the gentlest, path to the tumour.

Prof. Nikolaos Bechrakis: Planning the radiation is carried out using a unique 3D simulation on the basis of diagnostic images. We worked together for a long time on bringing together the patient data, the proton device and the technical features of the chair – and we also collaborate closely on the treatment for individual patients.

Can you tell us what proton therapy is in detail?

Prof. Nikolaos Bechrakis: After checking whether proton therapy is the best method of treatment for the patient concerned, the first step is always an operation to prepare for proton therapy. In this process, small clips which mark the tumour are implanted at the outer wall of the eye, the sclera. After this, the medical staff and the physicists come together in a Zoom meeting in order to discuss plans for the radiation, i.e. define the optimum access to the tumour.



Ina Rasch (MTR), Christina Wenk (MTR), Sandrina Bethaus (MTR), Alexander Korol (MTR), Dr Dirk Geismar (physician, WPE), Dr Andreas Förster (physician, Eye Clinic), Dr Jörg Wulf (medical physicist, WPE) and Martin Bischoff (physician, WPE) (from left)

Prof. Beate Timmermann: The proton treatment itself is then preceded by several trial run-throughs here at WPE. We try out sitting positions and the direction of vision and test whether the person concerned can use the chair to position him or herself in such a way that the planned access to the tumour is actually possible. In the actual treatment itself, which is mostly carried out four times, the radiation time is about one minute – but with getting the chair and everything else ready, patients are here with us for up to 90 minutes. This is why, currently, we don't treat more than four people per day. But they can rely on receiving top-level treatment for their eye tumour.

Robot-assisted production of cytostatic drugs

Only seven clinics in Germany are able to produce cytostatic drugs using a fully automatic robot. Two of them – UKM and UME – belong to the WTZ Consortium.

In the WTZ Consortium, 130,000 single doses are produced for chemotherapy use. In around 20 per cent of cases, a state-of-the-art robot is used which, because it is error- and fatigue-free, makes an important contribution not only to medication safety but also to the job satisfaction of staff working in hospital pharmacies.

“The pharmacy technicians have accepted the robot as a new member of their team,” says Dr Jochen Schnurrer, Head of the UME Pharmacy. After all, instead of competing for employees’ jobs, the robot provides valuable support for the pharmacy staff. “The preparation process for cytostatic drugs is quite strenuous, and the robot helps the technicians to avoid physical exertion and, as a result, any errors due to fatigue. This makes it possible to have age-appropriate workplaces, which in turn helps us

to retain our highly qualified staff. Also, the time needed for staff to learn how to prepare cytostatic drugs by themselves, with the aid of the robot, is relatively short, which makes it considerably easier to bridge periods of staff shortages.”





The ‘cytostatic robot’ cannot replace people, but it can make a decisive contribution to medication safety and reducing stress for the team working in the pharmacy.”

Dr Jochen Schnurrer
Head of the UME Pharmacy

A colleague, not a rival

Preparing cytostatic drugs takes place in clean-room conditions and always in the pharmacy, under controlled and validated conditions – never on the wards. This is the only way to ensure maximum safety for seriously ill patients and, at the same time, guarantee protection for staff working on dangerous, highly effective active ingredients. For the pharmacy technicians, this means wearing protective clothing, breathing filtered air, and repetitive routine work over several hours. Syringes have to be filled over and over again, and different volumes of various active ingredients have to be combined to individual preparations for each patient. “In chemotherapy, we work with combinations from 150 different active ingredients, and currently we have 1,200 active chemotherapy protocols in use which define the combination and dosage of these ingredients,” explains Dr Christoph Klaas, Head of the UKM Pharmacy. It is especially in standard processes and in the production of large volumes that the robot is used. “The machine comes up against its limits in the case of very fine dosages and complex production methods,” says Klaas. And what cannot yet be automated is the programming of the robot, nor the materials management and the logistics.



