Gerald Antoch is professor of radiology and chairman of the department of diagnostic and interventional radiology at Düsseldorf University Hospital. After completing his medical training, Prof. Antoch began working in general surgery before starting his training in diagnostic and interventional radiology at Essen University Hospital. He became a board certified radiologist in 2004. From 2004 to 2008, he worked as a consultant radiologist and became vice chairman of the department of radiology at Essen University Hospital in 2008. In 2010 he was appointed chairman of the department of diagnostic and interventional radiology at Düsseldorf University Hospital. “I am highly honoured to be invited by the ESR to give the Wilhelm Conrad Röntgen Honorary Lecture at ECR 2015. With high-quality scientific sessions and refresher courses the ECR attracts an increasing number of radiologists and technicians each year. In my opinion the ECR will evolve into the radiological meeting worldwide,” he said.

Prof. Antoch’s scientific research focuses on clinical hybrid imaging. He has published 209 original scientific articles and reviews, as well as 20 book chapters. He has received widespread recognition for his work with a number of awards. In 2003, he received the Alavi-Mandell Award from the Society of Nuclear Medicine, United States, and that same year he won Aunt Minnie’s Best Scientific Paper Award, which he won again in 2004. In 2005 he was awarded the Lodwick Award at Harvard Medical School followed by awards from the Bavarian Association of Nuclear Medicine and the German Cancer Research Center in the same year. In 2007 the German Radiological Society presented Prof. Antoch with the Wilhelm Conrad Röntgen Award.

In recognition of his significant expertise in the field of hybrid imaging and his great achievements in the field of research, Professor Gerald Antoch, from Düsseldorf, Germany, has been invited to deliver the Wilhelm Conrad Röntgen Honorary Lecture at ECR 2015.

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This medical device is intended for use by medical imaging and diagnostic health professionals. For complete information about precautions and optimal usage conditions for this medical device, we recommend consulting the instructions online/user's manual. FlowSens® • Class II b • CE Certificate: in compliance with directive 93/42/EEC - Certifying organization: LNE G-Med (CE 0459) • Technical data: CT dual-head soft bag injector - Hydraulic technology - Use with prefilled bags, bags and vials - Installation: ceiling mount / pedestal - Flow rate: 0.3 to 10mL/s - Maximum pressure: 21 bar / 2100kPa / 305 PSI - Limit of pressure: programmable - Pressure monitoring: graphical & numerical - Bag maximum capacity: 500mL - Number of phases & Volume per phase: 1 to 220mL - Air detection: automatic - Number of filling speeds: 3 - Filling: manual / automatic - Priming: manual / automatic - Delay between phases: 0 to 900s - Protocol programming modes: 3 - Test flow: flow rate & volume same limits as for the injection - Scan Delay: 0 to 300s, with or without dry contact - Injection Delay: 0 to 300s, with or without dry contact - Temperature maintaining: yes - Memory capacity (protocols): 20 libraries, 4000 protocols - Memory capacity (historical & statistics): 24000 injections, 300000 events - Voltage: 230V AC - Frequency: 50-60Hz - Power consumption: 1000VA - Injector pedestal dimensions / weight (H x W x D): 1422 x 750 x 750mm / 75kg - Injector ceiling mount dimensions / weight (H x W x D): 1016 x 358 x 503mm / 60kg - Remote console dimensions / weight (H x W x D): 355 x 300 x 249mm / 3.5kg - Power unit dimensions / weight (H x W x D): 654 x 608 x 336mm / 70.1kg - Complying with European Directive ROHS 2011/65/UE • Manufacturer: MEDEX - 240 allée Jacques Monod - 69800 Saint-Priest – France • Document revision date: 2014.
"Digitation, as we all know, needs a conscious effort on the part of the user: as radiologists, we do not want to be led but to lead. So we should stop for a moment and think how digitisation impacts our profession," said DRG president, Prof. Norbert Hosten from Berlin. New options for population-based imaging, radiology training and hybrid imaging techniques have been developed to help radiologists understand and lead the evolution of their discipline.

Imaging large cohorts of patients is a growing trend in healthcare. Such studies provide evidence-based data useful for the advancement of science and reimbursement agendas. They also serve to emphasise the radiologist’s role in medicine, by showing how their work contributes to patient welfare and the advancement of science.

In Greifswald, an university town near the Baltic Sea and Polish border, radiologists have teamed up with epidemiologists to perform whole-body MRI in healthy subjects as part of the Study of Health in Pomerania (SHIP). Katrin Hegenscheid, a radiologist at Greifswald University, is SHIP’s head of MRI studies. She will explain why imaging techniques are increasingly being used in large cohort studies for epidemiological research.

"Traditionally, longitudinal studies have relied on the clinical assessment of risk factors at baseline and their relation to the incidence of clinical events, such as stroke, myocardial infarction or death during the follow-up period," while this design has served well for the identification of many now established risk factors for various disease states, their power is limited to the number of overt events in the source population. Over the last two decades, imaging has increasingly been implemented in population-based cohorts in order to obtain information on the presence and extent of subclinical disease burden, allowing for a more comprehensive assessment of the development of disease states. As a result, a disease specific phenotyping of the human body in its various normal and abnormal conditions is possible," she said.

Hegenscheid will also present key information on SHIP’s population-based cohort study which was first conducted in 1993. "SHIP has two main objectives: to assess the prevalence and incidence of common risk factors, subclinical disorders and clinical diseases; and to investigate the complex associations among risk factors, subclinical disorders and clinical diseases. A particular characteristic of SHIP is that it does not specifically address one selected disease, it rather attempts to describe health-related conditions with the widest possible focus," she added.

Since 2008, a standardised MRI protocol has been part of the entire examination procedure and performed using a 3T MRI machine. The basic programme includes native whole-body MRI of the head, neck, chest, abdomen, pelvis and spine. Following the basic programme, contrast-enhanced cardiac MRI and MR angiography are performed in men, whereas cardiac MRI and MR mammography are performed in women. The MRI studies aim to assess prevalence estimates of subclinical MRI findings and normal variants in the general population along with deriving subclinical imaging biomarkers that may serve as a valuable source for the detection of early disease states and identifying novel imaging biomarkers of risk. They also look for predictive value of findings from whole-body MRI on the incidence of chronic diseases over the follow-up period, establish reference values for various organs and organ parts, and correlate MRI findings with metabolic and genome-wide analysis.

"For instance, MRI data from the brain of the study population have been used to generate three-dimensional volumes of the brain grey and white matter, or specific regions in the brain that were not associated with genetic, psychosocial and clinical factors in large consortiums. In this way, gen loci and risk factors, e.g., smoking, have been identified that influence specific parts of the human brain that are associated with cognitive diseases. In the same way, few gen loci have been identified influencing facial morphology in Europeans. Furthermore, MRI data from SHIP have been used to generate MRI reference values for organs, e.g., the aorta and aortic wall, the liver, the lung, or the female bony tissues," Dr. Hegenscheid said.

"Training is an important place to prepare radiologists and medical students for new paradigms in radiology. In a dedicated lecture, Dr. Martin C. Mark from Munich will present the achievements of Akademie Online, a teaching platform run by the German Röntgen Association. "Akademie Online is a very successful tool in which top-notch speakers debate about state-of-the-art discourses, technology and other aspects of our work as radiologists. There are special sessions for medical students to get them interested in radiology and help them with their exams. Technical assistants have their own sessions, and even courses required by the authorities may be completed here," Prof. Hosten explained.

"To prepare for the future, keeping up to date with technological advances is vital. Developments in the emerging and promising field of MRI/PET will be at the heart of the presentation given by Dr. Claus D. Claussen and Dr. Nils F. Schweizer, both from Tübingen. "At a technology-driven medical profession, new technology is the air we breathe. We are optimistic about the future of MRI/PET. Think of MRI – did it really look so promising in the beginning? Remember the joke by one specialist that MRI stands for no money remains. It proved to be utterly wrong, and maybe MRI/PET is closer to clinical reality than we now think," Prof. Hosten said.
Hot Shots from Day 2
CIRSE 2015 is the perfect platform for sharing the science behind image-guided medicine. Over 6,400 delegates from around the globe make it the world’s premier interventional radiological congress.

THINK BIG!
ESR seeks to build on initiatives to replace antiquated equipment

The ESR’s EuroSafe campaign is gaining momentum, following publication of the position paper on machine renewal. The document states equipment that is up to five years old is considered state-of-the-art technology. Properly maintained equipment that is six to ten years old is suitable for practice, but radiology departments should develop a strategy to replace them. Machines over ten years old must be replaced.

Delegates in public sector hospitals must approach the relevant authorities for the budget to renew such machines, according to speakers at today’s session. Presenters also intend to elaborate on the ESR’s analysis of the public procurement process across Europe, which is highly variable in complexity from country to country.

“For the first time, we can define our official position, which is more or less in line with the lifecycle guideline published by the American College of Radiology (ACR) and the Canadian Association of Radiology,” said Prof. Boris Brkljačić, chair of the Department of Radiology, University Hospital Dubrava, Zagreb, and head of ESR’s Communications and External Affairs Committee. “The ESR’s paper might be in many instances a crucial reference to talk in talks with national authorities and the government ‘when dealing with the important topic of equipment renewal, which represents a huge problem in many countries and departments.”

National societies can use the document when negotiating with regulators, hospital administrators and equipment buyers or when lobbying the government or informing the media, he adds.

Radiologists are under pressure, continued Brkljačić, who is also a member of the ESR’s Working Group on Economics. Older equipment cannot accommodate high patient throughput needs and cannot provide sufficient quality of examinations.

Although the ESR is a professional and scientific society, not a political one, if providers don’t agree to finance the renewal of machines, some individuals may feel the urge to move ahead with renewal incentives, Brkljačić noted.

The challenges are manifold: even before the economic crisis, the proportion of gross domestic product allocated to health differed from country to country and in 2012 the number of machines per country also differed. Surprisingly, the U.K. had only 6 MRI units and 8 CT scanners per million population in 2012, while Greece, Cyprus and Italy were among the countries with the highest number of machines, Italy being the highest with 24.6 MRI units and Greece having the most CT equipment with 34.8 CT scanners per million population. Outside the EU, Ireland had the highest number of CTs with 0.5 per million inhabitants.

With aging equipment coming decreasing safety for patients and staff – particularly in terms of radiation exposure – and delays in terms of accurate diagnosis and appropriate treatment for the patients because of poor quality images. Another issue is the increasing cost of maintenance and spare parts. Some countries are moving ahead with renewal incentives; in Turkey, for example, reimbursement is lower if MR procedures are carried out on older MR equipment.

While such incentives are not applicable to the public sector, in all national health systems, questions about future strategies for machine replacement must be raised now, today’s speakers concurred.

In a statement to ECR Today ahead of the congress, ESR’s Immediate Past President Prof. Guy Frija highlighted the need for modernising imaging equipment across Europe, as well as the importance of developing and politically supporting key quality and safety indicators.

“Quality of care and patient safety can only improve if we invest in education and training,” noted Frija. “The ESR’s European Training Curriculum for Radiology and the European Diploma in Radiology are important instruments for supporting these harmonisation efforts.”

Professional Challenges Session
Friday, March 6, 18:00-17:30, Room F2
PC12a Harmonised approach for imaging in Europe: myth or reality?

