James A. Brink is radiologist-in-chief at Massachusetts General Hospital, Boston and Juan M. Taveras Professor of Radiology at Harvard Medical School, in the United States.

Before completing his residency and fellowship at Massachusetts General Hospital in 1990, he received a Bachelor of Science degree in electrical engineering from Purdue University, Indiana and his medical degree from Indiana University. He then joined the faculty at the Mallinckrodt Institute of Radiology at the Washington University School of Medicine in St. Louis, where he was promoted to associate professor. He then went to Yale University in 1997 and served as chair of the department of diagnostic radiology from 2006 to 2013 before returning to Massachusetts General Hospital as radiologist-in-chief.

Dr. Brink is a highly experienced clinical radiologist, especially in the areas of the utilisation and management of imaging resources. He also has a particular interest and expertise in issues related to the monitoring and control of medical radiation exposure.

A major figure in the field of medical radiation protection, Dr. Brink serves as scientific vice-president for radiation protection in medicine on the National Council for Radiation Protection and Measurements. He is past-president of the American Roentgen Ray Society and a fellow of the Society of Computed Body Tomography & Magnetic Resonance, as well as a fellow of the American College of Radiology, where he also serves as vice-chair of the Board of Chancellors.

“Ours is a time when the practice and science of radiology are evolving at a rapid rate, and it is critical that we remain unified in our quest for new imaging technologies and care models. The European Society of Radiology provides a forum for diverse imaging professionals from Europe and beyond to come together in pursuit of these goals,” said Dr. Brink.

Over the course of his career, Dr. Brink has written 119 publications and 19 book chapters. He has also given 239 presentations. In acknowledgement of his many achievements, he has received honorary membership from the Italian Society of Medical Radiology and the American Association of Physicists in Medicine.

“Don’t miss today’s Honorary Lecture

Thursday, March 5, 12:15-12:45, Room A

Josef Lissner Honorary Lecture

Is the ‘Art of Medicine’ dead in the era of population health management?

James A. Brink, Boston, MA/USL
**CT and MRI contribute to major shake-up in breast imaging**

Radiologists are always on the lookout for the latest and greatest technology, and this is particularly true in breast imaging, because the primary modality, mammography, is not exactly perfect. Rapid progress in both CT and MRI are being made in this field.

CT and MRI offer more accurate, more sensitive methods for detecting breast cancer, compared to the conventional method of mammography.

CT can be performed with iodine-based contrast medium, which can help differentiate between malignant and non-malignant lesions. MRI, on the other hand, can use different contrast agents to differentiate between various types of breast lesions.

However, both CT and MRI have their own limitations. CT is good at detecting calcifications, but MRI is better at detecting masses. MRI is also better at detecting lesions in the chest wall and axillary lymph nodes.

In conclusion, both CT and MRI are valuable tools in breast imaging, but they are not a replacement for mammography. They are used in combination with mammography to provide a more comprehensive evaluation of breast lesions.

**References**


**Images**

- A: A full examination at 3 Tesla, A, B, and C: pre-contrast T1-weighted imaging, early and delayed post-contrast scans depicting a mass (in the ducts) and a mass in the chest wall.
- D: The DWI image where the cancer lesions can be seen hyperintense similar to contrast-enhanced images. E: The ADC map where the tumours are indicated by low signal intensity corresponding to typical restricted diffusion.
- F: CT and MRI differences in T2-weighted images.
Hot Shots from Day 1
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Cardiovascular and Interventional Radiological Society of Europe
Challenges and innovations will shape development of quantitative imaging

Cancer and other major diseases face a tremendous adversary with quantitative imaging – that is, when it is up and running in clinical practice. For the moment, integration of imaging biomarkers in Europe is a challenge, and a number of technical issues must be overcome.

To enable patients to fully benefit from these advances, a number of steps must be taken. Experts will present these solutions in today’s dedicated Professional Challenges session at the ECR.

There is no doubt that quantitative imaging is the future of radiology. Not only does it help to detect disease at a much earlier stage, but it also considerably improves treatment monitoring.

In healthy tissue for instance, researchers can use quantitative imaging to study the functional properties of this tissue in order to get the most important meaning for biologists, physicists, etc., in a non-invasive way. Based on this information, they can develop biomarkers, which help to study the disease and its natural history use the data to predict outcome, and most importantly, determine the responsiveness of individual patient to therapy – and assess its efficiency.

But the biggest advance may yet come from a recently introduced approach, namely MR Fingerprinting (MRF), which completely changes data acquisition, post-processing and visualization.

Instead of using a repeated, serial acquisition of data for the characterization of individual parameters of interest, MRF uses a pseudo-randomized acquisition that causes the signal from different tissues to have a unique evolution or ‘fingerprint’, which is simultaneously a function of the multiple material properties under investigation.

Processing after acquisition involves a pattern recognition algorithm to match the fingerprints to a predefined dictionary of predicted signal evolutions. These can then be translated into quantitative maps of the magnetic parameters of interest.

Professional Challenges Session

Thursday, March 5, 16:00–17:30, Room F1

PC 8a Integration of imaging biomarker activities on a European level

» Chairman’s introduction

G. Frigot; Paris/FR

From qualitative to quantitative imaging: a paradigm shift in radiology

S. Trautig; Vienna/AT

Experience of the Quantitative Imaging Alliance (QIBA) on RSNA

R. Boellaard; Amsterdam/NL

Introduction to the Quantitative Imaging European Task Force

B. Kauczor; Heidelberg/DE

Clinical validation of imaging biomarkers and their role in European Medicine Agency (EMA) applications
Join the Siemens Industry Workshops at ECR 2015

March 4th – 7th, Austria Center Vienna, Room 0.93/Entrance Level

Siemens is looking forward to welcoming you at ECR 2015. We invite you to join the Siemens Industry Workshops to discover more about innovative applications.

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Location for Industry Workshops:
Austria Center Vienna
Room 0.93/Entrance Level/Next to room F2

Registration on-site. Please note that only a limited number of seats are available on a first come – first serve basis.

And don’t forget to visit the Siemens Booth #11 located in Extension Expo A, Entrance Level.

Answers for life.
Development of a pan-European imaging biobank network making imaging data widely available and fully integrated with existing biobanks is a top priority for the European Society of Radiology (ESR), according to results of a report by the ESR Working Group on Imaging Biobanks, details of which will be presented at today’s meeting.

There is an obvious need for the development and implementation of imaging biobanks in Europe. Following ECR, the ESR Research Committee will launch the European imaging biobank initiative in order to gather the related clinical or phenotype data, such as imaging biomarkers.

These phenotypic imaging data, including multiple imaging biomarkers of the same patient, might be derived from radiology and nuclear medicine providing a far more complete pool of personalised information. Combining various sources and storage facilities for human biological material and information provide scientists and clinicians with a new resource to find associations and patterns of disease in large populations of patients and healthy volunteers, ultimately leading to clinical solutions and improved understanding of health and disease.

Frija stressed the importance of building imaging data and biomarkers into the existing landscape of European biobanks. “There is a great and urgent need to do so, since imaging repositories are dealing with big data, and a large number of data are needed to formulate a pan-European imaging biobank,” he said.

Setting up such an extensive, integrated imaging biobank would require expertise to implement specific technical requirements in terms of codification, standards and semantic interoperability, which is why the ESR felt strongly about the need to dedicate a formal working group to advance the scheme.

Currently one major use of imaging data is in tumour profiling, and the majority of tissue samples stored in biobanks are cancer-related. Frija highlighted that the integration of imaging data with tissue biomarkers would be a key objective for an imaging biobank.

“Currently heterogeneous data are used for tumour profiling, and therefore the development of interoperable databases is of key importance. By integrating imaging biobanks into other biobanks, the exchange of information and data would be facilitated. Combining various sources of information will improve individualised treatment selection and monitoring.”

In an ESR-led imaging biobank network is established, it will make an unprecedented amount of imaging data widely available and comparable with other biological data from across the Europe. “A European imaging biobank would provide imaging data that are not widely available at the moment. It is a resource that can be used by multiple researchers for a variety of different purposes,” Frija told ECR Today.

Some biobanks such as the European Cancer Organisation (ECO) have been in existence for up to 20 years. The UK Biobank, which stores cell and tissue samples, began in 2006, while the German PATH Biobank, which stores breast tumour tissue, has been existed for 10 years. Very recently, the German National Cohort (GNC) was started, collecting data and samples from 200,000 participants and MRI data from 100,000 participants. These collection and storage facilities for human biological material and information provide scientists and clinicians with a new resource to find associations and patterns of disease in large populations of patients and healthy volunteers, ultimately leading to clinical solutions and improved understanding of health and disease.

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There is an obvious need for the development and implementation of imaging biobanks in Europe. Following ECR, the ESR Research Committee will launch the European imaging biobank initiative in order to gather the related clinical or phenotype data, such as imaging biomarkers. "This is a very successful example of a pan-European biobank research infrastructure," said Kauczor. "Our task is spearheading the programme to build the first European-wide network of imaging biobanks.”

Frija highlighted that the integration of imaging data with tissue biomarkers would be a key objective for an imaging biobank. “Currently heterogeneous data are used for tumour profiling, and therefore the development of interoperable databases is of key importance. By integrating imaging biobanks into other biobanks, the exchange of information and data would be facilitated. Combining various sources of information will improve individualised treatment selection and monitoring.”

By BECKY MCCALL

Prof. Guy Frija will chair today’s session on imaging biobanks.

Further information on the ESR working group on imaging biobanks and the ESR research committee can be found at http://www.esr.org/cms/website.php?id=10/research/uar_research_committees.htm

Information on the BBMRI-ERIC organisation can be found here: http://bbmri-eric.eu

Professional Challenges Session
Thursday, March 5, 08:30-10:00, Room F2
#ECR2015F2 #PC5b
PC5b Imaging biobanks: from genomics to radiomics in the era of personalised medicine
Moderator: G. Antoch, Düsseldorf/DE

• Chairmen’s introduction
G. Frija, Paris/FR
E. Nert, Paris/IT

• The biobanks: genomic, molecular and proteomic – which link to radiomics?
M. Simmone, Rome/IT

• Radiomics: report from the ESR Working Group on Imaging Biobanks
H.-M. Kauczor, Heidelberg/DE

• Existing imaging biobanks
A. Jackson, Manchester/UK

• Extraction and analysis of biomarkers from medical images
R. Grossi, London/UK

Panel discussion: Future strategies for the development and the federation of biobanks, definition of standards, etc.
When a child is born with a serious brain-related defect, understanding the cause and its impact at the earliest stages of life is of utmost importance to determine the best course of treatment and to counsel parents about developmental problems, quality of life, or odds of survival. Advanced MRI techniques like diffusion tensor imaging (DTI) and arterial-spin labelling (ASL) are yielding clinically exciting discoveries and valuable information.

DTI provides qualitative and quantitative information about the microarchitecture of white matter. It can reveal information about the brain microstructure that may not be detected in conventional MR sequences of infants and children with brain malformations. With its ability to better categorise various brain malformations that may look similar on conventional MR imaging but may be caused by different pathomechanisms, DTI may allow transcribing MRI from basic anatomic imaging toward functional and embryology-based imaging. Conventional MRI is excellent in depicting the big functional centres, the outline of the brain. But it does not show how different parts of the brain are connected to each other or if there is an aberrant connection. DTI with fibre tracking do.