“Also, because the robot is not faster than the humans in our team, it does not represent any threat to their jobs. Rather, the robot is a colleague which can take a lot of stress and which works precisely and reliably.” That has an effect on the motivation in the team – and builds confidence vis-à-vis patients and health insurance funds.



Development partnership with the manufacturer

It is no coincidence that in Germany cytostatic robots are deployed primarily at university hospitals. “For it to be worthwhile to deploy such a robot, the department producing medication has to have a certain size,” explains Dr Jonas Engelbertz, who is responsible for the robot at UKM. “The robot manufacturer is a specialist medium-size company from Italy which attaches a great deal of importance to development partnerships.” This means that prototypes are tested on-site in hospitals, and twice a year the manufacturer invites all the hospitals that



It is especially in standard processes and in the production of large volumes that the robot is impressive, working without making errors or feeling tired.”

Dr Christoph Klaas
Head of the UKM Pharmacy



Dr Jonas Engelbertz
Pharmacist, Central Cytostatic
Drugs Preparation at UKM

use its robots to a meeting at which the further development of these robots is discussed. “We can say what we would like and thus have a decisive influence on this innovative technology,” says Klaas. Schnurrer and Klaas agree immediately when asked what their most pressing wish is: “Smaller volumes,” they say. But their wish list also includes further developments for other requirements. “This would mean that in future the robots could be deployed directly on the wards and take some of the pressure off the nursing staff.” There is a great potential there, and the technology is highly expandable. “We’re proud to be working in such an innovative environment, making a contribution to the continued development of this technology,” comments Engelbertz.

