



Bayer Radimetrics™

North America User Group Meeting 2015

Tips and Takeaways from Attendees

A Bayer Brief

Introduction

This year marked the first Bayer Radimetrics™ Enterprise Platform User Group Meeting in North America, which was held at the Marriott Hotel in Anaheim, California on the eve of AAPM's (American Association of Physicists in Medicine) annual meeting. With medical physicists from around the country in attendance, insights were gleaned about how to use the Radimetrics enterprise solution to support imaging dose compliance, safety and quality initiatives. This brief highlights several of the most discussed topics surrounding the use of Radimetrics software, and includes a number of recommendations from users and Bayer Radimetrics trainers.

A Strong Beginning: Pre-Implementation Best Practices

Radimetrics offers a robust set of features that support capabilities to monitor, report and analyze diagnostic imaging dose data. Users and trainers all noted that taking certain actions in advance of deploying Radimetrics lays the foundation for broader use of these tools — and is essential for applying dashboard tools to establish DRLs (dose reference levels) and conduct root-cause investigations when these thresholds are exceeded. The following exchange of ideas may help new and established users alike rethink their initial steps in deploying the platform.

Protocol Management

By far the topic that drew the most discussion was how to tame — that is, organize, sort and maintain — the collection of imaging protocols most facilities amass over time. Getting started with the Radimetrics platform inevitably reveals that

some or many will need to be streamlined. Accordingly, protocol management garnered a broad set of recommendations from users and trainers, all of whom observed that mapping master protocols prior to or early on in the implementation of Radimetrics is key to using quality improvement tools within the solution.

Attendee Takeaway: Put the organizational effort up front. Dr. Tony Seibert, a medical physicist at UC Davis Medical Center and presenter at the user meeting, recalled what he described as a morass of 3,550 unique protocol names across all modalities at the academic medical center. Searching for individual protocols, he described, was akin to looking for a specific cup of water just tossed into the ocean. He went on to note that multiple names for the same protocol were often generated after software upgrades and other maintenance to scanners.



Dr. Tony Seibert

Although Dr. Seibert's department was still in the midst of mapping device protocols to master protocol names, his insights reinforce the importance of carrying out protocol management at the beginning of deployment. Dr. Seibert offered a number of protocol sorting and mapping tips:

- ◆ Organize the CT (Computed Tomography) scanner nomenclature at the CT scanner (if possible) and reduce the number of technical protocols prior to sending data.

- ◆ Spend the time to sort or bucket the device protocols into a reasonable file structure with hierarchical rules. Be careful about which is first and which is second; for example, Dr. Seibert's department uses "Peds" first and followed by weight, age and other variables.
- ◆ Map the resulting device protocols into master protocol names. Dr. Seibert's medical center used RSNA (Radiology Society of North America) Radlex nomenclature, and added a few more unique to the organization. (See Figure 1)
- ◆ Understand this requires a substantial effort and input from the CT technologists during implementation.

Name:	Revision	Modality	Exam	Name:	Modality
*CT Ped Brain wo or w	1	CT	37	11,10 PED HEAD/C-SPINE/FACIAL (UP TO 4 YEARS OLD)	CT
*CT Ped C-Spine wo or w	1	CT	68	11,11 PED HEAD/C-SPINE/FACIAL (5-17 YEARS OLD)	CT
*CT Ped Head C-Spine wo or w	1	CT	24	11,11 PED HEAD/C-SPINE/FACIAL (5-17 YEARS OLD)	CT
*CT Ped Head Face C-Spine wo or w	1	CT	24	11,11 PED HEAD/C-SPINE/FACIAL (UP TO 4 YEARS OLD)	CT
*CT Ped Head Face wo or w	1	CT	3	11,11 PED HEAD/C-SPINE/FACIAL (UP TO 4 YEARS OLD)	CT
*CT Ped Maxillofacial wo or w	1	CT	69	11,12 PED HEAD/C-SPINE/FACIAL (5-17 YEARS OLD)	CT
*CT Ped Sinus wo or w	1	CT	5	11,12 PED HEAD/C-SPINE/FACIAL (5-17 YEARS OLD)	CT
			25	11,17 PED STRYKKER INCLUDE HEAD/FACE/C-4	CT
			4	11,17 PED STRYKKER INCLUDE HEAD/FACE/C-4	CT

Figure 1. Master protocol mapping using hybrid Radlex/organizational nomenclature.

