

Clinical Dose Optimization Service (CDOS) enhances quality, safety of imaging operations

In this LANDAUER CDOS Briefing, two significant outcomes from two separate facilities are shared as a result of the CDOS partnership, which is designed to find and fix CT scanner patient dose issues.

Developed by LANDAUER medical physicists expert in dose optimization, CDOS assists health care organizations to establish a program that meets Joint Commission accreditation requirements, fulfills state regulations and meets American Association of Physicists in Medicine recommendations. Patient radiation dose data is analyzed to identify causes of overdoses, performance is compared with internal and external benchmarks, and imaging protocols are optimized. State-of-the-art physics support and counsel are provided in these services.

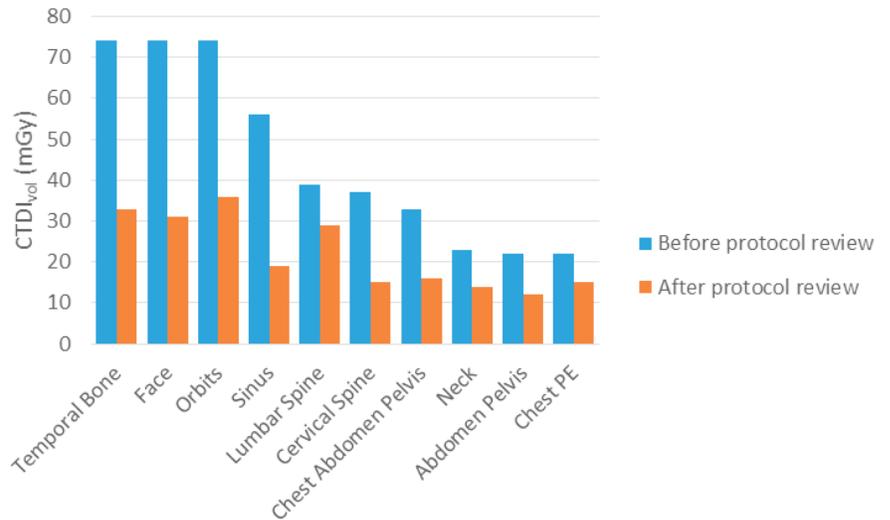
Optimization of 10 CT Protocols

The find:

CT protocols exceeded benchmarks

CT protocols at a mid-sized community hospital were reviewed and compared to external benchmarks as part of a Patient Dose Review Committee. The 10 protocols that exceeded the external dose index benchmarks by the largest amount were selected for protocols optimization in the first quarter. (Figure 1).

Figure 1



The fix:

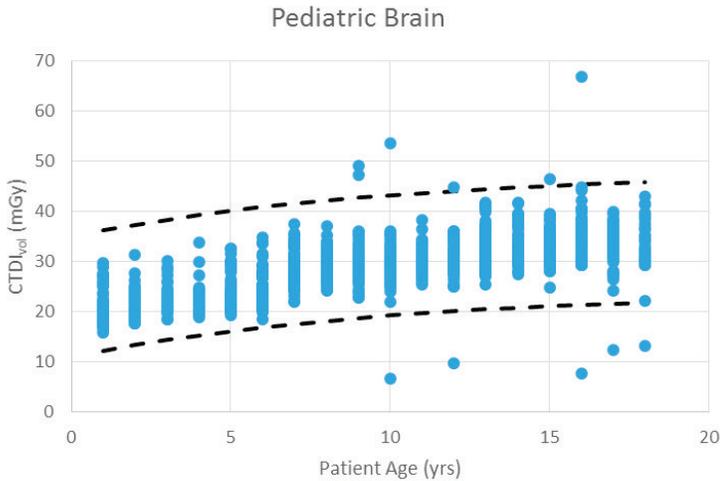
References from LANDAUER’s Best Practice Protocols were supplied. After modifying the protocols, doses were reduced by 48% across the 10 targeted protocols. This example showcases the immediate impact a Patient Dose Review Committee can have. Even though this particular scanner model did not support some of the state-of-the-art dose reduction techniques (like iterative reconstruction) **it was still possible to reduce doses significantly without compromising image quality.**

Patient Dose Investigation

The find:
 Operator technique impacts dose

When evaluating the relationship between CTDI_{vol} and patient age for a pediatric brain protocol (**Figure 2**), it was determined that the tube current modulation was generally providing the correct dose for a given patient age. However, some examinations showed higher and lower than expected doses for a given patient age.

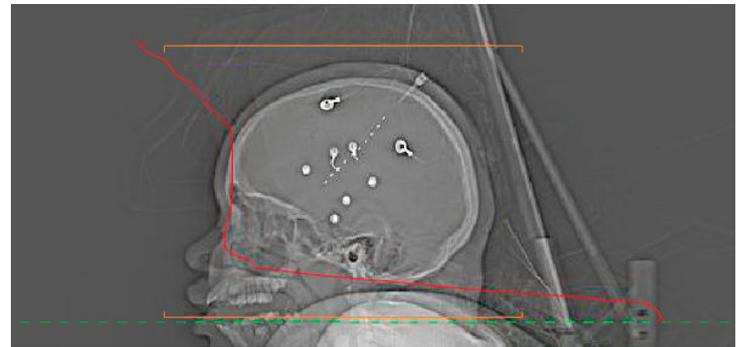
Figure 2



The fix:

Staff were educated on the impact patient positioning and scan range can have on the radiation dose. During this education, the staff were reminded of proper scan range for head exams as well as techniques to avoid unnecessary exposure to other anatomy.

Figure 3



The examinations with a higher-than-expected radiation dose can be attributed to patient positioning and scan range. In these patients, part of the shoulder anatomy was contained in the scanned range (**Figure 3**). Because this particular protocol used tube current modulation, the mAs was rapidly increased through the shoulder region to achieve the specified image quality level. As a result, the CTDI for the examination was elevated.

This example highlights the importance of proper patient positioning, which is one of the most common reasons for elevated doses.

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Because CDOS has a national reach, the CT Best Practices Protocol resource continues to grow and provides you with the unique opportunity to benefit from real-life practices.