Prof. Thierry A.G.M. Huisman, director of paediatric radiology and paediatric neuroradiology at Johns Hopkins Hospital in Baltimore, Maryland, U.S. hopes to convey his excitement about DTI in today’s session.

“Conventional anatomic MR imaging shows only the tip of the iceberg of microstructural brain malformations: DTI can be quite easily performed in any patient and provides a wealth of information. It is a matter of having the patience, perseverance, and a good knowledge of brain anatomy and function to ‘connect the dots’ and extract correct and relevant information out of a combination of the different sequences,” Huisman pointed out that it is necessary to know the clinical history of the patient to be able to pinpoint precisely what fibre tracts need to be reconstructed.

“If I am told that the child is not moving extremities, cortico-spinal fibre needs to be reconstructed, if there are memory problems, the limbic system, or if vision problems, the visual system,” he stated.

“I diagnosed at the prenatal stage, some malformations can be treated through post-processing and reconstructing the course of fibre tracts. As an example, if a neonate is not adequately moving its arms and/or legs, the cortical spinal tract can be reconstructed, specifically the fibres responsible for connecting the motor cortex and extremities. Huisman pointed out that it is necessary to know the clinical history of the patient to be able to pinpoint precisely what fibre tracts need to be reconstructed.

When a neural tube defect can be closed in a fetus, for example, the degree of malformation will not be as severe. And the additional information provided by DTI also may help guide a decision about continuing or ending a pregnancy. DTI and FT (fibre tracking) allow us to study the microstructure of the central nervous system in vivo. Collected data will help to better classify malformations and give important hints to the genetic bases of the encountered findings,” he noted.

“I think that DTI will help to guide the future identification and treatment of genetic diseases. DTI analysis together with MRI analysis will enable researchers to identify patients with similar characteristics and to help us know where to search for the gene locus.”

Furthermore, knowing exactly what and where a defective gene is located will help clinicians to identify different subgroups, make better diagnoses, and gain a greater understanding of patterns of inheritance.

**ASL – A NON-INVASIVE METHOD TO ASSESS HIE**

Hypoxic-ischaemic encephalopathy (HIE), brain tissue ischaemia caused by a lack of blood flow or oxygen perinatally, occurs in two of every 1,000 full-term births. It is a significant cause of neurodevelopmental outcome. Outcome biomarkers for HIE in neonates are critically important, because they can aid in therapeutic decision-making and can be used to evaluate the effect of neuroprotective therapies.

Infants with HIE tend to show focal distress prior to delivery, have abnormal Aggar scores, may require resuscitation at birth, and display neurological abnormalities such as seizures, decreased levels of consciousness, irritability and feeding difficulties. HIE is classified into three grades, ranging from mild to severe. Infants with mild HIE will recover, but those with moderate HIE have a 30% risk of disabilities, a 10% risk of death. More than half of neonates diagnosed with severe HIE will die in infancy. The majority of those who survive will suffer from severe neurological abnormalities.

Cranial ultrasound and MRI – conventional, diffusion-weighted imaging (DWI), DTI, magnetization transfer imaging (MTI), MR spectroscopy, and ASL perfusion – are being used to image neonates with HIE. ASL, perfusion MRI, a technique that inverts arterial blood water flowing toward the brain and serves as a tracer to evaluate brain perfusion, has been used with adults for more than 20 years. However, due to technical hurdles that only recently have been resolved, it has not been used to image newborns and infants, explained Dr. Jeroen Hendrikse of the Department of Radiology of the University Medical Center Utrecht. He is head of a team investigating the use of non-invasive ASL MRI in neonates to visualise and quantify brain perfusion in ml/min/100gr brain tissue.

“With most MRI exams that are performed, structural damage can be assessed, and the infarction can be seen, but no perfusion parameter has been available. ASL provides a relatively simple non-invasive method to obtain haemodynamic (perfusion) information from a scan that takes approximately five minutes,” he said. “In a study of 28 neonates imaged four days after birth published in the January 2015 issue of European Radiology, ASL not only complemented known MRI parameters in the prediction of outcome, but also provided additional unique and valuable information. Perfusion adds additional prognostic information, which was a surprising surprise to us.”

The study determined that basal ganglia and thalamic perfusion (deep grey matter) was higher a few days after birth in neonates followed for up to 18 months who had adverse outcomes of cerebral palsy or death. “We think that in conjunction with MR spectroscopy, it can be used as a non-invasive biomarker, as ASL perfusion had positive and negative predictive values of 100% and 94% respectively. It allows for an evaluation of the reperfusion phenomenon, which is related to delayed cell death. We also think that ASL may be useful to evaluate the effectiveness of neuroprotective therapies,” he added.

**Special Focus Session**

**Thursday, March 5, 16:00–17:30, Room B**

**SF 8a Advanced brain MRI techniques in paediatrics: toys or tools in daily practice?**

- **Chairman’s introduction**
  - A. Roos, Genoa/IT
- **Arterial spin labelling: measuring perfusion non-invasively in neonates and children**
  - J. Hendrikse, Utrecht/NL
- **MR spectroscopy: in vivo time V.S.**
  - J.F. Schoonder, Basel/CH
- **Diffusion tensor imaging: connecting the dots**
  - T.A.G.M. Huisman, Baltimore/MD/US
- **Panel discussion: Do advanced brain MRI techniques really change current practice?**  

**10 CLINICAL CORNER**

**ECR TODAY | THURSDAY, MARCH 5, 2015**

**By Cynthia E. Keen**

**Advanced brain MRI provides insights into brain malformations**

**ASL not only...**

**ASL perfusion – are being...**

**ASL perfusion MRI, a technique that...**

**ASL MRI in neonates to visualise and quantify brain perfusion in ml/min/100gr brain tissue.**

**“With most MRI exams that are performed, structural damage can be assessed, and the infarction can be seen, but no perfusion parameter has been available. ASL provides a relatively simple non-invasive method to obtain haemodynamic (perfusion) information from a scan that takes approximately five minutes,” he said. “In a study of 28 neonates imaged four days after birth published in the January 2015 issue of European Radiology, ASL not only complemented known MRI parameters in the prediction of outcome, but also provided additional unique and valuable information. Perfusion adds additional prognostic information, which was a surprising surprise to us.”**

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Population imaging studies gain ground in healthcare

Imaging large cohorts of people enables scientists to collect information useful for science and emphasises radiology’s role in healthcare. From the most recently available imaging biomarkers to data such as genomics and metabolomics, today’s dedicated Professional Challenges Session will show just how useful population imaging studies have become in the prognosis of countless diseases.

When radiologists follow a cohort of people for 20 or 30 years, the benefits for the patient increase tremendously. If a radiologist performs a CT examination of a patient’s coronary arteries and finds calcification, chances are that the patient will have a heart attack within the next few years. Unfortunately, at this stage, the patient is usually out of the radiologist’s reach. However, if patients choose to participate in a population study, they will be checked on a regular basis, and radiologists will be able to access previous information and initiate appropriate treatment earlier, significantly improving patient outcome.

Securing imaging data is always tricky and population imaging studies are an opportunity for radiologists to access this data. Showing the relevance of imaging findings highlights radiology’s role in the medical continuum, according to Prof. Stolbert-Hosten, of the Ernst-Moritz-Arndt University in Greifswald, Germany, who will chair the session today.

“Our way to prove that radiology can make people healthier and happier is to do large population imaging studies. Radiology can develop the kind of data that are necessary to prove that our methods really help the patient,” he said.

In Germany’s neighbour the Netherlands, significant population imaging studies have been performed over the past two decades. Researchers at the University Medical Center Rotterdam have, for instance, been repeatedly imaging a population cohort of more than 20,000 inhabitants to look at determinants like blood values and cognitive performance, and determine whether they correlate with the occurrence of certain diseases later in life.

They have found that population imaging helps to predict neurodegenerative diseases. Biomarkers such as regional brain volumes, distribution and quantification of white matter lesions, subclinical brain infarcts or microbleeds have been identified.

Researchers have also been able to pinpoint the structural and microstructural integrity of the white matter associated with the development of mild cognitive impairment and full-blown dementia long before any symptoms arise. Prof. Gabriel Kreitsch, chair of the Department of radiology at Emsch advisory, Medical Center Rotterdam, will focus on this particular aspect during the session.

Population imaging is also useful in cardiac and oncology applications, to track early signs of tumour development, and a number of other conditions ranging from liver cirrhosis to amyotrophic. Prof. Fabian Bamberg from Tübingen University Hospital and Steffen Petersen from the London Chest Hospital in Germany and Steffen Petersen from the London Chest Hospital in the U.K. will present the multicentre study done in their respective countries during the session.

Perhaps a more unexpected area of interest is imaging of polytrauma patients, a topic Dr. Sönke Langner, a radiologist working at Ernst-Moritz-Arndt University in Greifswald, will talk about during the session.

Langner is heading the Trauma Cohort Multicentre Study by the German Society of Trauma Surgery (DGU) and the German Roentgen Society (DRG). The first of its kind in Europe, the study will try to answer during the session concerns the radiologist’s responsibility in these studies, especially if she finds an abnormality.

“In a traditional epidemiological study you don’t intervene. In radiology you know what a kidney tumour looks like, so if you do an MR scan and spot such a tumour, I think you are obliged to intervene. Otherwise you will just observe how the patient gets sicker and in my opinion that is not possible being a doctor. The big question is when do we and do we not intervene? I think you should intervene when you are very sure of what you have and that you shouldn’t if you are not sure what a finding means,” Hosten said.

Prof. Dr. Reinhold Schmickler from the University of Münster will deal with this delicate issue in his presentation, which will end the session.

Professional Challenges Session

Thursday, March 5, 16:00–17:30, Room L1

PC 8b Imaging in population-based studies

- Chairman’s introduction
  N. Hosten, Greifswald/DE

- Population imaging for the prediction of neurodegenerative diseases
  G.P. Kreitsch, Rotterdam/NL

- The German National Cohort: population based imaging in a nation-wide multi-centre setting
  F. Bamberg, Munich/DE

- Population-based cardiac imaging
  S. Petersen, London/UK

- The Trauma Cohort: a joint project of the German Bngtsgen Society and the German Society of Trauma Surgery
  S. Langner, Greifswald/DE

- Ethical aspects of population imaging
  R. Schmickler, Münster/DE

- Panel discussion: What does the individual gain from population imaging studies?

Image 3

«Panel discussion: What does the individual gain from population imaging studies?»

Image 4

«Panel discussion: What does the individual gain from population imaging studies?»

Image 5

«Panel discussion: What does the individual gain from population imaging studies?»

CLINICAL CORNER

By Melisande Rouger

Imaging large cohorts of people enables scientists to collect information useful for science and emphasises radiology’s role in healthcare. From the most recently available imaging biomarkers to data such as genomics and metabolomics, today’s dedicated Professional Challenges Session will show just how useful population imaging studies have become in the prognosis of countless diseases.
Radiology is changing. Its possibilities are expanding: its place in healthcare has evolved. However, it has also become more vulnerable to financial turmoil. The future of the profession will depend on how radiologists decide to act and how well they can cope with external factors, a panel of experts will explain during today’s Professional Challenges Session at the ECR.

