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IMAGING MANAGEMENT REPORTING FROM RSNA 2010

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Honorary RSNA Membership

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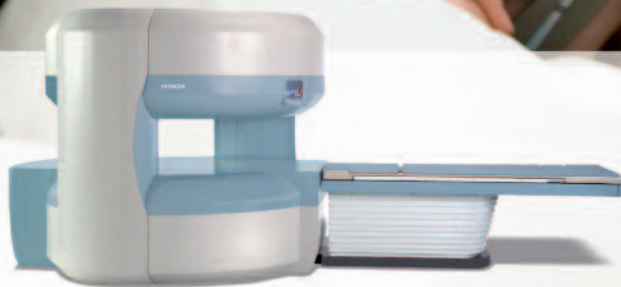
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IMAGING MANAGEMENT @ RSNA 2010

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EMC Consulting Group
Rue de la Loi 28/ 7
B-1040 Brussels, Belgium
T: +32/ 2/ 286 8500
F: +32/ 2/ 286 8508



Publisher and CEO
Christian Marolt
c.m@imagingmanagement.org



Managing Editor
Dervla Gleeson
editorial@imagingmanagement.org



International Editor
Edward Susman
ed@imagingmanagement.org



Editor
Lee Campbell
lc@emcconsulting.eu



Editor
Natalia Marczevska
nm@emcconsulting.eu



Communications Director
Iphigenia Papaioanou
i@imagingmanagement.org



Global Communications
Dr. Don I. Idrees
d.idrees.cd@imagingmanagement.org

Art Directors
Luca De Battista
design2@emcconsulting.eu

Aleksander Bugge
design1@emcconsulting.eu

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RSNA IN PHOTOS

IMAGING Management Editor-in-Chief Prof. Iain McCall Honored by RSNA



Iain McCall, M.D., D.M.R.D., F.R.C.R., Editor-in-Chief of IMAGING Management since 2006, has been recognised as a leader in medical imaging by the RSNA during this year's congress. The RSNA state that "...Prof McCall is the quintessential radiology educator. His studies of spinal degeneration and pain have informed countless radiologists across the globe". Dr. Hedvig Hricak, RSNA 2010's President affirms "Professor McCall exemplifies the best that our field has to offer. His dedication and his generous efforts to reach out to transitional countries are inspiring." Prof. McCall says that "It is a very great honor for me to be awarded RSNA honorary membership."

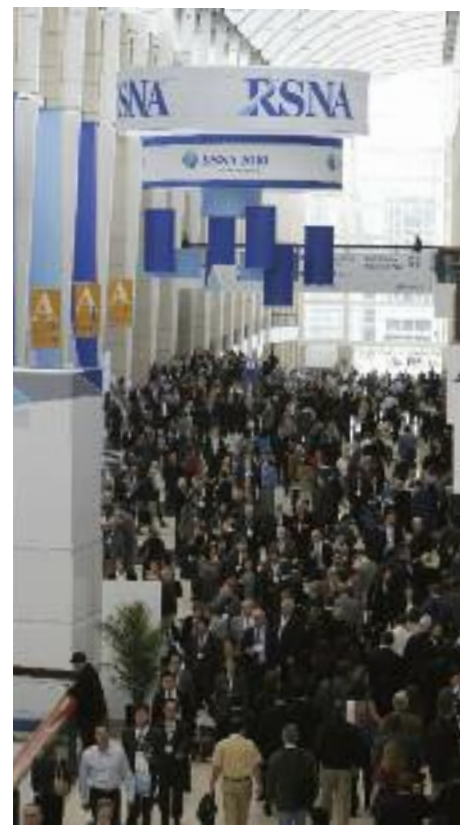
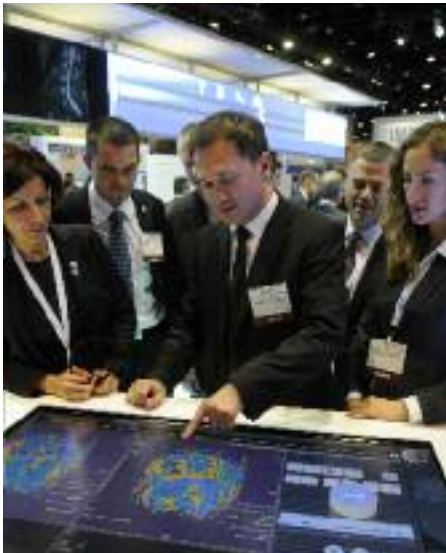




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RSNA 2010 ROUND-UP

IMAGING Management Top Session Picks

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I. USE AND OVERUSE OF EXAMS

- » **Emergency Departments See Substantial Increase in CT Exams**

A new study reports that the use of computed tomography (CT) in U.S. emergency departments is growing exponentially. If the growth trend continues, by 2011, nearly 20 percent of all emergency department (ED) visits may involve a CT exam. The results of this study were presented today at the annual

meeting of the Radiological Society of North America (RSNA) and published online and in the journal *Radiology*.

"It is not surprising that CT utilisation has increased," said lead researcher David B. Larson, M.D., M.B.A., director of quality improvement in the department of radiology at Cincinnati Children's Hospital Medical Centre in Ohio. "What's surprising is the sustained high rate of that growth. However, recent developments, such as increased awareness of cost, radiation concerns, national healthcare reform legislation and the economic recession, are likely to inhibit further growth."

Dr. Larson's research team used data collected by the National Hospital Ambulatory Medical Care Survey from 1995 through 2007 to identify nationwide trends associated with CT use in the ED. The researchers performed statistical analysis on a mean of 30,044 ED visits from each year over the 13-year period to estimate overall usage of CT in the ED.

"We have seen a remarkable growth in CT utilisation, not only in the number of ED visits that involve CT imaging but in the percentage of patients walking into the ED that receive a CT," Dr. Larson said.

According to the analysis, the number of ED visits that included a CT exam increased from 2.7 million in 1995 to 16.2 million in 2007, a 5.9-fold increase and an average growth rate of 16 percent per year. The percentage of ED visits involving a CT exam rose from 2.8 percent in 1995 to 13.9 percent in 2007.

