POST-RSNA RECAP

The Drive for Efficiency in Imaging

While efficiency has always been important in health care, the changes we see in today's environment are requiring the medical community to be even more diligent. Many are starting to recognize that the right equipment can make important differences. At this year's RSNA, Toshiba showcased how its systems are helping health care professionals meet the demands for efficiency without sacrificing quality.

Magnetic Resonance

The patient-focused features of the Vantage Titan™ improve exam efficiency and accuracy while mitigating issues around imaging claustrophobic and bariatric patients. The Vantage Titan features a large 71-cm aperture open bore and offers the industry's largest clinical field-of-view (55×55×50 cm). The bore's diameter enables technologists to scan patients with greater ease and reduces the feeling of claustrophobia. Toshiba's patented PianissimoTM technology, which reduces acoustic noise by as much as 90 percent, is also increasing the comfort level of patients during exams. Improving comfort level is critical because it often reduces the need for re-scans, thus improving efficiency.

St. Anthony Hospital in Gig Harbor, Wash., has experienced these benefits first hand. "The Toshiba Titan has been the workhorse MR system for us and is able to accommodate the wide variety of MR exams we perform each day," said Gary Leslie, MRI technologist at St. Anthony. "We are imaging multiple patients a day and have received direct patient feedback that the system is quieter and feels less claustrophobic than other MR systems. This has helped us to greatly improve exam efficiency and department throughput."

Additionally, the system's Atlas integrated coils allow physicians to perform multiple exams without repositioning the patient and also enable feet-first imaging for feet-to-shoulder exams. This means a more comfortable exam experience and results in enhanced workflow and technologist productivity. Also, Toshiba's SPEEDER parallel imaging allows for increased acquisition speed and reduced examination times.

X-ray

Today's emergency departments are challenged to provide rapid, accurate diagnoses for a variety of patient conditions when time is of the essence. Toshiba's RADREXTM-i digital radiographic system is designed to provide the features emergency departments require to offer the highest level of patient care.

The comprehensive RADREX-i offers a 600-lb. table weight limit, 600 kHU X-ray tube and an 80-kilowatt generator, allowing hospitals to image a variety of patients, including bariatric. The X-ray system enhances workflow with the RexView, a color LCD screen located on the overhead tube crane (OTC). Since the image appears on the OTC, technologists have immediate access to review the image and determine if they have what is needed for diagnosis, ultimately reducing exam time and increasing the chance of a positive patient outcome.

The RADREX-i's automated features also save time in emergency settings by automating exam selec-

tion and X-ray positioning. These features include:
• Auto-tracking to eliminate the need to manually position the X-ray tube detector by providing synchronization for table and wall-stand tracking
• Auto-collimation to save crucial time for the patient and technologist by automatically selecting the correct collimation size for the patient's body part
• Auto-program to eliminate the need for the technologist to manually select the program on the generator by automatically selecting the correct program
• Auto-center stop to provide visual guidance for fast, simple detector centering

St. Luke's Community Hospital in Ronan, Mont. uses the RADREX-i in its emergency department.

"When treating emergency patients, acting quickly is critical," said Steve Sivak, radiology manager, St. Luke Community Hospital. "The advanced features of the RADREX-i help us streamline workflow and accelerate throughput, providing a tremendous benefit to patients when time is limited."

Ultrasound
Many hand-carried ultrasound systems offer better access to patients when space is compromised, but cannot provide all of the advanced radiology capabilities required to perform exams in today's demanding ultrasound environment. Toshiba's new works-in-progress ViamoTM ultrasound system meets the needs of today's hospitals by combining portability with high-end radiology features. Viamo is the industry's no compromise ultrasound system with advanced radiology capabilities, previously unavailable on hand carried systems.

The Viamo combines the portability of a laptop system with advanced radiology features to deliver outstanding image quality, enhance diagnostic confidence and improve ease-of-use. Developed from a radiology foundation, Toshiba's Viamo provides the confidence to image patients at bedside, which generally require larger, more expensive cart-based systems. When an immobile patient needs a high-end ultrasound exam, the portable Viamo laptop ultrasound is brought to the patient to improve the patient's comfort without compromising exam quality.