The emergence of quantitative imaging and the development of imaging biomarkers are transforming the face of radiology. An increasing number of biomarkers are being validated and accepted as measures for prognosis, diagnosis or therapy monitoring. The transition from research to clinical practice has started in many areas, and clinical radiologists have become aware of this evolution. They must learn how to use these new tools, but it is tempting to resist change, especially when it means extra work, according to Prof. Gabriel Krestin, professor and dean of the department of radiology at Erasmus MC, University Medical Center Rotterdam, the Netherlands.

“Radiologists don’t like to perform measurements in daily practice because they are not used to it. They haven’t been trained for that and it’s time consuming. For instance, if you do a cardiac examination, extracting quantitative data from that examination takes up to 30 minutes, so you need dedicated personnel to do that – preferably radiographers. The workflow of the radiologist could be seriously disrupted if he/she had to perform such extensive post-processing of images, and the consultants would see a decrease in efficiency, particularly because nobody pays for the additional measurements,” he said.

A number of biomarkers are already used in clinical practice, such as the REGIS criteria for the following of arterial fibrillation in treatment. However simple they may be, even these measurements are not still not always performed in daily routine.

Emphasis must therefore be put on training, to convince radiologists of the importance of these measurements. Radiologists must also move from the traditional subjective description of findings to an objective description and measurement, in order to give precise diagnosis and advice to clinicians in the field of prognosis, monitoring and follow-up.

Plenty of imaging biomarkers are currently in development: biomarkers for vacular disease to evaluate the degree of dementia and volumes of white matter brain lesions (or lesions in the hippocampus for the prediction of Alzheimer’s disease) for cerebrovascular disease. In the United States, the Quantitative Imaging Biomarkers Alliance (QIBA), an initiative for quantitative imaging, offers a whole lot of biomarkers currently under validation.

“It is urgent for radiologists to become aware of biomarkers’ added value,” Krestin insisted. “It’s an ongoing process, and it’s extremely important for radiology in order to play a key role in what we today call ‘precision medicine’.

Another new concept radiologists must get to grips with is integrated diagnostics. There is plenty of biomarkers to characterise a disease or decide upon its therapy and follow-up: genetic, physiological, biochemical, etc. Other medical specialties have actually been using them for a while, and imaging biomarkers are just catching up.

Consequently physicians are starting to think that these biomarkers should be integrated into a single diagnosis and treatment plan. In other words, they would like to have a biopsy, laboratory medicine and imaging to come closer together to deliver an integrated answer to a clinical question based on different types of biomarkers. This would avoid a long process and increase efficiency and effectiveness,” Krestin explained.

Krestin suggested it should be a joint effort between all the specialties involved. Applying the best from different fields would speed up the diagnostic process compared with the step-wise approach currently in place. It would make things easier for the referring clinician and benefit the patient. The solutions for such integration have yet to be developed.

“We will need to have supporting IT solutions to answer the clinical request together. When the referring clinician asks a question about a suspected diagnosis, when he/she wants a prognostic indication for a certain disease, or needs to know if a treatment is working there should be a central entry point to the integrated diagnostic process. Subsequently, a combination of the most appropriate biomarkers will be determined, providing the most accurate answer in one single step. The IT solutions for such an integrated process do not exist yet, but this is the future, it would be a great benefit for healthcare and the patient,” Krestin said.

Another major change radiology has gone through recently is the ability to outsource its services. Teleradiology has brought along considerable advantages – providing an expert’s point of view when needed or offering diagnosis in the absence of a radiologist – but it has also led to abuses. Some hospitals work entirely with teleradiologists to save money, neglecting the consulting aspect of radiology and commoditising the specialty. In the process, they have exposed radiology to a great danger, according to Prof. Michael Fuchsjäger, chairman of general radiology at Graz Medical University, Austria, who will co-chair the session.

“The commoditisation of our services is really an issue and a threat. In this system, radiology is considered a technical rather than a clinical specialty. In the last two to three decades, radiology has become digitised, and a perception that we are working behind our screens in a dark and quiet room and don’t want to be annoyed by clinical questions has been created, which is highly detrimental to our profession. Some may have found a very safe niche here, working a nine-to-five job, but of course this is not what we are. We are consultants; we are here for problemsolving; interdisciplinary tumour boards for example, radiology should always be present – actually it is imposed by law in some European countries – to provide the diagnostic class that help physicians decide on how to manage the patient. We can also learn a lot from these clinical rounds. Nowadays, we call ourselves clinical radiology because we work closely with the patients and referring physicians,” he said.

To counter this damaging perception, radiologists have to be visible. They have to be active in clinical rounds, clinical meetings and multidisciplinary meetings, but also in their interaction with the patient, especially before or after imaging and treatment.

Fuchsjäger suggested, “You need to have your own view of the patient. You can’t just sit in the dark room and mouse click and internet,” he said.

Meanwhile, the healthcare system has started to change, but leaders must continue to raise the awareness of each and every radiologist. “It has become more and more obvious over the past ten years. Through the advent of all these telemonitoring services and outsourcing, radiologists became aware that they would become marginalised or bypassed in the healthcare system and they have to show their added value, which is definitely their expertise and consulting activities. It’s a shift that’s already happening and we need an argument on how we work, and radiology education should push that more,” Krestin said.

Adapting to changes will definitely improve their future prospects, and radiologists should bear in mind that they also depend on external factors. The session will shed a light on these economic issues, which have a tremendous influence on radiology – probably more than on any other medical specialty.

“The economy affects us in a tougher and more direct way than other medical specialties, because we are dependent on machines and technologies. Part of their equipment is very expensive, for instance some scanners cost up to two million euros. A university hospital can afford that, but not a small facility. Let’s hope the euro doesn’t devalue further,” Fuchsjäger said.
Dr. Alfonso Frigerio, from the Seralgologia di Screening at AOU Città della Salute e della Scienza in Turin, Italy, plans to go over point by point the weaknesses of the anti-screening publications. Several authors have repeatedly challenged mammography screening for the insufficient quality of evidence provided by the clinical trials, focusing on what they claim to be screening’s negligible effect on breast cancer mortality and on all-cause mortality, as well as conspicuous overdiagnosis. “All the above charges have been convincingly proved to be flawed and/or unfounded,” he noted. “A point will be made for the need to base any conclusions on evidence of the utmost quality, i.e., either from the ‘historical’ well-conducted and independently reviewed randomised trials, or from newer high-quality studies based on individual patient data and very long follow-up periods.”

Frigerio aims to confirm that mammography screening is an effective and efficient health intervention that may reduce breast cancer mortality in excess of 40% in those attending – at a cost-effectiveness ratio competitive with other medical interventions. More important than designating anti-mammography screening studies, however, is to reinforce the wealth of available data and the scientific strength of the studies that do show significant benefits of mammography screening programmes, he told ECR Today.

“I wish to help radiologists recognise the key points that make a publication concerning breast cancer screening really meaningful and reliable,” he stated. “I thus look forward to enhancing the awareness of breast cancer screening being not only an effective procedure, more than that, breast screening should stand out among the major achievements in modern oncology and one where radiology played a pivotal role.”

Not everyone views mammography screening so favourably, however. According to Dr. Anthony Miller, professor emeritus from the University of Toronto in Canada, mammography does not equate with an effective procedure, more than that, screening mammography reduces breast cancer mortality of the invited women by about 20–25%, whereas observational studies from service/programme screening show that the mortality reduction for those women who actually attend screening is higher; around 40% or more.

“Women should be carefully informed about screening mammography, its potential advantages (reduced mortality) and disadvantages, including false positive recalls and overdiagnosis,” he continued. “It is ethical that they be informed of the advantages and disadvantages of attending mammography screening.”

He goes on to point out that no mammography screening benefit was found in the Canadian National Breast Screening Study and the set of factors far outweigh any advantages. “We estimated that 32% of the impalpable invasive cancers detected by mammography were overdiagnosed, 72% if in situ cancers are included,” he pointed out. “We were accused of falsifying randomisation so that women with advanced cancer were included in the mammography arm, and using poor mammography. However, the groups were well balanced in breast cancer risk factors; equal numbers of women with palpable abnormalities in the two arms were referred for review; and our cancer detection rates were as good or better than the trials performed in Sweden, where adjuvant treatment for breast cancer was not available.”

Also, the population studies performed since the trials have in general failed to show an effect of mammography screening on the incidence of advanced breast cancer and breast cancer mortality according to Miller:

“They cannot avoid the biases associated with such studies and they have not been able to control for improved treatment,” he explained. “Thus, the rationale for screening by mammography should be reassessed. However, education, early diagnosis, and excellent clinical care should continue to ensure that as many breast cancers as possible are diagnosed at a small and treatable stage.”

Prof. Francesco Sardanelli, director of the radiology unit at the University of Milan School of Medicine in Italy, takes a more moderate approach, along with co-presenter Dr. Nemat Houssami, an associate professor from the School of Public Health at the University of Sydney in Australia.

“We know that screening mammography saves lives,” they wrote in a joint email response to ECR Today. “The relative weight of the contribution of better therapies versus earlier diagnosis from screening/mammography is difficult to measure directly but has been estimated using modelling; better therapies and earlier diagnosis more or less equally contribute to the reduction in mortality we have seen in the past two decades.”

However, the overall reduction in mortality should be evaluated also in relation to overdiagnosis and other harms from screening, they added. Generally speaking, screening mammography reduces breast cancer mortality of the invited women by about 20–25%, whereas observational studies from service/programme screening show that the mortality reduction for those women who actually attend screening is higher; around 40% or more. “Women should be carefully informed about screening mammography, its potential advantages (reduced mortality) and disadvantages, including false positive recalls and overdiagnosis,” they continued. “It is ethical that they be informed of the advantages and disadvantages of attending mammography screening.”

Frisco Sardanelli, director of the radiology unit at the University of Milan School of Medicine in Italy, will moderate today’s session on breast cancer screening.

**BY REBEKAH MOAN**

**Breast cancer screening: controversies look certain to generate fierce debate**

Today’s eagerly awaited session on breast cancer screening has the potential to be the most controversial at ECR 2015 because it includes the perspectives of not only screening advocates but also dissenters. Specifically, researchers will debate hot topics such as the Canadian National Breast Screening Study, followed by a period of questions and answers.
Artefacts in imaging: the highlight of the Physics in Radiology Refresher Course Programme

By Virginia Tsapaki

An artefact is an element that may be visible in an image, but that is not present in the object under investigation. Occasionally image artefacts are the result of inappropriate use of technical parameters; sometimes they appear due to the inevitable consequence of natural properties of the human body. In both cases, it is vital to be familiar with the appearance of these artefacts because they can obscure the morphology and physiology of the scanned part of the patient's body. In the worst case, artefacts may even mimic pathology.

Magnetic susceptibility artefacts: this artefact is seen in the MRI image while imaging metallic orthopaedic inserts (Case courtesy of Dr. Prashant Mudgal, Radiopaedia.org).