"CT is a wonderful technique that is widely available," Dr. Larson said. "Over the 13 years in our study, image resolution improved significantly, making CT a great tool to look for kidney stones, appendicitis and coronary artery disease."

For much of the 13-year period studied, headache was the complaint most commonly associated with a CT exam in the ED. But by 2007, headache was surpassed by abdominal

pain as the complaint most often associated with CT imaging. In 2007, patients with abdominal pain represented 12.8 percent of all ED visits involving CT.

CT exams to investigate abdominal pain have a higher radiation dose than CT exams used to determine the cause of a headache. The study found that, overall, the use of CT for complaints that are typically related to exams with a higher radiation dose grew faster than those typically related to exams with a lower radiation dose. This suggests that the radiation dose associated with CT in the ED may be growing at a faster rate than the growth in the overall use of CT.

» **MRI May Help Determine Time of Stroke Onset**

Magnetic resonance imaging (MRI) of the brain could expand the number of stroke patients eligible for a potentially life-saving treatment, according to a new study, published online and in the December issue of the journal *Radiology*.

Some patients who suffer an acute ischaemic stroke — in which a blood clot or other obstruction blocks blood flow in the brain — can be treated with a drug called tissue plasminogen activator, or tPA, that dissolves the clot and restores blood flow. However, the clot-busting drug can only be administered within four and a half hours of the onset of a stroke; when given beyond that window of time, the drug can cause bleeding in the brain.

According to the American Stroke Association, stroke is the third leading cause of death in the United States behind diseases of the heart and cancer. Approximately 795,000 Americans suffer a new or recurrent stroke each year.

"As many as a quarter of all stroke patients cannot be given tPA because they wake up with

A healthcare professional, likely a nurse or technician, is shown in profile, wearing blue scrubs and a lanyard with an ID badge. She is looking down at a patient who is lying down. The background is a clinical setting with medical equipment and bright lighting. The text "IMAGING 2.0" is overlaid in large white letters across the center of the image.

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stroke symptoms or are unable to tell their doctor when their stroke began," said lead researcher Catherine Oppenheim, M.D., Ph.D., professor of radiology at Université Paris Descartes in France. In the study, Dr. Oppenheim and her team of researchers reviewed data from consecutive patients with acute ischemic stroke treated at Sainte-Anne Hospital in Paris between May 2006 and October 2008. The time of stroke onset was well defined in all patients and each underwent MRI within 12 hours.

The 130 patients in the study included 77 men and 53 women (mean age 64.7). Of those, 63 patients underwent MRI within three hours of stroke onset and 67 were imaged between three and 12 hours after stroke onset. The radiologists analysed different types of MRI data on the patients, including fluid-attenuated inversion recovery (FLAIR), diffusion-weighted imaging (DWI) and apparent diffusion coefficient (ADC) ratios.

Using the MRI data alone, the radiologists were able to predict with greater than 90 percent accuracy which patients had experienced stroke symptoms for longer than three hours. "When the time of stroke onset is unknown, MRI could help identify patients who are highly likely to be within the three-hour time window when tPA is proven effective and approved for use," Dr. Oppenheim said. According to Dr. Oppenheim, using MRI to determine the duration of a stroke would change the way stroke is managed in the emergency setting.

» Combined Imaging Technologies May Better Identify Cancerous Breast Lesions

By combining optical and x-ray imaging, radiologists may be better able to distinguish cancer from benign lesions in the breast, according to a new study published in the online edition and January issue of *Radiology*. Researchers at Martinos Center for Biomedical Imaging at Massachusetts General Hospital in Boston helped develop a combined optical/x-ray imaging system capable of obtaining both structural and functional information of the breast.

The two technologies used were digital

breast tomosynthesis (DBT), a three-dimensional application of digital mammography, and diffuse optical tomography (DOT), which measures levels of hemoglobin concentration, oxygen saturation and other cellular characteristics, based on how light from a near-infrared laser is absorbed and scattered within tissue. "By co-registering optical and x-ray data, radiologists are able to map suspicious findings and analyse the functional characteristics of those areas," said lead researcher Qianqian Fang, Ph.D., a radiology instructor at Harvard Medical School.

"In the study, oxygen saturation levels were significantly lower in cysts compared to those in malignant and solid benign lesions and glandular breast tissue."

In the study, combined DBT and DOT was performed on 189 breasts from 125 women with an average age of 56 years. To perform the procedure, an optical source and detector probes were attached to a DBT unit and, with the breast compressed, optical data was acquired. The optical probes were then removed without altering the breast compression and a DBT scan was performed.

"We are very excited about adding optical imaging to DBT, because it is low-cost, safe, noninvasive and fast," Dr. Fang said.

Of the 189 imaging studies, 138 were negative, and 51 showed evidence of lesions. As determined by breast biopsy, 26 lesions of the 51 lesions were malignant, and 25 were benign. In the 26 malignant tumors, total hemoglobin concentration (HbT) was significantly greater than in the normal glandular tissue of the same breast. Solid benign lesions and cysts had significantly lower HbT contrast compared to the malignant lesions.

In the study, oxygen saturation levels were significantly lower in cysts compared to those in malignant and solid benign lesions and glandular tissue.

II. DESIGN OF IMAGING DEPARTMENTS

» Imaging Facility Design in an Age of Diminishing Resources

The learning objectives of this course were to discuss making educated decisions about newly constructed or renovated imaging facilities and to understand their impact on both first-costs and life-cycle costs of the facility. It is vital to recognise key design elements in the built environment that support MR imaging safety and support efficient staffing.

Dr Ronald Arenson, an expert in radiology informatics, workforce issues and the effect of managed care on radiology gave a presentation on *New Hospital Construction – Architecture and Management of Design* in which he used examples from his involvement in the design of the University of California, San Francisco (UCSF) Medical Centre at Mission Bay, due to open in 2014. Dr Arenson is chair and the Alexander R. Margulis Distinguished Professor of Radiology at the UCSF and a member of the RSNA Board of Directors.

