Welcome to Vienna. Welcome to the flower gardens of radiology. Welcome to ECR 2017.

Welcome to the European Congress of Radiology (ECR), the flagship scientific meeting of the European Society of Radiology (ESR).

With your help, we shall make ECR 2017 a memorable and unparalleled event, a supreme achievement in the annals of European radiology, with the support of all national, subspecialty and allied sciences societies.

For the organisation of ECR 2017, I was lucky to get off to a flying start, surfing on a wave of positive energy, generated by a string of successful meetings. Our congress boasts a long tradition of delivering scientific and educational excellence. ECR can be truly proud of an unmatched track record and look to the future with confidence. The growing impact of our society (ESR) and our congress (ECR) is internationally recognised, in Europe and around the globe, and our strong commitment to delivering excellence has earned us a reputation for quality and innovation. At ECR, we continue to explore the world of radiology with determination, confidence and ambition, and we do so with style and elegance, in a uniquely European tradition.

As President of this meeting, it is my pleasure to announce that ECR 2017 offers a very ambitious and challenging agenda. I invite you to explore the fascinating world of medical imaging and image-guided interventions, and to discover the exciting opportunities that lie ahead. The ECR attracts the best and the brightest, from students to professors, and offers them the ultimate in education and science, as well as the opportunity to build a network of professional relationships.

But there is more… ECR 2017 will have a unique twist compared with previous editions, because our meeting is specifically dedicated to YOUTH, die Jugend, de jeugd, la jeunesse, la giovinezza, la juventud, молодежь. During ECR 2017, I extend an open invitation to all and sundry to take a stroll in ‘the flower gardens of radiology’. Radiology is a beautiful, fragrant, sweet-smelling flower garden, and this is the message I want to bring to young radiologists, throughout Europe and across the globe. Our scientific programme for ECR 2017 reflects this focus on a new generation of radiologists, who demand high-quality education, delivered in an efficient, understandable, and customer-friendly way. To accommodate these young colleagues, there will be more interactive sessions, a more prominent role for social media, and we shall have topics that are of interest to young people, because they are the future of our profession. The broad consensus among the members of the Programme Planning Committee demonstrates our shared ambition for ECR 2017 to bring this message of hope to a new generation of radiologists.

As President of ECR 2017, I am extremely happy and proud that this new generation in radiology has heeded my call. We received an all-time record of submitted abstracts, which proves that this army of young, smart, ambitious, driven young professionals have entered our garden, ready and willing to plant new seeds and prepare new flowerbeds. Abstract submission for ECR 2017 closed with a record 6,757 abstracts submitted, representing a 22.8% increase on the previous year’s figure. The new record includes abstracts submitted for both scientific papers and oral presentations (+18%), and electronic posters for the ECR’s EPOS™ exhibition (+27%). The boost in submissions for EPOS™ reflects the overwhelming success of the Voice of EPOS sessions, introduced at ECR 2016, which give poster authors the opportunity to present their work in person at the congress.
In recognition of her major achievements in neuroimaging and advancement of the field, Professor Maria de Fátima Vasco Aragão from Recife, Pernambuco, Brazil, will present the Guest Lecture ‘Breaking News from Latin America: How to Recognise Zika Virus infections on imaging studies’ at ECR 2017.

Maria de Fátima Vasco Aragão is professor of radiology at the Universidade Federal de Pernambuco, Brazil, and Scientific Director of the Multimodal Diagnostic Centre in Recife, Brazil. She is a founding member of the Diagnostika Endoscopy and Radiology Clinic in Recife.

Professor Vasco Aragão received her medical degree from Pernambuco Federal University. She later became chief of the Radiology Department at Recife University Hospital in 1992 and chief of the Radiology Unit of the Diagnostika Endoscopy and Radiology Clinic in 2004.

Professor Vasco Aragão has received her degree from Pernambuco Federal University. She later became chief of the Radiology Department at Recife University Hospital in 1992 and chief of the Radiology Unit of the Diagnostika Endoscopy and Radiology Clinic in 2004. She was appointed head of the Neuroimaging and Interventional Radiology Unit at the Federal University of Pernambuco in 1997 and head of the Department of Radiology at the University of Recife in 2010. She is a founding member of the Brazilian Society of Neuroradiology.

She is an active member of the Brazilian Society of Neuroradiology. She has been involved in several national and international congresses. She is an active member of the International Society of Magnetic Resonance in Medicine (ISMRM) and the Brazilian Society of Radiology (SBR).

Professor Vasco Aragão is recognized for her contributions to the field of radiology, particularly in the area of neuroradiology. She has been involved in several national and international congresses. She has authored numerous publications in peer-reviewed journals and has contributed to the development of new diagnostic and therapeutic techniques in neuroradiology.

In her research, Professor Vasco Aragão focuses on the use of advanced imaging techniques to improve the diagnosis and treatment of neurological disorders. Her work has contributed to the advancement of neuroradiology and has had a significant impact on the care of patients with neurological conditions.

In recognition of her contributions to the field of radiology, Professor Maria de Fátima Vasco Aragão will present the Guest Lecture ‘Breaking News from Latin America: How to Recognise Zika Virus infections on imaging studies’ at ECR 2017.

The lecture will highlight the latest developments in the imaging of Zika virus infections, including the use of advanced imaging techniques to improve the diagnosis and treatment of neurological disorders. The lecture will also discuss the role of radiology in the management of patients with neurological conditions, particularly in the context of emerging infectious diseases such as Zika virus.

Professor Vasco Aragão is a leader in the field of neuroradiology and has contributed significantly to the advancement of neuroradiology and the care of patients with neurological conditions. Her work has had a significant impact on the field and has contributed to the development of new diagnostic and therapeutic techniques.

In conclusion, Professor Maria de Fátima Vasco Aragão’s presentation at ECR 2017 will provide an opportunity for radiologists to learn about the latest developments in the imaging of Zika virus infections and the role of radiology in the management of patients with neurological conditions. Her lecture will highlight the importance of interdisciplinary collaborations in the care of patients with neurological disorders and the need for ongoing research and innovation in the field of radiology.
with cerebral tumours (astrocytoma). I feel obliged to participate and contribute to the development of knowledge for the further understanding of this new tragic sickness that has appeared in Brazil, with the greatest number of cases being reported in my state. So I have made time to describe the findings jointly with other doctors. We are currently concentrating our efforts to help to describe the congenital syndrome of the Zika virus spectrum," she said.

Prof. Vasco Aragão served as president of the Pernambuco Radiology Society from 2014 to 2016, being recently re-elected for the 2016–2018 term. In her opinion, radiology is increasingly central to healthcare, but there are dangers looming for the profession.

"Since the discovery of X-rays by Wilhelm Conrad Röntgen in 1895, radiology has become essential for medical practice. In spite of this progress, the doctor-patient relationship is more distant than in other clinical and surgical specialties, and this distancing is increasing. The radiologist has less time to give attention to or talk to patients, since the number of examinations has risen sharply with the advent of increasingly rapid machines. There is tremendous pressure on radiologists to perform further examinations so as to get an adequate financial return for the institutions and doctors themselves, since the imaging studies have become much cheaper and the machines much more expensive. Over and above this, there is the necessity for doctors to constantly update their knowledge and at times assume administrative functions. All these factors lead doctors to distance themselves from their patients; reducing the time they need to study a specific case at greater depth and review previous examinations. Worst of all, this way of working is being passed on to students and residents as something normal and correct in our specialty, which it is not. The time has come to review and reflect on the true meaning and values of what it is to be a doctor and a radiologist," she said.

Prof. Vasco Aragão hopes to tackle these issues and share her experiences with her colleagues during ECR 2017, which will be her second visit to the Vienna meeting. "I am very honoured at having worked for many years in the world of radiology and having been acknowledged by the ESR. Unfortunately we are talking about this tragic sickness that is spreading throughout the world. I sincerely hope that specific and efficient vaccines and medication will be developed soon. The world has already gone through so many epidemics and problems that I have confidence in the future and that all the current challenges to health, ethics, politics, diplomacy, culture, economics, and education will one day be overcome. I hope that we are able to witness this change. May the ECR be a solid step in that direction.

### Guest Lecture

**Wednesday, March 1, 12:15–12:45, Room B**

**Breaking News from Latin America**

How to recognise Zika virus infections on imaging studies

Maria de Fátima Vasco Aragão; Recife, PE/BR

### Distinguished gastrointestinal expert to receive Honorary Membership during today’s Opening Ceremony

In recognition of his contribution to the advancement of liver imaging and his commitment to research and education, Professor Richard L. Baron from Chicago, United States, will receive ESR Honorary Membership at ECR 2017.

Richard L. Baron is professor and chair emeritus of radiology at the University of Chicago, where he also previously served as dean for clinical practice. He is the immediate past president of the Radiological Society of North America (RSNA).

Prof. Baron completed his undergraduate education at Yale University with a cum laude award and graduated from Washington University (WU), St. Louis School of Medicine. He completed his training in internal medicine at Yale University and his residency in radiology at the Mallinckrodt Institute of Radiology at WU. He later served as chairman of the department of radiology at the University of Pittsburgh.

"I always enjoyed solving puzzles as a child and adult, and radiology is perhaps the medical field that most resembles puzzle-solving activities," explained Baron. "I enjoy all the aspects of radiology and healthcare delivery; but best of all to me are the personal relationships. Interacting with patients and seeing how I can impact their healthcare would hit the top of the list, but close behind would be enjoying the daily interactions radiologists achieve with so many of our referring physicians.

His research interests lie in liver and biliary imaging, and he has authored more than 350 publications, 28 book chapters and one book. He has served as a visiting professor at more than 50 institutions, and has delivered numerous named lectures, including the Wilhelm Conrad Röntgen Lecture at ECR 2011.

Prof. Baron has also served as associate editor for Radiology and Liver Transplantation, and served in leadership roles for many radiology societies.

He and his generation were the first physicians to work with modalities like CT, which at the time required extensive research. Later on he too took roles in education, and has now focused his attention on patient care and teaching the new generation of radiologists.

"The exciting advances in the field of radiology have afforded me many opportunities to move into different directions in medical imaging. In my early years, when body CT was just beginning, clinical research was a large part of my professional interests. As the years passed I enjoyed opportunities to engage in leadership activities and help shape healthcare locally and nationally, as well as bring international radiologists together to advance the field. At the current time I remain active in patient care and education but have passed the torch on to the next generation of radiologists," said Baron.

He identifies the challenges of the profession in finding the balance between value and quality, and in the efforts radiologists will have to make to communicate in real-time with each other and other specialties. "In the United States our governmental health agencies are increasingly measuring our outputs and reimbursable activities on a value-based basis rather than a volume activity basis. This will be very challenging for radiologists to adapt. In a large part of this challenge will be how value and quality are defined and measured as these will be in light of the experiences of patients, third party payers, and referring clinicians. While technological advances have been a boon to the radiology community, they have also created barriers and problems for us in isolating radiologists from each other and from the general medical community. It will take creativity and effort for radiologists to increase meaningful real-time discussions among each other and with referring clinicians to maintain important informal education, and to keep the workday vibrant," he said.

Prof. Baron has received the Walter Cannon Medal from the Society of Abdominal Radiology, the Gold Medal of the Asian Oceeanian Society of Radiology, and honorary fellowship of the European Society of Abdominal and Gastrointestinal Radiology.

He has become a regular guest at the ECR since 1995, a first visit he vividly remembers.

“The airline had lost my luggage and I never received it throughout the entire meeting requiring me to become quite familiar with clothing shops in Vienna! But the best memory is of some international friendships I made there that have grown over the past two decades. The best aspects of the ECR are the international interactions and collegial relationships that can be built. In our home countries we all hear wonderful scientific and educational lectures, but to share information and learn new approaches with very different cultural experiences is truly the best opportunity." Prof. Baron said.

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**Opening Ceremony**

**Wednesday, March 1, 17:45–18:00, Room A**

**Welcome Address**

Paul M. Parizel; Antwerp/BE

ESR President

**Presentation of ESR Honorary Membership**

Richard L. Baron; Chicago, IL/US

James A. Brink; Boston, MA/US

Gloria Soto Giordani; Santiago/CL

**Presentation of ESR Gold Medals**

Jose Ignacio Bilbao; Pamplona/ES

Guy Frja; Paris/FR

Stephen J. Golding; Oxford/UK

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By Mélisande Rouger

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In recognition of his outstanding achievements in imaging and radiation protection, Professor James A. Brink from Boston, MA, United States, will be presented with ESR Honorary Membership at ECR 2017.

James A. Brink is radiologist-in-chief at Massachusetts General Hospital (MGH), Boston, and the Juan M. Taveras professor of radiology at Harvard Medical School. Prof. Brink received his medical degree from Indiana University and completed his radiology residency and fellowship at MGH in 1990.

Before opting for a career in medicine, he envisioned himself as an engineer and received a Bachelor of Science degree in electrical engineering from Purdue University, Indiana. His initial interest has enabled him to appreciate radiology on an additional level.

"I enjoy that radiology sits at the intersection of technical innovation and medical diagnosis. I like the challenge of leveraging imaging technology to diagnose and treat disease with as little invasiveness as possible. Much as a sleuth solves mysteries, radiologists solve diagnostic dilemmas on a daily basis," he said.

He joined the faculty at the Mallinckrodt Institute of Radiology, Washington University School of Medicine in St. Louis, where he rose to the rank of associate professor, and he served as chair of the department of diagnostic radiology at Yale University from 2003 to 2006 before returning to MGH.

His work focuses on utilization and management of imaging resources, and monitoring and control of medical radiation exposure. Prof. Brink currently serves as scientific vice-president for radiation protection in medicine on the National Council on Radiation Protection and Measurements and vice-chair of the medical and radiation studies board for the National Academy of Sciences, Engineering and Medicine. He is also past-president of the American Roentgen Ray Society and currently serves as chair of the board of directors for the American College of Radiology.

