



Ulm University Medical Center

**Ten years of working
with a Hybrid OR –
and ten good reasons
to continue**



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Ulm University Medical Center has one of the oldest trauma surgery teaching chairs in Germany. The Trauma, Hand, Plastic, and Reconstructive Surgery Clinic was founded in 1973 and serves a broad range of surgical patients. This includes inpatient and outpatient treatment of injuries to the extremities and joints, spine, pelvis, hand, and soft tissue, as well as follow-up treatment of injuries.

The Hybrid OR was first introduced to this hospital in 2012. The team started with the first model, Artis zeego, and switched to ARTIS pheno in 2020. "There've been huge advances in design and functionality," says Florian Gebhard, Director of the Department for Orthopedic Trauma.

A background image of two surgeons in an operating room, wearing blue scrubs, masks, and hairnets. They are focused on a patient, with one surgeon holding a surgical instrument. The room is dimly lit, with bright surgical lights overhead. Medical monitors displaying CT scans are visible in the background.

1 Multidisciplinary 24/7 use

2 No revision surgery since 2012

3 Large field of view

4 Faster recovery time

5 Optimal workflow in the OR

**6 Intraoperative 3D scans
with CT-like quality**

**7 *syngo* Needle Guidance
ensures high precision**

**8 Radiation exposure –
as low as possible**

**9 Multiple C-arm positions
can be saved**

10 Infection control

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Multidisciplinary 24/7 use

For economic reasons, the Hybrid OR at Ulm University Medical Center was designed to be a multidisciplinary system from the start. “We try to run ARTIS pheno every day for between eight and ten hours. From the beginning, the core unit was the trauma department. We added cardiac surgery, neurosurgery, and vascular surgery,” says Florian Gebhard, Director of the Department for Orthopedic Trauma. “The Hybrid OR is used in our daily routine, which means during our usual work hours. With more than nine years of experience, we now allow the Hybrid OR to be used during emergency cases, and for trained teams the system is accessible 24/7.”



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No revision surgery since 2012

“The system offers us the highest precision that’s achievable in an OR for placing implants precisely, and in addition, we do all of what used to be postoperative checks intraoperatively,” says Gebhard. No patient leaves this Hybrid OR without a final check, and “we’ve had no revision surgery since we started the Hybrid Operating Room in 2012.”



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Large field of view

Minimally invasive surgery of the spine requires precise 2D and 3D intraoperative imaging. Gebhard: "We use the ARTIS pheno for most of our spine and pelvic cases, because of the large field of view and the high image quality. Today, we can address more complex challenges in fracture care than with a standard C-arm and we can use this image quality to increase our accuracy when we put implants into the patients."



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Faster recovery time

According to the team at University Medical Center they prefer to perform minimally invasive spine surgeries, because it reduces blood loss during surgery and postoperative pain, resulting in faster recovery times. "There are no downsides in terms of reduction or fixation, so we started to use the Hybrid OR more and more often, and today most of our spine surgeries are minimally invasive. Also, we found that the length of stay could be reduced," Gebhard explains.



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Optimal workflow in the OR

Thanks to procedural intelligence – a unique combination of imaging and dedicated workflow software – surgical workflows are simplified and treatment for all patient cases and across all disciplines is standardized. “The full integration of the imaging system with the operating table and the navigation system enables an optimal workflow in the Hybrid OR,” says Peter Richter, Attending Surgeon at the Department of Orthopedic Trauma.



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Intraoperative 3D scans with CT-like quality

ARTIS pheno enables spine surgeons to perform precise iliosacral joint fixation. “We get adequate quality images of the spine and the pelvis in all patients, independent of their body mass index,” says Gebhard “and we can increase the accuracy of implant positioning dramatically as soon as we combine this image quality with guidance.” The final control of the results with *syngo* DynaCT takes only four seconds, says Richter: “In our opinion, 3D imaging is an essential tool in spine surgery. It gives the surgeon immediate control of screw or implant positioning. This is a big help, especially in complex anatomic regions, for example, the upper cervical spine or the cervical thoracic junction, where visualization is very difficult.”



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***syngo* Needle Guidance ensures high precision**

syngo Needle Guidance with automatic path alignment function clearly displays the length and angulation of the needle path and automatically positions the C-arm. The integrated laser crosshair projected onto the skin enhances needle guidance by indicating the entry point and the angle of the needle with no additional dose to help surgeons position the needle more precisely. Once a 3D scan is acquired, the surgeon can plan trajectories: They define a start and end point, and the C-arm aligns correctly to the position of the screws. In the fluoroscopic shots, the start and end points are always visualized so that the surgeon can orient the instruments based on the planned trajectory. "It helps us place screws in complex anatomic regions: for example, the cervical thoracic junction. *syngo* Needle Guidance provides high precision and safety for the patient and the surgeon," Richter affirms.



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Radiation exposure – as low as possible

Radiation plays an essential role in spine surgery, especially in minimally invasive cases. Both the surgical team and the patient are exposed and radiation should therefore always be kept as low as possible according to the ALARA principle. In the past, image quality optimization was often accompanied by increased radiation. “With the flat panel detector technology, the image quality can be increased with less radiation,” says Richter.



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Multiple C-arm positions can be saved

With ARTIS pheno, multiple positions can be saved and the C-arm can automatically move to these positions at any time during surgery. ARTIS pheno and the operating table are connected and communicate. Richter: "Thanks to different parking positions and options with different operating tables, this means high flexibility for orthopedic trauma and an optimal workflow during spine surgery, because different C-arm positions can be stored. No additional radiation is needed to find the position again."



10 Infection control

Infection control is crucial for protecting the safety of patients and staff in hospitals. ARTIS pheno features internal cable guidance and seamless, spill-sealed covers with smooth surfaces, making it easy to clean. "Because ARTIS pheno is a floor-based system, we have laminar air flow in our operating room," Richter says. "It's mounted on the floor rather than the ceiling, so ARTIS pheno isn't just easier to install in the operating suite, the flow of sterile air from the ceiling is uninterrupted."



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Prof. Florian Gebhard, MD

Director of the Department for Orthopedic Trauma
Ulm University Medical Center, Germany

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