

PRESS RELEASE

PRESS RELEASEAugust 31, 2022 || Page 1 | 6

New research and study laboratory by TU Braunschweig, Fraunhofer IST and Städtisches Klinikum

Patient room of the future opened in Braunschweig

Separate bathrooms for all patients, seamless and easy-to-clean bedside tables with dirt-repellent surfaces, automated cleaning concepts, disinfectant dispensers that display a smiley face when used: this is what the “patient room of the future” could look like. The walk-in demonstrator of such a two-bed room was opened on the grounds of the Städtisches Klinikum Braunschweig on 31 August 2022. In the research and study laboratory, experts from the fields of architecture, materials research and medicine develop practical model solutions for hospital architecture. Technische Universität Braunschweig, Fraunhofer Institute for Surface Engineering and Thin Films IST and Städtisches Klinikum Braunschweig have joined forces for this purpose.

The prototype of the patient room was developed in the KARMIN project and exhibited on the Charité premises as part of the World Health Summit 2020 in Berlin. Now the demonstrator is being transferred to a new application-oriented research and study laboratory. The cooperation partners - the Institute for Construction Design, Industrial and Health Care Building (IKE) of TU Braunschweig, the Fraunhofer IST and the Städtisches Klinikum Braunschweig - will thus be able to directly integrate and test research results in a real environment.

Direct feedback from practice

The fact that the walk-in model was built on the grounds of the Städtisches Klinikum Braunschweig on Naumburgstraße has a major advantage. It allows medical staff access for practical examinations and the researchers receive direct feedback from doctors, nursing staff and trainees.

“We do health services research together,” emphasises Dr Thomas Bartkiewicz, Medical Director of the hospital. “The important question for us here, for example, is: how can we convert a normal patient room into an intensive care room?” In the research and study laboratory, it is possible to recreate everyday hospital life and train various case constellations through the use of augmented reality. “In a forward-looking and sustainable way, we want to advance translational research and thus set the stage for further activities in the training and qualification of medical staff,” says Dr Bartkiewicz.

Press Contact: Dr. Simone Kondruweit

Fraunhofer Institute for Surface Engineering and Thin Films IST | Phone +49 531 2155-535 | simone.kondruweit@ist.fraunhofer.de
Bienroder Weg 54 E | 38108 Braunschweig | info@ist.fraunhofer.de | www.ist.fraunhofer.de

Avoiding infections with clever room planning

PRESS RELEASE

August 31, 2022 || Page 2 | 6

Even though the patient room has always been at the centre of hospital construction and hygiene, its importance has come to the fore in recent years - due to the increase in hospital infections with multi-resistant pathogens and not least due to SARS-CoV-2. Among other things, clever room planning should now help to prevent the transmission of dangerous germs. That's why the new research laboratory only looks like a normal two-bed room in a hospital at first glance: because in the patient room of the future, the beds are opposite each other instead of next to each other and there are two bathrooms. This division prevents cross-contamination and contact infections, which can happen when two people use the same wet room. The researchers have also placed six disinfectant dispensers along the work routes of the nursing staff. The scientists also thought of a special lighting design - from very bright during rounds, to warm colours during rest periods, to a light strip that is activated by sensors when patients get up at night.

"In the future, architects planning healthcare buildings will have to deal with the central question of how to create optimal conditions for patients and hospital staff while at the same time ensuring flexibility in operation," says Dr. Wolfgang Sunder, project manager at the Institute for Construction Design, Industrial and Health Care Building (IKE) at TU Braunschweig. "In doing so, we have to consider relevant topics such as infection prevention, comfort or digitalisation in an interdisciplinary way. So it's not nearly enough for medical professionals to look at the topic only from their perspective or for us to look at it only from the architectural point of view."

Automated cleaning processes

In addition to architecture, the research laboratory focuses on functional surfaces and materials. Bio-based surfaces that are easy to clean minimise the risk of high germ contamination. Surfaces that change colour as soon as they are contaminated with germs could also be used. "Analysis, adaptation and optimisation of surfaces as well as the use and development of new sustainable materials are central starting points for preventing the transmission of germs in hospitals and protecting patients from infections," explains Dr Kristina Lachmann, project manager at the Fraunhofer IST. "We are taking a holistic approach by, for example, identifying hotspots and using digital methods to develop and adapt efficient environmentally friendly cleaning processes." Through automation and the integration of modern sensor technology, workflows and processes can be made more effective and economical, and staff can be relieved.

FRAUNHOFER INSTITUTE FOR SURFACE ENGINEERING AND THIN FILMS IST

The project is scheduled for five years with an option for extension and will take into account the constant change in medical care. Industrial partners from the healthcare sector are also involved in the development of the patient room. In this way, the findings from the research and study laboratory can flow directly into the planning and construction processes of healthcare buildings, be transferred into the professional practice of hospitals and be used in the development of corresponding products.

