GE Healthcare

DoseWatch

CT **MG** **IR** **R&F** **Surgical C-arms**

DELIVER THE RIGHT DOSE

The appropriate radiation dosage is essential for diagnostic imaging practices, for each patient and every exam received over time. DoseWatch* enables you to monitor and manage radiation dose across your entire system, so you can:

Drive Awareness with cumulative dose tracking across the health system to assess radiation dose delivered to patients undergoing a variety of imaging procedures.

Optimize Performance through analytical tools to optimize the balance between IQ and dose, helping to improve patient care while minimizing risk.

Enable Compliance with reporting capabilities to internal stakeholders, patients, external governing bodies, and regulatory authorities.

DoseWatch Overview:
DoseWatch is a web-based dose management solution that captures, tracks, and reports radiation dose directly from the medical device, multi-modality and vendor agnostic. You can deliver the right dose by detecting the causes of excessive radiation and producing sharp and focused diagnostic images with lower exposure.

**Automatic multi-modality & multi-vendor dose tracking**
DoseWatch can automatically receive and store dosimetric information from imaging systems from a variety of vendors, including:

- CT-scanners
- Interventional Radiology (IR) Systems
- Cardio-Vascular (CV) Systems
- Mammography Systems
- Radiography Systems
- Surgical/Mobile C-Arms

Flexible data acquisition for enterprise-wide coverage
To provide users with a comprehensive data set for radiation dose monitoring and management, DoseWatch does not restrict data acquisition to strictly DICOM® Radiation Dose Structured Reports (RDSR). Instead, DoseWatch can collect dose related information from multiple sources, including image headers, DICOM Modality Performed Procedure Steps (MPPS), OCR on dose report images, etc. This flexible configuration allows users broad visibility to dose data across their installed base, even for older imaging equipment that are not RDSR compatible.

LEADERSHIP

PRACTICES

TECHNOLOGY
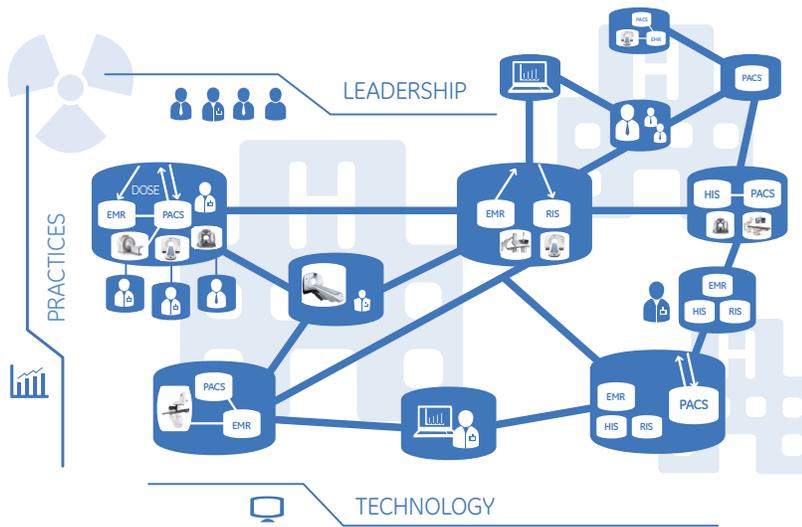
TRACKING: DRIVING AWARENESS

Advanced automatic dose notifications

DoseWatch includes a notification management system to alert users when an exam or a patient exceeds predefined thresholds (see figure 1 and 2). This system includes:

- Modality-specific, configurable, dose alert thresholds that can be set based on statistical parameters (median, average)
- Alert notifications by email
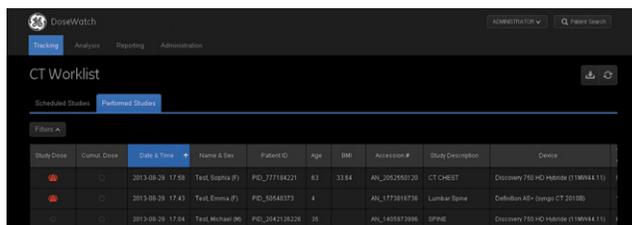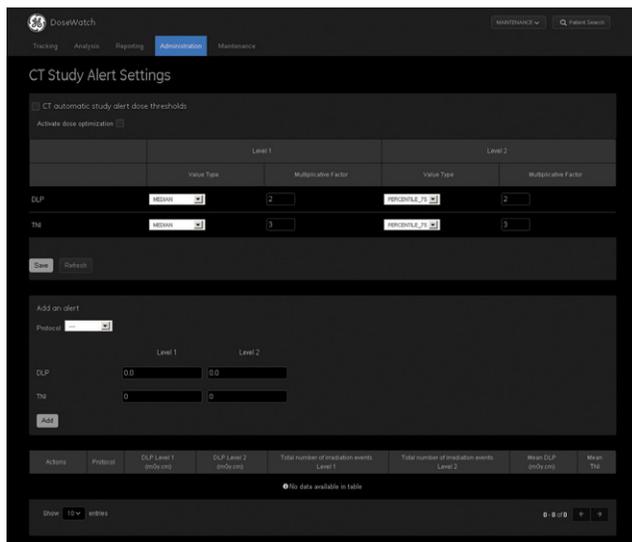- Alert notifications on the worklist page

