



Tim Pays You Back

Hot Topic

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Tim Pays You Back

Workflow is a term used very loosely in the medical community in recent years. What does it really mean to improve MRI workflow and what actions must be taken to achieve it? Do you scan more patients per workday by extending hours or cut back to the most essential scans to increase the number of patients in the same amount of time? The choices are not easy.

Siemens' Tim™ (Total imaging matrix) technology helps to address these issues. This MRI technology provides the tools necessary to scan more patients in less time, as well as offering higher diagnostic resolution. It has helped to change MRI forever.

Tim, a revolutionary RF technology, has enabled thousands of Siemens' customers

to experience extreme flexibility, accuracy and speed. With innovative workflow enhancements and applications powered by Tim, you can now achieve more patients per hour, do more sequences per scan and spend less time post processing.

Flexibility — Select Exams, Not Coils

Tim offers the ultimate in coil flexibility with Siemens' proprietary Matrix coil design. From a workflow perspective, this translates into never having to reposition coils on the patient during the examination. In addition, Tim streamlines patient positioning, offers flexibility in chasing disease and yields a lower equipment investment.

Figure A demonstrates how you can create a coil tailored to the clinical need of the patient with Tim.

Figure A.



Combined Head, Neck and Body Matrix coils.



Combined two Body Matrix coils for extended FoV.



Four-vessel MR angiography with large FoV.



Excellent large FoV abdomen.

Accuracy—Local and Total

Tim's unique Matrix coil design provides up to 100% more signal-to-noise (SNR) than standard coils. This means that you can achieve superior "local" resolution for very small structures, such as the inner ear, and realize unparalleled resolution for extended FoV, such as whole abdominal-pelvic imaging.

More than likely, disease does not stop at the end of a coil. With Tim technology, it's easy to cover pathology without repositioning the patient to the coil. Features such as AutoCoil Select and scan@center ensures that even a novice technologist can perform multi-organ exams with ease.

Figure B demonstrates Tim's seamless imaging capabilities. You can scan from a very small FoV all the way up to 205cm FoV without having to reposition coils while maintaining superior SNR.

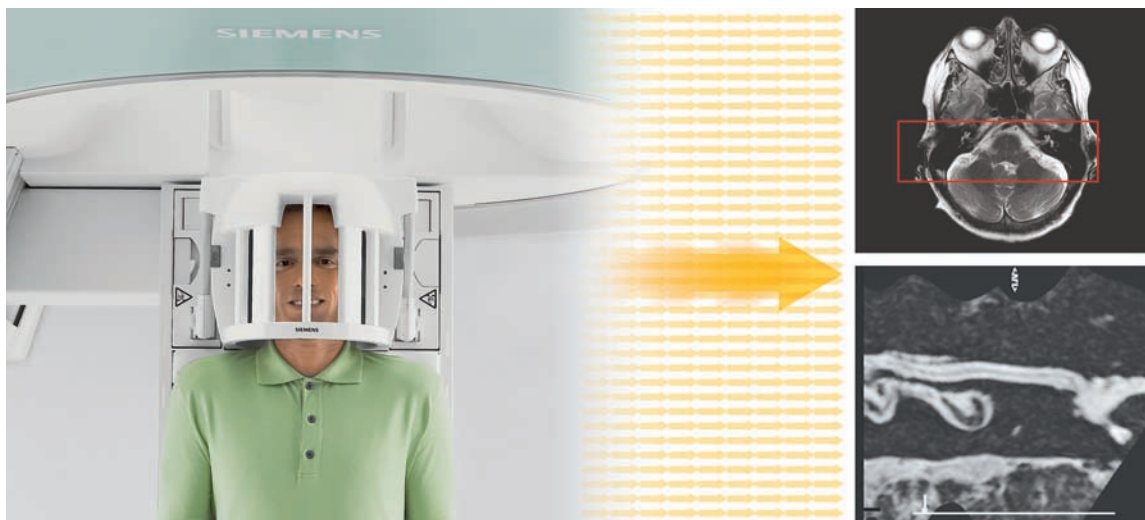


Figure B. Head Matrix coil for highest signal-to-noise and the smallest FoV. Inner ear exam.

