Brain imaging: the other face of HIV/AIDS

By Mélisande Rouger

HIV/AIDS is a public health concern worldwide, but its manifestations, especially in the brain, can be quite different depending on the environment in which it presents. These differences, which are particularly striking between rich and poor countries, should be recognised and addressed by all, as local problems are likely to spread in the near future, said Professor Anne Osborn in her ECR 2010 Opening Lecture on Thursday.

Thanks to top-notch, accessible medical care and widespread availability of the latest drug cocktails in so-called resource-rich countries, HIV/AIDS has become a chronic, manageable condition compatible with long-term survival. In contrast, HIV/AIDS often presents as an acute, fulminating, often-lethal disease in resource-poor nations.

The most dramatic manifestation is what Osborn referred to as “the deadly intersection” between HIV/AIDS and drug-resistant tuberculosis (TB), a disease on the rise in many poor countries. According to Osborn, “TB and HIV are rampant, and access to appropriate treatment is limited. This means radiologists often present as an acute, fulminating disease that forms a truly deadly and extremely challenging situation for healthcare providers.”

“TB is rampant in Africa, each disease magnifies and greatly amplifies the infectiousness and lethality of the other – with devastating consequences. It is this combination of HIV/AIDS and TB that forms a truly deadly intersection,” explained Osborn, a world-renowned neuroradiologist who teaches at the University of Utah School of Medicine in Salt Lake City.

Osborn chose to discuss this topic at ECR 2010 because of the location of the congress and its exemplary history of assisting radiologists in developing countries, which she thinks is admirable. ECR is uniquely positioned as the centre point between Western and Eastern Europe, between Europe and Africa, and Europe and Asia. There are a lot of radiologists from less-developed countries who attend ECR and who might not be able to attend meetings like RSNA because of the travel expense.

In Africa and many parts of Asia, HIV/AIDS and TB are rampant, and access to appropriate treatments is limited. This means radiologists see acute manifestations such as bacterial brain infections and acute fulminating meningitis, which are very rare in developed countries. “These patients simply don’t survive long enough to develop more familiar consequences of chronic HIV/AIDS such as opportunistic infections, tumours, and recently-described entities such as immune reconstitution inflammatory syndrome (IRIS),” Osborn pointed out.

However, radiologists in the U.S. and Europe will increasingly see such cases in the future as migration increases and the prevalence of multi-resistant TB rises, even in rich countries. Radiologists must be prepared to meet and recognise a face of HIV/AIDS that they have never seen before.

“We need to become familiar with unusual manifestations of HIV/AIDS. We need to learn now how to recognise those signs, this new unfamiliar ‘face’ of HIV/AIDS that we don’t know yet, because these cases will probably be showing up in our practices very soon,” Osborn said.

There is a true disconnect between the face of HIV/AIDS in poor environments and the one European or U.S. physicians know, she added. “This disconnect increases when we come to terms with the fact that there is a unique opportunity for us to make a difference in people’s lives, that we can make a difference in the outcomes of patients who have been HIV positive for almost 20 years. We can support educational outreach, making generic drugs available, and work together to eradicate co-morbid diseases like TB and malaria, which together kill more people annually than HIV itself does.”

If a patient is co-infected with both HIV/AIDS and TB, which often happens in areas such as sub-Saharan Africa, each disease magnifies and greatly amplifies the infectiousness and lethality of the other – with devastating consequences. It is this combination of HIV/AIDS and TB that forms a truly deadly intersection, explained Osborn, a world-renowned neuroradiologist who teaches at the University of Utah School of Medicine in Salt Lake City.

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She took the opportunity to appeal to ESR members to support worldwide efforts to advance HIV/AIDS treatment. “We can support educational outreach, making generic drugs available and work together to eradicate co-morbid diseases like TB and malaria, which together kill more people annually than HIV itself does.”
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Pioneering neuroradiologist to present Wilhelm Conrad Röntgen Honorary Lecture

By Melleinsde Bouger and Simon Lee

In recognition of his outstanding contributions and exceptional achievements in neuroradiology, Michael N. Brant-Zawadzki from Newport Beach, CA, USA, will present the Wilhelm Conrad Röntgen Honorary Lecture ‘Diagnostic radiation and carcinogenesis: What do we know?’ at ECR 2010.

Brant-Zawadzki, who is the Executive Medical Director of Neurosciences at Hoag Memorial Hospital in Newport Beach, California, and also holds an adjunct Clinical Professorship in Neuroradiology at Stanford University, will focus on the relationship between carcinogenesis and radiation at levels used for diagnostic radiology procedures during his lecture at ECR.

“This relationship is based on mathematical models of a hypothesis and is not established scientific fact, despite media and even medical communities to the contrary,” explained Brant-Zawadzki. “A more comprehensive understanding of the issue is needed. All can agree on the appropriate use of tests, including those which use diagnostic radiation, and the establishment of standardized, safest dose protocols for a particular patient study.”

Born in 1949 in Warsaw, Poland, he earned his undergraduate degree from Stanford University in 1971, and his medical degree from the University of Cincinnati College of Medicine, where he received the Hoffheimer prize, awarded to the top graduating medical student. He then trained in radiology and neuroradiology at Stanford University Medical Center, after which he spent six years on the Neuroradiology faculty of the University of California, San Francisco (UCSF). In 1986 he started working at Hoag Memorial Hospital as Director of MRI, a field in which he has excelled throughout his career.

He notably received the special Gold Medal from the Society of Magnetic Resonance in Medicine for outstanding pioneering achievements in magnetic resonance imaging in 1993, and was awarded Fellowship of the International Society for Magnetic Resonance Medicine in 1997.

Professor Brant-Zawadzki has authored and co-authored more than 180 papers in professional journals, has also authored or co-authored 17 textbooks and has a large number of book chapters to his name. He lectures nationally and internationally, and is a consultant to the industry in the imaging, pharmaceutical andinformatic fields.

He is a member of multiple professional societies and sat on the Executive Committee of the International Society of Magnetic Resonance Medicine, as well as on the Task Force on Clinical Guidelines for the North American Spine Society.

In addition, he has served as President of the Western Neuroradiological Society, a member of the Programme Committee of the American Society of Neuroradiology, and has been Chairperson of the Public Information Committee of the Radiological Society of North America.

He currently serves on the editorial board of numerous professional publications, including JAMA (Journal of the American Medical Association) and the American Journal of Neuroradiology.

Michael N. Brant-Zawadzki is a specialist in neuroradiology with particular interest in magnetic resonance imaging.

Wilhelm Conrad Röntgen Honorary Lecture

By Jan Porger, Prague/CZ, CIRSE President

As the new year is well on its way, so are the many CIRSE projects we have developed for 2010. The European School of Interventional Radiology (ESIR) is again providing young interventionalists with the opportunity to learn about specific procedures in two-day intensive courses in various European cities. The courses have been very popular with our young colleagues, as they combine excellent educational standards with an interactive format at a very low cost. In addition we have been offering hands-on courses in the centres of some of our industry partners.

The CIRSE Foundation will also host the second European Conference on Interventional Oncology in Florence (ECIO) at the end of April. Offering more than 33 hours of technical and clinical focus sessions as well as workshops, this important event accommodates the needs of a field that has grown substantially over recent years. New techniques and devices for direct tumour ablation and trans-arterial therapy are only a few of the developments on this market and CIRSE will be certain to keep up the key role of radiology in inter-ventional oncology.

Of course the highlight of the interventional radiological year continues to be the CIRSE annual meeting. After an outstanding CIRSE 2009 featuring many new and interesting aspects such as a health economics course series and hands-on workshops, we very much look forward to our 2010 congress in the beautiful city of Valencia, Spain. The 2010 programme will include old favourites as well as many new and exciting sessions.

The concept of main topics running parallel to avoid overlap has been further expanded, adding neuro-interventions as the seventh topic in addition to transcatheter embolisation, non-vascular interventions, interventional oncology, vascular interventions, clinical practice and imaging. The introduction of an extended neuro-interventional section was conceived to address the expanding role of the interventional radiologist in the management of stroke in hospitals the world over. Stroke prevention, imaging and treatment will be discussed in three special sessions. In addition, delegates will have the chance to have a closer look in two dedicated workshops and one hands-on workshop.

After meeting Brazil in 2009, CIRSE will meet the Hispanic countries of Latin America at CIRSE 2010, providing an interesting insight into IR practice in this vast continent. As part of the CIRSE mentor initiative we will also offer a session in cooperation with the European Society for Anaesthesiology.

Over the years CIRSE has developed into a society that offers its services around the year, giving interventional radiology a permanent platform and continuous support. In 2009 this resulted in the recognition of interventional as a Division within the UEMS (European Union of Medical Specialists) Radiology Section. In 2010 our main focus will be the establishment of the European Board of Interventional Radiology (EBIR), which will enable interventional radiologists to prove their skills with an official European postgraduate certification. We are confident that the EBIR will set new qualification standards in Europe and provide a useful tool in our struggle for adequate recognition of our specialty.

We hope that in the future the EBIR will incorporate CIRSE’s many educational activities, including its e-learning tool www.esir.org, which offers more than 1,300 videos, PowerPoint presentations and posters from previous CIRSE congresses.

If you are interested in learning more about CIRSE’s many activities or providing us with your ideas and input, I warmly invite you to visit our booth in the entrance hall or visit our website at www.cirse.org.

The red carpet is rolled out to welcome delegates at the CIRSE 2009 congress, as they flock into the meeting venue.

The ECR has honoured and humbled me with the invitation to be an honorary lecturer, and I would like to thank the organising committee, especially Prof. Szczerbo-Trojanowska, for their consideration. Being European by birth (Polish), but having had an American education, I consider the ECR and all my European colleagues not only as the bridge to my origins, but as valuable colleagues, collaborators, teachers, and students who continue to connect me to the worldwide radiology community.

Wilhelm Conrad Röntgen Honorary Lecture

Friday, March 5, 12:15–12:45, Room A

“Diagnostic radiation and carcinogenesis: What do we know?”

Michael N. Brant-Zawadzki, Newport Beach, CA/US

BIRCE prepares for an active year ahead

By Jan Porger, Prague/CZ, CIRSE President
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**Speedy response proves critically important in effective stroke care**

By Paula Gould

Acute stroke is a genuine medical emergency that demands rapid action, no matter what. This uncompromising message will be reinforced today in a headline ‘EM 2’ session organized jointly by the European Society of Radiology and the European Neurological Society, and chaired by the ECR 2010 Congress President Prof. Magdalena Szczepan-Trojanowska.

Stroke is a major cause of death and disability worldwide. Around 15 million people suffer a stroke every year, and of those, about five million die and another five million are left permanently disabled.

In Europe, as in other developed regions, more stroke patients are surviving than ever before. Many will nonetheless go on to have a reduced quality of life, remaining dependent on family or carers, unable to return to work or enjoy an active life. Consequently, a primary goal of stroke management is to improve survivors’ outcome, making prompt diagnosis and appropriate treatment of great importance.

Rapid diagnosis is the first, vitally important step, not least because patients whose symptoms have been caused by a burst blood vessel will be managed differently to those with an arterial blockage. The optimum time window for treating ischemic stroke patients intravenously with clot-busting drugs, such as tissue plasminogen activator (tPA), is three hours, with a possible extension of up to 4.5 hours. Once this time is up, then pharmacological thrombolysis is no longer recommended.

Initial diagnostic imaging should provide positive evidence for an ischemic event as well as ruling out other pathologies, such as intracranial bleeding, according to Prof. Franz Fix, head of radiology at the Medical University of Graz, Austria. But which modality should be used? Although CT is the mainstay of acute stroke imaging protocols in many hospitals and clinics, some physicians and radiologists prefer to work with MRI. The arguments in favour and against each modality will be presented by Prof. Majda Thurnher, professor of radiology at the Medical University of Vienna.

"The choice is not only about the best modality, it is also the one you can have immediately," he said. "It’s better to have a CT scan immediately than wait 30 minutes for the MRI scanner to be free."

All cases of acute stroke can be treated as medical emergencies, according to Prof. Didier Leys. Although doctors have a time window to work with for the administration of intravenous thrombolysis, drug therapy should ideally be started as soon as possible. Patients who arrive close to the end of that window are typically assessed and treated much more quickly than those who present soon after the onset of symptoms.

"It is not that practitioners are trying to lose time," he commented. "It is because they want to know more about the history of the patient, they want just one more sequence on MRI to get a better evaluation of the stroke. If you have more time, you tend to take more time, but this is not good." A smaller percentage of ischemic stroke patients may be referred for intra-arterial thrombolysis. Patients in this group will typically have arterial occlusions that are difficult to treat with intravenous tPA, and without some other form of intervention, their outcome is likely to be poor.

The range of endovascular techniques available for the treatment of ischemic stroke is growing, according to Prof. Dieter Vorwerk, director of the Institute of Diagnostic and Interventional Radiology, Innsbruck Hospital, Germany. The trend is for practitioners to use a combination of mechanical thrombectomy and tPA, rather than intra-arterial drug treatment alone. This dual approach is faster and more likely to be effective.

One relatively simple strategy is to use a guidewire to perforate the thrombus prior to tPA delivery. Another option is to use a balloon to dislodge or disrupt the clot, though this method is not quite as effective because the thrombus reforms straight away when the balloon is deflated, he stated.

A number of dedicated clot-catching devices have now been developed that can be used to extract the thrombus. Practitioners could alternatively try using an aspiration catheter to break up the clot and remove it bit-by-bit. Another option being explored is the insertion of a stent on the thrombus prior to tPA.

"What you need is an absolutely standardised workflow when a stroke patient is admitted," Vorwerk said. "At our hospital, the decision to do the intervention is based on CT angiography because candidates for intra-arterial thrombolysis are patients with a specific pattern of disease. These patients have a much better prognosis and outcome if they are treated endovascularly."
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Chairmen: E. K. Fishman, D. Fleischmann,
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Diffusion-weighted imaging (DWI) looks set to become mainstay for diagnosis of tumour response and lesion detection

By Frances Rylands-Monk

MR developments over recent years have allowed researchers to explore water molecule motion between cells using diffusion-weighted imaging (DWI) to indirectly measure cellular density within a tissue. This has provided a new and continuously evolving tool in oncologic imaging for lesion detection, characterisation, and therapy assessment.