"The emerging field of data science and machine learning, and their influence in healthcare, have recently caught my attention. "I have a long standing interest in issues related to radiation protection and the potential of artificial intelligence to greatly impact medicine at large, and it is incumbent upon us to stay at the forefront of these advancements for the benefit of our patients and our profession. As Chair of the Department of Radiology at MGH, my role in these investigations is more that of executive sponsor than primary investigator," he said.

He expects personalized medicine to significantly change radiology practice, and believes artificial intelligence will play an increasing role in helping doctors focus on patient care.

"The end point won’t change - we will still strive for excellence in patient care. However, how we get there will change. Care will need to be immediate, convenient, personal and affordable. We need to shift from a disease-focused mindset to a patient-focused mindset. Mrs. Jones is no longer a cancer patient, she is a patient with cancer. Where we need to focus is increased personalization. While we do this in specialised circumstances, we need to expand this with great emphasis on phenotype characterisation to keep pace with targeted, personalisation therapies. Here, machine learning and artificial intelligence will enable us to automate or semi-automate our tasks to meet these needs on a broad scale," he said.

Prof. Brink has written more than 10 textbooks and given more than 70 presentations all over the world. "Home of the ECR, has become a regular destination for him and he cannot remember the year he first attended the congress. "I think it was when I was still in training, I recall presenting a paper on gallstone lithotripsy, which, given how long ago this procedure fell out of favour, highlights how long it has been! I recall being impressed with the multinational and multicultural exchange of ideas, independent of political and national barriers. These are attributes that continue to impress me each time I attend the ECR," he said.

Honorary Membership awarded to leading paediatric radiologist from Chile

In recognition of her contribution to paediatric imaging and her involvement in the advancement of the field, especially in Latin America, Professor Gloria Soto Giordani from Santiago, Chile, will be awarded ESR Honorary Membership at ECR 2017.

Prof. Gloria Soto Giordani is a paediatric radiologist at the German Hospital in Santiago, having previously headed the department of radiology of Roberto del Rio Children’s Hospital in the same city.

She graduated with the best graduate award from the Pontifici Catholic University of Chile and completed her residency in radiology at Roberto del Rio Children’s Hospital. Prof. Soto has always wanted to work with children but did not initially consider radiology as a career path.

"When I graduated from medical school I did a paediatric residency. I wanted to be a paediatrician! However, during my training I had the opportunity to learn about ultrasound, at that time an emerging and very promising imaging modality for children. This was my first contact with radiology. After completing my radiology residency, I had the opportunity to do a year of training in paediatric ultrasound at the Hospital for Sick Children, in Toronto, where I not only learned about paediatric radiology but also met great mentors, made life-long friends and experienced how a high level paediatric radiology department worked," she said.

Back in Chile, Prof. Soto played an active role in the implementation of paediatric ultrasound in her country. Her main fields of interest are whole-body imaging, paediatric ultrasound and neonatal MRI.

She has witnessed the gigantic leaps made in imaging technology and the shifting role of the specialist in healthcare over the years.

"I have assisted in the incorporation of many diagnostic imaging advances and in the implementation of a complete new way of organizing day-to-day radiological work. I have seen how the roles of diagnostic imaging and radiologists have changed to what they are today: a fundamental part of medicine and healthcare. These continuous professional challenges have made my life as a radiologist a great journey, which I have fully enjoyed," she said.

Prof. Soto took on the role of president of the World Federation of Pediatric Imaging (WFPPI) in 2016. "This position offers me the challenge of improving access and quality of paediatric imaging worldwide, with a special emphasis in low resource settings," she said.

She has also served as a consultant to the World Health Organization, filling in as an invited speaker during the 68th World Health Assembly side event ‘Imaging for Saving Kids – the Inside Story about Patient Safety in Paediatric Radiology’.

Prof. Soto has also served as president of the Chilean Society of Radiology, the Latin American Society of Paediatric Radiology and the Inter American College of Radiology where she is currently Director of Education. She sits on the executive committee of Latinadex, an initiative to promote imaging safety in the region.

She believes her engagement with international radiological organisations has broadened her vision of radiological practice from a local to a more global perspective.
The concept of mental illness as illustrated by neuroimaging is the theme of today’s eagerly awaited session on how imaging in obsessive compulsive disorder (OCD) and Tourette’s syndrome (TS) is shedding light on disease understanding and potential avenues for therapy for these life-changing illnesses.

BY BECKY MCCALL

London team prepares to show how imaging contributes to patient outcome in mental health disorders

"It has given me the opportunity to work and try to improve the level of radiological practice not only in Latin American countries but also in Latin America," she said.

Prof. Soto has visited the ECR regularly since 2010. "I enjoy the friendly atmosphere of the congress, with many opportunities to share with colleagues and make new friends. I gave a special mention to the interesting side events that take place during the meeting, such as the International Summit, in which I have had twice the honour of participating in representation of Latin America," she said.

Her best ECR memory is the "ESR meets Chile' session in 2013, an exciting and very rewarding experience that gave us the opportunity to share with the audience radiological research that is done in Chile, and to bring a little bit of our culture to Vienna, including delivering a short talk about Chilean poets and wine."

Multidisciplinary Session

Wednesday, March 1, 16:00-17:30, Room E2
MS 4 Neuroimaging and mental health disorders

Chairman’s introduction
T. A. Yousry; London/UK

Focusing on obsessive compulsive disorder (OCD) networks with neuroimaging
E. Joyce; London/UK

"Looking at movement and mind: neuroimaging in Tourette’s and obsessive compulsive disorder (OCD) critical role of neuroimaging"
L. Zrinzo; London/UK

Multidisciplinary case presentation and discussion

Coronal MS image shows the position of bilateral electrodes targeting the ventral anterior capsule and ventral striatum in a patient undergoing deep brain stimulation for obsessive compulsive disorder.

Provided by Ludovic Zrinzo.
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Radiographers’ sessions to come strength to strength at ECR 2017

ECR 2017 will feature the largest radiographers’ programme to date at the European Congress of Radiology, and is now recognised as the official annual scientific meeting in medical imaging for radiographers by both the European Federation of Radiographer Societies (EFRS) and the European Society of Radiology (ESR).

In fact the number of sessions specifically for radiographers has been increased to 25, meaning that there are now dedicated radiographer sessions for the duration of the conference, covering topics of interest and relevance to all. With most radiographer sessions taking place in Room K, these sessions will this year offer the additional benefit of being simultaneously translated into German, Italian, Polish, and Spanish, offering attendees the ability to listen to presentations in their choice of language and hopefully improving engagement, participation and enjoyment for everyone.

The EFRS, who are the umbrella organisation representing more than 100,000 radiographers and more than 8,000 student radiographers through 31 national societies and 97 educational institutions from across 33 countries, will also host a Radiographers Lounge outside Room K for the duration of ECR 2017. Also new for ECR 2017 is the exciting addition, for the first time, of a separate Rising Star session dedicated to radiography students. This is a fantastic opportunity to showcase the talents of radiographers in training across Europe and more importantly to disseminate the results of the important research projects they are involved in. So we hope you will show your support for these stars of tomorrow and attend these sessions, starting on Thursday.

Of particular interest to the younger members of the radiography profession will be the EFRS Radiographers’ Basic Session (Saturday, March 4, 10:00–11:30, Room L6), another new session which looks at the various professional roles available for radiographers, including within management, academia and industry. The session will be useful for those with exposure to roles beyond the typical clinical event.

Another motivating addition in 2017 is a dedicated EFRS Workshop on Authorship and Reviewing (Saturday, March 4, 16:00–17:30, Room K), in association with Radiography (Owen), the official journal of the EFRS, which aims to encourage radiographers, and indeed any other novice authors or reviewers attending the ECR, to publish their own work or to see the evidence base for the profession can be improved, but also to familiarise attendees with the peer-review process for publication, which may seem daunting at first glance, but is eminently achievable and rewarding for those who do complete it. Of particular interest will be the tips and advice for success as well as the stimulating panel discussion on the end, where knowledge from authors, reviewers and publishers will be shared.

This year the EFRS will once again host its EFRS Meeti session for radiographers, in conjunction with representatives of the Association der Professoren on Alten Medizinische Klinik (APfM) and the Vereniging Medisch Beeldvormers (VMB) during the EFRS meets Belgium Session (Friday, March 3, 14:00–15:30, Room K). We look forward to hearing about the radiography profession in Belgium, but also some patient safety initiatives and radiation protection practices throughout Belgium, which we may all learn from.

There are two Professional Challenges sessions in the radiographers’ programme this year, both taking place on Saturday and both of which look at the importance of teamwork in medical imaging and interventional radiology: more than the sum of their parts (Saturday, March 4, 10:30–12:00, Room K) looks in particular at challenges and responsibilities facing the professions and how they can work together to improve outcomes, while A team approach: ensuring patient safety and care (Saturday, March 4, 16:00–17:30, Room K) will explore topics such as reporting, the interventional room and patient safety where radiographers, radiologists and medical physicists can work together to maximise patient benefits.

This year’s Special Focus session, which is also a Eurolde Imaging session, will centre on How radiographers enhance paediatric imaging (Sunday, March 5, 08:30–10:00, Room K). Some very pertinent topics will be presented, including the very topical and common question of informed consent and whether it is actually possible to obtain for paediatric patients, given the variety of ages and levels of maturity encountered. Dose reduction steps will likewise be covered, as well as what promises to be a stimulating presentation on personality traits and how these can be used to maximise cooperation from patients.

There are five Refresher Courses for radiographers, covering a diverse range of topics from Wednesday to Friday; they include MRI technology and techniques (Wednesday, March 1, 08:30–10:00, Room K), CT imaging: the role of the radiologist and technological developments (Thursday, March 2, 08:30–10:00, Room K), Modern imaging of major trauma (Wednesday, March 1, 10:00–17:30, Room K), CT imaging: the role of the radiologist and technological developments (Thursday, March 1, 16:00–17:30, Room K) and Patient safety: professional and organisational accountability of the radiographer (Friday, March 3, 08:30–10:00, Room K). Remember, there are a range of other Refresher Courses on offer throughout the ECR covering many areas of relevance for radiographers, which may also be of interest.

As usual there are a large number of scientific sessions covering a variety of topics over the five days from the modality-specific areas such as CT MRI and breast imaging to dose optimisation, education and professional issues, as well as more general topics. No doubt there is something for everyone. Likewise, there are plenty of other sessions throughout the congress with radiographer involvement or of interest to radiographers, in particular during the Eurolde Imaging sessions, which will be of great interest to all, looking at topics such as Dose reduction tips and tricks (RC 113), Clinical diagnostic reference levels (EU 0, Focus on appropriate image quality: what we have to know (EU 2), European CT dose repository (EU4) and Improving efficiency in radiology departments (FIR Session 1). Finally worth mentioning is the Proc & Cons Session (Friday, March 3, 10:00–11:30, Room K) which will look at the sometimes controversial topic of Providing an effective ultrasound service how and why? which will look at all sides of the debate on whether radiologists or radiographers should lead the provision of ultrasound services. On behalf of the ECR 2017 Radiographers Scientific Subcommittee and the EFRS, we hope you have had an enjoyable and rewarding meet. Don’t forget to pick up the special Radiographers Programme at the congress bags counter in the entrance hall.

Shane Foley PhD is EFRS Radiography Programme Coordinator at the University College Dublin, Ireland, and member of the Radiographers Scientific Subcommittee for ECR 2017.

ECR TODAY | WEDNESDAY, MARCH 1, 2017

HIGHLIGHTS 7

REFRIGHER COURSES

Wednesday, March 1, 08:30–10:00, Room K
RC 114 MRI technology and techniques
Moderator: M. Syngarou, Athens/GR
A. Mazi, Haidar/MT

A. Recent developments in structural and quantitative spinal cord imaging at 3T
M.C. Vannayen, London/UK
B. BF-related heating in clinical MRI
T. Ossman, Lund/SK
C. The benefits of diffusion imaging
J. Castillo, Maida/MT

Discussion and questions: How is patient care affected by MRI technology and techniques?

Wednesday, March 1, 16:00–17:30, Room K
RC 144 Modern imaging of major trauma
Moderator: P.H. Hogg, Saltford/UK
L. van den Hauwe, Antwerp/BE

A. Use of MSCT in disaster victim identification
J. Knol, Maarssen/NL
B. Conventional radiography in major trauma: role, technique modification and impact on interpretation
M. Hardy, Bradford/UK
C. Applications of ultrasound in the evaluation of major trauma
T. Helsby, Dublin/IE

Discussion and questions: Imaging of major trauma – what are the challenges
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Age assessments based on bone maturation raise complex scientific and ethical issues

Mass migration triggered by the unfolding crisis in Syria has heightened interest in radiology’s role in the protection of children. For young unaccompanied persons arriving in Europe without documentation, imaging can be used to determine age and as a result, their refugee status, having a direct impact on the aid they receive and where they can live.

At the other end of the spectrum of its uses, bone assessment is also a means to gauge the skeletal age of football players in tournaments such as the under-17 and under-20 world cups. This need arises when personal documents are lacking for players who come from countries with no official birth registration systems and when there is a suspicion that an older player is being included in a younger age category. This misclassification entails not only physical risk of exposing weaker players to injuries caused by older players but also under- mines the system of recognition or economic reward, which may be considerable in some cases,” said Dr. Sandra Diaz Ruiz, PhD, paediatric radiologist at the Astrid Lindgren Children’s Hospital, part of the Karolinska University Hospital, Stockholm.

Part of the appeal of MRI in young footballers is its lack of ionising radiation, and the modality has been used in wrist assessments by the International Federation of Association Football (FIFA) since 2003. MRI is not currently used to assess bone age in routine practice, but Diaz believes that it could be standardised to become an option both in clinical diagnosis of special syndromes and in forensic work, the latter being the main focus of her presentation today. As an adjunct to other methods, MRI yields accurate results to specific questions, but there are pitfalls, and problems can arise from the absence of standards to ensure that the age established by the scientific evidence is correct. Moreover, the fact that research predominantly pertains to males and Caucasian means that it cannot be used as a general reference.

