After many years of intense lobbying, claims, and counter claims about early research on MRI, the Nobel Committee for Physiology or Medicine must have thought they had resolved the issue in 2003, when they presented the prize jointly to Dr. Paul Lauterbur, a chemist from the University of Illinois, Urbana, U.S., and Prof. Peter Mansfield, a physicist at the University of Nottingham, U.K., for their discoveries related to the modality.

According to Dr. Morton Meyers, a radiologist and historian from East Setauket, New York, U.S., there should have been a third recipient of the award: Dr. Raymond Damadian, founder of the Fonar Corporation. “On one level, it (the sidelining of Damadian) illustrates the vindictive retaliation of an entrenched community … when it is challenged and the weaknesses of peer review and of the integrity of award processes,” he said in the Samuil A. Reinberg Honorary Lecture.

Comments from the audience are exceptionally rare after such lectures, but as soon as the applause for Meyers died down, Prof. Peter Rinck, chairman of the European Magnetic Resonance Forum and president of the Council of The Round Table Foundation, strutted to the microphone with obvious intent. “You should get your facts and then talk,” he said, adding that Damadian had plagiarised earlier work by Dr. Erik Odeblad from Stockholm, Sweden, who should have received a Nobel Prize for medical MRI because in 1955 he published the first medical nuclear magnetic resonance (NMR) studies, including relaxation time measurements, of living cells and excised tissue.

Meyers responded that with any new advance, there are numerous antecedents that sometimes go back decades. “Your point is well taken and I understand the issue you’re raising, but to my mind this further represents the difficulty the Nobel committee faces in apportioning due priority and credit,” he said.

During the lecture itself, Meyers cited other cases of scientific misconduct and incorrect behaviour. “Let us ponder here in conclusion a few fundamental questions: What are the main factors that determine the attribution of priority and credit? Is it the one who first conceived an idea, who first uncovered the potential of a new observation or finding? Or is it the one who recognised the pattern and meaningfulness in order to establish it as an advance? Or is it the one who develops and nurtures it to bring to everybody’s benefit?”

FACEBOOK QUOTE OF THE DAY

An awesome experience… My first ECR… A complete intellectual feast… Interactive imaging sessions are THE BEST… The Gold Medal Ceremony was inspiring & humbling… The Best conference I have ever attended till date. Kudos to the team… Looking forward to more”

Priyank Gupta

FAVOURITE TWEETS ABOUT ECR 2014

“Congratulations for the way #ECR2014 is enhancing and improving radiology education and learning”

elizondomemo

The long-running and hostile dispute over who should receive credit for the invention of clinical MRI resurfaced during Sunday’s Honorary Lecture.

After many years of intense lobbying, claims, and counter claims about early research on MRI, the Nobel Committee for Physiology or Medicine must have thought they had resolved the issue in 2003, when they presented the prize jointly to Dr. Paul Lauterbur, a chemist from the University of Illinois, Urbana, U.S., and Prof. Peter Mansfield, a physicist at the University of Nottingham, U.K., for their discoveries related to the modality.

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Radiologists saddle CT as 'workhorse' for evaluating complications after surgery

For suspected late post-operative complications in the abdomen, CT can provide swift and accurate diagnoses in what may be life and death situations. Such a diagnosis by radiologists is vital for the choice of therapy route, whether this is conservative treatment or emergency surgery, delegates heard at Sunday’s session on GI tract imaging.

"To ensure high quality visualisation, investigations with CT should include two injections of intravenous contrast with a sixty second delay between each, but no oral contrast. In addition datasets should be thin sections which can then undergo 3D reformatting," said Dr. Luís Curvo-Semedo from Coimbra, Portugal.

"Usually the colon is at the periphery of the abdomen. Instead you will have the small bowel at the periphery of the abdomen," he said.

"Strangulation, twisting both of the bowel loops and of the vessels themselves will be accompanied by signs of ischaemia – a thickening of the bowel wall. There may also be diminished enhancement of the bowel wall, and signs of necrosis which include gas in the bowel wall and in the portal and mesenteric veins."

"In the case of immediate complications following GI procedures, surgeons were concerned with knowing whether or not they would need to re-operate. It was not only imperative for radiologists to know normal and abnormal appearance post-surgery but also the key interventional management in case of complications according to Dr. Damian Tolan, consultant radiologist at St. James’s University Hospital, Leeds, U.K.

"Post-operative CT is very difficult and you have to make it as easy for yourself as you can use your best scanner. Don’t use the old single- or four-slice scanner. You need the all-singing all-dancing 64- or 128."

"With strangulation, twisting both of the bowel loops and of the vessels themselves will be accompanied by signs of ischaemia – a thickening of the bowel wall."

"An open mind is necessary when you are looking at patients with CT. Every patient’s nightmare of undergoing surgery only to have foreign material left in the body from the procedure, proved a lively part of the lecture on post-surgery imaging presented by Prof. Michael Maher, consultant radiologist at Cork University and Mercy University Hospitals, Cork, Ireland. Accidentally left material, as well as that deliberately left by surgeons, often unnoticed, such as Surgical, features specific radiological signs but needs careful interpretation."

"Surgical, for example, presented as a low attenuation 'gran' on CT with punctate, often peripheral gas that could be misinterpreted as abscesses. However, it is a constant enhancement, and is visualised as hypointense on T2-weighted MRI compared to abscesses which are hyperintense."

"Mashe might be hard to discern, depending on their composition. Interventions coils and clipped gallstones could also yield confusing radiological features that erroneously might suggest bullet wounds or caustic injury."

"When you see peculiar things, consider foreign bodies or a haematotic agent," Maher said. "We should never treat an ‘image’. We should dissect the case with the surgeon and correlate the clinical findings before a major decision is made."

"When you see peculiar things, consider foreign bodies or a haematotic agent," Maher said. "We should never treat an ‘image’. We should dissect the case with the surgeon and correlate the clinical findings before a major decision is made."
Clinical acceptance of ultrasound elastography remains astounded by worries over operator dependency

Deep concerns persist over the operator dependency of ultrasound elastography, judged on a heated discussion at the end of Sunday’s Special Focus session about imaging of thyroid nodules.

“Strain elastography is a very operator-dependent technique because you have to do the compression,” noted Dr. Kunwar Bhuta, from the department of imaging and interventional radiology, the Chinese University of Hong Kong, a member of the audience.

“The challenge may be less operator-dependent because it gives you quantitative metric. However, we’ve just done some recent work and even with quantitative method is it an operator-dependent,” he said, adding that in some recent studies involving over 700 nodules, very poor results have been reported for strain elastography.

He added that the amount of compression that applied on the thyroid gland and alter the stiffness of the nodule, but operator dependency remains a bigger issue that needs to be addressed, he said from the floor: “How easy is it to perform? What was the learning curve like? How operator consistent is it in your hands?” he asked the speakers.

“In strain elastography, because you are manually compressing and because the degree of compression alters the image, there’s a learning curve,” replied Dr. Andrew McQueen, a consultant radiologist at Freeman Hospital, Newcastle-upon-Tyne, U.K.

“There’s no doubt that your view of elastography changes as you increase your experience. It’s not a case that you’re simply passively observing, you are actually actively producing the image.”

At the Freeman, there are three operators who deal with high volumes of patients, and one of them has handled far more cases than anybody else. “If you are an expert operator doing high volumes, there is a good evidence that you get better results. The problems are due to variations between different observers,” he said.

In his lecture, McQueen showed how B mode ultrasound can identify key anatomic features and signs to predict malignancy accurately. He explained why specific findings of benignity with high negative predictive value should be left alone, technical factors are key considerations, and indeterminate nodules remain the challenge. Ultrasound elastography can measure and display tissue elasticity to assess lesion stiffness; soft nodules are extremely likely to be benign, while hard nodules may be malignant, he concluded.

According to session moderator and opening speaker Dr. Steve Colley, consultant head and neck radiologist at the Queen Elizabeth Hospital in Birmingham, U.K., it is important for radiologists involved in regular thyroid nodules ultrasound to develop an understanding of just how common thyroid nodules are, and of the relevant statistics relating to nodules, thyroid cancer, and the impact on over treatment of thyroid nodules – both terms of cost and patient autonomy, and morality.

“We clearly need to be familiar with the ultrasound features of thyroid nodules, namely the appearances of benign leave me alone nodules, appearances that strongly suggest malignancy, which nodules we can’t classify, and what are the various guidelines regarding management of these nodules,” he said. “As radiologists, we also need to be clear in our minds about the importance of our own reports and images, in order to set as the benchmark of thyroid imaging.”

Incidental thyroid nodules carry a massive potential cost to hospitals, yet the majority of these are benign. Focal Fluoodeoxyglucose (FDG) activity on PET/CT, however, has high associated malignancy rates and should be followed up in the absence of disseminated malignancy, Colley remarked.

The final presenter, Dr. Francesco Campony, a consultant radiologist from Valencia University Hospital, Spain, spoke about fine needle biopsy (FNB) of the thyroid nodules.

He emphasised that FNB is indicated according to the nodule ultrasound findings, the relevant guidelines, and multidisciplinary team discussion. Begin with non-aspiration, and if the needle does not stain, change to aspiration until the needle stains, he recommended. The aim is to stain the needle, and you should properly immerse the sample in the slide glasses. Cytological classifications from the Bethesda group should be used to determine the management of the nodule. After a second non-diagnostic FNB, the next step will depend on nodule size, ultrasound findings, clinical history, and multidisciplinary discussion.

Radiology trainees get to grips with emergencies

Emergency radiology (ER) in the night shift can be a tricky setting for radiologists of all ages and experiences, but it is particularly difficult for beginners in the specialty.

Radiologists carrying out emergency imaging should beware of what they see. According to Kosta Petrović, assistant professor at the Clinical Center of Vojvodina, Medical Faculty in Novi Sad, Serbia, who shared advice during the Radiology Trauma Forum on Sunday morning.

“My suggestion is to first see if the image corresponds to the patient. And do not make decisions without prior consultation,” he said.

Before they start in ER, trainees should learn the radiological signs of potential malignancy of the patients they may present with.

One of the biggest problems in the ER setting is the lack of time; trainees have no time to consult the internet or a book for back up. Conversely, signs given as examples in the literature may be very different from what they see. “Signs are not the same one day or five days after the illness, sometimes the situation changes within hours. It’s very important to know what the gap is between the beginning of the illness and the time of the examination,” he said.

Sometimes the pathology is there but it is poorly visualised. “For instance, you sometimes can’t clearly see early brain ischaemia. In this case, just change the window and observe the lesion in different windows,” he recommended.

It may be necessary to change the modality as well. Sometimes, no matter how hard we try, we are technically unable to show what the patient’s problem is, so we need to employ another imaging modality,” Petrović said. He gave the example of a patient with trauma, whose CT report stated possible mild haemorrhage without any other detectable lesion except thick brain architecture. Whereas the MR scan revealed huge extra axial fluid collection on both sides of the brain. “You have to know that blood in certain cases has a very similar density as brain on CT, and that every change in brain architecture has been taken very seriously,” he said.

Patients may also have multiple diseases at the same time, which may or may not be related to each other.

Petrović also advised the audience to consider infection, which can be become life-threatening if not treated in time. “Don’t think that a lesion on the brain is necessarily a tumour or ischaemia, it can be infection. It is valid for other parts of the body as well, the neck for instance.”

Furthermore, he recommended thinking “outside of the frame” and to image other parts of the body and be aware of technical pitfalls, which can lead to the wrong diagnosis.

Radiologists should also call the referring physician if they have a problem with urgent trauma, and when they notice that a tube is misplaced.

“Look at the pathology from different directions. Sometimes the lesion you see is so huge that you don’t see or think of checking for other lesions. For instance, always try to find acute aortic trauma in a case of blunt trauma,” he said.

Finally, he advised the audience to make a correct diagnosis fast and not to forget complications of the diseases. “Sometimes you don’t have time for complicated diagnostic procedures. Sometimes the complexity of injuries is so severe and there is so little time that any delay in your work is unacceptable,” he said.

In another talk, Dr. Alan Luciani from Université Paris Est Créteil, Faculté de Médecine, France, explored the potential of hybrid imaging in the detection and characterisation of hepatocellular carcinoma, a topic of the Forum since it is not in practice yet.

“It’s actually awkward to think of multiple hybrid imaging when dealing with HCC because detection and characterisation of HCC is confirmed,” he began, referring to the use of multiphasic imaging with CT or standard MRI, followed by venous or delayed phase washout.

“Hybrid imaging proves useful in the prognosis of the patient rather than just diagnosis. MR/PET or PET/CT may provide very useful information, for instance on tumour aggressiveness and other biological and metabolic phenomena.
Hot Shots
from Day 4
Receiving the certificate of achievement, the society’s president, Prof. Carlos Rodríguez Treviño, told delegates that it was an honour for the two societies to work together and that Mexican radiology had come a long way from its humble beginnings in 1926 in a downtown restaurant in Mexico City as demonstrated by its choice of lecture on state-of-the-art oncology imaging.

Keen to discover how Mexican radiologists intended to keep interventional radiology in the hands of the specialists, ECR President Prof. Valentin Sinitsyn took advantage of the panel discussion to ask about the relationship between Mexican radiologists and the country’s oncological colleagues.