Diffusion has not yet been studied sufficiently in large samples to provide a sound basis for the use of functional biomarkers. Within three to five years, larger studies may well validate parameters extracted by DWI, and diffusion will be used alongside Response Evaluation Criteria in Solid Tumors (RECIST) to routinely assess tumour response.

Traditionally, shrinking was deemed the most definite tumour ‘response’ post-treatment. But now, diffusion imaging measuring the Apparent Diffusion Coefficient (ADC) representing the mm2/s that water molecules are able to move between cells may show that intercellular water movement changes after treatment, even if the size of the tumour does not change.

"Using DWI, future treatments can be more personalised and doctors will have more information to decide whether or not to continue or increase treatment," said Prof. Filipe Caseiro-Alves, head of the imaging department at the University of Coimbra, Portugal, and chairman of this morning’s special focus session on DWI of the abdomen.

Being able to systematically solve problems using diffusion is related to repeatability and standardisation of the technique.

"Not all vendors approach MRI sequences in the same way and the results obtained on one machine may be very different on another. A Siemens machine, for example, may not yield the same ADC results as a GE machine," he noted.

A measurement of ADC value of 1.0 x 10-3 mm2/s that might indicate metastasis may have a different value on another machine, making direct extrapolations hard. For standardisation to occur, hardware needs to produce identical measurements. Science meanwhile needs to come up with values that mean likelihood of malignancy or benign tissue.

"Without machines yielding the same results, studies cannot be transposable to develop standard measurements. There needs to be internal standards for equipment, while radiologists should work to agree values and protocols through larger clinical studies," said Caseiro-Alves.

Some standardisation has been achieved. In the typically less cellular-packed benign lesions, water movement is free, but is more impeded in malignant lesions. Therefore, at extreme values it is possible to differentiate between benign and malignant tissue.

For example, 0.9 or 1.0 x 10-3 mm2/s would indicate a greater likelihood of malignancy and 2.5 x 10-3 mm2/s would favour benign tissue. However, in the middle, there lies a grey area where measurements are indeterminate and liable to vary depending on the type of scanner and the way in which a sequence is obtained. Moreover, false positive may occur due to limitations in having restricted diffusion in the case of fibrotic benign tumours. Another problem relates to liver patients with haemochromatosis because iron changes the signal received, leading to different visual impressions, and thus interfering with interpretation.

"Because it is not 100% specific, DWI should be interpreted in combination with other information from other techniques such as T2-weighted images and contrast enhancement, as well as morphological imaging," he stated.

Current problems in DWI technology such as low signal-to-noise ratio (SNR) and limited spatial resolution are likely to be overcome in part through the more widespread use of higher magnetic field strengths, such as 3T. Meanwhile, radiologists should learn how to best apply current knowledge.

"The technique can be unforgiving," warned Dr. Dow-Mu Koh, consultant radiologist in functional imaging at The Royal Marsden NHS Foundation Trust, Sutton, U.K. "If the scan factors are not optimal, image quality will be poor. There is a danger that doctors will rush to do these new techniques but then not do them well."

Because the technique is relatively new, Koh’s presentation at today’s session will be practical, outlining the broader principles of DWI and how protocols can be optimised to get consistently high quality images for diagnostic purposes.

"As far as I can see, it is a technique with very little penalty: no contrast is needed and it is quick and radiation-free; DWI now has a variety of clinical applications, including whole-body imaging, which is being widely investigated," Koh said.

In pancreatic imaging, DW-MRI is more sensitive for detection of pancreatic lesions than conventional MRI. If DW-MRI reveals no unusual pathology, it can be confidently stated that the examination is normal, but with conventional imaging this is not always the case, according to Dr. Celso Matos, associate professor and head of the MRI division at Erasme Hospital, Free University of Brussels, also speaking at today’s session.

DWI may be used as a baseline reference in follow-up studies of patients that are not surgical candidates, or if a lesion is not visualised in conventional MR, DWI can be used to detect any possible lesion present. In a study at Erasme Hospital involving 209 patients presenting with the full range of pancreatic disease, including cancer and inflammatory disease, adding DWI to conventional MRI increased the sensitivity and negative predictive value of MRI.

CT is still considered the first-line modality to image the pancreas. However, MR is more appropriate for follow-up studies, particularly in younger patients, for whom contrast and radiation from conventional techniques could be an issue, and it is also more able to detect some lesions, noted Matos. He also describes DWI as a useful tool in suspected cases of neuroendocrine lesions in the pancreas, and also for detection of malignant transformations in cystic tumours.

"If a patient is suspected of having a pancreatic cancer and MRI is scheduled, then the scan should also include diffusion-weighted imaging. In chronic pancreatitis, where there is increased likelihood of developing cancer, DWI should also be included," Matos said.

However in ‘positive’ examinations, radiologists face problems differentiating the pathology visualised in DWI from cancer or pancreatitis. To increase specificity, DWI of the pancreas should always be part of a comprehensive study that includes conventional T2-weighted, MR cholangiopancreatography and contrast-enhanced T1-weighted sequences, he said.

He underlined the need for more validation. "We don’t know if we are measuring cancer cell death through fibrosis or necrosis. We need to validate DWI techniques by comparing results with histopathology," Matos concluded.
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Advanced MRI captures the complexity of multiple sclerosis

By Paula Gould

MRI has become central to the diagnosis of multiple sclerosis (MS), a complex disease of the central nervous system that affects over 400,000 people in Europe. Around 90% of all MS diagnoses are now based on MRI findings, owing to the modality’s high sensitivity to inflammation and demyelinating plaques.

Trials have shown that an early diagnosis can make a big difference to the efficacy of MS drug treatments. Familiarity with the optimum diagnostic strategy is consequently crucial. Work is also underway to identify imaging biomarkers that could show whether a selected treatment is working or not, well before that same conclusion can be drawn from clinical findings.

This morning, members of the European Magnetic Imaging in Multiple Sclerosis (EAMIS) network will be sharing with ECR delegates their expertise on MS diagnosis and management. The state-of-the-art session will include practical tips for general radiologists who are faced with a potential case of MS, as well as details about research that will appeal to specialists in neuro-radiology.

"From a practical point of view, the most important message that we will try to give to all of the attendees is to be familiar with the diagnostic criteria," said Dr. Alex Rovira, head of the MRI unit at the Vall d’Hebron University Hospital, Barcelona, Spain, and the session chair. "In most European countries, the criteria required to start treatment with MS is to establish the diagnosis and this is done with MRI. To avoid a wrong diagnosis, we have to know about the typical features of this disease and how we should apply these imaging criteria."

An imaging-led diagnosis of MS is typically based on conventional MRI techniques. T2-weighted imaging can reveal lesions that indicate the presence of inflammation, demyelination, gliosis, and axonal loss, and even remyelination. This information may be used by radiologists to estimate the overall burden of MS disease. Contrast-enhanced T1-weighted imaging alone can be used to detect lesions that are currently active.

A firm diagnosis is not usually made until the disease has been identified clinically in a separate part of the central nervous system some time after the initial onset of symptoms. It may take a couple of years for this criterion to be met. Repeated MRI, on the other hand, may identify new ‘silent’ lesions and speed up the diagnosis.

Alternatively, and of equal importance, imaging may be able to exclude MS and identify the true cause of the patient’s symptoms. Once the diagnosis has been made, the value of MRI to MS patients begins to waver. Radiologists would like to use MRI to track the progression of this disease, and perhaps even forecast periods of remission and relapse, but it is very difficult to predict the outcome of treatment based on conventional MRI findings alone. What you see on imaging does not necessarily reflect what benefit the patient will get.

The main reason for this clinical-radiological paradox is the complexity of MS. The severity of the disease is due to a number of factors, and not all of this information can be captured from T2- and T1-weighted imaging alone. Conventional MRI techniques may be able to spot MS lesions, but they say little about changes occurring within those lesions or about damage to brain tissue that has a ‘normal’ appearance. More sophisticated techniques, such as MRI spectroscopy (MRS), diffusion tensor imaging (DTI), and functional MRI (fMRI) are needed to complete the picture.

"MS is not just focal inflammatory demyelination, as we used to think. There are a lot of additional things going on," said Prof. Massimo Filippi, director of the Neuroimaging Research Unit at San Raffaele University in Milan, and one of sessions three invited speakers. "It is a more complex puzzle that we still need to define."

This process would be aided if the application of these non-conventional MRI techniques could be standardised, according to Filippi. Clear criteria for the diagnosis of MRI based on conventional MRI approaches have already been established, but as yet, there is no ‘common language’ covering MRS, DTI, and/or fMRI findings.

Non-conventional MRI techniques are becoming increasingly important in preclinical and clinical trials as companies move towards the development of neuroprotective drugs, as well as anti-inflammatory agents. The development of internationally acceptable guidelines relating to MRI-based monitoring of MS would help researchers from different institutions to compare their results.

"We are lucky to have MRI, which is not a single technique but a set of techniques. We should not be using the same technique in all scenarios, but tailoring our approach to MRI when addressing different research questions," Filippi said.

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Head and neck: a complex and misunderstood region

By Melissaone Rouger

For most radiologists, the region consisting of the head and neck is an area of doubt and trouble. Apart from sinusitis, maxillofacial trauma or benign thyroid disorders, they are rarely confronted with pathologies in this complex region. The diseases that can be encountered in this region are very diverse, including congenital abnormalities, inflammation, infection and trauma, as well as benign and malignant neoplasms.

Imaging of this area can be done using different imaging techniques, each with their own possibilities and shortcomings. The role of conventional radiography is mainly limited to the evaluation of simple traumatic lesions of the mandibulofacial skeleton, while ultrasound is a good technique for evaluating the thyroid gland, lymph nodes and salivary glands for example. Computed tomography is a very robust technique for investigating inflammatory sinonasal disease, as well as cancers in the larynx, hypopharynx and oropharynx, and is more suited to visualizing para-nasal neoplasms and nasopharyngeal cancer. For these last two diseases, magnetic resonance imaging is the first choice technique.

Neoplasms in or close to the skull base have a lot of opportunities to grow into very small channels in the skull base, into which vessels and small nerves normally run. MRI is a better technique than CT for detecting these subtle infiltrations. Also, behind the tumour, there might be stagnation of fluids and secretions, which may look like tumour on CT. MRI enables the differentiation to be made.

In patients with an oncological condition, PET or PET/CT is mainly used to exclude distant metastases outside of the head and neck, and to search for secondary tumours. Many of these patients are heavy smokers and alcohol consumers, so the risk of them having a second tumour that has not been noticed yet is high. Knowing this is important because it may change the management of the patient.

“Radiologists are not very often confronted with these diseases, so they usually don’t like to read imaging studies from this region,” he said.

A second challenge they have to face is that the boundaries of the head and neck region are very different, including congenital abnormalities, inflammation, infection and trauma, as well as benign and malignant neoplasms.

Imaging of this area can be done using different imaging techniques, each with their own possibilities and shortcomings. The role of conventional radiography is mainly limited to the evaluation of simple traumatic lesions of the mandibulofacial skeleton, while ultrasound is a good technique for evaluating the thyroid gland, lymph nodes and salivary glands for example. Computed tomography is a very robust technique for investigating inflammatory sinonasal disease, as well as cancers in the larynx, hypopharynx and oropharynx, and is more suited to visualizing para-nasal neoplasms and nasopharyngeal cancer. For these last two diseases, magnetic resonance imaging is the first choice technique.

Neoplasms in or close to the skull base have a lot of opportunities to grow into very small channels in the skull base, into which vessels and small nerves normally run. MRI is a better technique than CT for detecting these subtle infiltrations. Also, behind the tumour, there might be stagnation of fluids and secretions, which may look like tumour on CT. MRI enables the differentiation to be made.

In patients with an oncological condition, PET or PET/CT is mainly used to exclude distant metastases outside of the head and neck, and to search for secondary tumours. Many of these patients are heavy smokers and alcohol consumers, so the risk of them having a second tumour that has not been noticed yet is high. Knowing this is important because it may change the management of the patient.

“This Foundation Course on Head and Neck Imaging tries to provide an introduction to this radiological subspecialty,” Hermans explained. Experts will discuss how to properly perform imaging studies in this region. Several sessions will each cover a subregion in the head and neck, reviewing normal anatomy and explaining how imaging can be useful in the evaluation of benign and malignant diseases.

For Hermans, head and neck radiology is a unique and therefore very interesting specialty. “I like it because it is complex and it contains specific pathologies that you won’t find in other parts of the body. Dedicated imaging can really make a difference in the management of the patient.”
Functional imaging in CT represents the new dimension

By Katrina Megget

It is very tempting to forget about morphological snapshots of organs, because the new frontier appears to be functional imaging.

New advances, such as the new generation of CT scanners and improved data analysis techniques, have contributed to a major leap forward for imaging cell and organ function. But as Prof. Patrik Rogalla, professor of medical imaging at Canada’s University of Toronto, will explain to delegates at this afternoon’s New Horizons session, there are still some limitations, and this phenomenon will probably not become widespread for at least another year or two, despite the outstanding potential benefits to patient care.

Functional imaging is not easy to define, but in a nutshell, it is an extension of morphological imaging. He describes it as the time axis added to the 3D space.

While CT scans effectively revolutionised disease diagnosis some three decades ago, the structural information snapshot hits a roadblock when it comes to understanding the behind-the-scenes working of the organ. This is where functional imaging comes in.

“Not only do we see the morphology but also what the organ does,” he said. “There are many diseases that affect both organ morphology and function, and there are others that purely affect the function. Functional imaging gives us a more complete picture.”

Rogalla gives a sporting analogy. If there is a soccer ball being kicked and a photo is taken of the ball, all that is seen is an image of the ball, but there are no details of the direction in which the ball is going. However, a movie of the game would mean we can see where the ball is going and in which direction and what the target is. Indeed, we would not only be able to see the ball but also the whole playing field. The same concept applies to functional imaging.