As in the case of CT partial volume artefacts, it is also well known that artefacts can so seriously degrade the quality of images that sometimes they are diagnostically useless. A literature search focused solely on artefacts in CT into more than 4,000 papers, whereas in MRI the number comes up close to 5,000 papers. Image artefacts are an area of increasing importance in hybrid imaging, namely in PET/CT and PET/MRI. According to a recent market study (PET/CT imaging facts, opinions, hopes, and questions. J Nucl Med 2014;55(suppl 1)), sales of PET/CT scanners have surpassed those of PET scanners by 18% (2003) and are anticipated to grow by more than 9% over the next few years. Over 5,000 systems have been installed worldwide, with the number growing continuously and with most clinical PET-only systems being replaced gradually by PET/CT. However, the use of the CT scan for attenuation correction in PET has the drawback of producing artefacts in the resulting PET image. While the integration of PET and CT into a hybrid system was challenging but technically feasible, the integration of PET and MRI was considered extremely demanding, if not impossible. The last couple of years the technical difficulties have been surmounted and about 20 clinical PET/MRI systems are operational worldwide.

To optimise image quality, it is necessary to understand why artefacts occur and how they can be prevented or corrected. The Physics in Radiology subcommittee has devoted two of the five refresher courses at ECR 2015 to this very important topic. Refresher course 553 Artefacts and pitfalls in tomography and 559 MR: artefacts and devices will help attendees understand common sources of artefacts and provide adequate solutions to either prospectively limit the chance of occurrence or correct for artefacts retrospectively. The courses intend to refresh the participants' knowledge of the physical origins of artefacts, teach methods for minimising them – including the artefacts in perfusion and diffusion MRI – and explain how to image regions of the body close to metal implants, as well as solutions to frequent image distortions.

Refresher Courses: Physics in Radiology
Thursday, March 5, 08:30–10:00, Room M
RC 553 Artefacts and pitfalls in tomography
Moderator: J. Damilakis, Iraklion/GR
- A. CT
  M. Karchbelie, Heidelberg/DE
- B. PET/CT
  T. Bayer, Vienna/AT
- C. MR/PET
  H.R. Quick, Essen/DE

Saturday, March 7, 16:00–17:30, Room M
RC 559 MR: artefacts and devices
Moderator: D. Bor, Ankara/TR
- A. Image artefacts in MRI and their mitigation
  D. J. Loeve, Aberdeen/UK
- B. Imaging around metal implants: artefact reduction in MRI
  C. McGurk, Belfast/IE
- C. Artefacts in perfusion and diffusion MRI
  T. Tosuog, Larissa/GR

Radiology Trainee Forum Programme
Thursday, March 5, 13:30–14:30, Rising Stars Lounge
Quiz-Master: J. Cáceres, Barcelona/ES
- Evaluation of choroid plexus with foetal MRI: what happens in ventriculomegaly?
  C. Turan, Istanbul/TUR
- Anatomical and morphometric variations of the intracranial vertebralbasilar system on MSCT and MR angiography
  S. Jakovce, Nis/SR

Student Sessions – Students will present their work
Thursday, March 5, 16:00–17:00, Studio 2015
#ECR2015Studio
Student Session 1
- The positive effects on CT reporting with a radiologist present at the initial clinical evaluation of polytrauma
  V. Sarfipillo, Catania/IT
- An audit of the practices of reporting of staging CT scans in primary malignancies
  R. CT, Price, Birmingham/UK
- Reproducibility of a novel semi-automated software programme for Pre-TAVR CT assessment
  K. Rohan, Belfast/UK
- Analysing CT images of patients who died after thrombolysis
  E. Tarjanyi, Debrecen/HU
- Trunk paediatric CT diagnostic reference levels
  D. Fernandez, Coimbra/PT

Student Session 2
- • Swi or T2* – which MRI sequence to use in the detection of cerebral microbleeds? The Karolinska Imaging Dementia Study
  S. Shams, Stockholm/SK
- • Background parenchymal enhancement on breast MRI in women receiving chest radiotherapy for childhood Hodgkin's lymphoma
  L. Zeng, Toronto, ON/CA
- • 3D-quantitative assessment of lesion response to MR-guided high-intensity focused ultrasound treatment of uterine fibroids
  J. Savic, Berlin/DE

RISING STARS Programme today at ECR

Basic Sessions – Special sessions suitable for residents, radiographers and radiographers-in-training
Thursday, March 5, 08:30–10:00, Studio 2015
#ECR2015Studio
Basic Session 1: Breast imaging
- Mammography
  P.J. Gilbert, Cambridge/UK
- Breast IR
  C.S. Balleyguier, Villejuif/FR
- Breast MRI
  F. Sardanelli, San Donato Milanese/IT

Basic Session 2: Neuroradiology
Thursday, March 5, 10:30–12:00, Studio 2015
#ECR2015Studio
- Aging and degeneration in the brain
  B. Gomez-Anson, Barcelona/ES
- Brain trauma
  M. Stagg, Poznan/PL
- Vascular malformations
  P. Viale, Almada/PT

Student Sessions – Students will present their work
Thursday, March 5, 14:00–15:30, Studio 2015
#ECR2015Studio
Student Session 1
- • SWI or T2* – which MRI sequence to use in the detection of cerebral microbleeds? The Karolinska Imaging Dementia Study
  S. Shams, Stockholm/SK
- • Background parenchymal enhancement on breast MRI in women receiving chest radiotherapy for childhood Hodgkin’s lymphoma
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  C. Turan, Istanbul/TUR
- • Anatomical and morphometric variations of the intracranial vertebralbasilar system on MSCT and MR angiography
  S. Jakovce, Nis/SR
The session will focus on staging of neoplasms of the female pelvis, renal cancer and hepatic tumours, and the role of ultrasound both as the first-line-modality and in identifying results of MR or CT. To find out a little more about the session, ECR Today spoke to session co-moderator Prof. Gerhard Mostbeck of the Wilhelminenspital Institute for Diagnostic and Interventional Radiology, Vienna, Austria.

ECR Today: Last year’s joint ESR/ EFSUMB session focused on results through combinations: this year is better results through integration. Can you tell us a little bit about what this theme means and why it was chosen?

Gerhard Mostbeck: Better results through integration means that ultrasound imaging (US) is thought to be an imaging modality that has to be integrated into the diagnostic work-up of a patient, regardless of whether US is applied by non-radiologists, sonographers or radiologists (there are stunning differences in US application between European Countries). Integration means to go a step further; that US has to be integrated into the diagnostic management of a patient (regardless of who is performing the test and that US images, videos and reports should be integrated into the RIS/PACS system for an equivalent IT system) of a specific hospital.

ECRT: How have the individual topics (female pelvis, renal cancer and hepatic tumours) been selected for this year’s joint session? Why are these areas particularly worthy of focus this year?

GM: What these topics have in common is that, in the clinical setting of a specific patient, US is the first-line-imaging-modality when diseases of the female pelvis or a renal neoplasm are suspected, or surveillance of a patient with diffuse liver disease (hepatic fibrosis, cirrhosis) is necessary for early diagnosis of a primary hepatic neoplasm. In clinical reality, these US examinations are not performed exclusively by radiologists, but rather by gynaecologists (female pelvis, urologists (kidneys), and gastroenterologists or liver surgeons (liver). Nevertheless, CT and MR in these questions highlighted by well-known authorities who are dedicated researchers and clinical authorities. All of the presenters are excellent lecturers, who have the authority within EFSUMB and the ESR to represent these topics from both sides, US and CT/MR. The speakers will communicate prior to their specific lectures, to make sure that the content of their talks doesn’t overlap.

ECRT: What do you think is the advantage of having joint sessions co-hosted by the ESR and the EFSUMB, and who benefits from this cooperation?

GM: In my opinion, there are two major advantages. First, thinking in terms of patient care, it is mandatory for all physicians involved in direct patient care in relation to these topics (neoplasms of the female pelvis, kidneys and liver) to have profound knowledge of the respective roles of all imaging modalities involved (even if one has only limited personal expertise in some of these techniques). Accordingly, there might be a direct benefit for patient care. Second, we are convinced that communication between US, CT and MR specialists is mandatory for multimodality patient care, now and in the near future!

ECRT: What would be your message to ECR participants who might consider attending this session?

GM: Short message (if you want to improve your multimodality imaging knowledge for patients with a suspicion of one of these common neoplasms, please go ahead and join our ESR/EFSUMB session!

MY ESR

Clinical Corner

The EFSUMB joint session takes a double-sided look at ultrasound integration

Of the many Joint Sessions taking place at ECR 2015, the one held by the ESR and the European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB) on Thursday morning perhaps embodies the spirit of cooperation the most. Each one of the three talks in this session is being given by two people, one from each society, in order to truly cover all of the topics from both perspectives.

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CLINICAL CORNER

TODAY’S SCIENTIFIC HIGHLIGHTS

JOSEF LISSNER HONORARY LECTURE

Is the Art of Medicine ‘dead’ in the era of population health management?

James A. Brink; Boston, MA/US

Thursday, March 5, 08:30–10:00, Room E1

SA 5 Rethinking ductal carcinoma in situ (DCIS)

Moderators: B. Hamm; Berlin/DE
N. Hosten; Greifswald/DE

» Chairman’s introduction
G. Forrai; Budapest/HU
T. Tot; Falun/SE

» Diagnosing DCIS with MRI
C.K. Kidd; Aarhus/DE

» Image-guided interventions for DCIS
R.M. Pijnappel; Utrecht/NL

» Panel discussion: Patient with DCIS: how to plan her therapy in 2015?

Thursday, March 5, 08:30–10:00, Room E2

PC 5a Looking into the future of radiology

» Chairman’s introduction
M.H. Fuchsjäger; Graz/AT
G. Paulo; Coimbra/PT

» Health technology assessment (HTA)
E.J. Adam; London/UK

» The influence of health economics systems on radiology
D. Katsofianakis; Athens/GR

» Quo vadis radiology professions? A pragmatic approach
G.F. Krastin; Rotterdam/NL

» Panel discussion: What is the role of European societies in building a sustainable model for radiology?

Thursday, March 5, 08:30–10:00, Room F2

PC 5b Imaging biobanks: from genomic to radiomic in the era of personalised medicine

» Chairman’s introduction
G. Frijia; Paris/FR
E. Neri; Pisa/IT

» The biobanks: genomic, moleculomic and proteomic – which link to radiomics?
M. Simmaco; Rome/IT

» Panel discussion: What does the individual gain from population imaging studies?

Thursday, March 5, 16:00–17:30, Room F1

PC 8a Integration of imaging biomarker activities on a European level

» Chairman’s introduction
G. Frijia; Paris/FR

» From qualitative to quantitative imaging: a paradigm shift in radiology
S. Tieting; Vienna/AT

» Experience of the Quantitative Imaging Alliance (QIBA) of the RSNA
R. Boellaard; Amsterdam/NL

» Introduction to the Quantitative Imaging European Task Force
H.-U. Kauczor; Heidelberg/DE

» Clinical validation of imaging biomarkers and their role in European Medicine Agency (EMA) applications
O. Clement; Paris/FR

» The role of imaging biomarkers in the EORTC clinical trials
N.M. deSouza; Sutton/UK

» Panel discussion: How to strengthen the role of imaging biomarkers in clinical trials

Thursday, March 5, 16:00–17:30, Room L1

PC 8b Imaging in population-based studies

» Chairman’s introduction
N. Hosten; Greifswald/DE

» Population imaging for the prediction of neurodegenerative diseases
G.F. Krastin; Rotterdam/NL

» The German National Cohort: population based imaging in a nation-wide multi-centre setting
F. Bamberg; Munich/DE

» Population-based cardiac imaging
S. Petersen; London/UK

» The Trauma Cohort: a joint project of the German Röntgen Society and the German Society of Trauma Surgery
S. Langner; Greifswald/DE

» Ethical aspects of population imaging
R. Schmücker; Münster/DE

» Panel discussion: How to strengthen the role of imaging biomarkers in clinical trials

Thursday, March 5, 09:30–10:00, in the Rising Stars & RTF Lounge

RTF MEET & GREET SESSIONS

Today, at the RTF Booth in the Rising Stars Lounge you will be able to meet the following Radiology Trainees Forum (RTF) representatives:

09:00–11:00 Ruslan Sakovich (Belarus)
11:00–12:00 Ewout Courrech Staal (Netherlands)
12:00–13:00 Kabir Abraham Varghese (United Kingdom)
13:00–15:00 Jaakko Heikkinen, David L. Tarnoki (Finland)
15:00–16:00 Viola Koen (Netherlands)

Join your European colleagues and representatives in an informal and related discussion, exchange opinions and points of view with them and present your ideas. Take advantage of this great opportunity!