- Chairman’s introduction
  L. Donoso; Barcelona/ES
- Current heterogeneities in imaging in Europe
  G. Frija; Paris/FR
- Imaging equipment: an ESR perspective
  B. Brkljačić; Zagreb/HR
- Equipment age – COCIR
  M. Denjoy; Brussels/BE
- Training and certification
  E. Wittig; Munich/DE
- Issues related to ending terminology and IT access
  P. Middenbergen; Mainz/DE
- Panel discussion: A global plan for imaging
  J. Grisela; Neurachberg/DE (Chair of the Working Group on Medical Applications – IRS, Germany)
  T. Peets; Brussels/BE (Policy Officer of Unit ‘Health and Wellbeing’ – DG CNECT, European Commission)
  A. Ryn; Brussels/BE (Director Health systems and products – DG SANCO, European Commission)
  G. Simeonov; Luxembourg/LU (Policy Officer Radiation Protection Unit – DG ENER, European Commission)
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Computer-aided diagnosis can act like a spell check for small polyps

Computer-aided diagnosis (CAD) can only enhance performance if used correctly, and does not reduce the need for training, experts agree. Furthermore, CAD is moving away from pure detection to clinical decision support, but the adoption of new reading paradigms for the screening scenario and improvements in how the technology presents results are both vital if it is to become an essential imaging tool.

CAD for colonography has shown particular promise, and most radiologists will come across it in their workflow and will need to understand sensitivity and specificity issues, as well as when CAD should be deployed in this area. The technique’s major diagnostic benefits are in small 6–9 mm polyps, which are often difficult for the radiologist to spot.

“CAD acts like a spell check for small polyps,” Prof. Stuart Taylor, professor of medical imaging and consultant gastrointestinal radiologist at University College London, told ECR Today in an interview ahead of the congress. “There are also instances when tumours and large polyps are missed by the radiologist before CAD draws attention to them.”

However, he is keen to highlight that CAD is not 100% accurate, nor does it obviate the need for training in CT colonography interpretation.

“The idea that doctors will not need to read as many validated cases to train themselves is incorrect, particularly in the detection of unusually shaped lesions, which is when the radiologist’s own eyes and knowledge will pay off,” Taylor noted.

“An untrained doctor may think a strange shape marked by CAD is too irregular to be a polyp and dismiss it as either a fold or retained faecal residue. In some cases missing a real lesion like this can have dramatic consequences for the patient as a missed polyp may be, or can become, cancerous.”

False negatives can present a challenge too. Typically the computer programme looks for the rounded bowler-hat contours of a polyp which stand proud of the bowel wall. It may miss the flatter polyps and even large mass-like lesions that don’t have typical rounded contours.

Most manufacturers are further developing CAD using validated CT colonography cases containing examples of unusually shaped flat lesions and also cancers, writing these characteristics into their software and training their programmes to recognise them. The diagnostic capacity of CAD is, therefore, continually improving.

CAD advances may also have a positive impact on patients with regard to full bowel preparation prior to the procedure.

“Refinements in software mean that the CAD software will increasingly be able to differentiate retained stool from real lesions, due to the increased attenuation of residue following the use of oral iodinated tagging agents. This should mean CAD will work better after reduced or non laxative preparation so that patients will no longer have to take unpleasant bowel preparation before CT colonography,” Taylor said.

Evidence suggests that second-read CAD is more effective in increasing sensitivity but adds to reporting time, he explained. Conversely while concurrent reading may take less time, radiologists can be tempted to only look at CAD marks, which may distract them from scrutinising non-prominent parts of the colon where there may be lesions.

A large multicentre Italian screening study has pointed to greater efficiency of using double-reading first-reader CAD (DR FR CAD). CAD initially reads the image, and this first interpretation is around 95% sensitive. Then the radiologist looks at the image with a primary 2D read. In experienced hands, this double-reading paradigm works well and leads to fast and accurate reporting, according to the project’s emerging data (Radiology, Vol. 268, No. 3, September 2013).

“If CT colonography is implemented as a population screening test, there will be very large numbers of datasets to read by a relatively small number of trained radiologists. Implementing CAD in a DR FR CAD paradigm may allow the reading of large case numbers in a limited time,” said Taylor.

At today’s update session, delegates will also hear how the mass screening programmes of the 1980s are now moving towards an individualised screening dynamic. For this to become optimal, any CAD tool needs to factor in risk constellation and point the radiologist to the best imaging studies for the patient, according to Prof. Dr. Ulrich Bick, professor of radiology and vice chairman of the radiology department at The Charité university hospital in Berlin.

“Traditional CAD doesn’t take into account risk factors such as age or genetics. This combined with its 98% sensitivity for finding microcalcifications means that the radiologist must decide whether or not the often numerous findings are clinically relevant,” said Bick, who will be presenting an update on breast CAD at today’s session.

Results from the European breast cancer diagnosis project, HAMAM, which used CAD in a more patient-tailored approach, are promising. The project integrates MRI, mammography and ultrasound with risk factors such as age and gene mutation carrier information. Some risk factors of the knee.
No second chance: incidence of lawsuits looks set to rise across the board

Radiology is one of the specialties most liable to claims based on medical malpractice, and radiologists do not get a second chance to amend an initial interpretation of an examination, according to an expert who will be speaking at today’s medicolegal session.

“There seems to exist a serious ‘infection’ of patients with litigiousness due to the cash-back mentality of consumers,” said Vienna-based lawyer Dr. Markus Ludvik. “Expect an increase of malpractice cases all over the world, especially for those patients with legal protection insurances.”

Most complaints about radiologists’ liability issues are based on failures of diagnosis, he noted. Radiological error is multi-faceted, including failures due to poor technique, perception, lack of knowledge and misjudgements, in interpretation, poor communication as well as the failure to suggest the next appropriate procedure.

Despite most doctors being well-informed about the basics of medicolegal malpractice, he thinks there is still a need for professional programmes to highlight the issues and there seems to be a lack of information concerning the specifics. He considers this is partly due to the fact that radiology may not have kept pace with changes in the field, as well as the fact that radiology may not have kept pace with changes in the field, as well as the fact that radiologists’ liability issues are based on the legal definition of failure. Ludvik also thinks that this situation may have something to do with what he refers to as a “faulty physician-patient relationship.”

“Whoever receives an order or request from another physician for a particular imaging study or procedure on a patient, the radiologist becomes part of the medical team,” he explained. “However, the radiologist will frequently have no personal contact with the patient and therefore this does not exempt them from legal obligations due to the requirements for comprehensive counselling and information.”

In today’s session, delegates will learn how to increase their awareness and knowledge of malpractice risks in the era of systemic malpractice suits and identify strategies that reduce and minimise the problems leading to malpractice litigation.

Ludvik places importance on accurate data administration and the importance of good insurance and documentation, co-presenter Dr. Jane Adam makes a clear and simple point: “Nobody is perfect and things go wrong, however hard we try.”

Despite such expert advice and communication as well as the failure to suggest the next appropriate procedure, patients tend to think imaging will always give the answer and is infallible, according to Dr. Jane Adam from London.

Radiologists are infallible, according to Dr. Jane Adam, a consultant radiologist at St. George’s Hospital in London, asks whether human error necessarily equates to substandard care, and suggests that radiologists should try to identify the root cause of errors, learn from mistakes made, and design systems and working practices to minimise them and prevent repeat mistakes happening.

“A radiologist cannot always avoid error, unless we never commit ourselves to an opinion, in which case we are not doing our job,” she emphasised.

Adam thinks that in the case of errors, a culture of openness and clarity – as opposed to secrecy and evasion – may help ameliorate the chances of ill feeling and possibly reduce the risk of a malpractice lawsuit. She also considers patients may have an unrealistic expectation about the accuracy of imaging, suggesting that a well informed patient who understands the reality that imaging may not reveal what the clinician suspects, may be less likely to sue in the case of a mis-diagnosis.

“Patients now tend to be under the impression that imaging will always give the answer and is infallible,” she added.

Adam will also consider the impact of error on the radiologist. She is clear that in the case of a misagnosis or mis-interpretation of an image, invariably this will cause great distress for the radiologist. Other than informal peer support from colleagues, there is not much in the way of a formal support network for the radiologist who has made an error or is being accused of having done so, and the stress can have an immense impact.

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A little knowledge is a dangerous thing. This 18th century English proverb is certainly applicable in the 21st century with respect to the subject of radiation risk from diagnostic imaging. As media from many sources incites the concerns of the general public, patients, and physicians, radiology professionals need to address the subjects of assessment of radiation risk and how to communicate this.

Today’s session will confront this issue with a frank discussion focusing on risks, perceptions, and meaningful dialogues with patients and referring doctors.

Every medical procedure has a risk and a reward. With the extraordinary advances in imaging over the past 20 years, appropriately ordered examinations and radiotherapy treatments offer a much greater evidence-based reward over potential risk. But because no evidence exists to prove that the risk from radiation is zero, it is the responsibility of the profession to keep radiation dose exposure both to patients and clinical professionals who administer imaging examinations as low as possible, as well as the safety of contrast agent administration and MRI scans as safe as possible, emphasises Paddy Gilligan, principal medical physicist at Mater Private Hospital in Dublin.

“Radiology professionals and hospitals need to be continuously vigilant,” he said. “Technological innovations such as automatic exposure control and iterative reconstruction have enabled CT dose to be reduced by up to 50%, but if this technology is not being used appropriately, it is not enabling these procedures to be safer. Dose monitoring software and audits undertaken of the data identify outliers that might otherwise go unidentified.”

In 2007, Ireland launched an Imaging Management Information System, and dose monitoring systems are now in use in all hospitals. After discovering significant variations for the same CT examination, the country has initiated a proactive optimisation programme to standardise procedures and radiation doses. Over time, collection of data from the dose monitoring system will contribute to a greater amount of research that will enable us to move more accurately calculate risks.

Gilligan believes that radiation risks are small, and can be further reduced by optimisation. During the session, he plans to discuss practical steps that radiologists can take today to evaluate patients with respect to risk of a procedure to use quantitative dose information to realistically assess risk, and to convey both risk and benefit of a given procedure to the ordering physician and the patient.

Gilligan, whose career spans 23 years as a medical physicist, has been a member of the Health Service Executive’s National Safety Radiation Committee (NRSC) in Ireland since its inception in 2007. He chairs its population dose subcommittee and its medical physics expert subgroup. The role of the NRSC includes establishing population dose levels, monitoring radiation dose reference levels established by the Irish Medical and Dental Councils, overseeing the safety of imaging modalities in use throughout Ireland, reviewing relevant new clinical risk practices to ensure that exposures and outcomes are in accordance with international best practices, and providing guidance notes and recommendations as needed.

Dr. Erik Briers, an ex-officio member of the board of directors of Europe Union, the European Prostate Cancer Coalition, is convinced that patients are accepting of radiation dose risk when they are well informed. Prostate cancer is not a homogenous disease, and a diagnosis of high, intermediate or low risk prostate cancer offers diverse treatments, many associated with long-term outcomes that are possibly debilitating and even controversial. The more a patient knows, the better informed he will be to understand treatment options offered and their potential outcome, according to Briers.

He encourages more collaboration between urologists and radiologists. “To make a proper diagnosis, patients need the most appropriate imaging procedures. If a radiologist receives an order that is not appropriate, or not the best type to ask for the best diagnosis, it is imperative that he provides consultation to the urologist or other ordering physician. Men suspected of having prostate cancer deserve this.”

They also need to be informed of the benefits associated with procedures that deliver the highest appropriate radiation doses. “I have never heard of a patient with suspected or proven metastatic prostate cancer refusing a PET scan out of concern for radiation. The PET scan enables oncologists to target the treatment. As a result of these findings, they may be able to live a year longer. Similarly, most patients are willing to undergo radiotherapy treatments if it will improve their quality of life in treating their cancers,” he noted.