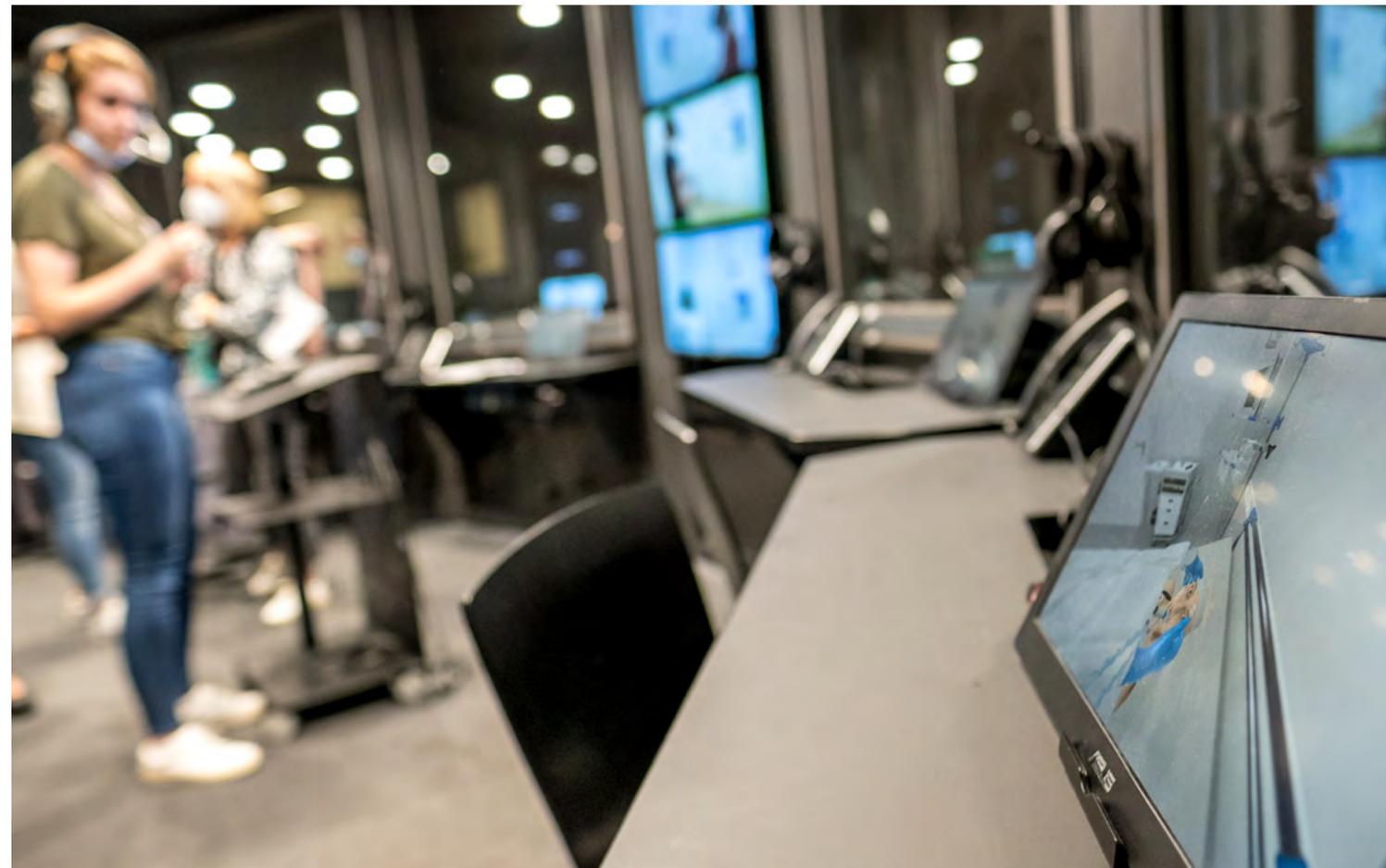


Digitalisation in medical studies

Digitalisation will play a major role in the health systems of tomorrow, and the WTZ Consortium is systematically preparing its students for it

Digitalisation is one possibility for developing medicine in an innovative way, freeing up more time for doctors and providing better care for patients. The key to all this lies in qualifying staff by means of appropriate, relevant training. Since 2022, a project has been running at WTZ Essen for this purpose entitled “Digitalisation in the context of medical studies” (DiKoMed); at WTZ, teaching is done using virtual reality, among other things.

“Although digitalisation is having a massive impact on our health system, there is no subject ‘Digitalisation’ on the medical training curriculum,” says Prof. Stephanie Herbstreit, a senior physician at the Clinic for Trauma, Hand and Reconstructive Surgery at UME. She heads the DiKoMed project, which is being funded by the North Rhine-Westphalian (NRW) Ministry of Education and Science in cooperation with Stifterverband (an association of companies, donors and foundations) and the NRW Digital University. “The idea behind DiKoMed is to teach students the basic knowledge and digital skills necessary for any considered and meaningful use of digitalisation during their future work as doctors.”



I am convinced that virtual reality will make a significant change to medical training within the next ten years.”

Prof. Bernhard Marschall
Dean of Studies at the Medical Faculty
of the University of Münster

Learning digitalisation

The format is designed as an online self-study course which runs through the entire course of students' studies. The content reflects the progress made in medical studies, with different focuses included in the pre-clinical foundation course, the clinical phase and the practical year. "At the beginning, the focus is on supporting individual learning –

for example, on researching medical literature. In the clinical semesters, it is above all medical information and communications systems, and telemedicine, which are taught. During the practical year, the programme includes artificial intelligence, virtual and augmented reality and medical apps," Herbstreit explains.

Initially, DiKoMed is offered on a voluntarily basis, with new content and topics gradually being fed in. Parallel to this, feedback is collected and the way DiKoMed is used is evaluated: "At the latest, the course content will be compulsory for students when the new licensing regulations for doctors are introduced." The entire contents of the project are accessible as an Open Educational Resource (OER) and are also available to other faculties or courses through NRW's digital learning and teaching portal [ORCA.nrw](#).



At WTZ we make sure that doctors develop an affinity with digitalisation while they are still students."