According to Dr Arenson, healthcare delivery in the U.S. will change significantly so it necessary to prepare for regular equipment change as technology advances. This is why it is important to be wise about the use of space when designing new radiology departments, as the space available will not change, but the equipment will. Ideally different areas should be separated by specialty but this is not always possible. There are nevertheless numerous important factors to consider such as the number of rooms needed, what procedures are expected, the length of each procedure and variation. Queuing theory also plays a big role as it is important in order to maximise utilisation of all rooms. The workflow of a radiology department is very important, which is why it is necessary to consider the travel routes and times of staff and patients, which influences the design of the waiting areas and dressing rooms. In general, the more open space in the design the better as this helps the flow of a department, however, there are many competing interests so rooms need to be designed in a way that can be multipurpose. Safety is of course the most important factor so there must be at

least three clear zones (public zone, transitional and safe zone), however, the comfort of the patient must also be considered, which is why lighting, heating and air conditioning services must be well planned out to avoid waste.

» Smart Design for Imaging

Dr Steven Horii, from the Hospital of the University of Pennsylvania in Philadelphia stressed that the best way to make smart decisions in design and architecture is to consult the people who will be using the facilities. He also agreed that it is not possible to have a successful long-term strategy based on technology possession alone, technology changes so the design needs to be adaptable and flexible. At times of financial difficulties and limited funds planning becomes even more important and designs need to be especially well thought out to cut costs. However, despite the financial crisis there are still critical projects taking place and 60 percent of all U.S. hospitals have projects underway or planned, 19 percent of which include imaging. The priorities of a radiology department have not changed much and customer satisfaction and improving productivity and workflow remain on top, however the challenges faced by facility managers are not solved by design but the impact of design planning, which is vital to the efficient functioning of any department. It is important to learn from others - not only other departments, medical centres or hospitals but also other industries. Evidence practice in radiology can be just as easily applied to design but in order to improve something you must first study it and understand it.

III. CURRENT ISSUES IN RADIATION SAFETY

» Recently Launched – New Project: 'Image Wisely' Campaign

The learning objectives of the session were to understand the goals and action plan of the recently launched 'Image Wisely' initiative, with regards to the radiation exposure from medical imaging; to understand the applicability and limitations of current CT dose metrics for

quantifying the radiation exposure delivered to individual patients and to understand current CT equipment features for monitoring and controlling the radiation dose. The aim of the session was also to consider future requirements for CT equipment manufacturers to monitor and control the radiation dose delivered with their CT scanners.

Image Wisely is an awareness programme of the American College of Radiology, the Radiological Society of North America, the American Association of Physicists in Medicine, and the American Society of Radiologic Technologists. Image Wisely, described as a 'wake-up alert' and a 'call-to-action', was launched at RSNA 2010 on Sunday November 28 as a national campaign to promote greater safety in radiology.

Image Wisely's objective is to encourage practitioners to avoid unnecessary ionising radiation scans and to use the lowest optimal radiation dose for necessary studies. Radiologists, medical physicists, technologists, and physicians are encouraged to take the pledge to image wisely for the health and safety of their patients. The Image Wisely website (www.imagewisely.org) provides educational resources and will include vendor microsites, which will offer users easy access to information about dose reduction techniques on specific equipment, dose monitoring, and dose optimisation. The goal is also ACR accreditation of CT scanners, as currently less than 50 percent of the scanners being used in the US are accredited. The key messages of the campaign are - be informed, get accredited and pledge to perform 'the right exam, performed the right way, every time'.

» Radiologists Call for National Strategy to Address Medical Imaging Overuse

Overutilisation of medical imaging services exposes patients to unnecessary radiation and adds to healthcare costs, according to a report appearing online and in the October issue of the journal *Radiology* that calls on radiologists to spearhead a collaborative effort to curb imaging overutilisation. "In most cases, an imaging procedure enhances the accuracy of a diagnosis or guides a medical treatment and is fully justified, because it benefits the patient," said

the article's lead author, William R. Hendee, Ph.D., distinguished professor of radiology, radiation oncology, biophysics and bioethics at the Medical College of Wisconsin in Milwaukee. "But some imaging procedures are not justified, because they are unnecessary for the patient's care. These are the uses of imaging that we, as medical physicists, radiologists, radiation oncologists and educators, are trying to identify and eliminate."

The growth in medical imaging over the past two decades has yielded important and life-saving benefits to patients. Medical imaging has allowed millions of patients to avoid more invasive diagnostic and treatment procedures. However, overutilisation of medical imaging services can be detrimental to patients by exposing them to unnecessary radiation. Between 1980 and 2006, the annual U.S. population radiation dose from medical procedures increased seven-fold, according to the National Council on Radiation Protection and Measurements.

In August 2009, the American Board of Radiology Foundation hosted a two-day summit with more than 60 participating organisations to examine the causes and effects of imaging overutilisation. The summit identified several key forces influencing overutilisation, including payment mechanisms and financial incentives in the U.S. healthcare system, the practice behavior of referring physicians, self-referral, defensive medicine, patient expectations and duplicate imaging exams.

"There are many causes of overutilisation of imaging in medicine," Dr. Hendee said. "Some of these causes, such as self-referral to physician-owned imaging facilities and defensive medicine to shield against potential lawsuits, are beyond radiology's influence to correct and must be dealt with more globally within medicine. However, some of the causes do occur within radiology, and the profession is hard at work to address them."

Summit participants offered several suggestions to reduce overutilisation, such as a national collaborative effort to develop evidence-based appropriateness criteria for imaging, greater use of practice guidelines in requesting and conducting imaging exams, decision

THE USE OF BREAST TOMOSYNTHESIS IN CLINICAL PRACTICE

Dozens of papers, scientific and poster sessions on breast tomosynthesis were offered at the 2010 Radiological Society of North America annual meeting. Interest was unusually high since Hologic, the women's health company, received a Food and Drug Administration (FDA) "Approvable Letter" for a 3D digital mammography tomosynthesis system just before the meeting. Commercial Hologic systems are already installed in Europe, the Middle East, South America, Canada and Mexico and parts of Asia but the biggest opportunity for the new technology is the United States where recall rates for breast cancer screening exams run from 10 to 15 percent.