“This is a key question. If we don’t understand what oncology and the patient need, and if we don’t assume our clinical responsibility then obviously other specialties will have to do this. This is the case with vascular radiology,” noted Dr. Guillermo Elizondo-Riojas, from the department of radiology, University Hospital (UANL), Monterrey, N.L., Mexico, who presented a talk on the impact of interventional radiology on cancer patients and noted good relationship existed between both disciplines.

“I would have to say that 99.999% of my patients are referred by oncologists or surgeons,” said Elizondo-Riojas, who underlined that both parties tried to help each other. “I make very clear to the patient that his or her doctor is the oncologist and I am just a consultant.”

Pursuing further insight on Mexico’s standard of care, Sinitsyn asked whether in imaging the more informative MRI ever took precedence over contrast enhanced CT.

“Can we skip CT and go straight to MRI? It’s a provocative question but I’d like to hear your opinion,” he asked.

Speaker Dr. Luis Antonio Sosa-Lozano, a cardiac radiologist at the National Institute of Cardiology Mexico City was not thrown by the query. “Now with hepato-specific gadolinium contrast agents, the information we can get from MRI is more powerful than from CT. However, it ultimately depends on the availability of the study as some hospitals in Mexico only have CT,” he explained.

Delegates also wanted to know how reimbursement worked in Mexico. Whether there was reimbursement for each procedure, and whether tissue sampling for drug trials was growth opportunity in the country.

“Reimbursement is an issue. We get reimbursed very badly from companies for what we do. In Mexico we don’t have clear CPT (current procedural terminology) codes for reimbursement especially in interventional radiology,” Elizondo-Riojas said.

News of radiology first hit Mexico’s shores in 1896 followed shortly by the arrival of the first x-ray machines that according to speaker Prof. Dr. Miguel Vergara in 1926 at the early fee (£2.50) to the late fee (£5.50) for the sixth time with the creation of the Mexican Federation of Radiology and Imaging (FMRI) which comprises 25 regional societies including the SMRI.

The current Society of Radiology (Sociedad Mexicana de Radiología e Imagen – SMRI) was founded in 1967 followed in 1974 by the creation of the Mexican Federation of Radiology and Imaging (FMRI) which comprises 25 regional societies including the SMRI.

As part of its ESR meets programme, the European Society of Radiology yesterday extended its embrace to Mexico’s Society of Radiology, thereby recognising the ‘North American country’ for its outstanding contribution to radiology.
New ESR President wants to draw national societies closer

ECR Today spoke with incoming ESR President Professor Lorenzo Bonomo about his vision for the year to come.

ECR Today: What are your plans and ambitions regarding your presidency?

Lorenzo Bonomo: It is with great pride that I take on the presidency of one of the most important and prestigious international scientific societies in the world. I am also particularly pleased that my presidency coincides with the ESR’s tenth anniversary, which will be celebrated next year.

So much has been done over the past few years thanks to the work of my predecessor, the Executive Council, the statutory committees, subcommittees, working groups and the tireless and efficient support of the ESR staff. Many of the objectives in our Radiology Initiative have been achieved together with other new important projects, started during Prof. Guy Frijlink’s presidency, and we will be his duty to consolidate and bring them to a conclusion. Among them are the development of a clinical decision support system in Europe, the creation of an accreditation council, and a strengthening of relations with other scientific societies in Europe and the EuroSafe Imaging Campaign. The whole learning-accreditation training field certainly requires close attention and a collaborative vision.

I would also like to draw the national societies closer, by intensifying dialogue with them to understand their needs, and helping them to promote and increase the visibility of radiology.

I hope that these initiatives will be followed by political developments between countries and therefore, aging the training of young people in a world where migration is increasing, by intensifying dialogue with them to understand their needs, and helping them to promote and increase the visibility of radiology.

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Molecular advances begin to contribute to personalised medicine

Molecular imaging of cancer patients is a dynamic and exciting area that underlines how radiology can contribute to personalised treatment. At today’s Refresher Course, three eminent researchers in MRI, ultrasound, and PET will provide a glimpse into the future by discussing the latest innovations in molecular imaging.

Prof. Fabian Kiessling, professor and chair of Experimental Molecular Imaging at Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen University and his colleagues are conducting research using microbubble ultrasound contrast agents for molecular imaging ultrasound. They have developed and undergone preclinical testing of a new radiotracer that is intended to be used in the treatment of breast cancer. The radiotracer targets a peptide receptor that is overexpressed in breast cancer cells. The team is hopeful that this new radiotracer will provide a more accurate and sensitive method for the detection and monitoring of breast cancer.

Prof. Wolfgang A. Weber is as excited as the other speakers about the potential of MRI for molecular imaging in oncology. He believes that targeted ultrasound can be used to improve the diagnosis and treatment of cancer. He is particularly interested in the development of new contrast agents that can improve the specificity and sensitivity of MRI. In addition, he is interested in the use of MRI to guide surgery and to monitor the response to treatment.

Dr. Matthew R. Mallon is excited about the potential of PET for molecular imaging in oncology. He is particularly interested in the development of new PET tracers that can target specific proteins in cancer cells. He believes that these new PET tracers will be able to provide more accurate and sensitive imaging of cancer than the current PET tracers.

The question is how to get out of this vicious circular argument. Unfortunately, regulatory agencies have not created guidelines for clinical trials to prove diagnostic accuracy and because of this, many imaging agents are not being developed or undergone preclinical testing. This is a huge problem because if nothing can be done, patients still want to know what their options are. The key is to change the mindset of the regulatory agencies to recognize the importance of PET radiotracers and to establish realistic guidelines that make economic sense for pharmaceutical companies. This is a huge challenge because regulatory agencies are not always willing to listen to the needs of patients and doctors.

The size and complexity of multinational clinical trials that are needed are so costly that pharmaceutical companies are not trying to commercialise new radiotracers for clinical use and if they did, the cost to a patient might be in the thousands of euros rather than a few hundred euros. This inflated cost due to clinical trial expenses will not be reimbursed. Weber thinks it would be unlikely.

There are many radiotracers that look very promising in single studies, but nobody has the courage to move ahead. This is a vicious circular argument. There is a lot of uncertainty with respect to demonstrating to the U.S. Food and Drug Administration and to European regulatory agencies as well as to insurance companies that new imaging agents should be approved and should be reimbursed for use in the general population. That, I think, is the key problem, he emphasised.

The question is how to get out of this situation. It will be necessary to change the mindset of the regulatory agencies to recognize the importance of PET radiotracers and to establish realistic guidelines that make economic sense for pharmaceutical companies. This is a huge challenge because regulatory agencies are not always willing to listen to the needs of patients and doctors.

There are many new PET tracers that work better than ones in clinical use in defining the progression of disease. For example, imaging agents for brain tumours. If in addition to being able to identify in real-time if a therapeutic treatment is working, and if it is not being able to immediately make changes, these new radiotracers also are very accurate in defining a patient’s prognosis, knowledge about prognosis and the stage of a disease is something that many patients value,” Weber said. “If you work in a cancer treatment centre, this desire is obvious. For many cancer patients with advanced disease, a PET scan using new radiotracers can more accurately identify how severe the cancer is, and what the odds are for a cure. This information helps a patient assess the risk of a treatment, its odds of success, and its cost. Even if nothing can be done, patients still want to know this.”

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Elastography is an emerging tool that enables tissue elasticity to be estimated in a non-invasive manner. Combined with ultrasound or MRI, it can be used in many clinical applications, including liver disease and oncology. It is now important that every radiologist learn about these methods if they are to truly benefit patients, experts will argue today during a dedicated Special Focus session at ECR 2014.

Ultrasound elastography (USE) and magnetic resonance elastography (MRE) have made their way into clinical practice, mainly for staging liver fibrosis and discriminating tumours in breast, prostate and ovaries.

The session will deliver an overview of these techniques, their physical principles, technical requirements, as well as the influence of various factors on results. Moreover, according to the session chairman Andrzej Paweł Wieczorek, associate professor of radiology and director of the Department of Paediatric radiology at the Medical University of Lublin, Poland, “Following this session, the audience will have an insight into clinical applications of elastography in liver, prostate and brain diagnosis. The strengths and weaknesses of elastographic modalities will also be compared and discussed under consideration of more established imaging modalities,” he said.

Dr. Sabine Bensamoun, a researcher at the National Centre for Scientific Research, has worked extensively on the development of MRE and USE in the liver and skeletal muscle tissues. She will focus on the assessment of liver stiffness with elastography techniques during the session.

One major advantage of MRE is that it can replace biopsy in treatment monitoring, she pointed out. “Radiologists and hepatologists want a less invasive technique to diagnose the stage of the fibrosis and to follow patients under treatment. We aren’t going to perform a biopsy every time we want to check the effects of therapy on a patient because it would be too invasive and dangerous,” she said.

In addition to anatomic images, MRE offers phase images, which reflect the functional properties of the liver. Based on these images, radiologists can obtain maps of stiffness, which indicate where the fibrous areas, represented by stiffer tissues, are located in the organ and how big they are. “This information is very useful in recognising whether treatment is working or not, radiologists can determine if the stiffness of these areas is back to the normal level, and if not, suggest a change in therapy.”

“In many ways, elastography is an advanced version of palpation, providing local measurements and material stiffness that correspond to the region to be examined. They can then measure the mechanical response to the pressure, thus reproducing the clinician’s manipulation. To do so, MRE uses an active driver, located outside the magnet, room, which generates continuous low-frequency vibrations.

Biospy remains the gold standard in treatment follow-up, but it is very local. However, MRE enables anatomic maps of the whole tissue to be obtained. Another advantage of MRE is that it can, through phase images, detect the presence of very small tumours that are barely visible on an anatomic image.

Last but not least, MRE allows the assessment of the viscosity, another potentially important piece of information in treatment follow-up. “Using stiffness maps, the radiologist can extract parameters of both elasticity and viscosity. Elasticity or stiffness will give you information about the global structure of the tissue, but viscosity will focus on what’s inside the liver. Looking at viscosity will give you information regarding internal changes in the liver. Viscosity is not a parameter used in clinical practice and in the future we will see the relevance of this parameter,” Bensamoun said.

The limitations of MRE use include technical failure in patients with hemochromatosis and iron overload conditions because of signal-to-noise limitations. False-positive results may also occur due to an increase in liver stiffness without the presence of stress in pathological processes such as inflammation, hepatic congestion, and vascular abnormalities.

If the patient is claustrophobic or has a pacemaker, the clinician will refer the patient to USE rather than MRE. Strain, shear wave, transient and acoustic radiation force are the main techniques in ultrasound elastography (Strain USE—also described as compression elastography, some-times elastography or real-time elastography) — as far as the most commonly used method. In order to carry out a USE examination, radiologists need to have dedicated software on a conventional higher-class ultrasound scanner and the transducer must also be compatible with the software.

“USE has many advantages over other methods of tissue elasticity estimation, as it is a low-cost, fast and non-invasive system, and has the potential for wider clinical availability. It provides information on tissue stiffness, which complements and is independent from the acoustic impedance and vascular flow information provided by B-mode and Doppler imaging, thus opening a new dimension in diagnostic imaging,” Wieczorek said.

However, USE analysis is much more local than MRE. Unlike MRE, USE only offers a shallow wave depth, so it is not recommended for obese patients because the wave will have trouble propagating itself. Finally, owing to a lack of standardisation and limited research, USE in its current form remains a highly subjective technique.

Besides liver imaging, quite extensive applications in the diagnosis of brain, testicles and lymph nodes have been reported as well. There are many other directions, which are not well established yet, such as arterial wall/thrombotic plaque characterisation, muscular/skeletal applications, diagnostics and evaluation of thrombosis or graft rejection of vascular transplanted organs and others, according to Wieczorek.

Both MRE and USE are gaining in popularity among radiologists, not only for the study of surgical organs, but also for the examination of deeper organs such as kidney. USE is increasingly used through an endoscopic approach, for example for pancreatic lesions, and MRE is currently under investigation in the heart, brain, skeletal muscle and kidney.

Future challenges lie mainly in developing the technology to overcome current technical difficulties, presenting the results in a more objective and unified way, and widening the current range of indications for more organs. Wieczorek hopes that the session will serve this purpose, by showing the achievements of elastography techniques and their potential for more applications. “In many centres, these techniques are still recognised as more appropriate for scientific purposes than useful clinically. But USE and MRE can be used in differential diagnosis, mainly discrimination malignant from benign focal lesions, and to obtain a more precise diagnosis of neurologic diseases, as well as avoid biopsies and other invasive procedures. It is our aim to propagate the idea of elastographic imaging, so that it is not only used in university and research centres but also by practising radiologists as part of routine diagnostic algorithms,” he concluded.

New results in MRE and USE should encourage the use of elastography
DBT is based on a full-field digital mammography (FFDM) platform. The x-ray tube moves through a pre-scribed arc to capture two-dimensional reconstructions of the breasts, which are reconstructed into a stack of 1 mm slices and the radiation dose is about the same, or slightly higher, than FFDM. The most important advantage of DBT is the elimination of superimposed issues, which improves detection of lesions otherwise hidden by dense breast parenchyma. "I have seen many interesting problems caused by overlapping tissues," said Prof. Per Skaane, from the radiology department at Ulleval University Hospital in Oslo, Norway. DBT improves sensitivity and specificity in women with dense breasts, and is superior to FFDM in tumour size assessment and mass visibility and cancer conspicuity. It is also superior for the detection of speculated masses and architectural distortion. DBT is comparable with FFDM or FFDM with mammalcalifications. The potential to improve sensitivity and specificity is of interest, particularly for breast cancerI-screening. An open question is whether DBT should be an adjunct to mammography in clinical workup, as well as in screening," he noted. "We need to be aware that most of the patients who breast radiologists would prefer to have 2D images for comparison with prior exams; for comparison right-left breast, and for supplying other institutions by request. Consequently, I do not think we should wait for DBT to replace FFDM." Studies so far clearly indicate that two-view DBT is superior both regarding sensitivity as well as specifity, but a challenge with "corporate mode"—including 2D/FFDM plus 3D (DBT)—is in standard views is a doubling of the radiation dose, Skaane explained. A solution is the implementation of synthetic 2D images reconstructed from the 3D dataset of the synthesised images are created by summing and filtering the stack of reconstructed DBT slices. Using synthetic 2D allows "corporate mode" to be implemented in screenng with the same radiation dose as for conventional 2D.

