

Optimization of protocols and processes in Computed Tomography: Almost R\$2,000,000.00 in savings in 3 years

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INTRODUCTION

Computed Tomography (CT) is a highly complex exam, which generates thousands of images, which must be stored for a few years. Most hospitals store it for approximately 5 years or a little longer. In university hospitals, the storage time for images tends to be longer, to be used in research. Therefore, the number of images generated can have a great financial impact. Processes that are not updated can generate wasted labor, which is why process review is important.

METHOD

Optimize without losing quality.
Discussion: Estimated savings after optimization and review of processes from June/2020 to October/2023: R\$1,920,000.00. Projected savings of R\$32,000.00 per month just with storage on the main server and backup.

CONCLUSIONS

Optimizing work processes and protocols in computed tomography is possible, and can bring good results, as long as the entire team involved works together. Keywords: Computed Tomography, work processes, university hospital, computed tomography protocols, process review.

RESULTS

- Tertiary public university hospital, which performs approximately 3,000 CT scans per month;
- High cost of technical labor;
- Generation of 3 million images monthly;
- Protocols without major updates for more than 10 years;
- Long-term storage of digital images (around 30 years) for medical research;
- In this case, as it is a tertiary public university hospital and receives highly complex patients, CT exams tend to be longer than exams in clinics or even low complexity hospitals;
- As the number of medical professionals is high, this also impacts protocols, which tend to be large and comprehensive;
- To meet all demand, two radiology technicians were stationed at the CT scanner during the day. At night just a professional;
- The number of manual reconstructions was high, requiring more labor;
- Storage time on the main server: minimum of 10 years;
- Backup storage time: minimum of 30 years;
- Some volumes of images were sent in duplicate, due to a protocol programming error;
- The participation of the team of radiologists and radiology technologists was fundamental in defining what could be optimized;
- Objective: optimize without losing quality;
- Estimated savings after optimization and review of processes from June/2020 to October/2023: R\$1,920,000.00.
- By storing images for a long period, the projection is a saving of R\$32,000.00 per month just with storage on the main server and backup, throughout the storage period;
- The service now only has 1 technician to perform CT at all times (there were 2 during the day). Cost reduction of approximately R\$16,000.00 per month with labor including salary, benefits and charges;
- Reduction of images sent to PACS by approximately 1 million monthly, around 30% of the quantity sent previously;
- Automation of some reconstructions in the CT scanner;
- Lower network overload, with fewer images being sent, and thus fewer images were downloaded each time the CT scans are viewed;
- There was no reduction in quality or risk to the safety of the exams performed;
- The project continues to be implemented, saving approximately R\$46,000.00 in public money monthly;
- In many widely used total abdomen and chest protocols, in addition to protocols for extremities and lower limb CT angiography, images were reconstructed at 0.5 mm thickness. We increase the thickness to 1 mm. As these are regions where the structures are large, no loss of quality or diagnosis was reported. Thus, there was a significant reduction in the volume of images generated throughout the month;
- In some protocols, such as CT angiography of cervical vessels and lower limbs, the volume was reconstructed twice, with a thickness of 0.5 mm. We changed it to rebuild only once with 1 mm thickness;
- Coronal and sagittal reconstructions with MIP and MinIP were manually reconstructed in all thoraces. This is no longer done, as in PACS the radiologist can perform this task when necessary.
- Coronal and sagittal plane reconstructions were manually reconstructed by technicians. This process was automated, now being carried out only by the tomograph.

The service now has only 1 technician to perform CT at all times. Cost reduction of approximately R\$16,000.00 per month with labor. Reduction of images sent to PACS by approximately 1 million monthly. Lower network overhead, sending fewer images. There was no reduction in quality or risk to the safety of the exams performed. The project continues to run, saving approximately R\$46,000.00 monthly. In many total abdomen and chest protocols, images were reconstructed at 0.5 mm thickness. We increase the thickness to 1 mm. In some protocols, the volume was reconstructed twice, with a thickness of 0.5 mm. Coronal and sagittal reconstructions with MIP and MinIP were manually reconstructed in all thoraces.

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