Don’t miss the Meet & Greet Session with ECR 2015 Congress President Bernd Hamm today, 09:30–10:00, in the Rising Stars & RTF Lounge.
Hopes rise that hybrid imaging can accelerate in a new era for MRI

Will 2015 be the breakthrough year for PET and MRI fusion? This and other hybrid techniques have been under investigation for many years, but they have tended to be regarded as research tools for academic groups or a hobby for the engineering staff of the large equipment vendors. This situation may be about to change.
The ‘bread and butter’ of the MRI sector are cylindrical systems. These account for approximately 70% of the global MRI market. 1.5T, 3.0T and 7T have all been the focus of innovation in recent years and certainly not the place for their potential range of clinical applications. However, the future progression of the market will be focused on one in particular – 1.5T.

The 3.0T market was tipped for strong growth three years ago, driven by promises of improved resolution and clinical outcomes. However, improvements in 1.5T systems accelerated through demand for more advanced mid-priced systems and concerns over the price of 3.0T equipment. The 1.5T market also meets the needs of both emerging and developed markets, as it offers a combination of better price-to-performance ratios. However, only 7T systems are projected to account for approximately 75% of the global MR market. 3.0T systems are projected to remain the majority of the market for the foreseeable future. The developed markets of North America and Western Europe are almost exclusively focused on 1.5T systems, largely due to its ability to serve the majority of the total market. Manufacturers are focusing on improving the operation of 1.5T systems by developing more advanced imaging solutions. As a result, a succession of products launched in the last two years focused on a key area of cost of ownership, noise reduction, small footprint and wider bore for increased patient throughput. The 1.5T Vantage Elan MR system from Toshiba offers a 6cm bore with numerous features typically found in a more expensive system, including noise-reduction technology. Market leader Siemens Healthcare launched the MAGNETOM Amira offering a high functionality 1.5T system at an affordable price point. GE Healthcare launched the 1.5T Signa Crea-tor and Signa Explorer systems, offering smaller footprint, reduced energy consumption and lower cost of ownership. Philips Healthcare recently launched the Ingenia 1.5T system serving improved patient experience and advanced imaging quality in a 1.5T system. Although leader in the Open MRI market, Hitachi has a strong product offering in the form of the Echelon Oval 1.5T Ultra-Wide bore system launched in 2011.

Investment in new advanced imaging solutions is currently being focused on CT equipment due to the need for new equipment that offers radiation dose reduction, software and tracking. As a result short term growth in the MRI market is low due to lack of investment. However, interest in 1.5T systems is projected to accelerate over the next four years with the global average annual growth rate for units peaking at 12% in 2025. Growth is projected to be led by the Eastern Europe, Middle East & Africa market and Asia where the penetration of MRI systems is low. The North American market remains challenging due to changes in reimbursement and as a result growth is significantly lower. However, even with this challenging market adoption of 1.5T systems is projected to be far stronger than that of 3.0T and open MRI equipment.

The total EMRA market comprises of Western Europe and Eastern Europe, Middle East & Africa provides a good example of the popularity of 1.5T systems for both emerging and developed markets. The Western European market recovers from economic turmoil, cost is an ever important factor in purchasing decisions. As a result, advanced 1.5T systems are projected to account for a far higher proportion of unit shipments compared to 3.0T systems over the next five years. Likewise the 1.5T market is projected to drive growth in the developing Eastern Europe, Middle East & Africa market with unit shipment growth for 1.5T systems estimated at 27% in 2015 compared to 30% for 3.0T systems.

Cost – that is the key factor affecting the advanced medical imaging market. For the MRI market it comes in many guises: up-front capital, operational, installation, services. All of these influence the purchasing decisions of hospitals globally and continue to stifle growth in the global MRI market. When systems cost upwards of €700k, each contributing factor is magnified in importance.

More T, doctor? No thanks.
Proposition preparation with EIBIR Support for Horizon 2020

Feedback from EIBIR Network Members on the first Horizon 2020 submissions

When it comes to realizing collaborative project ideas under European funding calls and coordinating international projects, the European Institute for Biomedical Imaging Research (EIBIR) offers professional guidance and support through a wide variety of different research-related services for its network members. For the first calls under Horizon 2020 in 2014, EIBIR was involved as project coordinator or partner in more than 20 proposals. In these proposals, EIBIR has collaborated with over 200 different partners, including 25 small and medium-sized enterprises (SMEs) from 22 countries.

The proposals that were submitted over the course of 2014 covered a variety of topics, including radiology, paediatrics, cardiovascular disease, oncology, and gene therapy. All proposals featured a strong biomedical imaging component. Among the submitting members were Prof. Laure Fournier from University Paris Descartes, France, and Dirk Smeets from icoMetrix, an SME located in Belgium – below are their thoughts on working with EIBIR during the preparation of the proposal and its submission.

ECRT: What did you like about EIBIR's proposal preparation and management services?
LF: I knew EIBIR existed and was familiar with the services they provide. Basic research, including animal studies, would be a big part of the proposed project and from speaking with EIBIR, EIBIR's support seemed like a natural fit to have EIBIR on board.

ECRT: What did your experience with EIBIR allow you to do?
LF: All aspects of proposal writing were supported by EIBIR. In particular, the organisation of for instance conference calls and completing administrative forms was being taken care of by EIBIR in the background.

ECRT: How would you rate your experience working with a partner for proposal preparation and project management?
LF: EIBIR really helps taking away the administrative burden of the proposal. As such, the scientific contributions can focus on the writing of the scientific parts.

ECRT: As one of our new Industry Partners, what is the added value of the EIBIR membership for you?
DE: We believe EIBIR enhances the visibility of icoMetrix in the field of biomedical imaging and helps us to enlarge our network, towards potential customers and future collaborators, who can visit us at ECRT booth E3a.

ECRT: How would you rate your experience working with a partner for proposal preparation and project management?
DE: EIBIR really helps taking away the administrative burden of the proposal. As such, the scientific contributions can focus on the writing of the scientific parts.
Ukrainian radiologists keep working to improve their discipline

The main aims of the Association of Radiologists of Ukraine (ARU) are the development and improvement of radiology in our country, along with the integration of national radiologists into the European radiological family.

After the adoption of the European Training Charter at the European Congress of Radiology in 2014, the ARU began the process of implementing it into our national radiology services.

Last year, during the National Radiological Congress in Kiev and at a radiological forum in Odessa, radiologists from our country discussed the European Commission document ‘Radiation protection: referral guidelines for imaging’. Currently, we are trying to introduce this document into clinical practice after its approval by the Ministry of Health.

Radiological science is a very important branch of radiology, which gives us the ability to educate the next generation of Ukrainian radiologists.

Scientific research in the field of radiology in Ukraine is conducted in two radiological institutions belonging to the Academy of Medical Sciences of Ukraine: the Gregoriev Institute of Medical Radiology in Kharkov and the Institute of Nuclear Medicine in Kiev, as well as at specialised radiological departments at 11 medical universities in Ukraine. The research work of these institutions is aimed at working out new techniques in diagnostic radiology, radiotherapy and nuclear medicine. It also develops new methods of prevention, diagnosis and treatment of radiation lesions. Furthermore, it focuses on the improvement of dosimetry provision of radiation therapy, optimising radiation load from medical procedures, medical application of imaging radiation, and research development in radiology.

The Institute of Medical Radiology in Kharkov has been participating in scientific programmes in biological dosimetry under the aegis of the Commission of the European Union since 1993. Together with the National Committee for Radiation Protection (Great Britain), the Institute of Nuclear Safety of France and the Institute of Geriatrics and Cytology at the Belarus Academy of Science, our members worked on the project ‘Doses to the Belarus and Ukrainian populations resulting from the Chernobyl accident’.

The radiological department of Kharkov Medical Academy of postgraduate training investigated the possibilities of micro-focus x-ray systems in clinical practice.

Major areas of research are tomosynthesis in mammography, optimisation of the control system for x-ray equipment and teleradiology in clinical practice.

Because of the purchase of three systems for PET/CT diagnostics, as well as several modern linear accelerators for radiation therapy by the National Medical Academy of Postgraduate Training in Kiev, some scientific research in the oncologic field has been planned.

The Institute of Nuclear Medicine has performed investigation into CT perfusion in patients with hepatic diseases and cancer processes of the head and neck.

The Ukrainian mammographic system for tomosynthesis (3D mammography) is currently under clinical testing for the screening and early detection of breast cancer.

Unfortunately, the government of Ukraine does not provide sufficient funding for research in the field of radiology. Hospitals have government-funded budgets, but only for day-to-day radiological services. Departments at medical universities do not have their own modern equipment, and university departments have to cooperate with better-equipped general hospitals for investigations. Research often attracts young practising radiologists, who work in these hospitals. During the last two years, eight young radiologists completed a PhD programme and defended their theses.

Every year at the end of March in Kiev, the ARU organises the National Radiological Congress, during which our radiologists report the results of their scientific research. They must publish scientific articles in two Ukrainian radiological journals. The international activity of our members consists of research cooperation with foreign societies (BSNA, ESTRO, SNM), scientific centres, institutions, foundations and other organisations. It also includes participation in scientific conferences, visits by researchers to other countries for scientific research, fellowships and training.

One of the aims of the ARU is the scientific development of radiology in Ukraine for the period 2014–2017. The government of our country has decided to establish high-tech centres of nuclear medicine, diagnostic radiology and radiotherapy in some areas of Ukraine. But this is still a work in progress.

More information about the Association of Radiologists of Ukraine can be found at aru-ua.org.
Introducing clinical decision support for imaging referral guidelines in Europe will help doctors choose the best exam for every patient. This document highlights the importance of establishing DRLs for high-dose medical examinations, in particular computed tomography and interventional radiology procedures. The utility of DRLs in radiation protection of patients is very well acknowledged in the newly published European R53 (2).

**The PDiRL Project**

European DRLs for Paediatric Imaging (PDiRL) is a new multi-month EU project, which aims to develop a methodology for establishing and using DRLs for paediatric medical imaging, and to update and extend the European DRLs to cover as many procedures as possible. The PDiRL Project is headed by the European Society of Radiology with other participating organisations including the European Federation of Organisations for Medical Physicists (EFOMP), the European Society of Paediatric Radiology (ESPR), the European Federation of Nuclear Medicine (FEKnM), the Finnish Radiation and Nuclear Safety Authority (STUK), “Research Centre Henri Tudor (CRP-HT)” as a subcontractor.