I think the synthetic 2D views make the really important "breakthrough" for breast cancer screening," he added. "We have hoped for this tool for many years, which means more interpretation time. But that has changed now. The latest BISNA, the increase in reading time from 30 seconds (FFDM) to 60 seconds (FFDM-DBT) must be weighed against the significantly higher cancer detection and the significant improvement in recall rate." MULTIPARAMETRIC HIGH-FIELD MRI

Multiparametric MRI is a rather new type of highly accurate 3D imaging, which is increasingly used to descriptor the combined use of multiple parametric MRI methods—i.e., MRI sequences able to obtain quantitative data (although it often remains semiquantitative), according to Dr. Pascal Baltzer, an associate professor in the radiology department at Medical University Vienna. The methods are diffusion-weighted imaging (DWI), MR spectroscopy (MRS), dynamic contrast-enhanced MRI (DCE-MRI) as well as T1/T2 mapping, magnetisation transfer imaging, quantitative susceptibility imaging, diffusion tensor and kurtosis imaging, intravoxel incoherent motion imaging and more. Usually, multiparametric MRI refers to DWI, MRS, and DCE-MRI and is most used in breast uing.

"Multiparametric high-field MRI carries the inherent promise of quantifying, in vivo, the metabolically active lesions, according to Dr. Thomas Wagner, a consultant in nuclear medicine at the Royal Free Hospital in London. Fluorodeoxyglucose (FDG) is the most commonly used tracer, and it's a glucose analogue breast carcinomas demonstrate increased glucose consumption and the intensity of the uptake has been correlated with prognosis, hormonal receptor and HER2 status, Ki67, and nodal involvement. "PEM is still a research tool at this stage," he commented. "In the future, it may help to stage the disease locally, characterise breast lesions better, provide early assessment to neoadjuvant chemotherapy, and help target biopsy." Further developments and trends include the use of new tracers such as fluorothymidine, which can assess proliferation: and has shown to be of interest in early assessment of response to chemotherapy. Fluoro-eradiology is another new tracer and has the potential to image oncogene receptor status in vivo, he said. Wagner said he was excited about the technology because PEM-guided biopsy has the potential to target the most metabolically active lesions, which could help decide on the most appropriate treatment. Also, the fusion of PEM images with other breast imaging modalities such as MRI and mammography may also contribute to better patient management and increase diagnostic accuracy.
The use of structured radiology reports and report template technology remains controversial and divides opinion. Proponents praise structured reports for improving clinical clarity, consistency, and understandability by referring physicians.

The technology helps increase the efficiency of a reporting radiologist and can help improve overall report quality. Opponents express concern that its use will eliminate the professional knowledge and value conveyed in an individually dictated report and reduce a report’s specificity. They also fear that templates will be cumbersome and inefficient to use. In such speech recognition-driven templates, the technology has been slow to be adopted.

This year could be a pivotal one for structured reporting. In January, a team of experts prepared a library of best-practice radiology reports recorded its 1,000,000th view/download. The development of an Integrating the Healthcare Enterprise (IHE) profile for report templates has created a standard, and the ESR has launched an ambitious campaign to support and expand the RSNA initiative throughout Europe. Many imaging informatics professionals believe 2014 will mark an acceleration of report template adoption from a snail’s pace to a steady march towards ubiquity.

Today’s Special Focus session will address the technical and clinical challenges that need to be understood and planned for to facilitate the technology’s use and make it beneficial to patients, healthcare professionals, and ultimately patients themselves. The RSNA library is now known as RadReport, and the ESR initiative to expand it will be discussed at the ECR session.

A structured report utilizes a format that provides a consistent order for its contents. Structured reporting systems contain templates correlated to the type of examination being reported. Each template includes categories of information that should be reported, functioning much like a checklist. Each template offers a menu of standard terminology to describe techniques and findings.

The terminology may be provided by the software, or may originate with the radiology department. For each of these categories, a prepared, template language selected allows for modification and augmentation based on the customisability permitted by the software. Such terminology is most efficiently used with speech recognition-driven dictation systems. This way, terminology can be used with traditional dictation, with references to template language macros added by traditional transcriptionists.

Prof. Charles Kahn, professor of radiology at the Medical College of Wisconsin and chief of its Division of Informatics, has been a longstanding proponent of intelligent use of structured reporting. As a founder member of the RSNA Structured Reporting Subcommittee that began a project in 2007 to identify and promote excellence in reporting by preparing best-practice report templates for commonly ordered exams in 21 specialty categories, Kahn has worked diligently to make these known to radiologists throughout the world.

The RSNA established the subcommittee to evaluate and develop reporting systems, processes and tools that would enable radiology information to be captured, stored and presented in a clear and consistent format.

In 2009, the first tangible efforts of the RSNA Structured Reporting Initiative were published with an online free library of 10 best-practice templates based on the recommendations of more than 100 experts from 22 radiology specialties. There are more than 20 reports located at www.radreport.org.

Kahn served as chair of the RSNA Structured Reporting Subcommittee. He has also been a member of the ESR’s eHealth and Informatics Subcommittee for four years.

“We want to share the work we’ve done with our ESR colleagues. The goals of this RSNA initiative are to improve the quality of radiology reports, promote the use of best practice guidelines and increase the productivity of radiologists. Reports prepared in a consistent format using some form of standardised terminology can be aggregated and analysed more readily. Today there can be advanced data-driven healthcare,” he told ECR Today.

At the session today, Prof. Jelle O. Barentsz of the radiology department at Radboud University Nijmegen, the Netherlands, will discuss the value of using structured reports for prostate cancer exams. He will explain how it can facilitate research and quality assurance programmes and allow for comparison of inter-observer variability in the decision process.

“One of the most important recent accomplishments for structured reporting has been the creation of the IHE Management of Radiology Report Templates (MRRT) profile. This profile creates a standard that we didn’t have before. Now we have a technology that allows the RSNA library of templates to be freely accessed by the vendor community, easily adapted and used,” noted Kahn. “The subcommittee is now in the process of converting the English language templates into this HTML-based format, which will allow them to be viewed using a web browser. Additionally, our template library is designed to accommodate the world’s variety of languages, which I think has stimulated the interest of the ESR.”

Prof. Osman Ratib, head of the Division of Nuclear Medicine and Molecular Imaging at the Hôpitaux Universitaires de Genève, Switzerland, is chairman of the ESR Health and Informatics Subcommittee.

“The ESR has launched a call for participation to all European national societies and subspecialty societies to nominate delegates to help us,” he said. “With their assistance, we hope to collect large numbers of report templates to convert into a structured format based on the IHE MRRT profile. Our goal is to involve as many specialists as possible to join this project, provide their expert opinions, and review the new proposed templates.”

So far 49 representatives from 34 countries have joined. The initiative will also include new templates and translations of both the existing RSNA templates.

“I think it is very important that templates be translated into the major languages of Europe in order for them to be adopted and used. Translation will also reinforce the use of consistent language,” said Ratib, who adds that at a minimum, translations should be available in French, German, Italian, Russian, and Spanish, and ideally also in Czech, Danish, Finnish, Hungarian, Norwegian, Portuguese, and Swedish.

Dr. Mansoor Fatehi, director of the Medical Imaging Research Center in Tehran, Iran, believes that offering templates in native languages to radiologists is important. He said that members of the Iranian Society of Radiology of which he is currently secretary general, have translated some of the most popular RSNA report templates into Farsi. However, he noted that there are some important differences in Farsi and Arabic compared to other European languages, including right-to-left order for indexing issues and different shapes of letters in different situations within words. Most PACS do not support Arabic or Farsi languages, and there is no consistent way to change Farsi words into Latin words.

“What is going to be very important for adoption is that practice patterns and work habits define the structure and content of the templates,” he told ECR Today. "Templates will need local modifications in addition to translation. For example, reports tend to be a bit shorter in Iran.”

Fatehi said that template-based structured reporting can lead to unnecessary long reports that are not welcomed by either radiologists or referring physicians. He believes in modularity structured reporting where the templates can be dynamically built according to clinical needs.

At today’s session, he will discuss technical challenges in the development of structured reporting systems, including user interface, database structures, and output file and documentation problems. There are different options for user interfaces in the design of structured report systems. The data entry interface may consist of a set of pull-down menus. On the other hand, the interface may be designed as a point-and-click system to graphically localize the region of interest and then describe the features. Integration with speech recognition systems offers voice commands, but it is expected that the technical challenges also will be available."
Interventional radiology (IR) is a rapidly growing subspecialty, and more and more diseases can now be treated with endovascular procedures. These techniques can, for instance, be used in the treatment of atherosclerosis, post-traumatic lesions and neoplasms; three diseases associated with a high mortality.

Ultrasoundography should be the first-line imaging method, Szczero-Trojanowska recommended. “It is a widely available, safe and inexpensive modality, but it demands experience and knowledge of endovascular treatment methods and their potential complications. Usually during the first year after angioplasty and stenting, the patient should come for an ultrasound control after six months and then once a year,” she said.

For stenting grafting of aortic aneurysms, regular follow-ups are necessary to identify changes in aneurysm size, graft patency graft migration and endoleaks. The frequency and methods used to accomplish this goal are topics of debate. “Traditionally CT angiography plus plain radiographs were performed at one, three and six months post-procedure and yearly thereafter. Now, angiography is recommended after one and two months after stent graft placement. If no endoleak is found and there is clear shrinkage of an aneurysm, colour Doppler sonography may be sufficient as a follow-up imaging method,” she said.

Endovascular treatment is generally successful, and its effectiveness is increasing, thanks mainly to technological development of new devices, catheters, guide wires, stents, balloons, embolecision materials. The effectiveness of ilio-femoral recanalisation is now almost at 100%, and the same applies to carotid and subclavian arteriopathies, according to Szczero-Trojanowska.

For common complications, such as an erroneous interpretation of the atherosclerotic plaque or atheromatous or pseudoaneurysm formation at the attachment site of the stentgraft, a contrast injection under ultrasound guidance is indicated. The session will present many other treatment options, including restenosis, mechanical thromboembolism for distal embolisation, and stenting for dissection, mechanical thromboembolism for thrombosis and surgical embolecision for distal embolus that can occur immediately after angioplasty or stenting. For restenosis, a complication that can happen at a later stage, angioplasty performed with drug-eluting balloons can bring good results.

In addition to detecting complications, follow-up imaging enables treatment response in patients with neoplastic diseases to be controlled. Josef Ignacio Bilbao, professor of radiology and head of Interventional radiology at the Navarra University Hospital in Pamplona, Spain, will present the various strategies used to image oncological patients after embolisation procedures.

“Until we always evaluate immediately before and follow-up and then, depending on the established protocol, every three months or every year. CT is good for both morphological and functional response, because the uptake of contrast in the tumour enables to assess both a decrease in size and functionality. MRI is increasingly important because it offers significant functional information about the evolution of the necrotic tumour tissue. PET/CT is also used in some cases, as it enables morphological and functional assessment,” he said.

Chemoembolisation and radioembolisation are almost exclusively used for treating primary liver tumours and metastases in the liver, but there are also indications in the kidney, lung and bone. Functional assessment in treated tumours is all the more important considering that it may take months for a tumour to shrink, whereas one can assess functionality after a few weeks. “In the clinical scenario, to decide optimal treatment for the patient, you cannot always wait for months, you must act quickly. So you need to assess tumoural activity very early,” said Bilbao.

Studies to detect the response of tumoural biomarkers are ongoing. Results should complement morphological response criteria, which sometimes fail to predict outcome. “If you have a picture of the particular activity of a biomarker on a tumour, you need to prove that this functional response is effective, because this is an important predictor of survival. Tumour response must be associated with survival, otherwise this is just a picture,” he said.

The future Beyond the Response Evaluation Criteria for Solid Tumours (RECIST) lies in the personalisation of response assessment, according to Bilbao. “It is not the same as for radiofrequency, in which you burn the tumour, or embolisation, which may imply necrosis by vascularisation, or angiointerferonics. The way to understand response must be, if possible, personalised to every kind of therapy. It must be an association of both morphology and function,” he said. To prove this point, he will present delegates with the results obtained with modified RECIST (mRECIST) in hepatocellular carcinoma and the methods that have been established for some specific treatments, such as targeted therapies, at the end of his presentation.
If you consider all the most commonly encountered entities and different diagnoses, you could easily fall into the same trap as scientists did a long time ago. It took a long time, until Pierre Louis’s assertions that bloodletting was not good for cholera were accepted, which was routine practice in post-revolution Paris. Even if we think we have mastered one job, we have to become pupils in the next and strive to keep up to date, to learn what is best practice today. A couple of decades ago, an ideal imaging algorithm might have looked different. And we have to guarantee that what we learn today will still be considered best practice in 20 or 30 years.