figure 1

figure 2

Scheduled studies worklist[1]

DoseWatch displays a worklist for each modality with planned exams including patient information, irradiation history and notifications if the previous number of exams and/or the cumulative dose for the patient exceeds predefined thresholds.

Study overview and details

For each exam, DoseWatch can display detailed information on:

- The patient: Names, Age, Body Mass Index, etc.
- The exam: Protocol, acquisition parameters, etc.
- The dose: exam, patient, modality, etc.

CT acquisition quality review

Isocenter shift: DoseWatch displays a graph with the patient's centering and evaluates the isocenter shift.

mA modulation: DoseWatch displays on a scout the patient's density and the mA level by slice (see figure 3).
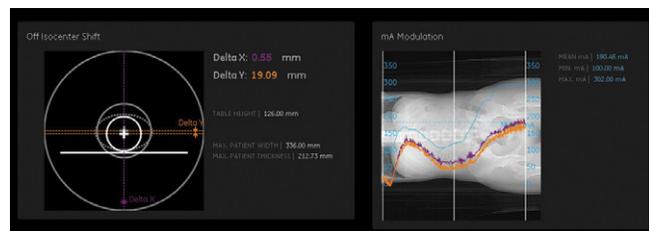

figure 3

Size-Specific Dose Estimate (SSDE) (CT)

DoseWatch evaluates automatically the SSDE in the AAPM TG204 version based on scouts. The SSDE is a metric developed by the AAPM (American Association of Physicists in Medicine) to evaluate dose according to patient size (see figure 4).

figure 4

Incidence Map (CV/IR)

Gauges: DoseWatch gives access to a summary of dose data by type of sequences (Fluoro or Record) and gauges to visualize the exam dose comparing to thresholds.

RPAK Incidence Map: DoseWatch displays a 2D map with the RPAK (Referential Point Air Kerma – ref. IEC 60601-2-43) contribution by incidence. The value and the position of the point with the highest cumulative RPAK are also indicated (see figure 5).
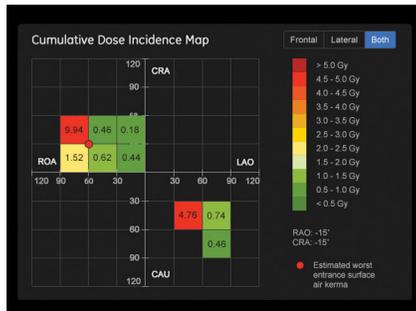

figure 5

Patient banner and history

Patient demographic and high-level exam information is available at a glance from the patient banner. DoseWatch provides quick access to print the exam dose report and patient history. Within the banner, a user can quickly access the patient's dose history which includes:

- The list of all examinations from any modality with an easy access to the exams details,
- A cumulative dose by modality
- A timeline view of all irradiation events

Virtual target values (for CT and CV/IR/C-arms)

DoseWatch displays for each specific type of exam:

- Internal Mean value for last 12 months,
- Internal Mean value for last X months,
- Reference Value established by the admin.

ANALYSIS: OPTIMIZING PERFORMANCE

Trends and exam analysis

DoseWatch includes a variety of embedded analysis capabilities, including:

- Dose per study/protocol (CT) displays the mean, min and max doses for a particular study description.
- High dose level studies & cumulative patient dose display examinations with highest dose and patients with highest cumulative dose.
- Dose comparison enables users to compare dose between sites, device, study description and age range. This analysis can be performed along local study description, standard study descriptions or protocol name when available.
- Export capability is available to help users with more in-depth analysis. A user can export the data from pre-configured analysis functions or users can completely export each modality database.

Standardization of exam description

To facilitate data analysis and improve alerts efficiency, administrators can map local imaging procedures elements with standard procedures. For CT, the lexicon used is the RadLex® Playbook 1.0 developed by RSNA® and adopted by ACR® for the DIR project. In addition, a customizable interfacing with the department information system can be implemented to keep study descriptions up-to-date for a better mapping with lexicon entries.

