

AI synergistically transforms the MR experience



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Access to MR is still surprisingly challenging with waitlists of several weeks not uncommon. And, even where MR is more readily available, the quality and type of examinations may not be equivalent in major medical centers compared to community settings.

However, continued advancements in MR are expanding access to more patients – not only for routine examinations but also for very challenging studies that traditionally were provided in predominantly academic hospital-based settings. Now, technology is enabling community providers to provide these complex MR examinations. Both the quality and comfort our healthcare group can provide to our patients has changed remarkably with the introduction of several GE HealthCare technologies that are synergistic in transforming the MR experience.

This issue of *SIGNA™ Pulse of MR* features articles that touch on patient access, from the newest innovations in cardiac imaging benefiting patients who previously couldn't tolerate examinations, to bringing high-quality MR neurography from an academic environment to the community. We also share how technology can address sustainability by reducing the energy impact of MR imaging. Rounding out this issue are technical articles on how AI is pushing the boundaries of MR in MUSE diffusion imaging, a new approach to ultra-high contrast brain imaging[†] and the promise of metabolic MR imaging[†].

The combination of technologies such as AIR™ Coils and AI-enhanced image reconstruction has been game-changing for our patients. Our technologists have lost count of how many times a patient, who previously had a MR examination, is taken out of the magnet and says “Is that all, is it over?” At the same time, the quality improvement, both in terms of image clarity and sharpness, is enormous. In some cases, the speed of the acquisition allows us to easily include specialized sequences that are not typically included in our standard protocol to further benefit our patients. We haven't yet encountered any significant negatives of employing GE HealthCare's deep-learning MR technologies and we have found that, in almost all cases, we set the noise reduction on high with excellent results. In the routine examinations, such as a lumbar spine, we leverage innovations such as 2D and 3D AIR™ Recon DL,

FOCUS and AIR Recon DL for PROPELLER to create amazing 2D and 3D spine examinations in just over 5 minutes. And the diagnostic quality far exceeds what we could obtain just a few short years ago.

Our centers that have deployed deep learning for MR image reconstruction have reported notable improvement in patient satisfaction, reflecting the positive impact of this technology on the patient imaging experience.

These new technologies lead to less dependence on operator experience and technical ability. A superior technologist will likely always deliver a superior examination, but AIR™ technology means that it's much easier to turn out a good examination that will provide the patient with an accurate diagnosis, even in the hands of a less experienced technologist. And upcoming developments to GE HealthCare's MR user interface will push that forward, making the job of the technologist easier and allowing them to concentrate more on the patient rather than the technical details of the examination.

There's a lot of talk about AI in radiology but it's abundantly clear: AI and deep learning are here to stay, and we can embrace it or get run over by it. I'm occasionally asked to discuss GE HealthCare's deep-learning technology (AIR Recon DL) and I have been surprised by the amount of resistance there is, often based on lack of familiarity. For me, this technology creates a new excitement. We can use these innovations to bring a more complex examination, like MR neurography (MRN), to community outpatient clinics so that referring physicians can bring the benefits of these techniques to patients where these services were not previously available. And it's not just MRN, but also cardiac imaging powered by innovations like Sonic DL™ Cine, which we currently use in our academic settings but plan to roll out to our imaging centers this year through community-based cardiac programs.

Yes, we can look at the ability to perform examinations more quickly in terms of operational efficiency, which is especially relevant in the current environment of decreasing reimbursement. But, that misses the much more important benefit: access for more patients and to more types of examinations to a scarce commodity that can help improve healthcare and save lives. **S**

[†] Technology in development that represents ongoing research and development efforts. These technologies are not products and may never become products. Not for sale. Not cleared or approved by the US FDA or any other global regulator for commercial availability.