Automated Dose Monitoring Solutions

A MEASURED APPROACH
TO DOSE MONITORING

Automated Dose Monitoring Solutions support hospitals to help improve delivery of patient care and promote compliance.
FEW TODAY WOULD DENY THE ESSENTIAL ROLE IMAGING PLAYS IN HEALTHCARE AND PATIENT OUTCOMES. ON THE CONTRARY: IMAGING HAS BEEN ALMOST SYSTEMATICALLY EXPANDING ITS REACH THROUGH HOSPITAL DEPARTMENTS AND DISCIPLINES, PROVIDING A UNIQUE GLIMPSE INTO PATIENTS AND PATHOLOGIES.

BUT WHILE THE BENEFITS HAVE BEEN UNQUESTIONABLE, THE ‘SIDE EFFECTS’ CANNOT BE IGNORED, SPECIFICALLY IN TERMS OF INCREASED EXPOSURE OF PATIENTS TO IMAGING RADIATION. THE EUROPEAN COMMISSION BASIC SAFETY STANDARDS DIRECTIVE IS JUST ONE EXAMPLE OF THE REGULATIONS AND LEGISLATION THAT ARE STARTING TO MANDATE RADIATION TRACKING. IN FACT, THIS IS AN ISSUE THAT MANY HEALTHCARE PROVIDERS HAVE ACKNOWLEDGED FOR YEARS. HOWEVER, NOT ALL DEPARTMENTS ARE AS AWARE AS RADIOLOGY ABOUT THE POTENTIAL IMPACT OF ACCUMULATED RADIATION DOSE.
Consistency and standardization are key to the ALARA Principle

AND WHILE MOST ORGANIZATIONS REQUIRE DOSE TRACKING, UNTIL RECENTLY THEY DID NOT HAVE AN AUTOMATED METHOD TO COLLECT, ORGANIZE AND ANALYZE EXPOSURE DATA. WHAT’S MORE, METHODS FOR CALCULATING AND REPORTING RADIATION EXPOSURE HAVE BEEN INCONSISTENT. FOR EXAMPLE, DO THEY FOCUS ON DELIVERED RADIATION OR ON ABSORBED DOSE? A DIGITAL MONITORING SOLUTION CAN PROVIDE AN ENTERPRISE-WIDE, STANDARDIZED SOLUTION THAT ALLOWS THE HOSPITAL TO NOT ONLY MEET ITS LEGAL REQUIREMENTS, BUT TO IMPROVE ITS INTERNAL WORKFLOW, MONITOR AND ANALYZE IMAGING DOSE ON MULTIPLE LEVELS, SAVE TIME AND EFFORT, AND MAINTAIN THE QUALITY OF ITS IMAGING SERVICES FOR PATIENTS AND CLINICIANS.

When talking about dose, both ‘monitoring’ and ‘reduction’ need to be addressed, although of course they are linked. Monitoring alone will not reduce dose, but it is essential if dose reduction is to be systematic and effective globally. How can clinicians and radiologists make an informed decision for the patient without access to the patients’ dose history? Dose reduction can be effected from a number of factors – everything from hardware and software, to reductions in unnecessary image-taking. The key is to determine the lowest dose while ensuring that image quality is sufficiently high for diagnosis. Monitoring, on the other hand, requires collection and analysis of dose data. And while the ALARA principle may remain the key method used to determine the proper exposure technique for a given examination, the technology and the methods used to achieve and monitor the lowest reasonably achievable dose continue to evolve.
Key insights for patient safety

The new EU directive mandates member countries to have national legislation on safety standards by February 2018, but healthcare facilities shouldn’t wait for the last minute to start collecting dose data. While data entry can involve a lot of manual work, dose monitoring solutions are available that can automatically track, save and analyze dose data for each patient. This not only saves time, it creates a wealth of information that can be put to very good use!