“There are not enough studies that represent the entire popula- tion. Instead small studies aim to answer specific questions,” she told ECR Today. “Furthermore, some involve several grade scales of the same body part examined with different MR field strengths. The interpretation of these grade scales may be confusing to inexpe- rienced radiologists.”

She pointed out that, by other studies, which found that because MRI is a lengthy process and sensitive to body movement, this is a sig- nificant limitation of its use. Children. Other factors in bone age esti- mation remain controversial: gender, ethnicity, nutrition, physical activity, geographical location, other socioeconomic factors, and exposure to the sun as an acceler- ation factor in maturation should all be considered. Widening study cohorts to include a range of different groups of subjects could also be looked at, and would constitute a way of reaching consensus on proto- cols and grade scales. These stud- ies must be wide, multicentre, and guarantee the inclusion of these different factors, according to Diaz. Beyond determining age in foot- ball and forensic medicine, a key application of bone age assess- ment is the evaluation of growth and puberty disorders. Dr. Fabrice Dedouit, PhD, head of the Imaging and Forensic Anthropology Unit of the University Center of Legal Medicine, Lausanne-Geneva, Switzerland, thinks such evaluation is fun- damental to determining patient management and choice of therapy. “In patient follow-up it is critical to continue using the same method and not change to a different means of assessment,” he said.

The two most widely used sys- tems are the Greulich & Pyle Atlas (GP) and the Tanner-Whitehouse (TW) methods. Published in 1959, GP is the most widely used. It is based on hand x-rays from 1000 Ameri- cans of northern European descent living in Ohio, aged between 0 years and 18 years, which were taken from the Brusch Foundation longi- tudinal study between 1940 and 1952 and compiled into an atlas. To help determine bone age, plain x-rays of the left hand and wrist can be compared with reference atlas images for each age category and for both sexes. Evaluation is based on the exist- ence and morphology of the epiphyses of the metacarpals and the phalanges and their fusion, the car- pal bones, and the inferior epiphys- eal saw of the ulna and radius. While it is simple, with inter- and intra-observer differences, crit- ics state that the method is based on an old study and is not representa- tive of modern, multi-ethnic, taller, and heavier populations from vari-
New tools for radiologists: from liquid biopsy to artificial intelligence

Liquid biopsies, deep learning and biomarkers, and novelties in molecular imaging will all come under intense scrutiny on the opening day of ECR 2017 during a professional challenges session on rapidly emerging technologies.

“...my whole message to radiologists is that liquid biopsy is complementary to the imaging evaluation. It provides another layer of information to tailor treatment to patients,” said Prof. Michael Ignatiadis, from the Department of Medical Oncology at the Jules Bordet Institute in Brussels.

Liquid biopsy, unlike traditional biopsy, uses a simple blood draw. This means it is minimally invasive and can be repeated multiple times. Combined with radiology, it can be used to monitor how the tumour molecular landscape varies with response to treatment.

Already liquid biopsies are helping clinicians make treatment decisions in metastatic cancer. Ignatiadis told ECR Today. On June 1, 2016, the first liquid biopsy test was approved by the U.S. Food and Drug Administration (FDA) to identify patients with metastatic non-small cell lung cancer (NSCLC) who are candidates for adjuvant chemotherapy.

“...This is a new model for drug development in breast cancer,” he explained. “In the future, as the technology evolves, I believe that NGS approaches will be used more often in the clinic for the detection and characterisation of ctDNA.”

Detecting circulating tumour cells (CTC) can identify cancer patients at risk of relapse – before the growing tumour is visible with imaging. In the Treat CTC clinical trial, Ignatiadis and his co-authors used liquid biopsy to identify breast cancer patients who had completed surgery and adjuvant chemotherapy but still had circulating tumour cells.

“This is a new model for drug development in breast cancer,” he noted. “If we can demonstrate that a drug can clear CTC or ctDNA from the blood, this might eventually cure more women. You treat the disease much earlier. You also speed up drug development because you don’t have to wait for a relapse.”

Speaking in the same session, Dr. Angel Alberich-Bayarri from the Biomedical Imaging Research Group at La Fe Polytechnic and University Hospital in Valencia, Spain, plans to discuss some of the limitations of artificial intelligence (AI) in radiology.

“...AI, like deep learning, shouldn’t alarm radiologists,” he commented. “They are tools to help radiologists work faster and more safely. They are tools to help radiologists work faster and more safely. They are tools to help radiologists work faster and more safely.”

Deep learning uses computer algorithms to select and extract features from medical images, but a limitation is that it needs a huge amount of data to give a similar performance to people. It requires millions of scans to learn how to characterise a particular disease.

A solution is to give annotated features to the algorithm rather than let it extract features from the images, reducing the number of scans needed, according to Alberich-Bayarri. He intends to present an example – an algorithm trained with 4,000 images – designed to identify the main findings on x-rays and CT scans.

Another important aspect is the performance of neural networks. He supports a new kind of network – a generative adversarial network (GAN) – that promises to improve deep learning by giving better performance with less training, and fewer images needed.

GAN uses two competing neural networks. One takes random data as input and generates sample images. The other receives generated images and the sample images, and must discriminate between the two sources. The two networks are trained simultaneously and – in theory – compete to make the generated images indistinguishable from the real images.

Finally, Alberich-Bayarri will discuss how different manufacturers calculate imaging biomarkers, quantifiable biological indicators of disease, in different ways. There are two major organisations seeking to establish a consensus: the European Imaging Biomarkers Alliance (EIBALL) and the Quantitative Imaging Biomarkers Alliance (QIBA).
In today’s session, experts will provide an insight into image-guided interventions in oncology with a particular focus on illustrating the importance of quality assurance in image-guided oncological interventions and their effect on treatment outcomes.

In recent years, IR has played a vital role in the field of oncology, and alongside medical, surgical and radiation oncology, constitutes a key pillar in cancer care. Vascular and non-vascular procedures such as transarterial chemoembolisation, radiofrequency ablation (RFA), microwave ablation, radioembolisation, cryoablation and high-intensity focused ultrasound (HIFU) are delivered locally, minimise damage to nearby tissue and avoid the systemic side effects of chemotherapy.

For the interventional radiologist providing oncologic therapies it is important to understand the rapidly changing field of oncology and to have a broad knowledge of oncologic diagnoses and available therapies to treat them. Radiologists providing image-guided interventions in oncology have an outstanding understanding of imaging as well as a diversity of interventional skills. However, they lack formal training in oncology and an understanding of chemotherapy and radiotherapy, according to Prof. Andy Adam from the Department of Radiology at Guy’s and St. Thomas’ Hospital in London.

Insufficient knowledge of medical, surgical and radiation oncology and the up-to-date practices to perform as a clinician are currently among others, the biggest challenges for interventional radiologists working in the field of cancer care. Practising clinicians makes it easier for the interventional radiologist to prepare the patient appropriately to obtain true informed consent and to ensure adequate follow up. It is very important to consider the patient and not the image; he emphasised, adding that interventional radiologists practising in this field need to take primary clinical responsibility for their own patients before and after a procedure, as well as during it.

According to Adam, this is the only way to ensure that interventional radiological procedures are put in perspective in relation to other potential methods of treatment, that complications are treated effectively and promptly and that recurrent or residual tumours are detected and re-treated appropriately. Furthermore, he sees a problem in the lack of sub-specialisation.

“It is a disadvantage when communicating with physicians of other medical disciplines. The interventional oncologist should understand the disease and be familiar with treatment alternatives other than those offered by interventional radiology. Sub-specialisation in interventional oncology is likely to increase and has substantial advantages, as it provides a clear path for referrals and makes it easier for interventional oncologists to participate fully in multidisciplinary meetings,” said Adam.

In his presentation, Adam plans to highlight the importance of clinical practice in image-guided interventions in oncology and to outline the related curriculum that is being developed. “The curriculum will focus on the basics of the biology and physiology of cancer and the essentials of medical, surgical and radiation oncology as well as on the advanced understanding of interventional radiological procedures employed in the treatment of cancer patients,” said Adam.

Following Adam’s presentation, Dr. Lieberh Renny, from the Division of Oncology at the Royal Brunei and Women’s Hospital in Australia, will discuss the importance of quality in image-guided interventions in oncology and the content of practice standards, which have been developed by the Cardiovascular and Interventional Radiological Society of Europe (CIRSE) for that purpose. The standards, which have been broadly divided into three areas, including facility management, treatment planning and delivery, will also summarise the main developments in molecular imaging.

Philipp Pereira, from the Clinic of Radiology Minimally Invasive Therapies and Nuclear Medicine at SLK-Klinikum Heilbronn, Germany, on the other hand, will look at a different angle in his talk. He will specifically outline the evidence base for image-guided interventions in oncology as well as major current trials and registries. “High-quality guidelines are necessary for a structured knowledge transfer. Evidence-based guidelines serve as a basis for the optimisation of disease management programmes and for the definition of quality indicators, which are being used for the certification process of comprehensive cancer centres,” he said, emphasising that evidence-based guidelines and standard operation procedures are an important tool for the medical community in general but especially for oncology, a discipline for which multidisciplinarity and combined therapies are essential for treatment success.

“Nevertheless, it is important to note that apart from hepatocellular carcinoma and more recently for colorectal cancer, international recommendations of expert societies do not seem to recognise the real value of interventional oncology due to many reasons. The expertise for these treatments is still limited; only a few hospitals have radiology departments that can offer the entire spectrum of interventional oncology that is necessary for them to be dependable partners for oncologists, surgeons, hepatologists, urologists or radiation therapists. Furthermore, there is still a relatively low level of evidence of clinical trials within interventional oncology. A lot of international studies provide levels of evidence that remain lower than those usually encountered in oncology. Additionally in some European countries, a certain level of competition between medical disciplines restricts the diffusion and the establishment of interventional treatments in standard algorithms. Finally, performing large clinical studies remains challenging without the support of large pharmaceutical companies,” explained Pereira.

Also in this session, Prof. Eric de Kervelo, from the Department of Radiology at the Saint Louis Hospital in Paris, will provide an update on how molecular imaging and image fusion are shaping oncology and will also summarise the main developments in molecular imaging.

Case No 1: A) Colorectal liver metastasis before CT-guided microwave ablation. Case No 1: B) Colorectal liver metastasis, 3D-positioning of the microwave antenna. Case No 1: C) Colorectal liver metastasis, first control at follow-up with MR imaging showing a complete necrosis with granulomatous rim.


Special Focus Session

Wednesday, March 1, 16:00–17:30, Room F2

1SF An Image-guided interventions in oncology: the pieces of the jigsaw

• Chairman’s introduction
  J.I. Bilbao, Pamplona/ES

• How molecular imaging and image fusion are shaping oncology
  E. de Kervelo, Paris/FR

• Registrars, trials and the evidence base
  PL. Pereira, Heilbronn/DE

• Oncology: what matters and it how to do it
  A. Adam, London/UK

• Quality assurance: an essential development
  L.M. Kerviler, Women’s Hospital in Australia

• Panel discussion: What will be the future of image-guided interventions in oncology?

Case No 3: A) Colorectal lung metastasis, controlling after microwave ablation showing a surrounding ground glass opacity reflecting a complete coagulation of the tumour. (All images provided by Prof. Philippe Pereira)
Experts to provide insights into the management of pelvic pain in women

AYADELARD DE BACKER

In a Special Focus session today on female pelvic pain, three experts will illustrate the most frequently encountered gynaecological diseases responsible for acute and chronic pelvic pain, with the aim of raising awareness among radiologists of how to ensure adequate patient care and management of gynaecological conditions.

Acute pelvic pain in women is a common clinical presentation necessitating urgent medical evaluation. The duration of acute pelvic pain may range from several hours to several days. Prof. Ricardo Manfredi, from the Department of Radiology at the University of Rome – PoliChir, Italy, plans to go over the underlying aetiologies of acute pelvic pain in non-pregnant patients point by point and explain how to recognize various emergencies of the female pelvis. Gynaecological, obstetric, urinal and gastrointestinal causes of acute pelvic pain may range from several hours to several days.

The clinical presentation may be specific and in some cases the differential diagnosis between lower abdominal and pelvic pain may be difficult, as acute pelvic pain may exist in the absence of a gynaecological cause. High-frequency endovaginal ultrasound helps illustrate the diagnosis of the entire abdomen within a few minutes without ionising radiation and provides sensitivity similar to that of CT.

During his talk, Manfredi intends to explain how to optimise MRI of the female pelvis in patients with acute pelvic pain and to illustrate how to optimise image interpretation to narrow the differential diagnosis.

In the second part of today’s session, Prof. Rosemarie Forstner, from the Department of Radiology at Paracelsus Medical Private University in Salzburg, Austria, will discuss the prevalence and the etiologies of chronic pelvic pain. Chronic pelvic pain, which is defined as pain occurring during the umbilicus that lasts for at least six months, is a common problem, presenting a major challenge to healthcare providers due to its often unclear etiology and complex natural history. Similar to acute pelvic pain, its causes may be due to gynaecological and non-gynaecological etiolities. In her talk, Forstner plans to focus on musculoskeletal pain disorders such as sacroiliac joint pain, insufficiency fractures, gastrointestinal and genitourinary causes; but more importantly on gynecological causes, including endometriosis, adenomyosis, and hydrosalpinx, as well as due to inexperienced investigators, for example, CT enables the assessment of a patient’s abdomen and pelvis, is a sexually transmitted infection, as she noted.

From the focus on female pelvic pain, R.A. Kubik-Huch, Baden/CH, will speak about causes of pelvic pain specific to pregnancy. During his talk he especially plans to illustrate how pregnancy alters the way imaging is undertaken and to familiarize radiologists with the increasing role that MRI can play.

