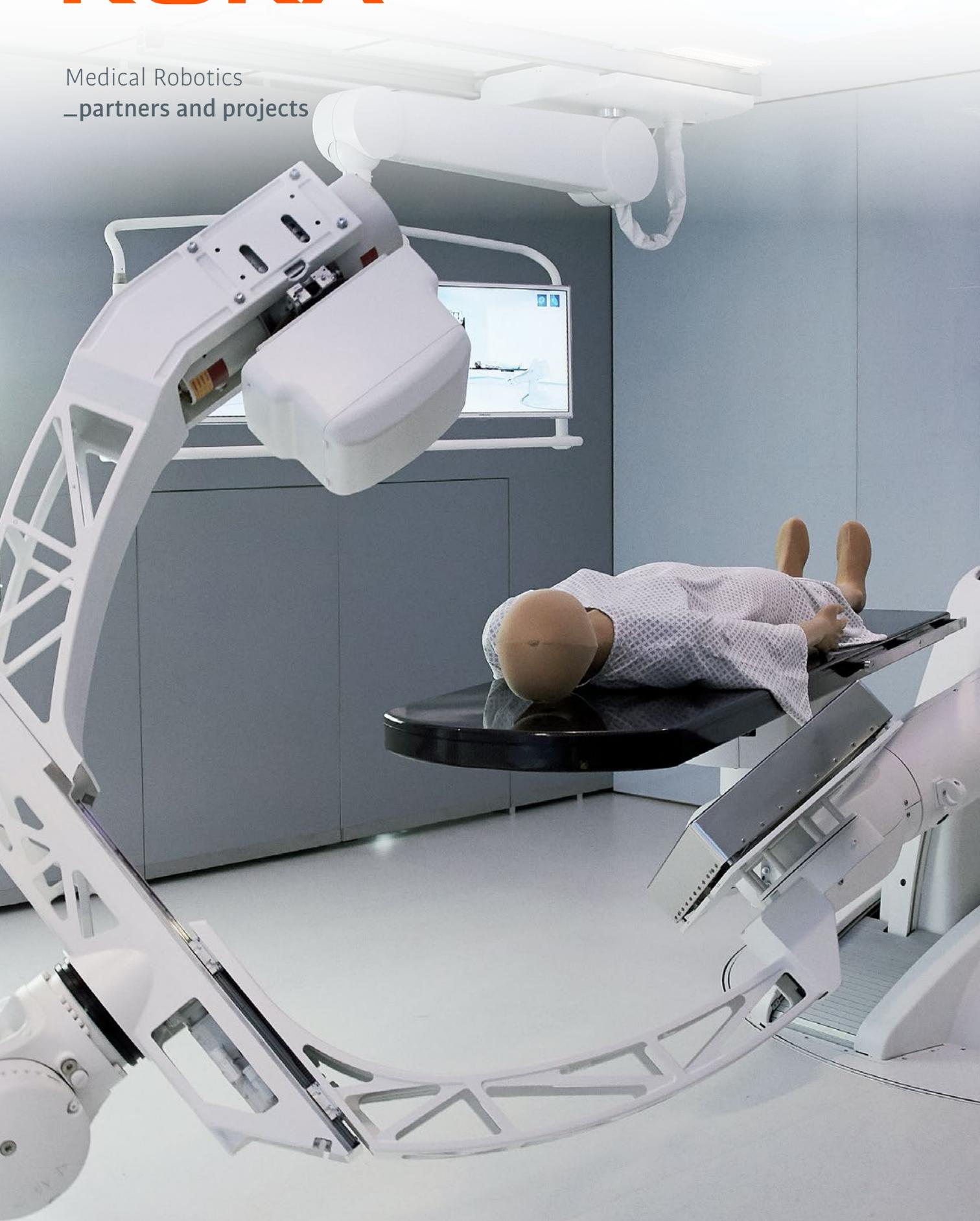


KUKA _your partner in medical robotics

KUKA

Medical Robotics
_partners and projects



ARTIS pheno

Siemens Healthcare: Medical robots for revolutionary X-ray imagery

ARTIS pheno is a new robot-supported angiography system which has enabled Siemens Healthcare to open up a new dimension in the fields of minimally-invasive surgery, interventional radiology and cardiology.

With the ARTIS pheno, X-ray examinations of blood vessels can be carried out far more quickly and accurately because a C-arm X-ray unit moves around the patient automatically and in an exceptionally flexible manner. As such, the region of the body on which the system is focusing can be imaged from virtually all directions without having to relocate the patient.

In the event of any interruptions, the memory function enables the system to resume the examination at a later time from the very same position it left off.

The outstanding imaging quality means results can be checked even during an ongoing intervention. The robotic heart of the X-ray system is a KUKA QUANTEC robot with its KR C4 technology. The KUKA medical robotics team has spent the last few years optimizing the robot and they are continually expanding the scope of its functionality. Therefore it is easier for our partners to use it for a wide range of clinical applications.



KUKA technology opens up a new dimension in X-ray imagery: the Siemens ARTIS pheno (© Siemens Healthcare GmbH)

hirob

Automated hippotherapy

Patients with neurological deficits need intensive therapeutic exercise to regain torso control and stability. The rehabilitation robot "hirob" can assist with this in an innovative manner. It opens up the possibility of automated hippotherapy by imitating the exact movements that a horse's back makes while the horse is walking.