Like in real life, we have to make a choice of how we spend our time at the congress, what we want to listen to, in which field we would like to deepen and update our knowledge. And this year it is not going to get any easier to find out in which of the nearly 20 rooms per session ‘radiology is happening’. Monday, March 10 gives us the opportunity to get to know another session type. After four days of the congress, when our minds are buzzing with new information and different entities and differential diagnoses, you could easily get drowned in the huge number of slides. At the same time, it is a good chance for general radiologists to get a simple update on subjects outside their usual field and everyday practice, thus preventing us from recommending the radiological equivalent of bloodletting for cholera.

If you are looking for a transition zone between scientific and highly academic courses and everyday practice, you should feel comfortable in the Case-Based Diagnosis session and will hopefully find the interlude on visual illusions amusing. Joy and good humour facilitate healing, but should also help you to memorise lessons of practical use to you and your patients.

Case-Based Diagnosis Training
Monday, March 10, 12:30–13:30, Studio 2014
Moderators: K.M. Friedrich, Vienna/AT
S. Robinson, Vienna/AT

- Neuro
  - D. Prayer, Vienna/AT
- Maxillofacial
  - S. Robinson, Vienna/AT
- Musculoskeletal
  - F. Saul, Vienna/AT
- Liver
  - L. Marti-Bonmati, Valencia/ES
- Breast
  - M.H. Fuchs, Graz/AT

Presentation and award of the most stunning submitted visual illusions
Monday, March 10, 14:00–15:00, Studio 2014
Moderators: M. Toepker, Vienna/AT
W. Schima, Vienna/AT
K.M. Friedrich, Vienna/AT
C. Czerny, Vienna/AT
M.H. Fuchs, Graz/AT
L. Marti-Bonmati, Valencia/ES
S. Robinson, Vienna/AT
D. Prayer, Vienna/AT

Case-Based Diagnosis Training – Part II
Monday, March 10, 14:00–15:00, Studio 2014
Moderators: K.M. Friedrich, Vienna/AT
S. Robinson, Vienna/AT

- Head and neck
  - C. Czerny, Vienna/AT
- Chest
  - H. Pruch, Vienna/AT
- Spine
  - K.M. Friedrich, Vienna/AT
- Gastrointestinal
  - W. Schima, Vienna/AT
- Genitourinary
  - M. Toepker, Vienna/AT

Is bloodletting good for cholera? Why we need evidence-based radiology

The ECR offers basic courses for those who want to consolidate their fundamental knowledge. It facilitates multidisciplinary exchange and improves interaction.
Increasing efficiency and patient safety are top priorities for all radiologists, especially because many of them are feeling the pressure of a steadily increasing number of patients having imaging examinations. Today’s Refresher Course focuses on several healthcare informatics tools that are just starting to be adopted in Europe, including clinical decision support (CDS) software, radiation dose monitoring, and structured report templates. They represent another wave of innovation in the evolution and operation of digital radiology departments.

CDS software is on the brink of entering the clinical arena, and is expected to make a big splash. The concept is meeting European radiologists and referring physicians under the most appropriate exams for their patients has existed for decades, and commercial products have been available for at least five years, but adoption has been slow.

Now CDS implementation is starting to gather pace in the U.S. in large part as a result of use of computerised physician order entry systems (CPOE) and the commercialisation by the National Decision Support Company edition of the ACR’s best-practice guidelines into a CDS system called ACRSelect. ACRSelect was licensed and implemented in Europe within a few years, based on a project being implemented by the ESR and steady adoption of CPOE systems, according to Prof. Peter Mildenberger, professor of radiology at University Medical Center Mainz in Germany.

Hospitals using electronic medical records are purchasing CPOE systems to expedite orders and reduce medical errors. CDS systems take this a step further by advising physicians about the appropriateness of the exam being ordered as they order it. CDS recommends the most appropriate procedure, if different, to avoid unnecessary exam that will not be of clinical value and potentially reduce their exposure to ionising radiation, and to better utilise the modality and clinical expertise of a radiology department.

An important step was taken with the publication of a software-based second edition of the Société Française de Radiologie (SFR) best-practice guidelines containing 900 individual recommendations involving 40 different clinical situations for use by radiologists and referring physicians. Also, the ESR is working on a large-scale project to develop European imaging referral guidelines and to embed them into a web-based CDS system available at the point of care. Last spring ESR began to discuss the idea of implementing a CDS system by the European Referral System (ERS) to be called ESRSelect. Meetings by the ACR, the National Decision Support Company (the company licensed by ACR to sell ACRSelect), the ESR, and other European organisations were held throughout 2013 about implementing a pan-European CDS.

Prof. Luis Donoso-Bach, the director of the imaging department of Hospital Clinic de Barcelona, the academic hospital of the University of Pau, in Spain, is a member of ESR’s clinical decision support committee project. He is also leading the first large-scale referral of patients in Europe that is fully integrated with a hospital CPOE. Project planning began in early spring 2013. Members of the hospital’s radiology imaging department and its IT department are working together, strongly supported by hospital’s managing director, Dr. Josep M. Piqué. The first steps they undertook was to translate the ACRSelect software screen displays and the clinical situations from English into Spanish, map all of the codes, and then integrate the software with the hospital’s CPOE system. That was a relatively uncomplicated process, according to Donoso-Bach. What has been more challenging is implementing follow-up of the advice radiologists at Massachuse/tts General Hospital in Boston, the first hospital in the U.S. to use a CPOE/CDS system, Donoso-Bach said that the Hospital’s Chief of Radiology made the decision to begin use with his own primary care and general physicians. The hospital had already deployed a specific information system for primary care. It retained global consulting group Stratek/house/Care (PwC) to provide change management services and assist with thorough testing and initial deployment by a small selected group of general practitioners.

After all known issues had been resolved, CDS went live in a limited capacity at the end of 2013. The system is being used when musculoskeletal and neurological examinations are being ordered. The rollout of the entire system will be gradual. Once this group has fully adopted the system, planning will begin for implementation in the emergency department.

This pilot programme may inspire other hospitals. Mildenberger commented, “There is a lot of discussion and interest in CDS. But there are challenges. While IT concepts for CDS are well known, and standards for classifications are available, semantic interoperability is still a developing area.” He will discuss the opportunities and challenges in this presentation at this session.

Improving the quality and efficiency of dose management of patients, a priority of the ESR, is also improving through IT developments. Today it is possible for automatic systems to collect and archive patient dose data individually as part of the DICOM header of an image or through other DICOM services such as the modality performed procedure step or radiation dose structured reports. From an imaging informatics perspective, the process is still in early stage development.

Prof. Eladio Valero has had first-hand experience at the head of the medical physics service at San Carlos University Hospital in Madrid. Starting in 1995, the university began to develop software tools for the automatic tracking of radiation dose and contrast medium administration. These tools have allowed us very easily to discover how patients were treated. They have the potential to greatly improve efficiency and quality of imaging. Improved dose data can be managed comprehensively and efficiently to maintain the highest quality of care and potentially avoid exposure to radiation. Valero has joined the RSNA/ESR initiative, and this year the focus will be on radiation doses, transfer these valuable data to a patient’s radiology report, to process dosimetric data, and perform analysis,” he said. He believes that better software is needed to enable the European directives and ESR’s recommendations to be effective. Prof. Davide Caramella, head of radiology at Santa Chiara Hospital in Pisa, Italy concurs. “My department has been very active in testing software tools for the automatic tracking of radiation dose and contrast medium administration. These tools have allowed us very easily to discover how patients were treated. They have the potential to greatly improve efficiency and quality of imaging. Improved dose data can be managed comprehensively and efficiently to maintain the highest quality of care and potentially avoid exposure to radiation.”

Unlike dose management software, structured reports systems are mature and viable. It’s now a matter of convincing radiology departments. At this session, Dr. Emanuele Meri, assistant professor of radiology at the University of Pisa, will discuss how the structure and standardisation of a radiology report can improve quality and efficiency of reporting.

CDS software is on the brink of entering the clinical arena, and is expected to make a big splash. The concept is meeting European radiologists and referring physicians under the most appropriate exams for their patients has existed for decades, and commercial products have been available for at least five years, but adoption has been slow.
Shoulder imaging and intervention

Shoulder imaging and intervention are becoming more important in clinical practice as ageing populations and patient expectations have increased demand. The shoulder is also one of the joints in the human body that can suffer from a number of pathologic conditions, in both young and elderly patients, such as rotator cuff tears and tendinosis, subacromial-subdeltoid bursitis, calcific tendinopathy, and degenerative conditions.

Cuff tear in supraspinatus tendon. The calcification elevates the bursal surface of the tendon resulting in impingement.

Full-thickness tear of supraspinatus tendon. The edge of the tendon (arrow) has retracted from the greater tuberosity. The defect is occupied by fluid and detached muscle. Hyperosmosis as present at the tuberosity.

Full-thickness tear of supraspinatus tendon. The margin in partial-thickness tears but is invasive and carries a risk of causing joint infection. MR arthrography is also the best imaging method for assessing shoulder instability. Ultrasound is superior in assessing rotator cuff calcification and can be used for dynamic examinations and for interventional procedures.

When it comes to the importance of performing dynamic manoeuvres in the diagnosis of rotator cuff involvement, experts seem to be divided on the issue. “Some people believe that a dynamic US examination is essential in identifying and diagnosing impingement. Others believe that impingement is a clinical diagnosis or best confirmed by injecting local anaesthetic (often under ultrasound guidance) to see if this abolishes the impingement symptoms,” Beggs explained.

Being inexpensive, readily available, and radiation-free, ultrasound is the imaging modality of choice for guiding interventional procedures around the shoulder. Thanks to its high resolution and multiaxial capabilities, ultrasound can be used to guide needles precisely in the tendon of the rotator cuff, the bursa or the gleno-humeral and acromio-clavicular joints.

Different kinds of procedures can be performed around the shoulder. Probi and drill procedures, so-called “impingement bursectomy,” can help improve pain and allow a return to sport. However, it remains controversial as impingement is a multifactorial condition with many causes including glenohumeral and acromio-clavicular joint effusion and rotator cuff tendinopathy. Magnetic resonance imaging is currently the gold standard in the evaluation of rotator cuff tears. However, it must be remembered that not all tears require surgery; the patient’s age, the patient’s activity level, the patient’s surgical history, and the surgeon’s experience are all important factors to consider.

Finally, when asked about future developments and hot topics, Beggs had this to say: “Developing themes include the realization that there is a high prevalence of asymptomatic rotator cuff tears. We believe that not all tears require surgery; the importance of assessing fatty atrophy and infiltration of the rotator cuff muscles in patients with rotator cuff tears, as fatty atrophy indicates a poor functional prognosis as the rotator cuff muscle damage is irreversible and the apparent efficacy of US-guided interventions, although this last point is controversial. Several studies have shown the advantage of US-guided interventions, but one well-known study showed that blind injections of steroids into the bursa were as effective as US-guided shoulder injections in patients with impingement.”

Turkey invests in radiological education

The Turkish Society of Radiology (TSR) is a non-governmental organisational and one of the foremost medical specialty organisations in Turkey, the Turkish Medical Specialist Board, an official body of the Ministry of Health in Turkey.

The vision of the TSR is to be a global pioneer in science, contribute to the science of radiology in accordance with the public interest and the primary decision-making authority in the field of radiology. Its mission is to establish the science of radiology in accordance with the public interest and the primary decision and social relations between its members.

The Turkish Society of Radiology publishes the quarterly peer-reviewed journal Diagnostic and Interventional Radiology. This journal is a member of original articles, reviews, pictorial essays, technical notes and case reports relating to the fields of diagnostic and interventional radiology. It has been published since 1994, peer-reviewed and adheres to the highest ethical and editorial standards. In 2007, Diagnostic and Interventional Radiology was accepted for indexing in Science Citation Index. Expanded. The impact factor of Diagnostic and Interventional Radiology (TSR) was 0.756 (JCR 2012). The circulation evaluation period is 24 days and the article acceptance rate is 24%. This journal is also available online to all readers on the web (www.dirjournal.org).

The Society continues to run the Winter School programme, through which we are able to provide a two-week training programme during their residency period with all costs covered by the Turkish Society of Radiology. Every year, approximately 250 to 300 residents are trained in basic radiology by distinguished lecturers.

The TSR also aims to support our young colleagues who want to work in any field of radiology, either at home or abroad. Between 2001 and 2013, a total of thirteen full members were entitled to acquire TSR scholarships, nine for TSR foreign scholarships and four for TSR domestic scholarships. The evaluation of new applications is still in progress.

The Society holds its National Congresses of Radiology each year, as well as symposia and other small-scale meetings. Attendance at the annual congresses is in the range of 1,500 to 2,000 radiologists. The 35th National Radiology Congress is going to be held in Antalya.

The TSR is an ESR institutional member society, which develops infrastructure and human resources rapidly, implements high-quality training programmes for the students and young colleagues, and submits invaluable scientific contributions to the international level.

We want to express our sincere thanks to the ESR for selecting Turkey as one of the guest countries (ESR meets Turkey session) at ECR 2013. For this special session we have already prepared our scientific and social presentations.

We have 2,035 members and we hope that our number of members and awareness of our discipline will increase in the forthcoming years.