The prospects for the new technique are encouraging, and already some areas of functional imaging are growing in popularity, particularly CT perfusion. The development of multislice CT has seen a radical advance in CT perfusion to a volume-based examination, and while traditionally relegated to applications in acute stroke, CT perfusion is finding a real home for itself in tumour therapy.

Use of the technique is still restricted mainly to specialist centres, but CT perfusion in tumour therapy is a potentially widely applicable technique, according to Dr. Vicky Goh, consultant radiologist at the Paul Strickland Scanner Centre, Mount Vernon Hospital, Northwood, U.K. Just by looking at the growth of blood vessels (angiogenesis) and blood flow through the tumour, it has enormous potential as a prognostic biomarker for cancer, as well as providing details about a tumour’s response to drugs.

And it is cheaper and easier than using other techniques, such as dynamic contrast-enhanced MRI, she noted. Because of this, CT perfusion could not only be a huge benefit to patients but also to healthcare systems.

“This is a very simple test from which you are getting a lot of information. Anybody could take this up and do it on their scanner,” Goh said.

The main concern with any type of functional imaging, including CT perfusion, is radiation dose. However, with technological advances, such as greater gantry rotation speed, more acquired slices and faster volume coverage, imaging has become more efficient, and the radiation dose does not necessarily correspond to the increase in time taken for imaging, Rogalla explained.

“That’s why there is a push for functional imaging from these new opportunities. There is more information from the same radiation dose,” he said.

However, the technology still needs to be fine-tuned. Functional imaging remains limited by temporal resolution standards, which are not good enough. Meanwhile, radiologists have yet to receive the tools to standardise evaluation of the procedure, for at the moment, different equipment manufactured by different companies may produce different results, Rogalla added. Yet, functional imaging may still pave the way for the future, and ongoing research is investigating technologies and how to understand the reliability of analysis models.

“At the moment, I think we are under-utilising the information obtained in imaging,” he said. “There’s more information we could get. I’m not saying: use functional imaging in all instances. It may not solve all the problems. There are challenges, but also opportunities for this to become an addition to what we do. Functional imaging is one piece in the whole mosaic of applications in radiology. I believe it will become part of our future imaging protocols.”

Head and neck tumour (arrow) with an enlarged neck node (asterisk). A: Baseline axial images. B: Post-treatment (phase I study of cetuximab, combretastatin, and radiotherapy) images demonstrate tumour shrinkage and reduction in vascularity. (Provided by V. Goh)
MRI contrast agents advance with pathology understanding and technological change

Despite advances in the diagnosis and treatment of risk factors for atherosomatic disease, it remains responsible for substantial morbidity and mortality in developed countries. Until recently, the risk of carotid disease in symptomatic patients was determined by simple luminal measurements, but advances in technology and the understanding of plaque are ushering in a new era of assessing risk by characterising individual plaque components, according to Prof. Jonathan H. Gillard, a reader and honorary consultant neuroradiologist at Cambridge University Hospitals, Cambridge, U.K.

Attendees at this afternoon's refresher course on organ-specific and future contrast media in MRI should come away with a better understanding about how contrast agents can visualise plaques and about the clinical applications and indications for using such agents and techniques. The current goal is to be better able to characterise plaque risk, whether it is in the carotid, coronary or peripheral vasculature, he explained.

"Risk from atheromatous disease is more than simple degree of stenosis," he told ECR Today.

"The aim is to identify morphological and functional components associated with risk, namely a thin fibrous cap, large lipid core and inflammatory infiltrates."

The challenge is to develop imaging tools to identify and quantify these plaque changes using MRI, CT, and PET, with and without novel compounds, Gillard added.

Studies of plaque activity, for example, have demonstrated the ability of FDG-PET to image inflammatory activity in humans. Other studies have validated contrast agents taken up by macrophages and visible with high-resolution MRI. This type of MR procedure allows the potential to image not only individual plaque structure but also function, thereby giving an improved understanding of why two patients with identical degrees of luminal stenosis may have completely different degrees of vulnerability.

Cell-specific markers of inflammation, especially with MRI contrast agents, can assess plaque instability, with the potential to alter the management of patients, he said. "The challenge is to validate these techniques in the carotid and assess their utility and effectiveness in clinical practice."

The question arises, however, as to the course of treatment for patients whose vulnerable plaques have been identified through imaging. These techniques enter into new clinical territory, such as identifying patients with moderate carotid disease in whom there is no proven treatment plan, Gillard noted. For now, the most important factor is to indentify vulnerable patients, ideally before they have had an event such as myocardial infarction or stroke.

"Once we have done this, clinical trials can be designed to evaluate specific therapeutic and intervention treatments," he stated.

Evidence exists that aggressive statin therapy reduces plaque burden. Gillard was the senior author of a report about the first use of ultrasmall superparamagnetic iron oxide-enhanced (USPIO) MR imaging (J Am Coll Cardiol 2009;53:2019–2020). The ATHEROMA study found that aggressive lipid-lowering therapy over a three-month period was associated with a significant reduction in USPIO-defined inflammation.

"A cool feature is that this contrast is ‘switchable,’ meaning we can turn it on and off repeatedly," he said. "The agents, based on proteins and sugars, resemble naturally occurring molecules and represent a whole new class of contrast agents that can provide multiple contrasts with different saturation frequencies, which we can turn into multiple colours."

The various colours permit a distinction of different polyphenyldiamines to be made, he added.

Specific indications for these agents include cell tracking, pH imaging, and imaging of drug delivery. Additionally, they help eliminate the risk of nephrogenic systemic fibrosis because they contain no metals.

Several types of CEST contrast agents have been described, containing amide, amine, or hydroxyl protons as off-resonance exchangeable protons. Very few groups in the world are currently developing this new type of contrast agent, and most radiologists may not have heard about it yet, said Bulte, noting that these will be very important to imaging in the future.

Developments in specific plaque contrast agents are important because atheromatous disease is a burden that encroaches on all radiologists, emphasised Gillard, adding that many of these techniques are currently available for routine practice.

During today's course, Jeff W.M. Bulte, Ph.D., a professor of radiology, biomedical engineering, and chemical & biomolecular engineering at Johns Hopkins University School of Medicine in Baltimore, Maryland, U.S., will speak about non-metal-based MR contrast agents that perform chemical exchange saturation transfer (CEST) imaging. When the bio-organic contrast media is irradiated with a saturation pulse at a specific off-resonance frequency, the protons lose their capability to create signal, with the signal lost transferred to bulk water (the source of MR signal) through chemical exchange.

"A cool feature is that this contrast is 'switchable' meaning we can turn it on and off repeatedly," he said. "The agents, based on proteins and sugars, resemble naturally occurring molecules and represent a whole new class of contrast agents that can provide multiple contrasts with different saturation frequencies, which we can turn into multiple colours."

Additional information on this topic can be found in these studies:

Refresher Course
Friday, March 5, 16:00–17:30, Room N/D
RC 606 Organ-specific and future contrast media in MRI
Moderator: A.J. van der Most, Leiden, NL
A. Real added value of liver-specific contrast media
D. Clement, Paris/FRA
B. Contrast for atherosclerosis imaging
J.H. Gillard, Cambridge/UK
C. CEST-type contrast media in MRI
J.W.M. Bulte, Baltimore, MD/US

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Imaging’s role increases in diagnosis of cardiomyopathies

By Emily Hayes

They are a major cause of progressive heart failure and death, but cardiomyopathies can be tough to spot for clinicians, and missed cases can have fatal consequences. During a special focus session on Friday afternoon, expert speakers will review the use of imaging for diagnosing the mysterious condition and for mastering its many faces.

Much of cardiac imaging practice is focused on characterisation of coronary artery disease, and radiologists may be less familiar with primary cardiomyopathies, which are defined as diseases of the myocardium of unknown origin and are associated with cardiac dysfunction.

Conventional wisdom used to hold that cardiomyopathies were not very common, but imaging advances in MR and CT have enabled detection of more cases and helped uncover a heterogeneous group of diseases. Cardiomyopathies occur in about 1 in 5,000 people, but the incidence can be much more or less common, depending on the disease type.

“Most radiologists know cardiomyopathies exist, but the majority do not know the details of modern classification and peculiarities of different types of cardiomyopathies,” said Prof. Valentin Sinitsyn, chair of radiology at Moscow State University’s Cardiology Research Complex, who will begin the session with an introduction to CMR, including its history.

Five major types have been identified: dilated, restrictive, hypertrophic, arrhythmogenic right ventricular, and unclassified, which includes several forms that are less commonly reported. Echocardiography has been the main imaging technique used for diagnosis of cardiomyopathies and is still widely used, but MRI has become increasingly valuable in differentiating it from other conditions, such as heart attack and congenital heart disease.

Depending on the disease type, patients may present with a variety of symptoms, including breathlessness, exercise intolerance, and chest pain. Imaging is performed both by cardiologists and radiologists, and many centres are moving toward multidisciplinary assessment to achieve the best outcomes for patients.

Some high-profile, tragic cases of missed diagnoses have raised awareness about cardiomyopathies in recent years. For example, in 2008, a 19-year-old Russian hockey player named Alexei Cherepanov collapsed during a game in Moscow and later died of heart failure. He suffered from the hypertrophic form of cardiomyopathy and is still widely used, but MRI has become increasingly valuable in differentiating it from other conditions, such as heart attack and congenital heart disease.

The role of cardiac MRI as an imaging modality for characterising cardiomyopathy is expanding markedly,” he said. “We used to think cardiomyopathies were uncommon. But as use of cardiac MR and other imaging modalities increases, several types are being diagnosed with increasing frequency.”

For example, reports of Takotsubo cardiomyopathy, initially described in Japan in the early 1990s, have been cropping up in Europe and North America. This type of cardiomyopathy is also called “broken heart syndrome” because it is commonly triggered by emotional stress, but based on clinical symptoms, it may be hard to tell the rare broken-heart syndrome from a run-of-the-mill heart attack or other common pathologies. The syndrome is known to mimic myocardial infarction; patients present with acute chest pain, arrhythmias, and, in the worst cases, cardiogenic shock.

Cardiac MRI can provide exquisite depiction of the tell-tale apical ballooning characteristics of broken-heart syndrome. In fact, cardiac MRI has become the reference standard for noninvasively depicting global and regional myocardial motion abnormalities. On gadolinium-enhanced MRI, late myocardial hyper-enhancement is typically absent in Takotsubo cases. This helps differentiate the condition from myocardial infarction and myocarditis, which normally do show patterns of late hyper-enhancement.

Treatment for each of these conditions is completely different, so the cardiac MRI findings have a direct impact on clinical management decisions, Dodd said.

Another unclassified type that will be featured during the session is isolated left ventricular non-compacted syndrome, which is characterised on imaging by an increased ratio of non-compacted to compacted myocardium.

Clinical presentation varies widely for this type of cardiomyopathy. Some patients may be relatively asymptomatic and others will develop progressive heart failure, arrhythmias, and thromboembolic events. Cardiac MRI is particularly useful for evaluating the left ventricular apex and lateral wall, which may sometimes be difficult to visualise with echocardiography, he added.

Special Focus Session

Friday, March 5, 2010
16:00-17:30, Room L/M
SF 6 Imaging of cardiomyopathies

• Chair’s introduction
  V.E. Sinitsyn, Moscow/RU

• Imaging of cardiomyopathies: What is important for the cardiologist?  J.Bogaert; Leuven/BE

• MRI and MDCT in dilated cardiomyopathy
  J. Bogaert; Leuven/BE

• MRI and MDCT in hypertrophic cardiomyopathy  M. Gutberlet; Leipzig/DE

• Uncharted waters: Unclassified and rare cardiomyopathies
  J.D. Dodd; Dublin/IE

• Panel discussion: Imaging of cardiomyopathies: A wake-up call for the general radiologist

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Paediatric non-traumatic emergencies, which represent a large proportion of all paediatric cases, are very specific cases and necessitate treatment from staff who have relevant training.

Special Focus Session
Friday, March 5; 08:30-10:00, Room K
SF 3c: Pediatric non-traumatic emergencies: What we must know!

Chairman’s introduction
K.J. Johnson; Birmingham/UK

Musculoskeletal emergencies
Fred E. Avni, Brussels/BE

Abdominal emergencies
G. Raspereza, Amsterdam/ NL

Thoracic emergencies
C.E. de Lange, Den Haag/NL

Neuroradiology
G. Garel; Paris/FR

Chairman’s introduction
K.J. Johnson; Birmingham/UK

Panel discussion:
How to manage the stressed pediatrician

Dr. Catherine Garel, a paediatric radiologist at the Robert Debé Hospital in Paris, France, will show in her lecture how important it is to appreciate alarming symptoms requiring urgent investigation, and to differentiate true emergencies, for which cerebral imaging may directly impact on therapeutic management, from ‘delayed’ emergencies related to parental and/or medical anxiety.

Children suffering from a lung, oesophagus or thoracic wall abnormality may present with breathing difficulties, feeding or swallowing problems, or less specific general symptoms like fever, sepsis or chest pain.

Aspirated foreign bodies, for instance a small coin or a peanut stuck in the trachea or bronchus, are potentially lethal. These children may present with a choking episode; however these patients may sometimes present with less alarming symptoms, like recurrent respiratory tract infections. The radiologist should be familiar with the indirect radiological signs of an aspirated foreign body rather than trying to see the foreign body itself while imaging the patient, Raissaki explained.

Dr. Charlotte De Lange, from The National Hospital in Oslo, Norway, will show in her lecture how thoracic emergencies always require a rapid diagnosis to establish a medical or surgical intervention plan, and how radiological imaging most often plays a key role.

Abdominal emergencies may prove dangerous when resulting in bowel ischaemia, peritonitis and the patient’s demise. Presenting symptoms may be alarming to begin with, such as acute abdominal pain. However the differential diagnosis may include surgical and medical causes of abdominal pain that may or may not require surgery, and the radiologist can offer significant help in clinically equivocal cases.

