

Efficient Formula for Higher Productivity and Cost Savings

Taking on the AXIOM Luminos *d*RF fluoroscopy and radiography system was a huge leap forward for the Department of Medical Imaging at the Hospital Oost-Limburg in the Belgian Genk. After six months of operation, substantial workflow improvements have proven the high capabilities of the two-in-one solution.

By Rita Wellens, PhD



During the past decade, the Department of Medical Imaging at the Hospital Oost-Limburg (ZOL) underwent major organization changes. These came about to meet internal restructuring needs and to enhance clinical effectiveness as well as cost savings.

ZOL was established in 1995 after a merger of three hospitals with a capacity of 500, 200 and 150 beds, respectively. With more than 2,400 staff and 200 medical doctors, it is one of the largest non-academic hospitals in Belgium. It provides healthcare services to about two-thirds of the residents of Genk – which has a

total population of 64,000 – and is also frequented by citizens from neighboring countries such as the Netherlands.

Reorganization and Digitization

Medical imaging procedures take place at each hospital campus of ZOL and at the emergency ward located at the main Sint-Jan campus. In 1997, systems using plates for computed radiography (CR) became operational. The six examination rooms featured four Siregraph fluoroscopy systems, one Vertix wall stand and one AXIOM® Iconos R200 digital fluoros-

copy unit. All medical imaging sites were thus equipped with CR readers.

In 2007, ZOL implemented AXIOM Luminos *d*RF, a fully digital flat-detector system combining digital fluoroscopy and digital radiography, and eliminating the use of cassettes.

Professor Yvan Palmers, MD, Head of the Department of Medical Imaging at ZOL, explains the reasons: “In general, there is a progressive decrease in the number of X-ray examinations due to greater use of magnetic resonance imaging, computed tomography and ultrasound. The best way to manage this evolution is to



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Professor Yvan Palmers, MD, Head, Department of Medical Imaging, Hospital Oost-Limburg, Genk, Belgium

adapt the number of X-ray rooms and to enhance the workflow and efficiency of the remaining ones.” Palmers agrees on a global trend: “Hospitals in general are under high pressure to reduce costs. They have to maximize utilization of available equipment, increase the productivity of their staff, and try to decrease the number of rooms occupied.”

The main driving force behind the reorganization was the need to establish medical imaging facilities capable of adapting to varying diagnostic application mixes. Other factors included the need to comply with guidelines for good

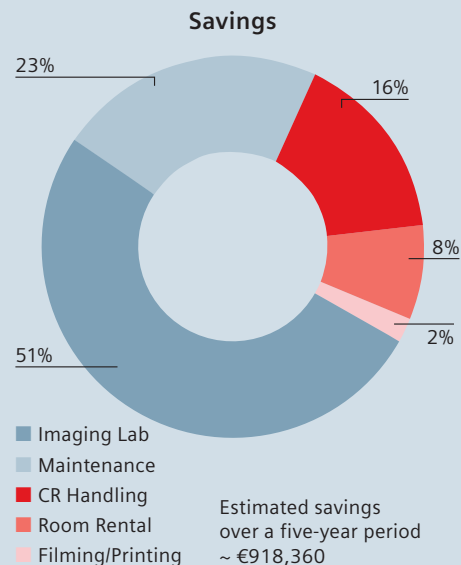
medical practices concerning the use of medical imaging as well as with stringent national and international recommendations for radiation dose and image quality. Last but not least, planning also targeted freeing up space for more patient rooms, reducing both staffing and operational costs, and improving efficiency by optimizing workflow.

As a result of the reorganization the new generation of digital X-ray systems with flat detectors were implemented. A final reduction from six rooms (five equipped with fluoroscopy capabilities) to three rooms (two with fluoroscopy

capabilities) was achieved by replacing four Siregraph systems and the Vertex wall stand with one AXIOM Aristos MX and one AXIOM Luminos *d*RF, while retaining the AXIOM Iconos R200.

The Lumino(u)s Workflow Impact – Half the Rooms, Double the Throughput

During two evaluations, conducted in April 2007 and August 2007, a comparative study assessed the exam duration from system set-up through image documentation recorded with Siregraph versus AXIOM Luminos *d*RF. The results



Source (all): Hospital Oost-Limburg, Genk, Belgium

of the Hospital Oost-Limburg showed that AXIOM Luminos dRF achieved a reduction in total exam duration of 56 percent relative to the Siregraph system. This was mainly due to the elimination of nine out of 21 workflow steps that were mainly linked to CR cassette handling.

The easy system positioning, as well as the integrated postprocessing and image documentation features of AXIOM Luminos dRF, all add to significantly reduced patient turnaround time. Upon arrival, a patient can now be scheduled for the complete therapeutic and diagnostic path. Thanks to the DICOM (digital imaging and communications in medicine) modality's worklist-driven settings, AXIOM Luminos dRF automatically selects the exam parameters aligned to the clinical indication. Image data management is optimized by seamless integration into the hospital and radiology information system (HIS/RIS) as well as the picture archiving and communication system (PACS).

Professor Palmers highlights several factors responsible for the impressive drop in patient turnaround time observed with the new system after only six months of operation: "The table geometry of AXIOM Luminos dRF is outstanding and enables optimal patient handling. The

lowest position is at regular chair height, 48 centimeters, which also means much greater comfort for the patient and the technician during patient transfer and positioning," he explains. Additionally, the easy one-button operation and fast tilting are important improvements. "Especially at peak workload times, AXIOM Luminos dRF's capacity for quick handling is much appreciated by both staff and patients," says Palmers. There is also no cassette handling anymore, so there is more time to focus on the patient.