Briers believes radiologists have the ability to provide expert counsel, and would like to see them become much more visible to patients who undergo imaging. He observed that in Europe, most patients only interact in a radiology department with a nurse or a technologist, and they may feel inhibited asking about the risks of a procedure. Much more education is needed about the benefits imaging offers. It is needed to counter fears about radiation that might be downright inaccurate or not at all realistic, he thinks.

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Dr. Erik Briers, an ex-officio member of the board of directors of Europe Union, the European Prostate Cancer Coalition, is convinced that patients are accepting of radiation dose risk when they are well informed. Prostate cancer is not a homogenous disease, and a diagnosis of high, intermediate or low risk prostate cancer offers diverse treatments, many associated with long-term outcomes that are possibly debilitating and even controversial. The more a patient knows, the better informed he will be to understand treatment options offered and their potential outcome, according to Briers.

He encourages more collaboration between urologists and radiologists. “To make a proper diagnosis, patients need the most appropriate imaging procedures. If a radiologist receives an order that is not appropriate, or not the best type to ask for the best diagnosis, it is imperative that he provides consultation to the urologist or other ordering physician. Men suspected of having prostate cancer deserve this.”

They also need to be informed of the benefits associated with procedures that deliver the highest appropriate radiation doses. “I have never heard of a patient with suspected or proven metastatic prostate cancer refusing a PET scan out of concern for radiation. The PET scan enables oncologists to target the treatment. As a result of these findings, they may be able to live a year longer. Similarly, most patients are willing to undergo radiotherapy treatments if it will improve their quality of life in treating their cancers,” he noted.

Briers believes radiologists have the ability to provide expert counsel, and would like to see them become much more visible to patients who undergo imaging. He observed that in Europe, most patients only interact in a radiology department with a nurse or a technologist, and they may feel inhibited asking about the risks of a procedure. Much more education is needed about the benefits imaging offers. It is needed to counter fears about radiation that might be downright inaccurate or not at all realistic, he thinks.
Active surveillance in the prostate-specific antigen (PSA) era is an important solution to some of the problems of over-diagnosis and over-treatment of patients with low risk prostate disease, according to Prof. Anwar Padhani, consultant radiologist at the Paul Strickland Scanner Centre, Middlesex, U.K.

He recommends MP-MRI before active surveillance for men who have raised PSA as the only unfavourable feature of their disease, and believes that using MP-MRI during active surveillance shows changes in tumour phenotype over time. Padhani thinks MP-MRI can increase the precision of patient selection for active surveillance and minimise the inclusion of higher risk patients and that MP-MRI shows changing tumour phenotype during the active surveillance period.

"Why wait two to three years before the bad patients reveal themselves?" he remarked. "The key to successful implementation of MP-MRI is a combination of good integration, reporting and communication."

Prof. Arnauld Villers, chief of the urology service at Hôpital Claudel Huriez, CHRU Lille, France, is equally concerned about the current imprecise eligibility criteria for detection of prostate tumours. "Only recently has active surveillance inclusion criteria included MRI results, and radiologists’ involvement is crucial for active surveillance indications," he noted. "These criteria are not very accurate, and the issue is how to better identify patients harbouring very low risk or insignificant disease using the current diagnosis pathway."

Expertise and successful outcome in this field requires education and working case discussions with histological results and feedback during multidisciplinary team meetings with urologists and pathologists, but he warns that it takes time to achieve results. Traditional sampling strategies have been based on a lack of understanding of the prevalence of anterior cancers, which is why interventional MRI holds such promise, he added.

"The American Association of Cancer Research plans to discuss the challenges and benefits of initiating active surveillance and how, by using multiparametric (MP) MRI, physicians can increase the precision of patient selection for active surveillance at initial staging."

"Central question here is: Can MRI substitute for early (end of year) or re-confirmatory biopsy in active surveillance patients? Restricted prostatectomy of potential active surveillance candidates have been shown to have unfavourable pathologic characteristics in a substantial proportion, and template biopsies with systematic sampling in potential active surveillance candidates or active surveillance patients (1 year) indicate a 30–40% misclassification rate using conventional diagnostics, he explained. This may be related to the fact that this process has only been established since 2012.

Furthermore, among the challenges of using active surveillance are the optimal selection criteria still are not completely known and the strategies and inclusion criteria vary between hospitals. But MRI addresses these challenges because it offers better characterisation before active surveillance begins, which in turn reduces the initial inclusion of patients with unfavourable pathology. Also, MRI may help in the identification of triggers for definitive therapy during active surveillance – or “picking up the bad players earlier,” as Padhani puts it.

"In many cases, however, the offer of active surveillance is not made as physicians do not fully accept this approach because they do not understand their role in active surveillance and because of its imprecise diagnostic process. Also, patients may not accept active surveillance as an option because they perceive such approaches as ‘being doing nothing’,” adds this to the low adherence to active surveillance protocols and lack of consensus on defining eligibility and identifying disease progression, and it is easy to understand why poor uptake and suspicion of the process of active surveillance is a concern, he explained.

Today ECR delegates will have an opportunity to hear first-hand how active surveillance should be adopted more frequently when appropriate to do so. During his talk, Padhani, who is also a professor of cancer imaging at London’s Institute of Cancer Research, plans to discuss the clinical implications of active surveillance and how, by using multiparametric (MP) MRI, physicians can increase the precision of patient selection for active surveillance at initial staging.

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How best to avoid pitfalls in sports injuries of the knee

Take a closer look at the meniscus when imaging and avoid over- or under-calling common meniscus pathologies. That’s the advice of Dr. Gustav Andreisek, head of musculoskeletal and MR imaging at the University Hospital of Zurich, Switzerland. In particular, portions of the meniscus, such as the roots or the ligamentous attachments of the meniscus to the capsule, are usually missed during reporting, he explained in an interview with ECR Today.

Abnormalities of the meniscus are common, especially in the elderly population. Depending on a patient’s age, meniscal tears have been reported to occur in about one third to one half of patients complaining of knee problems. Andreisek pointed out that a distinction needs to be made between meniscal tears related to an acute trauma and tears second- ary to degeneration. Among those tears related to sports injuries, the most frequent causes include skiing, football, field hockey, squash.

Today he plans to discuss some of the technical issues relating to imaging protocols in order to acquire high quality images of the meniscus; the intermediate portions, but it is also very important to have a close look at the roots of the meniscus. Missing a tear may result in instability. He also pointed out the importance of radiologists using clear language accompanied by a precise description in addition to rating systems to describe meniscal abnormalities. “This is more likely useful for the clinician than any grading system.”

Asymptomatic meniscal tears are also worth noting. A landmark paper by Zanetti et al (American Journal of Roentgenology, September 2003, Volume 181, Number 3) showed that several meniscal abnormalities are frequently found in asymptomatic patients. The authors evaluated the cartilage healthy knee in 100 patients who underwent MRI of a symptomatic knee. It was shown that especially horizontal and oblique meniscal tears are very frequent in the asymptomatic knees, whereas radial, vertical complex, and displaced tears are likely more rele- vant and associated with pain and symptoms.

Andreisek added that it was very likely that those abnormalities/ tears do not have any clinical rele- vance. “These abnormalities need to be considered during image interpretation.”

Continuing the theme of diagnos- tic and therapeutic: challenges, Dr. Simone Waldt, associate professor of radiology at the Technical University of Munich, Germany intends to raise the subject of meniscal instability and osteochondral lesions in her talk, during the same session. In the refresher course, the will discuss standardised imaging methods in order to assess abnormalities that are predisposing for patellofemoral instability, for example, trochlear dysplasia, patella alta, TT-TG distance, rotational deformities of the lower limb and patellar tilt. A typical pitfall in the diagnosis and treatment of chronic instabil- ity is that not all relevant anatomical factors are considered during preoperative planning. “One could suggest the following diagnostic procedures as guidelines in the preoperative assessment: radiographs in two planes, a CT to assess bone abnormalities and the TT-TG distance and MRI in the acute setting,” she concluded.

Abnormalities of the meniscus are often the cause of clinical symptoms, for example, the instabil- ity of the MPFL [medial patellofemoral ligament] should be assessed carefully. This ligament is the most important passive stabil- izer of the patellar joint. The MPFL should be assessed on transverse images,” she noted.

Waldt highlighted that treatment decisions with respect to osteochon- dral lesions [surface lesions] that have a traumatic aetiology and involve both the cartilage and subchondral bone, required that the following key questions should be answered by means of imaging: the integrity of the cartilage over the lesion, the stability of the osteochondral frag- ment and the integrity of the carti- lage of the opposite side of the joint. She also intends to discuss diag- noses and therapeutic options for chronic instability. “It is extremely important to consider that the cause is usually multifactorial, so that ther- apeutically a unilatera approach often does not lead to improvement in symptoms,” she highlighted. “Important factors to consider are trochlear dysplasia, patella alta, TT-TG distance, rotational deformi- ties of the lower limb and patellar tilt.”

“Important factors to consider are trochlear dysplasia, patella alta, TT-TG distance, rotational deformities of the lower limb and patellar tilt.”

A reporting meniscal tears: pitfalls and how I avoid them.

G. Andreisek, Zurich/CH

The collateral ligaments and postero-lateral corner: what are they? why do they matter and how do I assess them?

V. Vasilevskia, Nikolaevskaia, Skopje/MK

The patellofemoral joint and osteochondral injuries: how do I assess and what do I report?

S. Valdres, Munich/DE

ESOR ASKLEPIOS Courses 2015

The established ASKLEPIOS project is tailored toward serving professional development by addressing recognised needs in the context of continuous radiological education. Its programmes include multithematic, organ-oriented, multimodality and multidisciplinary advanced courses, aimed at senior residents, general radiologists, private practitioners in radiology, and allied specialists.

Oncologic Imaging
May 14-15, Sochi/Russia

Multidisciplinary Course
October 1-2, Geneva/Switzerland

Multidisciplinary Approach to Cancer Imaging
October 15-17, Brussels/Belgium

For further information on the detailed programmes and registration, please visit myESR.org/esor
MRI for diagnosis of malignancy in mammographic microcalcifications: a systematic review and meta-analysis

A comprehensive literature review and meta-analysis examining the reliability of breast MRI in assessing microcalcifications detected by mammography

Despite an ongoing debate about the value of mammography in breast cancer screening, the majority of breast imaging experts agree on the fact that mammography saves lives. Mammography does, however, have limitations and can yield equivocal findings, such as those pertaining to lesions associated with scarring tissue, or other ambiguous architectural abnormalities, or those showing up in only one orthogonal view, thus requiring further diagnostic work-up. Furthermore, define lesions that are classified as Breast Imaging Reporting and Data System (BI-RADS) category three (probably benign) and four (suspicious abnormality) are usually selected to undergo ultrasound-guided biopsies (BI-RADS four) or put in short-term follow-up (BI-RADS three). Since the majority of patients with these findings end up having benign lesions only, these patients would greatly benefit from alternative options.

It has been previously shown that breast MRI is a valuable tool for excluding malignancy in equivocal findings that are not associated with microcalcifications. This led us to further explore the much-debated utility of breast MRI in resolving microcalcifications. In this year’s presentation, we run a systematic review and meta-analysis of all studies investigating the use of contrast-enhanced breast MRI for the differentiation of mammographically detected microcalifications. This is an important analysis because mammographic microcalcifications make up nearly one third of all mammographic findings. The relevance of our findings presented at this year’s meeting is further underscored by the very low positive predictive values (PPV) of mammographic microcalcification findings associated with BI-RADS three (PPV range: 27–71%) and even BI-RADS four lesions (PPV range: 20–39%), following stereotactically guided vacuum-assisted biopsy validation.