Speed — Parallel in All Directions

When sequence parameters are minimized to the fullest, how can you achieve faster scans without affecting image contrast? Parallel imaging techniques have enabled users to scan even faster without compromising resolution or contrast. Only Tim provides total integrated Parallel Acquisition Technique (iPAT) functionality with all multi-channel coils, in all directions, with all contrasts up to the entire 205cm FoV. *syngo*[®] GRAPPA, Siemens' unique parallel acquisition technique, can be utilized throughout the body including the spine and abdomen (Figure C). Furthermore, *syngo*[®] GRAPPA uses a k-space-based reconstruction algorithm that eliminates pre-aliasing artifacts in the chest and abdomen which are common with image-based reconstruction techniques.

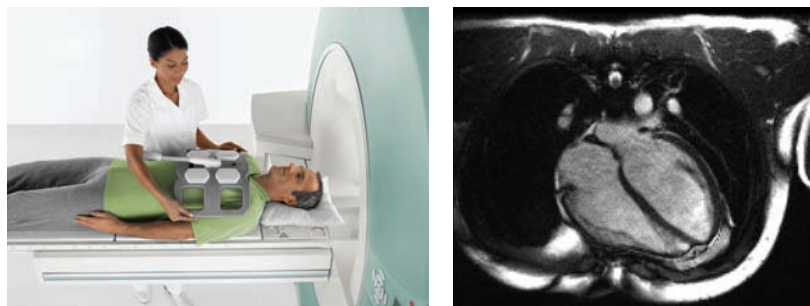


Figure C. Body Matrix coil with high signal-to-noise allows you to push the limits with *syngo*[®] GRAPPA, Siemens' unique parallel acquisition technique.

TrueFISP, iPAT (*syngo*[®] GRAPPA) x3, 4 heartbeats per slice without pre-aliasing artifacts, 1.8 x 1.8 x 7mm resolution with 20 phases, finger pulse gated without ECG leads. Courtesy of Northwestern University Hospital, Chicago.

Workflow at the Scanner

Workflow does not stop with coil positioning or image acquisition techniques. With pressure to do more with less, facilities are maximizing exam times with their current systems but are still finding it difficult to do more patients per day. However, with the right technology, it is possible to scan more patients without sacrificing image quality.

Siemens has been at the forefront of workflow enhancements at and beyond the scanner. Take, for example, AutoCoil Select and AutoCoil Detect. With these innovations, technologists do not have to worry about checking to see if the coils are turned on. The system does this automatically and ultimately saves time by not having to rescan a patient if the coils are accidentally turned off.

Figure D demonstrates many of Siemens' unique workflow features which can increase throughput.

Siemens' Unique Workflow Features					
	Workflow Feature	What is it?	Results	Benefit	Goal
Technologist	Scan Assistant	Automatically shows parameter constraints and offers possible solutions.	↓ET	Increased Patient Throughput	Increased Revenue
	Scan@Center	Enables maximum image quality by automatically moving table into magnet isocenter.	↑IQ		
	Intelligent Coil Control	Intelligent SW to detect coil position and efficient handling of coils.	↓RS		
	AutoCoil Detect	System detection of coil elements within scanned field of view.	↑IQ		
	AutoCoil Select	Automatic, dynamic or interactive selection of coils within the field of view.	↓RS		
	Tim Assistant	System recommends PAT factors for the selected applications.	↑IQ		
	PhoenixZIP	File contains data of all protocols of the MR examination.	↑RP		
Radiologist	Inline Technology	Automated processing without user interaction.	↓ET		
	Composing	Composing of two or more data sets of different table positions of the same patient.	↓ET		
	Diffusion	Real-time calculation of trace-weighted images and ADC.	↓ET		
	Ventricular Function	Volumetric evaluations of cardiac cine data right after image reconstruction.	↓ET		
	MIP	MIP of angiograms.	↓ET		
	Subtraction	Subtraction of two data sets.	↓ET		
	DynaVIBE	Motion correction of multi-phase VIBE data sets for increased conspicuity of small lesions.	↓ET		
	Wash-in Wash-out	Quantitative evaluation and fast analysis of data with colorized maps.	↓ET		
Radiology Administrator	ChorusMR	Solution for setting up MRI examinations at the Radiology Information System (RIS).	↓ET		
	Inline Billing MPPS	Accounting information is exchanged between the RIS and the MR modality.	↓ET		
	Protocol Distribution	Web-based technique in which the RIS acts as central MR protocol repository.	↑IQ		
	Protocol Planning	RIS planning tool to schedule and protocol MR exams.	↑IQ		
	Inline Follow Up	PhoenixZIP can be used at the RIS to schedule follow-up exams.	↑RP		
	Expert-i	Interactive remote assistance during exam.	↑IQ		

Figure D. Siemens' unique workflow features increase throughput and revenue.

