

Operating Rooms for LungenClinic - Großhansdorf, Germany

The LungenClinic Grosshansdorf in Großhansdorf, Germany, is an internationally recognized hospital specializing in all lung and respiratory diseases. Each year, it treats about 12,000 patients on an outpatient and inpatient basis, focusing on pneumonia, oncology, thoracic surgery and anesthesia.

The clinic wanted its ORs equipped with a centralized medical audio, image viewing, data and video management system that, along with the integration of PACS and HIS, would facilitate work in the OR.

Digital and analog signals, aligned with the workflow and controlled from the OR workstations via touchscreen or contactfree, were needed to be transmitted, stored and retrieved almost in real time. In addition, the clinic sought the capability to transmit signals from the ORs to the clinic's internal network.



Everything in sight: LungenClinic improves workflow in the OR with solutions by EIZO

From CT scans to endoscopy videos and electronic patient files the conventional light box is no longer adequate when a doctor wants full access to all available information about a case. Many clinics still manage with PCs on mobile technology carts – with the corresponding space and logistical difficulties, alongside hygiene issues. The LungenClinic Grosshansdorf (Lung Center Grosshansdorf) gave great importance to sourcing an efficient and future-proof solution for their new thoracic surgery rooms and so installed special Surgical Panels by EIZO.

The EIZO system includes several high-resolution displays, some mounted on the walls and others suspended from the ceiling so that the movement of the OR team is not hindered. Integrated video management allows the surgeon flexible yet centralized control between any picture signal, both live recording or saved images, which can be easily switched between any of the displays, according to need. This allows the surgeon to concentrate fully on the patients' care.

In the near future streaming technology will allow live transmission directly from the OR for educational purposes.

Annually about 12,000 patients are treated at the LungenClinic Grosshansdorf of which 7,000 are in-patients. Every year 1,000 to 1,100 lung surgeries are performed at the specialist clinic.

To ensure the best possible medical care for patients, according to the latest medical standards, the teaching hospital of the University in Lübeck set up a new functional wing in October 2014. It houses the central sterile supply department, an outpatient center, two operating rooms for thoracic surgery as well as corresponding preoperative and postoperative departments.

“It was our goal to create state of the art ORs with modern communication technology fully meeting all current demands with regard to medical care and hygiene whilst also embedding a high level of future compatibility, thus making a sound investment” explains Wolfgang Gerckens, Commercial Director at the clinic.



The requirements regarding the technology, especially the image management aspects, were very high and included live transmission in HD-quality, an integrated audio system, the ability to shift between different screens, touch screen operation on one of the displays and several different data inputs on another.“ An important factor was also reliability. Large quantities of data are now collected for every patient and the physician treating the patient has to have access to that data at all times and that is why fallback routines were really important to ensure constant and reliable availability”, says Medical Technician Malte Sommer together with the Head of Medical Technology Mr. Puchert, who helped to draw up the system specifications.



✗ Video workstations for different requirement profiles

The choice was made to invest in the concept offered by EIZO GmbH who provide a complete range of the latest state of the art displays, video management and data transfer technology which when combined with their Surgical Panels provides a comprehensive and flexible solution. Both ORs were equipped with several different displays and control systems for different purposes. The work-station for nurses was updated with a 23“ display with an integrated PC, a lockable storage space and a pivoting antimicrobial membrane keyboard to facilitate access to the hospital information system (KIS). A connected barcode scanner simplifies the tracking of consumable supplies. The main control unit is a panel with an integrated PC, a 47“monitor for high-resolution images and a 23“ touch screen which allows access to the picture signal distribution and medical documentation software such as PACS. This station is also equipped with a pivoting and height-adjustable keyboard, which can adapt ergonomically to the user's preferred working posture to ensure the highest possible comfort and reliability. In addition the keyboard features embedded pressure keys which can be used to switch the video signal in case of a breakdown of the internal PC system.

The viewing options are complemented by a 47“ grand display featuring different signal input options at the front.

All monitors utilize their highest potential with HD resolution with brightness up to 700 cd/m² and a contrast ratio of 3000:1 at 23“ and 1000:1 at 47“ screen diagonal.



The display of grayscale is accurately aligned with the DICOM/CIE standard and guarantees reliable imaging and high degree of interoperability. The packaged unit consisting of a display and PC with a depth of only 10.5 cm and is countersunk into the wall to conserve space.