On the other hand, a very quiet, sleepy child presenting with lethargy may suffer from intussusception. This situation may lead to bowel infarction and perforation if left untreated. Radiologists should know how to immediately make the diagnosis and treat the patient.

Dr. Karl J. Johnson from Birmingham Children’s Hospital, UK, will discuss and analyse these problems during his lecture, and will also recommend imaging algorithms.

It is important to have a proper understanding of these different situations and attending the session could help participants to gain knowledge of common problems and rarities, Raissaki believes.

“As a radiologist you might have to deal with stressed clinicians, who might rely on you for the correct diagnosis or who might want to consult you about the appropriateness of a test in a particular case, so you must know how to react and enhance the chain of healthcare. This session will not only be about familiarising participants with the images but also about making them understand the nature of the emergency, to be more knowledgeable and reactive in certain cases and know which condition may cause certain symptoms,” she said.

Finally, caring for children also means caring for their stressed parents. Good communication and an ability to cope with emotional pressure are skills that radiologists should also acquire in paediatric medicine.
The adrenal glands may be small in size, but they can still generate giant-sized diagnostic dilemmas. Most adrenal masses cause no health problems, but a small proportion may signal underlying hormonal disease or malignancy. However, an abnormal or unexpected finding does not necessarily mean the patient needs treatment, as speakers at ECR 2010 will explain. Radiologists can expect to leave the state of the art session with a complete set of algorithms for characterizing adrenal abnormalities.

‘Adrenals: small glands, big problems.’ The first half of this session’s title effectively sums up radiologists’ take on adrenal pathology. More and more abdominal imaging examinations are revealing adrenal masses as incidental findings. Should such masses be a subject for further investigation or removed to prevent the spread of a silent disease, or are they harmless abnormalities? Adrenal masses revealed on imaging that had been expected to pose yet another diagnostic dilemma. Can you be sure that the lesion observed is linked to the pathology under investigation? Is that really a sign of metastatic spread or a coincidental benign adenoma?

Most adrenal masses revealed on imaging may still generate giant-sized diagnostic dilemmas. Observation of enlarged lymph nodes may help differentiate adrenal hyperplasia opposed to adrenal adenomas. Observation of enlarged lymph nodes may help differentiate adrenal hyperplasia opposed to adrenal adenomas.

Fortunately for delegates attending today’s state of the art symposium, the full session title ends with the words: ‘… and practical solutions!’ Radiologists can certainly expect to learn exactly why the adrenal glands pose an almost daily diagnostic challenge. But they should also leave the conference room with a full account of how different imaging modalities can help clarify what is found.

The main tools and techniques used to image the adrenal glands will be presented by Prof. Marie-Francoise Bellin, chief of radiology at the Bichat Hospital in Paris. Radiologists are most likely to encounter adrenal pathology on CT at first. The CT images may provide all the information needed to characterize the lesion, but if not, then MRI is most likely to be the next step, she noted. Oncologists may be referred for a PET/CT scan in institutions that have access to this modality.

Bellin will also set out the key imaging landmarks of healthy adrenal glands. An appreciation of normal adrenal anatomy will allow radiologists to be sure that the lesion they have seen really does originate in the adrenal glands and not in the kidney or surrounding organs. Anatomical landmarks can additionally be of use when identifying the cause of hyper-functioning adrenal disease. Observation of enlarged lymph nodes may help differentiate adrenal hyperplasia from adenoma.

Imaging features from CT and MRI will be presented and correlated with histological features of benign and malignant lesions, providing a guide to differential diagnosis. Signs to consider include the lesion’s size, whether the mass is heterogeneous or homogeneous, hypervascular or hyper-vascular, and whether it contains fat. Another question to ask of lipid-containing lesions is whether the fat is intracellular or macrophagic, Bellin said.

Delegates will also be introduced to the clinical and radiological features of some of the most common diseases associated with renal insufficiency, including tuberculosis and histoplasmosis. ‘CT especially plays an important role in confirming the diagnosis,’ she said. ‘Key questions include: Is the abnormality unilateral or bilateral? Is there a haemorrhagic component?’

The dilemma facing many radiologists on an almost daily basis will then be discussed explicitly. When are adrenal abnormal findings problematic, and which masses should not concern physicians? Dr. Gerhard Herrmann, associate professor of radiology at the Medical University of Vienna, and Dr. Ulrich Mader-Lisse, associate professor of radiology at the University of Munich, will address the two halves of this thorny subject.

Most adrenal masses observed by radiologists will be incidentalomas, according to the session’s moderator, Prof. Yves Menu, chairman of the radiology department at Saint Antoine Hospital, Paris. The discovery of these clinically silent lesions is growing, owing to the improved performance and increased use of cross-sectional imaging modalities, and the aging population.

Most incidentalomas turn out to be benign adenomas. This diagnosis is highly likely if the Hounsfield density of the mass on unenhanced CT is less than 10 HU. Another test is to look at the washout pattern after contrast administration, if the density has decreased by more than 50% within 10 minutes, then the lesion is probably not an adenoma.

This information is not always available though, he explained. Contrast-enhanced CT may be performed without a prior unenhanced scan. In addition, by the time an adrenal mass is spotted on contrast-enhanced images, it may be too late to study washout characteristics. MRI is an option at this stage. If the lesion shows a drop in signal in opposed phase sequences, this indicates intracellular fat content, a significant feature of adenomas.

Firm identification of a benign adenoma is not necessarily the end of the story either. Between 5% and 10% of non-functioning, adrenal adenomas will become hormonally active within the next 12 months. Consent has yet to be reached on how these masses should be monitored, Menu said.

The session will conclude with a discussion about two clinical cases that neither the speakers nor the audience will have seen previously. This type of practical, problem-solving exercise was tested at the end of a session at ECR 2009 and proved to be extremely popular with delegates, Menu said. The cases will illustrate common clinical situations that radiologists are likely to face in their daily practice.

“I have chosen cases where there may be a disagreement on the way to do the imaging work-up because there is disagreement in real life,” he said. “Some institutions do not have the same access to MRI or PET/CT. The question is: Do we agree on the need for follow-up?”

State of the art session tackles the challenge of adrenal abnormalities

By Paula Gould

CLINICAL CORNER

Friday, March 5, 2010

ECR TODAY 2010

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X-rays and other ionising radiation are essential not only in medical diagnostic imaging but also in security technology. Furthermore, visualisation of humans with x-rays is perceived as a threat to the individual’s privacy. Exposure to x-rays is considered menacing because of the possible biological effects and damage to the body. The unsuccessful terrorist attack on Northwest Flight 253, Amsterdam-Detroit, on December 25, 2009, has recently brought security technology back to the attention of the public and politicians. This is also the case for imaging methods and the chemical and physical detection of explosives with x-rays.

X-rays are an object of politics. Politics refers to their potential and to the risk of their employment. Recent legislation dealing with x-rays and other ionising radiation includes the Homeland Security Act (HAS) and the Medical Exposure Directive (MED) 97/43/Euratom. In the USA, the Homeland Security Act (HSA) of 2002, Pub. L. No. 107-296, 116 Stat. 2135 (Nov. 25, 2002), introduced in the aftermath of the September 11 attacks, created the United States Department of Homeland Security. The scope of homeland security includes emergency preparedness and response (for terrorism and natural disasters), implying volunteer medical, police, emergency management, and fire personnel; domestic intelligence activities, largely today within the FBI; critical infrastructure protection; border security, encompassing both land and maritime borders; transportation security, including aviation and maritime transportation, biodetection, detection of radioactive and radiological materials; and research on next-generation security technologies. Each of these objectives means potential utilisation of x-rays, other ionising radiation and the total scope of imaging technology. In Europe, the Medical Exposure Directive (MED) 97/43/Euratom (Council Directive 97/43/EURATOM, on the health protection of individuals against the dangers of ionising radiation in relation to medical exposures OJ L 180 of 09.07.1997) committed the EU member states to legislation concerning medico-legal and non-medical x-ray exposure. The updating of the Directive was promoted with a Symposium in Dublin on October 8 and 9, 2009.

Politics has to favour, refute or comment on x-rays, diagnostic imaging methods and analysis methods using x-rays, when the use of such methods offers the possibility to resolve questions which are considered important by the people of their country or by other states. This is also the case in sports. The age assessments of Chinese Olympic champions (female gymnasts) in 2008 and of competitors at the U17 Soccer World Championship in 2009 are known examples. The Chinese female gymnasts were thought to be 14 years or less and not 16 years as prescribed; in the U17 soccer competition, Nigeria, the defending champions, withdrew 15 out of 38 players after age determination with MRI.

Media, art and marketing are objects and instruments of politics. They employ x-rays and they try to attract attention. Radiographs of the skeleton, showing golf balls and animals are produced to create surprise.

The exhibition shows a selection of topics where x-rays and other forms of ionising radiation connect with the world of politics, including methods of medical diagnostic imaging employed for non-medical reasons (for example determination of future height of adolescent athletes), and of non-medical exposures to ionising radiation for border control and for security by non-medics.

Visit the Special Exhibition on the 2nd level of the congress venue next to the EPOS™ Lounge.
Manufacturers figure out mathematical solutions to minimise dose and improve safety in CT

By John Bonner

Radiology is a medical specialty created by a fertile marriage between biology and physics. But it is an entirely different academic discipline that is the focus of the research by major vendors of CT technology on show this year at the ECR’s technical exhibition. These studies have been centered on the subject that the illustrious 19th century German scientist Carl Friedrich Gauss called ‘the queen of sciences’ – mathematics.

Each company’s attention is fixed on the goal of making CT a safer imaging modality by solving the conundrum through which attempts to reduce the radiation dose to the patient will normally lead to increased noise and loss of image quality. That is because of the limitations of the filtered back projection (FBP) algorithm, which is the current industry standard for reconstructing CT images from raw data.

One possible solution to the problem of generating clinical pictures with low noise is another type of algorithm known as iterative reconstruction, which was first proposed in the 1970s. In this approach, the system creates a synthetic image, computes projections from the image, compares the original projection data, and updates the image based upon the difference between the calculated and the actual projections. Unfortunately, such calculations are so hungry for processing power that the reconstruction occurs far too slowly to be a practical option in a real-world radiology department.

Siemens has come up with a solution to this problem with its IRIS (iterative reconstruction in image space) software. This avoids the most time-consuming element in standard iterative reconstruction by avoiding the need to move data back and forth between the raw data space and image space. It creates a single matrix dataset, and all of the iterative reconstructions are then carried out within the image space to eliminate the noise that is carried over with the full dataset used to create that original image.

“IT is the result that we maintain the same image correction quality of theoretical iterative reconstruction, but avoid having to go back to the raw data space,” explained Alexander Zimmermann, Siemens’ director of global product marketing. “Then, by removing the image noise without degrading image sharpness, we offer significant dose savings for a wide range of clinical applications. Any delays that this process might cause in completing the reconstruction will be hardly noticeable in routine use.”

Siemens estimates that by using IRIS, radiologists will be able to match the image quality achieved with FBP by using around 60% of the dose. Alternatively, they can maintain the same radiation exposure to generate images that are significantly better than those possible with the current technology. The company will be demonstrating the capabilities of the IRIS technology on its ECR booth, and will be equipping its Somatom Definition EXPO Gallery, Publishers Row (1st Level): Daily 10:00–18:00

It is focusing on how to make a CT scan a safer and less stressful experience for that most vulnerable patient group: children.

Paediatric patients are a particularly challenging group for CT designers and radiologists because of their different morphology compared with adults (less body fat, lower bone density, smaller vessels, etc.) and a frequent inability to lie still during a scan. So Toshiba is promoting its Aquilion ONE 320-detector row CT system as the ideal solution to the challenges of imaging children. Its ability to capture up to 16 cm in a single rotation helps reduce the amount of radiation a patient receives and lessens the need for patient sedation, according to the vendor.

This scanner also features the company’s SURE-Exposure protocol software, which automatically takes details on the size and age of each patient and tailors the radiation dose to achieve optimal image quality for each examination. The software uses protocols that have been selected based on the patient’s age, size, and type of examination to ensure patients receive only the radiation required to obtain a clear diagnostic image. The scanner is available with a range of other child-friendly features, including litigation, an educational tool that helps them to learn to hold their breath and a visually appealing design on the scanner housing.

Although most of the new CT technologies on show in the exhibition are software-based applications, there will be at least one piece of novel hardware on show. Siemens is launching a new ‘entry level’ 16-slice scanner designed to meet the needs of institutions wishing to provide a CT service but on a strictly limited budget. The new scanner is part of the company’s Somatom Emotion range.

At ECR, Philips is unveiling its own proprietary version of the iterative reconstruction algorithm, dOseWise, which forms part of the DoseWise suite of radiation management tools. The company set out to develop software capable of lowering the radiation dose while maintaining high image quality and fast reconstruction times. It estimates that dOseWise can cut the dose of coronary CT angiography studies, for example, from 0.35 to 1 mSv, a reduction of up to 80% over conventional FBP reconstruction, without losing image quality. Yet dOseWise was designed to provide the same look and feel of the original, higher-dose radiation images, so there will be no additional training needed, according to the vendor. dOseWise will be available for new and installed Brilliance iCT and 64-slice scanners with an expected delivery date in the second half of 2010.

GE Healthcare’s ASIR (adaptive statistical iterative reconstruction) product was first introduced on its top-end Discovery CT 750 HD scanner in October 2008. The technology has since been used in imaging more than 400,000 patients around the world. ASIR will now be available throughout the company’s product range, with the launch of the Brightspeed Elite range of compact CT scanners.

“There is ASIR, a dose reduction of up to 40% can be gained, while maintaining the image quality,” said Francois Roche, CT product manager at GE Healthcare. “This produces an effect like a turbo for a car engine; it boosts the power of the engine with lower fuel consumption – or in this case, a reduced dose for the patients. As a result, scanning speeds is increased, and it allows an equivalent speed on a 60-slice helical scanner making it one of the most versatile CTs in its range.”

Meanwhile, Toshiba is focusing on how to make a CT scan a safer and less stressful experience for that most vulnerable patient group: children.