Prof. Joachim Fandrey
Dean of Studies at the Medical Faculty
of the University of Duisburg-Essen

Teaching with virtual reality

Digital teaching has long been integrated within the Medical Faculty of the University of Münster: since 2008, microscopy has been carried out at the computer, and all written examinations are computer-based. The e-learning center of competence develops and deploys digital teaching methods; and all lectures have also been offered in a hybrid format since the end of the Covid-19 pandemic. With its "Learning Center for Individual Medical Activities Training and Development (LIMETTE)", Münster also has one of the most innovative centers in the field of medical training. "What students have learnt can be reproduced much better if it was learnt in a practical context instead of at a desk or in a lecture," explains





Prof. Stephanie Herbstreit
Senior physician at the Clinic for Trauma, Hand and Reconstructive Surgery at UME

Prof. Bernhard Marschall, Dean of Studies at the Faculty of Medicine. “This is why, in our teaching hospital, we regularly put students in situations where they have to make specific decisions – by means, for example, of virtual reality.” For this purpose, Dr Markus Holling, Deputy Director of the Neurosurgical Clinic at UKM, and computer scientist Prof. Benjamin Risse jointly developed a simulation for which they were awarded the Teaching Prize 2021. A diagnosis of brain death can be realistically simulated using this software. “Students put on a VR headset and find themselves in a virtual intensive-care room in which they have to perform all necessary tests on a likewise virtual patient who has had a serious accident. On the basis of the immediate results, they then have to decide whether the patient is brain-dead or not.” The exercise is part of the teaching module on transplantational medicine, which is compulsory for students in their seventh semester, and Münster is currently the only university which uses VR in its curriculum.

Diagnosing brain death is particularly well-suited to VR applications. “Few things in medicine are as clear as brain death – and as difficult to simulate with dummies or actors,” says Holling. But for Bernhard Marschall, the brain-death exercise is only a first glimpse of the opportunities offered by the technology. “The project – which is funded by the German Ministry of Education and Research and is set to run for three years – aims to build up an AI-based simulation and training platform.” Its deployment is currently being prepared in the Department of Dermatology. “Here, too, actors are only suitable to a limited extent for distinguishing between benign and malignant melanomas.” In the next stage, movements, too, are to be integrated into the simulation before, ultimately, communicating with the virtual patient becomes possible. “The long-term aim is to simulate a complete ward by means of VR, so that the complete team can learn in an interprofessional way and in a protected room.”



Dr Markus Holling
Deputy Director of the Neurosurgical Clinic at UKM

Clinician Scientist Programme

In the WTZ Consortium, targeted funding programmes support doctors who wish to do research in addition to their hospital work

Medical progress needs doctors who have received the best possible training, both in patient care and in research, and who are active in both. In this interview, Prof. Anke Hinney, Vice-Dean for Junior Researchers and Diversity at the Medical Faculty at the University of Duisburg-Essen, and Prof. Annalen Bleckmann, Director of WTZ Münster and a member of the Steering Group for the Münster Clinician Scientist Programme “CareerS”, explain which funding programmes are used to support medics active in research at WTZ, from undergraduate to professor.

What exactly is a clinician scientist?

Prof. Anke Hinney: Clinician scientists are doctors who care for patients in their everyday work and, at the same time, are engaged in intensive research work. This means that they make a unique contribution to medical developments. As a result of their direct contact with patients, clinically relevant aspects come under scrutiny in their research work, and, at the same time, new research findings can be integrated directly into the treatment of patients.

Prof. Annalen Bleckmann: Anyone who opts for this dual career needs protected time for research while someone stands in for them in the hospital. That only functions if the hospital management, the medical team and the research team work hand in hand and support the clinician scientists in the path they have chosen. For years now, therefore, both WTZ locations have had special funding programmes for clinician scientists which enable them to have protected research time – as well as including a mentoring programme, special further training and opportunities to build up networks.

How are these funding programmes structured?

