

A SNAPSHOT OF RADIOLOGY'S MANY INEFFICIENCIES

Katelyn Nye, General Manager, Mobile Radiography & Artificial Intelligence at GE Healthcare, X-ray, outlines the top inefficiencies in radiology departments, and discusses how intelligence platforms can address them.

Katelyn Nye is the General Manager, Mobile Radiography & Artificial Intelligence at GE Healthcare, X-ray, where she is segment leader for GE Healthcare's mobile radiography product line and AI/Analytics for the X-ray business. Previously, for nearly three years, Nye was the X-ray Global Product Manager, Artificial Intelligence & Analytics, where she developed product concepts through close customer observations and collaborations and defined features and user requests. In this role, she also managed global engineering efforts throughout the development cycle. Nye is a recipient of the 2017 Edison Women in Technology Award and the AIRP Award for Best Scientific Poster at the Society of Skeletal Radiology Annual Meeting.

What are the greatest inefficiencies in radiology departments today?

Nye: For starters, there are inefficiencies around patient scheduling and waiting rooms. This directly impacts the patient experience, of course, but could also be said to delay timely treatment, with a subsequent impact on patient outcomes.

Another inefficiency is around the quality of diagnostic studies. In radiology, this results in repeat exams or interpretation mistakes.

Finally, there are inefficiencies in communications. This inefficiency can be person-to-person, such as when the RAD is unable to reach an ordering physician, or person-to-machine, such as when the RAD is interacting with the EMR and has to search through multiple screens to get a patient history.

How can an intelligence platform address these inefficiencies?

Nye: Smart scheduling can streamline patient scheduling and waiting rooms. An intelligence platform can also catch and reduce errors on medical devices, preventing patient call-back. We believe there's a significant opportunity to lighten the load for radiologists by using AI to, for instance, flag cases that need prioritized review. These systems can also improve communications, both between RAD and physician, by helping focus attention on the most critical cases, or between the RAD and the EMR, subsystems and devices when, for instance, fetching relevant patient history.

How does Edison, GE Healthcare's intelligence platform, improve the user interface and workflow, making access to clinical data easier?

Nye: Critical Care Suite introduces AI to improve technologist workflow by identifying quality errors on a device immediately after acquisition, helping improve the technologist's productivity and the patient's overall experience.

Critical Care Suite applications bring AI capabilities at the point of care to help the clinical care team prioritize cases that present critical findings in frontal chest X-ray images.

Intelligent Protocol Check accurately conducts (AUC>0.99) an automated quality check to detect errors on the acquisition system, such as improper protocol used, thus enabling the technologist to determine if the image needs to be repeated or reprocessed before sending to PACS. For example, if a chest X-ray protocol was selected, but an abdomen exam was conducted, the AI algorithm will detect that error and alert the technologist at the point of care before the patient leaves the facility or the technologist drives away with his/her mobile X-ray unit.



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Intelligent Field of View accurately detects (AUC>0.99) when a lung field is clipped in a frontal chest X-ray, allowing the technologist to determine if a repeat is required before sending the image to the PACS.

- Assists the technologist in his/her quality check by monitoring the coverage of the lung field and notifies any user if a lung field is clipped.
- Provides real-time feedback on patient positioning, which is helpful for busy technologists.

Intelligent Auto Rotate saves the technologist 3-4 user interface clicks on >80% of mobile chest X-ray exams.

- At a medium-to-large size hospital, that totals a savings of nearly 20 hours, or 3 working days and 70,000 clicks per year.¹
- With an AI algorithm being 99.4% accurate, it is estimated that 20 hours of manual clicks would be reduced to 7 minutes per year.²

References

1. GE Healthcare Data on File
2. Younis, K., et al. (2019). Leveraging Deep Learning Artificial Intelligence in Detecting the Orientation of Chest X-ray Images. SIIM Conference on Machine Intelligence in Medical Imaging (C-MIMI), Oral Presentation.

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