Paediatric patients are a particularly challenging group for CT designers and radiologists because of their different morphology compared with adults (less body fat, lower bone density, smaller vessels, etc.) and a frequent inability to lie still during a scan. So Toshiba is promoting its Aquilion ONE 320-detector row CT system as the ideal solution to the challenges of imaging children. Its ability to capture up to 16 cm in a single rotation helps reduce the amount of radiation a patient receives and lessens the need for patient sedation, according to the vendor.

This scanner also features the company’s SURE-Exposure protocol software, which automatically takes details on the size and age of each patient and tailors the radiation dose to achieve optimal image quality for each examination. The software uses protocols that have been selected based on the patient’s age, size, and type of examination to ensure patients receive only the radiation required to obtain a clear diagnostic image. The scanner is available with a range of other child-friendly features, including litigation, an educational tool that helps them to learn to hold their breath and a visually appealing design on the scanner housing.

Although most of the new CT technologies on show in the exhibition are software-based applications, there will be at least one piece of novel hardware on show. Siemens is launching a new ‘entry level’ 16-slice scanner designed to meet the needs of institutions wishing to provide a CT service but on a strictly limited budget. The new scanner is part of the company’s Somatom Emotion range.
Research and clinical application of Computer Assisted Surgery technologies at EndoCAS

By Vincenzo Ferrari, Cinzia Freschi, Giuseppe Megali, Davide Caramella, Andrea Pietrabissa, Franco Mosca

During IMAGINE 2007 EndoCAS Center presented various works, including a first prototype of its laparoscopic navigator. The platform provides capabilities for patient-specific 3D surface model generation, 3D visualisation, intra-operative registration, surgical navigation and robotic assistance during laparoscopic surgery.

The steps forward since IMAGINE 2007 regarding the improvement of some functionalities and the development of new components, not only for laparoscopy, are described in the following sections.

EndoCAS Segmentation Pipeline

Regarding the generation of patient-specific 3D models, we developed a segmentation approach for MDCT post-contrast images based on anatomical, empirical and functional considerations concerning the timing of contrast distribution. We studied the optimal phase for the segmentation of each entity and we designed an optimal removal sequence that, starting with easy structures, allows identification of objects that are complicated to segment. Using a software tool made by us on the top of ITK-SNAP 1.5, based on region growing, following the proposed extraction sequence can generate and validate 3D models for bones, ureters, kidneys, pancreas, spleen, arterial, portal-splenic-mesenteric and cava vessels in about 30 minutes of work. The same approach is now used for generation of liver models as shown in the figure.

Surgical planning and simulation

Now we use our 3D models not only for surgical navigation purposes but also for the pre-operative phases. We generated 3D models for the planning of eight interventions performed in our hospital and other Italian centres. We also use our segmentation software for the simulation of cutting planes for hepatectomy, including estimation of the volume of each cut segment. Other types of simulation are done by importing 3D models into commercial modelling software like Maya by Autodesk. We use this approach for many kinds of simulation like, for example, the evaluation of the specific anatomy of different orthopaedic implant sizes and shapes. Finally, we are working on the simulation of more advanced surgical tasks using deformable models and haptic interfaces in the context of the ARAKNES European project (FP7/2007-2013).

Mixed Reality

Our navigator is now equipped with augmented-reality functionalities. In particular we implemented monocoscopic and stereoscopic mixed reality systems, using the laparoscopic image and a stereoscopic video see-through developed based on a commercial Head Mounted Display (HMD). The projection model of the virtual camera has been analytically adapted to the real one, and calibration routines, for point-of-view localisation, in respect to a sensorised frame, have been developed, obtaining a perfect alignment between the real and virtual view. The use...
of machine vision routines also allowed us to develop solutions that do not require the use of an external localisation system, where the camera position is auto-localised in the scene elaborating video images.

Abdomen Registration

We evaluated error sources that influence the registration of pre-operative images and we developed solutions that do not require the use of machine vision routines also allowed us to compensate all error sources from the radiological department to the surgical room.

Robotic ultrasound-guided biopsy

Using the robotic arm and the ultrasound module of our navigation platform we developed a proficient solution to perform biopsies. We have developed an integrated system that provides the clinician two types of assistance: an augmented reality visualisation allows accurate and easy planning of needle trajectory and target reaching verification; and a robot arm with a six-degree-of-freedom force sensor allows the precise positioning of the needle holder and allows the clinician to adjust the planned trajectory (cooperative control) to overcome needle deflection and target motion. Preliminary tests have been executed on an ultrasound phantom showing high precision of the system in static conditions and the utility and usability of the cooperative control in simulated non-rigid conditions. Current activities are focused on the clinical evaluation of the system and on the electromagnetic localisation of the needle in order to obtain its instantaneous position. This makes very useful data for manual or automatic (robotic) guidance during the insertion.

News from the Norwegian Society of Radiology

By Nils-Einar Kløw, Oslo/Norway, NFR President

The Norwegian Society of Radiology is a member of the Norwegian Medical Association and includes more than 800 members. This includes 537 active certified radiologists and 166 radiographers in training. Currently 39% are women and this number increases to nearly 50% for those less than 50 years old. In 2008, 88 new radiologists were certified, which included 43 from other countries. Recruitment to radiology is good and approximately 9% of all certified specialists this year were radiologists. With a population of 4.6 million there is one radiologist per 8,500 people. The financial status in our country is good, so access to MRI and 64 slice and higher CT is also good. However, the number of PET-CT (2) and SPECT-CT (2) is still low.

All medical doctors have one- and a half years of clinical practice before certification as a medical doctor and before entering into specialisation. The Norwegian Medical Association currently administers the educational programme of specialisation and certification, but this may be taken over by the government in the near future. The programme committee is elected by the Radiology Society. The duration of training in radiology is five years, and one of these years may be clinical practice, scientific work or teaching. During residency there are ten mandatory week-long courses which end with written examinations. There is no examination before finishing the specialisation and nuclear medicine is not part of the curriculum. There are no formal radiological subspecialties, but there are four specialised groups within radiology, including neuroradiology, paediatric radiology, interventional radiology and the recently established thoracic radiology. We plan to establish more groups to improve the quality and collaboration between colleagues, and to increase research. The curriculum for each programme has not been completed yet.

An important task is to increase research in radiology. The Norwegian Radiology Research Forum was established in 2007 with help from EIBIR, with Prof. Jarle Rørvik as chairman. Research programmes and discussions are now part of every national meeting and strategy plans are on their way. These include basic science using imaging, translational imaging research, clinical radiology, and health and public radiological science. The research programme is integrated into the work done by the board of the Radiological Society. Presently, thirty radiologists or trainees in radiology are in a PhD programme.

The Nordic Radiological Societies publish Acta Radiologica in collaboration, which is an important journal for publication of both Nordic and other radiological research. Presently, the Norwegian radiologist Arnef Skjernsland is the chief editor. Additionally, we publish the journal NorskRøntgen in Norwegian four times a year. The chief editor of NorskRøntgen is Gunnar Sandhuk. This journal is published together with nuclear medicine.

Teleradiology gives us many opportunities to improve quality and access to radiology imaging. Norway is a land with forests and mountains, the cities are small, and a large part of the population lives in remote areas. With the presence of PACS all over the country, the location of the radiologist is less important than before. The radiologist on call may be centralised, second opinions are possible and radiographers can be given more responsibility for patient handling and imaging. We have recently set up a work group to evaluate the possibilities of teleradiology and to look into possible problems, legal aspects etc. The work being done by the ESR on this front is important for us.

Radiographers have challenged us recently by starting a small educational programme in ultrasound. The aim has been to do some abdominal ultrasound as well as reporting. There are clearly some smaller hospitals that welcome the additional workforce to relieve the huge workload of their few radiologists. Additionally, there is a surplus of radiographers. Our society has taken a negative view, in particular towards the plan for the radiographers to do their own reports. We have not come to a conclusion yet, as many radiologists welcome some help on otherwise busy days. Apart from this issue, the society collaborates with the radiographers and a three-day national conference will be held together with them in April, which will also include diagnostic physicists, radiation protection authorities and the Centre for Informatics in Health. Every October we have a national scientific meeting, including the assembly, in which nuclear medicine is also invited to participate.

Further information can be found on the society’s website www.radiologforeningen.no

myESR.org
Taming of the queue – the MRI Lean Process Improvement Initiative

As a member of the CT/MRI Expert panel, which advises on short and long term strategies to improve access and reduce waiting times for key services under Ontario’s Wait Time Strategy and Cancer Care Ontario, David Wormanld’s focus lies on governmental relations. With a passion for Lean Process Improvement and Quality Management, he is currently a coach with the Provincial MRI coaching team. He is also a surveyor for the not-for-profit organisation Accreditation Canada, providing national and international healthcare organisations with an external peer review process to assess and improve their services to their patients and clients based on standards of excellence.

A graduate of the Michener Institute for Applied Health Sciences, he holds a dual registration with the College of Medical Radiation Technologists of Ontario in Radiography and MRI. He also has a diploma in Health Administration from the Ontario Hospital Association and an undergraduate degree in political science from the University of Toronto. He is also currently working on his MBA at DeGroote School of Business, McMaster University, in Hamilton.

Asked about his presentation for the ECR 2010 Hospital Management Symposium, he explained: “The high demand for MRI services in Ontario has resulted in long waiting times for patients. The waiting times for elective MRI, which vary across Hamilton Health Sciences campuses, exceed the provincial target. Gaining efficiency in MRI departments is one way to address this issue and improve patient access to care. To that end, the Diagnostic Imaging Department implemented an MRI Process Improvement Initiative by leveraging process improvement methodologies to optimise clinical capacity, improve patient flow and build the structures and processes necessary for continuous improvement. The project was managed through the Project sponsor, Steering Committee, Team Leads and Core Team.”

“The Hamilton General campus provides secondary, tertiary and quaternary services and is the regional centre for trauma, vascular, cardiac and neurosurgery. The McMaster campus is the regional provider for paediatrics. In and out-patient MRI waiting times vary across these campuses (average of 114 days and 38 months respectively) exceeding the Ontario provincial government waiting time target of 28 days for an elective out-patient MRI. The current waiting time performance has been identified as a barrier to providing patients with timely access to diagnostic care, treatment, and quality of care.”

The Core Team (DI Managers, MRI Technologists, Radiologists, Decision/Finance Support, and PACS/RIS Administrators, RN resource, Coding/Clerical resources, porters and IT) began with an initial onsite assessment (observation and interviews). The initial diagnostic component of the project was Value Stream Mapping, for which the team collaboratively mapped out the current MRI process, identified areas of opportunity and developed a comprehensive action plan of improvement initiatives including the project dashboard and process level metrics.

The resulting action plan included two targeted Rapid Improvement Events (RIE) to develop, trial, and implement solutions. These will be presented at the Symposium, as well as the methods used to measure improvements and the effects of changes, benefits included standardisation of work across campuses (booking processes), increased capacity (additional slots/week) by 15%, decreased booking turnaround times from 27 to 2 days, implementation of centralised booking model (call centre), decreased no-show rate from 8% to 3%.

Among lessons learned? “Communicate early and often. There is no good time.”

And the message for others? “Early involvement and planning are critical. Always consider WFM and ensure radiologist engagement.”

Health technology assessment and innovation in hospitals – a European perspective

Dr. Claudia Wild, Director of the Ludwig Boltzmann Institute for Health Technology Assessment in Vienna, Austria, will speak on Evaluation and Innovation at the ‘Information Technology and Radiology’ session at tomorrow’s symposium.

Dr. Wild studied communications and psychology at the University of Vienna and political science at the Ohio University in Athens, Ohio, U.S. After gaining her doctorate in philosophy at the University of Vienna, she became a research associate on ‘media impact on cognitions’ at the Institute for Communications and Political Sciences, University of Vienna, and was involved in other freelance media impact research projects.

Later, as Senior Researcher at the Institute of Technolo- gy Assessment, at the Austrian Academy of Sciences, Dr. Wild was involved in the research field of Health Technology Assessment in Austria. She has also served as the Director of the Ludwig Boltzmann Institute for HTA since April 2006. In 2009 she gained a lecturing qualification in social media (Medical University Graz) on ‘resource allocation in healthcare systems’.

Dr. Wild has served, or is still serving, as a member of various councils, committees and boards, including the Supreme Health Council (advisory committee of the Health Minister), the Viennese Council of Bioethics, the Scientific Advisory Committee of the EBM-Working Group at the Austrian Federation of Social Insurances, the Public Health working party at Transparency International – Austrian Chapter, the Scientific Advisory Committee of DAHTaP/DMII, and the International Advisory Board of ZEFQ.

She is also a lecturer for postgraduate courses at leading Austrian universities on health technology assessment, public health and hospital management, ethics in resource allocation in healthcare, pharmaceutical economics, and health management, and reviews on public health and policies for various publications.

Dr. Wild is a member of various international institutions including the HTA (Health Technology Assessment international), INSHTA (International Network of Health Technology Assessment), and EUPHA (European Public Health Association).

In terms of health technology assessment in hospitals, Dr. Wild points out that ‘Healthcare systems are confronted with a rising number of new technologies, which are often costly: Decisions regarding introduction and reimbursement must be made when the impact of these new technologies on health and on the healthcare system is uncertain. To support national or regional decision makers, health technology assessment (HTA) are produced by HTA institutions. In globalized markets, and especially within Europe, assessments by HTA institutions, decisions about providing access, and additional data collection regarding a technology of interest can take place in several countries, either at the same time or within a short time window. This means that a lot of HTA knowledge or useful information to HTA is produced simultaneously in different countries, with only slight differences in scope or timeline.

‘A lot of duplication takes place, which can be reduced or avoided to allow a more efficient use of resources. Coordination and collaboration in this field are still poor. One WP in EUnetHTA Joint Action will be focused on the assessment of new (or innovative) technologies – as decision support for reimbursement – performed at the post-market approval stage.”
From imaging to services – the role of the radiology in the strategic role of a medical centre

Prof. Debatin is not only a renowned lecturer, but also a recognised expert in and strategist for hospital management. Under his leadership, the University Clinic Hamburg-Eppendorf has developed several innovative approaches to increase medical quality and scientific performance along with profitability. During his presentations, the role of radiology in the strategic plan of medical centres’ Professor Debatin will discuss the potential of the diagnostic radiology service and how to exploit this effectively.

