Flow in the Urology OR

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For the past three months, endourologist Michael Straub, MD, and his team have put the world's first UROSKOP Omnia to the test in regular operations. *Medical Solutions* visited the committed physician in Munich, Germany. He reported having experienced greater precision and ergonomics than ever before. By investing in this workstation, the urology clinic has reached a new dimension in efficiency and cost-effectiveness.

By Frank A. Miltner

Everything is in flux at the University Hospital Rechts der Isar: There is always renovation, modernization, or new construction that takes form weekly. Like an island of medicine, like a city within a city, the labyrinth of countless buildings, clinics, and departments is located right in the heart of Munich, a southern German metropolis with 1.5 million inhabitants. While the university hospital's namesake, the Isar river, carries 200 cubic meters of fresh mountain water from the Alps to the Bavarian capital every second, medical innovations are constantly finding their way into the facilities just a few hundred meters away – lately, in the form of UROSKOP® Omnia, which was recently added to the Urology Clinic and Polyclinic. More than 7,500 patients are treated here each year. This is where quality and efficiency come together.

Speed is no problem for the managing senior physician at Rechts der Isar, Michael Straub. He just returned from a few days backpacking, covering nearly 100 kilometers (62 miles) of the natural landscape in just four days. Now Straub, in his mid-forties, is standing, full of energy, in the operating room (OR) explaining how the world's first UROSKOP Omnia from Siemens works. His team has just used the system to relieve a 40-year-old patient of bladder stones.

UROSKOP Omnia is an innovation: Siemens' first flat-detector-based urology workstation suitable for routine use. For the first time, UROSKOP Omnia was utilized for three full months under real-world conditions and its functionality was analyzed. That is reason enough for a summary of its progress: Does the system work reliably for medical purposes? Is it also cost-effective? The latter question is especially important in Germany, because not only does this country have high medical standards, but it also has required high efficiency standards since 2003. As compensation for each patient who carries statutory insurance – nearly 90 percent of all German citizens – hospitals receive only all-inclusive fees (case-based lump sums). The fee for a given treatment is based on the disease, which is defined according to the G-DRG (German Diagnosis-Related Groups) system. The result: The more efficiently patients are treated, the greater the likelihood that the hospital will be able to cover its own costs.

Workflow is Key

"During this first quarter, we used the device to diagnose and treat exactly 432 patients so far, up to twelve of them per day," says Straub. "Previously, we had 1,900 patients a year, split between two systems. Now UROSKOP Omnia is almost

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>
> Michael Straub, MD,
> Managing Senior Physician,
> University Hospital Rechts der Isar,
> Munich, Germany

Taking Stock: The First Three Months
Total: 432 patients, six of them children, with a total of 518 procedures:

Type of intervention	Number of procedures
MCU (micturating cystourethrography)	5
Normal X-ray imaging	100
TURB (transurethral resection of the bladder), PDD-TURB (with photodynamic diagnosis), TURP (transurethral resection of the prostate), Sachse and laser urethrotomy, bladder stone lithotripsy	96
Antegrade varicocele sclerotherapy	1
Inguinal testicular exploration	2
Nephrostomy and cystostomy (placement and replacement)	35
Double-J stent placement and replacement	210
PCNL (percutaneous litholapaxy)	6
URS (ureterorenoscopy) and RIRS (retrograde intrarenal surgery)/flexible URS	63

enough by itself to handle the same number of patients."
The patient, now under anesthesia, is lying on the adjustable table. The operator stands in front of the patient while the anesthesiologist stands near, monitoring the patient's vital signs. At eye level, the physician looks at the double monitor: X-ray on the left, endoscopic control image on the right. There is a great deal to manage in terms of workflow; and just like the Isar river, the work is always flowing and must be efficiently monitored. In the Urology Department, body fluid has no effect on the device. The heart of UROSKOP Omnia, its flat detector, is securely sealed away inside the device. UROSKOP Omnia is easy and quick to clean, making the time between patients shorter and ultimately more efficient.

Saving Time with Every Patient

"The new device delivers time savings of about 20 percent per intervention. That is what urology needs," Straub says pleased. Overall, he and his team perform about 2,000 endourological procedures every year – for diagnoses of the urinary bladder or ureter, procedures such as bladder stone lithotripsy, placement and changing of ureteral stents, and a dozen other procedures of various kinds (see table). Most are routine interventions, but even the more complex cases are treated using UROSKOP Omnia. The unit's cost-effectiveness is also based on the excellent handling it offers, a feature that was developed through close cooperation with experienced urologists: The minimal table height of 72 centimeters is ideal for patient transfer. It only takes the push of a button and the table automatically changes from the preferred patient transfer position to the preconfigured working position. Whether the intervention is being performed percutaneously, via the skin or transurethrally, via the urethra and ureter, the workstation can be set in just a few seconds. It thereby meets the patient's needs as he or she lies, for working in either a standing or seated position depending on the patient, the procedure, or the operator's own preferences.
"Patients no longer need labor-intensive repositioning during a procedure," explains Straub. In addition, the device can be used to treat immobile or obese patients weighing up to 272 kilograms (600 lbs) with ease. The table also relieves the strain of treatment for older patients. They can sit up comfortably, making routine procedures faster and easier to perform.