So can breast MRI be used as a problem-solving tool in breast microcalcifications detected by mammography? The short answer is yes and no. Yes, because several studies reported combined breast MRI specificities and sensitivities of mammography-detected microcalcifications in excess of 90%. No, owing to the substantial heterogeneity of the studies and surrounding political debate. Our findings mirror, in a way, the great divide between MRI enthusiasts who praise the high sensitivity of the method and MRI opponents who refer to the high cost inherent to the procedure. However, if we manage to focus on the patient diagnosed with microcalcifications who would psychologically and physically benefit greatly from a swift non-invasive diagnostic work-up, would it be factually safe to rely on the MRI findings? Thus is the question we set out to answer by analysing all studies published on the topic since 1996 to date. The study revealed that patient selection, study design, and first and foremost, the image interpretation methodology strongly impact yield results. Most importantly, our findings call for more standardised methods and ensuing streamlined protocols, something that would greatly benefit policy makers, radiologists, referring physicians and patients.
Diagnostic ultra-low dose CT with a novel ultrafast compressed sensing algorithm

Computed Tomography (CT) reconstructs 3D images from a number of x-ray projections acquired from multiple angles around the patient. CT results in a relatively large radiation dose compared to conventional radiography, and this is of concern for increasing the long-term risk of developing cancer.

The focus of CT development over the past decade, including iterative CT reconstruction algorithms, has been on diagnostic low-dose CT that maintains spatial and contrast image resolution. Filtered back projection (FBP) is currently the standard reconstruction method, due to its image reconstruction speed and good image quality when many projections are available. However, FBP requires data from many projections to reconstruct a full fidelity image. Therefore, limited-angle CT (LACT) images reconstructed with FBP are of non-diagnostic quality, while LACT is of a great interest in clinical applications for its improved temporal resolution.

The major problem in CS-based LACT reconstruction is that the theoretical conditions needed for CS are not fully satisfied. UF-CS addresses this problem by grouping similar 2D image fragments (i.e. blocks) into 3D data arrays. This helps CS to reveal the fine details shared by grouped blocks and, at the same time, preserves the features of each individual block. Consequently, UF-CS improves the quality of the images reconstructed by CS from a set of incomplete projections.

Compressed sensing-based (CS) CT reconstructions hold great promise for low-dose CT. This is a relatively new theory that enables the recovery of data from few measurements. Using this property, CS reconstructions are capable of reconstructing high-quality images from a substantially smaller number of x-ray projections than needed for FBP, thereby requiring a much lower radiation dose scan protocol. However, CS significantly increases the computational complexity which in turn increases the reconstruction time. At ECR 2015, we present a new ultrafast CS-based CT reconstruction algorithm (UF-CS) that reconstructs diagnostic LACT images from approximately 100 degree projections. This approach decreases x-ray radiation and improves CT temporal resolution simultaneously.

The above images demonstrate the restoration process between image blocks and PPFT using similar 2D image fragments of low-dose LACT images in a few seconds.

**Comparison of LACT images reconstructed with FBP and UF-CS.** Top: an axial CT image from a custom-made coronary plaque phantom. Bottom: in vivo trans-axial CT image of the mid thorax displayed using standard window width (W 1500) and level (L -650). Images are reconstructed by (Left) FBP from 360 degree projections, (Middle) FBP from 100 degree projections, (Right) UF-CS from 100 degree projections.

**Scientific Session: Physics in Radiology**

**Friday, March 6, 10:30–12:00, Room M**

SS1013 Optimisation of patient dose in CT
Moderators: A. Del Guerra; Pisa/IT
A. Kwee/S, Potsdam/DE
H. Pidcock, Mental Health Policy Research Unit, Manchester/UK
H. Petzow, Medical University of Innsbruck, Innsbruck/AT

- Diagnostic ultra-low dose CT with a novel ultrafast compressed sensing algorithm
  S. Hashemi Amroabadi, S. Homampour, N.S. Paul, Toronto, ON/CA

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**BY SAYED MASOUD HASHEMI AMROABADI, SHABNAM HOMAMPOUR, NARINDER S. PAUL**
**Are we overcalling pulmonary embolism and why?**

**Discordance in interpretation of CTPA between general and chest radiologists**

CT pulmonary angiography (CTPA) is widely accepted as the imaging gold standard in the investigation of pulmonary embolism (PE). It has also repeatedly been shown that the majority of clinicians will initiate anticoagulation treatment in the event of a radiologist reporting the presence of PE, regardless of pre-test probability or other clinical factors.

However, as in all other areas of radiology, there will be some discordance in the positive CTPA interpretation, usually due to an array of artefacts that can mimic PE which have been well described over the past 20 years.

This creates the potential for patients needlessly suffering compli- cations of anti-coagulation and falsely being labelled as high risk for thrombosis in the future.

We wanted to audit our practice to determine our own positive rate and the causes for misinterpretation.

As there is no defined reference standard with which an interpreted CTPA can be compared to in order to measure accuracy, we had to create one of our own.

We assembled a three-mem- ber expert panel of experienced subspecialist chest radiologists from specialist centres in Ireland and the USA who would blindly reinterpret CTPAs for the presence of PE. A CTPA was deemed to be positive for the presence of PE would be revised to negative if all three panel members were in agreement.

This rigorous standard has never been employed to date, CTPA diagnostic accuracy in the past and we believe it is the best reference standard that can reasonably be achieved.

We reviewed all CTPAs performed in a calendar year (1997) in a busy tertiary-referral University Hospi- tal. We sub-selected all studies which were reported as positive for the presence of PE (52.8.8%) and these studies were blindly and separately reinterpreted by our expert panel.

The results were alarming as had 69.9% of these studies being rein- terpreted as negative for PE by our panel with a near-perfect inter-ob- server agreement.

Therefore potentially 1 in of all patients diagnosed with PE in our institution in a single year was misdiagnosed.

Cases of suspected misdiagnosis were relatively evenly distributed amongst a staff of experienced, fellowship-trained, consultant radiologists.

The majority of misdiagnosed PE were isolated emboli, located in peripheral segmental or subse- quential pulmonary artery branches. Motion artefact related to breathing or cardiac pulsation was found to be causative for misinterpretation in the majority (33.3%) of cases.

We feel the findings and message of this study are very important for a number of reasons.

Firstly, it highlights the many minims of PE on CTPA and the importance of being aware of these pitfalls, given the willingness of many to accept a positive CTPA as completely diagnostic of PE.

Secondly, as reported rates of CTPA, positivity vary between 11% and 30%, we feel it is highly possible that misdiagnosis of PE is an unrec- ognised, widespread issue.

And finally, there is ongoing debate, with no definitive consensus, over the correct management of isolated subsegmental PEs diag- nosed on CTPA. This study serve as a reminder that some of these 'emboli' may not be present at all.

In conclusion the performed MR examination protocol allows us to detect both small-bowel and colonic involvement in a paediatric popu- lation with Crohn's disease, and supports the MaRIA score as an imaging-based quantitative index of disease activity correlated with endo- scopic and clinical activity indices.

**The role of magnetic resonance enterography in evaluating the activity of paediatric Crohn’s disease**

Magnetic resonance enterography is a non-invasive, inlining radia- tion-free imaging technique that can identify inflammatory changes along the small bowel in the diagnosis and follow-up of Crohn’s disease in chil- dren. Currently, there is no standard-of-care imaging technique that can reasonably be used to support an imaging-based index of disease activity, useful for guiding treatment in paediatric patients.

In the following way a bowel cleansing procedure the day before the examination with PEG solution tailored to patient weight, and 20mg/kg of a solution with a dose of 20mg PEG dissolved in 150ml of water, injected between 10 and 15 minutes before the examination.

This protocol use hydroxybutyl- ronide as an anti-spasmodic agent and gadolinium chelate (0.1mmol/ kg) as intravenous contrast, the MR examination was performed at 1.5T.

The feasibility of this examina- tion is demonstrated by the MR examination’s sensitivity related to terminal ileum and colonic involve- ment of 71% and 99% respectively on a per-patient basis, and 53% on a per-segment basis compared to endoscopy as a reference standard, in a paediatric population of 24 cases. Moreover, small-bowel involvement, except terminal ileum, was detected in 13 patients.

Furthermore, the aim of the study is to support an imaging-based index of disease activity, useful for guiding therapeutic decisions and evaluating the efficacy of the latter on follow-up.

In order to quantify disease activ- ity based on MR examination find- ings, we used the simplified MaRIA score (Magnetic Resonance Index of Activ- ity score, proposed and validated by Rimola et al.), which considers parietal thickness, parietal oedema expressed by T2w signal intensity, relative contrast enhancement and the presence of mucosal ulcerations.

However, we used this in a different manner from the validated study mentioned above, as the values in our investigation related to the colon (ascending colon, transverse colon, descending colon, sigmoid and rectum) were added to the ones related to the small bowel (jejunum, ileum and terminal ileum).

In this study we show a moderate correlation (Spearman correlation r=0.7, p<0.001) between the MaRIA score, calculated for colon and small bowel, and the popular clini- cal index PDAI (pediatric Crohn’s disease activity index).

There was also a good correlation (Spearman correlation r=0.7, p<0.001) between the MaRIA score, calculated for the colon and terminal ileum only, and the simple endoscopic score for Crohn’s disease, obtained by terminal ileum colonoscopy.

In conclusion the performed MR examination protocol allows us to detect both small-bowel and colonic involvement in a paediatric popu- lation with Crohn’s disease, and supports the MaRIA score as an imaging-based quantitative index of disease activity correlated with endo- scopic and clinical activity indices.
CT manufacturers edge towards optimum blend of accuracy and safety

Achieving the right balance between diagnostic quality and public safety is often critical to the advancement of novel CT applications. In the ECR 2015 technical exhibition, leading CT vendors are demonstrating how their latest products can provide greater clinical utility while limiting any potential risks from radiation dose.

Notable among these is Siemens’ Somatom Definition Edge, which has overcome the main drawback of single-source dual energy scanners and will allow this technology to be deployed in routine clinical use.

“What we have been trying to do is close some loopholes in the clinical performance of CT scanners by developing technologies that are not fully explored at the moment and to make them more accessible to a wider range of customers,” explained Jan Freund, head of product marketing for CT.

The problem with conventional dual energy devices is that the data are acquired with two beams used sequentially (fast kV switching), which tends to reduce image quality or the two spectra are separated on the detector side, after the radiation has already passed through the patient’s body. This means the extra morphological information obtained when using beams at two energy levels can only be achieved by increasing the dose.

The company’s twin-beam dual energy system uses filters that split the beam into different energy spectra before it reaches the patient. This provides improved tissue differentiation and defines more precisely the distribution of any contrast medium. The technology can be particularly useful in, for example, identifying a pulmonary embolism or revealing areas because it is so difficult to persuade children to stay still and increase the faster the rotation and the more time to adjust the scanning protocol,” Freund pointed out.

Philips has responded to the pressure on vendors to address potential health risks by introducing the DoseWise portal, radiation dose management software solution, aimed at managing exposure risk to patients and their caregivers.

“This is based on the DoseAware personal monitoring system that measures and displays an individual’s exposure to radiation in real-time. In addition, DoseAware Xray makes real-time dose measurement even more precise and useful in a single display, giving immediate feedback on scattered x-ray dose per procedure to help staff manage exposure, according to the vendor.

Philips describes the software as ‘vendor-agnostic’ and says it can be used with multiple imaging modalities, including CT, mammography, fluoroscopy and radiography.

Meanwhile, GE Healthcare is spinning out three new additions to its Revolution family of high-end scanners. The original product was displayed last year at ECR as a work in progress and has now received its CE mark and has been installed in hospital sites across Europe.