The outer surface is a flat case made from powder-coated sheet steel and anti-reflective single-pane safety glass which can be easily cleaned with all disinfectants officially approved by the Robert-Koch-Institute. Contamination is eliminated since there is no air exchange with the OR.

Two ceiling mounted monitors with two supply units were installed which enable the surgeon to view all images whilst working on the patient. The monitors above the operating table can be adjusted freely. The adjacent anesthesia room is also equipped with a ceiling mounted supply unit and monitor. All appliances are free from the floor and there are no rolling carts or cluttering cables which facilitates both the cleaning of the rooms and hygienic working.

✗ "From an ergonomic perspective, the system is a quantum leap."

Dr. Christian Kugler - Head of Thoracic Surgery

✗ Ergonomical operating thanks to flexible image control

The core of the EIZO Surgical Panels is the video management technology lying behind the screen and the sophisticated transmission system. The central control of all image sources (MRI, CT or digital X-ray images from the patient file) to live recordings of endoscopy, ultrasound and surgical cameras and the display of vital parameters allows a comprehensive, adaptable and flexible review of any relevant image or video.

The system is specifically designed to be modality independent so it is compatible with different systems from various manufacturers and it can process digital and analog signals of all known formats. Thanks to this “surgical cockpit” the doctor has access to all images exactly where he or she needs them. “From an ergonomic point of view this system is a quantum leap”, states Dr. med. Christian Kugler, Chief Physician in the Department of Thoracic Surgery in Grosshansdorf. “Previously the viewing direction, the body and operating axis didn’t line up.

The surgeon had to crick his neck or walk directly in front of the monitor in order to view the screen. The new displays are much more comfortable and the viewing of the pictures is improved which in the end enhances the patient’s well-being.”

In addition the operating tables are also designed to meet the highest ergonomic standards. The surgeons at the Lung Center use the monitors primarily to display radiology diagnostics, endoscopic recordings especially bronchoscopies as well as thorascopies which is a non-invasive method of exploration of the thoracic cavity.

The surgeon may determine the image source and the image distribution on the displays. In case other images are needed later, the assisting nurse or the anesthesiologist can easily modify the settings. “Right now we mainly use the cinema setting which shows the images passing through in sequence”, says Dr. Kugler. Surgeons can also activate video sequences via a foot control with freely configurable functions.

✕ Technology multi-secured and future-oriented

A significant criteria for the concept of image management for the high quality requirements in the OR was signal processing. Diagnostically relevant images cannot tolerate the compression loss of regular extenders. EIZO uses a special extender, originally developed for radiology purposes, which guarantees lossless transmission within 36m. All picture signals can be output in real-time and in Full-HD-quality (1080p60 or 3G-SDI). The processing of all connected image sources occurs internally and progressively to ensure the highest display quality. Optical fiber cables were used. “This offers the advantage that even greater quantities of data, for example 4K or Ultra-HD images, can be handled effortlessly”, notes Matthias Lubkowitz, Vice President of EIZO GmbH Branch Office Plauen.

“Additionally the signals are always electrically isolated, so that there is no danger of electric shocks for staff or patients.”

To ensure “failure-free” transmission an extra optical fiber cable was installed in addition to the main line as well as a parallel copper line as an extra failsafe solution. Reliability and sustainability were crucial factors when choosing highly durable components for the control devices and playback units. So doing ensures a long product lifecycle which is guaranteed and replacement parts are readily available. Furthermore the entire system is modular and sits in a case system developed inhouse, so that each component can, if necessary, be replaced within 15 to 20 minutes. “That minimizes not just potential downtime but allows a system update if new interfaces become available and that update capacity ensures long-term use”, explains Medical Technician Sommer.

✕ Future plans: Teaching via video stream

Since September 2014, the Surgical Panels and the video management technology of EIZO – OR Solutions has been in use at the LungenClinic Grosshansdorf. The technology has proven itself in the OR to make everyday work easier. However, the extensive systems could also be used in future for another purpose: A HD streaming module integrated in the consoles allows the transfer of recordings from the OR via TCP / IP over the Internet, which could thus be incorporated in a course for medical students.

“Even now we can display images from a camera installed in the operating lamp on the big screen, for example, so that students can watch,” said Dr. Kugler. “The streaming of live images would be a feasible next step.” That the appropriate technology could be seamlessly integrated into the overall system, was one of the reasons for the purchase of the EIZO system for the teaching hospital of the Lübeck University, as the commercial manager confirmed: “The importance of such teaching methods will grow. With the new system we are prepared for it.”





✕ More information:

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