The main task of PDiRL is to develop a methodology for establishing and using DRLs for paediatric imaging and produce new European guidelines on paediatric DRLs. PDiRL aims to update and extend the European DRLs as provided in RP 193 (2) to cover more procedures.

PDiRL Achievements

A worldwide review of literature on patient doses and DRLs for children of different age groups, or other distributions, and for different examinations has been carried out with an emphasis on European literature. Questionnaires have been distributed to confirm and update the data on paediatric DRLs in European countries as available from the EC project, Dose Datamed (DDM2) database (3), and to collect information to prepare sections of the guidelines. The first complete draft of the guidelines has already been submitted to the EC.

The review of DRLs has indicated that for interventional, fluoroscopy-guided cardiac procedures, no national DRLs exist but only a few local DRLs have been suggested, and for interventional non-cardiac procedures, no DRLs have been suggested at all. PDiRL efforts are in progress to establish multi-national DRLs for paediatric interventional procedures. PDiRL will hold a workshop in Lisbon, Portugal, on October 15–17, 2015. A range of topics pertaining to the current status, difficulties and future possibilities in the field of paediatric DRLs will be discussed. The outcome will form the basis for European Guidelines on DRLs for paediatric imaging covering plain radiography, fluoroscopy, and other interventional procedures and CT.

The scientific committee of the PDiRL workshop has endeavoured to set up an exciting programme, which includes round tables and panel discussions, as well as oral and poster presentations. The call for abstract submissions for oral and poster presentations on the topic “Patient Doses from Paediatric Diagnostic and Interventional Procedures – Establishment and Use of Paediatric DRLs” will close in April 2015. Besides our scientific programme, participants can enjoy sightseeing, architecture, museums and Portuguese cuisine in Lisbon. More information about the PDiRL project and workshop can be found at www.europesafefilmaging.org/pdirl

**ESR and NDSC launch ESR iGuide**

Introducing clinical decision support for imaging referral guidelines in Europe will help doctors choose the best exam for every patient.

ESR Guide is a Clinical Decision Support (CDS) system developed by the ESR in cooperation with the National Decision Support Company (NDSC), for distribution in Europe. This product will make imaging referral guidelines available in a user-friendly way, supporting referring physicians in choosing the most appropriate exam for each of their patients. Used as a stand-alone tool or integrated with hospital order systems and electronic health records, ESR iGuide not only offers references up-to-date and scientifically valid guidance, it also provides an efficient, traceable and reliable way of selecting and ordering imaging exams in daily practice, improving the clinical workflow to the benefit of general practitioners and other specialists, radiologists, hospital managers and patients alike. According to incoming ESR President Prof. Luis Donoso, “Imaging referral guidelines are an essential tool to achieve this, and they are only available in 70 percent of European countries. The recommendations that are available differ starkly from country to country even though there is no sound evidence for such divergences. Moreover, as developing and updating guidelines is a complex, arduous process, it is questionable whether these recommendations are. And, not least, they are usually only available as a book or in PDF format. These and other factors contribute to a significant lack of use of referral images of guidelines.”

Introducing clinical decision support for imaging referral guidelines in Europe will help doctors choose the best exam for every patient.

EurSafe Imaging Session 1

Thursday, March 5, 14:00–15:30, Room M

**Clinical decision support: making imaging referral guidelines work for patients, doctors and hospital managers**

- Chairman’s introduction by G. Zyla, President of the European Society of Radiology
- CDS impact on guidelines development by K.J. Dreyer, Boston, MA/US
- Adapting and updating guidelines by M.G.M. Hunink, Rotterdam, NL
- ACR select implementation experience by J.A. Brink, Boston, MA/US
- ESR iGuide by L. Donoso, Barcelona/ES
- Discussion
EXPERIENCE
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For more information, visit www.samsung.com/healthcare/ecr2015
During the last decade there has been growing interest in head and neck imaging. It is partially due to advances in modern imaging (functional imaging techniques, hybrid imaging and MR imaging of previously difficult areas) but it is also greatly influenced by evolving surgical techniques and the growing popularity of non-surgical treatment options. Therefore, head and neck radiology is in constant change. The demands for improved healthcare are greater than ever and diagnostic capabilities have greatly improved.

Subspecialty radiology, including head and neck imaging, is slowly becoming an obvious necessity in busy academic hospitals. The special knowledge required for the interpretation of head and neck diseases is now unquestioned. Furthermore, research, either basic or clinical, is mandatory for the advancement of this specialty.

Since its launch in 1987, the European Society of Head and Neck Radiology (ESHNR) has been highly successful in accomplishing its mission of teaching the state-of-art practice of head and neck radiology. It currently has 271 active members from 34 countries. Its main goal is to support and stimulate the exchange of knowledge in all aspects of head and neck imaging and diseases; and to promote the highest standards of research, education and training.

The ESHNR, besides organising conferences, courses and scholarships, is evolving to become a truly multidisciplinary body bringing together clinicians (head and neck surgeons, radiation therapists, and medical oncologists), pathologists, other health professionals, basic scientists and patient organisations involved in any aspect of head and neck radiology and treatment.

In 2015 our Annual Conference will be held in the historical city of Krakow, Poland for the first time. The meeting will be dedicated to head and neck oncology and the multidisciplinary treatment of cancer. A substantial part of the meeting will also be dedicated to discussing the properties of tumours in functional imaging. The whole meeting will consist of keynote lectures, imaging quizzes, special focus sessions, interactive sessions (called Make your Own Diagnosis), scientific papers and posters. Prizes for the best oral and poster presentations will be, as usual, offered by the ESHNR. There will also be a chance to take the European Subspecialty Diploma in Head and Neck Imaging examination.

If you are a member of ESHNR, please join us during sessions and courses. If you are not a member, please stop by our booth to learn more about our warm, friendly and dynamic society.

More information about the ESHNR can be found at www.eshnr.eu
Founded more than a century ago by Antoine Bécère and other eminent pioneers of our discipline, the French Society of Radiology (SFR) is one of the oldest in Europe. Since its establishment, the SFR has known how to evolve, by pursuing and leading the crucial technological and medical developments of radiology. The SFR has always integrated young radiologists into its society and, in order to represent them, will try to answer the question of what is on the horizon for 2020 by drawing on the main lines of radiological development.

The year 2020 is within the near future. Indeed, five years is the time needed to train a resident in radiology in France, and in many other European countries, recommended by the ESR. The exponential development of techniques in radiology has led to a substantial turnover of radiological exams. Important work has been done by creating a guide du bon usage des examens radiologiques. Important events we offer at ECR to learn more about how we are changing has most evolved their practice in the past decade, the use of MRI and specific interventional radiological devices are the most often cited. It is now that radiology has completely transformed medical practice, from emergencies to follow-up treatment, and from diagnostic to interventional radiology. It requires advanced technical equipment from the beginning of a resident’s training to be able to acquire a level of excellence and to keep up to date with technical diagnostic and therapeutic innovation.

Let’s take the example of acute strokes. Acute ischaemic stroke patients admitted to hospital within four and a half hours from symptom onset, and without haemorrhagic or large ischaemic lesions, are considered ideal candidates for reperfusion therapy. Non-contrast computed tomography (CT) has long been the first-line diagnostic tool in acute stroke patients, thanks to its availability 24 hours a day. CT, together with CT angiography and CT perfusion, are first used to exclude haemorrhagic lesions which are a contraindication for reperfusion therapy and may also help to identify early signs of ischaemia. The interest in MRI as a tool for acute stroke management lies not only in the capability of this technique to detect early ischaemic lesions with high sensitivity (diffusion MRI), but also in identifying ischaemic tissue (perfusion MRI). A complete clinical multimodal MRI stroke study for acute stroke takes less than 15 minutes and is feasible within the thrombolytic time window. One important advantage for patient care is MRI’s ability to act as a clock, determining if the onset of the stroke occurred less than 4.5 hours before. In this application, awakening stroke patients with no precise clinical onset time could still benefit from reperfusion therapy.

For all these reasons, brain MRI scans are recommended in cases of acute neurological symptoms. But are brain MRI scans accessible to all patients within a suitable time frame, regardless of their geographical location? Here we raise the difficult issue of dealing with an economic crisis while still requiring expensive equipment. Compared to European countries, France has around 11 MRI systems per million inhabitants, whereas the average for Western Europe in 2012 was 25 per million. We must work hand-in-hand with our institutions to renew and develop the number of MRI units and to optimise access to high-quality health care regardless of regional inequalities. The goal is not only to increase the number of MRI units, but also to improve the overall management of access to diagnostic and therapeutic radiology. This would also mean decreasing unnecessary expenses, e.g. of unjustified radiological exams. Important work has been done by creating a ‘guide du bon usage des examens d’imagerie’ validated by the French Society of Radiology, can be found at www.gbu.radiologie.fr. Indeed, unnecessary radiological exams also diminish the resources available to others, without any benefit for the patient. Management of access to radiological care may look like wishful thinking but knowledge of its application must grow with awareness.

A new and enlightened vision of health economics is necessary if we want to protect advanced medicine that is accessible to the global population. This is the challenge that radiologists will have to face in the coming years.

Dr. Myriam Edjallé-Gouon is a neuroradiologist and PhD student from Paris, France.
In its ninth year, the European School of Radiology continues to promote the European Society of Radiology’s strong and unflagging commitment to invest in radiological education while pursuing its two main goals: to assist in harmonising radiological education throughout Europe, by supporting the implementation of the European Training Curriculum, and to raise the scientific profile of radiological education.

The past eight years of ESOR have been marked by an outstanding growth in a wide range of modal activities, including visiting schools, seminars, tutorials, teach-the-teachers programmes, visiting professorship programmes, visiting scholarships, and exchange programmes for fellowships. So far, ESOR has delivered structured continuing education to almost 12,000 residents and board-certified radiologists worldwide.

Furthermore, ESOR has gradually evolved into a major, if not the major, international provider of complementary education in radiology, as it is now active worldwide. With its expanded outreach programmes, the ASKLEPION Courses, the AIMS School and Seminar, the Visiting Professorship Programmes and the intercontinental scholarships and exchange programmes for fellowships, ESOR is able to respond adequately to the actual needs of radiologists in the developing world following agreements between the ESR and the corresponding member societies. The importance of ESOR’s contribution to this end can be better appreciated if one considers the statistics from the past few years. Out of the 1,000 yearly participants in ESOR activities 80% are steady coming from the radiologically developing world, while 30% of the scholarships along with 50% of the exchange programmes for fellowships were granted to applicants from Eastern Europe, Latin America, China, the Middle East and Africa.

In addition to impressive numbers, ESOR is proud of being instrumental in mobilising the resources available for radiological education in Europe and the world, and for creating a long-term educational commitment, and structured network, the ESR community, through partnerships. All this has been greatly appreciated utilisation of teaching resources has been implemented with the unlimited support of highly esteemed and renowned lecturers, tutors, mentors, volunteer reference training centres, local organisers, subspecialty and national societies, academic institutions and valued industrial partners. ESOR is greatly indebted to them all. In 2015, ESOR is consolidating its programmes, those in line with the strategic budgetary review of the ESR, while enriching its portfolio by introducing two additional outreach programmes in Latin America, one in cooperation with the Academica Colombiana de Radiología (ACR) and one with the Colegio Interamericano de Radiología (CR). In addition, ESOR is moving to offer a small number of structured, competitive and certified for one year fellowship programmes, to be implemented in Europe for the first time. These fellowships will be covered by a grant, offered by the enroling reference institutions and are intended not only to improve the needs, but also to show the step forward and the high standards of this major European education endeavour in partnership.