The new Toshiba Viamo laptop ultrasound system offers:
• Best-in-class imaging capabilities in a laptop size, making it ideal for high-end radiology, vascular, emergency and OB/GYN exams, even at bedside. For example, Viamo is beneficial during liver transplants when medical personnel must image the anastomoses to assess blood flow through the vessels.
• Excellent image quality and color flow comparable to larger, more expensive cart-based systems.
• Ease-of-use with a simple touch-screen interface that is programmable in panel or tablet modes.
• Ability to interchange Toshiba transducers while using the Viamo's transportation pole, thus improving productivity and flexibility, while saving health care costs by reducing the need to purchase multiple transducers. This unique feature improves productivity and saves money for current customers by using their existing Toshiba transducers on the Viamo. Additionally, new customers are able to use Viamo transducers with other Toshiba ultrasound systems they may purchase in the future.

Computed Tomography
Overall, Toshiba's Aquilion® line continues to be focused on exam efficiency and the company has added several new features to help the medical community. The Aquilion line comes with a host of SURETechnologies that automate parts of the exam, which not only provides efficiencies, but also safer exams. For example, Variable Helical Pitch (vHP) ensures greater workflow efficiency by enabling physicians to complete an exam of more than one anatomical region consecutively – i.e. without stopping to alter the helical pitch of the exam. Toshiba's CT line also features items like the iStation, a screen on the gantry that provides automatic exam feedback to the technologist, and a table with a 660-lb. weight limit that also lowers within inches of the ground, enabling patients to sit on the table more easily.

While the entire Aquilion line boasts efficiencies, Toshiba's Aquilion® ONE is designed for today's health care environment because it can streamline workflow by providing a more accurate, complete and timely diagnosis with one exam. The Aquilion ONE can image a patient in 0.35 seconds, whereas conventional helical CTs can take four or five seconds, approximately 10 to 12 times slower. Beyond

its fast acquisition time, the Aquilion ONE can replace several tests with one exam, eliminating the time, cost and staff required to perform additional unnecessary exams. It also allows physicians to treat at-risk patients immediately and send healthy patients home without additional testing and staff support.

Beyond Comfort: The Importance of Patient-Friendly Features

When patients have to have any diagnostic imaging exam, they are understandably nervous. Often times the anxiety they feel comes from thinking that a particular exam is going to be difficult, time consuming or uncomfortable. Toshiba has developed its technology with patients in mind and incorporates many patient friendly features into its systems. At this year's RSNA, Toshiba highlighted its patient friendly features.

Magnetic Resonance

For patients undergoing an MR exam, discomfort from claustrophobia and the loud noise of the magnet are among the highest complaints. To address this, Toshiba developed the Vantage TitanTM MR, which features a large 71-cm aperture and open bore, offering the industry's largest clinical field-of-view (55×55×50 cm). The bore's diameter reduces the feeling of claustrophobia. Titan's ultra short, open bore was designed to increase comfort and improve the imaging of all patients, especially those who are claustrophobic and/or bariatric. The open bore's larger diameter enables facilities to scan bariatric patients with greater ease and provides patients with a greater feeling of openness to reduce claustrophobia.

Toshiba's PianissimoTM technology reduces noise by up to 90 percent, making Toshiba's MR systems the quietest available. Since the patient experiences lower noise levels with Pianissimo, patients stay more relaxed during exams and fewer motion artifacts are acquired, which helps improve image quality. Useful for imaging pediatric patients, Pianissimo helps technologists image patients more successfully and reduces repeat exams.

With all of the concern surrounding gadolinium, Toshiba's proprietary contrast-free MRA techniques enable safer MRA imaging of patients with known renal compromise. These techniques include Fresh Blood Imaging (FBI) for evaluating peripheral vascular diseases of the lower legs and extremities; Contrast-free Improved Angiography (CIA) for easier visualization of smaller vessels; Time-Spatial Labeling Inversion Pulse (Time-SLIP) for evaluating hemodynamic, functional assessments, and visualization of vascular structures; and Time Space Angiography (TSA) to create non-contrast time-resolved imaging with high temporal resolution. Contrast-free techniques are safer for patients with renal conditions and require less set-up time, so the overall MR exam is completed faster, without compromising image quality.

Computed Tomography

The Aquilion® ONE was specifically developed with patients in mind. Not only is the comprehensive exam much faster than traditional CT exams – 0.35 seconds versus conventional helical CTs that can take approximately 10 to 12 times longer – but also radiation exposure is dramatically reduced because of volume acquisition. These patient benefits are especially important during neuro and pediatric procedures.