Performed studies worklist

The performed studies tab provides a list of all exams stored in the database classified by modality. This list includes patients, exams, dose and notifications stored by study date. It is possible to filter by time period, site, device and study description and sort along each field.

REPORTING/COMPLIANCE: SHARING RESULTS

Reports

DoseWatch includes two types of reports:

- Monthly summary (for CT and CV/IR) automated monthly reports with predefined analysis and graphs on dosimetric practices. Analysis parameters are customizable and reports can be configured to be sent by e-mail.
- Custom reports to generate a PDF file by defining the following parameters: the period on which the analysis is performed, the threshold used, calculated for each local study description, the minimum number of tests by local description for it to be taken into account, the name of your institution, the site of interest.

Preconfigured and customizable reports

DoseWatch allows users to generate preconfigured monthly reports for CT and CV/IR as well as create custom reports (see figure 6).
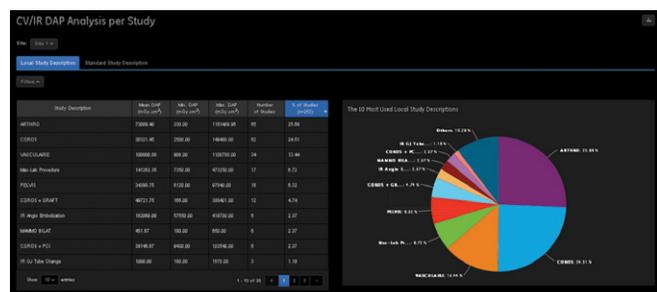

figure 6

National Reference Levels[2]

To promote compliance with local dose reference levels DoseWatch gives users the opportunity to:

- Customize DRL (Diagnostic Reference Levels) for available countries,
- Create a Microsoft® Excel® export matching national regulatory

IHE compliance & ACR compatibility

DoseWatch complies to the IHE Radiation Exposure Monitoring (REM) dose consumer (for collecting dose information) and dose reporter profiles (for publishing dose reports in national/regional registries, e.g. the ACR DIR). DoseWatch is an ACR (American College of Radiology) DIR (Dose Index Registry) Certified Software Partner.

DoseWatch Optimization Services

GE Healthcare provides a dedicated Clinical Applications Specialist to provide onsite DoseWatch training. The Clinical Applications Specialist will work directly with the user(s) to:

- Review historical Dose data
- Outline and review all protocols currently set up
- Identify opportunities to standardize and adjust protocols
- Identify opportunities to better use dose saving features
- Review ALARA principles

Upon completion of implementation and DoseWatch training the Clinical Applications Specialist will provide a follow-up to work with the customer to review the collected data to help establish a baseline and determine next steps. This session will also be used to insure proficiency in use of the web interface and the reporting and analytical tools.

GE Healthcare has an Information Technology (ITPS) organization to support the entire DoseWatch implementation: project planning, system installation, modality device integration, information system integration, trainings.

INTEGRATION WITH ENTERPRISE USER DIRECTORIES

For sites using an enterprise user directory, DoseWatch supports LDAP integration with openLDAP or Microsoft Active Directory® to enable centralized user authentication based on the user's enterprise credentials. LDAP v2 and v3 are supported.

Inbound and outbound interfaces[4]

DoseWatch supports inbound and outbound interfaces with a variety of information systems within your site.

Inbound interface: DoseWatch inbound interface relies on HL7® to receive patient information updates, patient merges and imaging procedure updates from RIS or CVIS (Cardiovascular Information System) or any other HL7-compliant system.

Outbound interfaces allow DoseWatch to send dose information to RIS, CVIS, reporting solutions or EMR. DoseWach supports various protocols including DICOM MPPS or Radiation Dose SR, and HL7 messaging.

DoseWatch also integrates with PowerScribe® 360 | Reporting from Nuance® Communications to automatically insert an exam dose summary in reports generated by this reporting solution.

DoseWatch is a Class I CE marked device in compliance with the applicable requirements of the Medical Device Directive 93/42/EEC and the site is certified according to ISO 13485:2003 - Medical Devices Quality Management Systems.

[1] This feature depends on the option selected and the device connected

[2] This feature depends on your country

[3] LDAP: Lightweight Directory Access Protocol

[4] These features depend on the option purchased and may require additional software and/or services from the interfaced system vendor

About GE Healthcare

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world. GE (NYSE: GE) works on things that matter - great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

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imagination at work