S. G. Collins, a video film producer based in Amsterdam, videotaped the comments of dozens of luminaries in Europe, and North and South America for a documentary on tomosynthesis premiered at RSNA. Below are excerpts from the documentary.



Dr. Eric Escolano

Radiologist in private practice,

Grenoble, France



Prof. Giovanni Gandini

Radiology Professor and director of the diagnosis department for images at the University Hospital San Giovanni Battista,

Torino, Italy



Dr. Pierre Gignier

Radiologist with a special interest in senology, Hôpital Privé of Antony,

France



Dr. Pietro Panizza

Chairman of the Italian Society of Radiology, and Radiologist, San Raffaele Hôpital,

Milano, Italy



Prof. Patrice Taourel

University Professor, Radiologist and department head, Hôpital Lapeyronie,

Montpellier, France



Dr. Christophe Tourasse

Head of the breast imaging center, Hôpital Privé Jean Mermoz,

Lyon, France

What does breast tomosynthesis do that mammography doesn't?

Prof. Gandini: The main problem with digital mammography is the same as analog mammography: the overlapping of radiopaque images — therefore false images, images that we call overlapping. Tomosynthesis should avoid these 'summation' images, because it breaks up the image.

Dr. Tourasse: Tomosynthesis gives us more confidence in our readings, which leads to a lower recall rate. In most

cases, cancer not seen on 2D can be identified on a second reading with tomosynthesis.

“We are deeply convinced that our patients benefit from the tomosynthesis.”

Dr. Gignier: Tomosynthesis enables us to eliminate a false image made by tissue overlap. We have found cancers with our 3D tomosynthesis images that were not visible with our 2D images.

The other big benefit of tomosynthesis is the improvement of the workflow of patients, since we don't do localized compression views any more, since thanks to the tomosynthesis, all [tissue] overlays are removed.

Dr. Panizza: The first time I saw tomosynthesis, I imagined the possibility of reducing [the number of] ultrasound [exams]. That is nowadays my main problem, because there are few radiologists and non-radiologists who are able to do high quality ultrasound exams. Ultrasound is an expensive test,

which is not so easy to use in the screening phase. Therefore the possibility of having greater sensitivity than mammography thanks to tomosynthesis can reduce the number of ultrasounds and therefore costs.

Prof. Gandini: What I can say for sure is that tomosynthesis increases the confidence in the radiologist when it comes to diagnosing a malignant tumor. Because two characteristics that are typical of breast cancer are better demonstrated. And those are the calcifications, and the spiculation margins. Spiculations are more visible with tomosynthesis than with 2D mammography.

Dr. Gignier: We installed a Hologic Selenia Dimensions breast tomosynthesis system a year ago. We must have performed some 5,000 exams on that machine. Tomosynthesis allows us to better localize the lesion's position in the breast, especially in the density of the breast. The exam itself is faster, because we don't need to take plus / minus 15° views for our stereotactic coordinates. Just one tomosynthesis acquisition gives us all these elements. So, we save time, we gain two additional images per patient, yet the procedure is strictly the same.

Have you found cancers with tomosynthesis you might have missed with 2D?

Prof. Taourel: We have had significant experience in tomosynthesis; we must have made some 3,000-4,000 exams in the 18 months that we've been using it. We are deeply convinced that our patients benefit from the tomosynthesis.

We have detected additional cancers... It's true that it doesn't happen every day, not even every week, but... every team using [tomosynthesis], and ours in par-

ticular, finds some additional cancers that wouldn't have been seen in mammography, since there was no trace of them, or they wouldn't have been seen in mammography because they weren't pertinent enough — and even if there were some signs, they were too subtle, so they have been missed.

“Tomosynthesis enables us to eliminate a false image made by tissue overlap. We have found cancers with our 3D tomosynthesis images that were not visible with our 2D images.”

So there are cancers we detected — we could see better [with tomosynthesis]. We could see contralateral cancers, we could see multicentric ones.

Does tomosynthesis take more time than a conventional mammogram?

Dr. Escolano: The time needed for reading one tomosynthesis is comparable to a doctor having to read one or two additional images [views]. But you have to counterbalance this doctor's time with the fact that before, he or she would also have to read additional images. And the patient needed to go back to the mammography room, we had to wait for the results of this additional image. So generally speaking, even though there is some additional time required for a single tomosynthesis reading, on the whole we are gaining doctors' time per patient.

Prof. Gandini: If tomosynthesis allowed me to reduce the number of ultrasound tests — and an ultrasound test takes about 20 minutes — I should compare the time that I save, those 20 minutes,

with the minute that I need to read the tomosynthesis images. This would certainly be a lot of time saved for the doctor.

What patient would benefit the most from breast tomosynthesis?

Prof. Gandini: The patient for whom tomosynthesis is useful is a woman with a dense breast, in about 40 to 50 percent of the total; in women who have had surgery for breast cancer; and in those cases where you have asymmetries in the fibrous glandular between the two sides. These are the patients for whom tomosynthesis can be crucial.

Dr. Taourel: In the beginning we believed that tomosynthesis would be most effective in dense breasts. In fact that's not really the case. If the breasts are really dense, think of plaster: you cut a lump of plaster, you get slices of plaster, and you still can't do any diagnostics.

To be able to do a diagnosis, there must be some interface between the lesion and the fat tissue, and this is how you can make your diagnosis.

So, in my opinion, its best use is not in particularly dense breasts or low density breasts. In the dense breasts it will miss fewer cancers — although it still will... In low density breasts we won't miss any, but also, it's going to be most effective in what I call "disharmonious breasts" — breasts where the longitudinal features are not well organized, where in mammography we see pseudo distortions everywhere. In tomosynthesis we're really able to say "no, this is just a tissue overlap." Or sometimes, we will be able to see something amidst the fat tissue that was not seen otherwise, because in tomosynthesis we can clearly see distortions. Even if the tumor is not dense, it distorts, it pulls the sides, and that's how we can recognize it.

support at the point-of-care, education of referring physicians and the public, accreditation of imaging facilities, management of self-referral and defensive medicine, and payment reform.