Revolution is ideally suited to the particular demands of cardiac and paediatric imaging, explains Karl Bight, general manager of GE’s Northern Europe medical imaging business.

“This is a very fast scanner with a 0.28 second rotation time, which means that you can do a whole heart scan in a single rotation. So you are unlikely to need beta blockers to slow down the heart rate to get high image quality,” he said. “Speed is also important in paediatric examinations because it is so difficult to persuade children to stay still and the faster the rotation the more coverage that you get then the better the results.”

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Continued from page 17

Hitachi’s Scenaria 128-slice wide-bore scanner has cardiac applications.

Adaptive iterative dose reduction 3D (AIDR 3D) from Toshiba can help to reduce patient dose.

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COMPUTED TOMOGRAPHY
New detector technology improves patient safety

Chair: Prof. A. de Roos, Leiden University Medical Center, The Netherlands
FRIDAY, MARCH 6, 12:30 – 13:30, ROOM C
Safer imaging – clearer outcomes
Jeffrey Hall, Clinical Marketing Manager, Toshiba Medical System Corporation, Japan

New detector technology in clinical practice
Dr. R. Bull, Consultant Radiologist, Bournemout Hospital, UK

Widening the scope of clinical CT applications
Prof Dr. M. Prekop, Head of Radiology Department, Radboud University Medical Center, Nijmegen, The Netherlands

For a complete overview of our educational program please visit www.toshiba-medical.eu/ecr2015

ULTRASOUND CT MRI X-RAY SERVICES
www.toshiba-medical.eu

Revolution Evo is the first in a trio of new scanners, and is designed to meet the demands of busy emergency care centres. It features the company’s new Clarity Imaging System, which it says provides much better spatial resolution over previous generation scanners, as well as the adaptive statistical iterative reconstruction (ASIR) method that can lower dose by up to 80% in patients of all ages, without compromising workflow.

The technology was also developed with one eye on future developments in the field and offers the flexibility for the customers to expand into advanced applications such as trans-catheter aortic valve implantation (TAVI), planning and high heart rate coronary CT angiography (CTCA) as well as examinations in patients with implants.

In addition, GE will be demonstrating the Revolution EVO (Gemstone Spectral Imaging) system intended for use by those centres with a strong interest in spectral imaging. This scanner is designed for use in tissue characterisation and advanced functional imaging.

The third new system is Revolution HD, which can help users achieve their imaging goals with improved efficiency and expanded applications, while delivering diagnostic confidence with lower levels of radiation, the company says.

Toshiba is unveiling Aquilion Lightning, which can safeguard the patient by minimising both their radiation exposure and contrast dose. The key to this is the new PUREVISION detector, which will be available on all scanners in the Aquilion series. This technology is claimed to redefine detector technology, enabling radiologists to reach new levels in high quality but ultra-low-dose imaging with up to 40% reductions in both radiation and contrast. The system also incorporates the company’s next generation iterative reconstruction technique, AIDR 3D Enhanced.

Aquilion Lightning is an environment friendly system which supports a wide range of premium applications like SEMAR to improve visualisation of implants, support- ing bone and adjacent soft tissue. It also has SURESubtraction software which provides unparalled visualisation of vessels and contrast-enhanced tissue-structures. Meanwhile its variable helical pitch allows seamless change of pitch during one continuous acquisition,” explained Hank Zomer, senior manager with Toshiba’s European CT business unit.

A leading attraction at the Hitachi stand is the Supria 64ch CT scanner, which is scheduled to be launched across Europe later this year.

According to a statement from the company, “Supria has a patient-friendly gate-changing 75 cm-wide gantry bore, equipped with newest iterative reconstruction dose reduction technology. It is a high-speed scanner with less than 90s rotation speed and the latest 3D reconstructions that provide rapid coverage for efficient and precise examinations. Supria 64ch only has three system components which makes it very compact and economical.”

Hitachi is also demonstrating a major software upgrade for its Scenaria 128-slice wide-bore scanner. This will provide enhancement in reconstruction speed, real-time image display during scan acquisition, prioritising post-reconstructions and allowing faster multiplanar reconstructions for better workflow, it says.

“ECG Dose Modulation, an additional dose reduction technology for cardiac studies which will complement the existing Cardiac Package and together with Cardio Conductor and Cardio Harmony (as well as unique Hitachi Intelligence Lateral table shift), will make cardiac studies fast, efficient and safe for the patient,” noted a corporate statement.

Choosing and applying an appropriate contrast medium is, of course, critical to achieving the highest diagnostic accuracy with CT. At ECR 2015, Bracco staff are demonstrating their web-based support tool Tailored Protocol Software, available on the company website (Bracco.com). This was developed by a group of expert users and will help radiologists to fine-tune their contrast-enhancing scanning parameters to the needs of individual patients, noted the vendor.
Dedicated to the coordination and support of European research projects, the European Institute for Biomedical Imaging Research (EIBIR) is currently involved in three thriving projects: two projects under the Virtual Physiological Human theme, VPH-PRISM and VPH-DARE@IT, continue to progress towards improvements in the treatment of breast cancer and dementia. Both projects will enter their third project year in 2015. MITIGATE aims to develop and fund under the HEALTH theme, technology to effectively treat patients with metastatic GIST, who are resistant to the currently available tyrosine kinase inhibitors TKIs.

Closed-loop molecular environment for minimally invasive treatment of patients with metastatic gastrointestinal stromal tumours (MITIGATE)

The ambitious four-year project MITIGATE aims to develop and validate an integrated closed-loop process to effectively treat patients with metastatic GIST who are resistant to the currently available tyrosine kinase inhibitors TKIs.

Coordinated by the Ruprecht-Karls-University Heidelberg and EIBIR, six distinguished research organisations and four Small and Medium Enterprises enthusiastically pursue their ultimate goal to develop new protocols and guidelines to effectively diagnose and treat patients with metastatic GIST. The envisaged personalised treatment concept combines innovative strategies for biopsy, inline tissue analysis, molecular tumour characterisation, theranostics by imaging technologies and companion small molecule- or cell-based drugs followed by the assessment of biodistribution, dose calculation and measurement of therapeutic effectiveness. In addition, new concepts of minimally invasive treatment will be applied.

Since MITIGATE’s kick-off in October 2013, the consortium has focused on the refinement of endoscopic biopsy systems, the optimisation of approaches for generation of single cell suspension, the analysis of different GIST cell lines by mass spectrometry IMS-MS for molecular signatures, the development of an innovative, highly immuno-competent mouse model, and the assessment of the first magnetic resonance (MR) perfusion images.

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Golden age of CT may be over but all is not lost

Growth in the global CT market has been restricted by a number of factors over the last five years. The economic down-turn in 2009 resulted in a significant decline, from which many developed markets are only now starting to recover.

Following the rapid succession of new systems offering increased slice technology, many tipped dose reduction to be the next wave of technology innovation to grip the market. There has certainly been a concerted effort to develop radiation dose reduction software and monitoring, with numerous systems refining this technology launched between the period 2012 to 2016. Perhaps more importantly scrutiny over protocols and evaluation of the overuse of CT in many disciplines has had two major consequences; firstly, greater focus on clinical application; secondly, development of systems to streamline patient care.

Three key trends are emerging as key drivers for technology innovation in 2015; automated workflow, scalability and clinical focus.

AUTOMATED WORKFLOW

Unscheduled CT scans from the emergency department account for approximately 40% of all CT scans in the hospital. This means they are largely exploitative and take up valuable time and money. Streamlining patient care in this type of scenario will significantly increase patient throughput and return of investment for hospital providers. Manufacturers have made significant advances in reducing the length of scan in CT exams. It is argued by many now that scan speeds are as short as they can be. To further increase patient throughput, the complete CT protocol needs to be considered. Automated workflow features and pre-programmed standard scans are increasingly seen in new CT systems. Furthermore, integration of CT equipment with healthcare IT systems allows images to be quickly accessed and analysed. This aims to significantly speed up unscheduled and scheduled CT scans, allowing equipment to be utilised by an increasing number of patients. Speeding up the overall protocol of CT exams is vital to offset declining reimbursement for CT equipment, particularly in the developed US market.

SCALABILITY

Across the board market leaders Siemens Healthcare, Philips Healthcare, Toshiba Medical Systems, GE Healthcare and Hitachi Medical Systems are now offering scalable systems. The majority of equipment is available in a number of slice configurations, with the option of virtual scan software to increase analysis and image resolution. This allows the technology to be utilised by a wide range of users in a variety of developed and emerging markets. Furthermore, scalable systems allow multi-national suppliers to develop their installed base in emerging regions. Basic configuration systems can be purchased at lower cost by first generation users. As their requirements develop software add-ons, upgrades and additional features can be purchased. This type of flexibility is increasingly common particularly in the high-cost medical imaging market such as CT where technology from leading manufacturers is desired, but the up-front cost restricts purchasers in emerging markets.

CLINICAL FOCUS

Increased clinical focus is not a new trend to the medical imaging market. CT has shown superior imaging for lung cancer, early detection of cystic fibrosis in addition to cardiac and pulmonary diagnosis. Over the past two years interest in systems tailored towards these specific care areas has intensified. Despite radiation concerns there is a preference for the use of CT over other imaging modalities in these applications. Furthermore, a focus on minimally invasive interventional procedures has also generated attention. Focus and refinement of systems for specific clinical applications that help support physician workflow will enable vendors to experience heightened growth in the developed, saturated markets of the US and Western Europe.

The ‘golden age’ of the CT market is now a distant memory. Manufacturers are today expected to prove the clinical excellence and improved clinical outcomes of their systems to purchasers. Unit shipments of CT systems are projected to increase by approximately 20 percent over the next five years with long term cost savings will be at the forefront of purchasing decisions. Consequently, those suppliers that can develop a portfolio inclusive of scalable, automated and clinically focused equipment will reap the rewards in the long-term.

Nicola Goatman is a senior analyst with IHS Medical Technology. IHS Medical Technology provides high quality and in-depth market research and consultancy services to the medical device industry. Coverage includes medical imaging equipment, clinical care devices, healthcare IT, consumer medical devices, medical displays and wearable technologies.
European radiation protection research on the move

The Multidisciplinary European Low Dose Initiative (MELODI) was founded in 2009 to address gaps in scientific knowledge of the effects of low doses of ionising radiation on humans and the environment, which may have the potential to undermine the robustness and effectiveness of the radiation protection regulatory system. Such knowledge gaps may constitute obstacles to innovation and the improvement of techniques needed to ensure adequate protection of people and the environment, and may be one of the causes of the present lack of consensus in society in Europe in particular; about the optimal conditions for the use of nuclear technology for energy, medicine, research, etc.

MELODI has identified several key challenges which need to be addressed collectively:

1. First, the problem is not only scientific; it also raises issues of the organisation of multidisciplinary research across Europe. To achieve this, an operational plan is needed to integrate the scientific expertise and resources in Europe, with the aim of challenging the knowledge gaps in radiation protection research. The objective is to attract scientists working with new technologies and platforms in order to investigate radiation protection scientific issues and thus stimulate the formation of research teams gathering different disciplines.

2. Second, a holistic scientific strategy based on well established priorities should be developed in order to rationalise research efforts and to enhance the feasibility and success rate of research projects by ensuring that the resources needed are available.

3. Third, a coherent, stable and reliable Europe-wide funding system should be established for a significant period. This system should be competitive and based on scientific excellence, and act as a driver for the implementation of the recognised strategic priorities across the whole spectrum of radiation protection scientific issues.