"AXIOM Luminos dRF offers static and dynamic imaging in one system, provides instant real-time images with a large dynamic range, and permits instant image quality control. The large size of the digital flat-panel detector – featuring a 43 x 43-centimeter field of view – means that we require fewer images and fewer retakes. The immediate availability of the images through PACS further speeds up the diagnostic process," says Palmers. He adds that workflow will be fully optimized as soon as all the staff has received training to work with the AXIOM Luminos dRF system. Currently, 11 of 18 people can already operate the system.

"Fewer work steps, fewer retakes, and more streamlined data integration not

only lead to fast patient throughput but also to a reduced likelihood of human error," emphasizes Palmers. "The versatility of the AXIOM Luminos dRF system is central to overall workflow optimization, since this two-in-one system can be utilized for general radiographic procedures as well as fluoroscopic exams and even angiographic studies. It allows flexible adjustment to varying examination mixes."

Coping with the Shortage of Certified Staff

The reduced number of rooms also affected the number of clinical staff members needed to operate the equipment. "The added value of the user-friendly ergonomics of AXIOM Luminos dRF has allowed us to employ less costly logistic personnel for carrying out patient handling tasks," says Palmers. "This use of logistic personnel also frees up more time for our clinical staff to invest in diagnostic imaging issues, and it fits perfectly into our staff rotation system. And it has helped us cope with a shortage of clinically certified staff." He enthusiastically recalls, "After only a few days, AXIOM Luminos dRF was accepted and used for routine examinations. Once the system was tuned in to the local routine and

Summary

Challenge:

- Maximize utilization of available X-ray equipment
- Effective assignment of staff
- Decrease number of rooms occupied
- Reduce workflow for higher efficiency

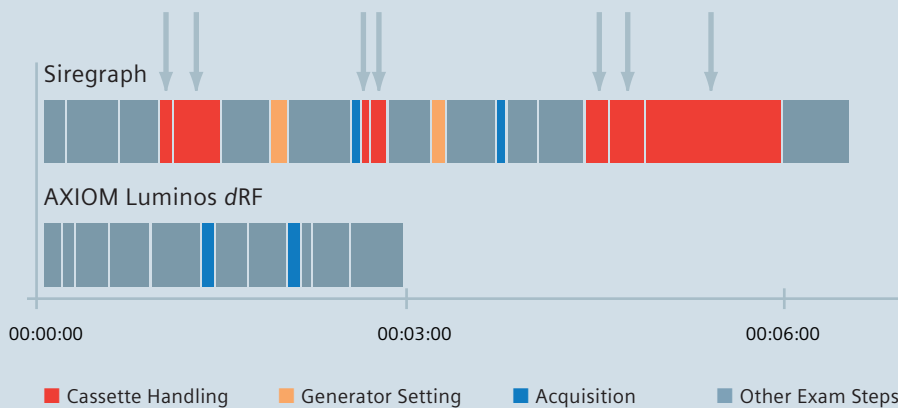
Solution:

- Two-in-one system: AXIOM Luminos dRF with digital flat detector for fluoroscopy and radiography

Result:

- Improved workflow with higher productivity at the Department of Medical Imaging, Hospital Oost-Limburg: 43 percent fewer steps and 56 percent less time
- Half the rooms, twice the patient throughput
- Fewer retakes and more streamlined data integration
- Enormous cost savings

Cassette Handling Eliminated



fully integrated in HIS/RIS and PACS, the AXIOM Luminos dRF progressively enjoyed the preference of all users because of its unique features: ergonomic table geometry, two-in-one system without cassette handling, better image quality at lower dose thanks to the CARE [Com-

bined Applications to Reduce Exposure] feature, and real-time quality control. One could definitely say that there is increased job satisfaction among our employees – and decreased stress and strain for our patients.”

Financial Impact and Prospects

The financial outlook for ZOL is bright. Total annual costs per year, which were €721,129 before digitization, are calculated to decrease by 25 percent to €537,457 after digitization. The drop from six to three examination rooms equals 111 square meters less space to be rented and maintained. The elimination of two out of three CR cassette readers has already resulted in lower maintenance costs with concurrent savings on film and print supplies. The fact that logistic personnel can now be hired to replace more expensive clinical staff for certain operating tasks contributes to savings on labor costs. And the drop in the number of medical imaging systems reduces staff training costs. Over five years, average savings at ZOL are projected to total €918,360.

Summarizing ZOL’s bright financial picture, Professor Palmers says, “What is important to consider is not the cost of purchase but the cost of ownership.

Investing in AXIOM Luminos dRF has been a cost-effective solution. The investment will pay for itself in three to four years maximum.”

The evolving story of the reorganization of the Department of Medical Imaging at ZOL in Belgium is a happy one. Acquisitions such as the versatile high-tech AXIOM Luminos dRF system have been a future-proof solution for realizing higher productivity and cost savings through improved workflow.

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“The table geometry of AXIOM Luminos dRF is superior.”

Professor Yvan Palmers, MD,
Head, Department of Medical Imaging,
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Further Information

[www.siemens.com/
AXIOM-Luminos-dRF](http://www.siemens.com/AXIOM-Luminos-dRF)