Attendee Takeaway: From 700 to less than 300 protocols.

Other attendees also underscored the importance of organizing protocols pre-deployment. One Radimetrics user recalled how her department went methodically through every protocol to remove duplicates and correctly match each anatomical part with the right protocol. As she described it, "If we had a chest/abdomen/pelvis, the chest had to match a standard chest. A head was a head was a head. Without contrast had to match with contrast."

The effort paid off with a newly pared down set of protocols — from 750 to, at current count, about 280.

Bonus Trainer Tip: *TJC (The Joint Commission) requires regular protocol management and review. Radimetrics trainer Jason Specht noted that as an aid to these efforts, the Radimetrics platform can generate monthly reports of protocol alerts that indicate when a protocol has been approved for use or is nearing its revision date. These, in turn, can be kept on hand in the event of a Joint Commission audit.*



Jason Specht

Training and Adoption

Radimetrics automates what would otherwise be a daunting manual process — tracking and monitoring dose information

from every diagnostic exam. To fully benefit from this efficiency, however, some time is required to learn and use Radimetrics' reporting and analytics tools. Attendees and trainers offered a number of best practices in this realm.

Attendee Takeaway: Designate a Dose Monitoring Champion.

Dr. Seibert noted that it is important to engage a point person for Radimetrics from the very beginning. He also suggested that one or more people be put "in charge" of using Radimetrics every day to gain efficiency with the system. Above all, don't take training lightly.



Carolyn Hohenberger

Trainer Tip: Establish Dose Monitoring & Governance Team.

Radimetrics trainer Carolyn Hohenberger described Bayer's suggested approach for getting the most value from the solution. In advance of implementation, and with the objective to organize a Radimetrics Task Team, Bayer coordinates a Webex meeting with the facility's key technical and clinical people. This in itself is

a process that helps identify which staff from which specialties should be involved in implementation, training (on- and off-site) and adoption.

Strategies for Setting DRLs

From regulatory compliance to analyzing outliers, setting DRLs is a critical but somewhat ambiguous step in using Radimetrics. As Hohenberger noted, some of the most frequently fielded questions from new Radimetrics sites concern this subject. How to define DRLs? Which ones should we set for alerts? What are the alert thresholds? Following are some of the tips and takeaways on this topic of heightened interest.

Trainer Tip: Focus on Your Facility's Immediate Need.

Hohenberger reminded attendees that the Radimetrics platform is a flexible program that allows users to approach DRL and alert setting from a simplistic or sophisticated level. Sometimes, the immediate need is to get threshold levels set to identify outliers. In this case, protocols can be "binned" in large buckets to set DRLs on a broad scale. By the same token, CT protocols can be categorized very specifically to set protocols to granular levels, such as distinguishing between multi-phase and single phase exams.

Attendee Takeaway: Use Histograms to Help Devise DRL Values.

Dr. Seibert described how his medical center creates histograms in Radimetrics platform to identify CTDIvol DRL values. Using the sample protocol "CT abdomen multiphase with

and without contrast,” he showed attendees a histogram that contained a number of studies performed under this protocol over a defined date range. He then demonstrated how to use the 5th, 50th and 98th percentiles of the data set to identify the minimum, average and maximum CTDIvol values for dose alert setting. (See Figure 2)

