



mediCAD[®]
The Orthopedic Solution

Reference report



The benefits of digital pre-op planning in endoprosthetics

Krankenhaus Nordwest in Frankfurt uses mediCAD[®]

HECTEC GmbH
Ottostr. 16
84030 Landshut
Tel.: +49 871 - 330 203 0
Fax: +49 871 - 330 203 99
www.hectec.eu
info@hectec.eu





The clinic for orthopedics, trauma, and spinal surgery at Krankenhaus Nordwest in Frankfurt, Germany, has been using digital planning tools for hip endoprosthetics for many years. They also depend on them for elective interventions like planned arthrosis indications and treatment of fractures in trauma patients. Krankenhaus Nordwest is a modern clinic serving a large city and serves as a teaching hospital associated with Goethe University Frankfurt. It has 582 beds distributed across ten different clinics and four institutes, making it one of the most important hospitals in the region. The clinic for orthopedics, trauma, and spinal surgery is one of these ten clinics. This is where diseases and injuries affecting the musculoskeletal system are treated. Doctors at the clinic perform both elective endoprosthetic procedures to the hips, knees, shoulders and elbows as well as all modern osteosynthetic procedures to bones, the joints, the pelvis, and the spinal column.

At a glance

- PC-based digital planning of operations is steadily replacing conventional planning with paper and templates.
- No additional effort required for legally compliant documentation.
- Straightforward selection of specialist prostheses for severe congenital and post-traumatic deformities.
- Planning on healthy leg transfers easily.
- Use for knee prosthetics planned.



Step-by-step switch to pre-op planning

The PC-based digital planning of hip operations is steadily replacing conventional planning with paper and templates. "New doctors, in particular, are a big fan of digital planning," according to Chief Doctor Ute Degelmann. By planning operations on a computer, they gain a better understanding of the procedure they will perform. According to Dr Degelmann, "Those of us with decades of experience doing endoprosthetics can look at the radiograph and see immediately what's going on. For younger doctors, digital planning is a great way to learn and practise." The flexible structure of the program is ideal. The sequence of planning steps is not rigidly defined. Instead, the surgeon selects where he or she requires support.

In addition to all common planning methodologies, the most recent version 3.5 of mediCAD[®] includes bilateral deformity corrections according to Dror Paley, automated corrective osteotomies near the hip joint, intertrochanteric osteotomies for planning operative extensions of the femoral head into the joint socket on patients with hip joint dysplasia, and direct transfer of all planning data directly to EndoDok. The software integrates mobile devices, giving doctors immediate access to planning data from virtually anywhere.

Simulation of operations

In the team's experience, there are two main areas where mediCAD[®] from Hectec has special benefits for routine surgical procedures. First, operations can be fully simulated. Potential problems that may become apparent only during the operation can be detected early, during planning. The surgeon can then analyse the situation without stress and find the best solution. Since prostheses cannot be stored hygienically directly in the operating room, there is frequently a waiting time during the operation, especially when uncommon implants are used. However, when planning is completed in advance, the required sizes can be provided during normal pre-op preparations.



Complete documentation automatically

Secondly, digital planning resolves two problems associated with documentation: Documentation is generated automatically during planning, saving time. And the documentation is always complete. Compared to handwritten documentation in patient records, this saves significant amounts of time. According to Chief Doctor Sabine Kasperek, "I have the peace of mind of knowing that all steps in the planning process are completely documented with full legal compliance, something that is becoming increasingly important for me and the hospital."

Special benefits with unusual anatomies

Due to the wide range of operations performed at the hospital, digital planning and simulation of the operations are particularly valuable. The hospital treats a relatively large number of patients with severe congenital and post-traumatic deformities. But when interventions are planned digitally in advance, modular and highly specialised prostheses can be ordered in a timely manner. As a result, there are no surprises and even unusual indications can be treated optimally with non-standard prostheses. This is true especially for advanced hip dysplasias on very small or very young patients. Standard models are often too large, so having an easy way to compare the patient's actual anatomy to the large amount of prosthesis data in the program before the operation results in optimal preparation. Examples include insertion of a saw cut or precise determination of the angle of the joint socket before starting the operation. Of course, this is only possible with a comprehensive database of implants. mediCAD[®] contains more than 80,000 implants from more than 130 manufacturers around the world. According to Hectec, the database provides immediate access to more than 90% of all existing implants for planning purposes. If a manufacturer is found to be missing, it is added to the database.



Automatic calibration

Two functions in the program are particularly helpful for just about all planning procedures: automatic detection of the calibration sphere, which ensures that planning proceeds precisely without manual adjustments, and simulation on the healthy leg. The ease with which this occurs makes it very useful. There is no need to plan and compare two prostheses. Planning on the healthy leg is sufficient. This data can then be transferred easily to the diseased leg.

Less time, greater precision

Saving time benefits the hospital, the surgeon and the patient. Operations are planned with significantly greater precision and can therefore be performed faster. This reduces the hospital's costs for each operation while reducing stress on both the doctors and patients. According to the hospital's experiences in Frankfurt, after 20 to 25 digital planning sessions, doctors are generally so proficient with this method that they can complete planning in about two minutes, including documentation.

Based on these positive experiences, the hospital intends to start planning knee endoprosthesis digitally with mediCAD[®] as well.



Sabine Kasperek and Dr Ute Degelmann digitally planning a hip operation.