



# Perfectly equipped

Philips Hybrid OR is prepared for all eventualities ranging from minimally invasive to multiple trauma

## Who/where

Clinic and Polyclinic for Vascular and Endovascular Surgery in the University Hospital 'Klinikum rechts der Isar' of the Technical University, Munich, Germany.

## Challenge

A hybrid, state-of-the-art operating room that offers maximum flexibility to respond to the needs of the different user groups.

## Solution

A hybrid OR realized with Philips, certified to clean room class 1A. The FlexMove ceiling-mounted system provides flexibility and freedom of movement. The AlluraClarity angiographic system produces high quality images at low dose levels, and the FlexVision XL Monitor displays an overview of all the relevant details for the complete OR team. The Veradius Neo mobile C-arm system acts as a variably deployable standby system of the highest quality and flexibility.

When treating vascular disease, clinics and doctors increasingly rely on hybrid ORs. They provide flexibility in choosing the appropriate therapy, which can range from minimally invasive to open surgery, or a combination of both. This increases the possibilities to treat high-risk patients. However, a good hybrid OR is more than the sum of its parts. It needs to satisfy different technological and clinical conditions, ranging from clean room classification, to providing the necessary image quality with low radiation dose levels.

Achieving all of this in a single solution takes a competent and experienced partner like Philips.

“The patient's safety comes first”, says Professor Dr. med. Hans-Hennig Eckstein, Director of the Clinic and Polyclinic for Vascular and Endovascular Surgery in the University Hospital 'Klinikum rechts der Isar' of the Technical University, Munich. The clinic has established itself as a vascular center and – with the Munich Heart Center – also as an aorta center in Munich. Prof. Eckstein, who manages both centers, had been working towards adding a hybrid OR for some time, before the purchase order was finally signed at the beginning of 2013. “The idea was to convert our old vascular surgery OR into the new hybrid OR”, he reports, “but really it was too small”. So he and his colleagues talked to a number of potential suppliers to find a solution. “The solution from Philips, with its ceiling-mounted system won our vote”, says Prof. Eckstein.

Associate Professor Dr. med. Christian Reeps, a senior consultant at the clinic, adds: “One important aspect for us was that the OR had to comply with 1A clean room standards, which it does thanks to the laminar airflow ceiling. The room also had to be fully functional as a conventional OR. That is, we had to be able to move the anesthesia equipment around freely, and the catheterization equipment had to be either in or close to the room.”

# PHILIPS



The new Hybrid OR in the University Hospital 'Klinikum rechts der Isar' in Munich.



Full flexibility on 56" screen: the views can be personalized as needed with FlexVision XL.

The FlexMove track system was the best solution for this: it runs outside the Airflow zone, which avoids creating turbulence in the displacement flow. As a result, complying with 1A clean room requirements (German sterility standards for OR's) was no problem. "Besides, the ceiling mounting means there are no obstacles for the anesthesia equipment", says Dr. Reeps. A Philips/Maquet alliance, which includes support for the Magnus hybrid OR table, makes this the only system for vascular surgery on the market that can be freely positioned, either at the head or the foot end, without having to change the basic layout of the tables and anesthesia equipment. An important consideration for Prof. Eckstein was that "the method we use for a minimally invasive intervention is completely different from open surgery. And good image quality is a necessary precondition for this work." This is why he places great importance on the quality of the angiographic equipment, both for the ceiling-mounted monoplane imaging system and its mobile counterpart, a Veradius Neo, high-end C-arm. He explains: "The Philips concept combines the best of state-of-the-art technology, with flexibility and positioning versatility. On top of that, well-trained Philips technicians are available for maintenance as needed."

The ceiling-mounted AlluraClarity monoplane imaging system represents a completely new generation of machines. This results in new standards of image quality and radiation dose. It offers excellent image quality, in terms of resolution and contrast. Prof. Eckstein

comments, "the system delivers high resolution CT-like images with rotational angiography scans. It can do this using low radiation levels and still produce high quality images." Even the medical professionals at the clinic find the result astounding: "We are truly impressed; we did not expect to achieve this level of fine detail", says Dr. Reeps.

At the same time, the system's intuitive handling has also gained many admirers. Prof. Eckstein comments: "I consider ease-of-use to be important. Even with a lack of computer skills, the system is simple and intuitive to use. The touchscreen simplifies the work, as does the fact that you can store the images directly from the table."

Dr. Reeps also finds the FlexVision XL monitor system with its 8-megapixel LCD display to be a tremendous bonus: "The large screen lets you present all the information at the same time." For example, they can superimpose CT scan images of the patient made before the operation on top of the current images of the patient, both preoperatively and during the operation itself. That makes navigation easy. Dr. Reeps continues, "we also have access to data such as the patient's ECG, the oxygen supply and the transesophageal echocardiogram on the large overview screen – which, by the way, also presents the information with a superb resolution." And at the end of the operation, they can create a 3D image of the treated area very easily, and even view the parenchyma and the organs, as well as the arteries.



The Veradius Neo: variable back-up and highly advanced secondary system in a single unit.