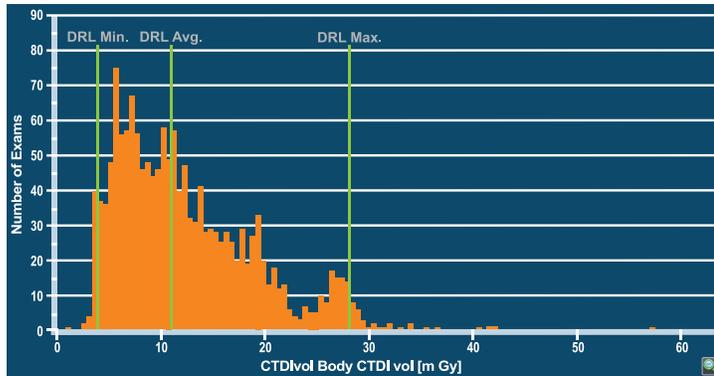


Figure 2. Using histogram data to identify DRL values.

Dr. Seibert also noted that any DRL should be validated against national standards (as published by ACR DIR or an accreditation CT program) and that the local DRLs most often should be similar or lower than the national standards.

thresholds using BMI, setting DRLs based on patient diameter can be achieved with the water equivalent diameter function within the Radimetrics platform.

A Deeper Dive with Dashboards

Various anecdotes shared at the user meeting revealed that for numerous sites, Radimetrics platform is a valuable source of information that supports both business and clinical decisions.

Attendee Takeaway: Outlier Analysis for Quality Control.

Dr. Mark Supanich, also a medical physicist at an academic medical center and presenter at the user meeting, described how Radimetrics platform played a key role in ending radiologists’ complaints about grainy Pulmonary Embolism (PE) studies. To assist his team in discovering the source reason behind this image quality issue, Supanich built a histogram dashboard within Radimetrics comprised of PE studies from a broad date range, with SSDE plotted. (See Figure 3)

The histogram depicted disparate spikes in distribution, including one low distribution area where studies were around five milligray. By clicking on that area, Supanich was able to get more granular detail on the exams.