Application-adapted X-ray System

The flexible handling and unique improvements in imaging and digital postprocessing support clinical workflow in urology. UROSKOP Omnia is the first multifunctional urology workstation on the Eurpoean market equipped with a dynamic flat detector measuring 43 by 43 centimeters. Its semiconductor matrix elements with high sensitivity to X-rays record the image information and make it possible to depict the completed image on the screen within just a few seconds. It is no longer necessary to change cassettes or develop the image – it is avail-

Dr. Michael Straub is the first to use UROSKOP Omnia in the clinical routine.
The University Hospital Rechts der Isar has seen increased workflow efficiency as a result.

able immediately and with just one click can be sent into the digital picture archiving and communication system (PACS) used in the "filmless hospital." The HD Endo Store function marks the first time that endoscopic and ultrasound images are saved to patient files, together with the X-ray images, in the common digital imaging and communications (DICOM) format.

But there is still more to report: The size of the flat detector now makes it possible, for the first time, to demonstrate the entire urinary tract of an adult patient, from the lower edge of the bladder to the upper edge of the kidneys, in just one image. The time-consuming process of capturing two images is no longer necessary. The resolution of more than 2800 by 2800 pixels also enhances diagnostic accuracy. The X-ray field depicts even fine details, and the urologist can view them conveniently on one of the unit's two TFT color displays, with no loss of quality – and from any position, since the screens can be repositioned thanks to a spring-articulated swivel arm.

The two displays allow for another key feature, Straub says: The X-ray image can be displayed simultaneously with the endoscopic or ultrasound findings. That means that the urologist has the results of three methods of analysis available. "That's what makes it such a big success, because the parallel display of different image information enables supplementary findings to be shown side by side, just like in a navigation system," Straub says with enthusiasm. This configuration not only benefits the quality of the procedure, but also the operator's health. He no longer has to bend forward in order to reach the patient while at the same time looking to the side to see the screen. "Everything is in my field of view, without having to turn around," Straub says. As a result, it took very little time for him to become accustomed to the new workstation.

The patient has now been freed of his bladder stones, and the anesthesiologist is bringing him out of anesthesia. The color of the MoodLight element smoothly changes from a pleasant reddish-yellow

Summary

Challenge:

- Improve the cost-effectiveness of standard diagnoses and interventions in endourology while maintaining high quality – at a single workstation
- Reduce or eliminate delays in workflow, while maintaining high efficiency
- Maintain high quality, for instance through excellent hygiene and optimized imaging
- Provide multifunctional ergonomics for patients and operators alike so that excellent results can be achieved

Solution:

- UROSKOP Omnia, the first flat-detector-based urology workstation on the European market
- First device in regular operation at University Hospital Rechts der Isar at the Technical University in Munich; tested for three months in regular operations with high patient throughput

Result:

- In three months, 432 patients were treated without any delays in the workflow (up to twelve interventions per day); UROSKOP Omnia is almost equal in capacity to the two workstations before
- Total time spent per patient has been reduced by about 20 percent, yielding lower personnel costs per procedure, due to fewer instances of patient repositioning, faster imaging, faster cleaning and preparation times, and ergonomics that can be adjusted to the operator for ideal fit
- Workstation offers unique comfort and convenience for the operator, helping to ensure greater accuracy during diagnosis and therapeutic interventions
- Short learning curve and no technical disruptions

University lecturer Michael Straub, MD, born in 1968, studied medicine at the University of Ulm, where he earned his specialist qualifications as an urologist in 2004. Since 2006, Straub has been a managing senior physician at the Urology Clinic and Polyclinic at University Hospital Rechts der Isar in Munich. He is also a lecturer within the Department of Medicine at Technische Universität München (Technical University of Munich) and a member in the working group "urinary stones" of the Deutsche Gesellschaft für Urologie (German Urology Society).

tone during the operation to a bright white to prepare for the next patient. While the table is being cleaned, Straub draws his conclusions: "Being able to work without repositioning the patient and the ability to gain a complete overview image of the urinary tract with excellent image resolution are ideally realized in this new workstation. Free access to the patient, individually adjustable table height, and sophisticatedly designed table movements are other features that make it pleasant to work on UROSKOP Omnia. Plus, patient comfort is enhanced even as examination times are reduced."

So what about the device's cost-effectiveness in a system of case-based lump sums? It is without question. The Director of the Urology Clinic, Professor Jürgen Gschwend, MD, says, "With this investment, we are expanding our focus on endourology."

UROSKOP Omnia unites the high treatment success rate required by the lump-sum reimbursement system with up to 20 percent time savings and high versatility – not only in urology, but also in gastroenterology. The next patient is already being brought into the OR. During our conversation with Dr. Straub, the Isar has transported more than 700 million liters of water.

Frank A. Miltner *has a degree in biology and has been working as a journalist in the healthcare sector for more than 15 years, including as an editor for the newsmagazine* FOCUS, *editor-in-chief of* NetDoktor.de, *and managing director of the media agency* albertZWEI media GmbH. *He has reported on Siemens innovations in this magazine several times.*

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