More information about the Society can be found at www.turkrad.org.tr

BY ABDULHAKIM COŞKUN

Chairman’s introduction

I. Beggs; Edinburgh/UK

US of the rotator cuff

A. Flageas; Athens/GR

MRI of the rotator cuff

S. Waldt; Munich/DE

US-guided interventions of the shoulder

L.M. Scopinaro; San Donato Milanese/IT

Panel discussion: Controversies and confusion in shoulder imaging

EBU 116. Shoulder imaging and intervention

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Special Focus Session

Monday, March 10, 08:30–10:00, Room B

(eCR26166 #SF16A)

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Patient safety and dose reduction remain key priorities for digital x-ray vendors

Radiology department staff will always be concerned about the radiation dose received by their patients when they undergo routine imaging procedures. But there is one group that will generate far greater levels of anxiety among the attending radiologists and technicians, along with a determination to make sure that the examination is carried out as safely as possible.

Those very important patients are children, of course, and particularly those with chronic conditions who require repeated follow-up examinations to monitor progress in their treatment, like kids with congenital orthopaedic problems.

Among the many innovations on show in the commercial exhibition at ECR 2014 for reducing radiation risk, there is one that effectively eliminates any iatrogenic hazard for this patient group, according to the company that developed the technology.

Paris-based EOS IMAGING specialises in developing and manufacturing hardware and software for orthopaedic imaging, and describes itself as a “stereoradiology” company, rather than a digital radiography vendor. It specialises in low-dose imaging based on the detectors developed as result of the work of the 1992 Nobel Laureate Georges Charpak.

It is presenting the stereoradiography workstation for the first time at ECR.

“From the beginning our technology produced a dose that was two to four times lower than conventional digital radiography. This new software allows us to go even further in reducing the dose. Patient exposure is now seven times lower than it was previously, so we estimate that it is now 10 to 50 times lower than CT and 30 to 50 times lower than digital x-ray as a result we are capable of imaging the skeleton in children with a dose that is roughly equivalent to the earth’s natural radiation,” said Marie Meyn, the company’s chief executive officer.

Patients are examined standing up in their normal weight-bearing position. From two low dose anterior-posterior and lateral projections, the software creates 3D models of the spine, femurs and tibia for use in surgical planning and follow-up monitoring. More than 180 angle and length measurements are automatically calculated from the spine and lower limb; 3D modelling, enabling physicians to evaluate the patient’s condition and map their path to recovery, according to the vendor.

On the TOSHIBA booth, the company is demonstrating its dose-tracking system for use in fluoroscopy procedures. The device is designed to minimise problems in patients undergoing lengthy interventional examinations.

Regulations from the International Electrotechnical Commission (IEC) require manufacturers to display two dose parameters on their fluoroscopy monitor: the dose area product and entrance dose. But the methodology used in that process does not give an accurate measurement of the radiation reaching the patient’s skin surface, according to Andreas Patz, clinical marketing manager for Toshiba’s x-ray business unit. It is a theoretical calculation that takes no account of either backscatter effects or the type of tissue being examined, he warned.

Moreover, existing monitors only provide a retrospective assessment of the cumulative dose, whereas the new technology provides real-time values that allow the technician to modify the procedure to prevent injury.

“The effects of backscatter mean that previous systems may underestimate the real skin dose by 30 to 40% and if you have a local hot spot this will significantly increase the risk of skin damage. With the dose-tracking system, the technician will receive a warning to reduce the dose or change the angulation. So this is a support tool which increases awareness of the real skin dose delivered to the patient and prevents adverse effects,” Patz explained.

Meanwhile, PHILIPS is presenting a new version of its MoorDosage wDR digital radiography system designed to offer the benefits of a small and highly manoeuvrable imaging unit for those areas of the hospital where the available space may be limited, such as the trauma ward and neonatal intensive care units. The latest addition to the company’s product range includes the new SkyFlow scatter-correction algorithm that allows the radiographer to produce high quality, high contrast chest examinations without the use of grids.

“That provides a double benefit in reducing the amount of radiation used and simplifying the imaging process which will be beneficial since the workflow of the radiographers involved,” explained Duncan Porter, head of imaging systems field marketing for Philips. Another important feature of the system is the lightweight SkyPlate wireless detector that is available in two sizes. One is for standard imaging in adult patients, and a smaller unit will be particularly useful in paediatric and intensive care situations.

This is where access to the patient may be compromised and having...
that smaller detector can provide much greater flexibility.”

Improving diagnostic precision is also a key part of the latest equipment on display at the CARESTREAM booth. The latest version of the Carestream digital radiography system that is used in general radiography environments, private practices, small clinics, general orthopaedic and chiropractic offices. According to the vendor, “The system combines a simple and smart design with proven AgfaHealthCare technology to create an affordable system. It can be used for a broad range of medical radiography applications, while its high speed and image quality can be adjusted to meet the customer’s unique needs. Compact and affordable, yet robust and reliable, it offers an easy workflow for the radiography environment.”

AgfaHealthCare is looking to enhance its reputation with the new S4335/W digital radiology detector. It states that the unit is a high sensitivity direct deposition-type detector that will provide high quality images at low radiation doses. As a standard cassette-sized unit weighing only 5 kg, the detector is designed to be portable, lightweight and compact to meet the procedural demands of customers and increase patient throughput.

Siemens is exhibiting the following products at ECR 2014: the Tiansia It2x crossover angiography system, Sonation G4 multifunctional RT room solution, OtsuScope Actensa surgical C-arm, and Mobile-Daft Evolution wireless DR system. The vendor is focusing its efforts on these core areas: tomosynthesis for general radiographic examinations, slot radiography, motion-tolerant SCORE, ESM, and SCORE ShortView. Improving the safety of routine tomosynthesis examinations is the goal of a new product on display at the SIEMENS stand. The company is exhibiting its Mammatom Fusion system, which incorporates a second generation caesium iodide receptor offering enhanced sensitivity at a much lower dose compared with older models. This is achieved through an innovative layered configuration of the photodiodes that ensures more efficient utilization of the radiation. The unit also features Siemens OpDose technology which ensures that the radiation dose can be set for each individual patient without risk of compromising image quality.

Karlin Bartbel, head of outpatient marketing for women’s health unit, said that the Mammatom Fusion system is a mid-range product offering both diagnostic and screening capabilities. “Especially in mammography screening, a high patient throughput is common. Therefore, the Mammatom Fusion includes a branch of selected premium features like in the high-end segment. This will give the new unit the versatility needed to support maximum patient throughput in a busy radiology department at an affordable price,” she said.

BY SARAH JONES

Digital tomosynthesis offers lung cancer detection alternative

In the continuing battle to improve patient care standards and lower healthcare spending, healthcare providers and vendors are looking to utilize current technologies in new and creative ways. A recent example of this is evident in the array of new general radiography and digital tomosynthesis (DT) combined systems available. Recent clinical studies have shown the benefits of combining DT with conventional X-ray exams in the detection of cancerous lung nodules. Even better, DT can also reduce cost and free up advanced imaging resources. Below, we outline a few key considerations impact tomosynthesis may have on CT in the next three years.

CT DENT SCREENING PROTOCOL

Current national guidelines on the use of X-ray chest imaging in lung cancer screening. However, any abnormal finding often leads to a second scan using a full CT scanner. With DT, the need for follow-up CT scans could be removed for many cases. DT provides a higher resolution/quality compared to general radiography X-ray alone, albeit at a lower resolution than CT. This enables physicians to make a clearer diagnosis from the initial scan, thus reducing the number of patients sent for follow-up CT scans. Researches have found that detection rates using DT are comparable to CT. In terms of dose, DT X-ray exposure is around three times more than digital X-ray alone, but is 3 times less than chest CT. However, patient awareness at this peak, limiting the use of high-dose CT could be avoided by providers and patients alike.

REIMBURSEMENT

In the US, there is currently no specific code for DT as part of an X-ray scan. However, reimbursement is applied if classified as an unlimited diagnostic X-ray procedure. Recently, US Medicare and Medicaid services released proposed outlining CT reimbursement to be cut by 7% this year, the 8th year in a row that CT has been cut. In Europe, uncertainty also surrounds the reimbursement of DT with general X-ray scans. Hospitals and imaging centers are therefore looking for alternative ways to achieve the same results using different modalities. In some cases, cone beam CT and ultrasound imaging are being used as alternatives to CT and MRI. What is clear at this stage is that lack of clear reimbursement guidelines for DT will hinder large scale adoption in the near future. However, with CT rates now declining heavily many savvy healthcare providers may still adopt DT without reimbursement, as long as savings in efficiency, workflow and less pressure on CT resources can be maximized.

OTHER APPLICATIONS

To date, DT application has focused on the identification of lung nodules. However, results from the benefits of using DT during abdominal, spinal and orthopaedic exams are ongoing. Conventional CT has limited functionality for orthopaedic use due to the inherent limitations of system resolution. Conventional radiography techniques are also unable to easily distinguish 3D structures DT in addition to general radiography offers an intrinsic advantage, if it is able to provide improved resolution ability in the digital plane space also allowing 3D volumetric imaging. Recent studies have shown that using DT has aided in detecting small fractures and articular DT. Articula may be an area where CT could aid screening programmes. Using CT in combination with conventional X-ray provides greater visibility of joint space, a fundamental aspect of monitoring the development of the disease.

CONCLUSION

Every year, one in a significant number of cases with X-ray DT combined with a way currently being explored by healthcare providers’ need for cost saving solutions. Continued pressure on reimbursement in the CT market is also putting pressure on imaging centres and hospitals in finding alternative image modalities. In the short term, few hospitals have the budget to buy new CT conventional X-ray systems. Lack of clarity for reimbursement will also hinder uptake longer term. As current general radiography systems need replacing, adoption of CT will increase, reducing reliance on CT. This is due to the multiple benefits of using CT for healthcare providers and patients, reduced radiation dose and inconvenience of secondary scanning for the patient, reduced cost and fewer demand on centralised CT for the hospital.

While use of CT will certainly not completely remove the need for CT in more complex cases, it is expected to be a front-line tool for lung cancer detection in the near future. If specific reimbursement for DT is approved and X-ray funding continues to decline, the case for DT will become even more compelling.

Sarah Jones is an analyst with Medical Devices & Healthcare IT. HIS.
EIBIR’s Joint Initiatives expanding

The European Institute for Biomedical Imaging Research’s Joint Initiatives are interdisciplinary groups working towards a common bioimaging-focused research goal.

Some examples of the activities within the Joint Initiatives include initiating and coordinating collaborative research efforts, organising workshops and symposia, training and educating young scientists through exchange programmes and summer schools, and sharing state-of-the-art equipment.

Last year saw a number of changes made to the Joint Initiatives. Two new directors have assumed responsibility for the Cancer Imaging Working Group and Cell Imaging Network. Additionally, two new initiatives have been established, one focusing on paediatric radiology and the other on Image-guided radiotherapy.

EIBIR is delighted to be able to introduce the experts who have recently strengthened its biomedical imaging network.

CANCER IMAGING WORKING GROUP

Prof. Nandita deSouza from the Royal Marsden Hospital, UK, is the new director of the Cancer Imaging Working Group. Prof. defouza has identified two goals for the Working Group: first to integrate the work of the EIBIR Cancer Initiative with that of the European Organisation for Research and Treatment of Cancer (EORTC) Imaging group so that common interests are aligned, thereby reducing the duplication of effort. Second is to explore opportunities for novel imaging biomarkers by combining modalities and image processing efforts.

An initial task, in collaboration with the EORTC, will be the development of a Virtual overview for central review. This ambitious undertaking is composed of many steps. However, its realisation would be a very significant step forward, and something that neither organisation could achieve independently.

CELL IMAGING NETWORK

This Network is led by Prof. Michal Neeman from the Weizmann Institute in Israel. The first goal for the Network will be to build a community of European researchers interested in cellular imaging and, if possible, to enhance the links among groups developing cellular based therapies, from basic biology to translation. Secondly, the Network will seek collaborative funding to help advance the field, following the success of the FP7-funded ENCITE project coordinated by EIBIR.

A dedicated cell imaging session was held yesterday at the ECR, featuring presentations from five experts in the field. Topics ranged from Optical imaging in the clinic to MR imaging for pancreatic cancer transplantation.

PAEDIATRIC RADIOLOGY

Prof. Karen Rosenfeld from the Hankeld University in Norway, and director of the new Joint Initiative for paediatric radiology explains that the initiative’s first activities will draw on ongoing projects within the European Society of Paediatric Radiology (ESPR) seven working groups.

The initiative’s overall goal will be to initiate, facilitate and enhance multi-institutional, multinational research in paediatric imaging, image-guided interventions and radiation protection, and specifically prospective multi-institutional clinical trials with their origins in paediatric radiology. In particular, smaller paediatric radiology institutions will be given the opportunity to participate in multicentre research projects, and greater numbers of patients with rare diseases are expected to be generated for improved statistical reliability. It is also hoped that the initiative will promote the sharing of institutional research projects amongst partners of the network, to create synergies, expand project participation and promote research excellence in paediatric radiology in Europe.

IMAGE-GUIDED RADIOTHERAPY

The Joint Initiative for image-guided radiotherapy will focus on the three aspects of thoracic imaging in radiation oncology, specifically:

a) utilising imaging in diagnosis by optimising treatment according to the patients’ specific needs and situation, and by evaluating the response.

b) focusing on images to support decision-making and capitalising on the technical opportunities within the field.

c) currently identifying the need to import broader communication channels to reach media, decision-makers and patients to position this radiological discipline so it receives the consideration it deserves.