PRESS RELEASE

August 31, 2022 || Page 3 | 6



The patient room of the future was officially opened today. Present: (from left) Dr. Andreas Goepfert (Managing Director of Braunschweig Municipal Hospital), Science Minister Björn Thümler, Dr. Thomas Bartkiewicz (Medical Director of Braunschweig Municipal Hospital), Dr. Patrick Hoyer (Research Coordinator Fraunhofer-Gesellschaft), Prof. Dr. Angela Ittel (President TU Braunschweig), Lord Mayor Dr. Thorsten Kornblum, Prof. Carsten Roth (Head of Institute for Structural Design, Industrial and Healthcare Construction), Dr. Kristina Lachmann (Project Manager Fraunhofer IST), Dr. Wolfgang Sunder (Project Coordinator, Institute for Structural Design, Industrial and Healthcare Construction) Prof. Dr. Christoph Herrmann (Head of Fraunhofer IST), Dr. Michael Thomas (Head of Department Fraunhofer IST). © skbs/Björn Petersen

Voices on the opening

PRESS RELEASEAugust 31, 2022 || Page 4 | 6

Björn Thümler, Lower Saxony Minister for Science and Culture:

“Innovative approaches in hospital hygiene save lives. The new research and innovation laboratory of TU, Fraunhofer IST and the Städtisches Klinikum is a quantum leap for Braunschweig as a healthcare location. In this patient room of the future, specialists from research and hospital care can test and follow up in a practical and vivid way how innovations in functional surfaces and automated cleaning systems can contribute to a noticeable improvement in hospital hygiene. Because for me, every preventable hospital infection is one too many.”

Dr Thorsten Kornblum, Mayor of the City of Braunschweig:

“The patient room of the future is a great example of research made in Braunschweig! For years, outstanding projects have been created through close cooperation between universities, research institutes and public institutions. I am very pleased that TU, Fraunhofer IST and our municipal hospital are pulling together to develop the patient room of tomorrow. Our health is our most valuable asset - this was impressively demonstrated to us by the Corona pandemic. It is therefore all the more important to ensure the highest possible health protection in the clinics through innovative and practical solutions such as the infection-preventive patient room and to further relieve the nursing staff through smooth processes.”

Professor Dr Angela Ittel, President of TU Braunschweig:

“The patient room of the future offers great conditions for interdisciplinary collaboration between architecture, materials and infection research. At the same time, practice-relevant topics and research findings can flow into academic teaching and professional training. A win-win situation, not only for the region! The opening of the research and study laboratory is also a further step on the way to the holistic development of our university - a path that we as TU Braunschweig would like to take together with the region. The focus here is on the mutual exchange of knowledge between the university and society.”

Prof. Dr.-Ing. Reimund Neugebauer, President of the Fraunhofer-Gesellschaft:

“In the light of demographic change and an increasing shortage of skilled workers, the intelligent use of innovative technologies and processes is essential to make health affordable for all and to ensure the best possible patient care. I am very pleased that, together with the TU Braunschweig and the Municipal Hospital, we are establishing the Patient Room of the Future, an application-oriented research and study laboratory that

Press Contact: Dr. Simone Kondruweit

Fraunhofer Institute for Surface Engineering and Thin Films IST | Phone +49 531 2155-535 | simone.kondruweit@ist.fraunhofer.de
Bienroder Weg 54 E | 38108 Braunschweig | info@ist.fraunhofer.de | www.ist.fraunhofer.de

FRAUNHOFER INSTITUTE FOR SURFACE ENGINEERING AND THIN FILMS IST

will contribute to these goals for society as a whole. The Fraunhofer IST is making an important contribution to the protection of particularly vulnerable people in outpatient or inpatient treatment, especially with its innovative solutions from the field of functionalised surfaces and materials as well as automated cleaning systems.”

PRESS RELEASE

August 31, 2022 || Page 5 | 6

Open House Day

For the public, the Patient Room of the Future will open its doors for one day on Tuesday, 6 September, from 4 pm to 7 pm.

The cooperation partners

The research team combines the disciplines of architecture and materials, coating and surface technology, represented by the Institute of Construction Design, Industrial and Health Care Building (IKE) at TU Braunschweig and the Fraunhofer Institute for Surface Engineering and Thin Films IST. Both institutes have many years of research experience in the health sector. In addition, both institutions have been cooperating in teaching and research with the Städtisches Klinikum Braunschweig for more than ten years. As a maximum-care hospital, the clinic provides university-level care to the Braunschweig region. In addition, 19 industrial partners are involved who contribute their knowledge to the construction and further development of the patient room.



Handing over the keys in front of the patient room of the future: (from left) Dr. Andreas Goepfert (Managing Director, Braunschweig Municipal Hospital), Dr. Thomas Bartkiewicz (Medical Director, Braunschweig Municipal Hospital), Dr. Kristina Lachmann (Project Manager, Fraunhofer IST) and Dr. Wolfgang Sunder (Project Coordinator, Institute for Structural Design, Industrial and Health-care Construction).

© skbs/Björn Petersen

The Fraunhofer Institute for Surface Engineering and Thin Films IST is an innovative partner for research and development in surface technology, with expertise in the associated product and production systems. The aim is to develop customized and sustainable solutions: from prototypes, through economic production scenarios, to upscaling to industrial magnitudes – and all this whilst maintaining closed material and substance cycles. The Fraunhofer IST is one of the seventy-five institutes of the Fraunhofer Society, Europe’s leading research organization.

FRAUNHOFER INSTITUTE FOR SURFACE ENGINEERING AND THIN FILMS IST

PRESS RELEASE

August 31, 2022 || Page 6 | 6



View into the patient room of the future. There are two bathrooms here. This division prevents cross-contamination and contact infections.

© Fraunhofer IST, Paul Kurze



In the patient room of the future, the beds are opposite each other instead of side by side.

© Fraunhofer IST, Paul Kurze