The Spectrum of new hardware and how it is changing clinical management:

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In the field of body MR imaging numerous new hardware developments are recently becoming available in the clinics. Advances in technology include MR systems operating at higher field strengths, hybrid MR scanners, more powerful RF and gradient systems, multi-channel coils with parallel imaging and parallel transmission capabilities, new and faster reconstruction algorithms, improved memory capacities, artefact correction and innovative sequence design and sampling strategies.

These advances clearly display the trend to move from characterizing acute diseases and curative public health strategies to a more personalized, predictive and preventive imaging environment. Functional and quantitative assessment of multiple anatomic areas in conjunct with high spatially and temporally resolved information enables the evaluation and diagnostic work-up of the entire patient i.e. entire biological system especially in the context of chronic diseases instead of being limited to imaging of body parts or target organs. This, in turn will help to understand mechanisms of diseases, to monitor medical therapy, to develop minimally invasive interventions and to change the individual clinical management.

The spectrum of new hardware in body MR imaging has lead to a versatility of clinical applications: functional assessment of bowel disorders and cartilage, quantitative estimation of abdominal fat and lipid content, detection and differential diagnosis in oncology and monitoring anticancer therapy response, evaluation of aging, guidance of medical interventions and cell tracking. Advances in parallel imaging and sampling strategies have rendered ultra-fast imaging possible for body applications including flow-sensitive 4D vascular imaging and real-time MR assessment of abdominal disorders. Hardware innovations will continuously gain a more prominent place in health care systems worldwide to pursue the ultimate medical goal which is the improvement of clinical decision making and patient management.