4. Last, but not least, radiation protection research must also investigate societal aspects of the problem.

The 6th MELODI public workshop, held in October 2014 showed the progress made.

In particular, a Memorandum of Understanding (MOU) between MELODI and sister platforms (radioecology with ALLIANCE; dosimetry with EURADOS; emergency preparedness with NERIS) has brought together the respective communities, not to merge them, but to identify how common actions could benefit them all. Similarly, a few months ago, another similar MOU was signed between MELODI, EURADOS and the five main European medical associations which gather health professionals directly concerned by the use of ionising radiation for medical purposes: EANM (nuclear medicine), ESTRO (radiotherapy), ESR and EFS5 (radiology), EFOMP (medical physicists). Thus, gradually a new radiation protection platform centred on the beneficial use of medical exposure has emerged, with its own priorities consistent with those of MELODI and EURADOS.

A key aspect of the research strategy to be developed hinges on the development of a good consensus on research priorities, and on needs for access to experimental infrastructures or other scientific data (biobanks, cohorts, etc.) as well as training and education resources needed to provide radiation protection research with highly qualified scientists. MELODI now has unique experience in developing such priorities, and assembling them in strategic research agenda (SRA) proposals, which are then discussed and tested in open workshops gathering representatives of the scientific communities concerned. Thus in Barcelona, the sixth version of the MELODI SRA was presented. It is available on the MELODI website www.melodi-online.eu

The further development of future EURATOM calls aiming for a wider range of scientific aspects of radiation protection research and a strategic approach to funding of radiation protection research in Europe. It will also provide reliable and attractive competitive call programmes open to the whole scientific community, including non-EU countries who have arrangements with the EU allowing them to participate (with their own funds) in EURATOM R&D programmes. The progression from the network of excellence instrument (DeReM) to the OPERRA project, which tests new avenues for multidisciplinary open calls, and lately to the proposal for the EJP CONCERT, provides a strong signal to the research communities about the consistent effort currently being made under the Horizon 2020 banner to enhance radiation protection research in Europe over the years ahead. CONCERT will thus gather a majority of European research institutions and universities with a high interest in radiation protection research.

MELODI and the other European platforms work together to deliver a bright future for the research communities concerned with radiation protection science, facilitating advanced research programmes addressing important and highly complex issues with a good chance of success. These associations are open for membership. Please join them to strengthen their actions, and benefit from the influential network they already represent today.
This presentation will highlight current data from the Australian national MDCT DRL survey that demonstrates the dose saving outcomes of applying iterative reconstruction (IR) to standard MDCT acquisitions.

The Australian National Diagnostic Reference Level Service (NDRLS) has been collecting national MDCT dose data since August 2011. To date, a total of over 2,000 compliant surveys have been submitted from over 240 facilities. MDCT scans are broadly stratified by age cohort (baby, child, adult) and anatomical region (head, neck, chest, abdomen-pelvis, chest-abdomen-pelvis, lumbar spine). Adult data submitted to the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), since May 2013, where iterative vs non-iterative scans have been identified, has indicated that the use of iterative reconstruction is achieving dose savings of 20–30% compared with similar non-IR scans in routine practice.

For each compliant survey submitted, a Facility Reference Level (FRL) was computed. Surveys are considered compliant if they include data for at least 10 patients per protocol, however for better statistical precision we recommend that data for 20 patients be entered. The NDRLS survey does not place a weight restriction on selected patient data. The FRL is the median value of the relevant dose index, i.e. the volume Computed Tomography Dose Index (CTDIvol, mGy) and Dose Length Product (DLP, mGy.cm). The median metric value is used as it is a more robust indicator than the mean and less sensitive to outlier data.

The NDRLS database was amended in April 2013 to enable clients to indicate whether or not iterative reconstruction was applied to the submitted set of patient data for a specific protocol. Figure 1 shows the dose reduction achieved with IR for adult scans surveyed as compared with non-IR scans and the existing national DRLs for the same anatomical regions. In broad single figure terms, the use of IR is achieving dose savings of around 20–30% in routine practice.

I invite you all to attend and hear how the introduction of iterative reconstruction has had a beneficial impact on Australian MDCT patient dose.

Anthony Wallace is Director of Medical Imaging, Australian Radiation Protection & Nuclear Safety Agency in Yallambie, Australia.

Data distributions and the impact of iterative reconstruction algorithms from the first three years of the Australian MDCT DRL project (2011–2014)

Top radiologists read more than just images

www.european-radiology.org
This year, the first MIR@ECR session will focus on professional issues in radiology and will comprise a ‘best of’ selection of cutting-edge topics.

After an introduction about the MIR Subcommittee by its chairman Prof. Peter Mildenberger, Prof. Erika Denton, from the U.K., will give a talk titled ‘Update on radiology: a strategy for the future’, which will be followed by Prof. Emanuele Neri, from Italy, who will speak about imaging biobanks, based on his long experience in this field and as chairman of the ESR Working Group on Imaging Biobanks. The next lecture will be an ‘Update on decision support for radiology’, delivered by Prof. Keith Dreyer from the United States. Prof. Sergey Morozov, from Russia, will follow with an ‘Update on social media in radiology’, a topic that was already discussed with great interest at the recent 2014 MIR Annual Meeting in Italy. The first session will be closed by ESR Communications & External Affairs committee chairperson, Prof. Boris Brkljačić, speaking on economics.

The second session is on improving quality and safety in radiology. Dr. Adrian Brady, from Ireland, will present a lecture titled ‘First experiences from a nation-wide peer review in radiology’. The second talk will be delivered by Dr. Peter Cavanagh, from the U.K., on ‘How to organise meaningful audits in radiology’, and last but not least, Prof. David Koff, from Canada, will talk about ‘Errors in radiology: how to learn from a systematic approach’. The session will then be rounded off by a panel discussion on ‘learning from critical situations or errors’. Highly renowned speakers from throughout Europe and North America will discuss their personal experiences and share their expertise with meeting participants, who we invite to actively contribute to our sessions with their own experience and advice.

Both sessions will include enough time for discussion, including participation from the floor; and the break in between will offer a good chance to discuss topics individually or in groups with the speakers or other radiologists.

Find out more about MIR at www.mir-online.org

**MIR @ ECR Session 1**

*Friday, March 6, 13:00–15:00, Room D2 #ECR2015D2*

- 13:00 Overview on MIR activities and why attending MIR conferences
  P. Mildenberger; Mainz/DE
- 13:10 Update on radiology: a strategy for the future
  E. Denton; Norfolk/UK
- 13:30 Update on imaging biobanks
  E. Neri; Pisa/IT
- 13:50 Update on decision support for radiology
  K. J. Dreyer; Boston, MA/US
- 14:10 Update on social media in radiology
  S. Morozov; Moscow/RU
- 14:30 Update on economics
  B. Brkljačić; Zagreb/HR
- 14:50 Discussion

**MIR @ ECR Session 2**

*Friday, March 6, 15:30–17:30, Room D2 #ECR2015D2*

Improving quality and safety in radiology

- 15:30 First experiences from a nation-wide peer review in radiology
  A. Brady; Cork/IE
- 15:50 How to organise meaningful audits in radiology
  P. Cavanagh; London/UK
- 16:10 Errors in radiology: how to learn from a systematic approach
  D.A. Koff; Hamilton, ON/CA
- 16:30 Panel Discussion: Learning from critical situations or errors: examples from around the world
  E. Denton; Norfolk/UK
  J. Jakobsen; Oslo/NO
  U. Senol; Antalya/TR
  J.A. Brink; Boston, MA/US
  C. Kahn; Philadelphia, PA/US
  M. Fatehi; Tehran/IR
  P. Valdes Solis; Marbella/ES
MARCH 7, 2015
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STARTS: 9 PM

ECR 2015

GET YOUR TICKET AT THE REGISTRATION COUNTER, €40 incl. VAT
Pioneer in new imaging modalities receives ESR Gold Medal

In recognition of his pioneering work in novel imaging technology and his dedication to strengthening ties between radiologists in Europe, Professor Claus D. Claussen, from Tübingen, Germany, will be awarded the Gold Medal of the European Society of Radiology at ECR 2015.

Claus D. Claussen is professor of radiology at Eberhard-Karls Universität Tübingen in Germany and was chairman of the department of radiology at University Hospital Tübingen from 1988 to the end of March 2014. He has been director of metabolic imaging at the German Diabetes Center in Tübingen since April 2014.

In 1971, Prof. Claussen graduated from Heidelberg University with a degree in medicine. He later completed a residency in radiology at the University of Heidelberg and worked as a staff radiologist until 1979. During his time from 1979 until 1998 working in the department of radiology at the university hospital in Berlin (since 1990 Charité) he became vice-chairman of the department in 1996 and was promoted to professor of radiology in 1998. He moved to the University of Tübingen in 1998 and served as chairman and full professor of radiology until 2014. He also served as a visiting professor at the Mayo Clinic Rochester in Minnesota, United States.

Over the last four decades, he has been one of the pioneers in developing and introducing new imaging modalities, together with his team, into clinical practice: dynamic-CT (1981), gadolinium contrast MRT (1983), cardiac CT (1999), 3T MRT (2000), whole-body MRT (2001). With a particular interest in MRT/PET, Prof. Claussen has been involved in the development of hybrid MRT/PET imaging technology since 2006, which has major potential in the field of molecular imaging. Over the last ten years together with Prof. Pichler, he has built up one of Europe’s largest and most successful preclinical molecular imaging laboratories in Tübingen.

He has published in a large range of highly regarded peer-reviewed scientific journals, including the New England Journal of Medicine, Nature Medicine, Circulation, AJCC, Radiology and European Radiology. He has also served as a reviewer for Radiology European Radiology and the Journal of Nuclear Medicine. Prof. Claussen also works to support international cooperation, and has served as president of the German Radiological Society and the European Society of Gastrointestinal and Abdominal Radiology’s congress in 1999.

He is president of the Society for Promoting Biotechnology and Medical Technology South-West Germany, Stuttgart, and was chairman of the ESR’s Ethical Compliance Subcommittee. In recognition of his work, Prof. Claussen has received numerous awards and honours, including honorary membership of the Austrian, French, and German Societies of Radiology and ESAR.

“I am happily married with my wife Jutta. We have three children, Cora (26), she is a student at the Charité University Hospital, Berlin, Carla (30), she is a student at the Medical School in Munich, and Consulina (29) received a Business Science degree in business from the University St. Gallen in Switzerland. My personal interests are opera, theatre and art, and I am member of the board of trustees of the state Gallery in Stuttgart. I also love jogging and tennis,” said Prof. Claussen.

BY MICHAEL CREAN

ESR Gold Medal awarded to recipient of novel gastrointestinal and oncologic imaging

In recognition of his long and dedicated service to the European Society of Radiology and his outstanding work in the field of gastrointestinal radiology, Professor Yves Menu from Paris, France, will be awarded the Gold Medal of the European Society of Radiology at ECR 2015.

Yves Menu is professor of radiology and chairman of the department of radiology at Saint Antoine Hospital, Paris. Originally from Dijon in the east of France, Prof. Menu graduated from the University of Paris VI Medical School in 1976, and began his residency in neurosurgery, endocrinology and radiology at the Assistance Publique Hôpitaux de Paris and University of Paris in 1977. He became a board certified radiologist in 1981 and then a fellow at Beaujon Hospital’s department of radiology in Clichy. At Beaujon Hospital, he was promoted to professor of radiology and, in 1990, he was appointed chairman of the department of radiology at Bichat Hospital in Paris. He returned to Beaujon Hospital in 1993 and served as chairman of the radiology department until 2007, when he assumed the post of chairman of Bichat Hospital’s department of radiology and professor of radiology at the University of Paris XI.