When a patient comes to a hospital's emergency department exhibiting stroke symptoms, it can take hours to diagnose and treat the patient when time is of the essence. Toshiba's Aquilion ONE dynamic volume CT system has the ability to improve the quality of life for patients with neurological symptoms, especially related to stroke, by reducing diagnosis time to minutes. In fact, the system allows physicians to reduce diagnosis time for life-threatening conditions, such as a stroke, from hours or days to minutes. Unlike any other CT system available, the Aquilion ONE covers up to 16

cm of anatomy using 320 ultra high resolution 0.5 mm detector elements to image an entire organ, including the brain, in a single rotation. It can show the organ's dynamic blood flow and real-time function. The ability to see dynamic function, such as blood flowing through the brain, is critical for stroke patients in emergency settings and enables rapid and accurate diagnosis when time is critical.

Another reason to select dynamic volume CT is for its pediatric applications. The Aquilion ONE can significantly lower patient radiation dose exposure and decrease the sedation needed for exams. Traditionally, when children are imaged using multi-detector CT, sedation is required to keep the patient still long enough to obtain a clear diagnostic image. The Aquilion ONE's fast exam time means less patient sedation is required. The system also features Toshiba's SUREExposure™ Pediatric software, which automatically takes inputs on the size and age of each patient and tailors radiation dose to achieve the best and safest image quality for each exam. The software uses protocols selected based on the patient's age, size and type of exam to ensure patients receive only the radiation required to obtain a clear diagnostic image. SUREExposure Pediatric software comes standard on all Aquilion products.

X-ray Vascular

CT is not the only modality in which radiation is a concern. Toshiba's Infinix-i product line incorporates features that help to reduce exposure. For example, the systems come with fluoro dose level settings and fluoro pulse rate settings. Toshiba offers the industry's widest range of pulse rates, which means that physicians have the ability to reduce flyoro pulse rate and fluoro dose level in an exam, providing two quick methods of reducing radiation exposure to the patient. Additionally, Toshiba's lateral plane variable isocenter on its biplane systems saves time and exposure. During biplane positioning, the user will fluoro frontal plane and adjust table panning to center the part of interest. Next, they will fluoro the lateral plane and adjust lateral isocenter to match the frontal set-up. No additional fluoro is needed. Not only does this cut down on fluoro exposure, but it also speeds the exam time, reducing the risk to the patient.

Infinix-i systems also provide the greatest anatomical coverage and patient access in the industry, providing more efficient and safer patient care. Greater anatomical coverage means that they system moves around the patient, rather than moving the patient. Moving the patient can introduce greater risk.

The Infinix-i's tables also are more patient friendly. Not only are the systems' table weights the highest in the industry at 550 lbs., but also the tables include thicker pads complete with Tempur-Pedic® technology, making extended procedures more comfortable. Also, the new the CAT-880B hybrid catheterization table introduced at RSNA offers the lowest table top height of any catheterization table in the industry. Toshiba has even introduced accessories that expand the width of the system tables to accommodate larger patients and make the exams more comfortable.

Ultrasound

The move toward portability in ultrasound is helping physicians deliver more comfortable patient care. The ability to bring a diagnostic imaging system to the patient can often mean that someone already in discomfort does not have to be moved in order to be scanned.

In addition to the Viamo handheld system, Toshiba has continued its focus on portability by introducing the Aplio MX. Thirty percent lighter than traditional cart-based systems, the Aplio MX enables hospitals to complete advanced ultrasound exams, usually performed with larger systems, on a more portable system without sacrificing quality. Furthermore, it enables medical staff to easily bring the system directly to the point-of-care. For example, if someone is on a gurney and should not be moved, medical professionals can easily transport the MX to the patient's location and get a high quality exam.

Toshiba's Aplio MX ultrasound system includes:

- 4D imaging to produce high resolution renderings and arbitrary volume cuts in real-time or offline allowing virtual reconstruction in formats similar to CT and MRI.
- Differential Tissue Harmonic Imaging for the better imaging of difficult-to-image patients, like bariatric, without sacrificing resolution to give superior border and tissue definition.
- ApliPure to enhance both image clarity and detail

definition with real-time compounding technology to simultaneously perform spatial and frequency compounding during transmitting and receiving.
• Advanced Dynamic Flow to provide color Doppler imaging at an unprecedented level and show flow with directional information for even the smallest vessels.
• Precision Imaging to provide more detailed ultrasound images by capturing information from multiple lines to improve definition of the structure and minimizing noise and clutter.
• Elastography to enable a non-invasive medical imaging technique that evaluates tumors based on their stiffness (elasticity) compared to normal tissue.
• MicroPure to help physicians detect micro-calcifications using ultrasound, an imaging technique that is less strenuous on the technician and the patient than mammography, the current gold standard.

