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Case  
Study



MAGNETOM Aera

Barnes-Jewish West County Hospital's Experience  
with Abdomen Dot Engine

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# Experience with Abdomen Dot Engine

## Barnes-Jewish West County Hospital

Barnes-Jewish West County Hospital is located in Creve Coeur, MO, USA, a suburb of St. Louis, and is aligned with Barnes-Jewish Hospital, which is consistently listed on the honor roll of America's Best Hospitals by *U.S. News & World Report* magazine. Barnes-Jewish Hospital is considered to be a world leader in liver transplantation and the management of end-stage liver and hepatobiliary diseases including hepatocellular cancer and cholangiocarcinoma. Diagnostic imaging such as body MRI, MR angiography

(MRA), MR cholangiopancreatography (MRCP), and MRI of the liver and pancreas may be used in the assessment of hepatobiliary disease. The Barnes-Jewish West County Hospital imaging center is comprised of a large group of Washington University physicians and fellows reading a variety of exams, including MRI. Barnes-Jewish and Barnes-Jewish West County hospitals image patients from the greater St. Louis area and Southern Illinois and Mid-Missouri regions.

### The System

The 70 cm Open Bore MAGNETOM® Aera was the MRI system chosen for the recent addition to the MRI department at Barnes-Jewish West County Hospital, due to the new technology offering Tim® 4G and Dot® for improved workflow and patient throughput.

The MAGNETOM Aera's ultra-short length of 145 cm as well as the Open Bore design may reduce the number of patients declining MRI examinations due to claustrophobia.

Tim 4G technology provides improved signal-to-noise ratio (SNR). The standard system configuration of 48 RF channels and up to 204 coil elements, which can be connected creates an imaging matrix that is 100% more dense than the original Tim imaging matrix. This allows maximum use of coil elements at full fields of view without ever running out of RF channels. Tim 4G also introduces a new set of ultra-high-density coils (e.g., body imaging with the Body 18 coil in conjunction with the Spine 32 coil) to support increased parallel imaging capabilities.

The Dot (Day optimizing throughput) technology helps provide improved diagnostic confidence and image consistency through functionality such as the new AutoAlign and Auto Bolus Detection features of the system. The introduction of exam strategies to adapt to patient condition or clinical question and guidance with images and text can help improve departmental productivity.

### The Outcome

Barnes-Jewish West County Hospital was able to incorporate its clinical standards as a result of Dot technology. Through customization, the Abdomen Dot Engine was able to meet clinical workflow needs of the institution. The facility was able to improve its image consistency and patient throughput in body imaging with the ultimate goal of standardizing body imaging workflow for 30-minute time slots.



## Experience with Abdomen Dot Engine

Two of the most important features of the Abdomen Dot Engine for Barnes-Jewish West County were:

- Consistent liver dynamics (Auto Bolus Detection), which is critically important to diagnostically optimized MRI body images. It has been shown in literature that an optimal arterial phase can provide unique differentiating characteristics of benign, malignant, hypervascular, and hypovascular primary and metastatic liver tumors.<sup>1</sup>
- Robust diffusion to help in the diagnosis of cancer and response evaluation of innovative therapies. Due to the new ultra-lightweight Body 18 coil (Tim 4G coil design with ultra-high-density of coil elements) which can be combined with the Spine 32 and better diffusion sequence (gradient reversal), body diffusion shows improved SNR and image consistency.

A collaborative consultation between the body imaging radiologists and Siemens Clinical Education Specialists helped customize Abdomen Dot Engine. With this approach, the facility was able to improve its image consistency and patient throughput in body imaging by decreasing the complexity of the exam and standardizing body imaging workflow for 30-minute time slots.

Barnes-Jewish West County's clinical standards were discussed and implemented to personalize Dot technology to the needs that would optimize its day. True to its name – Day optimizing throughput – Dot.

## Dot Customization Is Easy

- A core body protocol consisting of sequences that would be acquired on all abdominal examinations was defined.
- For these sequences, Dot allows multiple exam strategies to accommodate a patient's condition to optimize scan time and help acquire better image quality. So these sequences were built to include multiple strategies (e.g., breath-hold protocols, *syngo* BLADE protocols, triggered for non-breath-hold protocols).
- To the core body protocol, patient context decisions (PCDs) were added to further customize their specialized body examinations (e.g., liver pre-transplant, kidney/adrenal, MRCP, hemochromatosis, MultiHance®, Eovist® hepatobiliary imaging, Eovist bile leak imaging, and non-breath-hold/moving patients). With "one" click, PCDs help expand institute-specific predefined tailored sequences that help answer a given clinical question. PCDs help expert-level scanning.

### Reference

- <sup>1</sup> Sharma P, Kalb B, Kitajima HD, Salman KN, Burrow B, Ray GL, Martin DR. Optimization of single injection liver arterial phase gadolinium-enhanced MRI using bolus track real-time imaging. *J Magn Reson Imaging*. 2011;33:110-8.

## Conclusion

With the core body protocol coupled with patient context decisions approach, the facility was able to improve its image consistency, patient throughput in body imaging by decreasing the complexity of the exam, and standardization of body imaging workflow for 30-minute time slots.

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