The most important factor is for radiologists to redefine their own professional self-image, he said. "Radiologists are secondary service providers and that is how they should understand their role. Otherwise they will not be able to recognize and fulfil the needs and expectations of their customers, the referring physicians. If they fail to meet these needs, the referring physicians will stop asking for the radiologists’ services.”

How can all their needs be met? "Quality always has top priority, meaning the possible diagnosis for the best possible price," Debatin said. Put simply the radiologist must know more than the primary referring physician. Thus a radiology department needs specialists rather than generalists. Only a specialist can offer the expert knowledge needed to determine which information is relevant for which clinical aspects of some of the referring physicians and other colleagues except tailored protocols and a focused diagnosis that answers all clinically relevant issues.

Quality also means that the radiology depart- ment offers a 24/7 diagnostic service by com- petent specialists. Radiology is clearly moving – how the systems and procedures are set up and built a large personal relationship network with healthcare executives, corpora- rate leaders and top govern- ment officials in Europe, Asia and Latin America.

He has held his current position for nine years in the organisation established as a part of Johns Hopkins Med- ical centre to provide a focus for all international activities. In this role he evaluates and develops educational, research and clinical care links with foreign institutions and oversees international institutional affiliations and manage- ment contracts.

"Medical care in hipathetic institutions, or hospitals, is delivered to patients in every country. While the fundamentals of the process are similar everywhere, many differences may be observed due to multiple factors; the variations in healthcare culture, regulatory environment, funding levels, the expectations of funding sourc- es, and in the expectations of patients (and/or referring doctors) - determined - to a great extent - how the systems and procedures are set up in hospitals. These factors are mostly unchangeable in the short term, although they may be influenced by them," Dorotovics explained.

"The tools hospitals have to improve their operational effec- tiveness and quality of care are mainly limited to the management of their own resources and pro- cesses. Hospital managers, who are looking for specific solutions or best practices, usually limit their research to the local or regional hos- pital community. With the ‘globalisation’ of healthcare, however, they are learning increasingly more about sub- stantially different setups, methods and systems that are working well in other parts of the world. Such practices are also more than ever in the public arena," he said.

"None of these successful models related to – for example – the extension of the role of nurses, the increase of operational trans- parency, improvement of the workflow, terms, are worth being evaluated by any hospital manager," he concluded.

In his presentation, Dr. Dorotovics will discuss the cultural aspects of best practice models and their effects on the cost structure.

How many slices and tesla does the radiologist really need?

Dr. André Hoppen, Sales Director at VR Medico Leasing GmbH in Berlin, Germany, will speak on Cost Manage- ment in Radiology at the ‘Management and Economics’ session at tomorrow’s symposium.

The prices for high-end equipment are at the top end of six figure sums, sometimes even seven figure sums, but it is not only the acquisition that incurs costs. Other than conventional x-ray equipment, large modern scanners incur considerable additional costs. For example, with a Tesla scanner, which has relatively low power consumption and there are additional costs of around €100,000 to €150,000 due to electricity and air conditioning technology installations alone. In addition, the respective maintenance costs often can be high. With MRI installations, it is particularly impor- tant to take out full service contracts. These are also recommended for CT scanners to ensure they maintain their value. The manufacturers’ original service commitments become increasingly important here:"

"I recommend a 16-slice CT as the basis of modern equipment because about 90% of radiology problems can be addressed with this," said Dr. Hoppen. "A 16-slice scanner will incur costs of around €1 million over an eight-year period, including the costs for a medi- cal imaging technician as well as updates and electricity, but excluding the radiologists’ fees. MRI scanners incur similar costs. In my view a 1.5 Tesla machine should be the basic, stan- dard equipment. However, how many slices you finally want to invest in remains the radiologists’ decision. As long as there is sufficient patient potential to make the equipment work econo- mically, we will support your plans."

Other than conventional x-ray equipment, large modern scanners incur considerable additional costs.
Innovative methods in interventional diagnosis at the DRG’s annual meeting

By Florian Schneider

This year’s German Congress of Radiology focuses on interventional diagnosis and therapy, vascular diseases and the thorax. Prof. Walter Gross-Fengels from Hamburg-Harburg, President of the 91st German Congress of Radiology, explains: "The increasing expectancy of life goes along with a growing number of patients with vascular and cancer diseases. Interventional radiology uses a wide spectrum of innovative methods that help us to treat these cases.

As a young discipline within diagnostic radiology, intervention has developed into a leader of medical innovations. It goes in particular with the trend of miniaturisation, which enlarges the potential to combine different techniques and methods of other medical fields. Approximately 150 lectures will approach this main topic at the congress. Furthermore, the wide range of radiological subjects will be categorised by theme.

"We are extremely pleased to organise the German Congress of Radiology in close partnership with organisations from the national to European levels – for example, the German Society of Angiology (DGA), the German Society of Vascular Surgery (DGG) and the Cardiovascular and Interventional Radiological Society of Europe (CIRSE). Once again it becomes clear that the challenges of tomorrow have to be faced by interdisciplinary teams," states Gross-Fengels.

This year, the German Congress of Radiology will take place in Berlin (Messe Süd) from May 12 to 15. The German Society of Radiology (Deutsche Röntgengesellschaft e.V.) expects 7,000 participants, including vascular disease specialists from abroad. Besides various scientific presentations and interdisciplinary discussions, participants will have the opportunity to select practically relevant courses from an extensive range on offer. In addition, a substantial industrial exhibition will demonstrate the current developments in diagnostic imaging technology. Courses at the congress will be held in German.

Radiologists search for smart brains

"The smartest brains for radiology" has become the motto for the society’s sponsorship programme, which allows young medical professionals to participate free of charge at the 91st German Congress of Radiology in May 2010. The concept behind this is as simple as it is efficient. Radiologists authorised to train young physicians name and invite their 'smartest brains'. Amongst them, student apprentices of their department, doctoral students and also students attending their lecture. The sponsorship programme includes travel and accommodation costs and naturally free access to the congress.

"With more than 500 lectures and advanced training courses, the German Congress of Radiology is the most important congress in the German language. It will be an excellent opportunity to present the range of our profession and make it attractive to young professionals," declares Gross-Fengels, initiator of the young academic programme. "In addition to the regular congress programme, the participants of the sponsorship programme will be invited to an exclusive session taking into account their specific perspective. Questions on their professional development and scientific careers will be answered. Also, the diversity of our profession will be represented. Furthermore, the congress will provide the occasion for them to meet and network with radiologists."

"All medical disciplines compete for the smartest brains," adds Prof. Gerhard Adam from Hamburg, President of the German Society of Radiology. "Radiology, as an innovative and diverse discipline, has positioned itself at the front of this competition. It has become a lasting issue for our profession, which has changed in the past and will continue to do so in future!"

Find further information about the programme at www.drg.de

For further information on the congress please visit www.roentgenkongress.de
EIBIR has set ambitious goals with a new strategic plan

By Jürgen Hennig, Freiburg/DE and Gabriel Krestin, Rotterdam/NL

After almost four years since the foundation of the European Institute for Biomedical Imaging Research (EIBIR), we are pleased to provide you with a review of its structure and activities, as well as an outlook on the first achievements of our joint initiatives and international projects, and information on future networking activities. The mission of EIBIR is to coordinate and promote the development of biomedical imaging and related technologies within Europe and support the dissemination of knowledge with the ultimate goal of improving diagnosis, treatment and prevention of disease. We are particularly delighted with the success of grant proposals submitted to the EU Research Framework Programme FP7, ENCITE (European Network for Cell Imaging and Tracking Experiments) and HAMAM (Highly Accurate Breast Cancer Diagnosis through Integration of Biological Knowledge, Novel Imaging Modalities, and Modelling) as well as Euro-BioImaging – from Molecule to Patient, coordinated by EIBIR.

Over 40 new research institutes joined the EIBIR Network during 2009, increasing the membership to over 280 research institutes with a focus on biomedical imaging or related disciplines. This number shows that networking activities in our specialty are much needed and highly appreciated by the European biomedical imaging community at large, EIBIR has proposed the financial viability of EIBIR and its structure has been significantly improved and is much appreciated by the European biomedical imaging research community at large. EIBIR has proposed a concept of modest service package fees to be paid by industry partners, EIBIR Network members and shareholder organisations that benefit from the services provided by EIBIR. We are confident that this new concept will ensure a stable future for EIBIR and its network members in particular, and pave the way for further development of our services and network activities.

Many of our new initiatives during 2009 would not have been possible without the continuous support of the European Society of Radiology and our industry partners, who subscribed to the mission of EIBIR and have provided financial support right from the beginning. Starting in 2010, we hope to see the Industry Panel grow, with a number of new industry members taking an active role in our network, as the new support concept foresees reduced fees to attract a larger number of industry members.

More and more European organisations are eager to support and seek cooperation with EIBIR. Negotiations are currently underway with the Cardiovascular and Interventional Radiological Society of Europe (CIRSE) as well as with the European Society for the promotion of Picture Archiving and Communication Systems in Medicine (EuroPACS), who have expressed their wish to join EIBIR as shareholder organisations. EIBIR’s management and coordination of European research projects has increased in 2009, and the team of project managers at the EIBIR office has expanded in order to be able to cope with the growing demand for support, from project idea and proposal writing, to project management and coordination of dissemination and training activities.

During 2009, the EIBIR project Euro-Biodiag, a pan-European research infrastructure project aiming to provide access to imaging technologies across the full scale of biological and medical applications, from molecule to patient, has gained significant shape, although not without tussling problems, with the proposal for the 3-year preparatory phase being submitted in December. The project is jointly coordinated by EIBIR and the European Molecular Biology Laboratory. More information can be found at www.eurobosimageur.jo.

The two FP7 research projects that were started in 2008 under the coordination of EIBIR (the cell imaging project ENCITE and the breast cancer project HAMAM) progressed well during 2009, with their first annual reports submitted to the European Commission and some satisfying initial results published. In addition, we are pleased to see the project start of PED-DOS.NET, a literature survey on dosimetry and the health effects of diagnostic applications of radiopharmaceuticals, in early 2010, and to inform you of new project proposals that were initiated during 2009.

A COST Action on imaging and theranostics was submitted in January 2010. The aim of the project is to gather Europe’s major research groups in the development of novel diagnostic/therapeutic agents (theranostics). In collaboration with an international team of experts in 14 countries, this interdisciplinary work will enable understanding of the microscopic picture of drug delivery/release and therapeutic effect. During 2009 we were pleased to officially welcome the European Organisation for Research and Treatment of Cancer (EORTC) as a new co-sharer in the organisation of conference events. We look forward to a fruitful cooperation and to joining forces in ensuring a better integration of imaging into clinical trials. The first step in that direction was the creation of the EIBIR Cancer Imaging Working Group, made up of members from the European Society of Radiology, nuclear medicine and image processing, as a new joint initiative.

There is an EIBIR Lounge in Foyer Fat the entrance level of the ECR congress, where further information will be available. Research and innovation will help to secure the future of our profession. Therefore, your personal contribution will be crucial to achieving EIBIR’s goals.

All ECR delegates and interested institutions are cordially invited to visit us there to receive information on EIBIR activities and discuss hot topics and ideas in biomedical imaging research.

We cordially invite you to the 2nd EIBIR Session to learn about EIBIR’s scientific activities (see box on the left side).

More information on the session programme: http://www.eibir.org > News

3rd Workstation Face-Off Session

After the great success in 2008 and 2009, ECR 2010 will, for the third time, feature a ‘Workstation Face-Off’ session.

Continuous rapid technical advances in CT require state-of-the-art post-processing tools and workstations. Increasingly, radiologists have to be able to interpret 3D datasets and large data volumes. For numerous applications, dedicated post processing workstations are available. All major vendors offer an ample variety of hardware and software, and it is often difficult to recognize the individual strengths and weaknesses of different equipment. Our 3rd annual Face-Off Session will allow you to get an impression of the 3D capabilities and large data volume handling provided by the latest workstation technology. Several workstations from vendors like GE, Philips Healthcare, Siemens, Terence, Visage Imaging GmbH and Volta Images will be set up on stage to each other, and a selection of cases provided by the ESR will be demonstrated. These cases will for the first time include a PET/CT dataset that focuses on follow-up imaging and comparison of lesions over time; in addition, a CT perfusion case will be presented. The aim of this session is to stimulate a realistic ‘teaching room’ atmosphere and to give an impression of how different workstations perform in a clinical scenario. We would like to personally invite you to attend this exciting ‘tourism’ of post-processing!

Face-Off Session

Friday, March 5, 12:15–13:30, Room F1
Coordinators: C.R. Backer; Münster/J, A. Graiser; Munich/DE
How IT supports radiology – an overview of current developments

By Peter Mildenberger, Mainz/DE

The introduction of digital imaging in all fields of radiology and digital workflow using RIS and PACS has led to fundamental changes in the daily work of many radiologists. Therefore, radiologists should know some fundamental facts on the underlying IT concepts. Knowledge in this field can help in decision making on acquisition of new IT-systems, in the evolution of workflows, in discussions with IT administrators, and in other situations. It is not necessary to become an IT expert, but to have an idea of current concepts and IT tools, which could help radiologists to improve their work.

