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Working Together

The theme of the 99th Annual Meeting of the Radiological Society of North America is "The Power of Partnership". Nowhere is this concept better exemplified than in the cooperation between academic medical centers and industry partners in the development and improvement of diagnostic imaging. This issue of MAGNETOM Flash contains a wealth of examples of how such collaborations have advanced the discipline of MRI.

As the world population's healthcare needs grow, so must diagnosis and disease management continue to advance. Diagnostic imaging plays an increasingly central role in detecting and characterizing disease, and guiding therapy. In particular, MRI remains a cornerstone of neurologic, orthopedic, oncologic, and cardiovascular imaging.

MRI has long had advantages in leveraging useful contrast mechanisms for visualization of anatomy and pathology. This is well-demonstrated in articles describing visualization of diffusion-weighted imaging data [Doring et al. page 12], spectroscopic imaging of prostate cancer [Scheenen et al. page 16], susceptibility-weighted imaging [Ascencio et al. page 52],

and quantitative myocardial relaxivity mapping [Moon et al. page 104].

However, gone are the days when lengthy examinations producing inconsistent image quality were considered acceptable. In an atmosphere of rising cost and diminishing resources, all imaging is under pressure to demonstrate consistent examination quality, despite increasing use in challenging populations, such as the obese and those with diminished breath-holding capacity. In their article on the New York University-Langone Medical Center experience using Radial VIBE*, Tobias Block et al. show the power of a motion-robust non-Cartesian strategy to obtain free-breathing, artifact-free, volumetric T1-weighted image sets in the body [page 6]. Such paradigms can be applied to improve image quality in patients unable to hold their breath, and to enhance the MRI experience by providing healthier patients with a more comfortable examination with fewer breath-holds. In addition, colleagues at the University Hospital of Lausanne and Northwestern University demonstrate the feasibility of rapid cardiac acquisition using compressed sensing* methods

[page 108 and 117]. Such techniques are shown to produce high-resolution, multiplanar acquisitions in single breath-holds, which can both shorten total examination time and provide comparable or more accurate measurements of left ventricular ejection fraction and stroke volume, compared with conventional methods.

The broad availability of commercial wide-bore systems with high channel counts makes clinical MR imaging a reality in a larger portion of the population. Particularly in the United States, where over 35% of the population is obese [<http://www.cdc.gov/obesity/data/adult.html>], high-quality imaging is now available to more patients than ever, with greater physical comfort. In addition to comfort, turnaround time is also considered an important measure of examination quality, and as a first-line diagnostic modality, MRI must provide rapid, definitive diagnosis in order for appropriate treatment to be rendered in a timely manner.

*WIP, the product is currently under development and is not for sale in the US and other countries. Its future availability cannot be ensured.

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This is exemplified in the article by Kambiz Nael et al., who describe a six-minute comprehensive acute stroke protocol, combining brain structure imaging, functional measures including diffusion- and perfusion-weighted imaging, and MR angiography [page 44]. This ‘one-stop-shop’ approach can facilitate rapid triage of appropriate patients to endovascular management while avoiding unnecessary, and potentially dangerous, delays in diagnosis.

Finally, Mark Griswold et al. and Masahiro Ida address another important element of a comfortable MRI experience, as they discuss simple methods for optimizing frequently-used pulse sequences to reduce acoustic noise [page 30 and 35].

In the following pages, fifteen high-quality articles from a diverse group of authors are presented. These highlight important advances that build on the excellent contrast/visualization

capabilities of MRI, strengthen image quality and robustness, or that improve the patient experience and throughput. Importantly, they show the success that can be realized by bringing innovators from academia and industry together into cooperative teams.

Happy reading, and see you at RSNA!



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