



A big improvement with Digital Radiography

Philips DigitalDiagnost reduces X-ray dose

Who/where

Dr. Goya Enriquez,
Head of the Radiology Department
Ana Catalá, Technical Coordinator
of the Radiology Department.
Place: Vall d'Hebron Maternity/
Children's hospital, Barcelona

Challenge

To reduce the radiation X-ray dose
received by children in automatic
Spine and Lower Limbs radiographs

Solution

Philips DigitalDiagnost system

Over a year ago, the Vall d'Hebron Hospital in Barcelona upgraded the X-ray room in its Children's Area and replaced the old analogic system with a new Philips digital system.

In recent years, this hospital has become increasingly concerned about the radiation X-ray doses given to children during radiological procedures. As it is a pediatric and maternity hospital where examinations are carried out on children up to the age of 18, the hospital's aim is even more worthwhile considering children are far more sensitive to radiation than adults. This issue becomes increasingly important when spine studies are performed on patients with scoliosis, as they generally require one or two annual examinations over several consecutive years – mainly during the years of maximum growth; in addition, “scoliosis is more common in girls and radiation of the breast area can lead to further complications in adulthood”, says dr. Enriquez.

A team seeking to improve radiological examinations

Dr. Goya Enriquez, Head of the Radiology Department and Ana Catalá, Technical Coordinator of the Radiology Unit, explained the measures taken in the department over the years to optimize scoliosis studies in children and minimize

the radiation doses used while maintaining optimum image quality.

The Philips DigitalDiagnost system at the Maternity/Children's Hospital is used to obtain X-rays for evaluating scoliosis and the lower limbs in a fully automated manner. It scans the patient in seconds and up to three slightly overlapping images are produced automatically to obtain a final diagnostic image with an excellent quality. Almost all studies are performed with the patient standing.



Dr. Goya Enriquez and Ana Catalá

Photo of the hospital, courtesy of the University hospital Vall d'Hebron

PHILIPS
sense and simplicity

“The change has been worthwhile and we are extremely happy with the decision taken by the management.”

Dr. Goya Enriquez, Head of the Radiology Department



DigitalDiagnost at Vall d'Hebron hospital in Barcelona helps to reduce X-ray dose with children.

The previous analog system provided protection against radiation through the use of breast shields in girls and specific collimation, among other measures. Dr. Goya Enriquez says: “After a training period with the new Philips DigitalDiagnost system seeking the best way of reducing radiation dose, we concluded that by positioning the patient so that the images are taken from back to front through the body, and working with the parameters offered by the system, the X-ray doses could be reduced by virtually 50%.” This reduction was achieved using 95 kilovolts as well as by lowering the density level to -2 and doubling the sensitivity of the detectors — something

that can easily be carried out from the control screen using the options offered by the equipment. Dr. Goya Enriquez: “As a rule, we use settings, which vary from patient to patient, programmed by technicians from our department and Philips to achieve a low radiation dose.” A further advantage reported by radiologists is that, in contrast to the previous analog system, digital systems always produce high-quality images regardless of the technique used, something to which technicians must be alert in order to prevent excessive X-ray doses. With the previous analogic system, overexposed X-rays produced extremely dark images, indicating that the operator

had used an excessively high X-ray dose. However, with digital technology such “output” do not exist. Professionals using the DigitalDiagnost must be specially trained in the technique and aware that image quality remains good regardless of the X-ray dose used to ensure that the desired effect is achieved. A further advantage of the system is that the settings can be adjusted according to patient age and size.

Importance of committed staff

Dr. Enriquez emphasizes the importance of the work carried out by radiology technicians as, in addition to ensuring the X-ray is taken correctly, they are responsible



DigitalDiagnost produces high quality images.

for the X-ray dose patients receive and for selecting the technique to be used for the examination. Ana Catalá explained how the system had been adapted: “the customization was relatively easy, though some time was spent learning how to use the device itself and adjust the X-ray dosage required; then, it was just a matter of transmitting it to the rest of the team.”

With regard to the radiology team, Dr. Enriquez stated: “this is a group that has been working together for nearly two years and we aimed to form a team of well-trained technicians specializing in the field of pediatric radiology, as there are few pediatric radiologists and many children require this type of examination. In terms of the impact the new system has had on the staff, their work has been made easier since they no longer need to work with films and all images rapidly appear with good quality on the monitor at the first time. The settings are programmed, but the technician may on the fly change whatever he needs and stay in full control of the technical parameters and the X-ray doses emitted.”

A worthwhile change

Dr. Enriquez tells us: “Analog systems had become obsolete and change to a digital system was essential despite the financial cost involved. The change has been worthwhile and we are extremely happy with the decision taken by the management.”

The area involved underwent extensive renovation not only with regard to the equipment itself but also its general appearance, working conditions, ease of use of the user interface, UNIQUE image processing, and automatic functions that increases patient throughput.

A wireless future

“Potential improvements in the field of digital diagnostic systems should focus on portable equipment with wireless flat

detectors” said Dr. Enriquez. This type of equipment would be extremely useful in the field of pediatrics, since it would make it easier to carry out radiological examinations on newborn babies, patients on stretchers or in a wheelchair. From a practical point of view, lightweight equipment with small detectors can be moved easily and even placed in incubators. Philips already offers reliable wireless flat detectors that produce images with the same high quality as those using fixed detectors.

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Ana Catalá, Technical Coordinator of the Radiology Unit



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