In the hybrid OR, the Veradius Neo mobile C-arm with flat detector technology works primarily as a standby, for use during the open part of surgical procedures. It also serves as a back-up during routine maintenance. An absolute must in the view of these medical professionals. Dr. Reeps explains: “If the ceiling mounted angiographic system is not available, we have to have access to a fallback device.” But the mobile C-arm is also used for other purposes: in the second OR, it is used as the standard device for less complicated cases.

“We worked with the Veradius Neo’s predecessor for a year, before we had the hybrid OR”, says Dr. Reeps. “And that already meant a clear improvement compared with our old angiographic system. Its image quality is so good that we had no problems when implanting complex vascular prosthetics – we were able to perform all our operations with the device.”

He explains the further high-level quality enhancement brought by the AlluraClarity system in the hybrid OR with the following analogy: “You can safely drive from Munich to Hamburg with an Audi A3 or with an Audi A8. With both cars, you can drive in a sensible way. However,

“One important aspect for us, was that the OR had to comply with 1A clean room standards, which it does in combination with the airflow ceiling.”

*Dr. Reeps, senior consultant*

“The range of therapies has expanded. The hybrid OR was an important step in fulfilling our objective of offering our patients high quality treatment.”

*Prof. Dr. Eckstein*

the A8 offers much greater comfort.” Indeed, the hybrid OR is the better solution for patients with impaired kidney function and for the more complex procedures: and both endovascular and open surgery treatments are possible. “As a result, with the Philips hybrid OR, we now find ourselves in the fortunate position of being able to offer all forms of therapy”, says Dr. Reeps.

### Clinic Profile

The Clinic and Polyclinic for Vascular and Endovascular Surgery in the University Hospital 'Klinikum rechts der Isar' of the Technical University, Munich has treated patients suffering from acute and chronic arterial and venous vascular disease for more than 35 years. It specializes in treating narrowing of the carotid arteries, widening of the aorta, circulation problems in the blood-vessels in the pelvic area and legs, inserting AV shunts for dialysis patients and treating varicose veins. Currently, the clinic performs around 2000 surgical and endovascular procedures on more than 1200 patients each year. The clinic attaches particular importance to intensive interdisciplinary and collegial collaboration. In 2000, this led to founding the Interdisciplinary Centre for Vascular Disease MRI. In 2012, the Technical University of Munich and the German Heart Centre, Munich got together to found the Munich Centre for Aorta Disease.





Dr. Reeps (left) and Prof. Dr. Eckstein

## **Interview with Prof. Dr. med. Hans- Henning Eckstein, Director of the Clinic and Polyclinic for Vascular and Endovascular surgery at the University Hospital 'Klinikum rechts der Isar' in Munich.**

1.) Professor Eckstein, your clinic specializes in diagnosing and treating vascular diseases of the carotid and aortic arteries and of the blood-vessels in the pelvic region and legs. What special challenges do you face in your chosen area of specialization when making a diagnosis and treating problems?

Our main challenge is the increasing age and multi-morbidity of the patients. We have to give very careful consideration to each and every treatment of high-risk patients of this type. At the same time, the market offers a steady stream of new catheterization procedures and we have to assess which is the most suitable for the patient in question. At the end of the day, our goal is to offer optimum treatment to the patient, and patient safety is of the utmost importance.

2.) What were your reasons for investing in a hybrid OR?

The range of therapies has expanded. The hybrid OR was an important step in fulfilling our objective of offering our patients high quality treatment. This is because the capacity to sensibly combine both treatment methods – open surgery and minimally invasive procedures – is just as important as perfect management of post-operative complications. It is only fair to use the best method for the patient concerned.

3.) How did the initial familiarization phase go?

That will still take a little while. But to be perfectly honest, I was more concerned about us being totally helpless when the people from Philips were no longer on site. I would never have believed that X-ray equipment could be so intuitive to use, which is a pleasant surprise!

4.) How has the new OR changed your work and work processes?

We regularly treat very complex pathologies, which would have been untreatable in the past. And we can only do so thanks to better stents and high quality imaging. Exceptional imaging allows rapid treatment in combination with significantly low radiation levels. We are able to treat patients more effectively, and also high risk patients are being referred to us. In long procedures, the workflow is also hugely important, along with the image quality and the radiation dose. Being able to operate the systems ourselves, and moving the machines around with so little effort makes our work much easier. The room positions are easy to program, so we can move the equipment out of the way as needed, and then, without difficulty, return it to the same, optimally configured position.

5.) What special challenges does working in a hybrid OR involve?

The objective is to offer the best possible medical treatment in the OR and everybody has to work to achieve that. We work as a team and so we are only as good as the degree to which all of our staff are familiar with and able to operate the equipment. We have also set up our own team of nursing staff for the hybrid OR. As well as interdisciplinary collaboration, people also need to work autonomously. This is because we also treat emergencies here. At night and during the weekends, the duty vascular surgeon is now able to provide treatment autonomously without support from other departments. But that is only possible because the hybrid OR is such an effective instrument.



Results are specific to the institution where they were obtained and may not reflect the results achievable at other institutions.

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Printed in The Netherlands.  
4522 962 98341 \*AUG 2014

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