What are the new Joint Commission requirements for CT dose monitoring and protocol review?

In the Joint Commission Comprehensive Accreditation Manual for Hospitals the hospital documents in the patient’s record the radiation dose index (CTDvol, DLP, or size-specific dose estimate [SSDE]) on every study produced during a diagnostic computed tomography (CT) examination. The radiation dose index must be exam specific, summarized by series or anatomic area, and documented in a retrievable format.

What are Patient Dose Monitoring Tools?

Radiation dose monitoring programs retrospectively record the patient dose index, patient habitus, and technical factors for every imaging study performed in an imaging department. There are a variety of commercially available radiation dose monitoring programs available (listed below). Each radiation dose monitoring program should support: recording patient dose indices, establishing expected dose ranges, alerting when cases fall outside the expected dose range, benchmarking performance against external references, and automated reporting of patient dose indices.

Commonly used radiation dose monitoring programs
- Dose Monitor
- DoseWatch
- Imalogix
- Radimetrics
- Sectra Dose Track

What is the ACR DIR?

The American College of Radiology Dose Index Registry (ACR DIR) is a database designed to aggregate CT dose indices from facilities across the nation to provide dose reference levels. Data being sent to the ACR DIR is anonymized. The ACR DIR does not support alerting for patients outside of expected dose ranges or provide detailed analysis of doses at a specific facility. The goal of the ACR DIR is to provide dose reference levels based on practices across the nation. It does offer limited reporting capabilities.

What is Dose Check?

Dose Check is a feature of CT scanners required by NEMA XR-29 which checks the CT dose index prior to the study against expected dose ranges. Dose Check uses two levels: notification and alert. The alert level is a global level across all protocols. The notification level can be set specifically for each protocol but does not consider patient size. Dose Check does not support automated alerting or reporting of patient CT dose indices.

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Is a dose monitoring program necessary to meet the Joint Commission Standards?

No; however, without the right tools, meeting the Joint Commission requirements will be extremely labor intensive and ultimately not sustainable. The manual approach to meeting the Joint Commission requirements would require the technologists manually documenting patient dose index for every study and reviewing them at a regular basis. In addition to being time intensive, this process is error prone and unreliable. Therefore, the manual approach is not recommended as a long-term solution.

Does a dose monitoring program satisfy the Joint Commission?

Dose monitoring programs are helpful, but not sufficient to meet Joint Commission requirements. They collect patient dose indices, support automated alerting for cases that fall outside expected dose ranges, and provide reporting to assist in the protocol review process. You still have to have the expertise and processes to review cases that exceed expected dose ranges. Additionally, the Joint Commission requires CT protocol review with input from a radiologist, medical physicist, and technologist. In short, dose monitoring programs provide you with all the tools required, but you still need the people and processes in place to meet Joint Commission standards requirements.

Does the ACR DIR satisfy the Joint Commission?

The ACR DIR is designed to compare dose indices to other facilities across the country. It is not designed to identify cases that exceed the expected dose range as data sent to the ACR DIR is anonymized. It is possible to go to the ACR DIR website and manually identify cases exceeding expected dose ranges including the date and time of the study. You then have to go into PACS and manually search by date and time to identify the study in question. The DICOM headers can then be opened and compared to the normal documented protocol to determine what happened. Because of the manual nature of this process, it is very labor intensive.

What is Dose Check?

Dose Check is a component in NEMA XR-29 and was not designed to meet the Joint Commission requirements. Dose Check is designed to notify the technologist prior to the scan that the dose is predicted to exceed the expected dose range. The Joint Commission requires reviewing doses after the exam that exceeded expected dose ranges. Dose Check does not determine whether the actual scan exceeded expected dose ranges, document when doses exceed expected dose ranges, or allow reviewing cases that exceed expected dose ranges. Therefore, Dose Check is not well suited to meet the Joint Commission requirements.

How does CDOS help me meet the Joint Commission requirements?

The CDOS consists of three components: monitoring of dose alerts, participation in clinical dose optimization committee meetings, and regular reports summarizing and documenting this data. Specifically, we provide monthly reports summarizing all the cases exceeding expected dose ranges, quarterly reports with detailed protocol reviews, and annual reports with a system-wide protocol analysis. In addition to these reports, we will provide an expert medical physicist to guide you through the dose optimization process at regularly schedule clinical dose optimization committee meetings. Together, these services address the Joint Commission standards requirements to establish protocols including the expected dose range, review the protocols with input from a medical physicist, and analyze cases that exceed expected dose ranges.

Why do I need CDOS if I already have a dose monitoring program?

Patient dose management requires both tools for monitoring patient dose and the expertise to interpret and act on data from these tools. Just as safe aviation requires both navigation software and an experienced pilot, dose optimization requires both dose monitoring software (like Radimetrics) and an experienced medical physicist. Even though flight navigation software provides valuable information, it is insufficient to safely fly a plane. An experienced pilot must interpret and react to problems
Frequently Asked Questions about Clinical Dose Optimization

that come up along the way. Similarly, an experienced medical physicist must interpret information from the dose monitoring program and guide dose optimization efforts along an appropriate course of action. For this reason, the CDOS is an essential component in creating an imaging program that consistently results in diagnostic quality images at the lowest radiation dose.

How is what CDOS offers different from what our physics group is already providing for us?

Patient dose tracking and dose optimization are not components in standard medical physics practice. This has been explicitly stated by the American Association of Physics in Medicine Practice Guideline 1a: CT Protocol Management and Review Practice Guideline. As a result, these Joint Commission standards requirements likely do not fall under your current physics contract. Further, this is a relatively new field for medical physicists and most physicists do not have specific training in this area. Landauer Medical Physics has assembled a team of experts with over 5 years of experience providing dose optimization across a broad range of medical centers. Let our team of experts guide you through the process smoothly and efficiently, ensure that you meet all regulatory guidelines, and see measurable improvement in your imaging operation.

Why should I spend additional money on CDOS as opposed to an internal solution?

By bringing in experts, we can help you perform the work in a fraction of the time it would take to perform on your own. In a paper titled, “Radiology Stewardship and Quality Improvement: The Process and Costs of Implementing a CT Radiation Dose Optimization Committee in a Medium-Sized Community Hospital System”¹, a team of clinicians explored the cost of developing a dose optimization program from scratch. They found that “Given these results, the resources required to review and modify 30 protocols per year on each of 4 CT systems would be $165,836 the first year.” Landauer Medical Physics has employed a team of physicists with 5+ years of experience in dose optimization. We have streamlined the process deliver CDOS 3.0 for the same size hospital for a fraction of the cost.

Does our radiation safety committee satisfy the Joint Commission requirements?

No. The role of the radiation safety committee is to review occupational radiation exposure, whereas, the clinical dose optimization committee reviews and analyzes patient doses. The regulations for both committees are completely different as is the skill set needed to do it effectively. There may be some overlap in membership between the committees. Landauer Medical Physics has expertise in both committees.

Can you provide me with concrete examples of what we would get from the CDOS program?

We would be glad to provide you with a sample report demonstrating how we have helped some of our clients satisfy the Joint Commission requirements and improve their imaging operation.


LANDAUER Offers Clinical Dose Optimization Services.

Please contact the CDOS Team Leader, Olav Christianson, at OChristianson@landauermp.com for more information.