Prof. Anke Hinney: In Essen the University Medicine Essen Clinician Scientist Academy (UMEA) – funding for which has just been approved for a further two years by the German Research Foundation (DFG) – has been in existence since 2019 under the direction of Prof. Dagmar Führer-Sakel. Here – in addition to the DFG-funded Clinician Scientist Programme – we offer a Junior Clinician Scientist Programme, as well as, since just recently, an Advanced Clinician Scientist Programme funded by the German Ministry of Education and Research (BMBF) and headed by Prof.



Prof. Anke Hinney
Vice-Dean for Junior Researchers and Diversity at the Medical Faculty of the University of Duisburg-Essen

Ulrike Bingel. The Junior Programme is aimed at junior doctors who are released from their work for at least three months to focus on their research and publications. The Clinician Scientist Programme includes a 50 per cent release from work to undertake research, as well as a complementary mentoring and qualification programme over a period of three years. The BMBF Advanced Clinician Scientist Programme is only offered at seven other locations in Germany. Here, the researchers are released from work to undertake research over a period of six years.



Prof. Annalen Bleckmann
Director of WTZ Münster and a member of the Steering Group for the Münster Clinician Scientist Programme “CareerS”



In the WTZ Consortium we attach great importance to supporting physicians on their individual career paths from undergraduate studies to a professorship.”

Prof. Dagmar Führer-Sakel

Director of the Clinic for Endocrinology, Diabetology and Metabolism at UME and Head of the University Medicine Essen Clinician Scientist Academy (UMEA)

Prof. Annalen Bleckmann: Prof. Michael Schäfers has developed something similar in Münster: we call it Clinician Scientist Programme “Careers” and it, too, has been receiving funding from the DFG since 2022. The “Starter” module funds research work and further training undertaken by junior doctors, with a protected research period of up to 12 months. The “Boost” module has a protected research period of 18 months which can be distributed flexibly over three years. The researchers also receive funds to cover costs for materials and travel and they are integrated in a strong research community. As far as researchers setting up their own working groups is concerned, we are currently working with the Interdisciplinary Center for Clinical Research on continuing to develop very successful funding possibilities already available, which we are transferring into the “Group” module. For taking the career step from heading a group of junior researchers to obtaining a professorship, there are also so-called Clinical Translational Professorships in Münster, which promote close links between research and patient care.

Prof. Anke Hinney: The Clinician Scientist Programme can also lead to a professorship in Essen, too. Here, five middle-ranking professorships are available for graduates of the programme.

Is the Clinician Scientist Programme open in principle to everyone?

Prof. Annalen Bleckmann: Anyone who is on the appropriate training level and meets the application criteria can apply with his or her own idea for a project. The interdisciplinary “Careers” Board looks through the project applications submitted, after which the shortlisted candidates introduce themselves and present their projects in person; then the final selection is made.

Prof. Anke Hinney: At UMEA, 40 people have already completed the Clinician Scientist Programme. They are all really pleased that on their career paths they didn’t have to choose between working in a hospital and doing research, and they all benefit enormously from exchanging ideas with one another.



Prof. Michael Schäfers

Director of the Clinic of Nuclear Medicine, Vice-Director of WTZ Münster and spokesman for the new Clinician Scientist Programme entitled “Careers”



Prof. Ulrike Bingel

Head of University Pain Medicine at UME and Head of the Advanced Clinician Scientist (ACS) Programme “UMEA2”

Radioimmune therapy for glioblastoma

WTZ Münster is heading a study looking at whether local treatment with a radio-labelled antibody fragment improves prognoses for patients with glioblastoma

After surgery, radiotherapy and chemotherapy, 85 to 90 per cent of patients with glioblastoma develop a recurrence in the immediate vicinity of the surgical cavity. The aim of a new type of medication which is injected directly into the surgical cavity is to destroy the remaining tumour cells and slow the process down.