The Information and Communication Technology (ICT) Subcommittee of the ESR has prepared some informative posters on different topics. These are:

- Introduction and Overview on DICOM and IHE
- Workstation Development and Multimodality Viewing
- Structured Reporting
- Image Sharing with Portable Media
- Image Compression
- Radiation Exposure Monitoring
- eLearning - overview of ESR activities
- Integrating Teaching Files into PACS using IHE TCE
- eHealth - Developments and Initiatives in Europe

The composition of these topics gives current high quality information at a glance. The participants of ECR 2010 will find information on:

- the introduction of DICOM, which is the standard in medical imaging and the concept of IHE, which is an initiative to enhance interoperability of modalities and information
- the development of the reporting workflow, which has changed completely over the past decade, now including 3D imaging, CAD and new concepts in reporting
- technical developments to enhance the documentation and tracking of radiation exposure; new recommendations on the use of image compression or image sharing with portable media (e.g. CD, DVD, USB Memory)
- how to use the digital infrastructure to improve activities in research and education
- and last but not least, the development of eHealth and influence of radiology

There will be a chance to meet experts in this area (see schedule at the booth). Interested visitors are welcome to share their experience and expertise with the ICT subcommittee.

The information booth of the ICT Subcommittee is located in Foyer A on the 2nd Level.
ESR considered key stakeholder in EU healthcare legislation

By Sonja Guttenbrunner and Milosande Rouger

EU legislation is having a huge impact on medical imaging and healthcare, and the European Society of Radiology (ESR) is playing a key role in safeguarding radiologists’ and patients’ interests.

In recent years the ESR has intensified its activities in this regard and has adopted a pro-active approach resulting in the establishment of an ESR EU Taskforce in 2009. By closely monitoring EU agencies, the ESR is trying to draw the attention of relevant stakeholders and decision makers to the implications of proposed EU legislation.

First and foremost, the ESR co-founded the ‘Alliance for MRI’ in March 2007 to protect the future of magnetic resonance imaging (MRI), a modality essential in fighting against life-threatening diseases such as brain tumours, cancers and heart conditions. The aim of the Alliance is to ensure that the threat posed by the EU Physical Agents 2004/40/EC (EMF) directive to the future of MRI is averted and that patients in Europe will not be precluded from state-of-the-art healthcare services.

The Alliance has already successfully influenced the postponement of the implementation deadline of the directive from April 2008 to April 2012 to allow more time for the evaluation of new data on electromagnetic fields (EMF) and their short-term effects on the human body.

The ESR is also monitoring the proposal for a directive on the application of patients’ rights in cross-border healthcare to put in place a specific instrument to ensure European citizens further legal certainty as to their rights when moving within the EU to get treatment. The aim of the directive is to make it easier for patients to obtain approval and to set an organised financial framework to pay for the healthcare, but the ESR is concerned that it offers little to ensure the quality and safety of patients whose treatment involves cross-border eHealth.

As eHealth is one of the main future topics that will affect radiologists in many ways, the ESR has not only commented on the EC communication on Telemedicine for the Benefit of Patients, Healthcare Systems and Society, but has also established good contacts with the relevant units within the relevant Directorate General and is trying to get involved in various consultation processes on this topic. One result of this collaboration is that the ICT for Health unit of the European Commission accepted the invitation to hold a joint session at ECR 2010.

Another important issue that will occupy the ESR in the years to come is the revision of the European Referral Guidelines for Imaging. The ESR wants to ensure that the interests of all concerned parties are reflected in this revision and therefore will try to play an active part in this process.

Further fields of action include the submission of a response to the EC Green Paper on the EU Workforce for Health and to the consultation on clinical trials, the recast of the medical chapters included in EURATOM, the European Partnership for Action against Cancer, which was launched in September 2009 in Brussels, and many other issues of relevance to the radiology profession.

Find out more about ESR action at: www.myESR.org > EU Affairs

The ESR is also established good contacts with the relevant advisory bodies in cross-border eHealth.

The Free Publications booths are located on both the first level and on the second level integrated, into the EPSONS™ Lounge. Enjoy another valuable service at ECR!
ESOR awards diplomas to 40 young radiologists

The European Society of Radiology is delighted that for the third time 40 young radiologists have successfully completed trainee programmes organised through the European School of Radiology (ESOR). The trainees underwent an intense three-months period of their chosen topic or subspecialty at a training centre of their choice, led by an assigned tutor. Tutorials, lectures, hands-on teaching of routine clinical cases and/or modality techniques and protocols were an essential part of the training. One satisfied trainee echoed the feedback received from many of the participants, describing the experience as "a milestone and turning point in my professional career". This great success was marked by the outstanding commitment of volunteer training centres, subspecialty societies and the industry (Bracco).

Such programmes are an excellent opportunity to get to know another training environment and to pick up an interest in subspecialisation in radiology. They will be continued in 2010, and interested residents and young radiologists are invited to apply online at www.myesr.org/esor until March 30, 2010.

The following trainees completed the three-month Visiting Scholarship Programme.

Congratulations!

Ioana-Balcescu Axente
Colecta Clinical Hospital, Bucharest/RO
Topic: Urogynological Radiology
Training centre: Hospital Barcelona/CAT

Ardi Bardi
University Hospital Centre “Mother Teresa”, Tirana/AL
Topic: Breast Imaging
Training centre: Policlinico Gemelli Catholic University, Rome/IT

Anastas Dorecki
University Clinic of Radiology, Skopje/MK
Topic: Neuroradiology
Training centre: University Medical Centre Ljubljana/SI

Gorisdar Ercog
University Hospital Dubrava, Zagreb/HR
Topic: Neuroradiology
Training centre: Gazi University, Ankara/TR

Caterina Farell
Leighton Hospital, Cheshire/UK
Topic: Cardiac Imaging
Training centre: Eberhard-Karls-University, Tübingen/DE

Fidel Nüñez Marin
Hospital de Saint Pau, Barcelona/ES
Topic: Neuroradiology
Training centre: Barri and The Royal London NHS Trust/UK

Eva Fuller-Millets
University Hospital, Libin/PL
Topic: Abdominal Radiology
Training centre: Addenbrooke’s Hospital, Cambridge/UK

Alkaterini Fintou
University Hospital, Greece/CH
Topic: Abdominal Radiology
Training centre: Pérez-Saldivre, Perto/FR

Sorin Chiaia
Fundeni Clinical Institute, Bucharest/RO
Topic: Musculoskeletal Radiology
Training centre: Barri and The Royal London NHS Trust/UK

Lígia Filipa Pereira Gonçalves
Hospital de Sao Marcos, Braga/PT
Topic: Musculoskeletal Radiology
Training centre: Leiden University Medical Centre, Leiden/NL

Serdar Güneyli
Ataturk Medical Centre, Istanbul/TR
Topic: MRI Protocols
Training centre: Eberhard-Karls-University, Tübingen/DE

Tobias Henning
Technical University, Munich/DE
Topic: Neuroradiology
Training centre: Addenbrooke’s Hospital, Cambridge/UK

Bram Hochberger
Parhose-Pirea Filho Hospital, Porto Alegre/BR
Topic: Chest Imaging
Training centre: University of Heidelberg, Heidelberg/DE

Kawthar Issa
Surgery Teaching Hospital, Sulaimaniyah/Iraq
Topic: Breast Imaging
Training centre: Psichiriako Universitario Tor Vergata, Rome/IT

Katarzyna Kapucicka
University Hospital, Krakow/PL
Topic: Musculoskeletal Radiology
Training centre: Mater Mostrocoridis Hospital, Dublin/IE

Ballas Kristian Kovic
Semenovs Medical University, Budapest/HU
Topic: MRI Protocols
Training centre: Medical University of Vienna/AU

Peta Kallling
Klinikum Berlin-Buch, Berlin/DE
Topic: MRI Protocols
Training centre: Psichiriako Universitario Tor Vergata, Rome/IT

Alexandre Lima Carneiro
Hospital Sao Joao, Porto/PT
Topic: Cardiac Imaging
Training centre: UZ Leuven/BE

Jaykumar Nair
Indira Gandhi Medical University, Nanj-Mumbai/IN
Topic: Neuroradiology
Training centre: Autonomous University Hospital/BE

Maria Navallar
Hospital Universitario 12 de Octubre, Madrid/ES
Topic: Oncological Imaging
Training centre: Memorial Sloan-Kettering Cancer Center, New York/USA

Glykeria Petrochilos
KAT General Hospital, Athens/GR
Topic: Musculoskeletal Radiology
Training centre: Imperial College NHS Trust – St. Mary’s Hospital Campus, London/UK

Amir-Reza Radmand
Sharati Hospital – Tehran University of Medical Sciences, Tehran/IRAN
Topic: Abdominal Radiology
Training centre: Medical University of Vienna/AU

Saumil Rautkans
Medical University Hospital, Kaunas/LT
Topic: Neuroradiology
Training centre: Gu de Chauliac, Montpellier/FR

János Tölcsér
Sziget Hospital, Budapest/HU
Topic: Abdominal Radiology
Training centre: Midim University Hospital/SE

Ismail Willekens
UZ Brussels/BE
Topic: Abdominal Radiology
Training centre: General Hospital Roys Villanueva, Zaragoza/ES

The following trainees completed the three-month Exchange Programme for Fellowships. Congratulations!

Javier Arnau Garcia
Marques de Valdecilla University Hospital, Santillana del Mar/ES
Topic: Abdominal Imaging
Training centre: Saint-Antoine Hospital, Paris/FR

Hamid Reza Ashkazar
University Hospital, Ghent/BE
Topic: Head and Neck Imaging
Training centre: Hôpital de Hautepierrre, Strawberry/FR

Sandra Balato Gonzalez
Complejo Hospitalario de Pontevedra, Santiago/ES
Topic: Abdominal Imaging
Training centre: Hospital Eramus, Brussels/BE

Jan Baxa
University Hospital, Pilsen/CZ
Topic: Cardiac Imaging
Training centre: Medical University of Vienna/AU

Daisy Bloemkamp
Academic Medical Center, Amsterdam/NL
Topic: Paediatric Imaging
Training centre: Hospital Vai’di Hebron and Childraves University, Barcelona/ES

Catherine Grierson
John Radcliffe Hospital, Oxford/UK
Topic: Abdominal Imaging
Training centre: Academic Medical Center, Amsterdam/NL

Sonja Mafalda Kirchhoff
University Hospital, Munich/DE
Topic: Abdominal Imaging
Training centre: University of Pisa/IT

Leon Meneses
University College London Hospitals NHS Trust, London/UK
Topic: Cardiac Imaging
Training centre: La Japonesa University of Rome/IT

Mara Nedaeva Pekova
Medical University, Plovdiv/BG
Topic: Cardiac Imaging
Training centre: University of Banger, Gzwned/Uk

Tadeja Porep
University Medical Centre, Ljubljana/SI
Topic: Cardiac Imaging
Training centre: University Hospital, Zurich/CH

Ana Prto
Hospital Sao Joao, Porto/PT
Topic: Abdominal Imaging
Training centre: Derriford Hospital, Plymouth/UK

Elias Primetis
Areteion – University Hospital, Athens/GR
Topic: Cardiac Imaging
Training centre: Ludwig Maximilians-Universität, Munich/DE

Elena Sammossiti
Nicola General Hospital, Nicosia/CY
Topic: Head and Neck Imaging
Training centre: University Hospital of General/CH

Rui Santos
IPO – Portuguese Oncology Institute, Porto/PT
Topic: Paediatric Imaging
Training centre: Great Ormond Street Hospital for Children NHS Trust, London/UK

The ESOR and ESR will honour their achievements on the occasion of the ESOR session.

ESOR Session
Friday, March 5, 14:00-15:30, Room C
Opportunities for education
During this session, ESOR, the European School of Radiology, will give an insight into the variety of educational programmes and young radiologists will talk about their experiences.

Moderators: N. Guozsyniarski; Iraklion/GR
C.J. Harrod; Vienna/AT

• Introduction
C.J. Harrod; Vienna/AT
ESOR in action
N. Guozsyniarski; Iraklion/GR
Educating future leaders
M. Massa; Amsterdam/NL
Fellowships in radiology: Why and How
B. Mariconis; Zurich/CH
My experience as a local organiser
P. Nektarine; Bruxelles/BEL
My experience with ESOR
S.M. Kirichhoff; Munich/DE
B. Kovacs; Budapest/HU

Visit the European School of Radiology at the ESOR Lounge in Foyer E on the entrance level.
EURORAD – your first step into scientific publishing

Case reports are an important part of a young scientist’s education, but are often not accepted by major scientific journals. EURORAD was established to be an active training platform, which results in quite a high acceptance rate (73%). This gives many, often young, authors the option to publish citable scientific material, and with the help of the referees’ feedback helps them to improve their writing skills. Created in 1999, EURORAD is the largest peer-reviewed online database of radiological teaching files worldwide. Since its foundation by Prof. Albert L. Baert from Leuven/BE and co-workers, it has grown into a database of over 3,300 published cases from all different kinds of radiological specialties.

Writing is something essential for a clinician’s career, but learning how to write a good paper is something that doesn’t come easy – it has to be learnt and the more feedback is received, the better. EURORAD, the ESR’s online database of radiologic teaching files and case reports, is an advantageous tool to support young scientists. A good scientific publication does not exist right from the first moment – authors are asked to deliver good and interesting cases, and reviewers have to decide whether the case provides a new perspective on the diagnosis or underlines the existing focus with new and better images. Good and constructive feedback is a key factor in writing a good paper, and the EURORAD editorial team works very hard to offer this. In the past year, 110 reviewers have reviewed over 470 submitted cases and enabled almost 350 new publications, all of them fully citable though a unique DOI (digital object identifier) number. To make EURORAD cases are fully citable via a unique DOI (digital object identifier) number. To make EURORAD also useful for training purposes, cases are also available as blinded ‘teaching cases’ where the diagnosis is not revealed in the title or the text, but in an extra field, which can be viewed separately. Only the clinical summary and images will be presented in the teaching case format.

If you are not only interested in being a user, but would also like to contribute, you should consider submitting your case to EURORAD. Under the tab ‘submit a case’, which can be found on the homepage www.eurorad.org, you are invited to follow the submission procedure as indicated by the system.

Once you have submitted your case, it will be checked by the Electronic Publication Coordinator (EPC) for omissions and errors, and then forwarded to the respective section editor. They will have a first look at the case and, if there are no major issues, will select a reviewer and forward the case.