Automated Dose Management solutions not only help prepare hospitals and clinics to meet regulatory requirements, they provide key insights throughout the care process, from the departmental management, to researchers, to the physicians and patients themselves. Patients and physicians can make informed decisions on necessary imaging, medical physicists can detect anomalies, regulatory agencies can enhance dose level guidelines and Diagnostic Reference Levels (DRLs) based on modality auditing and collected dose data, and researchers can compute correlation statistics, to name a few.
Peak skin dose monitoring: In the discussion about radiation dose, topics like peak skin dose and contrast monitoring should not get lost. Interventional radiology can result in skin reactions, particularly when a certain radiation dose threshold is reached. Keeping Peak Skin Dose (PSD) as low as possible can potentially prevent severe reactions and speed up recovery. The dose management solution gives an indication of the real skin dose and calculates peak skin dose maps, allowing quick action to be taken.

“The solution powered by tqm|DOSE™ has an intuitive interface but still has all tools for in-depth analysis of the data. Although we have multiple radiology departments, all data is stored in one single database. It enables us to do internal and external data comparisons and this facilitates our dose reduction efforts. The software also provides assurance that we continuously comply to legal regulations.”
Dr. Geert Souverijns, head of radiology, Jessa Hospital, Hasselt, Belgium.
What to look for in an Automated Dose Management Solution?

How does a hospital select the tool that will support its dose monitoring requirements, and ultimately provide the information needed for dose reduction efforts? There are several questions to ask about the solution being considered:

- Does it include the tools for the necessary data analysis?
  - Do these tools monitor on the patient, device and modality levels?
  - Do they go beyond ‘dose parameters’?
  - Can you filter?

- Does it offer easy and high-performance tools for workflow analysis?
  - Can you immediately see how much time has passed between two exams for the patient?
  - Can you instantly compare the number of exams by hour, day, week...?

- Does it include live and personalized dashboards that provide the specific details each user needs?
  - Does the technologist receive immediate feedback?
  - Can results be compared to databases?
  - Does it include justification tools?

- Does it integrate with the PACS or image viewer, across the hospital or clinic?
  - Does it provide instant patient dose information on the PACS workstation and beyond?

- Does it include quality control tools? Such as mean fluoro time per operator, volume of exams per operator, detection of overlap scanning, automated SSDE (Size Specific Dose Estimates) and patient positioning control and messaging?
  - How about automated analysis of rejected images, peak skin dose monitoring, contrast monitoring and clinical image quality scoring?
  - Does it include MRI, ultrasound and nuclear medicine?

- Does it offer compliance monitoring for regulations such as the European Commission Basic Safety Standards Directive?
  - Does it support you to evaluate the need for dose exposure on a case-by-case basis and track, record and maintain each dose given to all patients?
Agfa HealthCare Dose Management powered by tqmlDOSE™: seamless and performant

In the case of Agfa’s Dose Management platform, the answer to all of these questions is ‘yes’. It offers an advanced solution for patient radiation dose monitoring, analysis and improvement in digital imaging. The vendor-neutral dose management solution seamlessly integrates into existing PACS environments, including Agfa HealthCare’s Enterprise Imaging, and can be integrated into the Agfa HealthCare XERO Viewer. Dose and metadata information are collected directly from the PACS for analyses at the study, patient, device, modality and institution level.

With this information on radiation exposure levels, referring physicians can make better-informed decisions, while the radiology department can support its compliance with best practices and regulations. As an example, a treating physician wants to order a CT exam for a patient. With the XERO Viewer, he sees that the patient recently underwent a CT, and he consults the dose to which the patient was exposed. Using that information, he can evaluate whether it is best for the patient to continue with the CT scan, or to postpone it for a while. He has more key information for the delivery of patient care in the short and long-term.

With Agfa Dose Management, the hospital also has quick and easy access to the data it needs to demonstrate compliance with national and other regulations as well as internal processes, with automated data collection using DICOM header analysis, Structured Reports, DoseReports, IHE REM profile and more.

By implementing Agfa Dose Management, hospitals are well-prepared to address today’s challenges in reporting patient radiation dose, find ways to improve dose management, and be assured of their timely compliance with the upcoming European safety regulations.

*Agfa HealthCare Dose Monitoring Solution with Qaelum tqmlDOSE™ platform is not available in the U.S. or Canada.

Agfa HealthCare’s Dose Monitoring Solution includes Qaelum’s tqmlDOSE™ platform. Qaelum has become a leader in advanced dose management software solutions. The Dose Monitoring solution was developed by the radiology specialists of a university hospital. Development began as part of a ‘non-commercial’ initiative, and was very focused on the needs of the field.