Glioblastoma is the most common type of brain tumour and has a very poor prognosis for survival. “Unlike breast cancer, for example, there is no maintenance treatment which limits the growth of the tumour after the standard treatment consisting of surgery, radiotherapy and chemotherapy,” explains

Dr Michael Mütter, a senior physician at the Neurosurgical Clinic at UKM. “Medication administered orally or intravenously scarcely reach the relevant area because of the blood-brain barrier, among other things. So, in our study, we introduce the active ingredient directly into the surgical cavity in three cycles, four weeks apart.



The LuCaFab preparation, the groundwork for which was carried out over a long period of time, is based on linking a radioactive beam source with an antibody fragment which targets a protein that occurs in a high concentration on glioblastoma cells, but not on healthy brain cells. The LuCaFab targets radiation onto the tumour cells and destroys them while minimising radiation exposure to healthy tissue.

“LuCaFab was studied in a variety of animal experiments and used for three patients as part of attempted curative treatment for them – without any side effects,” says Prof. Lars Stegger from the Clinic for Nuclear Medicine at UKM.

The study has been running since the end of 2022. It is set to last around 16 months and to include 12 patients. Currently, people are being sought to participate in the study at the Clinics of Neurosurgery and Nuclear Medicine in Münster, Essen, Cologne and Würzburg. “The aim of the Phase I study is to determine the safety and the maximum dose of LuCaFab which can be tolerated. Our experience so far leads us to expect a significant extension of the average period of survival,” says Stegger.

As Prof. Karsten H. Wrede, Deputy Director of the Clinic for Neurosurgery and Spinal Surgery at UME, adds: “For our patients, this complex, interdisciplinary research is very important. As a result of it, new forms of treating glioblastoma will be available to us in the future. Because of the collaboration between WTZ Münster and WTZ Essen, we are now able to undertake this project together after many years of preparation.”



This study is exceptional, in many respects. As a result of the collaboration between the fields of neurosurgery and nuclear medicine, it is the only one of its kind. It involved an enormous amount of work to get it approved, but it promises enormous benefits for patients.”

Dr Michael Müther
Senior physician at the Neurosurgical Clinic at UKM



Prof. Lars Stegger
Deputy Director of the Clinic for Nuclear Medicine at UKM



Prof. Karsten H. Wrede
Deputy Director of the Clinic for Neurosurgery and Spinal Surgery at UME

Myeloid leukaemia in children with trisomy 21

WTZ Essen is heading a study looking at whether a new type of medication can improve survival rates in children with Down's syndrome and acute myeloid leukaemia

Children with Down's syndrome have a 150 times higher risk of contracting acute myeloid leukaemia (AML) in the first few years of their lives. Their chances of recovery are 85 to 90 per cent, but some of the children have to struggle with severe side effects of their treatment, some of them life-threatening. A new type of medication aims to change that.

Research on AML in children with trisomy 21 has been carried out for over 20 years now in the WTZ consortium. "Children with Down's syndrome are particularly vulnerable: the basic disorder not only entails a high risk of leukaemia, but also increases the likelihood of severe side effects during chemotherapy," explains Prof. Andreas Groll, a consultant at the Clinic for Paediatric Medicine at UKM. "Through our work with patients with Down's syndrome, we have gained valuable insights into how the leukaemia arises," adds Prof. Dirk Reinhardt, Director of Paediatric Clinic III at UME and Head of the **AML study group**.

"We have learnt, for example, that the mutation which is responsible for AML is already present before birth and, in around five per cent of newborn babies, leads to temporary leukaemia, which, however, then disappears again. However, within the first four years of their lives, 20 per cent of these children then develop leukaemia which requires treatment."

The aim of the study, which began in 2021, is to reduce the side effects of this treatment while maintaining the survival rate. To this end, the medication used so far is being replaced by CPX-351 – a combination product in which cytarabine and daunorubicin are encapsulated in liposomes in a ratio of 5:1. So far, 12 patients have been included in the study, with a final figure of 150 being aimed at.