Because the patient is continually required to react to the movement of the robot, the exercise enables him to improve his balance and he learns to keep his torso rigid.



Unique therapeutic exercise with "hirob", the robotic horse.

CyberKnife

Accuray: Robot-guided radiation therapy

Leading radiation therapy centers around the globe use the CyberKnife system from Accuray for high-precision tumor treatment.

Instead of a scalpel, the surgeon uses a bundled, high-energy X-ray beam. The CyberKnife hits tumors with pinpoint accuracy leaving the surrounding healthy tissue undamaged, irrespective of where in the body the tumor is located. As the patient lies on the operating table the CyberKnife is guided around him by a robot arm. This ensures that the dose is concentrated in the tumor. An imaging system stereotactically records the position of the tumor and simultaneously signals any movements the patient makes – such as motion due to breathing – to the robot. The robot then compensates for these motions immediately.

The treatment table that the patient lies on is also robotically controlled. This combination results in extremely high precision and quality of therapy and allows patients to undergo operations as out-patients.

Accuray has been working in partnership with KUKA since 2000. This pioneering work culminated in the first commercially available robot-guided radiosurgery system.



The patient lies freely positioned on the robotically controlled treatment table while the CyberKnife treats the tumor.



BEC uses KUKA robots for precise positioning of the patient during particle-based radiation therapy (© Thomas Kästenbauer)

exacure

BEC: Patient positioning using KUKA robots

Radiation therapy patients can be positioned accurately using robots and components made by KUKA. To this end, system partners develop customized applications in collaboration with KUKA. For example, Buck Engineering Consulting (BEC) has presented a patient positioning solution for the MedAustron Center for Ion Therapy and Research in Vienna, Austria. A KUKA robot is the cornerstone of this product. In this application, the high-energy beam remains stationary and the bed carrying the patient is moved, allowing the beam to be aimed with the utmost accuracy.

AOT



The laser head – held by a KUKA LBR – enables bone surgery to be performed with unprecedented precision (© AOT)

Cutting bones without any contact

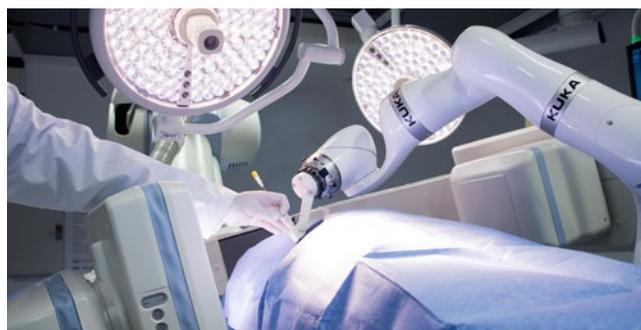
Surgeons still regard the saw as the tool of choice when it comes to cutting bones. However, this method causes loose bone material to end up in the cut surfaces and often slows down the healing process. CARLO (Cold Ablation Robot-guided Laser Osteotomy), a project run by the Swiss company AOT, provides assistance in this respect. The laser head which is guided by the integrated KUKA robot uses cold laser technology and cuts bones without making any contact. In addition to straight cuts, crescent-shaped and even puzzle-shaped cuts are possible. By using this method the surface of the bone remains intact and the cut can be accurately reassembled. This significantly reduces the patient's healing time following the operation.

M²OLIE

M²INT: Minimally invasive treatment of tumors at the molecular level

The targeted removal of tissue (so-called biopsies) is required to diagnose cancer patients with metastases in a safe manner. Doctors now work hand in hand with robots to treat tumors in oligometastatic patients in a minimally invasive manner at the molecular level: The doctor localizes the insertion site with a 3D X-ray system and guides the robot carrying the biopsy needle to the site.

The robot ensures that the needle guide is at exactly the right position and orientation for the needle to reach the tumor. The insertion itself is performed by the doctor in collaboration with the robot and he repeats the procedure for each metas-



Thanks to its mobile platform, the medical product including the LBR can be easily transported into the operating room if required.

tasis. This enables the doctor to navigate more accurately, to diagnose the metastasis more quickly and even treat it right there and then. Both the patient and the operation team benefit from the shorter operation time. This project is supported by the Federal Ministry of Education and Research.

HighRes Biosolutions



A laboratory scientist is hand teaching the HighRes Biosolutions CoLAB system

CoLAB High Throughput Screening system by HighRes Biosolutions

Traditional laboratory automation tend to isolate users from their systems. A CoLAB enabled system allows the user to operate his automation system in the same lab space without the need for extensive shielding and safety measures. The CoLAB Family is based on collaborative robotics by KUKA, to work in various laboratory configurations. Equipped with miscellaneous automatic safety features, these systems are available for either new lab automation or as dynamic extensions of an existing system. In the free floating teach mode for the robotic arm, the user can easily adapt the system's configuration to meet new requirements.

www.contact.kuka-robotics.com



www.facebook.com/KUKA.Robotics



www.youtube.com/kukarobotgroup



Twitter: @kuka_roboticsEN



Details provided about the properties and usability of the products are purely for information purposes and do not constitute a guarantee of these characteristics. The extent of goods delivered is determined by the subject matter of the specific contract. No liability accepted for errors or omissions. Subject to technical alterations.

© 2017 KUKA Roboter GmbH

www.kuka.com/healthcare