I would like to encourage all of you to participate and benefit from all ESOR programmes, use the opportunities offered for exchange and interaction, and share the knowledge and skills needed to meet requirements of today and tomorrow. I am confident that ESOR will maintain its leading role in serving our vibrant community for years to come and will continue to deliver successfully, connecting the world of radiology.

**ESOR further enhances ESOR’s commitment to education and training**

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<tr>
<th>SCHOLARSHIP PROGRAMME 2014 IN EUROPE</th>
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<tbody>
<tr>
<td>Alireza Abrishami, Tehran, IRN</td>
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<td>Maria Cruz Agustín Casas, Santiago de Compostela, ES</td>
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<td>Simone Altobelli, Rome, IT</td>
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<td>Andreas P. Amado, Munich, DE</td>
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<td>Oleksiy Barysbam, Zagreb, HR</td>
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<td>John Clodagh Bamford, London, UK</td>
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<td>Silvia Bernardo, Rome, IT</td>
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<td>Teimuras Azaz, Serrako Kamerica, RO</td>
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<td>Alessandro Camplani, Milan, IT</td>
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<td>Ralf Chademura, London, UK</td>
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<td>Dan Costache, Timișoara, RO</td>
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<td>Luca Cristiano, Rome, IT</td>
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<td>Kristina Davidson, Belgrade, RS</td>
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<td>Arianzina D’Errico, Naples, IT</td>
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<td>Franko Fazan, Rome, IT</td>
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<td>Matthias Gazierts, Leipzig, DE</td>
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<td>Dinara Jumattaliev, Astana, KZ</td>
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<td>Pietro L. Mangan, Munich, DE</td>
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<td>Sedef Ersin Yoruk, Tbilisi, Tbilisi, TB</td>
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<td>A. Sanfilippo Peteras, Zagreb, HR</td>
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<th>EXCHANGE PROGRAMME FOR BREAST IMAGING FELLOWSHIP 2014</th>
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<td>Florence Bautz, Paris, IT</td>
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<td>Ruma Sovolov, Naples, IT</td>
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<td>Sielkwiet Niamh Thaker, Jaggerston, IN</td>
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<td>Mattias van Buren, Ghent, BE</td>
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<td>Jaime Verdejo, Santiago, CL</td>
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<td>Anzë Veldhuis, Laren, KZ</td>
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<td>Valeria Vinc, Rome, IT</td>
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<td>Ulrich Groene, Tubingen, DE</td>
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<td>(Case Western Scholarship Programme)</td>
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<td>Francesco Isabella, Naples, IT</td>
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<td>Diana Sorina Feier, Cluj-Napoca, RO</td>
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<td>(MSCS Scholarship Programme)</td>
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<td>Nicola Lindsay Roberton, London, UK</td>
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<td>Bella Chamorro, Moscow, RU</td>
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<td>Olga Nikolaou, Thessaloniki, GR</td>
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<td>Sasa Hofit, Maribor, SI</td>
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<th>EXCHANGE PROGRAMME FOR HEAD AND NECK RADIOLOGY FELLOWSHIP 2014 (IN PARTNERSHIP WITH ESOR)</th>
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<tr>
<td>Anthony Cyril Bartley, Jodhpur, All Montserrat Domingo Ayllón, Nancy, FR</td>
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<td>Aleksandrina D’Errico, Naples, IT</td>
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<td>Lavinia Manuela Lenghal, Cluj-Napoca, RO</td>
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<th>EXCHANGE PROGRAMME FOR MUSCULOSKELETAL RADIOLOGY FELLOWSHIP 2014 (IN PARTNERSHIP WITH ESSR)</th>
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<td>Mohammad Farshad, Tehran, IRN</td>
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<td>Xiang Liu, Beijing, China</td>
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<td>Malika Mahajan, Bangalore, IN</td>
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<td>Maria Papasiopoulu, Patras, GR</td>
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<th>EXCHANGE PROGRAMME FOR BREAST IMAGING FELLOWSHIP 2014 (IN PARTNERSHIP WITH MERRCC)</th>
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<td>Oshani Abeyson, London, UK</td>
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<th>EXCHANGE PROGRAMME FOR CAR-DIAC RADIOLOGY FELLOWSHIP 2014 (IN PARTNERSHIP WITH ESG)</th>
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<td>Ekaterina Perelin, Moscow, RU</td>
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<th>EXCHANGE PROGRAMME FOR TWO-LOGIC RADIOTHERAPY FELLOWSHIP 2014 (IN PARTNERSHIP WITH ESI)</th>
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<tr>
<td>Manuel Gutierrez Gimeno, Barcelona, ES</td>
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<td>Ineke Willemsen, Brussels, BE</td>
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<th>VISITING PROFESSORSHIP PROGRAMME FOR CHINESE RADIOLOGISTS 2014 (IN PARTNERSHIP WITH ESSR)</th>
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<td>Zheng Kai, Jilin, China</td>
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<td>Xiachao Man, Shanghai, CN</td>
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<td>Haibo Wan, Zhengzhou, CN</td>
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<th>VISITING SCHOLARSHIP PROGRAMME FOR CHINESE RADIOLOGISTS 2014 (IN PARTNERSHIP WITH ESI)</th>
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<td>The certificates will be awarded during the ESOR Session today at 14:00 in Room N</td>
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The European Society of Radiology (ESR) is more than just a professional society; it’s also the centre of a global community of radiologists. Of course, being part of a community means helping one another and taking responsibility for future generations. The ESR has always been a strong advocate for this international radiological community. Bringing trainees from low-income countries to the European Congress of Radiology (ECR) free of charge and funding open-access publications are just two examples of the many ways the society has served the community so far.

The ESR Support Initiative is the society’s new social responsibility project. The aim is to improve access to training, education and resources for radiologists and related scientists in less affluent regions, thereby improving healthcare standards for patients. As the economy continues to struggle in many parts of Europe, the ESR Support Initiative comes at exactly the right time to help alleviate major shortages in radiological resources and training.

Each year, one country will be selected as the focus of the ESR Support Initiative. This country will then benefit from special offers from the ESR’s Invest in the Youth programme, ECR Live, ECR on Demand, the European School of Radiology and EuroSafe Imaging as well as reduced ESR membership fees. Radiologists in the selected country will also have access to fellowships at hospitals and medical institutions across Europe, and trainee radiologists will have the opportunity to get involved in the ECR, either by visiting the congress or watching it online, and benefit from a range of career-enhancing educational resources from the ESR. This should provide a much-needed boost to those members of the radiological community who have had to make do with fewer resources and funding over the last few years.

The eligibility criteria for the ESR Support Initiative includes factors such as the official length of training in the country, the average salary of trainees, the number of trainees per year, the total number of radiologists and the amount of equipment available. All national radiological societies which are ESR Institutional Members are invited to apply. All applications are then reviewed by the ESR’s Board of Directors.

The ESR has selected Bulgaria to be the ESR Support Initiative country for 2015. The ESR’s current president and founder of the ESR Support Initiative, Prof. Lorenzo Bonomo, is already looking forward to seeing more Bulgarian radiologists taking part in the ESR’s activities as a result of the initiative, which he sees as just the start of a long and successful project.

“I am delighted that we now have the chance to share our resources with colleagues in Bulgaria. For me, this is just the beginning of the ESR Support Initiative’s great work, as we will continue to serve our community so that they can better serve their patients,” said Prof. Bonomo.
RADIOLOGY DEVELOPS FURTHER IN GEORGIA

The Royal College of Radiologists (RCR) has more than 9,500 Fellows and members worldwide in the disciplines of clinical radiology and clinical oncology. The RCR role is to advance the science and practice of clinical radiology and clinical oncology, further public education and promote study and research by examination, supervision and practical training and practice. The RCR organises its activities under the themes of leadership, education, and support, and has been developing and delivering a range of educational and awareness programmes to increase engagement and value for the last three years. The RCR is also a registered charity and promotes public benefit through its activities.

Our primary concern in 2015 is the state of UK radiology. There is a relentless increase in demand particularly for complex imaging such as CT and MR scans, which is far outstripping the ability of services to cope. This is leading to a failure to increase the radiology workforce in all parts of the UK. The results are increasing delays in reporting imaging tests with delayed diagnosis of cancer and other serious conditions.

The UK compared poorly with other European nations, with around 8 trained radiologists per million population – a figure which has remained almost static for the past five years. Meanwhile, the average increase in imaging activity in England has been 20% for CT and 12% for MRI for each of the last ten years. Despite that, imaging rates in the UK remain significantly below those found in other healthcare systems for most tests, suggesting that further growth is inevitable.

The RCR has built the case for greater investment in the training of diagnostic and interventional radiologists in all four UK countries. The key has been using data derived from our workforce censuses (www.rcr.ac.uk/radiology/census) since 1999, typified by the aegis of Georgian National Academy of Sciences. Due to its endeavours, the fields of radiology and therapy, such as CT and MR scans, which is far outstripping the ability of services to cope. This is leading to a failure to increase the radiology workforce in all parts of the UK. The results are increasing delays in reporting imaging tests with delayed diagnosis of cancer and other serious conditions.

The 640-slice CT enables our radiologists to perfect their skills in the subspecialty of their choice. We consider our post-diploma period of teaching to be our greatest achievement. After receiving their diploma, young doctors pass tests and get licences from outside the U.K. who wish to deliver radiology services in the UK. Please enquire at the RCR stand at ECR 2015.

Allied to our sustained lobbying for more radiologists has been the promotion of alternative models of service provision through the creation of regional radiology networks (http://www.rcr.ac.uk/radiology/radiology-networks). Bigger than existing local collaborations, these more extensive networks would share diagnostic expertise between hospitals for the benefit of patients. The RCR has received positive feedback on the idea which is being developed further.

Over the last year, the RCR has begun to offer leadership and mentoring development for Fellows and members. Clinical leadership of services in the UK is of increasing importance and prominence: our new initiative has been very well received and will be continued on in 2015 and beyond.

Since 2011, the RCR has developed its priorities for international development. Further automation of the RCR examinations will facilitate the exams being sat in more overseas countries, where there is major unmet demand. In response to growing interest in international cooperation, the RCR has created a network of interested Fellows and members who wish to deliver radiology education and training on a philanthropic basis to low and middle income countries. A number of projects are being considered or developed.

In addition to our Annual Scientific Meeting, held at the Barbican, London fully established as a major event in the radiological calendar. Across the three-day meeting, a programme of lectures and interactive workshops offered insight across a broad range of clinical and non-clinical subjects. Feedback from attendees was very positive indeed. The 2015 ASM once again to be held at the Barbican in London from September 7–9 will offer a similarly excellent programme and bookings can be made at www.rcr.ac.uk/ASM.

More information about the Royal College of Radiologists can be found at www.rcr.ac.uk.