Cases are not only available in English, but also in Spanish, thanks to a group of young radiologists from Spain, coordinated by Dr. Anna Alguersuari Cabiscol, interventional radiologist at UDIAT CD Parc Taulí Hospital in Sabadell, Spain. In the past two years, 1,000 cases have been translated, as well as the EURORAD navigation and search engine, and are now available online. In return, those translators were invited to visit the ECR in 2009 and 2010.

By Stefanie Muzik

EURORAD editorial team works very hard to offer this. In the past year, 110 reviewers have reviewed over 470 submitted cases and enabled almost 350 new publications, all of them fully citable though a unique DOI (digital object identifier).
The European Society of Urogenital Radiology’s aims for 2010

By Ronald Hamon, Brussels/BE, ESUR President

The European Society of Urogenital Radiology (ESUR), since its foundation in 1990, has established itself as the main professional body in Europe for radiologists with a special interest in the field of urogenital imaging and contrast media research. The ESUR is dedicated to furthering the development of this subspecialty and expanding the educational and research activities in this field. The annual scientific meeting of the ESUR offers the opportunity for exchange of professional knowledge and experience. The ESUR scientific meetings are held in a different country every year and are attended by radiologists and clinicians not only from Europe but worldwide. The 2009 ESUR symposium took place in Athens, at the foot of the Acropolis and drew the largest audience so far – over 500 participants from 37 countries.

The ESUR meeting in 2010 will be held in the beautiful and historical town of Bruges (Belgium) on Sept 8–12. The main topic will be ‘Image-guided therapy of the urogenital system’.

In 2011, we will have a joint meeting with the American Society of Uroradiology (SUR) on October 12–16 in Dubrovnik, the old Croatian seaport on the Adriatic coast. One of the main topics will be female pelvic imaging.

NEW

Supported by ESUR, the European School of Radiology (ESOR) organises a Galen course focusing on urogenital radiology, which will be held June 17–19 in Tallinn, Estonia.

In 2010, the ESUR launches a global education programme on the safe use of contrast media. The idea of this education programme is to provide ESUR-approved workshops on state-of-the-art use of contrast media in different countries and to thus promote the safe use of these agents and avoid adverse effects.

A scientific cooperation programme has been announced on our website, which aims at promoting the cooperation and possibly joint publication of rare urogenital diseases. This programme provides a platform for interested scientists and is expected to help them join forces to gain new insights into such rare diseases.

The European Society of Urogenital Radiology, with its 225 members, is a very active society, organising an annual meeting and different workshops, continuously updating the contrast media safety guidelines, and developing new guidelines for diagnostic and interventional radiology. Special attention has always been given to contrast media research and the safety aspects of these agents. The Society’s Contrast Media Safety Committee has published more than 20 important guidelines; all of these, including the latest version 7.0, are freely available on our website. These guidelines are the most popular feature of our websites with more than 3,000 hits per month.

Translations of the CMS guidelines are now available in Japanese, French, Greek, and Russian, and translations into Chinese, Italian, German, Hungarian, Hindi, and Arabic are in preparation.

Imaging Guidelines

The ESUR, with the help of its subcommittees, is establishing guidelines in the field of urogenital imaging and image-guided therapy. The Paediatric Working Group of the ESUR has already published three recommendations and is currently working on two further recommendations to be published in 2010 (‘Imaging in Childhood Urinary Tract Trauma’ and ‘Imaging in Childhood Renal Hypertension’). The Female Pelvic Imaging Group published a guideline entitled ‘Characterization of Ovarian Masses’ in 2009. Additional guidelines on staging of endometrial carcinoma, cervical cancer and ovarian cancer are being finalised and will be published this year. The ESUR has established a new working group on Prostate Cancer Imaging. A guideline for MR imaging of the prostate will be finalised in 2010. The guidelines on CT urography (CTU), which have already been published, will be updated including guidelines for MRU by the newly established CTU and MRU Working Group.

The Society believes that strong clinical-radiological cooperation is of vital importance in modern medical practice and has established strong scientific links with clinical societies such as the International Society of Nephrology and the European Association of Urologists. ESUR members are invited to speak on imaging topics at the meetings of these societies. Nephrologists and urologists from these societies are also invited by the ESUR to bring clinical perspectives to the society’s annual symposiums. Sharing and exchanging points of view with clinical colleagues has become one of the highlights of the educational programme of the ESUR annual scientific meetings.

We are fortunate in the ESUR that our worldwide members enjoy good friendship, which has developed over the years. Getting together every year at the annual meetings of the society has strengthened the team spirit among our members.

The European Society of Urogenital Radiology wishes all readers a successful and interesting ECR 2010.

For further information, please visit the website of our society www.esur.org
The Polish Medical Society of Radiology organises the radiological scientific and professional life in Poland. The society is managed by a triennially-elected board and it has branches in each province. The management of the society is assisted by specific sections (neuroradiology, MR/CT, paediatric radiology, interventional radiology, head and neck radiology, dental radiology, oncological radiology, radiological engineering) and committees (for education, training, and publishing).

Professor Karel Mayer became the society’s first president, which was established in 1896. Radiology in Poland developed very fast until the break of the Second World War, which took a heavy toll. Many radiologists, including eminent ones, lost their lives. Technical equipment was destroyed and radiological centres were buried. After the war, Poland, as a result of the agreement between the allied forces in Yalta, ended up behind the Iron Curtain in the zone of the Soviet influence. Limited contact with the world of science and no access to modern equipment considerably hindered the development of Polish radiology. Against all odds, it kept growing to the extent that was possible.

A great role in the post-war history of Polish radiology was played by the Polish Medical Society of Radiology and Professor Witold Zawadowski. A Training Centre for physicians from all over Poland was established in Warsaw, which is why it was possible to soon restore that branch of medicine in Poland. In 1920 the Polish Medical Society of Radiology celebrated its 80th anniversary. Its achievements and experiences were summed up during a special jubilee congress that took place in Kraków, which is where Polish radiology was born.

The Society issues a quarterly scientific journal, The Polish Journal of Radiology, which was first published in 1926. The first Editor-in-Chief was Professor Zyzgmunt Grudziński, an outstanding Polish radiologist, who developed a unique method of localising foreign bodies in the eyeball that is still used today.

Particular importance is attached to the training of young radiologists as well as the professional improvement of more experienced radiologists. This is achieved through numerous symposia, training courses and scientific workshops. A number of those are organised periodically within the educational system. The most important one, especially for radiologists under specialty training, is the so-called Polish Radiological School (two courses annually). In 1999 a thorough reform of the new specialty training system in radiology was introduced (including a unified, centralised exam). The training is carried out in accordance with a precisely set-out programme and only in accredited training centres that must meet appropriate formal, academic and organisational requirements. It is supervised by a special committee.

Doctors applying for the specialty training in radiology take a competitive test. Having completed the specialty training, doctors have to take a three-stage specialty exam (which takes place simultaneously in appointed academic centres). It consists of a multiple-choice test (120 questions), a practical exam comprising an ultrasound exam and the evaluation of 40 clinical cases (presented on a computer monitor) and an oral exam, during which three problem questions must be answered.

Important facts from Polish radiological history In Kraków, between January 8 and 15, 1896 the At the beginning of February 1896 the first Polish Roentgen laboratories were established in Warsaw and Kraków. Professor Walery Jaworski (he was an eminent gastrologist and discoverer of Helicobacter pylori) performed the first stomach examination in the world with the use of a contrast media (carbon dioxide). It was in Kraków, too, that the first Polish textbook of radiology was published in 1908.

In 1911 Professor Bronisław Sabat developed the method of tomography which made it possible to record the mobility of internal organs, particularly that of the heart and major vessels, for which he obtained a patent. Another method invented by Sabat was endoradiology.

Karol Mayer (the first Polish radiologist who became a professor of radiology) presented, as early as 1914, the principles of taking images by means of a tomographic technique. In his book ‘Radiological differential diagnostics of the heart and aorta diseases with the consideration of my own examinations’ published in 1916 in Kraków he described the principles and practical uses (tomographic images) of that technique, being considerably ahead of the world of radiology. Unfortunately, that was not noticed in the scientific world.

At that time, a Polish scientist, Maria Skłodowska-Curie (winner of two Nobel Prizes, for Physics in 1903 and Chemistry in 1911) was active in Paris. When the First World War broke out she established in France a front-line radiological service, which she directed and in which she worked. Skłodowska’s activity was of tremendous significance during the war, but it also contributed to the common application of x-rays in French medicine. She was the first woman to receive the Gold Medal from the Radiological Society of North America in 1922, and the American College of Radiology in 1931.
What’s on today in Vienna?

Theatre

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

<table>
<thead>
<tr>
<th>Theatre</th>
<th>Performance</th>
<th>Time</th>
<th>Artist(s)</th>
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<tbody>
<tr>
<td>Akademietheater</td>
<td>Das wundervolle Zwischending</td>
<td>20:00</td>
<td>Martin Heckmann</td>
</tr>
<tr>
<td>Burgtheater</td>
<td>Melodie des Lachens</td>
<td>20:00</td>
<td>Karl Farkas, Fritz Grünbaum, Georg Kreuder</td>
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<tr>
<td>Rabenhof</td>
<td>Cordoba – The Return Match</td>
<td>20:00</td>
<td>Florian Scheuba, Rupert Henning</td>
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<tr>
<td>Schauspielslum</td>
<td>Die Welt ist groß und Rettung lauert überall</td>
<td>20:00</td>
<td>Ilija Trojanow</td>
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<tr>
<td>Stadttheater</td>
<td>Die Feuerzangenbowle</td>
<td>20:00</td>
<td>Henrik Ibsen</td>
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<tr>
<td>Schauspielhaus</td>
<td>Cordoba – The Return Match</td>
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<tr>
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Concerts & Sounds

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<th>Location</th>
<th>Event</th>
<th>Time</th>
<th>Artist(s)</th>
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<tbody>
<tr>
<td>Musikverein</td>
<td>Vienna Symphony Orchestra</td>
<td>19:30</td>
<td>Thomas Dausgaard, Gautier Capuçon</td>
</tr>
<tr>
<td>Porgy &amp; Bess</td>
<td>Buster Williams Quartet</td>
<td>20:30</td>
<td>‘Something More’ (USA)</td>
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<tr>
<td>Arena</td>
<td>Anti Pop Consortium</td>
<td>20:00</td>
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<tr>
<td>Gasometer</td>
<td>Airborne</td>
<td>20:00</td>
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<tr>
<td>Szene Wien</td>
<td>Vienna’s Most Wanted</td>
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Opera & Musical Theatre

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<tbody>
<tr>
<td>Volksoper</td>
<td>Tiefland</td>
<td>19:00</td>
<td>Eugen d’Albert</td>
</tr>
<tr>
<td>Wiener Staatsoper</td>
<td>Simon Boccanegra</td>
<td>19:30</td>
<td>Giuseppe Verdi, conducted by Paolo Carignani</td>
</tr>
</tbody>
</table>
The protection of personal data is one of the fundamental rights of each individual, and the unauthorised disclosure of sensitive information about a person can lead to serious consequences. This applies especially to data regarding physical or mental health, sexuality and other areas where revealing confidential information is especially likely to cause embarrassment or discrimination.

In clinical research it is often necessary to collect information about the participants from medical records and interviews, including information about lifestyle, work and health. It is therefore very important that the person or team in control of the data observes all applicable regulations and codes of conduct.

In order to regulate the processing and use of personal data, numerous guidelines and directives have been issued by various international organisations such as the Organisation for Economic Co-operation and Development (OECD), the United Nations and the European Union. Their aim is to offer a reference for the respective member states and provide general principles to be implemented in their national legislation.

At European level, this area is regulated by the Directive 95/46/EC [1] on the protection of personal data, which was implemented in 1995 by Directive 95/46/EC [1] on the protection of personal data, the Personal Information in Medical Research guide provided by the UK Medical Research Council [2]. In order to ensure the highest possible level of protection of the rights of the participants and minimise potential harm and distress, several general principles should be followed.

Informed consent for the use of personal information must be obtained and the study approved by a Research Ethics Committee, and all personal information must be coded or anonymised as far as possible and as early as possible during data processing. Each individual entrusted with patient information is personally responsible for their decisions about disclosing it and must ensure that it is handled only by health professionals with an equivalent duty of confidentiality, and that the security measures are sufficient to prevent unintended leaks of information. Researchers must also minimise the risk of causing distress to the people they contact and decide at the outset what information should be made available to them once the study is complete.

Under very rare circumstances it might be necessary or permissible to use personal information without contacting all the research subjects and seeking their consent. When consent is impractical, it lies within the responsibility of the research team to the Research Ethics Committee and the health professionals to determine whether the likely benefits to society outweigh the limitations of the loss of confidentiality, there is no intention to feed back information to the individuals involved and there are no practicable alternatives of equal effectiveness.

Consent does not apply quite so rigorously to anonymised data from medical records, as it is no longer information about identifiable people and disclosing it does not breach the duty of confidence to the patient. Nevertheless patients and volunteers have to agree for their data to be used in such research. For some studies it may be sufficient to use unlinked anonymised data, that contains no information to identify people, but for others it might be more practical to work with linked anonymised data, which is anonymous to the research team but contains a coded identifier that can link the data back to the person, for example in the case of important incidental findings. Obviously no article should include any identifiable data of any sort within the text, tables or images.

There are now numerous tools available to anonymise DICOM data, the standard format for the storage and transfer of medical images. Their strategies range from the automated removal of all patient related information, which may render the data useless for the intended research, to manual editing, which can be prone to error. Therefore the selection of the best tool and approach has to be considered carefully depending on the study design and the information required.

European Radiology, the ESR’s official organ, and the society’s new journal Insights into Imaging strive to offer the highest possible level of protection of the rights of patients and study participants, and promote compliance with all applicable rules and regulations for all studies published. When preparing a study that contains patient information, it is first of all important to comply with the national legislation of the country where the research originates. National laws, however, are often formulated in a way that does not cover all possible circumstances in medical research. Therefore it is essential that the research team anticipates problems that could arise and takes all necessary measures to protect the data they have been entrusted with.

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**Privacy in Medical Research**

By Lucie Medlock