Prof. Menu’s main areas of interest are in the fields of gastrointestinal radiology, oncologic imaging and emergency radiology. He has published 130 peer-reviewed scientific articles, 19 book chapters and a book. He has also delivered 200 lectures, presentations and invited talks around the world. From 1992 to 1996, he was editor-in-chief of the Journal de Radiologie, the official journal of the French Society of Radiology, and served as reviewer for other journals like Intensive Care Medicine, European Journal of Radiology, Gastroentérologie Clinique et Biologique, Translational Oncology and Radiology. In 2010, he received the Editor’s Recognition Award from the journal Radiology, for his many years of service as a reviewer, and he is now an associate editor for this journal. He is an honorary member of the RSNA, Tunisian Society of Radiology and the Romanian Society of Radiology.

A long-time and active member of the ESR, Prof. Menu has been committed to advancing the profession and science of radiology. He served as president of ECR 2011 and on many ECR’s Programme Planning Committees. He was also chairman of the Professional Organization Committee and is now the scientific director of the European Board of Radiology (EBR).

“My colleagues made me a wonderful career. It is a career I am committed to advancing and one that I am passionate about. It is a career that I am proud of, and one that I am proud to have been a part of.”

“Needless to say, I am honored. Anybody would be. The ESR is something special for me. While serving this young society, I have been involved in its fantastic scientific and professional achievements. And this was, and remains, an attraction for so many talented colleagues. If I remember one feature, it would be that in the ESR, everyone gives their best to achieve a common goal. And the reason they give so much is that it is so rewarding. I gave a lot, but I received at least ten times more!”

BY MICHAEL CREAN

FRIDAY, MARCH 6, 2015

COMMUNITY NEWS
Dedicated teacher and gastrointestinal expert receives ESR Gold Medal

In recognition of his dedication to international cooperation and relations, as well as his outstanding contribution to radiological education, Professor András Palkó, from Szeged, Hungary, will be awarded the Gold Medal of the European Society of Radiology today at ECR 2015.

András Palkó is chairman and head of the department of radiology at Szeged University Medical School. He is also editor-in-chief of the journal *Magyar Radiológia*. A native of Budapest, Hungary, Prof. Palkó graduated from the University of Pécs in 1974. In 1993, he spent a year working as a senior registrar in Kuwait, and has also visited the United States and Germany during his career. From 1998 to 1999, he served as head of the department of radiology at Pécs County Hospital before becoming chairman and head of the department of radiology at Szeged University Medical School.

A dedicated teacher, Prof. Palkó has received several ‘best teacher’ awards from his students over the years. His main field of interest is abdominal-gastrointestinal radiology, with a special emphasis on oncological and emergency imaging.

Prof. Palkó has been an active member of the ESR for many years and served on the ESRs Board of Directors between 2003 and 2013 and as president in 2012. Since its foundation, Prof. Palkó has been actively involved in the work of the European School of Radiology and now serves as editor-in-chief of the ESR Education on Demand service. He is also a member of the European Society of Abdominal and Gastrointestinal Radiology and currently serves as its secretary-general.

“Being the president and member of the board of directors of the ESR allowed me not only to reach the summit of my career but, even more importantly, to have the opportunity to work together and become friends with so many outstanding colleagues from Europe and worldwide, memories of which I treasure for the rest of my life,” said Prof. Palkó.

During his long and distinguished career, Prof Palkó has published 11 articles in peer-reviewed journals and 31 book chapters. He has also delivered more than 200 invited lectures around the world. He has received widespread recognition for his achievements and contributions to radiology, having previously been awarded honorary membership by the Austrian, French, Irish, Polish, Romanian, and Serbian radiological societies, as well as the Radiological Society of North America.

ESR Journals, European Radiology & Insights into Imaging – Moving up!

During the Editorial Board meeting of European Radiology, which will take place at noon today, Prof. Maximal Reiser will report on his first full year of editorship.

With an increase of 16% in submissions, the journal now receives nearly 2000 initial submissions per year, approximately a fifth of which get accepted for publication. Due to the increased workload and expertise needed to handle all submissions with care and in a timely manner, Prof. Reiser will also introduce a growing team of Deputy Editors, which has been recently joined by Dr. Sujal Desai from London, U.K., who will be handling submitted manuscript papers.

Another highlight will be the presentation of the 2013 ESI Impact Factor, which rose up to 2.336. This means an increase of around 6.8 points compared to the previous year, and places the journal at rank 13 out of 121 journals listed in the radiology, nuclear medicine and molecular imaging section.

Reiser will further report on the journal’s various promotional activities, as well as on the first Albert L. Baert Editorial Fellow Dr. Giulia Zamboni’s visit to Munich and Vienna (read an interview with Dr. Zamboni in Sunday’s edition of ECR Today). In 2015, the Editorial Fellow will be Dr. Ryan Shulman from Harefield, U.K.

At the end of the meeting, the most cited papers published in 2012 (and subsequently cited in 2013 and 2014) will be awarded. These papers were ‘ESUR prostate MR guidelines 2012’ (Barentsz JO, et al.) followed by ‘CT image quality improvement using adaptive iterative dose reduction with wide-volume acquisition on 320-detector CT’ (Gabius J, et al.) and ‘Model-based iterative reconstruction technique for radiation dose reduction in chest CT: comparison with the adaptive statistical iterative reconstruction technique’ (Katzenstein A, et al.).

The European Radiology Editorial Board meeting will be followed by the Insights into Imaging Board meeting, hosted by Prof. Robert Herman. Insights into imaging will proudly announce that it has reached the 190,000 full text download mark in 2014, an impressive increase of 32% compared to 2013. Three papers were published on behalf of the ESR in 2014, including the most recent ESR publications: Renewal of radiological equipment (Sept. 2014) and International Summit 2014: Organisation of clinical ultrasound in the world (Nov. 2014). Prof. Herman will also present some editorial statistics, and at the end of the meeting he will hand over the awards for the most downloaded papers in 2014: ‘Bowel wall thickening at CT: simplifying the diagnosis’ (Teresa Fernandes, et al.) and ‘Insights into Imaging’ (Chiara Martinesi, et al.) and ‘Image in otoclerosis: A pictorial review’ (Bela Purohit, et al.).

By Michael Crean
By Norbert Hosten

Be creative on tech assessment, DRG president urges

Dr. Michael Forsting, president of the German Radiological Society (DRG) from 2011 to 2013, set out his views on the future of radiology, linking the concept of medical imaging with references to ‘viable interconnections.’ On the one side is the doctor practising his or her profession, and on the other side is the infinite potential of interconnected archives. These, I think, are the two poles between which our specialty moves.

The extremely short innovative cycles in our specialty have caused some areas of radiological science to mutate into something which you could provocatively term a ‘best drive’ for the latest models in the equipment industry. Each generation of equipment can do more than its predecessor did, and each generation produces more beautiful images. But to what end? How does the patient benefit? Radiology, as a related specialty, has an even tougher task. ‘Survival’ or ‘duration of recurrence-free survival’ is the criteria by which the success of radiotherapy can and must be measured.

Our specialty is caught in a dilemma. Radiology even interventional radiology is so closely bound to the entire process of treatment, to the patient’s entire case history that it is difficult to assess the influence of individual radiological procedures in a scientifically honest manner. The indicators of radiation oncology do not apply. That’s the first part of the dilemma.

As for the second part of the dilemma, today’s developed societies are, as a rule, not prepared to pay more for medical care and health, along with health management, is perceived as a cost factor, as an exorbitant profession item in ancillary labour costs. According to this view, medicine is not about consumption, it’s about production, and precisely what that means. Innovation can only be achieved through readjustment or redistribution.

Techniques like PET/CT and PET/MRI are famous examples of innovations that doctors and patients value very highly and which benefit the patient, but that authorities do not reimburse. The main reason the costs are too high. The argument put forward is that there is no evidence for these methods.

**BIG DATA: A NEW ROUTE TO EVERYTHING**

The classic proof of causality in clinical medicine is the randomised prospective clinical trial, preferred in the English-speaking world and since implemented globally. This is difficult to achieve in radiology for the reasons described above.

Medical images are available digitally and so are theoretically available globally, but their scientific evaluation is impeded by some things that I would call ‘difficulties.’ Every department has MRI studies of rare bone tumours, but there is no index that would allow access to all the rare bone tumours that are now archived in our facilities, even though this is exactly what is needed to provide evidence that a contrast-enhanced MRI examination or diffusion-weighted imaging leads to longer indicators of survival than an unenhanced MRI.

Big data shows us how mammography also does, insofar as it is summarised in the screening. Despite all the difficulties involved in defining it with scientific accuracy, the value of this method for patients and healthy women, the patient numbers on which the present publications are based, are absolutely unique. This is not the case with any other indicator or modality.

The people whose data we use must give their consent, of course. Data protection must be guaranteed and we need ethical approval for each individual trial. Here, we, as medical professionals, rise above commercial factors.

**COORDINATION IS THE MAGIC WORD**

The Academy of German Trauma Surgeons has an impressive collection of clinical data on patients who have suffered accidents in Germany. In the past few years, they have started to facilitate the exchange of radiological imaging data. Not all of us have been happy about this. Many of us have technical preferences which we very much want to see implemented. This is, of course, our right.

This raises one question: shouldn’t we use the opportunities to access this treasure trove of clinical information and imaging data that we actually helped to create? To this end, the DRG has entered into a cooperation agreement with the German Society of Trauma Surgery to allow shared scientific access to these resources. This is a rocky path to tread. But wouldn’t it be fascinating to conduct a study of 50,000 accident victims to investigate whether the 30,000 people examined with state-of-the-art CT had better survival rates than the 20,000 examined with older machines? Isn’t that an objective that makes collaboration with our clinical colleagues worthwhile?

The vast amount of imaging data will first have to be sifted. Anybody who has prepared 30 examinations for a receiver operating characteristic (ROC) analysis knows how difficult this is to achieve in everyday clinical practice. How should these vast quantities of data be evaluated? Are digital evaluation procedures really the only option?

Here again, the general realities of life in our society offer possible solutions. People are prepared to commit themselves to causes they believe to be worthwhile. Thousands searched the satellite photos of the Indian Ocean available on the Internet, for free, to look for debris from the missing aircraft MH 370.

The task of searching through radiological images for a single well-defined criterion is no more complex. Our epidemiological colleagues have developed training and quality algorithms. What is to stop us making 100,000 CT images available on the Internet and asking the radiological community to look for polymorphic calcifications, round foci, or ‘flame signs’ on the neck vessels of patients whose data we have used?

Perhaps we could offer this to our 100,000 reporting workstations in Germany.

Radiology as a technology-based discipline has a great opportunity to exploit the potential of new scientific participation in ways which have only been touched upon here. One could, in this note, look forward to exchanging views about these prospects with you.

More information about the German Radiological Society can be found at www.drg.de.

Editor’s note: This article is an edited version of a translation of an interview carried out in German and published online on 1 May by the DRG. Translations by Suzanne Tansman & Interpreting. The edited English translation originally appeared on AuntMinnieEurope.com.
BY MAREK SASIADEK

ESGAR offers large range of educational opportunities for 2015

The current term (2013-2016) of the Polish Medical Society of Radiology (PMSR) Board, which included Marek Sasiadek as president and Andrzej Umbarik and Marek Stajgo as vice-presidents, has been very active so far, with many new initiatives.

The PMSR keeps a uniform structure, covering all subspecialties. We do not have subspeciality or modality societies, but there are subspecialty sections of the PMSR, which have a great deal of autonomy. We believe it makes us stronger in negotiations with government institutions and other medical specialties.

