

Improving the Big Picture: CT Flowmaster Transcends Departmental Boundaries

The CT Innovation Unit at Herlev Hospital in Denmark has organized, tested, and implemented a more efficient way of using their available CT scanners for acute patients by creating the position of “Flowmaster”. The result is improved patient safety, more cost-efficient care, less waiting time for physicians after having ordered a CT, and staff who are better able to focus on their main tasks instead of administrative work.

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On the go: The Flowmaster, a position held by a member of the radiological team, ensures an efficient workflow.

Fast and mobile: The Flowmaster is in contact with doctors and staff beyond the radiology department.



Herlev Hospital is a skyscraper, actually the tallest building in Denmark, rising 120 meters over the town of Herlev on the northern outskirts of Copenhagen. But Herlev Hospital excels in other ways as well. To ensure the best possible use of the radiology department, the Capital Region of Denmark and Siemens Healthineers joined forces in 2013 to create the first Danish CT Innovation Unit. The Unit comprises representatives from all different teams, radiographers, doctors, and managers.

“We are the only Innovation Unit at departmental level at Herlev Hospital,” says Project Manager Henriette Raaschou. “But serving all other departments, be they cardiology, neurology, or

trauma units, our work has the potential to impact the entire hospital. You could argue that the staff members at the department of radiology are the last generalists in healthcare, involved in the care of all kinds of patients.”

Optimizing workflow

The Radiology Department at Herlev Hospital has seven CT scanners, with one traditionally being used for acute patients. By scanning 65 acute patients on a normal day, the patient volume is high at the Danish hospital. And sometimes, even one dedicated acute scanner is not enough. Keeping in mind that the quicker acute patients are

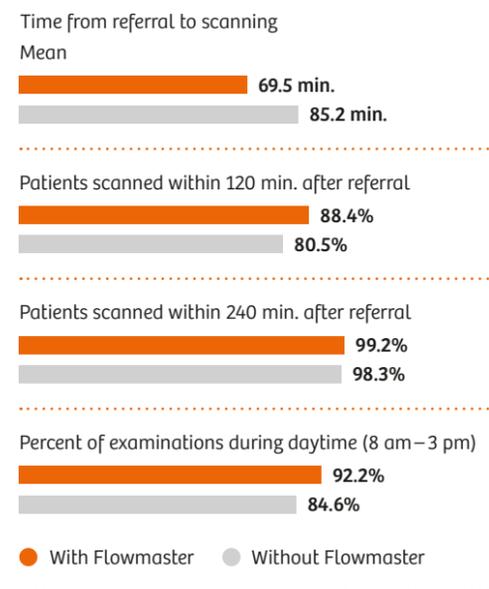
scanned and diagnosed, the quicker they can get the correct care, it is crucial to establish an efficient CT workflow – from ordering a CT to the scanning itself and from managing patient load in a smart way to keeping patient safety high, while at the same time utilizing all available scanners optimally. This can be particularly challenging, because all the departments other scanners are mostly fully booked, especially during peak hours. So the CT Innovation Unit identified the need for an overall workflow improvement regarding the CT management, with special attention placed on relieving staff and using their competencies optimally. To be more concrete, the goal for the radiographers was to be able to focus on the scanning process and for the



The Flowmaster's main task is keeping an overview of the workflow.

radiologists to be able to concentrate on the analysis, ideally with someone else taking care of the workflow optimization. The result of this discussion was the creation of the Flowmaster position.

Measurements with and without a CT Flowmaster at Herlev Hospital



"It's a bit like the work of an air traffic controller," says Felix Müller, MD, one of the doctors in the CT Innovation Unit. "One person takes on the single task of having an overview of the flow, making sure that the staff and equipment are working efficiently. When this works, the scanners are all used optimally at any given time, and no staff or equipment is ever idle."

Significantly shorter scanning procedure

This new system was first tested in November and December of 2017. Over a period of six weeks, the scanning department alternately worked with and without a Flowmaster, first every other week, then two weeks at a time. The result was very positive: "We were able to scan more patients during 'daytime' – that is, before 3 pm," says Müller, "and the average time from ordering a CT scan until the time the patient is scanned was reduced by more than 20 percent."

The majority of patients in the highest priority group are scanned within one hour, and, in the second priority group, where patients are to be scanned within two hours, almost every patient was scanned in time. "We are very happy to be able to guarantee this," the doctor says.

Higher equipment utilization and efficiency

The goal of using the equipment more efficiently also seems to have been reached. "There is far less dead time when a Flowmaster is working", says Henriette Raaschou. "He or she manages to steer patients to an available scanner very efficiently."

Safer patients and a more efficient use of all resources are thus two goals achieved by the Flowmaster approach. The third goal, more room for the staff to focus on their main tasks, seems to have been achieved as well: "Especially during peak hours, the advantage of having a Flowmaster in contact with the doctors and other staff beyond the radiology department is great," says radiographer Ulrik Frost. "This means we can focus on the scanning process without being distracted, by late-arriving patients, for example."



The Flowmaster manages patient flow and makes sure that the scanners are utilized optimally.

Bottom-up approach

The Flowmaster project was accomplished within an unusually short time period. One reason for this was that the necessity to improve organization was identified within the department itself, by the Innovation Unit at the radiology department and by the people scanning patients every day. This bottom-up approach was the reason why all staff members involved were highly committed.

During the weeks when the two systems, with and without a Flowmaster, were alternating, the staff were interviewed at the end of each workday to map how the difference was perceived. By engaging the staff in this way, the project was, in many ways, being implemented at the same time as it was being tested and evaluated.

It was with the same efficiency that the management decided, in March of 2018, to make the Flowmaster a permanent position within the radiology department, meaning that one member of staff would always have the specific task of maintaining an overview.

Innovation is key

"The management has been very dedicated to this project and to the creation of the Innovation Unit," says Henriette Raaschou. She has been

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Felix Müller, MD

working at Herlev Hospital as a radiographer and has now been given the opportunity to do a Master's degree in leadership and innovation in complex systems, to give her and the hospital better tools to continue working with innovation.

"I think it's important for innovation in medical care to focus on the workflow, on the big picture, and not on single systems or persons," she says. "This means that we need to give innovation much more attention than we do currently. The use of innovative approaches can create additional value, which in turn has the potential to affect the whole hospital." ●

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