The ambiguity about what constitutes an ovarian from an uterine mass, might be helpful in differentiating acute pelvic pain specific to pregnancy. During his talk, he especially plans to illustrate how pregnancy alters the way imaging is undertaken and to familiarize radiologists with the increasing role that MRI can play.

Considering the very low risk of inducing nephrogenic systemic fibrosis (NSF) with the use of a macrocyclic gadolinium-based contrast agent and the high diagnostic accuracy of MRI, it appears beneficial for a patient with advanced kidney disease to undergo a well-indicated enhanced MRI examination.

NSF is a progressive, potentially fatal, multi-organ system fibrosis disease related to exposure of patients with renal failure to some gadolinium-based contrast agents (GBCA) used in MRI. Patients with severe renal insufficiency, a glomerular filtration rate (GFR) less than 30 mL/min/1.73 m², and patients with acute kidney injury with a GFR of more than 30 to 60 mL/min/1.73 m² are at increased risk. Additional major risk factors for NSF are the use of high-dose and specific gadolinium-based contrast agents and a pro-inflammatory state.

There are differences in the incidence of NSF with different GBCA, which appear to be related to differences in physical-chemical properties and stability (Gadolinium chelates for MRI can be composed linearly with a chain shaped chelate molecule or macrocyclically with a ring shaped chelate molecule. Macrocyclic gadolinium chelates, which are pre-organised rigid rings of almost optimal size to cage the gadolinium ion, chemically and structurally appear highly stable. The stability of the gadolinium chelate influences the quantity of gadolinium released from the chelate in the body. This free gadolinium is thought to be the trigger for NSF.

In patients with renal insufficiency, the expenditure half-life is prolonged, allowing more time for exposure to GBCA. The exact mechanism by which free gadolinium after GBCA exposure has been related to endogenous cations, such as iron (Fe), including gadolinium to dissociate from its chelate (dechelation or transmetalation). In plasma, cations bind to the chelate portion of the GBCA and Gd³⁺ binds to available anions, such as phosphate, carbonate and hydroxide, to form insoluble salts. This process may lead to prolonged retention of macrocyclic gadolinium and potential risk in toxicity. This gadolinium may pass from the intravascular space to the extracellular space where it may interact with tissue macromolecules. Once in tissues, a cascade of events ensue that may lead to the development of fibrosis and NSF.

Because of the lack of effective treatment for NSF, prevention is important. Careful evaluation of renal function is mandatory in every patient with renal insufficiency before GBCA exposure. If MRI using GBCA is well indicated for a patient with renal function, gadolinium should be used with the lowest risk for NSF (see www.ESUR.org – ESUR guidelines on contrast media).

MRI plays a crucial role in assessing women with chronic pelvic pain, especially in regard to diagnosing endometriosis, the most common cause of chronic pelvic pain in women of childbearing age. In general, it is helpful in identifying different causes of chronic pelvic pain, however, these need to be set into the proper clinical context to ensure optimal patient care.”

Forstner said, adding that in patients with pelvic congestion syndrome, ovarian vein embolotherapy may also be offered. Finally, Dr. Mike Weston, from the Department of Radiology at St. James’s University Hospital, Leeds, UK, will speak about causes of pelvic pain specific to pregnancy. During his talk he especially plans to illustrate how pregnancy alters the way imaging is undertaken and to familiarize radiologists with the increasing role that MRI can play.

**CLINICAL CORNER**

Wednesday, March 1, 16:00–17:30, Room M 2

**SF ab The female pelvis**

**Chairman’s introduction**

R.A. Kubik-Huch, Baden/CH

**Acute pelvic pain**

R. Manfredi, Rome/IT

**Chronic pelvic pain**

R. Forstner, Salzburg/AT

**Pain in pregnant women**

M. Weston, Leeds/UK

**Panel discussion:** The management of pelvic pain is imaging always needed?
Can radiology ever be more like widget manufacturing?

Radiologists could adopt the systematic quality control methods of the manufacturing industry, above and beyond the use of structured reporting. That’s the belief of Prof. Christoph Wald, chairman of radiology at Lahey Hospital & Medical Centre and professor of radiology at Tufts University Medical School in Boston, U.S.

For several diseases, the diagnostic efficacy of MRI is superior to other imaging modalities. In patients with severe renal insufficiency after exposure to a macrocyclic agent, this is close to zero. Although NSF may be a devastating disease, contract-induced nephropathy is also a serious complication and is associated with increased morbidity and even mortality. Considering the very low risk of inducing NSF with the use of macrocyclic GBCA and the high diagnostic accuracy of MRI, it appears beneficial for patients with advanced renal disease to undergo a well-illustrated enhanced MRI examination using a macrocyclic GBCA.

"Radiologists need to care more about the integrity of the work product we put into the world, namely our radiology reports," he told ECR Today in a pre-congress interview. "The flaw in the current setup is radiologists act like a professional services such as radiology, but what do we wish to achieve? Systematic quality control is long a major obstacle is that some radiologists feel limited by strict reporting software. Many of them want to discuss their findings in their own words, in free text, they can feel forced into choosing a certain category when there are contraindications in the examination. Moreover, introducing structured reporting can slow down workflow because a typical radiologist can dictate a free text report in minutes. Sommer wants the session to cover various initiatives on structured reporting. These include the joint initiative between the European Society of Radiology (ESR) and Radiological Society of North America (RSNA).

Professional Challenges Session

Wednesday, March 1, 16:00–17:30, Room G

PC & Design and implementation of structured reporting

Chair: Prof. Christoph Wald, Boston, MA/US

• Introduction: modular multilingual structured reporting
  N. Fatehi, Tehran, IR

• Introduction to quality management for radiology reports
  M. L. Bransman, Glenview, IL

• Structured reporting: two decades of surveys and subcommittees, but what do we wish to achieve? J. M. Bransman, Glenview, IL

• Panel discussion: Structured reporting in ten years: large-scale or fairy-tale?
Dual-energy computed tomography (CT) was first proposed in the 1970s, but it is only now that it is beginning to find widespread clinical use, as a result of improvements in CT technology. The main benefit of dual-energy CT arises from the fact that x-ray attenuation is energy-dependent and the form of the energy dependence varies with atomic number. CT images obtained at two energies (i.e. two kV values of the x-ray beam) can therefore be used to decompose the images into information about the different materials (e.g. bone and iodine) in order to better distinguish different materials (e.g. bone and soft tissue) and to better decompose the images into information about the different materials (e.g. bone and iodine) in order to better distinguish them. Today’s Refresher Course will provide attendees with essential information about the technology, methods and applications of dual- and multi-energy CT.

A method for quantitative bone mineral analysis using dual-energy CT was developed by Genant and Boyd in 1977. Using a conventional CT scanner, two scans were carried out, one after the other, at different kV settings. This technique was not very successful due to the high radiation dose, image registration and other problems. The next key development took place in the 1980s and made use of a single x-ray beam, the kV of which could be switched rapidly between two values during the scanning procedure. This meant that two CT scans, at different tube potential values, could be obtained almost simultaneously. The method suffered initially from the inability to switch the tube current quickly enough, later advances in the technology did, however, enable the technique to be used in clinical CT scanners. More efficient and simpler, in some respect, is the approach of using dual x-ray sources, mounted on the same gantry but orthogonal to one another. The tube potential of the sources can be controlled independently allowing truly simultaneous dual-energy CT to be accomplished. The disadvantage here is that data recorded by one source-detector pair may be corrupted by scattered photons arising from the other x-ray source. The latest technology for dual-energy (i.e. indeed multi-energy) CT makes use of so-called photon-counting detectors. These make use of a single x-ray source, but the detectors are able to discriminate the energies of photons, so allowing them to contribute to separate reconstructed images, effectively obtained at a range of kV values. Although energy-discriminating solid-state detectors have been used in nuclear medicine for some time, their employment in CT had to wait for improvements in technology, especially as regards the ability to cope with the very high exposure rates used in CT.

Dual-energy CT was clinically begun after the introduction of dual-source CT systems in 2006. Now the latest CT technology allows simultaneous image acquisition at two or more energies, making the method applicable and useful in a variety of clinical applications. Dual-energy CT offers superior lesion detection and characterisation. It is used for detection and characterisation of renal stones, renal mass and liver lesions, in oncologic imaging, in vascular imaging and in metallic implant imaging (artefact reduction). Moreover, there are several promising applications under investigation in other areas such as musculoskeletal and cardiac imaging. Each CT manufacturer uses different algorithms for material decomposition. Thus, virtual monomorphic images can be created or blended images can be produced using a combination of low energy and high energy data (see Figure). Patient radiation dose and associated risks are always areas for concern. Initial studies have shown that dual-energy CT delivers higher doses to patients than single-energy CT. However, more recent publications have shown that dual-energy CT is associated with patient doses similar to those received during single-energy CT. However, it should be stressed that limited information on this is available in the literature at present; differences in acquisition techniques have important implications on patient radiation doses and further studies are needed to fully investigate this topic.

John Damilakis is Professor of Medical Physics at the University of Crete, Greece, and is President of the European Federation of Organisations for Medical Physics (EFOMP); he will chair the refresher course. David Lurie is Professor of Biomedical Physics at the University of Aberdeen, UK; he is Chair of the Physics in Radiology Subcommittee of ECR 2017.

References


RTF MEET & GREET SESSIONS

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

- 11:00–12:30 Martin Reim (Estonia)
- 13:30–14:30 Christine Tolman (The Netherlands)
- 14:30–16:00 Biljana Vujovic (Montenegro)
- 16:00–17:30 Luisa Andrade (Portugal)

Join our European colleagues and representatives in an informal and relaxed 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 ESR President Paul M. Parizel (tomorrow, Thursday, March 2, 12:30–13:50) in the ESOR & Rising Stars Lounge in the M Building.

Join us also at the RTF Quiz with Quizmasters José Cáceres and José Vilar tomorrow, Thursday, March 2, 12:30–13:30 in Room B (second level) and the RTF Delegates’ Meeting (General Assembly) tomorrow, Thursday, March 2, 16:00–17:30 in Room 0.96/0.97 (entrance level).

For more detailed information please visit the RTF Meeting Point in the ESOR & Rising Stars Lounge.

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#ECR2017

myESR.org
E Aub and UEMS team up to address EU issues facing radiology

In Europe medical practice is heavily influenced by EU policies but radiologists often ignore political issues. This attitude may become problematic as radiology has a dedicated position sitting at the crossroads of many medical disciplines. A panel of experts will try to pique radiologists’ interest and show the collaborative work done by the ESR and the European Union of Medical Specialists (UEMS), during a joint session at the ECR.

The ESR started to work with the UEMS (Union Européenne des Médecins Specialistes) on EU affairs a few years ago. A dedicated office in the ESR’s home known as Donus Medicus Europa was established in 2015 to further enhance collaboration. Both organisations believe there is room for improvement in the EU Directives on Professional Qualifications (Directive 2005/36/EC, amended by Directive 2013/53/EU), which aims to facilitate cross-border mobility of professionals within the EU.

For starters, in the Directive’s current form, radiology has an identity problem, according to UEMS Treasurer and former Secretary General, Dr. Bernard Maillet from Brussels, Belgium. “Radiology is listed as two specialties—Interventional Radiology and Diagnostic Radiology.” The problem is that many EU countries usually only recognise one of these IPC, the European Federation of Radiology, both initiatives of the society demonstrate how it is possible to harmonise training and research to produce a strong unified voice that can speak about the position of the UEMS and represent its interests and follow the work done by the ESR and the European Union of Medical Specialists (UEMS), during a joint session at the ECR.

Prof. Jane Adam, Chair of the ESR Quality, Safety and Standards Committee, will talk about the recognition of qualifications.

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Rectal cancer: modified three-point MRI-predicted TRG incorporating DWI

Since preoperative chemoradiotherapy (CRT) followed by a total mesorectal excision has been established as the standard treatment in patients with locally advanced rectal cancer (LARC), many investigators have tried to predict treatment response to CRT prior to surgery. The identification of treatment response to CRT may help optimise individual treatment strategies such as consolidation of chemoradiotherapy or the deferral of surgery. Although the pre-existing five-point, MRI-predicted tumour regression grade (MRI-predicted TRG) based on qualitative assessment of MRI-predicted tumour volume in the pre- and post-chemoradiotherapy (CRT) T2-weighted images (T2WI) could be a workable approach that can be used at the moment, the five-point MRI-predicted TRG system has not been widely used in daily practice except in some European countries. This is because it may not be easy for abdominal radiologists, or even rectal MRI experts, to qualitatively analyse tumour changes, especially in differentiating radiation fibrosis from residual viable tumours based on T2WI alone. To make MRI-predicted TRG readily acceptable and up-to-date, image interpretation must be simplified.

Recently, many studies have demonstrated that diffusion-weighted imaging (DWI) enhances clinical response assessment over T2WI for LARC after CRT. This might be because DWI produced higher lesions-to-background contrast, which allowed easier image interpretation. In addition, previous studies have reported that quantitative tumour volumetry based on DWI is significantly correlated with histopathologic TRG. Given all these factors, we hypothesised that a modified three-point MRI-predicted TRG incorporating DWI could be easily used as a surrogate for expected prognosis to CRT prior to surgery. In our retrospective study, 118 patients with middle/lower LARC who underwent PCRT followed by surgery were enrolled to evaluate the prognostic relevance of a modified three-point MRI-predicted TRG incorporating DWI. Two experienced radiologists independently reviewed pre- and post-CRT MRIs and evaluated MRI-predicted TRG based on T2-weighted images and high b-value DWIs (0, 1000 s/mm2) using the following grades: Grade 2, good regression (no obvious tumour signal intensity on T2WI and DWI, corresponding to the residual viable tumour area ≤ 50%, corresponding to the preceding five-point MRI-predicted TRG 1); Grade 1, intermediate regression (dominant fibrosis outgrowing residual viable tumour; regressed area > 50%, corresponding to the preceding five-point MRI-predicted TRG 2 ≥ 3); Grade 0, poor regression (dominant residual viable tumour volume; obvious fibrosis; regressed area ≥ 50%, corresponding to the preceding five-point MRI-predicted TRG ≥ 4).