AHRA and Toshiba Announce 2009 Putting Patients First Grant Recipients

At this year's RSNA, the AHRA: The Association for Medical Imaging Management and Toshiba announced the six recipients of the second annual Putting Patients First grant program.

This year's Putting Patients First grant program was expanded to include imaging centers and three additional grants specifically for pediatric programs. The six recipients were selected by the AHRA selection committee to receive up to $7,500 grants to fund programs, trainings or seminars aimed at improving patient care and safety in diagnostic imaging.

In its second year, this program has expanded its scope to include improving the imaging of children. Children have special imaging needs – exposure to radiation and contrast are concerns within the industry, as is ensuring that children are well prepared for the imaging experience. Putting Patients First will help facilities address these very specific needs.

"Grant programs like Putting Patients First are critical given today's health care environment and the pressures hospitals face due to limited resources and other financial challenges," said Debra A. Lopez, AHRA president, CRA, FAHRA. "This year's winning programs demonstrated quality and innovation in patient care. They will make significant improvements to patient care and better the imaging experience for physicians and patients, alike."

The programs funded by the AHRA/Toshiba Patient First grants include:

Children's Healthcare of Atlanta at Egleston – Use of Bismuth Shields in All CT Exams
Several recent publications report radiation dose reduction benefits when using bismuth shielding for pediatric patients undergoing multidectector CT. Therefore, Children's Healthcare of Atlanta at Egleston will implement the use of bismuth shields in all patients undergoing CT examinations. Implementation of this shielding program will entail staff training, purchase of bismuth breast and thyroid shields, ongoing review of images, development of resident and parental educational programs, and a cost analysis.

Community Health Network – Pediatric CT Imaging Simulation Program
By enabling pediatric patients to better understand the CT imaging process, radiation dose will effectively be reduced, patient comfort will be improved and the overall imaging experience will be safer. Therefore, Community Health Network will create an Internet-based simulation program to educate pediatric patients and their caregivers about the diagnostic imaging process (focused on CT). By incorporating audio, avatars and animation through a user-friendly computer program, patients will know what to expect of the imaging process and be more comfortable and compliant during the procedure.

Memorial Hermann Outpatient Imaging Division – Improved Process Program

Memorial Hermann's goal is to emphasize the importance of keeping radiation dose during CT procedures as low as reasonably achievable for pediatric patients, while still maintaining good image quality. It also recognizes the need for more education for the technologists and pediatricians on pediatric radiation safety. Therefore, Memorial Hermann will implement the Improvement Process Program to: 1) document the dose electronically PACs; 2) scan once - multiphase scanning is usually not necessary in children; 3) reduce or "child-size" the amount of radiation used; 4) audit and evaluate image quality monthly; and 5) provide physician and technologist continued education.

Highline Medical Center – Improvement Project for Scheduling Inpatients for Imaging Exams

One of Highline Medical Center's goals is to provide a patient-centered environment that personalizes, humanizes and demystifies patient care. Therefore, Highland Medical Center is undertaking an improvement project to develop, implement and spread a process for scheduling inpatients for imaging exams to accomplish safer patient care through: 1) better communication among the staff caring for the patient; 2) increasing involvement of the patient in his/her own care; 3) better coordination between services for tests and treatments leading to streamlined clinical pathway; 4) eliminating delayed/missed or incorrect imaging exams; 5) improving patient flow to potentially decrease overall length of stay; and 6) having imaging techs rounding on patients prior to high risk, invasive or advanced imaging procedures.

Shields Health Care – Understanding and Reducing Patient Anxiety

Shields Health Care wants to engage the patient in a common language that educates and reduces patient anxiety. Therefore, Shields Health Care will develop multi-lingual web-based tools as well as professional staff training. Phase one of the program will be to research causes and develop solutions; phase two will be to implement and cross train professionals and technical staff; and phase three will be dedicated to reflection on lessons learned and measuring program effectiveness and outcomes.

St. Patrick Hospital – Interactive Utility to Improve the Imaging Process

Inaccurate or inappropriate exam orders contribute to increased costs to patients, staff and facilities in terms of dose, money and time. Therefore, St. Patrick Hospital will create on its intranet Web site an interactive utility that is readily accessible to all staff to provide guidance regarding appropriate imaging studies and help facilitate clear exam orders to maximize the value of imaging studies. Once the program is developed for intranet users, St. Patrick Hospital will provide a condensed version of the utility on its hospital Web site with more links to helpful information in order to improve patient understanding of the process. This version also will be a tool used by clinicians and staff when discussing exam specifics with patients.

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