“Leaders can promote a culture of safety, by examining specific tools used to reinforce safety strategies and methods used to reinforce safety messages in the workplace.”

The Radiology report outlines several of these suggestions and states that these efforts will require the cooperation and active collaboration of many groups, including radiologists, physicists, oncologists, referring physicians, payers of healthcare services, patient and public interest groups and vendors of medical imaging equipment. A second summit called “Improving Patient Care through Effective Communicating in Imaging” was held in Washington, D.C., August 5 - 6, 2010.

In June 2009, the Radiological Society of North America (RSNA) and the American College of Radiology established the Joint Task Force on Adult Radiation Protection to address concerns about patient radiation exposure from medical imaging procedures. The task force subsequently broadened the participating primary member institutions to include the American Association of Physicists in Medicine and the American Society of Radiologic Technologists and is in the process of developing the “Image Wisely” campaign for adult radiation protection.

IV. MANAGING RISK FOR OPTIMAL PATIENT SAFETY

» Practical Methods for Creating a Culture of Safety in the Workplace

The learning objectives of this session were to recognise ways in which leaders can promote a culture of safety, by examining specific tools

used to reinforce safety strategies and methods used to reinforce safety messages in the workplace. The session also focused on specific tools used to prioritise safety goals based on institutional need and regulatory standards and identified the responsibilities and actions of administrators, managers, and front line personnel in reinforcing an organisation's ongoing commitment to safety.

One of the practical ways of creating safety in the workplace outlined during the session was using the 'Impact vs. Effort' or 'Effort vs. Benefits' decision matrix, which allows a decision to be quickly analysed by evaluating the possible outcomes.

The importance of having a safety committee was also highlighted. The committee should include representatives from all areas of the department and even medical facility, including maintenance staff. First of all, the safety committee should meet on a regular basis, for example every month, as this allows for an open exchange of ideas on what to change and improve. The meetings should be more like brainstorming sessions but with an agenda, and should promote creativity and not get caught up in the process of the meeting.

It is also important to determine and prioritise goals and have a clear list of accomplishments at the end of the year. Within the meeting it is common to have sub groups for improvement such as 'patients left unattended' or 'infection control', which allow participants to focus on particular problem areas but it is equally important to allow everyone to meet and discuss ideas together. Audits are also important, as it is necessary to check and ensure that the changes being made are having an effect. There are two types of audits – mandated (regulated and institutional) and internally developed. Both are important as they track progress and can highlight problems areas.

However, when creating a culture of safety in a workplace, the most important factor is active involvement and participation of the front line people as they are the most important for creating a culture of patient safety within the working environment and they should be the ones that decide how this should be promoted.

Any kind of visual aids can be used to promote safety such as colourful signs, flow charts - anything that will make people think, remember and follow the practice. Employees naturally want to make progress so the more they are involved, for example in designing the signs and posters, the more likely they are to take notice of them and adhere to the safety policies. It is after all, the people who create a culture of safety and not the policies and equipment.

» Radiation Fears Should Not Deter Women from Mammography Screening

The risk of radiation-induced breast cancer from mammography screening is slight in comparison to the benefit of expected lives saved, according to a new study appearing online and in the January issue of the journal Radiology.

“Our study shows that the risk of cancer associated with routine screening in women age 40 and over is very low, especially when compared to the benefits associated with early detection.”

Dr. Yaffe and his colleague, James G. Mainprize, Ph.D., developed a model for estimating the risk of radiation-induced breast cancer following exposure of the breast to ionizing radiation from various screening mammography scenarios and estimated the potential number of breast cancers, fatal breast cancers, and years of life lost attributable to mammography screening.

Using a radiation dose estimate of 3.7 milligrays (mGy), which is typical for digital mammography, and a cohort of 100,000 women, the researchers applied the risk model to predict the number of radiation-induced breast cancers attributable to a single examination and then extended the model to various screening scenarios beginning and ending at different ages.

The results showed that in 100,000 women, each receiving a dose of 3.7 mGy to both breasts, annual screening from age 40 to 55 years and biennial screening thereafter to age 74 years would result in 86 radiation-induced cancers, including 11 fatal cancers, and 136 life years lost. Conversely, for the same cohort it was estimated that 497 lives and 10,670 life years would be saved by earlier detection.

Pure confidence in action

Philips Ingenuity CT

Until now, CT scanning has too often been about trade-offs – high image quality or low dose, iterative reconstruction or speed. Well, no longer. The all new Ingenuity CT will make you reevaluate everything you know about low dose imaging. Imagine up to 80% less dose while maintaining diagnostic image quality. Use up to 50% less dose while improving spatial resolution by up to 35%. Or simply, improving spatial resolution by up to 58% at the same dose. The Ingenuity CT gives you control of the dial so you can personalize dose and image quality based on your patients' needs.

But that's not all. Picture using up to 15% less injected contrast routinely. Reconstruct the majority of all protocols in 60 seconds or less. Envision a revolutionary X-ray tube designed for no warm up or cool down, with an exclusive introductory two-year tube warranty. Ingenious clinical integration, focus on patients, and economic value putting you at the center of patient care. **It's Ingenuity CT.**



Key advantages

- iDose⁴ iterative reconstruction technique – holistic low dose imaging provides high image quality, low dose and fast reconstruction times
- An exclusive introductory two-year tube warranty
- Ingenious clinical integration, focus on patients, and economic value to seamlessly enhance clinician workflow and patient care

Four in one, no low dose trade-offs! iDose⁴

- Up to 68% improvement in spatial resolution
- Up to 80% less dose
- 67% of protocols reconstructed in less than 60 seconds
- Easy to use



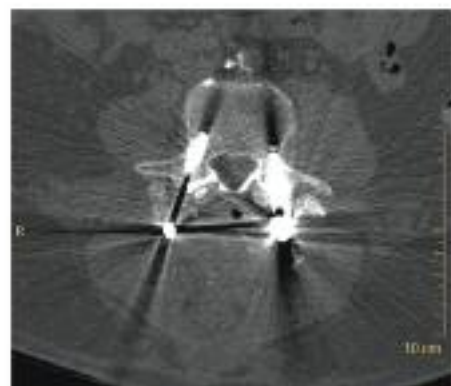
Before Ingenuity CT

iDose⁴ reduces noise and enhances the image quality demonstrated on the above bariatric study.