The results showed a significant difference in the three-year disease-free survival (DFS) rate depend- ing on the modified MRI-predicted TRG. The modified MRI-predicted TRG was independently associated with the three-year DFS. Interestingly, ymrT staging which has been always used in routine radiologic reports was not an independently associated factor. Overall, the results indicated that a modified three-point MRI-predicted TRG incorporating DWI can provide additional information beyond classical yTNM staging and may be used as a surrogate for expected prognosis to PCRT prior to surgery. Detailed results will be presented in our ECR 2017 scientific session.

Byung Geon Park, MD is a resident in radiology at Kyungpook National University Hospital in Daegu, Korea. Seung Hyun Cho, MD, PhD is associate professor of radiology at Kyungpook National University Chilgyek Hospital in Daegu, Korea.

Clinical Trials in Radiology Sessions

Since 2005, the European Congress of Radiology has been presenting late-breaking clinical trials in radiology (CTiR) during dedicated sessions. The clinical trials selected for presentation during the CTiR sessions are definite highlights in the field of radiology and can be used at the moment, as well as in the future. This year, for the first time, we included a scientific session of full text of these high-impact abstracts and lectures will be presented today, from 12:30 to 13:30, and tomorrow, Thursday, March 2, from 12:30 to 13:30. Both CTiR sessions will be taking place in Room M1. Each of the clinical trials in radiology presented during these two sessions is accompanied by a short lecture. These lectures are given by experts in the respective fields and will allow participants to better understand which clinical changes should be made based on the CTiR results. For ECR 2017, we received an all-time high number of CTiR submissions. Of the 263 abstracts submitted, the independent CTiR evaluation committee selected eight abstracts in a blinded review process for the two CTiR sessions.

ECR TODAY | WEDNESDAY, MARCH 1, 2017

BY MARC DEWEY

Clinical Trials in Radiology Sessions

Wednesday, March 1, 12:30-13:30, Room M1 Clinical Trials in Radiology (CTiR) 1
• New insights into preoperative breast magnetic resonance imaging (MRI) from the multicentre individual patient analysis (MPIA) study R.M. Trimболli, San Donato Milanese/IT Discussant: E.M. Follenberg, Berlin/DE
• The MIICRA trial: Minimally Invasive Complete Response Assessment of the breast after neoadjuvant systemic therapy M.E.M van der Noordaa, Amsterdam/NL Discussant: J.P. Gilbert, Cambridge/UK
• The MULTIFROST study – Multimetric MRI with subsequent randomisation to MRRUS fusion guided biopsy vs TRUS biopsy in the diagnosis of prostate cancer M.I. Szczyrbińska-Flasza, Dundee/UK Discussant: F. Asaad, Berlin/DE
• Study design and inclusion ROBINSICA trial: large-scaled population based (CT) screening trial for cardiovascular disease M. Voyer, Groningen/NL Discussant: M. Francone, Rome/IT

Clinical Trials in Radiology Sessions

Thursday, March 2, 12:30-13:30, Room M1 Clinical Trials in Radiology (CTiR) 2
• Non-invasive treatment of osteoid osteoma with MrFUS in paediatric patients only: a retrospective multicentre study F. Arrigoni, Laquila/IT Discussant: L.-S. Ording Müller, Oslo/NO
• Indocalce versus iopromide in contemporary coronary CT angiography: lumen opacification and effect on heart rhythm in the randomised IsoCOR trial M.M. Lubber, Rotterdam/NL Discussant: G.A. Krombach, Giessen/DE
• Comparison of pretest prevalence with prevalence of obstructive coronary artery disease using invasive coronary angiography or computed tomography angiography S. Feger, Berlin/DE Discussant: C. Lowen, Vienna/AUT
• Diagnostic value of novel MRI techniques for the primary staging and restaging of rectal cancer: multicentre study D.M.J. Lambregts, Amsterdam/NL Discussant: U. Attenberger, Mannheim/DE
ECR 2017 exhibitors display ultrasound’s 3D capabilities, resilience and adaptability

From 3D technology to digital-beam-forming and extended field-of-view images, ultrasound manufacturers continue to strive to deliver better overall image quality, ergonomics, and workflow and more mechanisation of both automated systems and point-of-care machines.

Spleen vasculature visualised with B-Flow imaging, a visualisation technique that displays the blood flow echoes in grey scale imaging, with different grey intensities according to the reflectors speed and dynamics. (Provided with GE Healthcare)

Three-dimensional image of ovarian follicles using inversion technology on the Aplio i-series 800 machine. (Provided by Toshiba)

Screen capture demonstrates Samsung’s S-Detect for breast ultrasound. (Provided by Samsung)

Vendors at ECR 2017 are showcasing new and upgraded ultrasound devices that aim to enable users to make more of the technology but are also more affordable.

Hitachi Medical Systems is demonstrating its full product line, and is introducing the Sofia-J, a new 3D breast ultrasound system to a European audience. Powered by the premium Artessa platform, the product captures a 3D volume dataset for an entire breast in only 30 seconds. The data for each breast is then sent to the radiology workstation as a single 3D volume where review tools enable the user to review the data, reviewing extra features on its premium system, the RS80A with Prestige.

Samsung’s S-Detect for Breast has applied a data bank of test results to the machine, proving to be a more effective tool. “Applying data from 10,000 accumulated breast exams from the Samsung Medical Center over the last 20 years to ultrasound imaging, S-Detect helps radiologists understand characteristics of breast lesions to determine whether they’re malignant or benign in a few clicks,” said Doug Kim, communications manager at Samsung Medical. “By adopting such a data-based algorithm in the processes of lesion segmentation, analysis of characteristic and assessment, healthcare professionals are now provided with more accurate results with all information being made available in a single report.”

GE Healthcare has reconsidered virtually every element of the imaging chain, from the pulse of the probe to the clarity of the pixels on the display. The Logiq E9 XDclear 2.0 system, which was originally showcased at ECR 2016, now combines this probe technology with the XDClear platform. This platform is built on the Agile Acoustic Architecture, the XDClear processing engine and a widescreen display.

For a variety of patient cases, GE is also showing a portfolio of ultrasound hardware and software products, including the Logiq E9 ultrasound unit with XDClear, which is designed to provide better images, enhanced ergonomics, and innovative tools to improve workflow and patient throughput in a budget-friendly solution, the vendor stated. Its XDClear transducers have been migrated to this platform, reportedly resulting in better performance and penetration on difficult to image patients. Also, the system now has an enhanced industrial design, featuring a wide screen display and a larger touch screen.

This follows an earlier announcement about the launch of the pocket-sized, dual-probe device, the Vscan Extend. This app-based machine can be used in hospitals, ambulances, and in rural areas, making the modality more accessible. It uses a novel touch screen and weighs just 466 grams. Aiming to build on the success of previous pocket-sized ultrasound units, the Vscan Extend offers smooth integration with a hospital’s DICOM system to complement existing documentation and reporting solutions along with cloud-based image storage and communication, GE stated.

Elsewhere in the technical exhibition, Toshiba Medical is introducing the Apio i-series ultrasound platform. The Apio i-series is a scalable ultrasound device that includes performance technologies and reportedly delivers extreme processing power and allows healthcare providers to do more, faster.

Toshiba’s beam-forming product, iBeam, seeks to optimise the efficiency of the beam, and is designed to increase penetration, spatial resolution, and contrast resolution, while at the same time reducing artefacts and clutter. The Apio iBeam can be used for a range of different clinical cases, and includes a high-frequency transducer (i MHz) and the IDMS active matrix transducer technology that makes it easier for users to image superficial structures and can expand the use of diagnostic ultrasound.

The Apio i-series provides intuitive ergonomics to boost productivity during daily routine and complex exams with iSense, and the systems offer an image-guided user interface to visually guide the clinician through the exam to simplify system operation and help improve efficiency. Toshiba claims to make ultrasound exams faster, the systems feature touch-control screens and real-time Quick Scan, which makes automatic image adjustments without pushing a button.

The manufacturer is also presenting the compact Xario Platinum Series, consisting of the Xario 100 Platinum and Xario 200 Platinum. These systems can be used to carry out various radiological, echocardiographic and cardiovascular exams.

The Xario Platinum comes with the added visualisation benefits of Toshiba’s Superb Micro-Vascular Imaging (SMI), an ultrasound Doppler technique that employs an algorithm that allows visualisation of minute vessels with slow velocities but without having to use a contrast agent.

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ECR2017
The idea of hand held ultrasound (HHUS) is not a new one, especially with first-generation systems being available for almost a decade. These first devices were a marvel in shrinking ultrasound technology into a smartphone-sized device. They also prompted a media storm of headlines boasting of a future where all physicians would shortly be wielding hand-held Star Trek ‘medical tricorders’ capable of being plugged into a smartphone or tablet and used to diagnose any condition.

The market for HHUS has been growing, with new models launched at ECR 2017 from all of the main second-generation producers. Image quality of HHUS was poor in early HHUS designs, but recent releases of HHUS specific for defined use-cases have been made. Significant improvements have also been made. Image quality of HHUS has been improved from the initial first-generation offerings, capitalising on advances in smartphone and tablet processing power. In addition, miniaturisation of system and probe technology has allowed a variety of designs, exemplified by systems under development that are ‘system in a transducer’ designs, in which all ultrasound hardware is cased within the probe body. This means the transducer can simply be plugged into a smartphone or tablet device, with the scanning software downloaded as an app. Some systems are also now wireless, further adding to the flexibility of use.

 probe design has also evolved, with some manufacturers combining two transducers within a single probe housing (most commonly linear and phased array). This increases the diagnostic capability of the system to cater for a wider array of clinical uses without the need to swap transducers between or during exams. Vendors of HHUS systems are also targeting future generations of users with focus on training for students. Online training tutorials and downloadable content for ultrasound will increasingly become common. Moreover, to mitigate the still relatively high cost of these HHUS devices, a variety of subscription and rental models for education and training users are emerging.

A step closer to Doc McCoy’s favourite toy?

A step closer to Doc McCoy’s favourite toy?

BY STEPHEN HOLLOWAY

Market snapshot for Hand Held Ultrasound (HHUS)

Market today: Very small (~5% of all ultrasound equipment sold in 2016)

Outlook: Strong double-digit growth (from small base)

Key target clinical uses:

- Emergency Medicine
- MSK (Sports Medicine)
- Out-of-clinic, primary care (and OB/GYN) Training & Education
- General Practice
- Vascular

Main market competitors:

- GE Healthcare
- Philips Healthcare
- Konica Minolta
- Claris Ultrasound
- Healcon
- Biosonics
- Mobius

Source: Signify Research

For further information on the detailed programmes and registration, please visit myESR.org/esor

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EIBIR – helping researchers secure EU funding

From proposal preparation to project management, the European Institute for Biomedical Imaging Research (EIBIR) provides researchers with support every step of the way in proposals for Horizon 2020 and other European funding schemes.

Navigating the rules and regulations of Horizon 2020 while carrying out an innovative, first-rate research project with partners from across Europe can be challenging, even more so when deadlines are looming. Multidisciplinary and multinational consortia require professional project management to ensure the successful accomplishment of the project’s goals.

Over the course of the past decade, EIBIR, a non-profit research organization founded by the European Society of Radiology, has helped shape the landscape of European biomedical imaging research by supporting scientists and helping them secure funding for their projects. EIBIR offers expert advice, project management and coordination, communication and dissemination services for collaborative research projects and clinical studies.

By providing management services as a full partner in a project consortium, EIBIR relieves researchers of the administrative burden, allowing them to focus on the scientific work and ensuring the best possible outcome for your project. EIBIR has extensive expertise in proposal preparation. There are several unique advantages to having EIBIR support the preparation of a research proposal. Our Scientific Advisory Board, with more than 35 international experts from various specialties, can provide critical scientific feedback on project ideas. EIBIR can also assist researchers in consortium formation and identify suitable academic, industry or SME partners for your project.

EIBIR provides expert support for writing research proposals. The EIBIR Team has over a decade of experience in preparing research proposals, and can provide call-specific templates with detailed descriptions and input requirements for each section. Through their experience, the EIBIR Team have gained a clear understanding of what the European Commission expects in each section of a research proposal. EIBIR also offers financial management support during proposal preparation and can assist in drafting and finalising the budget, which is often a difficult and sensitive task.

All aspects of proposal preparation are carried out by a team of experienced scientific writers with knowledge of the European Commission’s requirements and the European research landscape. Professional project management for your research

Upon successful evaluation of your proposal, EIBIR guides researchers through all phases of contract preparation and negotiation, and takes on the project management. During the project, EIBIR’s project management services include:

- Monitoring and managing the overall project
- Coordinating the reporting process and ensuring its timeliness
- Contractual management
- Financial management
- Day-to-day administrative tasks
- Meeting organisation, either face-to-face or electronically

A large part of any international research project is good internal and external communication. In addition to project management tasks, EIBIR can assume responsibility for the communication and dissemination aspects of a project.

It has an established and extensive network of contacts from among its network members, industry partners and shareholder organisations, such as the European Society of Radiology. This enables us to communicate your research widely and rapidly.

EIBIR can also provide a tailored communication and dissemination strategy which includes:

- Writing, design and distribution of dissemination material
- Development of a visual identity website and social media presence
- Representation at scientific meetings or congresses
- Organisation of outreach events, such as workshops, symposia or summer schools

Since its establishment in 2006, EIBIR has helped to secure over €68 million in research funding for biomedical imaging. This is testament to our effectiveness in promoting and supporting biomedical research.

At ECR 2017, EIBIR will host a session on EU research on cancer imaging on Friday, March 3, 08:30-10:00 in Room M4, with speakers from a range of other EIBIR-supported projects, including the recently launched Horizon 2020 projects HYPMED and GLINT.