Sweden launches its largest ever collaborative project

The nationwide Swedish CardioPulmonary BioImage Study (SCAPIS), sponsored by the Swedish Heart-Lung Foundation, is an important investment in scientific work for Swedish radiology and it is the largest collaborative project ever in Sweden.

Professor Göran Bergström, chair of the National Steering Group for SCAPIS has kindly provided and approved the publication of information regarding the study in ECR Today.

The aim of SCAPIS is to build a nationwide, open-access, population-based cohort for the study of cardiovascular disease (CVD) and chronic obstructive pulmonary disease (COPD). SCAPIS will recruit and investigate 35,000 men and women aged 50 to 65 years with detailed imaging and functional analyses of the cardiovascular and pulmonary systems. The data will be collected at six universities in Sweden (Uppsala, Umeå, Linköping, Gothenburg, Karolinska Institutet and Lund University) and another 5,000 participants at each site. A pilot study of 1,000 individuals examined according to the SCAPIS protocol was performed at Göteborg University in 2012 and proved the feasibility of the large scale study. Umeå, Lund and Gothenburg universities are scheduled to launch SCAPIS in January 2014.

THE MAIN AIMS OF SCAPIS ARE:

1. To use advanced imaging technologies for atherosclerosis in the coronary and carotid arteries together with information obtained from proteomics, metabolomics, and genomics technologies to improve risk prediction for cardiovascular disease.

2. To improve the understanding of underlying mechanisms of disease in CVD and COPD. An example is the use of detailed metabolic imaging with CT to elucidate the links between fat deposition patterns and risk of subclinical atherosclerosis and development of CVD in individuals with and without COPD.

3. To improve the monitoring of the epidemiology of CVD and COPD. An example is investigating why high morbidity and mortality rates from CVD and COPD persist in individuals with low socioeconomic status, despite an overall reduction in mortality from CVD and a levelling of age-adjusted mortality for COPD.

4. To evaluate the cost-effectiveness of using of new imaging techniques and modern omic’s technology to target preventive efforts against CVD and COPD.

IMAGING TESTS

The SCAPIS CT imaging protocol includes measurement of the calcium content in the coronary arteries and CT angiography using contrast injection. A high-resolution CT scan without contrast injection over the full lung volume is performed to provide information on airway wall thickness and emphysema, providing essential information in the phenotyping of COPD. The presence of pulmonary nodules will offer insights regarding the frequency and need for follow-up in a population not based on lung cancer screening criteria. The CT imaging protocols also include evaluation of: epicardial, intra-abdominal, intramuscular and intrabronchial fat deposits.

Ultrasonics is performed to detect, quantify and stage subclinical atherosclerosis in the carotid arteries. Patients with moderate to large plaques in their carotid arteries are asked to participate in a third visit for magnetic resonance imaging (MRI) to get in-depth information on plaque inflammation, lipid-rich necrotic core, thick fibrous cap, intra- and extra-lesion haemorrhage, and plaque volume.

ADVANTAGES OF SCAPIS OVER OTHER SIMILAR COHORTS

A few large-scale international studies have performed extensive cardiovascular and pulmonary imaging: for example, the Multi-Ethnic Study of Atherosclerosis (MESA), Dallas Heart Study and High Risk Plaque (HRP) initiative. The most important distinctions are:

1. The planned size of SCAPIS is almost three times that of the nearest competitor.

2. SCAPIS is the only study to use coronary angiography, which allows direct visualization and quantification of plaques in the coronary arteries.

3. SCAPIS combines direct visualisation of disease in lung and vessels with detailed metabolic imaging of fat deposits on a scale not attempted in any other study.

4. SCAPIS is the only study with recruitment of a population sample, and

5. The Swedish identification number and registers give superior advantages in follow-up.

SCAPIS will affect both clinical and scientific radiological work at university hospitals for years to come in Sweden, and the Swedish Society of Medical Radiology is looking forward to the project’s fruition.
Dutch radiologists avoid conflict to reach common goals

By Herman Pieterman

In June 2013, the European Society of Paediatric Radiology (ESPR) celebrated the 50th anniversary of its Annual Meeting in the historic city of Budapest/HU. Founded in 1963 in France, ESPR is one of the oldest subspecialty societies in Europe.

For the Radiological Society of the Netherlands, February 7, 2013, was a milestone worth marking. More than 95% of radiologists voted for a proposal to combine the residency programmes of radiology and nuclear medicine, a decision that’s valid as of January 1, 2015. Two years of general training or two years’ half-time general radiology and half-time specialisation (differed specialisations, a problem aggravated by restricted activities such as catheter procedures in nuclear medicine) in the newly combined programme, which will start on January 1, 2013, a three-month period of training in nuclear medicine will be incorporated into the common trunk and there will be an option to specialise in nuclear medicine during the second phase of the residency. Of course, we assume that the advantage of this will be closer collaboration in the near future. In fighting back the sea, the Dutch have developed dykes. In our case, dykes would be back to the future. Thus, the technical universities, supported by the technical industry, will develop new innovative devices and techniques.

As for the technical innovations that paediatric radiology has to face, it is the theme of our society’s work, as well as that of most radiology teams in the Netherlands. The fact that the former president of our national society was unanimously elected as a member of the steering committee to form a federation of national medical societies, and the fact that we were able to make a common guideline for cardiac imaging (both CT and MRI) is a clear sign of our success in reaching our goals. The ESPR is now in the process of establishing a new paediatric imaging working group within ESPR. Through these initiatives, the ESPR is making research one of its key institutional aims. Within this arena, it is worth mentioning that the ESPR already has five task forces. Child abuse, CT and MRI, Musculoskeletal, Neuroradiology, and Appropriateness. These formed to carry out specific tasks, develop projects, and establish guidelines.

With education as another important aim, the ESPR Education Committee, chaired by Prof. Jean-François Chateil, is currently working on a new curriculum for the Society’s educational platform, including the European Course on Paediatric Radiology (EPCR). These didactic courses offer young radiologists a chance to meet with world-class teachers in a friendly learning environment. In addition to this curriculum, the Education Committee is considering developing certification in theoretical paediatric radiology, which will probably require some form of examination in order to be formalised. Other educational initiatives in progress include developing educational material made available from courses and annual meetings on the ESPR website, and adapting existing e-learning platforms (e.g., through cooperation in the eLearning initiative of the ESR). The official journal, Paediatric Radiology, plays an important role in the distribution of educational and scientific material within all areas of paediatric imaging and related fields through a blend of original papers and reviews. The journal attracts and provides for the benefit of children worldwide, particularly paediatric radiologists operating in resource-poor areas.

Performing clinical research within paediatric radiology is a major challenge due to the comparatively low prevalence of most disease entities in children and the resulting sample size constraints. Therefore, there is a need for multicentre projects, cooperation with global institutions, and joint ventures with the industry. Within the Society, research governance is led by the ESPR Research Committee and the European Excellence Network on Paediatric Radiology (EENPR), led by Prof. Karen Rosendahl and Erich Sorantin respectively. They aim to initiate, drive forward and foster excellence within paediatric imaging-related research. To this end, the Research Committee is currently making an inventory of the present state of research initiatives within the ESPR, with the main goal of bringing experts within the field together and setting up coordination of the various research platforms and consortiums. Moreover, as a member of the European Institute of Paediatric Imaging (EIBIR) since 2011, the ESPR is now in the process of establishing a new paediatric imaging working group within ESPR. Through these initiatives, the ESPR is making research one of its key institutional aims. Within this arena, it is worth mentioning that the ESPR already has five task forces. Child abuse, CT and MRI, Musculoskeletal, Neuroradiology, and Appropriateness. These formed to carry out specific tasks, develop projects, and establish guidelines.

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Irish hospital uses iterative reconstruction to reduce paediatric CT dose

Being a dedicated paediatric hospital means we are naturally very cautious when using ionising radiation, especially with computed tomography (CT), which is a high dose modality. Recently published articles have highlighted the potential risks associated with the effects of radiation, particularly in children.

This topic has now reached mainstream media, including online forums. As part of the consent process, parents are more question- ing us more and more with regard to the radiation dose, the risk of cancer, and if there is an alternative. Since the installation of a iterative reconstruction (IR) technique in Temple Street, patient doses have been dramatically reduced for CT examinations without a loss of diagnostic image quality. Achieving as low a dose as possible is of particular importance as children are more susceptible to the effects of radiation because they receive a higher effective dose and have a greater lifetime risk (Pearce et al 2012; Matthews et al 2012).

Our iterative reconstruction technique uses an advanced reconstruction algorithm to produce diagnostic images equivalent or better than those acquired using filtered-back projection (FBP), the industry standard, at a fraction of the dose. It also overcomes low-dose limitations such as image noise and streak artefacts while optimising and improving spatial and contrast resolution. The user is able to alter the level of IR from 1–7, progressively increasing the smoothing effect as more image noise is removed thus enhancing image quality and significantly reducing dose.

Dramatic dose reductions of 43–96% in examination DLP for CT brain scans were deemed revolutionary for Temple Street, which specialises in neurosurgery and neurology, while maintaining the level of image quality necessary for diagnosis. The dose for orthopaedic CT extremity examinations was reduced 25–40% with greatly improved image quality in these already low-dose examinations. CT abdomen examination doses were further reduced by up to 70%.

The implementation of IR in September 2012, a continuous audit process has been employed with regular auditing of the CT doses. DRLs and image quality. A qualitative IR study assessing CT brain studies was performed which confirmed that image quality was diagnostic and in some cases better or preferred over FBP images.

The EuroSafe Imaging campaign, being launched at the congress this year promotes the safe use of radiation.

At last year’s congress, Dr. Willi Kalender made several recommendations, including the importance of minimising radiation exposure without compromising diagnostic image quality and the ALARA (as low as reasonably achievable) principle. However, he also emphasised that the benefit to risk ratio should be as high as reasonably achievable – “AHARA is the goal!” he said. This has, in our opinion, been achieved with IR.

Following Pearce et al 2012, the Alliance for Radiation Safety in Paediatric Imaging recommended that the radiation risk should be considered in the decision-making process with the immediate benefits outweighing the long-term risk. Furthermore, low-sized radiation doses were recommended for non-ionising imaging alternatives. At Temple Street, the same approach is followed with radiation protection, image quality and patient safety being of paramount concern. All CT scans must be justified, optimised and tailored to the patient, taking into account the ALARA principle and clinical question, with dose modification and dose reduction techniques utilised whilst ensuring the optimum diagnostic image quality. There are strict referral criteria and often a non-ionising modality is deemed more appropriate and performed instead.

The Irish Safe Imaging Network (ISIN) is the result of the collective efforts of radiologists, radiographers, medical physicists, manufacturers and the patient safety committee. The ISIN will be the best possible short-term and long-term outcome for the clinical care of children.

Temple Street Children’s University Hospital is located in Dublin, Ireland. It provides care to approximately 150,000 children from around Ireland each year with 50,000 children attending its accident and emergency department.

BY MARTINA BONNER AND COLM SAIDLEAR

By Martin Bonner is Lead CT Radiographer and PACS Administrator in the X-Ray Department at Temple Street – Children’s University Hospital in Dublin, Ireland.

Colm Saidlear works at the Department of Medical Physics at Temple Street Children’s Hospital in Dublin, Ireland.
Improving optimisation in Macedonia

Over the last ten to fifteen years, there has been a sharp increase in the number of CT scanners installed in the Republic of Macedonia. While there were less than ten CT scanners in 2000, in 2013 there were more than 35 CT scanners installed, with big variations in their performance. According to a European survey, conducted in 2011, on population doses from medical procedures, the number of CT scanners available in Macedonia per million population is higher than that of the United Kingdom or Slovenia.

Undoubtedly, this has resulted in a significant increase in the number and type of CT examinations performed, as well as the number of patients with multiple studies and follow-up examinations. New clinical applications for CT and the development of scanners with more detector arrays and more possibilities have led to considerably different approaches in clinical practice. The application of the ALARA principle faces new challenges, and the development (or adoption) of new local clinical protocols and exposure guidelines becomes even more necessary.

**EDUCATION AND TRAINING OF MEDICAL STAFF CANNOT KEEP UP WITH RAPID CT TECHNOLOGY DEVELOPMENT**

In the best case, each installation of a CT scanner in the Republic of Macedonia is followed by training, with one to two days, provided to particular medical staff by representatives of the manufacturer or by the local service engineers. During this training, medical staff become familiar with the operating scan procedures but not with the operating principles of the scanner and exposure optimisation methods. As a result of such training, the main message delivered to the medical staff to use the default parameters for each scanning procedure without any intention on a case-by-case basis, change of the parameter values.

Having no medical physicist employed or engaged to provide advice to each radiology department and no proper regulatory control, complicates the situation and necessitates this simple approach to scanning.

**THE MYTH ABOUT THE SUPERIORITY OF DEFAULT PROTOCOLS**

All this has another consequence: most radiology professionals are convinced that the default protocols are the most optimal ones. This is particularly true for scanners equipped with a system for automatic exposure control (AEC) that should guarantee exposure control. This leads to the belief that all is fine as long as the image quality is good. Under all these circumstances, especially if a procedure for patient dose recording is not implemented in the daily practice, it is very difficult to institute dose optimisation.