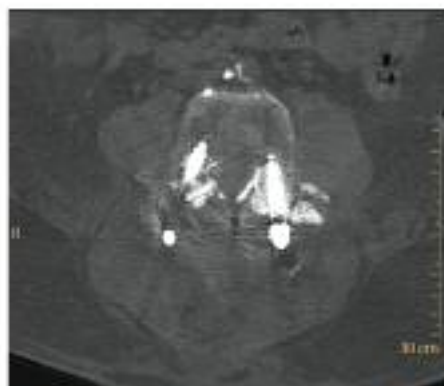
Ingenuity CT with iDose⁴

Routine CT of the abdomen demonstrating a pelvic mass highlighted using Magic Glass.



Before Ingenuity CT

Ingenuity CT provides a noticeable reduction in streak artifact from metal implants.



With Ingenuity CT



Trade-offs in imaging, consider them history.

Learn more at www.philips.com/IngenuityCT

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PHILIPS

sense and simplicity

EXHIBITORS AT RSNA 2010

Imaging Management's Top Picks Of Product Launches & Updates

VENDORS IN THE SPOTLIGHT

→ CARESTREAM HEALTH

→ PHILIPS

→ GE HEALTHCARE

→ HOLOGIC

→ SIEMENS

→ AGFA

→ HITACHI

→ TOSHIBA

CARESTREAM HEALTH

INTEGRATED DRX-1
WIRELESS CASSETTE

ADAPTIVE RIS SOLUTIONS

Carestream Health & Quantum Medical Imaging Team Up

An enhanced configuration on display at the Carestream Health booth at this year's RSNA, was the Quantum Medical Imaging Q-Rad Floor Mounted system which is now available with the wireless, cassette-size CARESTREAM DRX-1 detector from Carestream Health. This system is designed for high patient volumes within radiology departments, imaging centres, orthopaedic facilities, surgery centres and urgent care clinics. Beginning early in 2011, Carestream Health will sell the system in international markets and through its U.S. sales organisation as the CARESTREAM DRX Q-Rad Floor Mounted System.

Carestream Health also will offer the system in the U.S. through its dealer network as the Quantum Q-Rad Digital DRX Series. Q-Rad-Digital systems are feature-rich and provide full patient positioning functionality. These digital radiographic systems deliver precision and reliability through advanced integration design and features, such as TechVision. In addition these systems include innovations, such as the 650 lb. patient weight table capacity, rotating DR-Trays for easy positioning of a wireless digital cassette, FAIL-SAFE electromagnetic braking systems, collision avoidance electron-

ics and EZ-Glide handle controls. These and other features allow clinicians to capture high quality images during an examination, which can lead to improved patient care.

Flexible RIS Enables Facilities to Adjust to Changing Needs

The CARESTREAM RIS platform was also on display. This high-tech system equips healthcare providers to quickly and easily adapt data capture and workflow to address meaningful use requirements and other changes in healthcare practices and regulations worldwide. At the RSNA, the company demonstrated its ability to capture and share specific data required to meet U.S. Federal Government guidelines for meaningful use. The company plans to submit an application for certification of its RIS as an EHR module that meets meaningful use criteria in the first half of 2011. Due to its built-in flexibility, CARESTREAM RIS can meet the meaningful use initiative without requiring a new software release.

"Being able to redefine RIS workflows allows healthcare facilities to respond to government regulations including meaningful use, as well as adjust processes to satisfy emerging business needs," said Diana L. Nole, President, Digital Medical Solutions, Carestream Health. "Our RIS also offers advanced business intelligence tools that can help imaging centres, hospitals and healthcare systems of all sizes improve productivity, efficiency and profitability."

PHILIPS

NEXT-GENERATION CT WITH IDOSE

NEW NETWORKING WORKSPACE TO
FACILITATE COLLABORATION

U.S. LAUNCH OF EMERGENCY
DIGITAL RADIOGRAPHY SOLUTION

Next Generation Ct With Idose

Philips announced the new Philips Ingenuity

CT platform, an innovative technology that it says will help redefine low dose imaging, during the RSNA. The Ingenuity CT features iDose, Philips' next-generation iterative reconstruction technique, designed to provide equivalent diagnostic image quality at up to 80 percent less dose; improve spatial resolution by up to 35 percent with up to 50 percent less dose; or simply improve spatial resolution by up to 68 percent. This new platform is available as a standalone or hybrid imaging system via the Ingenuity CT scanner and the Ingenuity TF PET/CT system.

"The Ingenuity CT system maintains outstanding image quality at the absolute lowest possible dose without wasting a moment of valuable clinician time. In the past, because the combination of great image quality, low dose and fast reconstruction times has been a challenge for the industry, CT scanning has often been about trade-offs. The launch of the Philips Ingenuity CT, the next step towards fully optimizing low-dose imaging, is proof of Philips' commitment to eliminating the need to make trade-offs in patient care," said Gene Saragness, general manager, Imaging Systems, for Philips Healthcare.

At the heart of the Ingenuity CT is a new level of clinical integration and a wide variety of applications that put the focus on the patient while enhancing economic value. iDose4, Philips' newest generation iterative reconstruction technique adds improvement in image quality and fast reconstruction times, while reducing dose.