To learn more about European research funding and EIBIR’s services, please visit www.eibir.org or stop by our booth in the M building to discuss your project idea, and how we can help make it a reality.
Structured reporting platform improves CAD-RADS assessment

How to eliminate human error from the equation

Coronary CT angiography imaging is a robust non-invasive tool for the assessment of coronary artery disease (CAD), and is extensively utilized in patients with low to intermediate risk for obstructive CAD. Considering that high variability and inconsistency exist in the reporting of coronary CT angiography (CTA), finding a standardized framework for CAD assessment has long been desired.

The Coronary Artery Disease - Reporting and Data System (CAD-RADS) was recently introduced to facilitate interdisciplinary communication of coronary CTA results and to guide further diagnostic testing and therapy. This joint effort of various societies (Society of Cardiovascular Computed Tomography, American College of Radiology and North American Society for Cardiovascular Imaging) represents the first important step toward achieving uniform and consistent coronary CTA reporting using a standardized terminology. Implementation of CAD-RADS could result in decreased variability in image interpretation, assuming that readers can adequately read coronary CTA and learn to use the CAD-RADS scheme. We sought to assess how well readers (man) are able to classify patients into various CAD-RADS categories versus an automated CAD-RADS scoring tool (machine). We therefore compared the automated CAD-RADS evaluation with the reader’s manual performance.

In a single-center study, we prospectively analyzed the reports of 500 consecutive patients who underwent coronary CTA between August and December 2016. Five experienced readers evaluated CAD-RADS stenosis categories (0, 1, 2, 3, 4A, 4B, 5) and modifiers (V, N, S, G) using a structured reporting platform blinded to the automated CAD-RADS results. The reporting platform (machine) automatically determined the CAD-RADS classification based on the input of the physician, while the doctors reported their CAD-RADS value manually (man).

We detected a total agreement in 80.2% of the cases. The agreement in stenosis categories was 86.8%. In addition, we investigated the agreement of modifiers with the following results: 95.6% for V, 95.8% for N, 90.4% for S, and 95.6% for G, respectively. Although agreement seems to be almost perfect, this means that the readers forgot to apply the ‘S’ modifier in 27 cases, which could alter patient management and also lead to lower data integrity in research. Interestingly, 4.6% of all cases were falsely classified by the readers into non-existing CAD-RADS categories (e.g. 2N, Stenosis 4 without A or B missing S or G due to inattention). A discrepancy between the manual and automated scoring might lead to changes in patient management recommendations in up to 15% of cases.

Structured reporting tools in cardiac imaging have been predominantly implemented for research purposes to improve workflow and data integrity. Our work suggests that the implementation of automated CAD-RADS classification using a structured reporting platform can reduce the number of mistakes, which can improve the quality of healthcare services. Nonetheless, we also strongly encourage regular training of clinicians to ensure the proper use of CAD-RADS. Consequently, effective communication of coronary CTA results and adequate clinical decision-making can be established.

Structured reporting platforms with automated CAD-RADS score calculations reduce human error due to inattention; therefore, they might improve data quality and support clinical decision-making. We would like to invite you to come to our session and hear more about the advantages of structured reporting and additional factors related to common errors leading to CAD-RADS misclassification.

**Scientific Session**

*Evaluation of CAD-RADS in coronary CTA: man vs machine*

Wednesday, March 1, 14:00-15:30, Room E1

Moderators: T. Bauerle, Erlangen/DE
E. Svedstrom, Turku/FI

Bálint Szilveszter MD, PhD candidate is a member of the MTA-SE Cardiovascular Imaging Research Group at Semmelweis University in Budapest, Hungary

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The session will be chaired by Prof. Guy Frija from Paris, chair of the EuroSafe Imaging Campaign, and Mr. Georgi Simeonov from Luxembourg, European Commission Directorate-General for Energy. First, Frija will introduce the concept of clinical DRLs. DRLs were proposed around 20 years ago as an optimisation tool in medical imaging using x-ray radiation where – other than for occupational exposure and other uses – individual dose constraints do not apply and where doing more good than harm is the supreme rule.

DRLs are defined for the different modalities and body regions by the 75th percentile of the dose distribution in a population of standard-sized patients. While exposure in an individual patient may thus exceed the specific DRL, the median dose of the whole group of patients (at a local, national or regional level) has to stay within the DRL, in order to avoid unnecessarily high exposure.

Frija will also point to the limitations of conventional DRLs. He will do so by explaining that patients are not usually standard sized and different individual questions (indications) do not need the same image quality in order to be answered, which means DRLs should reflect the indication and patient size.

Prof. Reinhard V. Loose from Nürnberg, chair of the ESR Radiation Protection Subcommission, will then illustrate the reasons for clinical DRLs, their basics in the different imaging modalities and their practical impact. Radiography, fluoroscopy and intervention, as well as nuclear medicine, require clinical DRLs, but since CT is the major contributor to the medical population dose, he will dedicate a major part of his presentation to the specific implementation of clinical DRLs in computed tomography.

Prof. Eliseo Vaño from Madrid, chair of the ICRP’s Subgroup for Clinical DRLs, will present the ICRP’s approach to changing DRLs to DRLs based on clinical indications. From methodological region-related DRLs to DRLs based on clinical indications, he will be able to show both the ICRP’s draft for recommendations of DRLs in medicine and the results of the consultation on this draft. It is an important intention of the ICRP to standardise the methodology of establishing DRLs and he will include the related recommendations.

Recognising the need for clinical DRLs, the ESR started a pilot survey in 2015 to establish DRLs for a few frequent indications for CT. The results of this survey will be presented by Prof. Peter Vock from Spiez, Switzerland, member of the EuroSafe Imaging Steering Committee. Not only did this survey demonstrate the feasibility of online DRL surveys, it also allowed the definition of DRLs for these few indications. Furthermore, it showed a wide variation of results. Many factors contribute to the spread of these DRLs, their basics in the different imaging modalities and their practical impact. Radiography, fluoroscopy and interventional radiology, as well as nuclear medicine, require clinical DRLs, but since CT is the major contributor to the medical population dose, he will dedicate a major part of his presentation to the specific implementation of clinical DRLs in computed tomography.

The final lecturer, Prof. Richard L. Morin from Jacksonville, U.S., will then illustrate the reasons for clinical DRLs, their basics in the different imaging modalities and their practical impact. Radiography, fluoroscopy and intervention, as well as nuclear medicine, require clinical DRLs, but since CT is the major contributor to the medical population dose, he will dedicate a major part of his presentation to the specific implementation of clinical DRLs in computed tomography.

The session – through the implementation of the new European Directive – addresses most congress participants, whether they are radiologists, radiographers, medical physicists or administration and IT team members of departments of radiology in Europe.

Peter Vock is retired chairman and senior consultant radiologist at the University Hospital of Bern, Switzerland, he chaired the ESR Radiation Protection Subcommission for many years and is now the coordinator of the EuroSafe Imaging Subgroup for Clinical DRLs.

Clinical Diagnostic Reference Levels

For two reasons, today’s EuroSafe Imaging session will be entirely dedicated to diagnostic reference levels (DRLs). First, Article 56.2 of the European Basic Safety Standards (Council Directive 2013/59/EURATOM) asks the Member States to transpose the establishment of DRLs for radiodiagnostic examinations into their national legislation by February 2018, and second, the methods for establishing DRLs and their practical use vary a lot, which underlines the need for recognised standards.

In Portugal, the radiology training programme has been based on a 4+1 model since its inception in 1993, and at that time Portugal was among the first countries to include the concept of subspecialisation in the specific fields of neuroradiology and paediatric radiology. The residency programme in Portugal is highly demanding and includes a final board examination. Until now this system has prevailed, but we are currently in the midst of a changing process in order to accommodate the European Training Curriculum for Radiology and deliver a ≥2 level (1=1) post-graduate course to our residency programmes. This will be a major undertaking since the majority of Portuguese hospitals will deliver residency programmes in radiology that are more technique-oriented than organ-oriented. Several organisational issues need to be met, before we can fully embrace the ≥2 European structure.

The Portuguese Society of Radiology and Nuclear Medicine (SFRMN) has collaborated closely with the European Society of Radiology (ESR) in order to promote the ESR educational vision but locally a professional cultural change will undoubtedly be needed. University hospitals will need to focus more and more on organ-oriented services in radiology, promoting and protecting time for clinical research, and multidisciplinary meetings, along with more involvement in clinical research. The educational activities of the ESR, especially the annual exchange programmes such as fellowships, together with the subspecialisation learning by the School of the SFRMN, are instrumental tools to facilitate and anchor the future format of radiology training.

This is our big agenda for the years to come for the sake of radiology and for the sake of institutional harmonisation throughout Europe.

Prof. Filipe Caseiro-Alves is a radiologist at the Centro Hospitalar Universitario de Coimbra, Portugal, and President of the Portuguese Society of Radiology and Nuclear Medicine.
EuroSafe Imaging Stars: Erasmus Medical Center in Rotterdam

Dr. Marcel van Straten is a medical physicist. He has more than 15 years of experience in the optimisation and dosimetry of x-ray computed tomography.

EuroSafe Imaging Stars is EuroSafe Imaging's latest initiative to promote quality and safety in medical imaging. By recruiting a network of imaging departments committed to best practice in radiation protection, the Stars initiative aims to ensure that the efforts greater visibility, have a direct impact on clinical practice and establish a platform of European Society of Radiology to collect data for analysis and benchmarking.

The EuroSafe Imaging Stars institutions is the department of radiology & nuclear medicine, headed by Professor Gabriel P. Kresin, part of the Erasmus Medical Center in Rotterdam. The EMC is the Netherlands’ largest university medical centre, committed to a healthy population and excellence in healthcare through research and education.

Please read below an interview with Dr. Marcel van Straten from the department of radiology & nuclear medicine of the EMC, which is a five-star facility.

ECHR Today: Your radiology department joined the EuroSafe Imaging Stars network. Why did you apply and what are your thoughts on it?

Marcel van Straten: We applied for the Imaging Stars network because it allows us to share our experience in medical radiation protection with others and to show it with our patients. That initial fact reflects our own efforts on this topic within our department.

ECHR: What are your suggestions for improving the EuroSafe Imaging Stars initiative?

MvS: The self-evaluation comprises all criteria, and we would like to have more background information on the topics mentioned in this self-evaluation.

ECHR: Which future cooperation and activities within the network of Stars would you like to see?

MvS: It would be nice to see other departments throughout Europe deal with the implementation of the new Basic Safety Standards Directive, which has to be transposed by February 2018.

ECHR: Would you recommend other facilities to become EuroSafe Imaging Stars? If so, what arguments would you use to convince them?

MvS: Yes, we would absolutely recommend this. Don’t reinvent the wheel! Use best practice instead!

Information and support is provided before entering the 7T magnet.

Short-term effects during examinations in an actively shielded 7T MR

The number of magnetic resonance (MR) examinations in clinical routine and research are increasing rapidly along with the range of indications and body parts to be examined. Technical advances have allowed an increase in MR field strengths to ultra-high fields (UHF; above a Tesla), homogenous enough to create images of very high quality, and opening up new insights into disease pathophysiology. Increasing field strength, new technical advances, such as actively shielded UHF scanners, and the urge to move to diagnostic clinical scanning at UHF, justify taking another look at nursing care factors related to possible short-term effects experienced during MR examinations.

The purposes of our study are to collect information on frequency and quality of short-term effects reported by 124 research persons after examinations (n=154) performed during a six-month period in an actively shielded UHF 7T MR, to extract knowledge from the data that allows us to design patient-oriented and personalized care models and to facilitate future examinations that are both as comfortable as possible and of the highest diagnostic quality.

Special focus is set on the occurrence and strength of short-term effects, their dependence on spatial position and motion in the scanner in relation to center, and the comparison to published data from passively shielded magnets. Research subjects undergoing 7T MR were given access to online web-based questionnaire on occurrence (27) and strength (VAS, visual-analogue scale) of inconsistent movement, dizziness, nausea, headache, metallic taste (49). Although short-term effects are common, median VAS values for strength was in general very low (<10 for dizziness while entering the scanner, fewer than in for dizziness and inconsistent movement at all other spatial locations and zone for nausea, headache and metallic taste. As expected, a scan position with the head first (used for examinations of the knees for example) showed higher VAS values for inconsistent movement (p<0.001) and dizziness (p<0.0002 compared to feet first; but no significant differences for nausea, headache and metallic taste. Twitches, an expression of PNS, were reported in 7% of examinations, occurring primarily in torso, hands and arms, and tended to increase with higher predicted PNS values. Furthermore, 25% of the research subjects experienced light flashes, scanner noise levels were well tolerated and the communication system was well perceived.

Willfulness to undergo a future 7T MR was high both as research subject and patient (92%, 96%). Actively shielded 7T MR examinations are well tolerated although short-term effects such as inconsistent movement, dizziness and twitchs are more commonly reported compared to literature on passively shielded UHF systems. Healthcare strategies assuring patient compliance with UHF MR could preferably focus on increasing acceptance of short-term effects by means of cognitive and behavioural methods to cope with short-term effects combined with practical measures facilitating an examination for patients – such as increased comfort, balanced information and instructions, reassurance during examinations and empathic care.

BY BOEL HANSSON

BY BOEL HANSSON

Boel Hansson is a 7T research radiographer at the department of diagnostic radiology, Skåne University Hospital in Lund, Sweden.

Scientific Session

Wednesday, March 1, 14.00-15.30, Room K

SS 314 MR imaging

Moderators: L. Natale, Rome/IT K. Taylor; Cambridge/UK

• Short-term effects during examinations in an actively shielded 7T MR

Delegates at work during the joint workshop of ESOI and the EORTC in Rome, November 2016.

Before a new drug enters routine practice, validation through a clinical trial is needed. A clinical trial is a study of human subjects to test if a specific new drug is able to improve therapeutic intervention compared with current practice. This validation is measured through biomarkers, "a characteristic that is objectively measured and evaluated as an indicator of normal biological processes, pathologic processes, or pharmacologic responses to a therapeutic intervention" (Biomarkers Definitions Working Group, Clin Pharmacol Ther 2013 Mar; 93(3): 382-390).