Results key:

- ↓ET Decreased Exam Time
- ↓RS Decreased Repeat Scans
- ↑IQ Increased Image Quality
- ↑RP Increased Reproducibility

Tim Proves It.

The following case studies highlight facilities that have enjoyed significant increases in throughput by installing Tim-based MAGNETOM Systems.

Case #1 — Large Diagnostic Imaging Center

Overview: Zwanger and Piseri Imaging in Plainview, New York, replaced three competitive systems (two 1.5T and one 0.3T systems) with two Tim systems (one 1.5T Open Bore MAGNETOM Espree and one 3T MAGNETOM Trio). See Figure E.

Results*:

- Increased throughput from 35 patients per day to 50 patients per day
- Reduced time slots to 15 minutes
- Saved on service contracts, technologist salaries and square footage

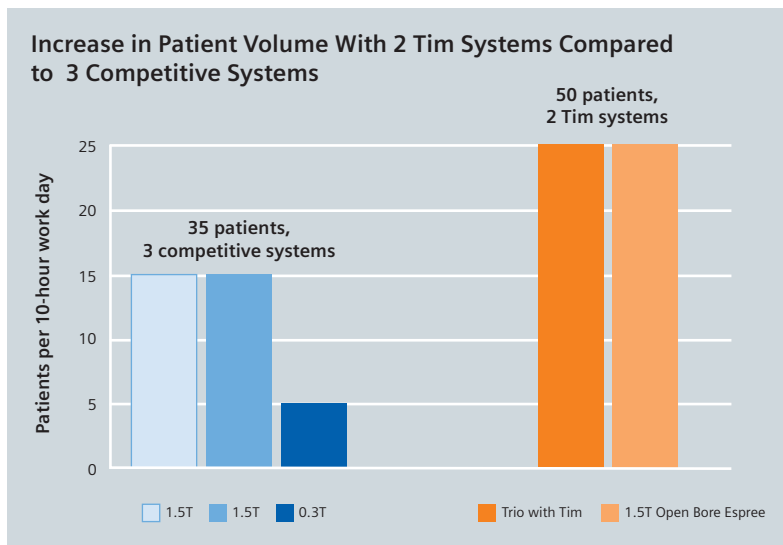


Figure E. Zwanger and Piseri Imaging in Plainview, New York, increased throughput from 35 patients per day to 50 patients per day by incorporating Tim into daily practice.

Case #2 — University Hospital

Overview: The University of Utah replaced two competitive systems with two 1.5T Tim systems (one MAGNETOM Avanto and one MAGNETOM Espree). See Figure F.

Results*:

- Routine exam times decreased
 - Whole spines with contrast: exam time was reduced by up to 50%
 - Whole spines represented 30% of spine work
 - Brain with contrast: exam time was reduced by up to 30%
- Complexity of exams increased and breadth of applications expanded
 - ceMRA carotid studies now performed—not done previously due to unreliability of bolus on prior system
 - Cardiac studies increased from one per week to 10 per week
 - Pulmonary studies initiated—not done on competitive system

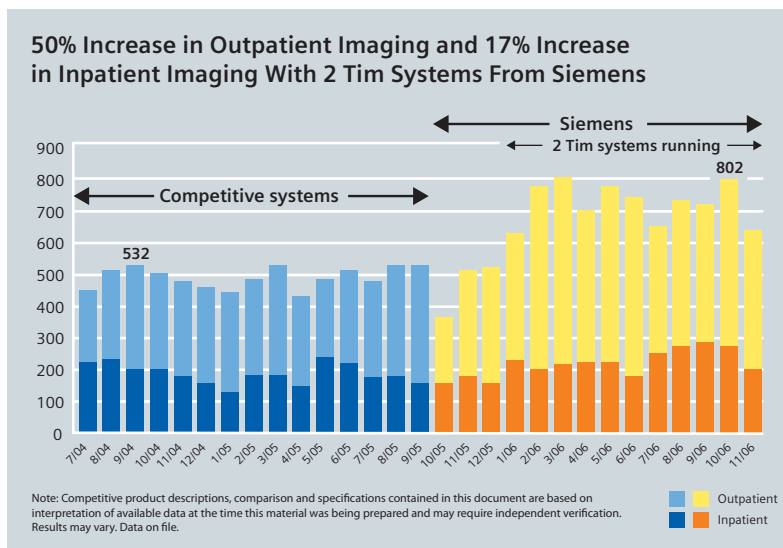


Figure F. The University of Utah boosted throughput by installing the MAGNETOM Espree and MAGNETOM Avanto Tim system.