New Networking Workspace To Facilitate Collaboration

Philips also used the annual meeting to introduce its clients to the Philips IntelliSpace Portal, a multimodality workspace that uses advanced networking capabilities to facilitate collaboration between radiologists and referring clinicians that may lead to faster, more accurate and informed

patient care. Featured at the 96th annual meeting of the Radiological Society of North American (RSNA) in Chicago, the IntelliSpace Portal turns virtually any PC into an advanced multimodality imaging system workspace and offers clinicians the ability to view images anywhere, from multiple imaging modalities, including those from non-Philips systems, without moving to a specialised workstation.

Philips Launch Cost-Effective Imaging 2.0

Philips launched their new Imaging 2.0 concept, which provides new integrated technology solutions for both clinicians and patients. The Imaging 2.0 concept is poised to address a dilemma that exists in healthcare today: more consumers are demanding quality healthcare, yet there is less money to treat them. Based on feedback from clinicians, Philips' approach to this dilemma is to enable enhanced and smarter collaboration through advanced technology with the hope of better patient outcomes and lower costs for the healthcare system. Part of these solutions are detailed, below:

- Ingenuity CT: a new CT platform that offers up to 80 percent less dose while maintaining diagnostic image quality and improving spatial resolution.
- Ingenuity TF PET/CT: a hybrid imaging system combining PET and CT to conduct studies in oncology imaging, cardiac perfusion and diagnostic CT.
- IntelliSpace Portal: a new multimodality, multivendor workstation that uses advanced networking capabilities to facilitate collaboration between radiologists and referring clinicians
- Juno DRF: a remote-controlled flat detector system that combines digital radiography and fluoroscopy applications in one system enabling a wide range of applications.
- DigitalDiagnost – ER Wireless: an x-ray system that allows easy manoeuvring for difficult anatomical views and optimizes access to critical patients in emergency rooms (ER), trauma units and recovery bays.
- iU22 xMATRIX Ultrasound: a new ultrasound system that allows clinicians to create two full-resolution images simultaneously

GE HEALTHCARE

GE SHOWCASES HEALTHYMAGINATION

At RSNA 2010, GE Healthcare highlighted a variety of technologies developed to support the Healthymagination strategy to help improve patient care worldwide.

"Since the launch of healthymagination, GE Healthcare has worked with caregivers and organizations around the world to develop innovative technologies to better address the needs of healthcare providers and their patients," said John Dineen, President and CEO of GE Healthcare. "This year, the company will showcase the results of this shared commitment in several areas of care including CT, X-ray and Healthcare IT, among others, all meant to foster providers' ability to deliver better healthcare to more people at a lower cost."

HOLOGIC

HOLOGIC CLOSE TO APPROVAL IN U.S. FOR 3D MAMMOGRAPHY

Hologic, Inc. announced at the RSNA that they have received an approvable letter from the U.S. Food and Drug Administration (FDA) for the Selenia Dimensions 3-D digital mammography tomosynthesis system. Final approval of the company's pre-market approval application for the system remains subject to satisfactory review and inspection of their manufacturing facility, methods and controls. The company plans to work closely with the FDA to complete this final inspection.

"We are extremely pleased to have received the FDA's approvable letter, which represents an important step forward in the commercialisation of our Selenia Dimensions tomosynthesis system," said Rob Cascella, President and Chief Executive Officer. "The Selenia Dimensions technology is designed to provide radiologists with enhanced screening and diagnostic capabilities through the incorporation of fast, high-quality 3-D imaging in combination with 2-D imaging. We believe this new technology will address many of the limitations present in standalone 2-D imaging and improve upon both sen-

sitivity and specificity. We look forward to working with the FDA to complete the remaining steps in the approval process."

SIEMENS

SIEMENS LAUNCH GUIDELINES FOR DOSE REDUCTION

Siemens presented a detailed explanation of dose reduction innovations on Siemens medical imaging equipment. Siemens said it is the first manufacturer to issue a "Guide to Low Dose." Created for physicians and medical technical staff, the guide describes the basics of radiation used for medical purposes, presenting a detailed explanation of dose reduction innovations on Siemens medical imaging equipment. Bernd Montag, CEO, Imaging & Therapy Systems Division, Siemens Healthcare said, "In all relevant imaging procedures, such as computed tomography, angiography and molecular imaging, Siemens has pioneered the development of dose reduction technologies for many years. Now, we're planning to launch a comprehensive education programme which will support clinical staff in protecting themselves and patients better against avoidable radiation exposure."

Siemens said its latest dose reduction innovation is FAST CARE, a hardware and software platform for CT scanners. The FAST CARE applications offer new functions and protocols for dose reduction, such as to simplify time-consuming, complex procedures, such as patient scanning or preparation for image reconstruction. CAREguard supports dose monitoring during complex interventional procedures. To help minimise applied skin dose and align with established or future regulatory requirements, Siemens states that physicians can use CAREguard to predefine up to three different skin dose thresholds.

AGFA

IMPAX MULTIMODALITY CARDIOVASCULAR SUITE

PLUS, NEW IMPROVED IMPAX 6.5 IN THE SPOTLIGHT

IMPAX MULTIMODALITY CARDIOVASCULAR SUITE

At the Agfa HealthCare booth, on display were its suite of cardiology imaging products designed to give the radiology community an opportunity to experience cardiology and vascular imaging and reporting solutions that effectively consolidate information and offer clinicians a single point of access to studies from multiple modalities.

Agfa HealthCare's new IMPAX Cardiovascular (CV) Suite is designed to support clinicians with a single, integrated cardiovascular information system targeted at cardiac catheterisation, echocardiography, vascular ultrasound, cardiac CT/CTA, nuclear cardiology and ECG data. The multimodality suite comes together for the cardiologist in the easy-to-use Cardiovascular Review Station. Demonstrations were offered to show how IMPAX CV's single point of access puts one toolkit at the cardiologist's fingertips.