Delegates at work during the joint workshop of ESOI and the EORTC in Rome.
ESTI to continue multidisciplinary and inter-specialty cooperation

For more than 20 years, the European Society of Thoracic Imaging (ESTI) has been promoting education and research in chest imaging, with the aim of improving patient care. The strong history of ESTI supports its continuous progress in moving forward, namely its enormous growth in recent years.

The last two annual meetings, held in Amsterdam in 2014 and Barcelona in 2015, were overall attended by more than 1,400 participants. The 2016 ESTI summit in Krakow was also quite successful with more than 250 participants, a noteworthy proportion of them coming from the United States and Korea. In Krakow, speakers presented the latest research and technical advances in chest imaging. The meeting was an excellent place to expand knowledge, renew old contacts and build new cooperation, particularly with both American and Eastern societies. In 2016, ESTI will be a member of the organizing committee of the Fourth World Congress of Thoracic Imaging (WCTI), which will be held in Boston from June 18 to 21. The WCTI Program Committee has put together an outstanding agenda of major research topics in chest imaging. The joint session of the ESOI 2015 meeting stimulated an important discussion on both lung cancer screening and assessment of response to new therapies for lung cancer. Indeed, ESTI wishes to continue such an essential multidisciplinary, as well as inter-specialty, cooperation.

European lung cancer screening trials have been conducted independently in different countries and have not yet provided the clear-cut advantage reported by the NLST, allegedly because of the intrinsic statistical limitation deriving from the fragmentation of the total population into small cohorts. While smaller trials have already disclosed the absence of a significant improvement in survival, results are still pending for the largest European trial, the Dutch-Belgian Randomized Lung Cancer Screening Trial (NELSON). Nevertheless, a pooled analysis has recently suggested a trend for improvement in survival, though not significant, and a pan-European pooling is planned (estimated >70,000 subjects randomised to either CT or control arm) to quantify the overall mortality reduction in lung cancer screening randomised-controlled trials. Furthermore, there is also an urgent need for better definition of imaging criteria in the assessment of lung cancer response to new treatments, such as immunotherapeutic and molecular targeted agents. The implementation of tools extracting high throughput of quantitative descriptors from routinely acquired CT scans can play a significant role as parameters for lung cancer response.

The clinical value of radiology in interacting with clinicians and other specialists should not be underestimated, and the need for maintaining and improving non-technical skills should be encouraged for thoracic radiologists. The diagnostic accuracy of diffuse lung diseases increases with multidisciplinary discussion among clinicians, radiologists and pathologists. However, recent studies have shown some limitations in the multidisciplinary diagnosis of some interstitial lung disorders underscoring an urgent need for standardised diagnostic guidelines. Another major ESTI goal is to further promote collaboration between the pulmonologist and the chest radiologist. Following the successful joint session on airway disease at ECR 2016, another joint session with the European Respiratory Society (ERS) on idiopathic interstitial pneumonias will be quite appropriate and ESTI meetings and the European Society of Cardiovascular Radiology (ESCR) are going to organize a joint meeting in Geneva, in 2018. That meeting would like these joint sessions to continue and to be steadily integrated into future ERS and ESTI meetings.

ESTI and the European Society of Cardiovascular Radiology (ESCR) are going to organise a joint meeting in Geneva, in 2018. That meeting will range from basic topics (e.g. the HRCT patterns) to recent research topics, and online discussion with the experts will be integrated into the learning system. For more information, please visit our website (www.thesociety.org) and the ESTI Booth in the M Building.
Maximilian F. Reiser steps down as Editor-in-Chief of European Radiology

Prof. Maximilian F. Reiser from Munich, Germany, is the outgoing chair of the Ludwig Maximilians University’s department of radiology in Munich, a position he has held since 1993. He also served as Dean of the medical faculty at the LMU from 2008–2016. Prof. Reiser has served the ECR and ESR in many functions, culminating in his ECR presidency in 2008 and ESR presidency in 2010–2011. He has been the Editor-in-Chief of European Radiology since 2014.

See the full story here.
Successful start for ESR’s new journal, European Radiology Experimental

Launched in December 2016, European Radiology Experimental is the newest member of the ESR’s journal family. We spoke to Prof. Francesco Sardanelli, from Milan, Italy, about what the future holds for the new publication.

It is my hope that the new journal will play a pivotal role in promoting innovation – a multifactorial process – and introducing new imaging modalities and techniques for individual risk stratification, diagnosis, prognosis and image-guided therapy (interventional).

ECRT: How did this new journal come into being, what is its overall purpose?

FS: The main aim is to foster a strong connection between radiology in the experimental setting and basic science. This connection is obvious for imaging research concerning phantom studies, cell models and radiology animal models, new modalities/techniques, new contract materials, tracers, therapy, and all their interplays. However, the new journal also welcomes reports on 3D modelling, printing and simulation, advanced teleradiology and new image reconstruction algorithms and post-processing. The sections of the journal were not created according to typical radiological subspecialties or body parts, but according to cross-border topics between medical radiology and basic science.

ECRT: How did you decide on your editorial board?

FS: Our goal was to include non-radiologists in our journal editorial board: physicists, bioengineers, biologists, chemists, information technology experts, as well as pathologists and colleagues from other medical specialties, or any other professionals with an interest in innovation in radiology. Thus, the board is composed of radiologists with a strong commitment to experimental studies and other professionals, especially those involved in basic science working in the world of medical imaging.

ECRT: How will your background help you in your role as Editor-in-Chief?

FS: My experience comes from clinical imaging: breast and cardiovascular imaging have been major areas of interest for me. From the technical side, I dedicated a lot of work to MR imaging/spectroscopy and the clinical use of contrast materials. However, during my career I developed a particular interest in research methodology, statistics, and the application of evidence based medicine in radiology. In my view, the basis for a good scientific paper is the soundness of study design and methods. This is absolutely crucial for studies concerning any type of innovation. Without good methodology we risk creating false hopes or decreasing the chances for new ideas that could change clinical practice in the future. I think that my methodological background will be helpful for selecting articles that can contribute to shaping our future and that I will be able to help authors to correct weaknesses in their manuscripts.

ECRT: What do you think the biggest challenge will be for European Radiology Experimental in the beginning?

FS: I predict two big challenges. The first is to attract scientists who are not radiologists but work for the progress of medical imaging. If they consider European Radiology Experimental as their journal, that will be a big success. The second is to convince radiologists working in the experimental setting that the new journal, with its particular scientific profile and its gold open access status, is the most suitable tool for giving their work the best visibility as a premise for large clinical studies.

ECRT: Do you have any advice for aspiring authors who would like to submit to European Radiology Experimental?

FS: First, authors should verify that their manuscript corresponds with the aims and scope of the journal. Second, the instructions for authors should be read carefully and all requirements should be fulfilled. Third, authors should make sure that their manuscript has intrinsic value.

ECRT: The Impact Factor is still considered an important measure of a journal’s success; do you think the initial lack of an Impact Factor can be compensated by other things?

FS: The Impact Factor is an important measure of a journal’s success, but it is no longer considered the only measure for an author’s or articles success. Other metrics, such as the number of quotations and the h-index are increasingly considered. This means that the accessibility of a paper through open access is very important for authors.

Dr. Francesco Sardanelli is Professor of Radiology and Director of the Postgraduate School in Radiodiagnosis at the University of Milan, Italy, and the first Editor-in-Chief of European Radiology Experimental.

ECR Today: As the recently appointed first Editor-in-Chief of European Radiology Experimental, what are your hopes and plans for the journal?

Francesco Sardanelli: Medicine is becoming increasingly innovative and the medical specialties involved in this process will be in a very good professional position in the future. This is also true for medical imaging. The role of radiologists in the next decades depends on their ability to be a major part of this movement.

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Your new journal in medical imaging for basic scientific discoveries, novel approaches and techniques in experimental settings

Fully Open Access
In recognition of his pioneering contribution to the advancement of interventional radiology, Professor José Ignacio Bilbao Jaureguizar, from Pamplona, Spain, will be awarded the ESR Gold Medal at ECR 2017.

José Ignacio Bilbao Jaureguizar is professor of radiology head of interventional radiology, and a consultant radiologist at the University Clinic of Navarra (UCN), where he was also previously chairman of the radiology department.

Prof. Bilbao received his medical degree from the medical faculty of Navarra University and completed his residency in radiology at UCN. He trained in interventional radiology at MD Anderson Cancer Center in Houston, United States, and received his PhD with a cum laude award from Navarra University.

His combined fascination for medicine and art led him to study radiology and then later interventional radiology.

"I always loved to study lines and volumes, even before I started studying medicine. I tried to combine my studies with my passion for arts and history. In my fourth year of medicine, I was shown a chest x-ray and I stood impressed: so many lines, spaces and shapes in just one picture! In my sixth year another great teacher showed me surgical capabilities and instruments, and I got another perspective of anatomy. Even though I had trouble deciding between surgery and radiology, I opted for the latter. In 1982, during my residency in Houston, I discovered interventional and vascular radiology and this has become my daily duty ever since," recalled Bilbao.

His research interests are portal hypertension, genore therapy, and percutaneous treatment of tumours, including chemotherapy and embolisation, especially in liver tumours. He is very actively involved in research to this day. “I am interested in all the possibilities offered by my subspecialty even if I have dedicated more time and efforts to two of them, namely oncologic interventionism and hepatic pathology. I have dedicated and still do dedicate a large amount of time to experimental interventional radiology and have worked with a wide variety of animal models. Right now we are working on two projects, one in rabbits on hepatic radioembolisation and another in swine on gene therapy," he added.

Prof. Bilbao is also working together with the Engineers School at Navarra University on fluid dynamics and the distribution of radioembolisation particles based on computational models. "We hope to learn more about how morphology or positioning of the microcatheter inside the vessel light influences the correct distribution of tumour treatment," he added.

Prof. Bilbao is a co-founding member and past-president of the Spanish Society of Vascular and Interventional Radiology. He has served as congress co-chairman of the Cardiovascular and Interventional Radiological Society of Europe (CIRSE) and as a member of its executive committee.

He has authored close to 200 publications and sits on several editorial boards. He has received the Gold Medal of the Spanish Society of Radiology and the Gold Medal of CIRSE.

Having been involved in many leadership roles, he has a broad vision of radiology and expects the field to tighten its links with nuclear doctors while opening up to new skills in other disciplines. He also warns against losing touch with the patient.

"Radiology is in perpetual motion, but I think that morphology and functions will increasingly go hand in hand and our links with nuclear medicine will become tighter. New image specialists will work with other disciplines, such as engineers or biologists, to analyse the large amounts of information that need to be managed. I also think that technological advances must not distract us so much as to lose sight of the patient and population health, true axes of our activity. In interventional radiology as in other subspecialties, we will be included in multidisciplinary teams even more and we will have to learn how to manage and, if the case presents itself, lead case, investigation and teaching," he said.

"I have attended all ECR meetings except in 2007 as I had to sit for a national examination. In 1990 I was invited to moderate a session on musculoskeletal imaging in Room A - I had never been in such a huge lecture hall. I loved everything, the atmosphere of the Austrian Centre Vienna, which hosts the ECR each year; the elegance with which every act is being carried out, the program’s quality and the professionalism of the organising office. I decided I would always attend and it has always surpassed my expectations. I could never have imagined, in the first years, that I would one day sit on the delegates in the opening ceremony. It’s easy to understand how grateful I felt, surrounded by my family, in this moment," he said.

**Outstanding radiologist and former ESR President awarded Gold Medal in today’s opening ceremony**

In recognition of his lifelong achievements in radiology and work in radiation protection, Professor Guy Frijia from Paris, France, will receive the ESR Gold Medal at ECR 2017.

Guy Frijia is professor emeritus of radiology and consultant at the imaging department of Paris Georges Pompidou European Hospital (GPIHS), where he has previously served as chairman. He is also a part-time professor of radiology at the faculty of health sciences of McMaster University in Ontario, Canada.

Prof. Frijia is a recognised expert in thoracic imaging and contrast products and has also helped to introduce information technologies to daily radiological practice. Recently, his main area of research has been radiation protection and he has cooperated in the establishment of guidelines and protocols in France.

He is a member of the scientific committee of the Institute for Radiological Protection and Nuclear Safety, co-chair of the imaging section of MEDIHC, a French business cluster specialising in biomedical engineering, and chair of the imaging committee of ESR.

Prof. Frijia has served in many leadership roles, notably as president of the European Society of Radiology from 2013 to 2015. Under his presidency, the ESR tackled many key issues including education, accreditation, imaging biomarkers, clinical decision support, and radiation protection. He previously served as General Secretary of the European Association of Radiologists, the forerunner of the ESR, and subsequently as a member of the Executive Council of the ESR.

He has also presided over the French Society of Gastroenterology for 12 years, turning it into the most important scientific society in France, and the International Society for Strategic Studies in Radiology in 2007.

"I was an advisor to the French Ministry of Health for the deployment of PACS in the country and is a former AAEA consultant. Professor Frijia is Doctor Honoris Causa of the University of Montreal, and an honorary fellow of several radiological societies. He was appointed Knight of the French Order of the Legion of Honour in 2008.

He has published more than 175 papers in peer-reviewed journals and co-written 30 books.

**Professor José Ignacio Bilbao from Pamplona, Spain, will be awarded the ESR Gold Medal during today’s Opening Ceremony.**

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The extraordinary era of innovation in radiology, the French experience

How can radiology assess innovation?