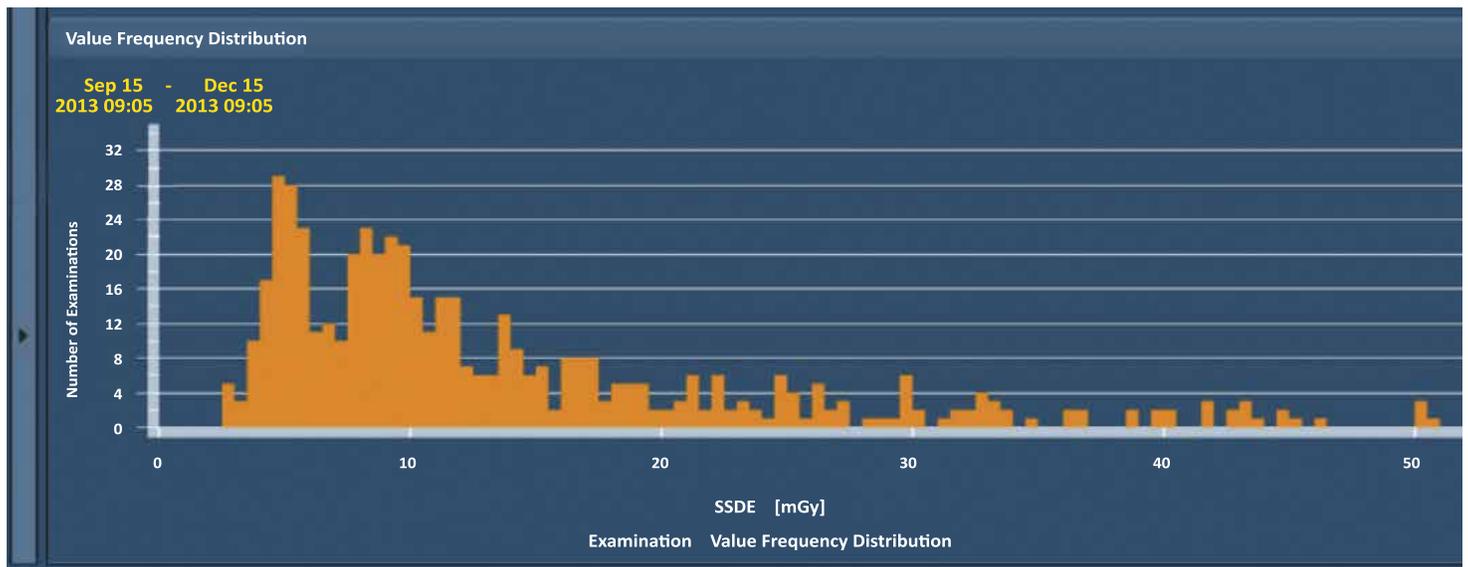


Figure 3: Histogram of PE studies with SSDE plotted.

Bonus Trainer Tips: Avoid Alert Fatigue. As Specht noted, new users who are unsure about which thresholds to set often err on the side of caution and configure alerts on every parameter. This can result in one study setting off five alerts, which can quickly overwhelm users. Specht recommended that users instead focus on what is most meaningful to them. Set thresholds for some basics such as CTDI, DLP, SSDE and effective dose, and “get to know your dose”.

A common element was soon apparent: all used two localizer radiographs; one lateral and one AP, on a scanner that allows for tube potential selection. From there, Supanich’s team identified and contacted the scanner’s manufacturer, who explained that processing lateral topograms — a recurrent component of this type of exam — created problems for the equipment.

Hohenberger added that size-specific DRLs are also a good option. If patient height and weight aren’t available in order to set

Supanich and his team subsequently devised a protocol that worked around this difficulty. Showing meeting attendees a second histogram, this one post-intervention, Supanich pointed out how the new distribution of studies contained no abnormal peaks of SSDE — and that he no longer received complaints about image quality for this particular exam.

Trainer Tip: Documenting Outlier Analysis. *An attendee stated that she believes inspectors in her state will eventually require that radiology departments document outliers and what decisions were made about them. She wanted to know if there was a function in Radimetrics platform that facilitated this. Hohenberger responded by describing a process for outlier documentation. First, DRL thresholds need to be established to trigger alerts and provide visibility to the outlier. Alert subscribers can document as well as share comments with other users when acknowledging alerts. In addition, there is an option to create and associate action levels with a DRL.*

Trainer Tip: Adjusting the dose value range for analysis. *Another user was curious to know if there was a way to set thresholds for scans that fell below certain DRLs for purposes of deeper investigating of image quality issues. Hohenberger answered that when building dashboards, there is a value of interest tab to limit the range to analyze. So, for example, if a user wants to examine only those values below a certain CTD_{lvol}, this process limits the dashboard to that range.*

Conclusion

Attendees discussed a broad and diverse range of topics about using Radimetrics platform for dose monitoring and reporting. More information about using the Radimetrics solution to support regulatory compliance and analyze radiation dose data for safety and quality initiatives can be found at www.Radimetrics.com. Bayer would like to thank all attendees for their invaluable contributions to this successful event. We look forward to many more.

About Radimetrics

Bayer's Radimetrics™ Enterprise Platform merges and mobilizes patient dose histories and current exam details from computed tomography (CT), x-ray, mammography and interventional imaging. A web-based, vendor-neutral platform, Radimetrics platform seamlessly integrates with existing imaging workflow and provides tools that can help reduce errors and increase efficiency. Features include customized dashboards, patient-centered protocoling, cumulative dose tracking; DRL alerts and more.



Bayer HealthCare

Radiology
Bayer HealthCare Medical Care
Bayer HealthCare LLC
100 Bayer Boulevard
P.O. Box 915
Whippany, NJ 07981
www.radiologysolutions.bayer.com



Bayer Medical Care Inc.
1 Bayer Drive
Indianola, PA 15051 USA
Customer Service/Orders
1-800-633-7231
Customer Service Fax
1-412-767-4120

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