Plus, New Improved Impax 6.5 In The Spotlight

Agfa HealthCare also took the opportunity to announce that IMPAX 6.5 will be one of the key solutions it will focus on at RSNA 2010. IMPAX is a sixth-generation integrated RIS/PACS workflow solution for data management and reporting, offering improved productivity through its automated worklists, advanced volumetric study management systems and ability to be deployed across and beyond the hospital enterprise to wherever radiologists need to report from, including at home. IMPAX unites information and imaging in one simplified workflow for reporting efficiency and rapid results distribution to the point-of-care.

The company pointed out that new to IMPAX 6.5 this year are advanced features which focus on usability, workflow and productivity, as well as business intelligence, including:

- New guided, extended workflow controls with personalized worklist management, advanced priority rules and color-based sorting for effective task management.
- Long-established, industry-leading IMPAX for Breast Imaging now offers full support

of the IHE Mammography Image Profile, solving typical display problems in mixed vendor environments.

- Multi-planar Spine Labeling.
- New IMPAX Business Intelligence (Work In Progress) and data mining tools with real-time digital dashboards for a more focused management of radiology departments as an add-on to IMPAX 6.5.
- IMPAX Kiosk*, newly released, is designed to improve the patient experience and reduce waiting time at registration, while reducing administrative costs and minimizing the instances where errors usually occur. At the self-serve kiosk, patients can identify themselves, check in and sign documents electronically.

HITACHI

OASIS BORELESS MR AT THE FORE

Oasis Boreless Mr At The Fore

Hitachi showcased its Oasis Bore-Less MR at RSNA 2010, celebrating installations at premier healthcare providers and brand new clinical capabilities. Saint Louis University (St. Louis, MO), Lourdes Hospital (Binghamton, NY), York Hospital (York, PA), VA Medical Center/Lyster Army Health Clinic (Fort Rucker, AL) and Desert Medical Imaging (Indio, CA) joined many other new Oasis users in 2010. The latest new software for Oasis provides users with TIGRE-C, a new dynamic abdominal imaging feature with increased SNR and temporal resolution, and access to advanced Cardiac imaging, MR Spectroscopy and Tensor imaging.

"I think our expanding high field user base and gaining such prestigious customers testifies to the marketplace's growing perception of Hitachi as a leading provider of truly patient friendly high performance MR imaging systems" says Shawn Etheridge, Director of MR Marketing.

Hitachi will also demonstrate new capabilities for Echelon 1.5T, including BSI (Blood Sensitive Imaging) for depiction of small veins and haemorrhage, plus VASC - ASL, another new non-contrast MRA technique. VASC-ASL, a spin-labeled MRA technique, delivers high quality vessel images without a contrast agent, providing an alternative to contrast methods

for patients with renal insufficiency.

TOSHIBA

INFINIX VF-I BI-PLANE VASCULAR X-RAY SYSTEM

SYSTEM TO REDUCE CT RADIATION DOSE

Infinix Vf-I Bi-Plane Vascular X-Ray System

When imaging patients in the cath lab, it is critical that the vascular X-ray system provides clinicians unprecedented access without restricting image angles. Designed to increase flexibility and diagnostic capabilities, especially in neuro and paediatric imaging, Toshiba America Medical Systems, Inc. showcased its Infinix™ VF-i bi-plane vascular X-ray system with dual 12" x 12" mid-sized flat panel detectors. The dual 12" x 12" mid-sized flat panel detectors is said to provide clinicians with the ability to obtain critical variations in angle combinations while providing better coverage during bi-plane neuro and vascular procedures on a broad range of patients, including paediatric. The wider field of view offered by the 12" x 12" flat panel detectors is reputedly ideal for cerebral examinations, full body imaging and device implantation. The mid-sized design provides twice the anatomical coverage in a single view than smaller flat panel detectors.

System To Reduce Ct Radiation Dose

Reducing radiation dose is a high priority for medical imaging manufacturers and healthcare facilities. Expanding its dedication to reducing CT radiation dose while maintaining diagnostic confidence, Toshiba America Medical Systems, Inc. is expanding its suite of low dose CT technologies. Toshiba will showcase dose reduction technologies, such as Target CTA and Adaptive Iterative Dose Reduction (AIDR) at congress.

Target CTA is a cardiac protocol for the Aquilion® ONE that is designed for patients including pediatrics. Since the Aquilion ONE can image the entire heart in one rotation, using the Target CTA protocol allows for more accurate targeting of the heart and minimises padding of the scan range. Target CTA can be most helpful to limit radiation dose during gated cardiac studies.

A medical image viewer that requires no updates,
no downloads and no extras?

No kidding?

XERO technology, all your images

Delivering images and information to caregivers across a wide range of technical and physical barriers has proven to be a continuing challenge in healthcare. But as care providers expand and integrate their capabilities beyond today's hospital walls and move towards integrated regional and national care solutions, the need for technology neutral solutions has never been greater. To support this need, Agfa HealthCare is introducing XERO, a zero-download medical imaging viewer developed to provide access to imaging information for clinicians at any point of care regardless of network constraints and/or the wide variance of platforms and administrative rules. By bridging the gap between the stringent controls of medical image formats and the flexible access formats of the internet, XERO accesses and delivers your DICOM images and reports, with none of the heavy infrastructure or headaches associated with legacy viewers. We are not kidding when we promise XERO technology for your DICOM images.

Learn more about our solutions via <http://www.agfahealthcare.com>.

Internet: www.shimadzu.eu
Email: medical@shimadzu.eu

Shimadzu Europa GmbH
Albert-Hahn-Str. 6-10
47269 Duisburg, Germany

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Evolution drives you forward

Merging clinical feedback with the most advanced technologies available on the market, the brand-new MobileDaRt Evolution adds evolutionary steps to mobile X-ray imaging. It covers examinations in patient wards, emergency rooms, traumatology, intensive care and pediatrics.

New FPD generation CXDI-55 G/C
the lightest and thinnest flat panel detectors worldwide

Dual connectivity of FPD provides maximum efficiency
meeting highest clinical demands

Gaining time – X-rays within just 3 seconds
optimized by various post-processing functions

Advanced operability features
through customer driven design adding comfort and safety during bedside operation



MobileDaRt Evolution



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