The PMSR holds a large radiology congress every three years. We had a very successful congress in 2013 in Warsaw (3,120 attendees, 27 foreign invited lecturers), and we are now preparing the next congress in Krakow, which will take place in 2016. Meanwhile, our sections organise multiple annual conferences and educational courses (about 25 each year), including the Polish School of Radiology, School of MR, as well as annual interventional radiology, CT, tomography and mammography workshops.

Recently, we changed the regulations of the PMSR’s scientific awards to encourage our members to improve the quality of their scientific work. Now there are three awards: an annual award for the best publication in the Polish Journal of Radiology and an award for the best overall publication record during the three-year period between PMSR congresses.

The quality of scientific work of Polish radiologists has improved markedly, which is reflected by international scientific awards. The most prestigious in recent years was Prof. Małgorzata Szczepaniak-Trojanowska obtaining honorary membership of the RSNIA in 2013. Besides that, Dr. Joanna Bladowska was awarded by the ESRH for the best neuroradiology oral presentation in 2013. Dr. Anna Zimny received the first award of ECR 2014 for the best oral presentation on MR imaging for new opportunities to improve the quality of abdominal radiology through education and innovation.

On November 6-7, the joint ESGAR/EUROG (European Society of Gastrointestinal and Abdominal Radiology) meeting will take place in Warsaw, Poland. The programme is very promising and new features were introduced. For the first time, there will be two different postgraduate courses on the first day of the meeting, addressing MRI of the abdomen and ‘Oncoimaging’ - the best protocols, functional tools, interventional procedures and ‘cookbook’ advice will allow radiologists to lead patient-oriented innovation in healthcare. The Research Centre, promoting adequate methodology, and School of ESGAR, following the European Training Curriculum for radiologists, are also major innovations in our meetings. The Annual Meeting 2015 will offer everyone a very rewarding experience with interactivity at the educational, scientific and cultural level.

More information about ESGAR can be found at www.esgar.org

Prof. Marek Sasiadek is President of the Polish Medical Society of Radiology.
TOP TIPS for trainees and teachers

BY CHRISTIANE NYHSEN

PART 3: Management in radiology

WHY TRAINEES AND JUNIOR RADIOLOGISTS SHOULD BE INTERESTED

You’ve read past the headline; congratulations! Management is really not as boring as many radiologists may think, and there are also many interesting projects to consider for radiology trainees, which really can be done in every clinical setting, as Prof. Peter Mildenberger from Mainz, Germany, explains below. He is the current chairman of the Management Subcommittee of the ESR and chairman of the Management in Radiology (MIR) Annual Meeting held every autumn, so he is the best person to give you further insights!

ECRT: I am a radiologist; do I really need to know anything about management? Which different aspects does management cover?
PM: The term ‘management’ might be misleading if someone is thinking about financial issues as the only or main aspect. Management covers a lot of different professional issues, including leadership, education, mentoring, communication, radiation dose monitoring, quality and safety in radiology.

ECRT: Are there any suitable conference, courses or qualifications for trainees or junior radiologists, which would look good on their CVs?
PM: The ESR is offering a half-day session at the ECR today from 13:00 to 14:30 in Room D (see page 23 for details of the session). This year there will be updates on several relevant issues and also a dedicated session on quality and safety. The ESR is also organising the Management in Radiology (MIR) Annual Conference, which is linked with a postgraduate course. High-level speakers from Europe and abroad will present there and will be available for individual discussions. Regarding the CV, there is the European Diploma in Radiology Subcommittee. Chair of the ESR Radiology Subcommittee.

ECRT: Do you have any advice on possible audit or research project topics that may be suitable for a poster, presentation or even publication locally, nationally or internationally?
PM: There are many potential topics for research projects, which are suitable in many different places, such as outpatient practice, and smaller or large hospitals. Examples would be:
- Optimizing the justification process for imaging requests
- Dose optimisation and radiation dose registers for improving imaging protocols (see also the ESR EuroSafe Imaging campaign)
- Introducing a CIRS (critical incident reporting system)
- Communicating unexpected or urgent findings
- Peer-review system (quality of reports, checking for errors, double reading parts of reports, etc.)

ECRT: Where could I learn more about management in radiology? Are there any journals or websites you could recommend?
PM: Besides the MIR website, which offers access to different information and presentations from past meetings, there are different journals, which cover professional issues.

ECRT: What level of recommendations for further and follow-up imaging according to guidelines?
PM: In my understanding, it is very important for young radiologists to have broad expertise in many different clinical areas, followed by some subspecialization to keep up with our referring colleagues and offer an excellent clinical radiology service. But there are also a lot of professional issues worth thinking about, because these are relevant to improving the quality in imaging, reporting, communication, etc., and to providing better service to our patients (see also the ESR Training Curriculum for Radiology).
JASPER JOHNS: REGRETS

AN EXHIBITION AT THE BELVEDERE

Jasper Johns, Regrets, 2013, Courtesy the artist
© Bildrecht, Vienna, 2015, Photo: © Jerry Thompson
With Jasper Johns: Regrets, the Upper Belvedere is presenting not only one of the most important and multifaceted American artists but also premieres the artist’s most recent body of work, developed over the last year and a half, and gives visitors the chance to see one of the most important series in Jasper Johns’ contemporary work. The exhibition features around 30 works, including two paintings, sketches and prints. Each of the two paintings is titled Regrets. This title is developed from a stamp that Johns had produced about five years ago, in order to swiftly decline the stream of requests and invitations that he frequently receives. Enlarged as a screen print, the words on the stamp appear in the top right corner of the two paintings, serving both as the artist’s signature and as the work’s titles. In June 2012, Johns discovered an old photograph of the young artist Lucian Freud in an auction catalogue. The photograph, part of a series taken around 1964 by the British photographer John Deakin, shows Lucian Freud perched on a bed, one arm raised to obscure his face in an introspective gesture. Jasper Johns was not only inspired by the scenery but also by the damages the image had suffered over the years. In the following months, the image became the starting point for his Regrets-series, where he takes the image through a succession of numerous permutations.

“I am especially delighted that with the Regrets series by Jasper Johns the Belvedere is able to vividly show the artist’s pioneering artistic practice as one of the main representatives of American post-war modernism,” Agnes Husslein-Arco, director of the Belvedere and zaer Haus, states. “His most recent series, which is based on the painterly graphic and print graphic processing of one single photograph, refers to the intertwine between everyday life and classic artistic expression so characteristic for his work. This is also what created his canonical position in art history. The exhibition therefore links history with present, which is a central goal of our interventions,” Husslein-Arco adds.

The Regrets series takes the image of Freud through a succession of cross-medium permutations, including small pencil sketches, a set of four ink-on-plastic drawings, and two prints, each presented along with a variety of preliminary states. But Johns not only incorporated the photograph of Freud into his work (most often doubled by its mirrored image), but also the physical qualities of the original black-and-white print, which Freud had extensively torn and creased in the course of his studio practice. A loss on the original photograph, for example, plays a prominent role in the composition throughout the series, creating a dominant dark form in the centre foreground. A large-scale watercolour, also titled Regrets, obscures the image nearly into abstraction, exploring the theme in yet another way. This series lays the importance of process and experimentation, the cycle of dead ends and fresh starts, and the incessant interplay of materials, meaning, and representation so characteristic of Johns’ career over the last ten years. This is a significant opportunity to see one of his most important series of contemporary works. Having emerged as a leading voice in American art in the late 1950s with paintings of iconic motifs such as flags, targets, and numbers, Johns has since developed a body of work of extraordinary narrative complexity and technical virtuosity. During his career, Johns has created some of the most important and compelling works of modern times.

This exhibition, Jasper Johns: Regrets is based upon one originally organised by The Museum of Modern Art, New York and organised by Christoph Heinrich, Ann Temkin, and Ingrid Langton. The Belvedere is the third iteration of Jasper Johns: Regrets – parts of it were presented at the Courtauld Gallery in London – and is the first major solo exhibition in Vienna since his retrospective of prints at the Vienna Secession in 1987.
**WHAT’S ON TODAY IN VIENNA?**

### Theatre & Dance

<table>
<thead>
<tr>
<th>Location</th>
<th>Performance</th>
<th>Theatre/Performance Details</th>
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<tbody>
<tr>
<td>Akademietheater</td>
<td>18:00</td>
<td>Die Schneekönigin by Hans Christian Andersen</td>
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<tr>
<td>Burgtheater</td>
<td>20:00</td>
<td>Bel Einbruch der Dunkelheit by Peter Turrini</td>
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<tr>
<td>Rabenhof</td>
<td>20:00</td>
<td>Sekundenschlaf by the Viennese actor and vaudevillian Andreas Vizjak</td>
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<tr>
<td>Schauspielhaus</td>
<td>20:00</td>
<td>Das Gemeindekind by Anne Habermehl and Gerald Reich</td>
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<tr>
<td>Tanzquartier Wien</td>
<td>20:30</td>
<td>300 el x 50 el x 30 el</td>
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<tr>
<td>Theater in der Josefstadt</td>
<td>19:30</td>
<td>Liebelei by Arthur Schnitzler</td>
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<tr>
<td>Vienna’s English Theatre</td>
<td>19:30</td>
<td>Venus in Fur by David Ives</td>
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<tr>
<td>Volkstheater</td>
<td>19:30</td>
<td>Die Physiker by Friedrich Dürrenmatt</td>
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### Concerts & Sounds

<table>
<thead>
<tr>
<th>Location</th>
<th>Performance</th>
<th>Details</th>
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<tbody>
<tr>
<td>Konzerthaus (Classical Music)</td>
<td>19:30</td>
<td>ORF Radio-Symphonieorchester Wien, conductor Ernst Theis, Wiener Singakademie, chorus K. Weill: The Ballad of Magna Charta, Down in the Valley</td>
</tr>
<tr>
<td>Musikverein (Classical Music)</td>
<td>19:30</td>
<td>Wiener Symphoniker, conductor Philippe Jordan, Camilla Tilling, soprano F. Schubert: Symphony No. 6, G. Mahler: Symphony No. 4</td>
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<tr>
<td>Porgy &amp; Bess (Jazz)</td>
<td>20:30</td>
<td>Akkordeonfestival Karl Edenia &amp; Peter Havlicek (Austria) / Yuri Lemeshev &amp; Pamela Stickney (Russia/US)</td>
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<tr>
<td>Arena (Alternative Music)</td>
<td>19:00</td>
<td>Donuts (Germany)</td>
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<tr>
<td>Szene Wien</td>
<td>20:00</td>
<td>Schweta Ewa</td>
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### Opera & Musical Theatre

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<tr>
<th>Location</th>
<th>Performance</th>
<th>Details</th>
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<tbody>
<tr>
<td>Volksoper</td>
<td>19:30</td>
<td>Die Hochzeit des Figaro by Wolfgang Amadeus Mozart</td>
</tr>
<tr>
<td>Wiener Staatsoper – Vienna State Opera</td>
<td>19:30</td>
<td>I Puritani by Vincenzo Bellini, conducted by Marco Armiliato, With Jongmin Park, John Tessier, Carlos Álvarez, Olga Peretyatko</td>
</tr>
<tr>
<td>Raimundtheater</td>
<td>19:30</td>
<td>Mamma Mia! by Benny Anderson &amp; Björn Ulvaeus</td>
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<tr>
<td>Ronacher</td>
<td>19:30</td>
<td>Mary Poppins by Richard M. Sherman &amp; Robert B. Sherman</td>
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*Please note that all performances, except at Vienna’s English Theatre, are in German.*