**THE FIRST STEP TOWARDS CHANGING SOMETHING IS PROVING THAT IT IS NOT GOOD ENOUGH**

We decided to examine existing clinical and exposure protocols for abdominal and pelvic examinations performed with a GE Bright Speed TS15A CT scanner in the City General Hospital September 8th in Skopje. Both types of examinations were performed using the very same scan parameters, including all scan acquisitions (series).

The first task was to assess scan range in terms of patient height for both types of examination, the second task was to assess AEC response to the patient sizes, and the final task was to assess noise level on the images in pre-acquisition contrast. Both patient groups had similar size characteristics. The same average patient height of 171 ± 12 cm and small differences in patient weight were found in both groups: the average patient weight of 75 ± 12 kg for abdominal and pelvic examinations and of 77 ± 17 kg for abdominal examinations.

The average scan range for abdominal and pelvic examinations was found to be only two centimetres longer than the average scan range for abdominal examinations. It should be emphasised that the very same scan range was found to be applied in all acquisitions. Additionally, a very weak correlations scan range for patient height existed in both types of examination.

**SECOND STEP – START THINKING DIFFERENTLY**

In order to reduce the patient dose, we decided to initiate some changes in the CT practice for abdominal and abdominal and pelvic scanning.

The first change was defining more rigid scan range margins according to the type of examination, and their consistent application to different patient sizes in the daily practice. For the abdominal examination, the scan region was defined from above the dome of the diaphragm up to the beginning of the sacral joint. For the abdominal and pelvic examination, the scan region for the abdominal examination was extended up to the initial tubercles. Thus, the well-known fact that different scan series do not need...
Finnish radiologists reduce number of unjustified CT exams

When used optimally, CT is one of the most valuable tools in medical imaging. However, patients scanned with CT are exposed to ionising radiation, which at such levels is assumed to come with stochastic risks. As the number of CT studies is increasing, the relatively high radiation dose of CT examinations and longer life expectancy of children means that special attention should be paid to optimising paediatric CT scans.

In CT optimisation, as in any radiological examination utilizing x-rays, the challenge is to minimise radiation exposure while maintaining diagnostic image quality. CT manufacturers have developed various technical tools for this purpose, including automatic tube current modulation (TCM), lower kVp values, adaptive beam collimation, partial scanning and iterative reconstruction methods. Despite these technical advances, the role of users is extremely important in clinical optimisation work. Therefore, it is essential that users are familiar with the scanners they are using.

Finnish paediatric radiologists, together with the Radiation and Nuclear Safety Authority (STUK), published the Finnish guideline for paediatric CT on the STUK website in 2012, which includes practical advice for the optimisation of paediatric CT examinations. As seen in the table, CT acquisition parameters similar to those used for adults should not be used. Instead, special CT protocols based on the patient’s weight (body) or age (head) should be applied to children. Due to their smaller size, and lower attenuation of radiation, paediatric patients can typically be scanned at lower kVp values, reducing patient doses significantly while also improving the image contrast in contrast-enhanced CT imaging. In addition to lower kVp values, both TCM and iterative reconstruction is used in all our CT protocols.

Our hospital is a dedicated children’s hospital and while most of the scans are done to adult patients, we perform approximately 100 paediatric CT scans annually with our 64-slice CT scanner (GE Lightspeed VCT XTe). All referrals for CT are reviewed by a paediatric radiologist, and if CT is not considered justified, the patient is referred to an alternative modality in cooperation with the referring doctor. Through education and active feedback, we have reduced the number of unjustified examinations from 14% in 2009 to 8% in the follow-up study 1.5 years later. Although our radiological department’s main function is to serve paediatric patients, adult CT is done with the same scanner by radiologists from other hospitals.

Experienced paediatric radiologists tolerate more noise in CT images than is typically accepted for adult examinations. The use of iterative reconstruction (ASiR, adaptive statistical iterative reconstruction) has also made it possible to increase the noise index value, NI (GE image quality parameter for TCM). The level of iterative reconstruction compared to filtered back projection (FBP) has been increased continuously in each paediatric protocol as our paediatric radiologists have become used to images that differ somewhat from the traditional contrast textures of FBP images. Figure 1 shows the radiation doses in head, chest and abdomen/pelvis CT for different patient groups scanned between August 2012 and March 2013. In body examinations, the dose indices were normalised to respond systematically to a 3 cm CTDI phantom. As the results show, the paediatric patients in our hospital are scanned with much lower radiation dose levels than adults.

CT optimisation has been a continuous practice in our department. By replacing the old 16-slice CT scanner with our new CT scanner in 2009, we were able to reduce patient doses significantly (Figure 2). The change was due to the growing awareness of dose issues and new technology, including the use of iterative reconstruction. Recently, further optimisation of the imaging parameters has been performed with emphasis on the use of iterative reconstruction and indication-specific protocols.

Touko Kaasalainen is a medical physicist at the HUS Medical Imaging Center / Helsinki University Central Hospital, Finland.

Figure 1: Mean CTDIvol and DLP values in different patient groups in head (top row), chest (middle row) and abdomen/pelvis (bottom row) CT.

Figure 2: Decrease in DLP of routine chest CT for metastasis survey from 2008 to 2010, when the new scanner was installed.

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Sessions will look different at ECR 2015, to help participants make the most of the scientific programme. ECR Today spoke with Professor Bernd Hamann from Berlin, Germany, who will preside over the congress next year, to find out what the biggest radiological meeting in Europe will look like in 2015.

ECR Today: What will be the main highlights of ECR 2015’s teaching programme?
Bernd Hamann: One of the major changes will be a restructuring of the session categories. Over the last few years, we kept adding new types of sessions, making it difficult for participants to find the sessions they are interested in and compile an efficient individual schedule. Apart from the Refresher Courses, which have become well established and accepted, we now offer more teaching courses under the heading of – European Excellence in Education. These courses are now structured according to the different levels defined by the European Training Curriculum for Radiology. The E3 programme consists of the following branches, which reflect different levels of education in radiology as well as the different stages of medical training. Also, the Rising Stars, European Diploma Prep Sessions, The Beauty of Basic Knowledge, ECR Academies, and ECR Masterclasses.

The Rising Stars programme is directed at medical students with an interest in radiology, as well as radiographers in training. The European Diploma Prep Sessions aim to provide preparatory sessions for future European Diploma in Radiology (EDiR) candidates. The content of the programme reflects level I and II of the European Training Curriculum. These courses are held in close cooperation with the European Board of Radiology (EBR). The Beauty of Basic Knowledge programme focuses on knowledge essential to the daily practice of radiology and is best suited to residents and board-certified radiologists. The ECR Academies consist of a series of sessions relevant to five branches, which reflect the main categories of self-assessment. The ECR Masterclasses are designed for participants and subspecialists seeking cutting-edge information in specific fields of interest. During the ECR, one ECR Masterclass is offered for each subspecialty in radiology (level III and beyond).

This new structure of a major part of the teaching courses offered at the ECR results from intense exchange and excellent cooperation between the Congress Committee members.

ECRT: What will the ECR Academies focus on?
BH: The ECR Academies in 2015 will focus on the new hot issues, such as hybrid imaging and image-guided interventions in oncology. In addition, there will be sessions covering gastrointestinal radiology and our popular interactive teaching sessions focusing on different aspects of radiology.

ECRT: With initiatives like the Rising Stars programme and the European Diploma in Radiology (EDiR), medical students and young radiologists find appropriate platforms for the exchange of knowledge. Will ECR 2015 continue these initiatives?
BH: The ESR fully supports the Rising Stars programme and the Invent the future initiative. Thanks to these programmes, and to the generally very modern orientation of the ECR, the average age of the congress is around 35 years, that congress is young and dynamic. In 2015, we will go even further, dedicating the last day of the congress to the Rising Stars. This means that every medical student can attend the ECR free of charge.

ECRT: Many joint sessions with various organisations (COCIR, EFUMB, ESMRMB, ESMOFIR and ESME) were held at ESR 2014. Will there be similar collaboration at ECR 2015?
BH: Yes, there will be joint sessions with the European Respiratory Society (ERS), the European Society for Magnetic Resonance in Medicine and Biology (ESMRMB) and the European Society for Radiopharmacy and Oncology (ESTRO). The joint course of the ESR and the Radiological Society of North America (RSNA) on emergency radiology will also be repeated.

ECRT: German radiologists always attend the ECR in very high numbers. Do you think your presidency will mean even larger numbers of German delegates next year?
BH: Yes. The ECR is very popular among German radiologists. Of course, I hope that even more radiologists from my home country will be attracted by my presidency and come to Vienna to attend the ECR. Moreover, we plan to further promote the ECR in countries from which interested groups of radiologists have already attended earlier meetings in order to attract even more colleagues. These mainly include Arab and Asian countries.

ECRT: It is also worth mentioning that, with the participation of young radiologists from these countries, the congress has become even more peaceful environment.

ECRT: How will you lead the congress?
BH: Germany will offer a session entitled ‘Late-breaking Clinical Trials on hot topics’. We will promote exchange among radiologists from these countries, who are encouraged to present papers on the results of their home countries’ politics, organisation of radiology and other interesting aspects in short interludes. I think that is what makes the ESR meet sessions particularly interesting.

ECRT: You have been chairman of the Congress Innovations Subcommittee for many years. What innovations can we expect for 2015?
BH: One of the major achievements of the restructuring of the session formats – as mentioned above. Another issue is that, based on the many scientific papers ranked as very good, we will try to provide even more slots for scientific sessions.

The ESR continues to work on protecting the intellectual property rights of speakers, an issue of top priority in the digital era. The speakers at ECR 2015 will be offered to have their slides protected by an ECR watermark to avoid copyright infringements.

Some scientific sessions will start with a short introductory lecture by a keynote speaker. Moreover, in all scientific sessions, we will use an online voting system to identify and award the best paper directly at the end of the session.

Finally, we want to launch a scientifically oriented pilot project, entitled: Late-breaking Clinical Trials, which will be a platform for presenting the most recent prospective studies and results of multicentre trials on hot topics. To make these sessions really up to date, there will be a special, very late deadline for submissions (Dec. 31, 2014).

A major focus is to promote scientific and educational sessions for radiographers. We are pleased that the number of radiographers attending the ECR has continually increased over the years.

On most days, the ECR is very crowded. We are therefore looking for solutions to overcome this problem by providing some dedicated quiet zones, where one can meet friends and colleagues to talk in a more peaceful environment.

As the interests of congress participants appear to change very quickly, we are conducting a survey among this year’s delegates to find out about their interests and wishes, and to take these into account in our planning for ECR 2015.

Another focus is ECR Live, a tool that enables radiologists to follow most sessions from anywhere in the world, and allows delegates to share their impressions of the congress in real time.

ECRT: You already presided over the German Congress of Radiology and the Joint Congress of the German and Austrian Societies of Radiology (with Prof. Walter Hruby). How useful do you think these experiences will be for the ECR?
BH: This was indeed a very instructive and interesting experience. I very much enjoyed my cooperation with Walter Hruby, who was always constructive and helpful. Of course, a president always has to organise the best congress ever. However, what is just as important is that the audience likes what we do. This means that a certain amount of level-headedness is also helpful. With the excellent support I get from the very dedicated members of the Programme Planning Committee and the many other helping hands, I am very optimistic.
Kazakhstan’s society joins forces with ESOR

The first Astana Tutorial, hosted by the European School of Radiology (ESOR) and supported by Siemens Healthcare, will take place on June 9–20, 2014 in Astana, Kazakhstan.

One of the ESOR’s most important creations, the European School of Radiology, under the leadership of Prof. Nicholas Gourtouni-Smyrniotis, has evolved and established itself as a major provider of radiological education in Europe and the world.

During the six years of its existence, ESOR has grown through the involvement of a wide range of schools, provision of seminars, tutorials, scholarships, Teaches-The-Teachers courses and exchange programmes for fellows. All of these hugely appreciated teaching resources have been provided through the unlimited support of highly esteemed lecturers, tutors, mentors.

By investing in the development of radiological education in Central Asia, ESOR initiated the Astana Tutorial with the aim of creating a learning arena for radiologists from Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, and of course from Kazakhstan itself for the young but highly ambitious and rapidly growing Kazakhstan, this event signifies another step in the development of radiological science in the country. The Astana Tutorial will include fifteen participants from Central Asia. The National Research Cardiac Surgery Center will be host facility for the Tutorial. Service is in the form of ESOR’s presence in Kazakhstan, the Radiological Society of Kazakhstan (RSK) works closely with ESOR to implement its initiatives in the country. Established in 1979, the Kazakh Republican Scientific Society of Radiology was later renamed the Radiological Society of Kazakhstan. The society’s main office is in Astana (capital of Kazakhstan). Today, the Society has about 1,500 members, 20% of them are also full members of the European Society of Radiology (ESR). Among the members of the ESR from Kazakhstan, residents comprise ten percent.

The RSK aims to promote radiological education and cooperation among its members with regard to professional, social and legal issues. Radiology education in Kazakhstan is mainly provided to around 100 residents by six medical universities and three scientific research institutions. Radiology residency training programs are under the legal authority of the Ministry of Health. The residency training period is very intensive and lasts two years. Residents have opportunities to participate in various master classes and attend conferences and seminars initiated by the Radiological Society of Kazakhstan, whose ultimate goal is to create a pool of the best educated radiologists in the country.

The RSK holds a biannual Eurasian Radiology Forum (EARF). Nineteen lecturers from nine countries (Russia, Austria, USA, France, Germany, the Netherlands, Czech Republic, Turkey, Belgium and Belgium) participated in the fifth EARF which took place in Astana, 2013. From Forum to Forum the number of participants grows. Materials of the Forum are published in the EARF Abstract book.

