



**Inside Philips Radiography**

# DoseWise

Perfect image. Perfect sense.

**PHILIPS**

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DoseWise is a set of techniques, programs and practices that ensures optimal image quality, while protecting people in X-ray environments. It is based on the ALARA (As Low As Reasonably Achievable) principle, but is so much more. It is a philosophy that is active at every level of new product design and development. And it includes creative thinking and smart solutions in three areas:

- Smart Beam
- Less Radiation
- More Awareness

This integrated, system-wide approach makes DoseWise a powerful example of the Philips mission to improve the quality of healthcare anywhere, anytime.



# How does DoseWise create a Smart Beam?

## **By adapting the beam's energy spectrum**

The key feature to manage the beam optimization process during clinical routines with Philips Radiography systems, is an integrated examination data base. This contains the full set of parameter settings (APR – Anatomically Programmed Radiography) for all examination types and patient classes. You only have to select the required examination and the system sets automatically the right parameters for optimum image quality with minimum radiation.

As soon as you select the type of examination, the automatic pre-filtration clicks into place and blocks those X-rays that do not contribute to image quality. The result is up to 30% less patient skin exposure.

## **By adapting the beam's shape**

The auto-collimation presets within the DigitalDiagnost system are programmed for each type of examination, DoseWise ensures that the beam is automatically pre-collimated to a standard size of head, pelvis, upper leg, etc. You can then fine tune this collimation if necessary.

For cassette-based systems, the specially designed architecture limits the X-ray beam's area to that of the cassette format, making 'overframing' impossible.

## **And by doing it automatically**

Because these energy spectrum and shape adaptations are initiated automatically, the beam behaves as though it 'thinks' for itself, adapting to each examination. It all adds up to a smart solution – for both patient and radiologist.





# How does it minimize radiation?

## By getting it right the first time

With a wide range of Anatomically Programmed Radiography settings (including specially developed ones for pediatric examinations), DoseWise does everything possible to ensure that every exposure results in a diagnostically relevant image. In addition, within the DigitalDiagnost and PCR product portfolio, the wide dynamic range of the detectors and the integrated image processing techniques ensure that even when exact exposure control is difficult, the result is still a good image. This is vividly demonstrated by the consistently good Image Quality. Even in bedside imaging without automatic exposure control. This ensures that an absolute minimum of retakes is needed. Hence, even when the situation is not ideal, the outcome is still 'First Time Right'.

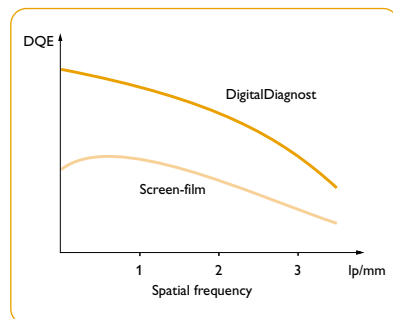
## By controlling the exposure automatically

The Philips BuckyDiagnost and DigitalDiagnost systems are equipped with 3 or 5 measuring fields for Automatic Exposure Control (AEC). AEC regulates the amount of radiation passing through the patient and

projecting onto the cassette or detector. It is connected to the examination data set, using for each examination always the appropriate dose level.

## By using radiation optimally

The Philips DigitalDiagnost systems are equipped with a large-area Cesium-Iodide/amorphous Silicon flat detector with 143  $\mu\text{m}$  pixel size. This type of detector is characterized by a DQE (Detective Quantum Efficiency) two to three times higher than that of screen film systems or CR detectors and a comparatively high resolution of 3,5 lp/mm, which makes it particularly suited for applications that require high image quality at low dose.



The Detective Quantum Efficiency of the DigitalDiagnost is about 2 to 3 times higher than that of conventional screen-film.

Furthermore, the DigitalDiagnost Systems make the best possible use of all the radiation that reaches the detector by absorbing it without adding interfering 'noise'. This is called a high signal-to-noise ratio. In addition, to ensure that the maximum percentage of radiation reaches the detectors, all table tops and grids are made from high-transparency materials.

### **By preventing incorrect exposures**

The AEC also monitors the exposure in real-time and can predict if the examination will produce a good image. If the beam is too weak, or not aimed at the detector, DoseWise will terminate the procedure within the first millisecond of exposure.



# How does it create more awareness?

## By using an integrated DAP calculator

Optimization of the radiation protection according to the ALARA principle requires feedback about the actual dose levels and the quality of the acquired images in clinical routine, both for the individual examination and on the average.

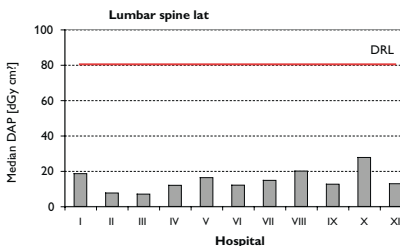
Philips Digital Radiography systems can come with an integrated Dose Area Product (DAP) calculation module. The DAP give you the relevant information you need for monitoring patient dose in an easy to interpret format. The DAP is the product of the dose value of the incident radiation and the irradiated field size. This has the advantage that it also includes the effect of collimation on patient dose. Furthermore it takes automatically into account a possible pre-filtration

## By giving feedback to the user

Direct feedback about the exposure factors and dose values is provided in the DigitalDiagnost after each image exposure by displaying these values at the operating console. All relevant exposure parameters (kV, mAs, ms, filter, grid use) and dose values (DAP) are stored together with the acquired image and documented on the film hardcopy or included in the DICOM header for display at the radiologist's diagnostic viewing station.

Internally the system collects those and other data for each X-ray exposure. These data are logged in the system and can be easily retrieved for analysis. By monitoring your average DAPs and comparing them against published reference values you can easily check if your installation is performing according to accepted standards. By making exposure data easy to see retrieve and analyze the spirit of DoseWise enables you to reduce dose wherever possible.

Median DAP values for lumbar spine lat examinations done with DigitalDiagnost at different hospitals in comparison to the DRL (Diagnostic Reference Level)



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To order the folder containing only the general brochure: 4522 981 94581

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