It can be done from the user perspective by changing the solution or a part of the service (e.g., connected devices), changing the user's activity (e.g., introducing new ablation techniques), or being aware of new technologies, and not yet used in radiology, and having an impact on indication in cerebral mechanical thrombectomy. Another way to innovate is to have a look at new technologies, even those not intended for radiological use. The French Society of Radiology (Société Française de Radiologie – SFR) has decided to promote this approach in order to support innovation. In this regard, close collaboration was established between the SFR and the French competitiveness clusters that actively promote collaborative research and international development such as Medizin. As a leader in promoting innovation for start-ups and enterprises involved in health located in the area of Paris, the Innovation Committee of the SFR was created in 2015. It includes radiologists in public and private practice, biomedical engineers, radiophysicists and professionals from MEDICEN Paris Région, SNTEN (national union of industry in the field of medical technology) and from other organisations involved in the field of research (INRIA) or medical counselling.

Each year, during the Journées Françaises de Radiologie diagnostique et interventionnelle (JFR) the SFR-Medizin-SNTEN award, including the Innovation Award and the coup de cœur award is awarded to two start-ups for developing innovative concepts. Ten to twelve start-ups are selected by the Innovation Committee to exhibit at the JFR congress in a dedicated area – the Innovation Village – near the technical exhibition. Interactive meetings are facilitated between start-ups, firms and radiologists. Start-ups are invited to attend scientific sessions, especially research sessions, and benefit from media coverage during the congress. For instance, during JFR 2015, the award for Improving LLETIC for their creative solution that allows non-destructive and real-time analysis of biopsy specimens in the radiological room. During JFR 2016, the coup de cœur was awarded to Litterum for having developed a catheter allowing a qualitative analysis of thrombs which could have an impact on indication in cerebral mechanical thrombectomy. Coaching to build-up experimental and clinical research, radiological expertise on the relevancy of innovations and the existence of future markets are services offered by the Innovation Committee to start-ups, in addition to collaboration with incubators and accelerators of start-ups provided by major engineering schools involved in health technologies.

Organizational innovation is also a challenging task for the SFR, which now has to deal with population ageing and growing number of referrals. It will be the radiologist’s job with the advent of artificial intelligence, predictive medicine and big data management. Imag- ing societies have a major role to play as ‘design thinkers’ driving innovation, a role already taken on by the SFR.

Professor Hélène Vernhet Kovacsik is head of the department of cardiovacular and interventional radiology at the Centre Hospitalier Universitaire de Montpellier and a member of the Innovation Study Group of the SFR. Dr. Julien Simonet is a member of the Innovation Study Group of the SFR. Prof. Jean-Yves Gauvrit is head of the department of neuro-radiology at the Centre Hospitalier Universitaire de Rennes. Prof. Jean-François Meder is head of the department of neuroradiology at the Centre Hospitalier Saint-Antoine in Paris and President of the SFR.
Performing effective examinations depends upon gaining the cooperation of the child, which means examinations are age dependent. In younger and uncooperative children, sedation or general anaesthesia may be required. The needs of parents or carers should also be understood and addressed when considering any paediatric service.

At the Society’s 53rd Annual Meeting and 39th Postgraduate Course from May 28 to June 3, 2017, professionals and friends will meet in Davos, Switzerland. The meeting venue is the Congress Center of Davos. We will discuss both new scientific and technical innovations from the diagnostic and interventional field. There have been several new challenges in the field of paediatric radiology with the emergence of the Zika virus epidemic in Latin America affecting mothers and their newborns, and the migration crisis in Europe involving children and young adults of unknown age. Both topics challenge medical and legal systems and cause dilemma which will be discussed in depth with leading physicians, radiologists and specialised research groups.

These global and intricate challenges underscores the importance of an integrated approach between international radiological and paediatric organisations whose goals reflect and complement those of the ESPR. For many decades, European paediatric radiologists have been actively involved in worldwide outreach initiatives, on an individual basis, or through international regional and global aid organisations.

Their current involvement mainly focuses on course education, hands-on training and diagnostic consultation (more recently, via teleradiology services). Within the European Union, the ESPR has well-established collaboration with the European Society of Radiology (ESR) via the European School of Radiology (ESOR) [www.esor.org]. This particular collaboration focuses on organising both basic and advanced imaging courses, in particular within areas of perceived need, including Eastern and Central European countries, as well as offering exchange programmes for paediatric imaging fellowships to centres of excellence within the EU. Furthermore, in 2016 the ESPR initiated and financially supported a new ‘Essentials in paediatric radiology and imaging’ course (Level 1-2), which was organised and run as an inter-university project by the University of Medicine and Pharmacy (UMF) ‘Iuliu Hatageas’ in Cluj-Napoca, Romania and the Division of Paediatric Radiology within the Department of Radiology at the Medical University of Graz (MUG), Austria, in cooperation with the Paediatric Radiology Group of the Romanian Radiological Society (GRP-SIRM). The course was set up to provide basic training in paediatric radiology, addressing important needs within Central and Eastern European areas, where no established paediatric radiology exists, and where there is no access or restricted availability to teaching, expertise, and best practice within paediatric imaging.

Besides plenary lectures covering all aspects of basic paediatric radiology needs, the course included workshops in small groups and participation in practical (hands-on) procedures. The evaluation of the course by the participants was very positive. As a consequence of this success and due to the large number of applicants (of which many had to be rejected because of limited capacity) the faculty decided to offer a similar basic teaching course on paediatric radiology in 2017.

A fundamentally important global initiative in line with these procedures is the European Board for Paediatric Radiology (EBPR), which was set up to provide training and education. The next European Course in Paediatric Radiology (ECPR), organised annually by the ESPR, will be the first course of this newly developed three-year cyclical educational curriculum. It will be held in Utrecht, the Netherlands from October 11 to 13, 2017 (www.ecpr2017.org). The theme of ECPR 2017 will be paediatric musculoskeletal imaging, covering state-of-the-art imaging in paediatric accidents and non-accidental trauma, rheumatology, orthopaedic diseases, oncology and skeletal dysplasia. The scientific programme will include state-of-the-art plenary lectures with several interactive hands-on and case-based sessions, presented by an international faculty of renowned speakers in the field of paediatric and musculoskeletal radiology. At the end of the course a written examination will be administered as part of the new EDiPR.

This examination will reflect the content of the ECPR course and will also include questions on anatomy and techniques. Performing clinical research within paediatric radiology poses a major challenge, due to the comparatively low prevalence of many disease entities in children and the resulting sample size constraints. Cooperation with global institutions and joint ventures within industry is key. The Paediatric Research Committee, led by Prof. Karen Rosendahl and the European Excellence Network in Paediatric Radiology (EENPR), led by Prof. Erich Sorantin, brings experts within the fields together to co-ordinate the various research platforms. Moreover, the ESPR has few very active task forces: child abuse, CT and dose, musculoskeletal, neuroradiology and uro-imaging. It is worth mentioning that the ESPR has been a shareholder of the European Institute for Biomedical Imaging Research (EIBIR) since 2011. To facilitate translational research, the Guy Sebag Research Grant for Clinical, Basic or Translational Research in Paediatric Radiology is awarded every second year during the Annual Meeting of the ESPR. Through these initiatives the ESPR is making research one of its key institutional aims.

The ESPR’s official journal, Pediatric Radiology, plays an important role in the distribution of relevant educational and scientific material, and is led by Dr. Dyrren Olsen, Editor-in-Chief. Pediatric Radiology informs its readers about recent advances and highlights progress in all areas of paediatric imaging and related fields. This is achieved by a blend of original papers, complemented by reviews that set out the present state of knowledge within a particular area of the specialty or summarise specific topics in which discussion has led to clear recommendations and conclusions.

Do not hesitate to visit the ESPR website for further information on upcoming projects, and to find out how to become a member and contribute to the progress of paediatric imaging within and beyond Europe. www.espr.org
Georgian Association of Radiology hosts its 4th international congress

Radiology is the most rapidly developing field of medicine in Georgia, and the Georgian Association of Radiology (GAR) plays a crucial role in promoting radiological innovations, installation of new diagnostic equipment and training of specialists who have improved the radiological service in the country. Geogian hospitals are now equipped with most modern imaging tools and in comparison to past years there is a relatively less disparity in radiological services between the capital and the provinces. It can be stated that with an established network of radiological services and trained specialists, Georgia has become a regional leader in diagnostic imaging within the southern Caucasian and Central Asia. There is also some medical diagnostic tourism from neighbouring countries to Georgian hospitals.

Defensive medicine is another practice performed by healthcare providers to safeguard themselves from patients’ claims while disregarding improvements in patients’ health. It can take the form of inappropriate examinations due to fear of liability, combined with inappropriate referrals for high-risk procedures. It can also be an unnecessary and costly, but is also an unnecessary risk for the patient when performed with imaging radiation (in radiology and nuclear medicine), in spite of recent determinations by scientific societies to promote radiological responsibility and imaging appropriateness. Moreover, many medical arts (imaging, therapy and intervention) contribute to wasted money and decreased levels of safety in contemporary medicine.

Inappropriateness in medical imaging is not only extremely costly but is also an unnecessary risk for the patient when performed with imaging radiation (in radiology and nuclear medicine), in spite of recent determinations by scientific societies to promote radiological responsibility and imaging appropriateness. Moreover, many medical arts (imaging, therapy and intervention) contribute to wasted money and decreased levels of safety in contemporary medicine.

The Italian Society of Cardiovascular Radiological Imaging (SIRMI) is an independent scientific organization formed with the aim of promoting medical imaging and interventional cardiology in Italy. It has been promoting the development of cardiac imaging in Italy for over 25 years and represents about 400 imaging cardiologists. It is a small, academic society that promotes the development of medical imaging in Italy and is a member of the European Society of Cardiac Imaging (ESCI).

Inappropriate cardiac CT examinations are performed worldwide and about half of these are cardiovascular examinations. According to recent estimates, at least one-third of all examinations are partially or totally inappropriate, in other words the risks and costs outweigh the benefits. The number of appropriate cardiac CT examinations is still around 20% today, and was around 30% a few years ago. Following the guidance of the American College of Cardiology Foundation, an appropriate imaging study is one in which the expected incremental information, combined with clinical judgement, exceeds any expected negative consequences by a sufficiently wide margin for a specific indication so that the procedure is generally considered acceptable care and a reasonable approach for the indication. Negative consequences include the risks of the procedure itself (e.g., radiation or contrast exposure) and the downstream impact of poor performance or inappropriate inappropriate tests (false negatives) or inappropriate diagnosis (false positives). This implies potential harm for patients undergoing imaging (who take the risks of an imaging study without a commensurate benefit), excessive delay in the waiting lists for other patients needing the examination and an exorbitant cost for society, with no improvement and possibly a reduction in quality care.

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Special Exhibition:
Contemporary Art. Andy Warhol to Anselm Kiefer

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WHAT’S ON TODAY IN VIENNA?

WEDNESDAY, MARCH 1, 2017

THEATRE & DANCE

Ludwig II
based on Luchino Visconti’s movie

AKADEMIETHEATER | 20:00
1030 Vienna, Lisztstraße 1
Phone: +43 1 51444 4145
www.burgtheater.at

Hexenjagd
by Arthur Miller

BURGTHEATER | 19:00
1010 Vienna, Universitätsring 2
Phone: +43 1 51444 4145
www.burgtheater.at

Monsieur Claude und seine Töchter
by Philippe de Chauveron und Guy Laurent
KAMMERSPIELE DER JOSEFSTADT | 19:30
1010 Vienna, Rotenturmstraße 20
Phone: +43 1 42 700 300
www.josefstadt.org

Diese Mauer fasst sich selbst zusammen
und der Stern hat gesprochen, der Stern
hat auch was gesagt
by Miroslava Svolíkova

SCHAUSPIELHAUS | 20:00
1090 Vienna, Porzellangasse 19
Phone: +43 1 317 01 01
www.schauspielhaus.at

Sieben Sekunden Ewigkeit
by Peter Turrini
THEATER IN DER JOSEFSTADT | 19:30
1080 Vienna, Josefstaedter Straße 26
Phone: +43 1 42 700 300
www.josefstadt.org

Medea
by Franz Grillparzer
VOLKSTHEATER | 19:30
1070 Vienna, Neustiftgasse 1
Phone: +43 1 52111 400
www.volkstheater.at

CONCERTS & SOUNDS

Wiener KammerOrchester
Conductor Stefan Vladar
Isabelle van Keulen, violin
W.A. Mozart: Concerto for violin and orchestra d major K 218; L. van Beethoven: Romance for violin and orchestra g major op. 40, Romance for violin and orchestra f major op. 50; F. Schubert: Symphony No. 8 c major D 944

KONZERTHAUS | 19:30
1030 Vienna, Lothringerstraße 20
www.konzerthaus.at

Orchestre Nationale du Capitole de Toulouse
Conductor Tugan Sokhiev
J. Massenet: Don Quijote
MUSIKVEREIN | 19:30
1010 Vienna, Bösendorferstraße 12
www.musikverein.at

Koglmann / Arcari / Pasztor
(Austria/Italy)
PORGY & BESS (JAZZ) | 20:30
1010 Vienna, Riemergasse 11
www.porgy.at

OPERA & MUSICAL

Peer Gynt
by Werner Egk

THEATER AN DER WIEN | 19:00
1060 Vienna, Linke Wienzeile 6
www.theater-wien.at

Heute im Foyer ...
String quartet playing music by
W.A. Mozart a.o.
VOLKSPER | 19:30
1090 Vienna, Währingerstraße 78
www.volkspere.at

Onegin
Ballet by Pyotr Ilyich Tchaikovsky,
choreography by John Cranko
WIENER STAATSOPER | 19:30
1010 Vienna, Opernring 2
www.wiener-staatsoper.at

Schikaneder
Musical by Stephen Schwartz
& Christian Struppeck
RAIMUNDTHEATER | 18:30
1060 Vienna, Wallgasse 18-20
www.musicalvienna.at

Don Camillo & Peppone
Musical by Michael Kunze & Dario Farina
RONACHER | 18:30
1010 Vienna, Sellerstrasse 9
www.musicalvienna.at

Please note that all theatre performances are in German.