Swiss roll out new changes in residency and audit

The Swiss Society of Radiology (SGR-SSR) celebrated its 100th birthday in 2013. This centennial was celebrated at the Swiss Congress of Radiology in Lucerne last May.

This centennial was celebrated at the Swiss Congress of Radiology in Lucerne last May. At this meeting, the Schinz Medal, the most prestigious award of the Swiss Society of Radiology, was awarded to Prof. Jürgen Heusing from Freiburg, Germany for his 'outstanding contributions to the medical imaging'. This year, the Swiss Congress of Radiology will be held in Montreux, June 13–18.

Radiation protection is still a topic high on the priority list of our society. Last year, we reported on the start of a project of clinical audits in radiology and nuclear medicine, where the complete process from indicating an examination to signing the report will be regularly examined by a board of experts.

The Swiss Medical Association (FMH) continues to restructure the training curriculum in all medical specialties. Therefore, we had to incorporate DOPS and Mini-CEX into the radiology curriculum. In addition, beginning in 2014, all documentations for each individual resident will be kept on an electronic log on a central internet platform. As part of a national programme supporting family practitioners, the federal government has enforced revenue cuts of 5% for different medical specialties, including radiology. Within the next two years, negotiations will continue to get a more detailed idea of how to establish this redistribution on an economic base.

CLINICAL AUDIT IN RADIOLOGY

In 2011, the Federal Office of Public Health started a project to implement clinical audits within Switzerland. Clinical Audit is a systematic examination or review of medical radiological procedures which seeks to improve the quality and the outcome of patient care through structured review whereby radiological practices, procedures and results are examined against agreed standards for good medical radiological procedures, with modifications of practices where indicated and the application of new standards of necessity” [1991 EURATOM, 1993].

Even though the medical societies affected are in favour of improving quality and keeping radiation doses as low as reasonably achievable, the implementation of such audits is controversial, and the time schedule set by the Federal Office of Public Health is quite ambitious, considering there are only a limited number of clinical guidelines available.

The project follows implementation in 2013 following a pilot study. The Swiss Society of Radiology is taking an active part in the working group set up by the Federal Office for Public Health and is constantly emphasizing that the project can only start once the standards are defined on a European level.

Back in 2008, the Swiss Medical Association (FMH) founded the Swiss Institute for postgraduate and continuous medical training (SWF) as an independent organisation in order to fulfill the legal requirements. The main duties of this institute are the accreditation of the different programmes for postgraduate medical training and the accreditation of training programmes. In 2013, the SWF worked in collaboration with the Swiss Society of Radiology on a revised programme for postgraduate medical training in radiology and by the decision of the authorities the revised programme got its accreditation.

Since January 1, 2014, all relevant documents during postgraduate training like the number of specific examinations, FMH and evaluation reports have to be documented in an electronic logbook (“E-Logbook”). The E-Logbook is administrated centrally by the SWF and all medical specialists. All residents get personal access to their data and are responsible for the records within their personal logbook. The relevant training institution must confirm the records entered by the residents. At the end of postgraduate training the logbook is used to obtain the postgraduate title. Besides its documentation function, it is foreseen that the logbooks will become the basis for funding postgraduate training in Switzerland. For the evaluation of residents, the SWF has implemented two new instruments following the example of the United Kingdom: Mini-CEX (Mini- Clinical Evaluation Exercise) and DOPS (Direct Observation of Procedural Skills).

The residents should get structured feedback several times a year about their procedural skills and this feedback should be documented.

By Bernhard Allgayer

Prof. Bernhard Allgayer is responsible for postgraduate and continuing medical education of the SGR-SSR.

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and it continues to contribute to the development of radiology in Georgia, its foundation in 1995, has played a very important role in the development of radiology in Georgia, particularly have benefited a great deal from these techniques—surgery can be planned with more precision and postsurgical outcome is better in these cases; indeed, it is very efficient for the general surgery as a whole.

Considering the modern technical equipment and high professional standards of radiologists in Georgia, it has developed a reputation as regional leader in the Caucus, specialists are referring patients from many parts of the Caucasus to Georgian centres.
“An unforgettable experience,” says former Rising Star

Tsvetelina Teneva, a resident in radiology from Varna, Bulgaria, recalls her first Rising Stars presentation in an interview with ECR Today.

ECRT: Did your participation in the programme help you chose radiology as a specialty?
TT: I was determined to specialise in radiology since my third year of medical education and did not change my mind. My participation in the programme confirmed that radiology is not only of great significance to medical practice, but also a charming and sophisticated specialty.

ECRT: How important is this initiative for Bulgarian medical students and residents? Why should they take part in the programme?
TT: The programme at ECR 2012 and all the congresses I attended ever since were unforgettable experiences for me. Now I am participating in the Invest in the Youth programme at ECR 2014. I am trying to spread the message of the ECR to other residents and students.

ECRT: You are now a resident in your home country, Bulgaria. What is the situation for trainees over there, are there enough resources to work with?
TT: As a resident in Varna, Bulgaria I have access to nearly every modern imaging modality. Communication with colleagues and other residents is very friendly and professional. Residents have access to many literature sources, both in print and online. Work in the radiology department is interesting and hard. Unfortunately, there is no adequate feedback from other clinics. Despite the availability of many options for courses in other hospitals in Bulgaria and abroad, there is a lack of financial support for residents.

ECRT: How could the ESR be of further help?
TT: The ESR is a society that not only supports, but also inspires its members. Congresses, courses, international sessions and even art installations have been developed to help all radiologists. What else could the ESR bring us? A monthly online international discussion about one interesting case or more residents’ meetings during the ECR could make good additions. The ESR is already the connection between radiologists worldwide.
Top tips for trainees and teachers
Part 5: Poster Presentation

Have you seen this year’s ECR posters yet? Fancy improving your CV by presenting a poster at the ECR next year? Then read on and let Prof. Maria Argyropoulou, EPOS editor, explain how different posters can be created and how to go about finding a topic. She’ll also provide some insight into planning and presenting award-winning posters. Yes, it is only a poster, but you should also see it as the first step on your path to greater things.

ECRT: Can you tell us about the best posters you’ve seen and what made them so great?
MA: All the Magna Cum Laude ECR posters share the same qualities: clarity, accuracy, simplicity, logical coherence, smooth flow of information and beautiful illustrations.

ECRT: What kind of posters would you reject and why?
MA: Posters lacking accuracy, methods or facts cannot be accepted. The purpose must suit the methods; conclusions need to comply with results. The poster needs to be understandable, in terms of language, coherence, smooth flow of information and beautiful illustrations.

ECRT: How can trainees find good topics, especially those working in small hospitals?
MA: Despite the scientific progress the human body remains a mystery and provides hundreds of unanswered questions and plenty of research space for everyone who wants to explore it. Small hospitals are usually short of state-of-the-art equipment or rare cases. Conversely, small hospitals have a serious advantage over large reference medical centres, which may be over-specialised, limiting the interdisciplinary integration of knowledge. In small hospitals, radiologists have a wide range of practice and communicate with many different medical disciplines. Sometimes the dots are just in front of our eyes but nobody has ever stepped back to see the bigger picture and connect them.

ECRT: What do you think is the best way to plan a poster project?
MA: Poster presentation is a complex task that need to go through careful planning:
Organise your time. Find out the deadline and make a schedule allowing for unexpected delays. Allow time for IT issues and reviews from your supervisors. Plan to submit at least one week before the deadline.
Choose your topic and a carefully crafted main message of the poster.
Gather your data, decide what is most important, then organise this material in the poster clearly and succinctly. Strictly follow author guidelines. All visuals and text should relate to those points and conclusions. Even if your data is perfect and presentation is good, it will be your choice of colours, images, graphs, charts and illustrations that distinguish you from the crowd. Get help if you find handling visual items challenging and ask your superiors for advice.

ECRT: What kind of posters do you think are more attractive than text? Use the reader gravity which pulls the eye from top to bottom and left to right (Waldron 1991).
Keep it simple! Remember that viewers will take away one or two points from your poster and simple messages are more memorable.

By Christiane Nyhusen

Slovenian radiologists look forward to busy year

Last year was a prosperous one for Slovenian radiology. After a rough time, lasting several years, the renewed list of ultrasound procedures has been endorsed by the National Health Insurance Company, embracing not only the latest procedures but also SAR’s recommendations.

During ECR 2013, the fifth Slovenian evening gathered together all congress participants involved in radiology in Slovenia. More than 80 people attended this great professional and social event, sharing their experience and discussing challenges in Slovenian radiology.

In collaboration with Bayer, international radiologists and residents gathered for an imaging master class on CT and MR. Renowned national and international experts shared their experience with the attendees, including personal communication.

Autumn was also very busy for the Slovenian radiological community. Younger members of SAR, mostly residents, actively participated in the 12th Croatian-Hungarian-Slovenian Symposium, which was held in the charming spa resort of Wetv Martin na Muri in Croatia. The Slovenian delegation successfully presented ten topics, sharing their experience with colleagues from the neighbour-
ing countries. Young radiologists were given a chance to present their experience in a friendly atmosphere, with some presenting for the very first time. Many new friendships were established, some will probably last for decades.

Meanwhile, SAR also took active part in the second MR School in Sarajevo, which was a great success. The School took place between November 14 and 17, partly overlapping with the 27th Alpe-Adria regional meeting of radiologists, which was held in Ljubljana on November 15 and 16. Young radiologists and experts from universities hospitals in Austria, Croatia and Slovenia shared their experience, informing each other of the status of radiology in their home countries.

A historical landmark for Slovenian radiology was marked in 2013, since it was 50 years since the first roentgenographic institute in Slovenia was established. The 70th anniversary was celebrated in November together with invited international experts and friends of Slovenian radiology. The anniversary book, including information on the first 10 years of Slovenian radiology, will be issued in early 2014.

Prof. Dimitrij Kuhelj is the president of SAR

BY DIMITRIJ KUHELJ

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The painter and graphic artist Franz Sedlacek (1891–1945) was one of Austria’s leading artists between the World Wars. A creator of strange, bizarre and mysterious scenes, Sedlacek draws the viewer into an unsettling world of surreal imagery. Following earlier works of graphic art and caricatures, Sedlacek turned to painting in the early 1920s. In a technique schooled on the Old Masters, he painted dream-like scenes populated by weird beings and gloomy landscapes suffused with pathos, remote from modern civilization. Many of his paintings were inspired by the art of German Romanticism. Veering between enthusiasm for technological advances and a sceptical attitude towards progress, his paintings combine romantic aspects with modern elements from industry and technology, bringing his motifs close to the art of the New Objectivity movement.

While Sedlacek was quite successful in his lifetime, it took until the 1990s for his œuvre to be rediscovered. The first comprehensive retrospective of his paintings was presented by Landesgalerie Linz in 2012; this exhibition is now on show, in slightly modified form, at Wien Museum. It consists of 48 paintings on loan from private and institutional owners, along with private documents from the life of the artist. Two of Sedlacek’s key works – The Chemist (1932) and Winter Landscape (1931) – belong to Wien Museum.

Self-taught and successful
Franz Sedlacek was born in Wroclaw in 1891 and grew up in Linz in a German-nationalist and anti-Semitic environment. An avid draughtsman already in his school years, he drew caricatures of fellow pupils and teachers. Following the wishes of his father, a manufacturer of machinery, Sedlacek took up studies at the Vienna University of Technology, where he enrolled in architecture at first, but switched to chemical engineering after two semesters. At the same time, however, he launched his career as an artist in Linz, where – together with his friends Bosch and others – he co-founded the artists’ group MAERZ in 1913. The group, which also featured literary ideas, was dedicated to a modernist and expressionist approach.

In 1916, Sedlacek’s key works – The Chemist (1932) and Winter Landscape (1931) – belong to Wien Museum.

Success in Europe and in the USA
Franz Sedlacek pursued his career as an artist with determination. From early on, he had professional photographs made of his pictures, some of which appeared in popular magazines. His work was shown at the Secession in 1920 and on several subsequent occasions, and in 1927 he became a full member of the institution. He also exhibited paintings at international events, including the 1929 World Fair in Barcelona, where he was awarded a gold medal for one of his works, and at shows in the US, including the Pittsburgh International Exhibition of Painting.

Sedlacek continued to be present in exhibitions during the years of Austerity and Nazi rule, including the propaganda show ‘Mountains and People of the Ostdmark’ at Vienna’s Kunsthalle. Sedlacek served as an officer in the German Wehrmacht from 1939 to January 1945, when he went missing on the eastern front near Toruń.

The paintings in the exhibition are grouped under seven headings: there are winter landscapes, ‘romantic’ landscapes, street scenes from cities and villages, Sedlacek’s extraordinary floral still lifes, Christian motifs (e.g. the flight into Egypt), which seem to have been popular with potential buyers, and fantastic creatures with phantasmagoric chimeras or deformed human figures, often inspired by literary sources. Another dominant theme in the confrontation between seemingly idyllic landscapes and set pieces of modern technology such as automobiles, power plants or aeroplanes.

Wien Museum

Museum of Vienna

Kärntnerstrasse 1040 Vienna

Opening hours: Tuesday–Sunday 10 am–6 pm
www.wienmuseum.at
WHAT'S ON TODAY IN VIENNA?

Theatre & Dance
Please note that all performances, except at Vienna’s English Theatre, are in German.

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