BY FRIDON TODUA

The Georgian Association of Radiology (GAR) has more than 9,500 members in Georgia. Its members include senior and junior radiolo- gists. The official journal of the GAR, the Georgian Journal of Radiology, has been published since 1999 under the aegis of Georgian National Academy of Sciences. Due to its endeavours, the fields of radiology and therapy such as CT, MRI, US diagnosis, nuclear medicine and radi- therapy have been brought together as one discipline: medical radiology. The GAR also hosts international congresses, symposia, seminars. There are also training courses for young specialists who are dedicated to the various fields of radiology. Scientific research takes priority in the activities of the Georgian Association of Radiology. Many members of the GAR have gained scientific degrees: young radiologists have been allotted grants. Many young members of the association have participated in the RCR, as well as in the RSNA Annual Meeting, and in conferences and workshops in vari- ous European countries. In Georgia, a physician radiologist must master all areas of radiology. We have a three- year residency programme, one year for subspecialty and a doctorate in radiology. In the first term of resi- dency they study roentgenoanatomy. After residency, young specialists perfect their skills in the subspecial- ization of their choice. We consider our post-diploma period of teach- ing to be our greatest achievement. After receiving their diploma, young doctors pass tests and get licences which are in accordance with Euro- pean standards. During this period, together with radiology they attend lectures and have courses in different subjects: e.g. surgery, neurology, etc.

As a result we achieve our main goal: we create physician-radiologists with clinically oriented minds.

One of the main goals of our Asso- ciation is the development of medical radiology by unifying the medical, scientific and technical potential of our country.

The Research Institute of Clinical Medicine is the main scientific base of the Association. It is equipped with four MR Scanners on which the investigations are carried out at modern standards: functional MRI imaging, mammography, MRI spec- tronometry. These methods are used for pre-surgical diagnostics of the patients. There are 16-slice, 160-slice and 64-slice CT scanners as well. The 64-slice CT enables our radiologists to make precise diagnoses of heart vessels and brain pathologies; it is also possible to make the investigation of brain perfusion and CT coronaograms. Today in Georgia, the Research Institute of Clinical Medicine is the only institution that has a department of nuclear medicine equipped with new 3 T-Can Systems. All these conditions attract the young specialists from all over the South Caucasus to master the radiology here.

In the recent years with the achievements of advanced methods in medical radiology, the Institute of Clinical Medicine, as a leading insti- tution in this field in Georgia, is corre- spondingly applying new methods of investigations, research and therapy in our country. The new high-field MR and 64-slice CT scanners have given us the opportunity to inves- tigate not only structural, but also functional changes during different diseases by using MRI, arterial spin labelling, diffusion tensor imaging, magnetic resonance spectroscopy and perfusion CT. These advanced methods have given us the unique opportunity for research as well. At the same time the obtained results can be implemented in the clinical routine. In Georgia, surgery and neurosurgery in particular have benefited much from these tech- niques. Surgery can be planned with more precision and post-surgical outcome is better in these cases, and it is very efficient for general surgery on the whole.

Considering the modern techni- cal equipment and high professional standards of radiologists in Georgia, it has developed a name as a regional leader in the Caucasus. Specialists are referring patients from different parts of South Caucasus to Georgian medical centres.

Prof. Fridon Todua is the Presi- dent of the Georgian Association of Radiology.

The Royal College of Radiologists calls for greater investment in diagnostic and interventional training.
Take the European Diploma in Radiology

EDiR
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Next Exams:

Warsaw, Poland: April 16–17
(exclusive for Members of the Polish Medical Society of Radiology)

ESR Learning Centre Barcelona, Spain: June
(International edition, open to all countries)

Malmö, Sweden: September, 8–9
(exclusive for members of the Societies of Radiology in Nordic Countries)

JFR, Paris, France: October
(exclusive for members of the French Society of Radiology)

TURKRAD, Antalya, Turkey: November
(exclusive for members of the Turkish Society or Radiology)

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Are you young and ambitious? Do you want to get a great job without abandoning thoughts of enjoyable hobbies and a family? Are you wondering how to get there while staying sane? Then please read below some great tips from Prof. Birgit Ertl-Wagner who is undoubtedly top of her game as a neuroradiology professor and section chief of MRI at the University of Munich, Germany, but who also manages to stay admirably grounded, having fun with her family!

**PART 2: Work-life balance**

**ECRT: How do you make time for your family and hobbies while keeping up with your career?**

**BEW:** It is really not easy to find time for family and hobbies and at the same time keep on top of your career – and the time is of course always too short. How I wish for 48-hour days! There are a few tricks, however, to avoid completely losing time on the front. I think it is very important to set time apart specifically for family and hobbies, instead of expecting time to just present itself. It is also easier for the children, when they know ahead of time when you will be there for them – and also when you will be gone and will not have time. This saves a lot of disappointment. And when you have set a time, try everything to keep it and avoid being overrun by other obligations. Maybe most importantly, make it quality time. Do something you and your family really enjoy. Don’t fall into the ubiquitous trap that you, for example, start sweeping the floor when you could finally have fun with your children.

**ECRT: Do you think there are any career options that make it easier to cope? Are there particular subspecialties that are less demanding, or work place factors that could help?**

**BEW:** I actually do not think that there are any specific subspecialties or career options that automatically make your work-life balance easier than others. My one piece of advice is that you should always choose what you really want to do. You will only be good at what you are doing, when you are truly interested in it. And maintaining a healthy work-life balance gets a lot easier when you are good at what you are doing and when you are enjoying yourself. So ask yourself what you really want to do (and not what somebody else tells you) – and see how you are doing and make your work-life balance easier.

**ECRT: According to your CV, you have trained in many different centres in Europe as well as the US. How did this influence your career? What is your advice to radiology trainees and young radiologists?**

**BEW:** I think it is important to gather experience in different training centres, both nationally and internationally. It broadens your scope and lets you experience not only different clinic regimes and routines, but also different management styles. My advice to young trainees and radiologists is to look for such experiences rather early in your career. It gets much more difficult to organise when you are more settled and when you have children.

**ECRT: You have published numerous articles and book chapters. How do you manage to fit this in between your work and private life, especially with young children at home? Do you sleep?**

**BEW:** Well, I certainly sleep too little and tend to work quite late into the night, when the children are already asleep. My typical ‘get-done’ time is between 8pm and midnight. I just hope that the few remaining hours of sleep suffice. When the alarm clock rings at 6am, my answer would be ‘no way, that wasn’t enough sleep’, but luckily an hour and a cup of coffee later the world looks different!

**ECRT: Any other hints or tips for staying sane and maintaining a successful career while enjoying a healthy private life?**

**BEW:** Well, to summarise it, stay true to yourself, enjoy what you are doing both professionally and privately, set quality time aside, and recharge your batteries often enough.

Dr. Christiane Nyhsen is consultant radiologist at Sunderland Royal Hospital, UK, and former chairperson of the ESR Radiology Trainees Forum.
LANDSCAPE IN MY MIND

LANDSCAPE PHOTOGRAPHY TODAY: HAMISH FULTON TO ANDREAS GURSKY
AN EXHIBITION AT THE BANK AUSTRIA KUNSTFORUM

Sonja Braas, Flood (The Quiet of Dissolution), 2006
Courtesy Galerie Tanit, München © Sonja Braas
The Bank Austria Kunstforum Wien presents a comprehensive exhibition showing positions in contemporary landscape photography. ‘Landscape in my Mind’ is a mental journey through different imaged articulations of the concept of landscape. The focus will be on contemporary neo-Pictorialist strategies: painterly tableaus in monumental format are placed in contrast to the sober objectivity of conventional black-and-white photos.

Elger Esser, for instance, does not see himself primarily as an artist-photographer, but as a picture-maker and landscape painter, who realises his works using photographic media. A focus of the exhibition is on the landscape as an experiential space documented with the camera. Photographers such as the land-art artist Hamish Fulton or the former Becher pupil Axel Hütte like to think of themselves as wanderers and travellers through the world. Photography has long ceased to be simply an objective medium reproducing reality, but in the digital age has become a means of alienation and manipulation. Andreas Gursky is a master of invisible manipulation by ‘collaging’ diverse photographs of a selected motif in one and the same work – for instance fantastical island groups that might be from a James Bond film – thus creating a new reality. Gursky also plays with the phenomenon of escalated monumentality, of satiation and exaggerated emptiness. Cross-country runners and race cyclists shrink to become busy ant-like colonies in sublime mountain landscapes. Balthasar Burkhard’s black-and-white pictures of mega-cities evoke feelings that are cosmic throughout. The rampantly growing big city is the cultural landscape and living space of twentieth- and twenty-first-century people. In conclusion we float above the world and take to the heavens. Stellar maps as we know them for instance from Thomas Ruff’s constellation pictures dissolve the landscape into gravity-free space. The ‘Mission Landscape’ leads us ultimately to the planet of Mars – the next station in the infinite reaches of space.
WHAT'S ON TODAY IN VIENNA?

Theater & Dance

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

Akademietheater
1030 Vienna, Lainzstraße 1
Phone: +43 1 5444 1145
www.burghauser.at
20:00 Dorian Gray
by Oscar Wilde

Burgtheater
1010 Vienna, Universitätsring 2
Phone: +43 1 5444 1145
www.burghauser.at
20:00 Maria Magdalena
by Friedrich Hebbel

Rahnhof
1010 Vienna, Rabengasse 3
Phone: +43 1 712 82 82
www.rahnhoftheater.com
20:00 Sekundenschlaf
Solo performance
by the Viennese actor and vaudevillian Andreas Vitásek

Schauspielhaus
1090 Vienna, Prützfangasse 19
Phone: +43 1 317 01 01
www.schauspielhaus.at
20:00 Das Gemeindekind
by Anne Habermehl and Gerald Reich

Theater in der Josefstadt
1080 Vienna, Josefstraße 26
Phone: +43 1 42 700 300
www.josefstadt.org
19:30 Liebelei
by Arthur Schnitzler

Vienna's English Theatre
1080 Vienna, Josefsgasse 12
Phone: +43 1 402 12 60 0
www.englishtheatre.at
19:30 Venus in Fur
by David Ives

Concerts & Sounds

Musikverein (Classical Music)
1010 Vienna, Bösendorferstraße 12
www.musikverein.at
19:30 Wiener Symphoniker, conductor Philippe Jordan
Camilla Tilling, soprano
F. Schubert: Symphony No. 6, G. Mahler: Symphony No. 4

Porgy & Bess (Jazz)
1010 Vienna, Ramergasse 11
www.porgy.at
19:00 Ganes ‘Bang Bang Sun’ (Italy)

Arena (Alternative Music)
1010 Vienna, Baumgasse 80
www.arena.at
20:00 TMT – Texta (Austria) & Blumentopf (Germany)
20:00 Salem’s Pot (Sweden) + Monolord (Sweden)

Opera & Musical Theatre

Volksoper
1050 Vienna, Währingerstraße 78
www.volksoper.at
19:30 Carmina Burana/Bolero/Afternoon of a Faun
Balldet

Wiener Staatsoper – Vienna State Opera
1010 Vienna, Opernring 2
www.wiener-staatsoper.at
19:00 Werther
by Jules Massenet, conducted by Frédéric Chaslin
With Ramón Vargas, Ludovic Tézier, Angela Gheorghiu

Raimundtheater
1010 Vienna, Wolfsgasse 18–20
www.musicalvienna.at
19:30 Mamma Mia!
by Benny Andersson & Björn Ulvaeus

Ronacher
1010 Vienna, Seilerstraße 9
www.musicalvienna.at
19:30 Mary Poppins
by Richard M. Sherman & Robert B. Sherman