* Data on file. Results may vary.

Tim Pays Back with Increased Referrals.

Case #3 — Diagnostic Imaging Center

Overview: Turville Bay MRI in Madison, Wisconsin, replaced their 0.3T vertical-field open system with a MAGNETOM Espree. See Figure G.

Results*:

- Four times increase in patient throughput
- Expansion into new patient referrals

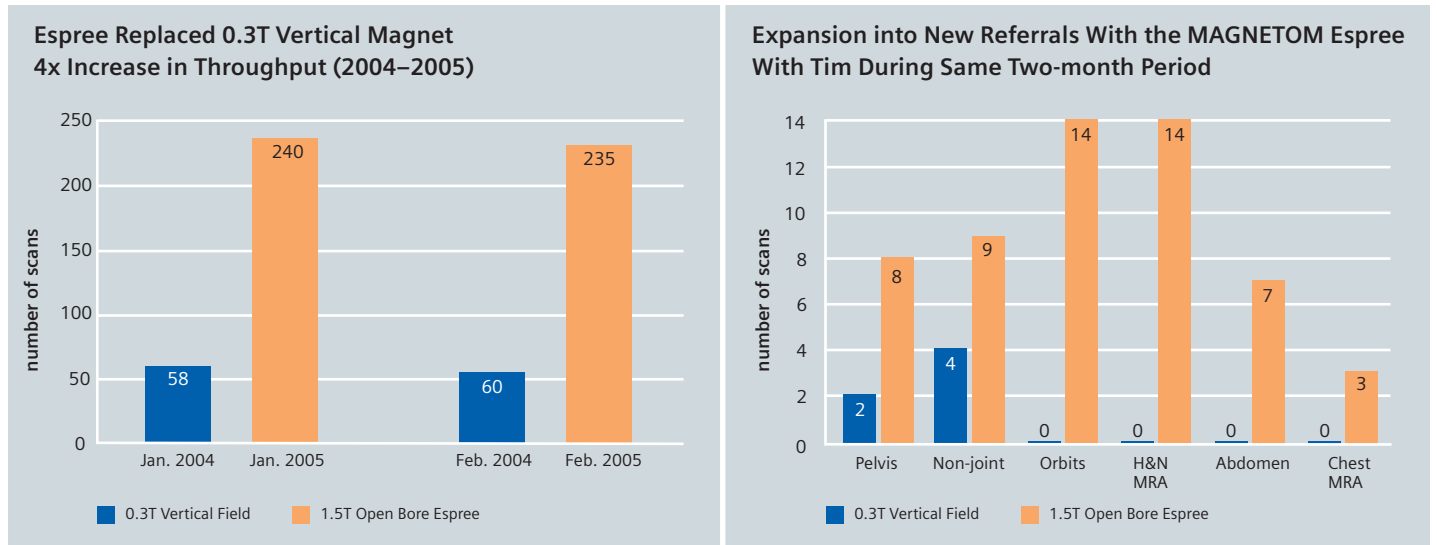


Figure G. Turville Bay MRI in Madison, WI experienced an increase in throughput and patient referrals due to MAGNETOM Espree with Tim. Courtesy of Turville Bay MRI and Radiation Oncology.

Conclusion

Tim enables flexibility, accuracy and speed. Combined with innovative workflow, Tim provides faster scans and improved patient throughput.

* Data on file. Results may vary.

Tim Family of Systems



MAGNETOM ESSENZA
The most affordable, all-new 1.5T MRI*



MAGNETOM Avanto
MRI Excellence in 1.5T



MAGNETOM Espree
The first Open Bore 1.5T MRI



MAGNETOM Verio
The most exciting equation in MRI — 3T + 70cm + Tim



MAGNETOM Trio, a Tim System
Unmatched 3T performance

* Data on file. Results may vary.

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