

"Radiodiagnostics Greatly Improved for the Smallest Patients"

In November 2009, the Clinic of Imaging Methods at the University Hospital in Pilsen (Czech Republic) brought a Shimadzu MobileDaRt Evolution radiography unit into operation. It was the first installation in the country. This premium digital x-ray device is known for its operability, mobility and image quality. For Pilsen university, it was equipped with a portable flat panel detector CXDI-60 C suitable for pediatric applications.

The 9 x 11 inch (23 x 28 cm) dimensions of the flat panel detector (FPD) are designed for scanning newborns in incubators for example. The detector can be inserted into a designated area for radiographic cassettes currently used in most incubators. Features like "inch mover" buttons allow a precise positioning at the bedside or the incubator.

At Pilsen University Hospital, the MobileDaRt Evolution is used for examining children in the neonatology department. Children prematurely born and newborns usually have to be placed in an incubator. Often, their weight is just 1 kg. The MobileDaRt Evolution system supports a wide range of radiographic examinations at bedside and easy positioning at standard incubators.

Image Quality Meets Low-Dose Management

In the past, these children were scanned using an analogue mobile device applying film material. "The result of scanning was often uncertain and repeated scanning was usually needed, which was very stressful and burdening for the youngest patients", said Dr. Martin Scheiner, product specialist at AURA Medical company, Prague.

Newborn babies and premature infants in particular are seven to ten times more sensitive to the effects of ionizing radiation than adults. It is therefore necessary to reduce the absorbed dose to the lowest level possible, while at the same time maintaining the quality of diagnostic information, i.e. image quality.

High-Quality Images Available Within 3 Seconds of Exposure

"The images are of high quality; there is no need to re-take, and they are almost immediately available", said Doc. MUDr. Boris Kreuzberg, Head of Department Imaging Methods at the Pilsen University Hospital. The images are sent digitally via DICOM to the hospital information network where they are made accessible to the physicians and stored in a patients' database. "This has greatly improved the radiodiagnostic care of the smallest patients, which is highly appreciated and considered by the neonatologists as a great step forward", added Dr. Kreuzberg.

The MobileDaRt Evolution has a large storage capacity of around 3,500 high-resolution digital images in the onboard computer. Intuitive PCguided operation allows easy and quick upload of stored images to the hospital network.

Compared with the previous film technology (CR technology) the radiation dose per one examination of a monitored quantity of diagnostic reference levels has decreased by an average of factor of ten. It has been due to the combination of positive factors resulting from the use of more complex technologies (i.e. increasing the voltage by 10 kV compared to film operation voltage) and the highly sensitive flat panel detector.

Instant Preview Image

Another benefit is the ability to shorten the exposure time of 4 ms, thereby preventing motion artefacts due to infants not being able to hold their breath for longer periods during inhalation.

The greatest advantage, especially appreciated by doctors as well as radiology assistants at the University Hospital, is the ability to obtain an instant preview image. The preview reveals whether the image shows everything the doctors need to see and helps to avoid repeated images and repeated exposure. A preview of just 1 Mpix is enough for the physicians to assess the patient's situation. Radiology assistants can, with minor modifications, tune the image into an ideal result and display it on the high-quality diagnostic station at a resolution of 3 Mpix.

Published on : Mon, 28 Feb 2011