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OR changing: From the classical OR to an integrated multimedia solution

A first-hand report from the hospital Krankenhaus der Barmherzigen Brüder in Regensburg

The hospital Krankenhaus der Barmherzigen Brüder in Regensburg was founded at the end of the 1920s and is the teaching hospital for the University of Regensburg; it treats patients from all over Lower Bavaria and the Upper Palatinate. In recent decades the building has been gradually expanded and now has slightly less than 900 beds. 31,000 persons are treated as in-patients each year and nearly twice as many as out-patients.

The number of departments has been increased since the 1970s, from only a few at that time to 19 specialist wards and five mixed in-patient wards in the meantime. This development is also reflected in the number of operating theaters. Whereas 20 years ago the hospital merely had three ORs, this number has now risen to 16. Further facilities are in Munich, Schwandorf and Straubing.

Starting situation

Stability through specialization and standardization

As a consequence of the constant increase in the complexity of the demands placed on the medical personnel and the technical equipment in the operating theater, the hospital Krankenhaus der Barmherzigen Brüder has decided to customize the operating theaters for the respective specialist areas. This means that the OR is specifically equipped with the devices important to the respective specialist discipline. The focus on the OR set-up supports the problem-free workflow for physicians and medical personnel. "With a view to the medical technology in particular, stable conditions are created through specialization. On the



Prof Dr Hans-Stefan Hofmann, Senior Consultant at the clinic for thoracic surgery

one hand, this benefits the personnel, who then operate a smaller range of devices and know exactly how to deploy these in an optimum manner. On the other hand, in the event of a technical malfunction we can quickly find the source of the error," is how the head of the central OR wing, Uwe Kleineidam, describes the advantages.

The standardization of medical technology devices in the ORs at a high technical level with simultaneous deployment of integrated complete solutions also contributes to the simplification of the workflow.

Integrated complete solution as the key to the multimedia operating theater

With the expansion of the existing central OR wing to include three new ORs in 2008 a system solution from MAQUET was used for the first time for the operating theater of the clinic for thoracic surgery. The decision was taken after the specifications had been laid down and various tenders had been analyzed in

detail. With the surgical table system ALPHAMAQUET 1150, the PowerLED 700 surgical lights and the key component, a TELEMEDICINE system, the essential elements of the OR were brought together to form an individual complete solution. All the devices are tailored to the specific needs of the surgeon and his team. The upgradeability of the individual modules and the possibility for problem-free expansion of the entire system offer the best-possible investment protection. The fully IT-based TELEMEDICINE system is easily accommodated by the existing IT landscape of the hospital and supports all the customary hardware and software interfaces.

The factor that tipped the scales in favor of the TELEMEDICINE system was this



The Barmherzigen Brüder Hospital

holistic integrated approach with the specification that all patient-relevant data and images sources be brought together at a central location and made available in the OR. Thus, for instance, imaging devices from other providers may be integrated with no problem whatsoever. For Ulrich Kießkalt, the head of the biomedical technology and investment goods procurement department, this is an important step towards implementing the multimedia operating theater. "The interplay of all the individual links in the pro-

cess chain is the decisive criterion. There has to be compatibility and the quality has to remain at a consistently high level throughout the entire process," says Kießkalt.

Implementation

TELEMEDICINE in thoracic surgery

With two high-definition monitors (19") installed above the surgical table, the self-explanatory touch-screen and the basic element AV CONFERENCE, the TELEMEDICINE system meets the high demands placed on its use in thoracic surgery.

Ulrich Kießkalt: "This development optimizes the ergonomics at the workstation. In the past it was difficult for surgeons to view the operating area, now the physician and the OR team can follow the events at the surgical table via the fixed monitors of the TELEMEDICINE system. The communication is no longer simply verbal for the main part, but also optical." An authentic visual portrayal of events at the operating table is also growing in significance with a view to minimally-invasive surgery.

Prof. Dr. Hans-Stefan Hofmann, senior consultant in the clinic for thoracic surgery, is convinced by the advantages of a fixed monitor: "Previously we had a mobile system, something which is totally impractical for the surgeon as only one person can see clearly during surgery. In principle you need two monitors. Quite apart from this, it makes sense from a maintenance stance and so as to minimize technical complications for the system to be permanently installed and not to have to trail it from one OR to the next and possibly cause damage through knocks and bumps."

The monitors are installed on space-saving ceiling service units and may be positioned individually. The placement of the basic element AV CONFERENCE outside the OR is both hygienic and also has a positive impact on the workflow. The AV CONFERENCE has its own IP address, with the effect that the maintenance of the system and the installation of updates may be conducted remotely by a MAQUET service technician.

Thanks to the professional documentation and archiving function of the system,

images, videos and patient data will in the future be stored centrally in PACS and the hospital information system. These may be viewed directly in the OR at the push of a button. Uwe Kleineidam: "For the surgeon, and thus for the entire workflow, it is enormously helpful if he can gather information about the patient's full history at a glance. Or if he can view earlier images on the monitor for the purpose of making a comparison, for example."

The broadcasting of what is happening on the surgical table from the OR into the

up problems. It performs the complex tasks in the background, and is transparent, clear and easy-to-operate for the user," is how Uwe Kleineidam describes the initial stages.

Conclusion and outlook

A total duration of two years was planned for the expansion of the central OR wing. At the request of the hospital the telemedicine project was realized within just six months – from the decision through technical clarification to user consultation and installation. The decisive factors for the swift imple-



The MAQUET TELEMEDICINE system used during thoracic surgery

auditorium is of particular significance for Krankenhaus der Barmherzigen Brüder. As the academic teaching hospital of the University of Regensburg numerous further training events are offered for the OR, which may be followed from different angles. "We do not just work with the endoscopic unit, but also with the light and room camera. At the same time we use the microphone function for communication with the audience," says Prof. Hofmann. Using AV CONFERENCE the live video images are broadcast via the local IT network into the auditorium.

Thanks to the simple and intuitive operation of the system, the necessary amount of training prior to the commissioning of the system was negligible: "We received a one-day introduction from MAQUET. We then organized two internal training courses. What can I say? The system is so plausible that there were no major start-

up problems. In addition to the hospital's lean organization and the excellent coordination, the preparation and support – both from a technical and commercial stance – for the departments involved from MAQUET.

With the commissioning of the new OR for thoracic surgery in June 2008 the benefits of an integrated OR system have already become clear: The positive impact on ergonomics, communication and the entire workflow in the OR are reflected in the enhanced transparency and efficiency, and thus ultimately in improved patient care.

As a consequence of the excellent experiences the Hospital Krankenhaus der Barmherzigen Brüder has also decided to realize a system solution comprising the TELEMEDICINE system and PowerLED 700 surgical lights for the OR for visceral surgery.