Because of the low number of cases, this study can only be carried out in a research alliance, and it is a perfect example of joint research in the WTZ Consortium and beyond."

Prof. Dirk Reinhardt
Director of Paediatric Clinic III at UME
and Head of the AML study group

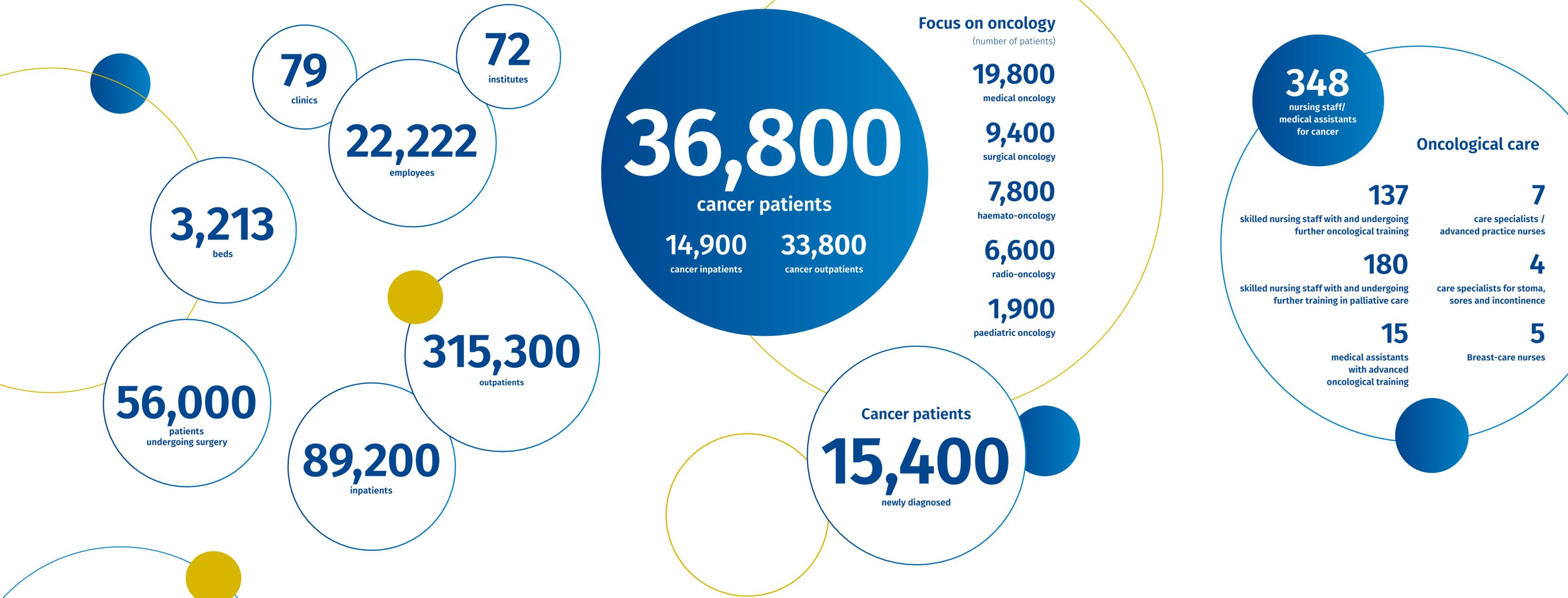
"As a result of what is fortunately a low number of cases, it will be about six to seven years before we can present any results," says Prof. Reinhardt. In addition to the primary question of the efficacy of CPX-351, the study is also pursuing other aims – such as the identification of prognosis factors as regards the risk of recurrence, toxicity and an unfavourable development.



Prof. Andreas Groll
Consultant at the Clinic for
Paediatric Medicine at UKM

Excellence in figures

University Hospital Essen and University Hospital Münster



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